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REVISED STANDARDIZED LIFE-SAVING APPLIANCE EVALUATION AND TEST REPORT FORMS (PERSONAL LIFE-SAVING APPLIANCES)

- 1 The Maritime Safety Committee, at its 102nd session (4 to 11 November 2020), approved the *Revised standardized life-saving appliance evaluation and test report forms* (MSC.1/Circ.1628).
- The original forms, as set forth in the *Standardized life-saving appliance evaluation and test report forms* (MSC/Circ.980) and its addenda, were developed on the basis of the requirements of the International Life-Saving Appliance (LSA) Code and the *Revised recommendation on testing of life-saving appliances* (resolution MSC.81(70)) by the Maritime Safety Committee, at its seventy-third session in 2001, with a view to providing guidance on how to conduct tests, record test data and verify tests. The Committee adopted several amendments to the LSA Code and to resolution MSC.81(70). These amendments were incorporated in the original forms which, due to their volume, were presented in six separate circulars, i.e. MSC.1/Circ.1628, MSC.1/Circ.1629, MSC.1/Circ.1630, MSC.1/Circ.1631, MSC.1/Circ.1632 and MSC.1/Circ.1633, pertaining to the equipment addressed in chapters II to VII of the LSA Code, respectively. The forms annexed to this circular apply to the equipment addressed in chapter II of the LSA Code, i.e. personal life-saving appliances (lifebuoys and associated equipment; lifejackets and associated equipment; immersion suits and associated equipment; anti-exposure suits; and thermal protective aids).
- The Committee, at its 107th session (31 May to 9 June 2023), approved draft amendments to the evaluation and test report forms emanating from amendments to resolution MSC.81(70) on thermal manikin tests, for dissemination as MSC.1/Circ.1628/Rev.1. The text of the *Revised standardized life-saving appliance* evaluation and test report forms (personal life saving appliances) is set out in the annex.
- The use of the revised forms will continue to be of benefit to Administrations and other parties, such as manufacturers, test facilities, owners and surveyors, and will be a major help in mutually accepting the type approval of appliances approved by other Administrations.
- Member Governments are invited to bring the annexed revised forms to the attention of all parties concerned with approving, manufacturing and testing of life-saving appliances, and to encourage them to use the forms.
- 6 This circular supersedes MSC.1/Circ.1628.



ANNEX

REVISED STANDARDIZED LIFE-SAVING APPLIANCE EVALUATION AND TEST REPORT FORMS (PERSONAL LIFE-SAVING APPLIANCES)

INTRODUCTION

Reference

These standardized life-saving appliance evaluation and test report forms have been revised on the basis of the requirements of the International Life-Saving Appliance (LSA) Code, as amended through resolution MSC.425(98), the Revised recommendation on testing of life-saving appliances (resolution MSC.81(70)), as amended by resolutions MSC.427(98) and MSC.544(107), and the Recommendation on means of rescue on ro-ro passenger ships (MSC/Circ.810).

Status

In general, the tests described in the Revised recommendation (resolution MSC.81(70)) constitute the test procedures and the LSA Code sets the acceptance criteria. The evaluation and test report forms are guidelines on how to conduct tests, record test data and verify tests. These forms are not intended to change the standards given in the LSA Code and resolution MSC.81(70), as amended. In the case of inconsistency between the forms and the LSA Code or the Revised recommendation, the text of the Code/resolution should prevail over that of the forms.

Layout

Each Administration may use electronically distributed evaluation and test report forms as the basis for customizing the layout to reflect the profile of the approving body, without changing the original contents.

Internal references

The evaluation and test report forms should be stand-alone documents. Therefore, all internal references in the original text from the LSA Code or resolution MSC.81(70) have been replaced by either the full-length text or a reference to other relevant evaluation and test report forms. However, in some of the forms, external references are kept for updating purposes.

Documentation of tests

For approval purposes, all detailed records of test data are to be enclosed with the report forms.

Verification of tests

Each test is to be verified passed or failed by an Administration representative's initials (e.g. recognized organization or surveyor) and date of testing. Each page is to be verified on completion by the Administration representative's signature and its date of completion.

Reporting of type approval

To facilitate unified reporting procedures, the completed evaluation and test report forms are to be seen as a documented verification of required type approval tests for each type of equipment. When documentation of type approval is required by a third party, the verified evaluation and test report forms should constitute the complete documentation of the type approval together with the relevant approval certificates.

REVISED STANDARDIZED LIFE-SAVING APPLIANCE EVALUATION AND TEST REPORT FORMS (PERSONAL LIFE-SAVING APPLIANCES)

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2.1 LIFEBUOYS AND ASSOCIATED EQUIPMENT

2.1.1 LIFEBUOYS

EVALUATION AND TEST REPORT

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2.1.1 LIFEBUOYS EVALUATION AND TEST REPORT

Manufacturer	
Туре	
Date	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

Lifebuoys	Manufacturer: Model: Lot/Serial Number:		Date: Time: _ Surveyor: Organization:	
2.1.1.1	Submitted	drawings, reports and	documents	
			Submitted drawings and documents	Status
Drawing	No.	Revision No. & date	Title of drawing	
	•		Submitted reports and documents	Status
Report/Docu	ment No.	Revision No. & date	Title of report / document	
			Maintenance Manual -	
			Operations Manual -	

Lifebuoys	Manufacturer: Model: Lot/Serial Number:	Date: Time: Surveyor: Organization:	
2.1.1.2	Quality assurance	Regulations: MSC.81(70) 2/1.1, 1.2	
or the International Life-Saving Appliance (LSA) Code, to be inspected, representatives of the Administration should make random inspection of		Quality Assurance Standard Used: Quality Assurance Procedure:	Passed/ Failed Passed/ Failed
	s to ensure that the quality of life-saving appliances and the ed comply with the specification of the approved prototype bliance.	Quality Assurance Manual:	Passed/ Failed
ensure that life prototype life- records of a	s should be required to institute a quality control procedure to e-saving appliances are produced to the same standard as the saving appliance approved by the Administration and to keep any production tests carried out in accordance with the a's instructions.		

Lifebuoys	Model:		Date: Time: Surveyor: Organization:		
2.1.1.3 \	isual inspection		Regulations: LSA Coo	de 1.2.2	
	Test Procedure	Acceptance C	riteria	Sig	nificant Test Data
, ,	pect the lifebuoy. Conduct s and verify characteristics as	,		Colour(s): Passed Quantity:	Failed Spacing:
				Passed	Failed
				Any operational restrictions?	
		Clearly marked with approval information from the organization that approved it and any operational restrictions.		Passed	_ Failed
	restrictions.		Comments/Observa	itions	

	Manufacturer:			Time:	
Lifebuoys			Surveyor:		
Lot/Serial Number: C		Organization:			
2.1.1.3	/isual inspection (continued)		Regulations: LS	SA Code 2.1.1	
	Test Procedure	Acceptance Crite	eria	Significant Test Data	
It should be established by measurement, weighing and inspection that: Be constructed of inherently buoyan it should not depend upon rush shavings or granulated cork, any or granulated material or any air cor which depends on inflation for buoyar Measure the inner and outer diameter. Should have an outer diameter of not		n rushes, cork any other loose air compartment buoyancy.	Construction materials: Outer diameter: mm Inner diameter: mm Mass: kg		
Weigh the lifebuoy. If it is intended to operate the quick-release arrangement provided for a self-activated smoke signal and self-igniting light, conduct the test in 2.1.1.10. Iess than 400 mm Not designed for quick release Should have a mass of not less than 400 mm In the signal and self-igniting light, conduct the test in 2.1.1.10.		Not designed for quick release:		Type / description of quick release arrangement: Does the lifebuoy have sufficient mass to activate the quick-release arrangement for a self-activated smoke signal	
				and self-igniting light? Passed/ Failed Weight: kg Grab-line diameter: mm	
		n four times the of the buoy in ecured at four circumference of	Grab-line length: mm Buoy outer diameter times four: mm Grab-line four times the outer diameter of body? Passed/ Failed Grab-line secured in four equal loops? Passed/ Failed Comments/Observations		

	Manufacturer:		Date:	Time:	
Lifebuoys	Model:		Surveyor.		
	Lot/Serial Number:		Organization:		
2.1.1.4 7	I Femperature cycling test		Regulations: LSA Code 1.2.2	2; MSC.81(70) 1 / 1.2	
	Test Procedure	Acceptano		Significant Test Data	
The following two lifebuoys.	test should be carried out on	Not be damaged in stowage to range -30°C to + 65°C	hroughout the air temperature	Passed Failed	
	ys should be alternately surrounding temperatures of 5°C.	The lifebuoys should show no s		(See following page for test data)	
Those alternating evelor need not follow da		temperatures and, after the tests, should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities.		Intact after this test? Lifebuoy No. 1 Observations on rigidity under high temp	
An 8 h expos	ure at a minimum temperature e completed in one day			Observations after testing for shrinking, crack etc.	king
chamber that under ordina	ens removed from the warm to same day and left exposed ary room conditions at a of 20°C ± 3°C until the next			Lifebuoy No. 2 Observations on rigidity under high temp	
day				Observations after testing for shrinking, crack etc.	king
An 8 h exposure at a maximum temperature of -30°C to be completed the next day				Intact after these tests?	
chamber that	ens removed from the cold t same day and left exposed			lifebuoy No.1: Passed/ Failed	
	ary room conditions at a of 20°C ± 3°C until the next			lifebuoy No.2: Passed/ Failed	
,.				Comments/Observations	

Lifebuoys	Manufacturer: Model: Lot/Serial Number:			Date: Time: Surveyor: Organization:				
2.1.1.4	2.1.1.4 Temperature cycling test – Test data			Regulations: LSA Code I/1.2	.2; MSC.81(70) 1	/1.2		
	•		OT CYCLE				D CYCLE	
Cycle 1	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: Time In: Temperature:		Date Out: Time Out: Duration:	
Cycle 2	Date In: Time In: Temperature:	0C	Date Out: Time Out: Duration:	hours	Date In: Time In: Temperature:		Date Out: Time Out: Duration:	
Cycle 3	Date In: Time In: Temperature:		Date Out: Time Out: Duration:	hours	Date In: Time In: Temperature:		Date Out: Time Out: Duration:	
Cycle 4	Date In: Time In: Temperature:	0C	Date Out: Time Out: Duration:	hours	Date In: Time In: Temperature:	oC	Date Out: Time Out: Duration:	
Cycle 5	Date In: Time In: Temperature:		Date Out: Time Out: Duration :		Date In: Time In: Temperature:		Date Out: Time Out: Duration:	
Cycle 6	Date In: Time In : Temperature :		Date Out: Time Out: Duration :		Date In: Time In: Temperature:		Date Out: Time Out: Duration:	
Cycle 7	Date In: Time In : Temperature :		Date Out: Time Out: Duration:		Date In: Time In: Temperature:		Date Out: Time Out: Duration:	
Cycle 8	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: Time In: Temperature:		Date Out: Time Out: Duration:	
Cycle 9	Date In: Time In: Temperature:		Date Out: Time Out: Duration:_	hours	Date In: Time In: Temperature:	o_C	Date Out: Time Out: Duration:_	
Cycle 10	Date In: Time In: Temperature:		Date Out: Time Out: Duration:	hours	Date In: Time In: Temperature:		Date Out: Time Out: Duration:	hours

	Manufacturer:		Date: Time:		
Lifebuoys Model: Lot/Serial Number:			Surveyor:		
			Organization:		
2.1.1.5	Prop test		Regulations: LSA Code	2.1.1.6; MSC.81(70) 1 / 1.3	
	Test Procedure	Acceptance (Criteria	Significant Test Data	
upper edge vi lower edge of which it is inte their lightest is whichever is it the water with In addition, on suspended fro device so that	should be suspended from its a a release device so that the the lifebuoy is at the height at nded to be stowed on ships in seagoing condition, or 30 m, the greater, and dropped into out suffering damage. e lifebuoy should be m its upper edge via a release the lower edge of the lifebuoy of 2 m, and dropped three oncrete floor.	Be constructed to withstand a the height at which it is stowed a lightest seagoing condition or greater, without impairing either that of its attached components The lifebuoy should withstand t of 2m on to a concrete floor with	above the waterline in the 30 m, whichever is the its operating capability or .	Number of lifebuoys: Lifebuoy no. 1 Drop height in water: Number of drops: Passed/ Failed Lifebuoy no. 2 Drop height in water: Number of drops: Passed/ Failed Condition lifebuoy no. 1: Passed/ Failed Condition lifebuoy no. 2: Passed/ Failed Lifebuoy selected for 2m drop height on conductor 1: Passed/ Failed Drop 1: Passed/ Failed Drop 2: Passed/ Failed Drop 3: Passed/ Failed Comments/Observations	_m _m _m _m

Lifebuoys	Manufacturer: Model: Lot/Serial Number:		Date: Tir Surveyor: Organization:	
2.1.1.6	Test for oil resistance	Regulations: LSA	Code 1.2.2; MSC.81(70) 1 / 1.4	
	Test Procedure	Ac	ceptance Criteria	Significant Test Data
for a period o	ebuoys should be immersed horizontally f 24 h under a 100 mm head of diesel oil m temperature.	damage such as	lifebuoy should show no sign of shrinking, cracking, swelling, e of mechanical qualities.	Lifebuoy No. Diesel oil head:mm Duration:hours Signs of damage? Passed Failed Comments/Observations

Lifebuoys	Manufacturer: Model: Lot/Serial Number:		Surveyor:	Time:
2.1.1.7 F	ire test		Regulations: LSA Cod	e 2.1.1.5; MSC.81(70) 1/1.5
	Test Procedure	Acceptance C	riteria	Significant Test Data
fire test. A test should be draught-free at the bottom of followed by minimum total. The petrol stallowed to bure. The lifebuoy stallower in an exposition, with 25 cm above to should be	buoy should be subjected to a st pan 30 cm x 35 cm x 6 cm placed in an essentially area. Water should be put in the test pan to a depth of 1 cm enough petrol to make a depth of 4 cm. Thould then be ignited and in freely for 30 s. Thould then be moved through upright, forward, free-hanging the bottom of the lifebuoy the top edge of the test pan so ion of exposure to the flames	The lifebuoy should not susta melting after being removed fro		Lifebuoy No. Dimensions test pan:xxcm Water depth:cm Depth incl. petrol:cm Exposure time:seconds Sustain burning or continue melting after being removed from the flame Passed/ Failed Comments/Observations

Lifebuoys	Manufacturer: Model: Lot/Serial Number:		Date: Time: Surveyor: Organization:					
2.1.1.8 F	lotation test		Regulations: LSA Cod	e 2.1.1.3; MSC.81(70) 1/	1.6			
	Test Procedure	Acceptance C	Criteria	Signific	ant Test Data			
tests should be not less than 1	uoys subjected to the above be floated in fresh water with 4.5 kg of iron suspended from and should remain floating for h.	deformation. The lifebuoys should float throughout the 24 h test period.		Lifebuoy no. 1 Lifebuoy no. 2 Suspended mass: kg kg Float duration: min min Intact after this test? Passed/ Failed Float for entire test period? Passed/ Failed Comments/Observations				
2.1.1.9 S	Strength test		Regulations: LSA Code 1.2.2; MSC.81(70) 1/1.7					
	Test Procedure	Acceptance C	e Criteria Significant Test Data					
50 mm wide st passed around with a 90 kg r	dy should be suspended by a trap. A similar strap should be di the opposite side of the body nass suspended from it. After lifebuoy body should be	similar strap should be posite side of the body spended from it. After		Significant Test Data Lifebuoy No. Suspended mass:kg Suspension duration:min Passed/Failed Comments/Observations				

	Manufacturer: Model:	Date: Time: Surveyor:		
Lifebuoys	Lot/Serial Number:	Organization:		

2.1.1.10 Test for operation with a light	and smoke signal	Regulations: LSA Co	de 2.1.1.7; MSC.81(70) 1/1.8
Test Procedure	Acceptance C	riteria	Significant Test Data
The tests should be carried out if the lifebuoy is intended for quick release with a light and smoke signal. The lifebuoy should be arranged in a manner simulating its installation on a ship for release from the navigating bridge. A lifebuoy light and smoke signal should be attached to the lifebuoy in the manner recommended by the manufacturers.	The lifebuoy should be release both the light and the smoke si. The weight of the lifebuoy should be release both the light and the smoke si.	gnal.	Lifebuoy No. Type / description of quick activating arrangement: Type of light and smoke signal: Light activated? Passed/ Failed Smoke activated? Passed/ Failed, Weight of the lifebuoykg Length of the line connected to the lifebuoym Passed Failed Comments/Observations

2.1.2 LIFEBUOY SELF-IGNITING LIGHTS EVALUATION AND TEST REPORT

Remark:	If a lifebuoy self-igniting light is a combined light/smoke signal it should be treated as a sole lifebuoy self-igniting light.
2.1.2.0	Quality assurance
2.1.2.1	General information 2.1.2.1.1 General data and specifications 2.1.2.1.2 Submitted drawings, reports and documents
2.1.2.2	Visual inspection 2.1.2.2.1 Approval marking 2.1.2.2.2 Expiry marking 2.1.2.2.3 Additional markings 2.1.2.2.4 Electrical short circuit protection 2.1.2.2.5 Construction and materials 2.1.2.2.6 Colour of lifebuoy light
2.1.2.3	Temperature cycling test
2.1.2.4	Light tests
2.1.2.5	Chromaticity test
2.1.2.6	Rain test and watertightness test
2.1.2.7	Case resistance test
2.1.2.8	Lens drop test
2.1.2.9	Floatation test
2.1.2.10	Drop test
2.1.2.11	Fitting test
2.1.2.12	Release and operation test
2.1.2.13	Vibration test
2.1.2.14	Mould growth test
2.1.2.15	Corrosion and seawater resistance test
2.1.2.16	Solar radiation test
2.1.2.17	Test for oil resistance
2.1.2.18	Fire test

2.1.2 LIFEBUOY SELF-IGNITING LIGHTS EVALUATION AND TEST REPORT

Manufacturer	
Туре	
Date	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

Lifebuoy self-igniting lights	Manufacturer: Model: Lot/Serial Number:	Surveyor:			
2.1.2.0 Quality assuran	ce	Regulat	tions: MSC.81(70) 2/1.1, 1.2		
Except where all appliances of the International Convention for or the International Life-Savi representatives of the Admir manufacturers to ensure that materials used comply with life-saving appliance. Manufacturers should be requensure that life-saving appliance prototype life-saving appliance.	f a particular type are required by chapter III of or the Safety of Life at Sea, 1974, as amended, ng Appliance (LSA) Code, to be inspected, histration should make random inspection of the quality of life-saving appliances and the the specification of the approved prototype dired to institute a quality control procedure to ces are produced to the same standard as the exapproved by the Administration and to keep tests carried out in accordance with the	Quality /	Assurance Standard Used: Assurance Procedure: Assurance Manual:	Passed/ Failed Passed/ Failed Passed/ Failed	

Model:				Date: Time: Surveyor: Organization:		
2.1.2.1.1 General data and	d specification	ns	Regulation	ns: LSA Code; MSC.81(70)		
General Information	on	Lifejacket Li	febuoy Light	Dimensions	Lifejacket Lifebuoy Light Weight	
TYPE OF SWITCHING					Details of Bulb, Battery & Voltages:	
FLASHING LIGHT					Comments/Observations	
STEADY LIGHT						

Lifebuoy self-igniting lights Model: Lot/Serial Nu		r:	Date: Time: Surveyor: Organization:				
2.1.2.1.2 Submitt	2.1.2.1.2 Submitted drawings, reports and documents Submitted drawings and documents						
Drawing No. Revision No. & date				Title of drawing		Status	
	<u> </u>						
	1						
	•		Submitted reports and doc	uments		Otatus	
Report/Document No.	Revis date	ion No. &		Title of report / document		Status	
			Maintenance Manual -				
			Operations Manual -				
	-						

Lifebuoy self-igniting lights Manufacturer: Model: Lot/Serial Number:			Surveyor:				
2.1.2.2 Visual Inspection	1		Regulation	Regulations: LSA Code 1.2.2.1/1.2.2.6/1.2.2.9/1.2.2.10/1.2.3			
Test Procedure		Acceptance 0	Criteria		Significant T	est Data	
Thirteen lifebuoy self-igniting lig should be examined in detail fo following items:					Results:	FAIL:	
Approval marking		 be clearly marked with approve Administration which approved restrictions; 					
		- be marked with a date of expiry;			PASS:	FAIL:	
Expiry marking		The Administration should determine	e the:		Results: PASS:	FAIL:	
Ехрігу такінд		period of acceptability, owing to deterioration with age. The established life must be justified by the manufacturer.		17.00.	TAL.		
Additional markings		Be provided the following information precise definition of intended use (e.		self- igniting	Results:		
		light"); serial number;			PASS:	FAIL:	
		identification of the manufacturer; where applicable, information on pr words: "DO NOT INCINERATE / DO TAMPER";			PASS: PASS: PASS:	FAIL: FAIL: FAIL:	
Electrical short circuit protection	n	be provided with electrical short of damage or injury;	circuit protec	ction to prevent	Results: PASS: Comments/Observations	FAIL:	

2.1.2.2 Visual Inspection (continued)	Regulations: LSA Code 1.2.2.1/1.2.2.6/1.2.2.9/1.2.2.10/1.2.3					
Test Procedure	Acceptano	ce Criteria	Significant Test Data			
	The lifebuoy self-igniting lights	should:	Results:			
Construction and materials	- be constructed with proper v	vorkmanship and materials.	PASS:	FAIL:		
Colour of lifebuoy light	 be of an international or vividence comparably highly visible coassist detection at sea 	d reddish orange, or a lour on all parts where this will	PASS: Comments/Observat	FAIL:		

forms Chromaticity Test					
orms Chromaticity Test					
light 5 Lens Drop Test 2.1.2.8 (if fitted)					
t 7 then performs Release/Operation Test 2.12					
f					

Lifebuoy self igniting lights Model:		er:umber:		Surveyor:			
2.1.2.	3 Temperature cyclin	ng test		Regulations	s: LSA Code 1.2.2.2	; MSC.81(70) 1/ 1.2, 1.2.1,	, 1.2.2, 10.2, 10.2.1
	Test Procedure		Acceptano	e Criteria		Signific	ant Test Data
alternately subjected to surrounding temperatures -30°C and at least +65°C. These alternating cycles need not follow immediately after each other and the following procedure, repeated for a total of not less than 10 cycles, is acceptable:		The lifebuoy self-igniting light stowage throughout the air +65°C. The lifebuoy self-ignitin of loss of rigidity under high ten should show no sign of damag swelling, dissolution or change should function after the test.	temperature ng lights sho nperatures a e such as sh	range -30°C to buld show no sign nd, after the tests, nrinking, cracking,	Results: Attach temperature cyspent at each temperature PASS:	ycling chart to record times ature. FAIL:	
2.	an 8 h exposure at temperature of +65° completed in one day; a the specimens remove warm chamber that sar left exposed under or conditions at a temperate ± 3°C until the next day;	to be nd hd from the me day and dinary room ture of 20°C				Comments/Observation	ons
3.	an 8 h exposure at temperature of -30°C to lithe next day; and						
4.	the specimens remove cold chamber that same exposed under ordin conditions at a temperate ± 3°C until the next day.	day and left nary room ture of 20°C					

		Manufactur	anufacturer:			Date:		_ Time:			
1.16.1	16 1 14 11	Model:				Surveyor:					
Litebuo	y self-igniting lights	Lot/Serial Number:				Organization:					
2.1.2.3	Temperature cycli	na test – Test	t data		Regulations	s: LSA Code I/1.2	2.2: MSC.81(70)	1/1.2			
	,	_	T CYCLE	•		egulations: LSA Code I/1.2.2; MSC.81(70) 1/1.2 COLD CYCLE					
	Date In:		Date Out:		Dat	te In:	Time	Date Out:			
Cycle 1	Time In:		Time Out:					Time Out:	<u> </u>		
Cyclo 1	Temperature:	<u>°</u> С	Duration:	hours	Ter	mperature:	<u>°</u> С	Duration:	hours		
	Date In:		Date Out:		Dat	e In:	Time	Date Out:			
Cycle 2	Time In:		Time Out:		In:			Time Out:			
Oyolo L	Temperature:	oC	Duration:			mperature:	oC	Duration:	hours		
	Date In:		Date Out:		Dat	te In:	Time	Date Out:			
Cycle 3	Time In:		Time Out:		ln:			Time Out:			
0,0.00	Temperature:	°C	Duration:	hours		mperature:	°C	Duration:	hours		
	Date In:		Date Out:		Dat	te In:	Time	Date Out:			
Cycle 4	Time In:		Time Out:		ln:			Time Out:			
- ,	Temperature :		Duration:	hours	Ter	mperature:	<u>°</u> C	Duration:	hours		
	Date In:		Date Out:		Dat	te In:	Time	Date Out:			
Cycle 5	Time In:		Time Out:		ln:			Time Out:			
-,	Temperature :	oC	Duration:	hours	Ter	mperature:	oC	Duration:	hours		
	Date In:		Date Out:		Dat	e In:	Time	Date Out:			
Cycle 6	Time In:		Time Out:		ln :			Time Out:			
,	Temperature:	°C	Duration:	hours	Ter	mperature :	°C	Duration:	hours		
	Date In:		Date Out:		Dat	te In:	Time	Date Out:			
Cycle 7	Time In:		Time Out:					Time Out:			
,	Temperature:	oC	Duration:	hours	Ter	mperature:	oC	Duration:	hourshours		
	Date In:					te In:	Time	Date Out:			
Cycle 8	Time In:		Time Out:		ln:			Time Out:			
,	Temperature:	0C	Duration:	hours	Ter	mperature:	0C	Duration:			
	Date In:		Date Out:		Dat	te In:	Time	Date Out:			
Cycle 9	Time In:		Time Out:					Time Out:			
,	Temperature:	oC	Duration:	hours	Ter	mperature:	0C	Duration:			
	Date In:		Date Out:		Dat	e In:	Time	Date Out:			
Cycle 10	Time In:		Time Out:					Time Out:			
,	Temperature:	<u></u> 0C	Duration:	hours	Ter	mperature:	oC	Duration:	hours		

Lifebuoy self-igniting lights		er: Date: Surveyor: Iumber: Organization:		Time:		
2.1.2.4 Light tests		Regulation	ns: LSA Code 2.1.	2/2.1.2.2/2.1.2.3; MSC.81(70) 1/ 10.2.2, 10.4, 10.4.9		
Test Procedure		Acceptance Criteria		Significant Test Data		
One lifebuoy self-igniting light passed the temperature cycling be taken from a stowage temp 30°C and then be operated in seawater at a temperature of -1 lifebuoy self-igniting light which the temperature cycling test taken from a stowage temperature of + third light should be taken from condition and operated in fresh water at ambient temperature of the first hour of op lifebuoy self-igniting lights immersed to a depth of 1 m for	test should berature of - mmersed in °C, another has passed should be perature of mersed in 30°C, and a om ordinary mmersed in ature. At the eration the should be	After immersion, all the lifebuoy self-igniting be extinguished and should continue operathour longer. All of the lights should be of white colour continue to provide a luminous intensity of in all directions of the upper hemisphere of flashing light, flash at a rate of not less that not more than 70 flashes per minute of corresponding effective luminous intensity 2 cd for at least 2 h. (see formula below effective luminous intensity.) The effective luminous intensity is to be formula:	Results: All luminous intensity data is to be attached here. PASS: FAIL: Comments/Observations			
If the voltage at 5 min of opera than the recorded voltage at the it is permissible to use a land same build standard for the test. Using the lowest recorded light output test can be care described below. The voltage of units should be monitored contour 2 h. To make sure that all the provide a luminous intensity than 2 cd in all directions of hemisphere for 2 h operation, to test should be performed:	e end of life op from the light output d voltage, a ried out as of the 3 test cinuously for e test units of not less of the upper	$\left(\frac{\int_{t_1}^{t_2} I dt}{0.2 + (t_2 - t_1)}\right)_{max}$ where: I is the instantaneous intensity, 0.2 is the Blondel-Rey constant and t_1 and t_2 are time - limits of integration in seconds.				

Lifebuoy self igniting lights Model:		facturer: l: erial Number:		Date: Time: Surveyor: Organization:	
	Lot/ Serial 140	Organizatio		Organization.	
2.1.2.4 Light tests (cont	inued)		Regulation	s: LSA Code	2.1.2/2.1.2.2/2.1.2.3; MSC.81(70) 1/ 10.2.2, 10.4, 10.4.9
Test Procedure		Acceptance	Criteria		Significant Test Data
It must be demonstrated that all lights reach the required luminous in all directions of the upper when using a photometer calibrated to the photometric state appropriate National or State Institute (Note: CIE Publ. No. further information.). Luminous all test unit lights should be men photometer directed at the colight source with the test light stable. Luminous intensity measured in a horizontal direction. The first measurement taken at 0° (horizontal) and should be taken in the azimuth intervals to a single measure (vertical). Luminous intensity should be a vertical direction, beginning a of the light source at the poir recorded light output, and recorded through an arc of 180	bus intensity hemisphere which is standards of ate Standard 70 contains intensity of easured by a center of the on a rotating should be ection at the source and gh a 360° at should be aud continue angle at 5° ment at 90° measured in at the center at of lowest continuously	Flashing lights with a flast than 0.3 s may be considered the measurement of their luming should provide the required directions of the upper heming between switching on and luminous intensity (incandes spent below the required luming light switches off should see figure 10.4.1.) Figure 10.4.1 "On-time" matter the same and the	d as fixed/steainous intensity I luminous intensity I treaching to the discence time) minous intensioned be measurement	ady lights for y. Such lights tensity in all time interval the required and all time lity when the disregarded	Comments/Observations All lights operated for first one hour and immersed to a depth of 1m for 1 min as mentioned below 1) Light 1, taken from -30°C, immersed in seawater temperature -10°C 2) Light 2, taken from +65°C, immersed in seawater of +30°C 3) Light 3, taken from ordinary temperature, immersed in fresh water at ambient temperature After immersion as mentioned above, all lifebuoy selfigniting lights continue operated for at least an hour longer: Yes/ No Comments/Observations

Model:				Date: Time: Surveyor: Organization:		
2.1.2.5 Chromaticity test Reg			Regulation	ns: LSA Code	2.1.2.2; MSC.81(7	70) 1/10.2.2, 10.4, 10.4.10
Test Procedure		Acceptance	Criteria		;	Significant Test Data
All measured data of lumino and voltage should be docume. One lifebuoy self-igniting light passed the light tests should be chromaticity to determine that the boundaries of the area "widiagram specified for each of International Commission on (CIE). The chromaticities of the igniting light should be measure of colorimetric measurement which is calibrated to the National or State Standar (Note: CIE Publ. No.15.2 continformation.). Measurement on points of the upper hemispher taken.	ented. It which has be tested for it lies within thite" of the colour by the Illumination lifebuoy selfed by means equipment appropriate ds Institute tains further at least four	The measured chromaticity coor the boundaries of the area of the The boundaries of the area for the following corner coordinates: x 0.500 0.500 0.440 0.300 y 0.382 0.440 0.433 0.344 (International Standard on Color colour tables to be developed by	e diagram as white lights a s: 0.300 0.44 0.278 0.38 urs of Light \$	s per CIE. ire given by 40 32	Results: All chromaticity of PASS: Comments/Obse	data is to be attached here. FAIL: ervations

Lifebuoy self-igniting lights Manufacturer: Model: Lot/Serial Number:				Surveyor:	Time:		
2.1.2.6 Rain test and Wa	tertightness	Test	Regulation 10.4.7	ns: LSA Code 1.2.2	2.8; MSC.81(70) 1/ 10.2.5,		
Test Procedure		Acceptano	e Criteria		Significant	Test Data	
One lifebuoy self-igniting light passed the temperature cycling be subjected to the rain test at IEC 60945:2002, paragraph having passed the rain test, a self-igniting light and its compource should be immersed under not less than 300 mm of for at least 24 h. After that test, the lifebuoy self-should be tested for function. At tested its function, and if it is light, it should be disasse examined for the presence of whether the state of the presence of whether the state of the state of the state of the presence of whether the state of the state of the state of the state of the presence of the state of the state of the presence of the state of the	g test should according to 8.8. After the lifebuoy plete power horizontally fresh water igniting light After having an electric mbled and water.	The lifebuoy self-igniting lights to be used in a seaway, be call in that environment. The lifebuoy self-igniting immersion under water. The lifebuoy self-igniting lig requirements of IEC 60945:20 There should be no evidence self-igniting light.	should be ropable of satistically should the should on the	d function after comply with the bh 8.8.2.	Significant Results: PASS: Comments/Observations	Test Data FAIL:	
prevented from switching during these tests.							

Model:		lumber:		Date: Time: Surveyor: Organization:		
2.1.2.7 Case resistance	test		Regulation	ns: MSC.81(70) 1/	10.2.7	
Test Procedure		Acceptano	e Criteria		Sign	nificant Test Data
One lifebuoy self-igniting light should be placed on its side on a rigid surface and a steel sphere having a mass of 500 g should		way that would affect its watertightness.		Results:		
be dropped from a height of 1.3 m on to the case at least three times. The sphere should strike the case near its centre on		The lifebuoy self-igniting light should function after the test.		PASS:	FAIL:	
one drop, approximately 12 mm from one end of the case on another drop and approximately 12 mm from the other end of the case on the third drop.					Comments/Observat	tions
2.1.2.8 Lens drop test		Regulations: MSC.81(70) 1/1			10.2.6	
Test Procedure		Acceptance Criteria			Significant Test Data	
If a lifebuoy self-igniting light h should be subjected to the dom		The lens should not break or crack.		Results:		
The lifebuoy self-igniting light should be cooled to -18°C and dropped twice from a height of 1 m on to a rigidly mounted steel		The lifebuoy self-igniting light	should functi	on after the test.	PASS:	FAIL:
plate or concrete surface. The distance should be measured from the top of the lens to the impact surface. The lifebuoy self- igniting light should strike the surface on the top centre of the lens.				Comments/Observat	tions	

2.1.2.9 Floatation test		Regulations: LSA Code 1.2.2.8; MSC.81(70) 1/ 10.2.4				
Test Procedure	Acceptano	ce Criteria	Sig	nificant Test Data		
	Test Procedure Acceptance lifebuoy self-igniting light should be cted to the floatation test. If the unit an automatic activation, it should be led during this test. Ilifebuoy self-igniting light should be led to float in water in its normal atting position for 24 h. Ilifebuoy self-igniting light is an electric it should be disassembled at the endertests and examined for the presence			nificant Test Data FAIL:		

Lifebuoy self-igniting lights	Model:	Date: Time: Surveyor: Organization:						
2.1.2.10 Drop test		Regulation	Regulations: LSA Code 2.1.2.4/2.1.1.6; MSC.81(70) 1/ 1.3, 10.2.3					
Test Proce	dure	Acceptance Crite	eria	Significant Test Data				
One lifebuoy self-igniting light visual inspection should be sult and the lifebuoy self-igniting light seleast two drop tests as follows: The lifebuoy self-igniting light water, such that the lower edge at which it is intended to be selightest sea going condition, greater. The lifebuoy self-igniting light selfirst by itself and then attached on sea activated lights this te with the sealing plugs fitted to water which will cause the lights.	should be subjected to at should be dropped into of the light is at a height stowed on ships in their or 30 m, whichever is should be dropped twice, to a lifebuoy.	The lifebuoy self-igniting light should withstand this test without impairing either its operating capability or that of its attached components. The lifebuoy self-igniting light should not suffer damage and should operate satisfactorily after each drop.		Results: PASS: FAIL: Comments/Observations				
2.1.2.11 Fitting test		Regulations: MSC.81(70) 1/ 10.2.8						
Test Proce	dure	Acceptance Crite	eria	Significant	Test Data			
The lifebuoy self-igniting light drop test should be subjected. A force of 225 N should be a lanyard that attaches the lifebuoy.	to the fitting test. pplied to the fitting and	Neither the fitting and lanyard nor the lifebuoy self-igniting light should be damaged as a result of this test. The lifebuoy self-igniting light should function after the test.		Results: PASS: Comments/Observations	FAIL:			
After having passed the fitting subjected to the release and o								

Lifebuoy self-igniting lights	Date: Surveyor: Organization:			or:	Time:				
2.1.2.12 Release and ope	ration test		Regulations: LSA Code 2.1.1.7; MSC.81(70) 1/1.8						
Test Proce	dure	Acce	eptance Crite	eria		Significant Test Data			
One lifebuoy intended for colifebuoy self-igniting light which test and a smoke signal should	n has passed the fitting	The lifebuoy sho self-igniting light.	ould activa	te the	lifebuoy	Results:			
chemical material intended t should be substituted by an eq material. The lifebuoy should b	o produce the smoke uivalent non- dangerous					PASS:	FAIL:		
simulating its installation on a sinavigating bridge. The lifebuoy smoke signal should be attach manner recommended by the lifebuoy should be released.	ship for release from the self-igniting light and a led to the lifebuoy in the					Comments/Obse	ervations		
2.1.2.13 Vibration test		Regulations: LSA Code 1.2.2.1/1.2.2.8; MSC.81(70) 1/ 10.4, 10.4.1							
Test Proced	dure	Acceptance Criteria					Significant Test Data		
One lifebuoy self-igniting light visual inspection should be sub according to IEC 60945:2002 p	jected to a vibration test	The lifebuoy self-igniting light should be				Results: PASS:	FAIL:		
	The lifebuoy self-igniting light should function after the test.		Comments/Observations						

Lifebuoy self-igniting lights	Manufacturer: Model: Lot/Serial Number:									
2.1.2.14 Mould growth te	st		Regulations: LSA Code 1.2.2.4; MSC.81(70) 1/10.4, 10.4.2							
Test Proced	dure	Acce	eptance Crite	ria	Significa	ant Test Data				
One lifebuoy self-igniting light visual inspection should be sub		The lifebuoy self-ig and not be unduly			Results:	5 40				
growth test.					PASS:	FAIL:				
The lifebuoy self-igniting light s spraying with an aqueous susp containing all the following cult	ension of mould spores	There should be n naked eye and the should function after	ne lifebuoy		Comments/Observa	tions				
Aspergillus niger; Aspergillus to pullulans; Paecilomyces varioti funiculosum; Penicillium ochrobrevicaulis; and Trichoderma v	i; Penicillium chloron; Scopulariopsis									
The lifebuoy self-igniting craft placed in a mould growth charmaintained at a temperature relative humidity of not less the incubation should be 28 days lifebuoy self-igniting light should (Note: The mould growth test)	amber which should be of 29°C +/- 1°C and a an 95 %. The period of s. After this period the d be inspected.									
the manufacturer is able to pro external materials employed w	duce evidence that the									

Lifeb	uoy self-igniting lights	Manufacturer: Model: Lot/Serial Number:			Surveyor:				
2.1.2		eawater resistance test		Regulations: LSA Code 1.2.2.4; MSC.81(70) 1/ 10.4, 10.4.4					
	Test Prod	cedure		Acceptance			Significant Test Data		
inspe seaw	ction should be subje	which has passed the visual cted to a corrosion and ording to IEC 60945:2002,	The lifebuoy self-igniting light should be corrosion resistant and not be unduly affected by seawater.			Results: PASS:	FAIL:		
(Note	: If there are no exposed	I metal parts the Corrosion ance Test need not be	comply with t paragraph 8.1 There should	Furthermore, the lifebuoy self-igniting light should comply with the requirements of IEC 60945:2002, paragraph 8.12.2. There should be no undue deterioration of metal			servations		
.2	be waived where the	water Resistance Test may manufacturer is able to be external metals employed	parts and the lifebuoy self-igniting light should function after the test. Where the exposed metal is part of the automatic switch sensor, the function test after the 28-day test						
.3	Automatic activated ve from switching during th	rsion should be prevented e test.)	cannot be don						
2.1.2	16 Solar radiation to	est		Regulation	s: LSA Code 1.2.2.5; M	SC.81(70) 1/ 10.4	, 10.4.5		
	Test Prod	cedure		Acceptance	e Criteria		Significant Test Data		
inspe accor (Note manu	ction should be subjected ding to IEC 60945:2002, : The solar radiation test facturer is able to pr	which has passed the visual ed to a solar radiation test paragraph 8.10. I may be waived where the oduce evidence that the the test, i.e. UV stabilized.)	The lifebuoy self-igniting light should be resistant to deterioration by sunlight. Furthermore, the mechanical properties and labels should be resistant to harmful deterioration by sunlight and the lifebuoy self-igniting light should function after the test.			PASS: Comments/Obs	FAIL: servations		

	Manufacture	er:		Date: Time:			
Lifebuoy self-igniting lights	Model:	umber:		Surveyor: Organization:			
	Loi/Serial IV	uniber					
2.1.2.17 Test for oil resis	tance		Regulation	ns: LSA Code 1.2.	2.4; MSC.81(70) 1/ 10.4,	, 10.4.6	
Test Procedure		Acceptano	ce Criteria		Significant Test Data		
One lifebuoy self-igniting light passed the visual inspection subjected to the test for oil according to IEC 6 paragraph 8.11. Automatic version should be prever switching during the test.	should be resistance 0945:2002 activated	After this test the lifebuoy se unduly affected by oil and sho such as shrinking, cracking, s of mechanical qualities. The lifebuoy self-igniting light	ould show no welling, diss	Results: PASS: Comments/Observation	FAIL:		
2.1.2.18 Fire rest		Regulations: LSA Code 2.1.1.5; MSC.81(70) 1/ 10.4, 10.4.8					
Test Procedure		Acceptano	e Criteria		Significant Test Data		
One lifebuoy self-igniting light passed the visual inspection subjected to a fire test. A test than 30 cm x 35 cm x 6 cm placed in an essentially draugh	should be pan not less a should be	The lifebuoy self-igniting light continue melting after being to period of not less than 2 s and flames.	otally envelo	ped in a fire for a	Results: PASS:	FAIL:	
Water should be put in the bottest pan to a depth of at least 1 by enough petrol to make a midepth of not less than 4 cm. should then be ignited and allofreely for at least 30 s. T self- igniting light should then through the flames, facing the lifebuoy self-igniting light not 25 cm above the top edge of so that the duration of expoflames is at least 2 s.	cm followed inimum total The petrol wed to burn he lifebuoy a be moved em, with the more than the test pan	The lifebuoy self-igniting light s	should functi	on after the test.	Comments/Observation	ns	

2.1.3 LIFEBUOY SELF-ACTIVATING SMOKE SIGNALS EVALUATION AND TEST REPORT

2.1.3.1	Submitted drawings, reports and documents 2.1.3.1.1 Quality assurance 2.1.3.1.2 Visual inspection 2.1.3.1.3 General data and specification
2.1.3.2	Temperature cycling test
2.1.3.3	Low temperature conditioning test
2.1.3.4	High temperature conditioning test
2.1.3.5	Ambient temperature conditioning and drop test
2.1.3.6	Humidity conditioning
2.1.3.7	Water and corrosion resistance test 2.1.3.7.1 Immersed for 24 h under 1 m 2.1.3.7.2 10 cm immersion ready-to-fire for 5 mins. test 2.1.3.7.3 Salt spray conditioning
2.1.3.8	Heptane test
2.1.3.9	Laboratory smoke obscuration test
2.1.3.10	Wave test
2.1.3.11	Attachment fitting strength test
2.1.3.12	Safety inspection

2.1.3 LIFEBUOY SELF-ACTIVATING SMOKE SIGNALS EVALUATION AND TEST REPORT

Manufacturer	
Type/Model	
Date of Approval	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

smoke signals Model: Lot/Serial Number			mber:	Surveyor:	Time:				
2.1.3.1 Submitte	ed drawii	ngs, reports a	and documents						
	Submitted drawings and documents								
Drawing No.	Revisi date	ion No. &		Title of drawing					
			Submitted reports and docume	ents		0			
Report/Document No.	Revisi date	on No. &	Title	e of report / document		Status			
			Maintenance Manual -						
			Operations Manual -						
			<u> </u>						

Lifebuoy self-activating	Manufacturer: Model:	Surveyor:						
smoke signals	Lot/Serial Number:		Organization:					
2.1.3.1.1 Quality assurance	ce	Regulations: - MSC.81(70) 2/1.1, 1.2						
of the International Conventional Amended, or the international Lamended, or the internationa	a particular type are required by Chapter III on for the Safety of Life at Sea, 1974, as ife-Saving Appliance Code, to be inspected, stration should make random inspections of a the quality of life-saving appliances and a specification of the approved prototype life-red to institute a quality control procedure to ces are produced to the same standard as ance approved by the Administration and to on tests carried out in accordance with the	Quality Assurance Standard Used: - Quality Assurance Procedure: - Quality Assurance Manual: - Description of System.						
		,	ssurance System acceptable: Yes/No ts/Observations					

Lifebuoy self-activating smoke signals	Manufacturer: Model: Lot/Serial Number:	Surveyor:	Surveyor:				
2.1.3.1.2 Visual inspection	on	Regulations: LSA Code I/1	.2; MSC.81(70) 1/1.9 and 4.5				
Test Procedure		ce Criteria	Significant Test Data				
Visual examination	Lifebuoy Self-Activating Smok	e Signal should:-					
Approval markings	Administration which approve	oval information including the ed it, date of manufacture and cictions, markings are to be	Passed	Failed			
Operating instructions		ructions or diagrams clearly oy self-activating smoke signal method of manual operation;	Passed	Failed			
Outer casing	not depend on adhesive tape water-resistant properties;	es or plastic envelopes for its		Failed			
Ignition system	be fitted with an integral mean	s of ignition;	Passed	Failed			
Fitted with light	if fitted with lights be test requirements of Lifebuoy Self-	ted in accordance with the ligniting lights, section 10.2.	Passed I Comments/Observations	Failed			
Acceptable life		determine the period of hare subject to deterioration					

Lifebuoy self-activating smoke signals	Model:			Surveyor:	Time:					
2.1.3.1.3 General data an	nd specifications		Regulations: LSA Code I/1.2 & III/3.3; MSC.81(70) 1 /4.8							
General Informat	tion	Di	mensions		Weight					
Construction Material:		Dimensions:								
Casing:		Length of Casing:			Design Weight:					
Top cover (If applicable):		Maximum Diamete	er of Casing:		Weight as Tested:					
Bottom Cover (If applicable	e):	Minimum Diamete	r of Casing _		Weight of Smoke Material					
Method of Ignition					Comments/Observations					
Operational Safety Delay (if Applicable)									
Number of lights (if Applica	able)									
Type of lens dome										
Amperage of Bulb										
Number of Batteries:	_									
Voltage of Batteries:	_									
Acceptable life of the item:	yrs									

LIFEBUOY SELF-ACTIVATING SMOKE SIGNAL CONDITIONING & SEQUENCE TEST CHART

TEST ITEMS CONDITIONING SEQUENCE									REFERENCES	REMARKS
Specimen No>	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22	MSC.81(70)	
Measuring dimensions and mass	А	А	А	А	А	Α	А	А		
Temperature cycling test (2.1.3.2)	В	В	В						1.9.1 & 1.2.1.	
Low temperature conditioning (2.1.3.3)	С								1.9.2	
High temperature conditioning (2.1.3.4)		С							1.9.2	
Ambient temperature conditioning (2.1.3.5)			С						1.9.3	
Operate Immersed under 25mm for 10 secs (2.1.3.4)	С	С							1.9.2	
Humidity conditioning (2.1.3.6)				С					1.9.4 & 4.2.4	
1 metre for 24 hours (2.1.3.7.1)					С				1.9.4 & 4.3.1	
Salt water spray (2.1.3.7.2)						С			1.9.4 & 4.3.3	
Safety inspection (2.1.3.12)	D	D	D	D	D	D	D	D	4.5 & 1.9.4	
Operation at ambient temperature			Е		Е	Е	Е	Е	1.9.3, 4.3.1	

LIFEBUOY SELF-ACTIVATING SMOKE SIGNAL CONDITIONING & SEQUENCE TEST CHART (continued)

Specimen No>	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22	References	Remarks
Operate at conditioning Temperature	Е	Е		E					1.9.2, 4.2.4	
Heptane test (2.1.3.8)							F		1.9.4 & 4.8.2	
Attachment fitting strength (2.1.3.11)	F	F							10.2.8 & 1.9.6	May be carried out by an independent laboratory acceptable to the administration and report submitted. Use specimens 1 and 4.
Wave height test (2.1.3.10)								F	1.9.5	
30 m drop test (2.1.3.5)			Н						1.9.3	
Smoke colour and emission time 15 minutes minimum	G	G	G	G	G	G	G	G	1.9.2 & 1.9.3	
Smoke obscuration (2.1.3.9)									4.8.3 & 1.9.4	May be carried out by an independent laboratory acceptable to the administration and report submitted.

Note: The letters in the above 'boxes' refer to the sequence of testing of each specimen lifebuoy self-activating smoke signal.

Lifebuoy self-activating smoke signals	Model:	er:umber:		Surveyor:		Time:		
2422 Townserstone and	ling to at		Demulation	MCC				
2.1.3.2 Temperature cyc Test Procedure	iing test	Acceptano		ns: LSA Code I/1.2	2.2; WSC 	Significant	Test Data	
Nine self-activating smoke sign be alternately subjected to temperatures of -30°C and +6	surrounding	After 10 cycles each specime should show no sign of damag swelling, dissolution or change	en should be e such as sh	rinking, cracking,	Specime			
alternating cycles need immediately after each other following procedure, repeated 10 cycles, is acceptable:	er and the				2. 3.	Passed		
an 8 h exposure at a temperature of +65°C to be in one day; and					4. 5.	Passed	Failed	
 the specimens removed fro chamber that same da exposed under ordin conditions at a temperature 3°C until the next day; 	y and left ary room				6. 7.	Passed	Failed	
3. an 8 h exposure at a temperature -30°C to be conext day; and 3. an 8 h exposure at a a decision at a decision					8. 9. Comme		Failed	
4. the specimen removed from chamber that same date exposed under ordinations at a temperature 3°C until the next day.	y and left ary room				Passed	Failed _.		

Lifebuoy self-activating Model:				Surveyor:		me:	
smoke signals	Lot/Serial Ni	oriber Organization					
2.1.3.3 Low temperature	e conditionin	g test	Regulatio	ns: LSA Code I/1.2	2.2; MSC.81(70) 1	1/1.9.2	
Test Procedure		Acceptano	ce Criteria			Significant Test D	ata
After at least ten complete		The three specimens should function effectively.		Specimen Num	ber		
cycles the first three smoke si be subjected to a temperature		Each specimen should show	no sian of	damage such as	1	2	3
at least 48 h, then taken from this stowage temperature be activated and operated in		shrinking, cracking, swelling mechanical properties after	j, dissolutio	n or change of	Condition after	Conditioning (Pass	s/Fail)
seawater at a temperature of function effectively at that tem	of -1°C, and	conditioning.	o. oop.o	g	Smoke emission time (min/sec)		
		The signal should not ignite explosively or in a manner					
		dangerous to persons close by, nor emit any flame during the entire smoke emission time of at least 15 min.			Smoke emissio	n quality (Pass/Fai	l)
		The colour of the smoke should be orange as defined by sections 34, 48, 49 or 50 of the publication Colour: Universal Language and Dictionary of Names.*		Smoke colour (Pass/Fail)		
				0		(Dana (Eail)	
					Smoke emissions during submergence (Pass/Fail)		
		*Special Publication 440, National Bureau of Standards,		au of Standards,			
		Washington, DC 20402, USA.			Comments/Obs	servations	
		After the smoke signals have minutes, the smoke-emitting should be immersed to a dept released the smoke signals should be smoke of a highly for a period of not less than 15 water.	ends of the h of 25 mm nould continutivisible colou	te smoke signals for 10 s. On being te to emit a steady or at a uniform rate	Passed	Failed	

Lifebuoy self-activating smoke signals	Model:	umber:		Date: Surveyor: Organization:			
2.1.3.4 High temperatur	e conditionin	ig test	test Regulations: LSA Code I/1.2.2 and II/2.1.3; MSC.81(70) 1/1.9.2				
Test Procedure		Acceptano				Significant Test Da	
After at least 10 complete cycles, the next three smoke sign		The three specimens should function effectively.		Specimen Numb	oer		
be subjected to a temperature		Each specimen should show	Each specimen should show no sign of damage such as		4	5	6
at least 48 h, then taken from t	this stowage	shrinking, cracking, swelling	, dissolution	n or change of	Condition after C	Conditioning (Pass	/Fail)
temperature be activated and seawater at a temperature of		mechanical properties afte conditioning.	er completi	ing the +65°C			
function effectively at that temperature.		Conditioning.		Smoke emission time (min/sec)			
		The smoke signal should not ignite explosively or in a manner dangerous to persons close by nor emit any flame during the entire smoke emission time.					
				Smoke emission	quality (Pass/Fail)	
		After the smoke signals have been emitting smoke for		Smoke colour (F	ass/Fail)		
		7 minutes, the smoke-emitting					
		should be immersed to a depti released the smoke signals sh			Smoke emission	during submerge	nce (Pass/Fail)
		quantity of smoke of a highly v	risible colour	at a uniform rate			
		for a period of not less than 15 minutes when floating in calm water.		en floating in calm	Comments/Obse	ervations	
		The colour of the smoke should be orange as defined by sections 34, 48, 49 or 50 of the publication Colour: Universal Language and Dictionary of Names.* *Special Publication 440, National Bureau of Standards, Washington, DC 20402, USA.			Passed	Failed	
				. 43004	anda		

Lifebuoy self-activating smoke signals	Model:	flodel: Survey			Time:			
2.1.3.5 Ambient Tempe	rature Condit	ioning & Drop Test	Regulation	ns: LSA Code I/1.2	2.2 & II/2.1.1.6; M	SC.81(70) 1/1.9.3		
Test Procedure		Acceptano	ce Criteria			Significant Test D	ata	
After at least ten complete		The three specimens should function effectively for a period			Specimen No.			
cycles, the last three smoke s	•	of at least 15 min.		7	8	9		
attached by a line to a lifebu	uoy having a	Each specimen should show			Condition after	Conditioning (Pass	/Fail)	
mass of not more than 4 kg sho the drop test into water p		shrinking, cracking, swelling						
MSC.81(70) 1/1.3. The lifet		mechanical properties after completing the ordinary room conditions at a temperature of 20°C ± 3°C conditioning.		Drop height (metre)				
have both a smoke signal ar								
light attached in the manner re by the manufacturers and be of		The amelia simual abasild a	The smoke signal should not ignite explosively or in a			n time (min/sec)		
a quick-release fitting. The sr	moke signals	manner dangerous to persons close by nor emit any flame						
should not be damaged function for a period of at least		during the entire smoke emission time.		Smoke emission quality (Pass/Fail)				
·		The smoke signal should not be damaged after the drop test.						
A lifebuoy and the smoke sign dropped each into the water from					Smoke colour (Pass/Fail)			
at which they are intended to b		The colour of the smoke sho			Smoke signal d	<u> </u> amaged after drop	test (Pass/Fail)	
ships in their lightest seagoing		sections 34, 48, 49 or 50 of the Language and Dictionary of N		Colour: Universal	emoko digilal d		1001 (1 000/1 011)	
30 m, whichever is the great suffering damage The lifebuoy and smoke signated dropped from a quick release for housing the signals.	als should be	*Special Publication 440, National Bureau of Standards, Washington, DC 20402, USA.		Comments/Obs	ervations			
					Passed	Failed		

Lifebuoy self-activating smoke signals	Model:	umber:		Date: Surveyor: Organization:			
2.1.3.6 Humidity conditi	ioning	Regul	atior	ns: LSA Code I/1.2	2.2 & II/2.1.3; MS	C.81(70) 1/4.2.4, 1	1.9.4
Test Procedure		Acceptance Criter	ia			Significant Test D	ata
Three specimens of smoke signals should		The three specimens should function (effec	tively.	Specimen No.		
be subjected to a temperatu and 90% relative humidity for a		Each specimen should show no sign of damage such as		10	11	12	
followed by ten days at 20°C 65% relative humidity.		shrinking, cracking, swelling, dissolu	ution	or change of	Condition after (Conditioning (Pass	s/Fail)
After the humidity test the specimens should be subjected to the function test at ambient temperature.		mechanical properties after completing the temperature of +65°C and 90% relative humidity for at least 96 h, followed by 10 days at 20°C to 25°C at 65% relative humidity conditioning. The smoke signal should not ignite explosively or in a manner dangerous to persons close by nor emit any flame		Smoke emission time (min/sec)			
				Smoke emission	 n quality (Continuc	ous/Intermittent)	
		during the entire smoke emission time.		Smoke emission colour: (Passed/Failed)			
		Each specimen should emit smoke of a highly visible colour at a uniform rate for a period of not less than 15 minutes when floating in calm water.		Comments/Observations			
		The colour of the smoke should be of sections 34, 48, 49 or 50 of the Universal Language and Dictionary of *Special Publication 440, National But Washington, DC 20402, USA.	publ Nam	lication Colour: nes.*	Passed	Failed	
		3 ,					

Lifebuoy self-activating smoke signals	Manufacturer: Model: Lot/Serial Number:			Date: Surveyor: Organization:			
2.1.3.7.1 Immersed for 24	h under 1 m		Regulation	ns: LSA Code I/1.2.	2 and II/2.1.3; MS	C.81(70) 1/4.3.1,	1.9.4
Test Procedure		Acceptar	nce Criteria		S	Significant Test Da	ata
Three specimens of smoke s		The three specimens should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical properties.		Specimen No.		1	
be immersed horizontally for 1 m of water.	24 h under			13	14	15	
			L = (2) l		Condition after C	Conditioning (Pass	;/Fail)
After this test the specimen subjected to the function tes		The signals should establish the without injury to the operator,					
temperature. during firing or burning.			Smoke emission	time (min/sec)	1		
		The specimen signal should not ignite explosively or in a manner dangerous to persons close by, nor emit any flame			Smoke emission	quality (Continuo	us/Intermittent)
		during the entire smoke em smoke of a highly visible colo of not less than 15 minutes w	ur at a unifo	orm rate for a period	Smoke emission	colour: Passed/F	ailed
		The colour of the smoke sh sections 34, 48, 49 or 50 of the Language and Dictionary of N *Special Publication 440, N Washington, DC 20402, USA	ne publicatio lames.* lational Bure	n Colour: Universal	Comments/Obse	ervationsFailed	

Lifebuoy self-activating smoke signals	Model:	er:umber:		Date: Surveyor: Organization:		ne:	
2.1.3.7.2 10 cm immersion ready-to-fire for 5 mins. test			Regulation	ns: LSA Code I/1.2	.2 & II/2.1.3; MSC	C.81(70) 1/4.3.2	
Test Procedure		Acceptano	ce Criteria			Significant Test D	ata
Three specimens of smoke signals should				Specimen No			
be made ready-to-fire, sub 10 cm of water for 5 min.	merged in	as shrinking, cracking, swelli mechanical properties.	ng, dissoluti	ion or change of	16	17	18
		···			Condition after C	Conditioning (Pass	/Fail)
The three signals should be ambient temperature in acco		The signals should establis effectively without injury to the					
the manufacturer's operating in		close proximity, during firing or burning.		Smoke emission time (min/sec)			
		The specimen signal should not ignite explosively or in a manner dangerous to persons close by, nor emit any flame					<u> </u>
					Smoke emission	quality (Continuo	us/Intermittent)
		during the entire smoke emis smoke of a highly visible colou					
		of not less than 15 minutes wh			Smoke emission	colour: Passed/F	ailed
	The colour of the smoke should be grange as defined by		Comments/Observations				
		*Special Publication 440, Na Washington, DC 20402, USA.		au of Standards,			
					Passed	Failed	

Lifebuoy self-activating smoke signals	Model:	mber: Organization:				ne:		
2.1.3.7.3 Salt spray condi	itioning		Regulations: LSA Code I/1.2.2 & II/2.1.3; MSC.81(70) 1/1.9.4, 4.3.3					
Test Procedure		Acceptano	e Criteria			Significant Test D	ata	
Three specimens of smoke sig	•	The three specimens should s		J	Specimen No			
be subjected to a salt spray (chloride solution) at a tem		as shrinking, cracking, swelling, dissolution or change of mechanical properties.		19	20	21		
+35±3°C for at least 100 h.	poraturo or	···			Condition after 0	Conditioning (Pass	/Fail)	
The three signals should be	activated at	The signals should establis effectively without injury to the						
ambient temperature in acco	ordance with	close proximity, during firing or burning.		Smoke emission time (min/sec)				
the manufacturer's operating in	rating instructions. The specimen signal should not ignite explosively or in a							
		manner dangerous to persons	close by, n	or emit any flame	Smoke emission	quality (Continuo	us/Intermittent)	
			moke emission time. They should emit sible colour at a uniform rate for a period			<u> </u>		
		of not less than 15 minutes wh			Smoke emission	colour: Passed/F	ailed	
		The colour of the smoke should be orange as defined by sections 34, 48, 49 or 50 of the publication Colour: Universal Language and Dictionary of Names.*			Comments/Observations			
		*Special Publication 440, Na Washington, DC 20402, USA.	itional Burea	au of Standards,				
					Passed	Failed		

Lifebuoy self-activating Model:	rer:	Date: Surveyor: Organization:			
2.1.3.8 Heptane test	Regulatio	ns: LSA Code I/1.2	2.2 & II/2.1.3.1; MS	SC.81(70) 1/4.8.2,	, 1.9.4
Test Procedure	Acceptance Criteria		;	Significant Test D	ata
Three smoke signals should function		The three specimens should not ignite the heptane.			
water covered by 2 mm layer of heptan floating on a layer of water. The smok		explosively or in a	22	23	24
signal should be allowed to but completely.			Heptane ignition	(Passed/Failed)	
Completely.	They should emit smoke of a highly v	isible colour at a	Smoke emission time (min/sec)		
	uniform rate for a period of not less than				
		Smoke emission	quality (Continuo	us/Intermittent)	
	The colour of the smoke should be orange as defined by sections 34, 48, 49 or 50 of the publication Colour: Universal				
	Language and Dictionary of Names.*	r Colour. Criivorcui	Smoke emission colour: (Passed/Failed)		
	*Special Publication 440, National Bure Washington, DC 20402, USA.	eau of Standards,	Comments/Obse		

Lifebuoy self-activating smoke signals Model: Solitor/Serial Number: O			Surveyor:	Time:	
2.1.3.9 Laboratory smoke	e obscuration t	est	Regulation	ns: LSA Code I/1.2	2.2 & II/2.1.3; MSC.81(70) 1/4.8.3, 1.9.4
Test Procedure		Accepta	nce Criteria		Significant Test Data
The smoke density and colour signal should be determined testing conducted at a water te+20°C to +25°C as follows: The smoke should be drawn apparatus consisting of a 190 duct with a fan capable of entrance air flow of 18.4 m3/min a light source with at least 10 co of the tunnel and a photoelectrother side the density of the pashould be recorded. If the photoelectrother total emitted light from the then the smoke density is zero means that no smoke is passin tunnel. The smoke density is the to be 100% when the photocell pick up any light of the light source passing smoke in the tunnel. Froof light which the photocell is all the smoke density should be Before each measurement, the of the 100% value should be comeasurement should be recorded.	by laboratory emperature of an through an mm diameter producing an and By means of ad on one side ric cell on the assing smoke ocell picks up the light source, percent which ag through the en considered is not able to ce through the om the amount able to pick up the calculated. Ight intensity thecked. Each	Smoke density should be minimum emission time. The colour of the orange simeans of visual comparison chart contain orange colours. The colour a gloss or matte finish, and five orange colour chips, coorange (Munsell notation orange (Munsell notation orange (Munsell notation orange (Munsell notation secured adjacent to one arfrom reddish orange to yel at least one side to the edge should be at least 50 mm ximum Note 1: A typical acceptable 6/14; 10 R 6/14; 1.25 YR 6/14; 1.25 YR 6/14; 10 R 6/14; 1.25 YR 6/14; 1.25 YR 6/14; 10 R 6/14; 1.25 YR 6/14; 1.2	moke should son, in dayl ing the rang comparison d consist of a evering the ra 8.75 R 6/ 6 YR MAX) in s. The colour nother, in ord lowish orang e of the chart a 100 mm in se e progression (14; 3.75 YR)	d be evaluated by ight, to a colour ge of acceptable chart should have a series of at least ange from reddish (14) to yellowish a gradual steps of r chips should be der of progression ge, and extend on . Each colour chip size. In would be 8.75 R MAX. method to convert	Laboratory Testing Report No. Report acceptable (Yes/No) Smoke obscuration rate achieved at -30°C % Burning time of smoke signal sec Smoke obscuration rate achieved at +20°C to +25°C % Burning time of smoke signal sec Smoke obscuration rate achieved at +65°C % Burning time of smoke signal sec Colour of smoke achieved Comments/Observations

Lifebuoy self-activating smoke signals	Model: Surveyor: Organization:			Time:	
2.1.3.10 Wave test		Regulatio	ns: LSA Code I/1.2	2.2 & II/2.1.3; MSC.81(70) 1/1.9.5	
Test Procedure		Acceptance Criteria		Significant Test Data	
A smoke signal should be test at least 300 mm high.	ed in waves	The specimen should function effective swamped. The smoke signal should not ignite extended manner dangerous to persons close by, induring the entire smoke emission time. It should emit smoke of a highly visible or rate for a period of not less than 15 minutes to waves of at least 300 mm high. The colour of the orange smoke should means of visual comparison, in dayling comparison chart containing the range of a colours. The colour comparison chart should matter than the colour comparison of a series of a colour chips, covering the range from (Munsell notation 8.75 R 6/14) to yellowish notation 5 YR MAX) in gradual steps of lightness. The colour chips should be seen one another, in order of progression from yellowish orange, and extend on at least or of the chart. Each colour chip should be	plosively or in a or emit any flame colour at a uniform as when subjected be evaluated by ght, to a colour acceptable orange ould have a gloss t least five orange reddish orange in orange (Munsell hue, chroma, and cured adjacent to reddish orange to be side to the edge	Specimen No. 25	sec
		Note: A typical acceptable progression wou 10 R 6/14; 1.25 YR 6/14; 3.75 YR MAX; ASTM D1535-97 specifies a method to Munsell notation and CIE coordinates.	5 YR MAX. Note:	PassedFailed	

Lifebuoy self-act smoke signals	Lot/Serial Number:		Surveyor:				
2.1.3.11 Atta	achment fittin	g strength te	est	Regulation	ns: LSA Code I/1.2	2.2, II/2.1.3 & II/2.1.1.6; MSC.81(70) 1/1.9.6 & 10.2.8	
Tes	st Procedure		Acceptance Criteria		Significant Test Data		
A force of 225 N s fitting that attache smoke signal to the carried out at the and +65°C.	should be app es the self-act the lifebuoy. T	ivating he test is to	The smoke signal or the fitting result of the test.		pe damaged as a		
						Passed Failed	

Lifebuoy self-activating smoke signals Manufacturer:				Surveyor:	Time:
2.1.3.12 Safety inspection	n	F	Regulation	s: LSA Code I/1.2	2.2, MSC.81(70) 1/ 1.9.4/ 4.5
Test Procedure		Acceptance	Criteria		Significant Test Data
It should be established inspection that the self-active signal:	•				
is indelibly marked with clear instructions on how it should and mounted and that the can be identified by day or n	be operated danger end	marked on the smoke signal.		Markings and identification of signal: Passed Failed	
does not depend on adhesive tapes or plastic envelopes for its water resistant properties; and		Adhesive tapes or plastic envelopes are not used to maintain water-resistant properties.		Water resistant without the use of envelopes or adhesive tape. Passed Failed	
 can be indelibly marked wi determining its age. 	th means of	Date of manufacturing and date on the outside.	of expiry in	delible printed	Smoke signal indelible date stamped Passed Failed Comments/Observations

2.2 LIFEJACKETS AND ASSOCIATED EQUIPMENT

2.2.1 INHERENTLY BUOYANT LIFEJACKETS

EVALUATION AND TEST REPORT

- 2.2.1.1 Submitted drawings, reports and documents
- 2.2.1.2 Quality assurance
- 2.2.1.3 Visual inspection
- 2.2.1.4 General data and specification
- 2.2.1.5 Temperature cycling test
- 2.2.1.6 Buoyancy test
- 2.2.1.7 Fire test
- 2.2.1.8 Oil resistance test
- 2.2.1.9 Tests of components other than buoyancy materials
- 2.2.1.10 Strength tests Body or lifting loop strength tests
- 2.2.1.11 Strength tests Shoulder lift test
- 2.2.1.12 Tests for lifejacket buoyancy material Stability under temperature cycling
- 2.2.1.13 Tests for lifejacket buoyancy material Compression and water absorption test
- 2.2.1.14 Tests for lifejacket buoyancy material Tensile strength test
- 2.2.1.15 Donning test
- 2.2.1.16 Water performance tests Preparation for water performance tests
- 2.2.1.17 Water performance tests Righting tests
- 2.2.1.18 Water performance tests Static balance measurements
- 2.2.1.19 Water performance tests Jump and drop tests
- 2.2.1.20 Water performance tests Stability test
- 2.2.1.21 Water performance tests Swimming and water emergence test
- 2.2.1.22 Infant and children's lifejacket Test subjects selection
- 2.2.1.23 Infant and children's lifejacket Water performance tests Righting test
- 2.2.1.24 Infant and children's lifejacket Water performance tests Static balance measurements

- 2.2.1.25 Children's lifejacket Water performance tests Jump and drop test
- 2.2.1.26 Infant and children's lifejacket Water performance tests Stability test
- 2.2.1.27 Infant and children's lifejacket Mobility test

2.2.1 INHERENTLY BUOYANT LIFEJACKETS EVALUATION AND TEST REPORT

Manufacturer	
Туре	
Date	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

Inherently buoyant lifejackets 2.2.1.1 Submitted of	Model: Lot/Serial N	umber:	Surveyor: Organization:	
		Submitted drawings and docur		Status
Drawing No.	Revision No. & date		Title of drawing	
		Submitted reports and docum	ents	Status
Report/Document No.	Revision No. & date	Title	of report / document	
		Maintenance Manual -		
		Operations Manual -		

Inherently buoyant lifejackets	Manufacturer: Model: Lot/Serial Number:	Surveyor:			
2.2.1.2 Quality assurance		Regulation	s: - MSC.81(70) 2/1.1, 1.2		
of the International Convent as amended, or the internat	f a particular type are required by chapter III ion for the Safety of Life at Sea, 1974, ional Life-Saving Appliance (LSA) Code, tives of the Administration should make	Quality Assu			
random inspections of man- life-saving appliances and ma- the approved prototype life-sa	Quality Assurance Procedure:				
Manufacturers should be requesto ensure that life-saving appleas the prototype life-saving apto keep records of any product Administration's instructions.	Quality Assurance Manual:				
Administration's instructions.		Description of System.			
		Quality Assurance System acceptable			
		Yes No			
		Comments/	Observations		

Inherently buoyant Iifejackets Manufacturer: Model: Lot/Serial Number:			Surveyor:		ne:	
2.2.1	1.3 Visual inspection		Regulations: LSA Code I/1.2.2.1, 2.2.1.5.5, 2.2.1.10, 2.2.1.13, 2.2.1.1		, 1.2.2.9, 1.2.3; LS	SA Code II/ 2.2.1.14, 2.2.1.5.3 &
	Test Procedure		Acceptance Criteria		Się	gnificant Test Data
.1	Approval markings		ently buoyant lifejackets should: early marked with approval information	n including the	Passed	Failed
	, pp. craaa	Admin operat	nistration which approved it, date of mational restrictions, and (if an infant or oppopriate symbol according to resolution			
.2	Retro-reflective tape	with a resolu the arr way th	ed with approved patches of retro-refleatotal area of at least 400 cm ² tion A.658(16). In the case of a rever rangement should be complied with note lifejacket is put on. Such material should the lifejacket as possible;	Passed	Failed	
.3	Lifejacket light	have p	provision to be fitted with a light;		Passed	Failed
.4	Donning and comfort	or is donne	constructed that it is capable of being of clearly capable of being worn in one of incorrectly, it is not injurious to the week comfortable to wear;	e way and, if	Passed	Failed
.5	Whistle	be fitte lifejacl	ed with a whistle firmly secured by a ket;	lanyard to the	Passed	Failed
.6	Colour of lifejacket		international or vivid reddish orange of visible colour.	a comparably	Passed	Failed

.7 weare	Buoyant Line & Means to lift the	or other means to secure it to a lifejacket worn by another person in the water. A lifejacket shall be provided with a	Passed	Failed
.8	Oversized lifejacket	suitable means to allow a rescuer to lift the wearer from the water into a survival craft or a rescue boat. If an adult lifejacket is not designed to fit persons weighing	Passed	Failed
	,	up to 140 kg and with a chest girth of up to 1,750 mm, suitable accessories shall be available to allow it to be secured to such persons.		

Inherently buoyant lifejackets	Manufacturer:	Surv	veyor:		me:	
2.2.1.4 General data and s	pecifications	Regulations: LS	A Code / M	SC.81(70)		
Construction Material:	Additional equipr	ment:		Donning instruc	tions:	
Fabric produced by: Type: Buoyant material produced by Type:	Type: Whistle: - Type: Light (if fitted):	☐ YES ————————————————————————————————————	□NO	□ YES	□NO	

Inherently buoyant lifejackets	Model:	:		Surveyor:	Time:	
2.2.1.5 Temperature cycling	g test		Regulations	s: LSA Code I/1.2	2.2.2; MSC.81(70) 1/2.1	
Test Procedur	e	Accepta	ance Criteria		Significant T	est Data
A lifejacket should be subjected cycling test of surrounding temperand +65°C. These alternating follow immediately after each following procedure, repeated 10 cycles, is acceptable:	peratures of -30°C cycles need not hother and the	The lifejacket materia damage such as sh dissolution or changes of	rinking, crac	king, swelling,	(See following page for test of Passed	data) Failed
1. an 8 h exposure at a minimum +65°C to be completed in o	•					
2. the specimens removed chamber that same day under ordinary room temperature of 20°C ± 3°C	and left exposed conditions at a				Comments/Observations	
3. an 8 h exposure at a maxi of -30°C to be completed the	•					
 the specimen removed from that same day and left ordinary room conditions at 20°C ± 3°C until the next day 	exposed under ta temperature of					
The lifejacket should then be examined.	xternally					

2.2.1.5	Temperature cycling test – Test of	data Regu	ations: LSA Code I/1.2.2.2; MSC.81(70) 1/2.1				
	нот (CYCLE	COLI	COLD CYCLE			
Cycle 1	Date In: Time In:°C	Date Out: hours	Date In: Time In:°C	Date Out: Time Out: hours			
Cycle 2	Date In: Time In:°C	Date Out:hours	Date In: Time In:°C	Date Out: Time Out: Duration:hours			
Cycle 3	Date In: Time In:°C	Date Out: hours	Date In: Time In:°C	Date Out: Time Out: hours			
Cycle 4	Date In: Time In:°C	Date Out: hours	Date In: Time In:°C	Date Out: Time Out: hours			
Cycle 5	Date In: Time In:°C	Date Out:hours	Date In: Time In:°C	Date Out: Time Out: Duration: hours			
Cycle 6	Date In: Time In:°C	Date Out: Time Out: hours	Date In: Time In:°C	Date Out: Time Out: Duration: hours			
Cycle 7	Date In: Time In:°C	Date Out: Time Out: hours	Date In: Time In:°C	Date Out: Time Out: Duration: hours			
Cycle 8	Date In: Time In:°C	Date Out: hours	Date In: Time In:°C	Date Out: Time Out: Duration: hours			
Cycle 9	Date In: Time In:°C	Date Out:hours	Date In: Time In:°C	Date Out: Time Out: Duration: hours			
Cycle 10	Date In: Time In:°C	Date Out: hours	Date In: Time In: Temperature:°C	Date Out: Time Out: Duration: hours			

Inherently buoyant lifejackets	Model:	r:		Surveyor:			
2.2.1.6 Buoyancy test			Regulations	s: LSA Code II	/2.2.1.11; MSC.81	l(70) 1/2.2	
Test Procedu	re	Accepta	nce Criteria			Significant Test D)ata
The two lifejackets subjected cycling and the hot and cold inf then be used for the buoyancy. The buoyancy of the two lifejameasured before and after submersion to just below the water. The test to be repeated as necessary to perform the test compartment in the uninflated.	ackets should be 24 h complete surface in fresh d as many times st once with each	The difference betwee the final buoyancy sho initial buoyancy.			Start (time): Temperature: _ Finish (time): Temperature: _ Buoyancy 1	Buoyancy 2kgFail	

Inherently buoyant lifejackets	Model: Su		Surveyor:	Pate: Time: Surveyor: Organization:		
2.2.1.7 Fire test			Regulations	s: LSA Code II/2	.2.1.1; MSC.81(70) 1/1.5, 2.3	
Test Procedu	re	Accept	ance Criteria		Significant Te	est Data
A test pan 30 cm x 35 cm placed in an essentially draugh should be put into the bottom depth of 1 cm followed by eno a minimum total depth of 4 cm then be ignited and allowed to The lifejacket should then be if flames in an upright, forw position, with the bottom of the above the top edge of the teduration of exposure to the flames.	ht-free area. Water of the test pan to a ugh petrol to make . The petrol should burn freely for 30s. moved through the rard, free-hanging he lifejacket 25 cm st pan so that the		ket should not sustain burning for more r continue melting after being removed mes.		Passed Failed Comments/Observations	
2.2.1.8 Oil resistance test		Regulations: LSA Code II/1		2.2; MSC.81(70) 1/1.4		
Test Procedu	re	Acceptance Criteria		Significant Test Data		
The lifejacket should be imm for a period of 24 h under 100 oil at normal room temperature	mm head of diesel	After this test, the lifeja damage such as sh dissolution or change o	rinking, crac	king, swelling,	Passed Comments/Observations	Failed

Inherently buoyant	Manufacturer: Model:	l o								
lifejackets	Lot/Serial Number:	Organization:								
2.2.1.9 Tests of component	s other than buoyancy materials ((Continued) Regulations: LSA Code I/1.2.2; MSC.81(70) 1/2.4								
Test Procedure	Acceptance Criteria	Significant Test Data								
All the materials, other buoyancy materials, used in construction of the lifeja including the cover, tapes, so and closures should be teste establish that they are: .1 rot-proof, .2 colour-fast and .3 resistant to deterioration exposure to sunlight and that they are not unduly affected by .4 seawater, .5 oil or .6 fungal attack	International Organization for Standardization, in particular publication ISO 12402-7:2006 Personal Flotation Devices – Part 7: Materials and Components – Safety Requirements and Test Methods (to be published)	Cover: Tapes: Seams: Additional equipment: Tensile strength as received (new material) (N/25 mm width):								

2.2.1.9	Tests of components other	er than buoyancy materials (Regulations: LSA Code I/1.2.2; MSC.81(70) 1/2.4	
	Test Procedure	Acceptance Criteria		Significant Test Data
			Type (N/2	ile strength after exposure to oil of oil: Duration: omm width)
			Type (N/2	ile strength after fungal attach. of oil: Duration: o mm width)
			Acceptable	4) Yes No 5) Yes No 6) Yes No

Inherently buoyant	Manufacturer: Model:			Date: Surveyor:					
lifejackets	Lot/Serial Number:			Organization:					
2.2.1.10 Strength tests - Boo	dy or lifting loop strength	tests Regulations: LSA Code I/1.2.2; MSC.81(70) 1/2.5.1							
Test Proc	edure	Acc	ceptance Crite	eria		Significant Test	Data		
The lifejacket should be imme of 2 min. It should then be rer closed in the same manner person. A force of not less that case of a child or infant-size lift for 30 min to the part of the lifej body of the wearer (see figure lifting loop of the lifejacket.	ersed in water for a period moved from the water and as when it is worn by a in 3,200 N (2,400 N in the ejacket) should be applied acket that secures it to the etal) and separately to the etal acket that secures it to the etal) and separately to the etal.	The lifejacket s	should not be st. uld be repea	damaged as a ated for each	Force applied: Time: Slippage: Closure(s) tester	Body strap d:	Lifting loop Lifting loop Failed		
50mm diameter for Infant ar L– Test load									

Inherently buoyant lifejackets	Model:	Manufacturer: Model: Lot/Serial Number:					Surveyor:						
2.2.1.11 Strength tes	ts - Shoulder lift test		Regulations: LSA Code I/1.2.2; MSC.81(70) 1/2.5.2								C.81(70) 1/2.5.2		
Test Pr	ocedure				Acc	eptanc	e Crite	eria				Significant Test Data	
The lifejacket should for a period of 2 m removed from the wate as shown in figure 2 i when it is worn by a less than 900 N (700 lor or infant-size lifejacket	be immersed in water in. It should then be er and closed on a form in the same manner as person. A force of not in the case of a child it should be applied for orm and the shoulder it (see figure 3). Yoke or over-the-head-type lifejacket				d not b d rema C 76,2 76,2	e dam in secu- of Busyant aberfal 102 63,5	E 381	F 432				Force applied: Shoulder tested: Test result: Passed Failed Comments/Observations	
C– Cylinder; 125mm c 50mm diameter fo L– Test load	F	igure 2	2 – Tes	Dim st form		ns in m oulder		for life	ejacket	S			

Inherently buoyant lifejackets					Surveyor:						
2.2.1.12 Tests for lifejack temperature cycling	ket buoyancy mat	erial – Stability under	Regula	ations:	LSA Code I/1.2.2; MSC.8	31(70) 1/2.6	(2.6.1-2	2.6.4)			
Test Procedur	re	Acceptance Criter	ia ·		Sig	nificant Test	Data				
The following tests should be a specimens of each lifejacket to A further four specimens of buoyancy material should be tensile strength test in 2.2.1.14. The specimens should be at leand be of the same thickness lifejacket. The specimen should be dimension should be recorded the case of kapok, the entire is subjected to the test. The dimensioned at the beginning and Where multiple layers of matachieve the total thickness lifejacket, the specimens should temperature cycling as prescrition. ↑ The dimensions of the skapok) should be recorded at cycle. The specimens should texamined.	carried out on eight buoyancy material. of each lifejacketer prepared for the 4. east 300mm square as as used in the labelled and the prior to the test. In ifejacket should be end of these tests, terials are used to a desired for the should be of the should be of the should be of the specimens (except the end of the last	The specimens should not s of internal and external chan structure or of mechanical quality and the structure of the specimens of the specimen	how any	sign	Dimensions prior to test Specimen No. 1 Specimen No. 2 Specimen No. 3 Specimen No. 4 Specimen No. 5 Specimen No. 6	Length	Width	Height Height Fail procedure	ed		
									-		

2.2.1.12 Tests for lifejacket buoyancy mate temperature cycling	erial – Stability under	Regulations: LSA Code I/1.2.2; MSC.81(70) 1/2.6 (2.6.1-2.6.4)					
Test Procedure	Acceptance Criteri	ia Significant Test Data					
Test Procedure →Two of the specimens should be cut open and should be carefully examined. ↓ Four of the specimens should be used for compression and water absorption tests, two of which should be so tested after they have also been subjected to the diesel oil test as prescribed in 2.2.1.8.	The specimens should not st of internal change of structure	how any sign	Signi ↑ Passed → Passed Variable Passed Comments/Observations (See following page for test Passed Passed Passed Comments/Observations	Failed Failed Failed St data) Failed Failed Failed			

l	Manufacturer:				Date:		Time:	
	-	Model:			Surveyor:			
lifejacket	S		nber:		Organization:			
2.2.1.12	Temperature cycli	ng test - Test da	ata	Regula	ations: LSA Code I/1.2	2.2; MSC.81(7	0) 1/2.1	
		НОТ (CYCLE			COL	LD CYCLE	
	Date In:		Date Out:		Date In:		Date Out:	
Cycle 1			Time Out:		Time In:		Time Out:	
	Temperature:	°C	Duration:	hours	Temperature:	°C	Duration:	hours
	Date In:		Date Out:		Date In:		Date Out:	
Cycle 2	Time In:		Time Out:		Time In:		Time Out:	
	Temperature:	°C	Duration:	hours	Temperature:	°C	Duration:	hours
	Date In:		Date Out:		Date In:		Date Out:	
Cycle 3	Time In:		Time Out:		Time In:		Time Out:	
	Temperature:	°C	Duration:	hours	Temperature:	°C	Duration:	hours
	Date In:		Date Out:		Date In:		Date Out:	
Cycle 4	Time In:		Time Out:		Time In:		Time Out:	
	Temperature:		Duration:	hours	Temperature:		Duration:	hours
	Date In:		Date Out:		Date In:		Date Out:	
Cycle 5	Time In:		Time Out:		Time In:		Time Out:	
_	Temperature:	°C	Duration:	hours	Temperature:	°C	Duration:	
	Date In:		Date Out:		Date In:		Date Out:	
Cycle 6	Time In:		Time Out:		Time In:		Time Out:	
	Temperature:	°C	Duration:	hours	Temperature:	°C	Duration:	
	Date In:		Date Out:		Date In:		Date Out:	
Cycle 7	Time In:		Time Out:		Time In:		Time Out:	
	Temperature:	°C	Duration:	hours	Temperature:	°C	Duration:	hours
	Date In:		Date Out:		Date In:		Date Out:	
Cycle 8	Time In:		Time Out:		Time In:		Time Out:	
	Temperature:	°C	Duration:	hours	Temperature:		Duration:	hours
	Date In:		Date Out:		Date In:		Date Out:	
Cycle 9	Time In:		Time Out:		Time In:		Time Out:	
	Temperature:		Duration:	hours	Temperature:	°C	Duration:	
	Date In:		Date Out:		Date In:		Date Out:	
Cycle 10	Time In:		Time Out:		Time In:		Time Out:	
	Temperature:	°C	Duration:	hours	Temperature:	°C	Duration:	hours

Inherently buoyant lifejackets	Model:	er:	Surveyor:	Time: :				
2.2.1.13 Tests for lifeja				gulations: LSA Code I/1.2.2; MSC.81(70) 1/2.6 (2.6.5-2.6.7)				
Test Pro	cedure	Acceptance Criteria	•	Significant Test Data				
The following tests shou specimens of each type material. The tests sho fresh water and the s	of lifejacket buoyancy buld be carried out in specimens should be	The specimens should show no sign such as shrinking, cracking, swelling, change of mechanical qualities.						
immersed for a period of 1.25 m head of water. The tests should be car	·	The results should state the buoyant which each specimen exerts when s water after 1 and 7 days immersion.						
.1 on two specimens	s as supplied;	The reduction of buoyancy should not for specimens which have been exp						
	ns which have been temperature cycling as 1.12; and	diesel oil conditioning and should not exall specimens.		for Passed Failed Specimen No. 4 N N %				
subjected to the to prescribed in 2.2	ns which have been temperature cycling as 2.1.12 followed by the prescribed in 2.2.1.8.			Passed Failed <u>Test results</u> : (Specimens subject to temperature cycling and oil exposure)				
				Specimen No. 5 N N % Passed Failed				
				Specimen No. 6NN %				
				Passed Failed Comments/Observations				

linerently buoyant	Manufacturer: Model: _ Lot/Serial Number:	Surveyor:			
2.2.1.14 Tests for lifejacket	buoyancy material – Tensile strength test	egulations: LSA Code I/1.2.2; MSC.81(70) 1/ 2.6.8			
Test Procedure	Acceptance Criteria	Significant Test Data			
Four specimens of each lifeja buoyancy material should be test material should be measured by and after the combined expedescribed in 2.6.6.3. of MSC.81	sted. standard, ISO 12402-7:2006 Personal flotation devices – Part 7: Materials components – Safety requirements and methods, acceptable to the Organization materials should have a minimum to	Min. Tensile Strength =140kPa (?) Specimen No 1 Yes No Passed Failed Specimen No 2 Yes No Passed Failed Test Results: (Specimens after combined exposure) Reduction in Tensile Strength <25% Specimen No 1 Yes No Over Passed Failed th of Specimen No 2 Yes No Passed Failed Specimen No 2 Yes No Passed Failed Specimen No 2 Yes No Passed Failed Specimen No 2 Yes No			

Inher	Inherently buoyant Manufacturer:Model:				Date:	Tir	ne:		
	ckets	Model: Lot/Serial Number:			Surveyor: Organization:				
2.2.1	.15 Donning Test			Regula			II/2.2.1.5; MSC.81(70) 1/2.7.1 to 2.7.4.3		
	Test	Procedure	Acc	eptance	Criteria	Si	gnificant Test Data		
ofte the Tes The pers	ninimize the risk of incorrent in adverse conditions, I following features and test subjects test should be carried sons who are completely ected according to the he following:	performance simple and positive cle require tying Adult lifejac various size and heavily should be	e should provide provide sure of knote should be seen to be so the seen to be	ary for proper d be few and de quick and that does not s. nould readily fit ults, both lightly All lifejackets of being worn rly in only one					
.1	small test subjects need	d not be adults;	way.	oi cieai	lly ill Offig Offe				
.2	at least 1/3, but not more than 1/2 of test subjects should be females, including at least 1 per height category but excluding the tallest height;								
.3	.3 at least one male should be from the lowest and highest weight group and one female should be from the lowest weight group and one female should be more than 80 kg and 1.8 m;								
.4	.4 at least one subject should be selected from each cell containing a "1"; and								
.5	containing a "X" to to subjects, with no more the	ects should be selected from cells otal the required number of test han one subject per cell. A uniform ht ranges should be maintained.							

2.2.1.15 Donning Test Regul							Regulation	Regulations: LSA Code II/2.2.1.5; MSC.81(70) 1/2.7.1 to 2.7.4.3						
		Test Pro	cedure			Ac	Acceptance Criteria Significant Test Data							
				Weight	range - kg									
Height ange m)	40 -43	43 – 60	60 -70	70 – 80	80 – 100	100 – 110	110 – 120	> 120	Comments/Observations:					
< 1,5	1	Х	Х	Х										
,5 – 1,6	Х	1	1	X	X				1					
1,6 – 1,7		Х	Х	1	X	X			4					
1,7 -,1,8			X	X	1	X	X	X	41					
1,8 – 1,9			X	X	X	1 X	1 X	X	41					
> 1,9						^	^	1	┚┃					
Т	able – Tes	t subject sel	ection for a	dult lifejacke	ets				Subj	SEX (M/F)	HEIGHT (m)	WEIGHT (kg)	Good Swimme (Yes/No	
									1					
									2					
									3					
									4					
									5					
									6					
									7					
									8					
									9					
									10					
									11	1		1		
									12					

2.2.1.15 Donning Test (Continued)	Regulations: LSA Code II/2.2.1.5; MSC	.81(70) 1/2.7.1 to 2.7.4.3
Test Procedure	Acceptance Criteria	Significant Test Data
 Clothing Each test subject should be tested wearing the clothing specified for the test and appropriate to their size, as follows: .1 Normal clothing means normal indoor clothing, which would not normally interfere with the donning of a lifejacket; .2 Heavy-weather clothing means the attire appropriate for a hostile environment, including a hooded arctic parka and warm cotton gloves. 		See following page for test data
Each test should be timed from when the order is given until the test subject declares that donning is complete. Test without instruction	For assessment purposes donning is considered complete when the subject has donned and securely adjusted all methods of securing the lifejacket to the extent needed to meet the in-water performance requirements, including inflation, if needed.	Total number of subjects:
The test subjects may be tested individually or as a group. Wearing normal clothing, the first attempt should be with no assistance, guidance or prior demonstration. The lifejacket, with closures in the stored condition, should be placed on the floor, face up, in front of the test subject. The instruction provided should be identical for each subject and should be equivalent to the following: "PLEASE DON THIS LIFEJACKET AS QUICKLY AS POSSIBLE AND ADJUST IT TO A SNUG FIT SO YOU CAN ABANDON SHIP."	The lifejacket should be capable of being donned by at least 75 % of the subjects, and within 1 minute. If a subject dons the lifejacket substantially correctly but fails to secure and/or adjust all closures, the jump test in 2.8.8 of MSC.81(70) and in-water performance tests in 2.8.5 of MSC.81(70) and 2.8.6 of MSC.81(70) should be performed with the lifejacket as donned to establish whether the performance is acceptable and the donning is successful.	# of subjects successful: # of subjects successful: Pass / Fail

2.2.1.15 Donning Test (Continued)	Regulations: LSA Code II/2.2.1.5; MSC.81(70) 1/2.7.1 to 2.7.4.3							
Test Procedure	Acceptance Criteria	Significant Test Data						
Test after instruction								
For each subject whose first attempt exceeds 1 min or is incomplete, after demonstration or instruction to familiarize the subject with the donning procedure, the test subject should then don the lifejacket without assistance while wearing normal clothing, using the same instruction and timing method as above.	Each subject should correctly don the lifejacket within a period of 1 min.	Pass / Fail						
Heavy-weather clothing test								
Each subject should then don the lifejacket without assistance while wearing heavy-weather clothing, using the same instruction and timing method as above.	Each subject should don the lifejacket correctly within a period of 1 min.	Pass / Fail						

Inherently b lifejackets	uoyant	Manufacturer: Model: Lot/Serial Number:		Survevor:						
2.2.1.15 Do	onning Test – Tes			Regulations: LSA Code II/2.2.1.5; MSC.81(70) 1/2.7.1 to 2.7.4.3						
		Test witho	ut instruction		Heavy weather clothing test					
Subject	Donning time (sec) All closures secured? Jump test (P/F) (Y/N)) In-water test (P/F)	water test (P/F) Donning Time (sec) Donning					
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
	·									
Comments/C	Observations:									

Inhoronthy by covere	Manufacturer:			Date:			Time	:			
Inherently buoyant lifejackets	Model: Lot/Serial Number:			Surveyor	·						
mejackets	Lot/Serial Number:			Organiza	ition:						
2.2.1.16 Water performance	tests- Preparation for water pe	erformance tests					II/2.2.1.2. ex 1, MSC.			2.2.1.4;	
Test Pr	ocedure	Acceptance	Crite	ia	Significant Test Data						
the lifejacket to assist a he	nded to determine the ability of elpless person or one in an te and to show that the lifejacket ment.						•		date:		
comparison to the performan	f a lifejacket is evaluated by ce of a suitable size standard erence Test Device (RTD) as	The RTD should and calibrated MSC.81(70), an validated acc MSC.1/Circ.1470.	accor nex cording	ding to 1, and	Calibra Test si	ated by: ubjects s	ame as in 2				
conditions. Each test for a cand	out in fresh water under still didate lifejacket and the relevant					SEX	test subjec	ts: WEIGHT	Good		
RTD should be conducted on	the same day.				Subj	(M/F)	(m)	(kg)	Swimmer? (Yes/No)	'	
mentioned in paragraph 2.2.1.	out with at least 12 persons as 15. Only good swimmers should				1						
otherwise obtained.	o relax in the water is rarely				3						
The test subjects should wear	only swimming costumes.				4						
	made familiar with each of the				5						
regarding relaxing and exhalin	B, particularly the requirements g in the face-down position.				6						
only the instructions provided	the lifejacket, unassisted, using by the manufacturer. Prior to				8						
taking measurements, the prop the RTD on the subject should necessary.				9							

2.2.1.16 Water performance tests- Preparation for water pe	Regulations: MSC.81(70) 1/						-	2.2.1.4;	
Test Procedure	e Criteria	a Significant Test Data							
After entering the water, care should be taken to ensure that there is no significant amount of air unintentionally trapped in the lifejacket or swimming costume.			11 12						

			Date:					Time:								
Inherently buoyant	Manufacturer:					Surve	evor:				Tillio.					
lifejackets	Lot/Serial Number:				_	Orgai	nization	า:								
2.2.1.17 Water performance to			Regulations: LSA Code II/ 2.2.1.6.2; MSC.81(70)1/ 2.8.5													
Test Procedure	Acceptance Criteria							Signifi	cant Te	st Dat	а					
Each test subject should assur a prone, face down position in t	he the mouth of the test			CAN	DIDA [.]	TE DEV	ICE TII	ME (se	c)		REF	ERENC	CE VES	ST TIME	(sec)	
water, but with the head lifted so the mouth is out of the wat	subject comes clear of	Subj	#1	#2	#3	#4	#5	#6	AVG *	#1	#2	#3	#4	#5	#6	AV G *
The subject's feet should supported, shoulder width apa	irt recorded to the hearest	1														
with the heels just below the surface of the water.	he 1/10 of a second, starting from when the subject's	2														
	feet are released.	3														
After assuming a starting position with the legs straight and arms along the sides, the subject		4														
	times, and the highest	5														
should then be instructed in to following sequence to allow to		6														
body to gradually and complet relax into a natural floati	should then be conducted	7														
posture: allow the arms a		8														
shoulders to relax; allow the le to relax; and then the spine a	gs lowest times discarded	9														
neck, letting the head fall into t	he	10														
water while breathing of normally.	Turning time: the average turn time for all subjects in	11														
'	the candidate lifejacket	12											<u> </u>			
During the relaxation phase, to subject should be maintained in			Ave	rage c	andid	ate tur	n time ((sec):			Ave	erage R	≀TD tu	rn time	(sec):	
stable face down position.	plus 1 s.			# of	candi	date no	turns	(NT):				# of	RTDı	no turns	(NT):	
Immediately after the subject he relaxed, with the face in the wat simulating a state of ut exhaustion, the subject's feashould be released.	er, if any, should not exceed the number in the RTD.	(* Delete Average # of can	e cand didate	est an idate t no tu	# of candidate no turns (NT): # of RTD no turns (NT): It and lowest value) ate turn time ≤ Average RTD turn time RTD +1s Passed Failed To turns (NT): ≤ # of RTD no turns (NT): Passed Failed Failed											

Inherently buoyant lifejackets	Manufacturer: Model: Lot/Serial Number:		Surveyor:								
2.2.1.18 Water performance	e tests-Static balance	measureme	ents	Regulations	ions: LSA Code II/ 2.2.1.4; MSC.81(70) 1/ 2.8.6 and 2.8.7						
Test Proced	ure	Ad	cceptan	ce Criteria	Significant Test Data						
At the conclusion of the rig making any adjustments in	body or lifejacket		Freebo	oard (mm)	Facep	olane (deg)	Torso and	Torso angle (deg) Light			
position, the following meas made with the subject floating	in the relaxed face-up		CLJ	RTD	CLJ	RTD	CLJ	RTD	Visible?		
position of static balance preceding tests.	resulting from the	1									
		2									
		3									
		4									
		5									
		6									
		7									
		8									
		10									
		11									
		12									
		Avg							XXXXX		
	CLJ – Cand RTD – Refe		•								

2.2.1.18 Water performance tests-Static balance	e measurements	Regulations: LSA	Code II/ 2.2.1.4; MSC.81(70) 1/ 2.8.6 and 2.8.7
Test Procedure	Acceptano	ce Criteria	Significant Test Data
1. Freeboard — The distance measured perpendicularly from the surface of the water to the lowest point of the subject's mouth where respiration may be impeded, if the mouth were not held shut. The lowest side of the mouth should be measured if the left and right sides are not level.	Freeboard: the aver the subjects should average for the RTD	not be less than the	Average freeboard, all subjects > average freeboard for RTD minus 10 mm Passed Failed
2. Faceplane angle – The angle, relative to the surface of the water, of the plane formed between the most forward part of the forehead and chin.	Faceplane Angles: subjects' faceplane not less than the arminus 10°.	angles should be	Average faceplane angle, all subjects > average for RTD minus 10° Passed Failed
3. Torso angle – The angle, relative to vertical, of the line formed by the forward points of the shoulder and hipbone (ilium portion of the pelvis).	Torso Angles: the subjects' torso and less than the ave minus 10°.	gles should be not	Average torso angles, all subjects ≥ average for RTD minus 10° PassedFailed
4. List angle – The angle relative to the surface of the water and a line between the left and right shoulder or a line through the ears if only the head is tilted.	Lifejacket light locat the lifejacket light sl visible over as grea upper hemisphere a	hould permit it to be at a segment of the	Does the location of the lifejacket light permit it to be visible over as great a segment of the upper hemisphere as practicable? Comments/Observations

Inherently buoyant lifejackets	Manufacturer Model: Lot/Serial Nu	:mber:		Date: Time: _ Surveyor: _ Organization:						
2.2.1.19 Water performance	e tests – Jum	p and drop tests	Regulatio	ons: LSA Code II/ 2.2.	1.5.6; MSC.81(70)1/2.8.8 and 2.8.9					
Test Procedure		Acceptance Criteria		Significant Test Data						
Without readjusting the lifejack subject should jump vertically in feet first, from a height of at lesholding the arms over the entering the water, the test strelax to simulate a state of utter. The freeboard to the mouth recorded after the test subject of the test should be repeated from at least 4.5 m. When jumping into the water, the should hold on to the lifejacket entry to avoid possible injury. It water, the test subject should after the test subject comes to repeated for any damage. The lifejacket and its attachment examined for any damage. believed likely from any jump or lifejacket should be rejected delayed until test from a lower additional precautions demons risk from the required test is according to the subject test is according to th	nto the water, east 1m while head. Upon ubject should be exhaustion. In should be comes to rest. In a height of the test subject during water Jpon entering ould relax to austion. The be recorded test. Into should be if injury is drop test, the or the test height or with trate that the	accordance with 2.2.1.1 minus 15 mm; .2 not be dislodged or caus harm to the test subject; .3 have no damage that woul affect its in-water performance or buoyance and .4 have no damage to it attachments.	1 m Jum Average Average (B) – (A Did the l buoyand Jid the l Average (B) – (A Did the l buoyand Average (B) – (A Did the l buoyand Jid the l Average (B) – (A Did the l No Did the l No Did the l No	e freeboard, all subject e freeboard for RTD (fr A)= ≤ 15 mr lifejacket become dislo lifejacket have damage ce?: Yes / No lifejacket have damage ump e freeboard, all subject e freeboard for RTD (fr A)= ≤ 15 mr lifejacket become dislo lifejacket have damage ce?: Yes / No	ts: mm (A) rom 2.2.1.18): mm (B) m Pass / Fail odged or cause harm to the test subject?: e that would affect its in-water performance or e to its attachments?: Yes / No ts: mm (A) rom 2.2.1.18): mm (B) m Pass / Fail odged or cause harm to the test subject?: Yes / e that would affect its in-water performance or					
NOTE: JUMP TESTS <u>SHOU</u> REPEATED IN THE RTD.	LD NOT BE			lifejacket have damage ents/Observations	e to its attachments?: Yes / No					

Inherently buoyant lifejackets Manufacturer: Model: Lot/Serial Number: 2.2.1.19 Water performance tests – Jump and drop tests Reg						Date: Surveyor: Organization: _	Time:
			and drop tests		Regulati	ons: LSA Code	e II/ 2.2.1.5.6; MSC.81(70)1/2.8.8 and 2.8.9
TEST DATA	SHEET (1 m Jum						
Subj	Subject surfaced faceup? (Yes/No)	Freeboard (mm)	Lifejacket became dislodged (Yes/No)	Subject was harmed? (Yes/No)	lifej atta	mage to acket or achments s/No)	Comments/ Observations
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							

Inherently lifejackets		Manufacturer: _ Model: Lot/Serial Numb	oer:			Date: Time: Surveyor: Organization:				
2.2.1.19	Water performand					ons: LSA Code	e II/ 2.2.1.5.6; MSC.81(70)1/2.8.8 and 2.8.9			
TEST DAT	A SHEET (4.5 m Ju									
Subj	Subject surfaced faceup? (Yes/No)	Freeboard (mm)	Lifejacket became dislodged (Yes/No)	Subject wa harmed? (Yes/No)	lifej atta	mage to acket or achments es/No)	Comments/ Observations			
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										

innerently buoyant	Model:	Number:			Date: Surveyo Organiza	r:							
2.2.1.20 Water performance to	ests – Sta	ability test	Regula	ations	: LSA Co	ode II/2.2	2.1.4; N	ISC.81(7	70) 1/2.	.8.10			
Test Procedure		Acceptance Criteria					Signif	icant Te	st Data	l			
The test subject should attain a face-up position of static balanc water. The subject should be into assume a foetal position as	e in the structed	The candidate lifejacket should not roll any subject face down in the water.					bject roll face- ? (Yes/No) Did the subject retu stable face-up pos (Yes/No)						
"place your elbows against you		(a) + (b) = 0			Can	didate	R	TD	Candidate		R	TD	
your hands on your stomach, under the lifejacket if possible, and bring your The number of subjects who			Subj	CW	ccw	CW	CCW	cw	CCW	cw	ccw		
knees up as close to your cl possible."	hest as	are returned to the stable face- up foetal position in the	1										
	The subject should be rotated clockwise around the longitudinal axis of the torso candidate lifejacket should be at least equal to the number who are returned to the stable												_
upper areas of the lifejacket so subject attains a 55 ± 5 degree l	that the list. The	RTD. (e) ≤ (g)	5										
subject should then be release subject should return to a stable		(e) ≤ (g) And	6										
position.		(f) ≤ (h)	8										=
The test should then be conduct the subject rotated counter-clock			9										
The entire test should then be rewith the test subject wearing the			10										
with the test subject wealing the	NID.		11										
				al '	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	_

Inherently buoyant lifejackets	Model:	rer: Number:		Surveyor:						
2.2.1.21 Water performance test	tests - swim	nming and water emergence	s: LSA Co	ode II/2.2.1.4; MSC.81(70) 1/2.8.11						
Test Procedure		Acceptance Criteria			Significant Test Data					
All test subjects, without w lifejacket, should attempt to and board a liferaft or rigid p its surface 300 mm above surface. All test subjects who s complete this task should perf	swim 25 m latform with the water successfully	At least two-thirds of the accomplish the task without also be able to perform it with (b) ≥ 2/3 (a)	the lifejacke	t should	Liferaf		atform	successfully board liferaft		
wearing the lifejacket.	om it again				Subj	Without lifejacket	With lifejacket	(b) 2/3 (a)		
				3 4 5			Passed / Failed			
					6 7					
					8 9 10					
					11 12 Total	(a)	(b)			
						ents/Observ		J		

Inherently buoyant lifejackets	Manufactu Model: Lot/Serial N									5	Surve	yor: _		Time:					
2.2.1.22 Infant and children	's lifejacket	- Test su	ıbjec	ts se	electi	on		Regu	latio	ns:	LSA	Code	e II/2.2	2.1.8; MS	C.81(70)	1/2.9 – 2.9	.1		
Test Procedure		Acceptance Criteria									S	ignificant T	est Data						
As far as possible, similar tests (to the adult tests) should be applied for approval of lifejackets suitable for infants and children.		Heigh t range (cm)	t 14 17 20 22 25 28 30 33 36 38 41 range								Size: Infant / Child								
For child-size lifejackets, tests should be carried out with at least 9 ablebodied persons, and for infant-size lifejackets, tests should be carried out with at least 5 able-bodied persons. All test subjects should be selected according to table 2.2 or table 2.3 as		79-	17	20 X	22	25	28	30	33	36	38	41	43	Subj	SEX (M/F)	HEIGHT (m)	WEIGHT (kg)	Manikin? (Yes*/No)	
		90- 118		х	1									2					
		102- 130 112-				1	X	1						3					
follows: .1 One subject should be se		135 122- 150							1	1	Х			5 6					
each cell containing a "1" .2 Remaining subjects s	hould be	145- 165									Х	1	1	7 8					
selected from cells cont "X", without repeating a co	ell.													9					
.3 At least 40% of the subjects should be male and at least 40% female.																			
.4 Devices for infants should on infants as small as 6 k														*Manikir	l n descrip	l tion:			

2.2.1.22 Infant and children's lifejacket	Test subjects sele	ction F	Regulations: LSA Code II/2.2.1.8; MSC.81(70) 1/2.9 - 2.9.1							
Test Procedure		Acceptance	e Criteria	a		Significant Test Data				
.5 A manikin or manikins may be substituted for test subjects if the	Table 2.3 -	Selection of	Infant Te	est Subject	ts					
manikin or manikins have been	Height range	,	Weight R	ange (kg)						
demonstrated to provide representative results compared to	(cm)	Less thar	n 11	11-14	14-17					
human subjects.	Less than 83			Х						
	79-105	Х		1	1					
	90-118				Х					

Inherently buoyant	Manufacturer:				Time:						
lifejackets	Model:										
	Lot/Serial Number:			Organization:							
	ren's lifejacket – nce tests – Righting test		Regulations: LSA Code II/ 2.2.1.8; MSC.81(70)1/ 2.9.2-2.9.3, An								
Test Proce	Α	Acceptance Crit	eria	Significant test data							
This portion of the test is intended of the lifejacket to assist a helexhausted or unconscious states.	calibrated	according	onstructed and to resolution applicable to the	RTD Size: Infant / Child							
lifejacket does not unduly restr		size.	31111CX 2 01 0, as	applicable to the	RTD Constructed by: date:						
The in-water performance of a comparison to the performa				Validated by:	date:						
standard reference lifejacket, i. (RTD) as specified in appendic	e. Reference Test Device				Calibrated by:	date:					
All tests should be carried out conditions. Each test for a carelevant RTD should be condu	indidate lifejacket and the										
The tests may be modified for 12 years of age who are not control to ensure their safety and coop	omfortable in water, so as										
Prior to taking measurements and fastening of the RTD o checked and corrected as nec	n the subject should be										
After entering the water, care sethat there is no significant am trapped in the lifejacket or swir	ount of air unintentionally										

Inherently buoyant	Manufacturer:					Da	ate:				Tir	ne:				
lifejackets	Model: Lot/Serial Number:						Surveyor: Organization:									
	Lot/Serial Number:			1		O	ganıza	tion: _								
2.2.1.23 Infant and children's Righting test (Continue)		ance tes	ts –	Regu	ılatioı	ns: L	SA Cod	de II/ 2	2.2.1.8;	MSC.	81(70)	1/ 2.9.	2-2.9.	3, Ann	ex 2, A	nnex 3
Test Procedure	Acceptance Criteria		Significant Test Data													
Each test subject should assum a prone, face down position in the	e the mouth of the test			CAN	DIDAT	E DE TRI	VICE TI	ME (se	ec)		RE	FERE		EST TIN	/IE (sec)
water, but with the head lifted use the mouth is out of the water	subject comes clear of	Subj	#1	#2	#3	#4	#5	#6	AVG *	#1	#2	#3	#4	#5	#6	AVG *
The subject's feet should be supported, shoulder width apar	e recorded to the nearest	1														
with the heels just below th		2														
surface of the water.	subject's feet are	3														
After assuming a starting position		4														
with the legs straight and arm along the sides, the subjection		5														
should then be instructed in th	e times, and the highest	6					<u> </u>									
following sequence to allow the body to gradually and complete		7														
relax into a natural floatin	g should then be	8					<u> </u>									
posture: allow the arms ar shoulders to relax; allow the leg		9					1									
to relax; and then the spine an																ļ
neck, letting the head fall into the water while breathing or																
normally.	Turning time: the							<u> </u>							<u> </u>	
During the relaxation phase, the	average turn time for all		Aver	age ca	andida	te tu	n time	(sec):			Ave	rage R	TD tu	rn time	(sec):	
subject should be maintained in	a I subjects in the candidate			# of	candic	late n	o turns	(NT):				# of	RTD r	o turns	(NT):	
stable face down position.	exceed the average time in the RTD plus 1 s.	exceed the average time (* Delete highest					ue)									
		Average	e cano	didate t	turn tin	ne <u><</u> A	verage	RTD tu	ırn time l	RTD +	1s Pa	assed_		Fail	led	
		# of can	ndidate	e no tu	rns (N	T): <u><</u> 7	of RTE	no tur	ns (NT):		Pa	assed_		Fai	led	

2.2.1.23 Infant and children's lift Righting test (Continue		ance tests - Regulations: LSA Code II/ 2.2.1.8; MSC.81(70)1/ 2.9.2-2.9.3, Annex 2, Annex 3
Test Procedure	Acceptance Criteria	Significant Test Data
Immediately after the subject has relaxed, with the face in the water, simulating a state of utter exhaustion, the subject's feet should be released.	The number of "no- turns", if any, should not exceed the number in the RTD.	

Inherently buoyant lifejackets	Manufacturer: Model: Lot/Serial Number:			Surveyor: _									
2.2.1.24 Infant and children' - Static balance r		formance te	rmance tests Regulations: LSA Code II/ 2.2.1.8; MSC.81(70)1/ 2.8.6, 2.9.2-2.9.3, Ann										
Test Procedure				Significant Test Data									
At the conclusion of the righting tests, without making any adjustments in body or lifejacket position, the following measurements should be made with the			Free	board (mm)	Facepla	ne (deg)	Torso an	gle (deg)	Light				
subject floating in the relaxed fa	ace-up position of static		CLJ	RTD	CLJ	RTD	CLJ	RTD	Visible?				
-	alance resulting from the preceding tests.												
Infant lifejackets should meet freeboard requirements, however		2											
torso angle, faceplane and mo	3												
necessary in order to:	4												
	bute to the rescue of the infant by a												
caretaker;		6											
.2 allow the infant to be faste		7											
contribute to keeping the caretaker;	e illiani ciose to the	8											
.3 keep the infant dry, with free	e respiratory passages;	9											
.4 protect the infant against b	numps and jolts during												
the evacuation; and	Jumps and joils during												
.5 allow a caretaker to monito	or and control heat loss												
by the infant.	Avg							XXXXX					
	CLJ – Candi RTD – Refer		•										

Model:	mber:	Survey	/or: Time: ization:					
2.2.1.24 Infant and children's lifejacket - W Static balance measurements (C		ons: LSA	:: LSA Code II/ 2.2.1.8; MSC.81(70)1/ 2.8.6, 2.9.2-2.9.3, Annex 2 &					
Test Procedure	Acceptance Criteria		Significant Test Data					
Freeboard – The distance measured perpendicularly from the surface of the water to the lowest point of the subject mouth where respiration may be impeded.	subjects should not be less than the ave for the RTD minus 10 mm	rage m	average freeboard, all subjects ≥ average freeboard for RTD ninus 10 mm					
if the mouth were not held shut. The lowes side of the mouth should be measured the left and right sides are not level.	t		Passed Failed Everage faceplane angle, all subjects > average for RTD minus					
 Faceplane angle – The angle, relative to the surface of the water, of the plant formed between the most forward part of the forehead and chin. 	less than the average for the RTD minus	not 10 s 10°	Passed Failed					
3. Torso angle – The angle, relative to vertical, of the line formed by the forward points of the shoulder and hipbone (ilium portion of the pelvis).	torso angles should be not less than	the A	average torso angles, all subjects > average for RTD minus 10° Passed Failed					
4. List angle – The angle relative to the surface of the water and a line between the left and right shoulder or a line through the ears if only the head is tilted.	Lifeiasket light legation, the position of	f the sible D pper as	Ooes the location of the lifejacket light permit it to be visible over is great a segment of the upper hemisphere as practicable? Comments/Observations:					

Inherently buoyant lifejackets	Model:	per:	Date: Time: Surveyor: Organization:						
2.2.1.25 Children's lifejacket test	- Water perfor	mance tests – Jump and drop	Regulations: LSA Code II/2.2.1.8, 2.2.1.5.6; MSC.81(70) 1/ 2.9, 2.8.8, 2.8.9						
Test Procedure		Acceptance Criteria	Significant Test Data						
Without readjusting the lifeja subject should jump vertically feet first, from a height of at	into the water,	Five of the nine subjects should perform the jump and drop test.							
holding the arms over the head the water, the test subject s simulate a state of utter ex	should relax to	When conducting water performance tests under 2.8,	I AVERSON TREEDOSIN FOR RILL ITROM 2 2 181. Mm (R)						
freeboard to the mouth shou after the test subject comes to	rest. The test	infant and child-size lifejackets should meet the following	g (B) - (A) \$ 15 111111						
should be repeated from a he 4.5m.	eight of at least	requirements for their critical flotation stability characteristics.							
When jumping into the water, should hold on to the lifejack entry to avoid possible injury.	et during water Upon entering	Following the jump and drop test, the lifejacket should:	Did the lifejacket have damage that would affect its in-water performance or buoyance?: Yes / No						
the water, the test subject simulate a state of utter expression of the state of th	xhaustion. The	.1 surface the test subject in a face up position with an							
freeboard to the mouth shou after the test subject comes to		average freeboard for all the subjects of not less than the	e 4.5 m Jump						
The lifejacket and its attachm examined for any damage. If ir		average determined for the RTD after the turning test in accordance with 2.2.1.23	Average freeboard for RTD (from 2.2.18) : mm (B)						
likely from any jump or drop te	ikely from any jump or drop test, the lifejacket should be rejected or the test delayed until test		3 (B) – (A)= ≤ 15 mm Pass / Fail						
from a lower height or with additional		.2 not be dislodged or cause harm to the test subject;	Did the lifejacket become dislodged or cause harm to the test subject?: Yes / No						
			Did the lifejacket have damage that would affect its in-water performance or buoyance?: Yes / No						

2.2.1.25 Children's lifejacket – Water perfor test	mance tests – Jump and drop	Regulations: LSA Code II/2.2.1.8, 2.2.1.5.6; MSC.81(70) 1/ 2.9, 2.8.8, 2.8.9
Test Procedure	Acceptance Criteria	Significant Test Data
Note: Water tests using children should avoid causing distress or risk to the child. Consideration should be taken of their age and ability.	.3 have no damage that would affect its in-water performance or buoyance; and .4 have no damage to its attachments.	,

Inherently lifejackets	buoyant	Model:	ber:		- 	Date: Surveyor: Organization:	Time:					
	nildren's lifejacket Imp and drop tests		mance tests – R	Regulations: LSA Code II/ 2.2.1.8, 2.2.1.5.6; MSC.81(70)1/2.9, 2.8.8 and 2.8.9								
TEST DATA	SHEET (1 m Jump	o)										
Subj	Subject surfaced faceup? (Yes/No)	Freeboard (mm)	Lifejacket became dislodged (Yes/No)	Subject was harmed? (Yes/No)		nage to lifejacket or chments (Yes/No)	Comments/ Observations					
1												
2												
3												
4 5												
5												
Ju	nildren's lifejacket Imp and drop tests	•	mance tests - R	egulations: LS	SA C	ode II/ 2.2.1.8, 2.2.1.	5.6; MSC.81(70)1/2.9, 2.8.8 and 2.8.9					
	SHEET (4.5 m Jun	. /										
Subj	Subject surfaced faceup? (Yes/No)	Freeboard (mm)	Lifejacket became dislodged (Yes/No)	Subject was harmed? (Yes/No)		nage to lifejacket or chments (Yes/No)	Comments/ Observations					
1												
3												
3												
4												
5												

Inherently buoyant lifejackets	Model:	urer:I Number:		Surveyor:Organization:										
2.2.1.26 Infant and children's Stability test	s lifejacke	t – Water performance tests –	Regulations: LSA Code II/2.2.1.8, 2.2.1.4; MSC.81(70) 1/2.8.10, 2.9											
Test Procedure	edure Acceptance Criteria			Significant Test Data										
The test subject should attain a relaxed face-up position of static balance in the water. The subject should be instructed to assume a foetal position as follows:		The candidate lifejacket should not roll any subject face down in the water.			Did the subject roll face- down? (Yes/No)			Did the subject return to stable face-up position? (Yes/No)						
"place your elbows against yo your hands on your stomach, u		(a) + (b) = 0		Cano	didate	R	TD	Can	didate	R	TD			
lifejacket if possible, and br	ing your	The number of subjects who	Subj	CW	ccw	CW	ccw	CW	ccw	CW	CCW	-		
knees up as close to your possible." The subject should be rotated or around the longitudinal axis of	clockwise	are returned to the stable face- up foetal position in the candidate lifejacket should be at least equal to the number who are returned to the stable	2 3									_		
by grasping the subject's sho upper areas of the lifejacket so	by grasping the subject's shoulders or upper areas of the lifejacket so that the subject attains a 55 ± 5 degree list. The		5									- - -		
subject should return to a stable position.		And (f) ≤ (h)	7									<u> </u> 		
The test should then be condu the subject rotated counter-clo			9											
The entire test should then be with the test subject wearing the												<u> </u> 		
			Total "No"	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	_		

Inherently buoyant lifejackets	Model:	er:lumber:		Surveyor:	Time:			
2.2.1.27 Infant and children's	s lifejacket -	· Mobility test	Regulations	.2.1.8; MSC.81(70) 1/2.9.2.5				
Test Procedure		Acceptano	e Criteria		Significant Test Data			
To be considered in and out of Mobility of the subject both in the water should be given considetermining the acceptability of for approval and should be comobility when wearing the asize RTD when climbing out of going up and down stairs, picarticle from the floor, and the from a cup.	and out of ideration in of a device ompared to appropriate f the water, king up an	Assistance may be given to wearer mobility should not be than by the appropriate size F	reduced to an		Does the lifejacket provide for acceptable mobility of the test subjects both in and out of the water and is comparative to the mobility of wearing the RTD? YES NO Passed Failed Method of evaluation: Comments/Observations			

2.2.2 INFLATABLE LIFEJACKETS (ADULTS & CHILD) EVALUATION AND TEST REPORT

2.2.2.1	Submitted drawings, reports and documents
2.2.2.2	Quality assurance
2.2.2.3	Visual inspection
2.2.2.4	General data and specification
2.2.2.5	Temperature cycling test 2.2.2.5.1 Inflation system function 2.2.2.5.2 Test data
2.2.2.6	Buoyancy test
2.2.2.7	Fire test
2.2.2.8	Oil resistance test
2.2.2.9	Test of materials for inflatable bladders, inflation systems and components 2.2.2.9.1 Coated fabrics test 2.2.2.9.2 Operating head load test 2.2.2.9.3 Pressure test 2.2.2.9.4 Compression test 2.2.2.9.5 Test of metallic components 2.2.2.9.6 Inadvertent inflation test
2.2.2.10	Strength tests - Body or lifting loop strength test
2.2.2.11	Strength tests - Shoulder lift test
2.2.2.12	Donning test (Uninflated situation)
2.2.2.13	Donning test (Inflated situation)
2.2.2.14	Water performance tests – Preparation for water performance test
2.2.2.15	Water performance tests – Righting test
2.2.2.16	Water performance tests – Static balance measurements
2.2.2.17	Water performance tests – Jump and drop test
2.2.2.18	Water performance tests – Stability test
2.2.2.19	Water performance tests – Swimming and water emergence test
2.2.2.20	Infant and children's lifejacket – Test subjects
2.2.2.21	Infant and children's lifejacket – Water performance tests - Righting test
2.2.2.22	Infant and children's lifejacket – Water performance tests – Static balance measurements
2.2.2.23	Children's lifejacket – Water performance tests – Jump and drop test
2.2.2.24	Infant and children's lifejacket – Water performance tests – Stability test
2.2.2.25	Infant and children's lifejacket – Mobility test

2.2.2 INFLATABLE LIFEJACKETS (ADULTS & CHILD) EVALUATION AND TEST REPORT

Manufacturer	
Туре	
Date	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

Inflatable lifejackets (Adults & Child) Manufacturer Model: Lot/Serial Nur		er:umber:	Surveyor:	Time:	
2.2.2.1 Submitted	drawings, reports and	documents			
		Submitted drawings and	documents		Status
Drawing No.	Revision No. & date		Title of drawing		
	Т	Submitted reports and o			Status
Report/Document No.	Revision No. & date		Title of report / document		
		Maintenance Manual -			
		Operations Manual -			
			-		

Inflatable lifejackets	Manufacturer:				
(Adults & Child)	Model:	Surveyor:			
(Addits & Office)	Lot/Serial Number:	Organizat	ion:		
2.2.2.2 Quality assurance		Regulations: - MSC.81	(70) 2/1.1, 1.2		
Except where all appliances of of the International Convention amended, or the international inspected, representatives of inspections of manufacturers appliances and materials use approved prototype life-saving Manufacturers should be requited to ensure that life-saving appliances the prototype life-saving appliances.	a particular type are required by Chapter III n for the Safety of Life at Sea, 1974, as Life-Saving Appliance (LSA) Code to be the Administration should make random to ensure that the quality of life-saving ed comply with the specification of the appliance. The red to institute a quality control procedure ances are produced to the same standard pliance approved by the Administration and non tests carried out in accordance with the	Quality Assurance Standard Used: Quality Assurance Proce Quality Assurance Manu Description of System: Quality Assurance Syste Comments/Observations	ual: em acceptable	Yes/No	

Inflatable lifejackets Model.		Manufacturer: Model: Lot/Serial Number:	Surveyor:		
2.2	2.3 Visual inspection		Regulations: LSA Code I/1.		
	Test Procedure	Acceptanc	e Criteria	Signifi	icant Test Data
		Inflatable lifejackets should:			
1.	Approval markings	be clearly marked with appro Administration which approved any operational restrictions;		Passed	Failed
2.	Retro-reflective tape	be fitted with approved patche with a total area of at learness resolution A.658(16). In the cathe arrangement should be convay the lifejacket is put on. Sure as high on the lifejacket as possible.	ast 400 cm ² according to ase of a reversible lifejacket, omplied with no matter which ich material should be placed	Passed	Failed
3.	Lifejacket light	have provision to be fitted with	a light;	Passed	Failed
4.	Donning and comfort	be so constructed that it is cap or is clearly capable of being w incorrectly, it is not injurious to comfortable to wear;	orn in one way and, if donned	Passed	Failed
5.	Whistle	be fitted with a whistle firmly lifejacket;	secured by a lanyard to the	Passed	Failed
6.	Colour of lifejacket	be of international or vivid red highly visible colour.	dish orange or a comparably	Passed	Failed
				Passed	Failed

7. Buoyant Line & Means to lift the wearer	A lifejacket shall be provided with a releasable buoyant line		
	or other means to secure it to a lifejacket worn by another		
	person in the water. A lifejacket shall be provided with a		
	suitable means to allow a rescuer to lift the wearer from the	Passed	Failed
	water into a survival craft or rescue boat.		
Oversized lifejacket			
	If an adult life jacket is not designed to fit persons weighing		
	up to 140 kg and with a chest girth of up to 1750 mm,		
	suitable accessories shall be available to allow it to be		
	secured to such persons.	Passed	Failed
Damaged in stowage and operation			
	A lifejacket shall not be damaged in stowage throughout the		
	air temperature range -30°C to +65°C and remain		
	operational throughout the air temperature range		
	-15°C to +40°C. (After testing of temperature cycling.)	Comments/Observations	

Model:		rer: Number:		Surveyor:		ime:	
				Organization:			
2.2.2.4 General data and sp	pecifications	}	Regulations	: LSA Code II/2.	2; MSC.81(70)		
Construction Material:		Additional equipment:			Donning instruc	tions:	
Fabric produced by:		Retro reflective material: -	☐ YES	□NO	□ YES	□NO	
		Туре:					
Type:		Whistle: -	□ YES	□NO			
		Туре:					
Inflation system produced by:		Light (if fitted):	□ YES	□NO			
Туре:		Туре:					
Cover fabric produced by:		Marked s	size	range:			
Туре:				_			
Fabric for the inflatable cha Produced by:	amber	Proper marking for infants an lifejacket:			Passed	Failed	
Туре:			□ YES	□NO			
Size and type of gas:							
Means of activating the inflation system:							

Inflatable lifejackets (Adults & Child)	Model:	···		Surveyor:	Time:
2.2.2.5 Temperature cycling		•	1		.2.2 & 1.2.2.3; MSC.81(70) 1/2.10.1.1
Test Procedur	е	Acce	ptance Criteria		Significant Test Data
Two inflatable lifejackets sho to a temperature cycling test temperatures of -30°C and uninflated condition. These a need not follow immediately and the following procedure total of 10 cycles, is acceptab 1. an 8 h exposure at a minimu +65°C to be completed in or chamber that same day under ordinary room temperature of 20°C ± 3°C to be completed the room that same day and left expositions at a tem ± 3°C until the next day;	at of surrounding at +65°C in the alternating cycles after each other, repeated for a le: um temperature of the day; and from the warm and left exposed conditions at a until the next day; um temperature of the day; and the cold chamber sed under ordinary	Two uninflated inflata of the temperature externally. The inflata show no signs of cracking, swelling mechanical qualities. Temperature test data	cycling should able lifejacket m damage such dissolution or	be examined aterials should as shrinking, changes of	Examination 1. Lifejacket No. 1 Passed Failed 2. Lifejacket No. 2 Passed Failed 3. Cold inflation test, auto inflation Temperature of water°C. Time to inflate and relief valves blowing sec. Auto inflation Passed Failed 4. Cold inflation test, manual inflation Temperature of water°C. Time to inflate and relief valves blowing sec Manual inflation Passed Failed Comments/Observations

Inflatable lifejackets (Adults & Child)	Model: S			Surveyor:	Time:
2.2.2.5.1 Temperature cycling	g test - Inflation sy	stem function	Regulations:	LSA Code I/1.2.	.2.2 & 1.2.2.3; MSC.81(70) 1/2.10.1.1 - 2.10.1.3
Test Procedur	е	Accep	otance Criteria		Significant Test Data
The automatic and manual should each be tested immed temperature cycling test as foll 1. After a high temperature inflatable lifejackets should be stowage temperature of + 6 be activated using the automatic system by placing it in temperature of + 30°C and the activated using the manual inflatable lifejackets should be stowage temperature of -30° activated using the automatic by placing it in seawater at a 1°C and the other should be the manual inflation system. After exposure to a temperature period of at least 8 h, two lifest activated using the manual inflational fully inflate. After exposure to a temperature period of at least 8 h, two lifest activated using the manual inflational fully inflate.	cycle, the two be taken from the ciso. One should atomatic inflation seawater at a be other should be offlation system. cycle, the two be taken from the C. One should be conflation system a temperature of exactivated using the conflation system at the conflation system and the conflation system system and the conflation system and the conflation system	The lifejackets should fully tests. Each should fully The lifejackets should f tests. Each should fully	r inflate.		.5 Hot inflation test, automatic inflation Temperature of water°C. Time to inflate and relief valves blowing sec Automatic inflation PassedFailed .6 Hot inflation test, manual inflation Temperature of water°C. Time to inflate and relief valves blowing sec Manual inflation PassedFailed .7 Exposure to temperature of -15°C for 8h Did the two lifejackets fully inflate using the manual inflation system? Passed Failed .8 Exposure to temperature of +40°C for 8h Did the two lifejackets fully inflate using the manual inflation system? Passed Failed

Inflatable li (Adults & 0		Model:	r: umber:		Date: Surveyor: Organization: _		_ Time:	
2.2.2.5.2 T	emperature cyclin	g test - Test o	data	Regula	tions: LSA Code I/1.2.	.2.2 & 1.2.2.3;	MSC.81(70) 1/2.1	0.1.1
		НО	T CYCLE	•		COL	D CYCLE	
Cycle 1	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: Time In: Temperature:		Date Out: Time Out: Duration:	
Cycle 2	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In:Time In:Temperature:		Date Out: Time Out: Duration:	
Cycle 3	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: Time In: Temperature:		Date Out: Time Out: Duration:	
Cycle 4	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: Time In: Temperature:		Date Out: Time Out: Duration:	
Cycle 5	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: Time In: Temperature:		Date Out: Time Out: Duration:	
Cycle 6	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: Time In: Temperature:		Date Out: Time Out: Duration:	
Cycle 7	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In:Time In:Temperature:		Date Out: Time Out: Duration:	
Cycle 8	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: Time In: Temperature:		Date Out: Time Out: Duration:	
Cycle 9	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: Time In: Temperature:		Date Out: Time Out: Duration:	
Cycle 10	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: Time In: Temperature:		Date Out: Time Out: Duration:	

Inflatable lifejackets (Adults & Child)				Date: Time: Surveyor: Organization:			
2.2.2.6 Buoyancy test			Regulatio	ns: LSA Code	II/2.2.2.3, 2.2.2; MSC.81	1(70) 1/2.2, 2.10.1.1	
Test Pro	ocedure	Acc	eptance Cri	teria	Signif	ficant Test Data	
and cold inflation test should test. The buoyancy of the two lifejack and after 24 h complete submering fresh water. The test to be necessary to perform the test of the uninflated condition. A lifejacket subjected to the automatically with one compasshould be repeated until each of the uninflated condition. (The following equipment alternatives may be used to callifejacket: 1. a mesh basket or tray large eand adequate weights to or lifejacket; 2. a tank of fresh water large	enough to accommodate the cket with the uppermost part of the surface of the water; and to ± 0.015 kg.	buoyancy a should not o buoyancy.	and the fir exceed 5% er should b	en the initial lad buoyancy of the initial buoyancy of the initial be fitted with	Weight of the mesh bas Buoyancy of front chan Buoyancy of front chan Difference in buoyancy Buoyancy of back chan Difference in buoyancy Passed	sket with the lifejacket:sket without the lifejacket:nber at startnber at 24 hrmber at startmber at 24 hrmber at 24 hrmber at 24 hr	Kg. Kg. Kg. Kg. Kg. Kg. Kg. Kg. Kg. Kg. Kg. Kg.

Inflatable life is alcote	Manufacturer:			Date:	Time:		
Inflatable lifejackets (Adults & Child)	Model: Lot/Serial Number:						
(Addits & Cillia)			Organization:				
2.2.2.7 Fire test			Regulatio	ns: LSA Code II/2.2	.1.1; MSC.81(70) 1/2.3, 2.10.1	.1	
Test Pro	ocedure	,	Acceptance	Criteria	Significant Tes	t Data	
and cold inflation test should the lifejacket should be inflated and A test pan 30 cm x 35 cm x essentially draught-free area, bottom of the test pan to a depetrol to make a minimum total then be ignited and allowed to lifejackets, one inflated the ot moved through the flames in a position, with the bottom of the	temperature cycling and the hot en be used for the fire test. One	burning for melting after The inflated a result of pa	more than being remo lifejacket shassing through ifejacket sha	nould not sustain 6 s or continue ved from the flame. rould not deflate as gh the flames. could remain inflated ::	1. Lifejacket No.1 Passed 2. Lifejacket No.2 Passed Comments/Observations	Failed	

Inflatable lifejackets (Adults & Child)	Manufacturer: Model: Lot/Serial Number:			Date: Surveyor: Organization:	Time:	
2.2.2.8 Oil resistance test		Regulations: LSA Code I/1.2			.2.4; MSC.81(70) 1/2.4	
Test Pr		Acceptance	Criteria	Significant Test Data		
Two of the inflatable lifejackets resistance test.		examined ex sign of dama	xternally an age such as dissolution	ejacket should be d should show no shrinking, cracking, or change of	Condition of Lifejacket No.1 after 24 hours. Passed Failed	
The lifejacket should be immer 24 h under 100 mm head of temperature.					Condition of Lifejacket No.2 after 24 hours. Passed Failed	
					Comments/Observations	

Inflatable lifejackets (Adults & Child)		Date: Time: Surveyor: Organization:						
2.2.2.9 Tests of materials for inflatable bladders, inflation systems and components				Regulations: LSA Code I/1.2.2.1, 1.2.2.4 & 1.2.2.5; MSC.81(70) 1/2.4, 2.10.4 - 2.10.4.1				
Test Procedure		Acceptance Criteria			Si	gnificant Test Data		
All the materials used in the consof the lifejacket, including the tapes, seams and closures, in bladders, inflation system components should be test establish that they are: 1 rot – proof, 2 colour-fast; and 3 resistant to deterioration exposure to sunlight, and that they are not unduly a by 4 seawater; 5 oil; or 6 fungal attack	e cover, offlatable ons & sted to	The results should be acceptable to the International Organization fo Standardization, in particula publication ISO 12402-7:2006 Personal flotation devices – Part 7 Materials and components – Safety requirements and test methods. The results should be acceptable to the International Organization fo Standardization, in particula publication ISO 12402-7:2006 Personal flotation devices – Part 7 Materials and components – Safety requirements and test methods.	Cover:	_	Seams:	Additional		

	Inflatable lifejackets Model: Surv			Surveyor:	Date: Time: Surveyor: Drganization:				
2.2	2.2.9.1 Coated fabrics test			Regulations: LSA Code I/1.2.2.1, 1.2.2.4 & 1.2.2.5; MSC.81(70) 1/2.10.4.1.1-4					1-4
	Test Procedure		Acceptano	ce Criteria			Significant Te	st Data	
Coated fabrics used in the construction of inflatable buoyancy chambers should comply with the following requirements:		should							
1.	Coating adhesion should be accordance with ISO 24111 the method described at part at 100mm/min	O 2411:2000 using coating adhesion should not be less					Coating Adhesion (dry)N,	- Test Results in Weft Failed	
2.	coating adhesion should when wet following ageing a ISO 188:2007 with an expo ± 0.5 h in fresh water at (76 following which the meth 2411:2000, paragraph 5.1 applied at 100mm/min.	according to sure of 336 $0.0 \pm 1.0)^{\circ C}$ od at ISO	coating adhesion when wet should not be less than 40 N per 50 mm width.			Coating Adhesion (wet)	- Test Results in Weft		
	tear strength should be accordance with ISO 4674-ISO 4674-2:1998 using me	1:2003 and thod A1.	(3) After being tested accord ISO 4674-2:1998, method A1 be less than 35 N.	, the tear streng	gth should not	3.Passed4.	Tear strength: d Flexure Test:	Failed	N
4.	resistance to flex cracking tested in accordance 7854:1995 method A using cycles.	with ISO	(4) After being tested according to ISO 7854:1995, method A there should be no visible cracking or deterioration.			d ents/Observations	Failed		

Inflatable lifejackets Model:		Surve		Surveyor:		Time:		
2.2.	2.9.1 Coated fabric test (c	continued)		Regulations:	LSA Code I/1.2	2.2.1, 1.2.2.4 & 1	.2.2.5; MSC.81(70)	1/2.10.4.1.5-8
	Test Procedure		Acceptanc	e Criteria			Significant Test Da	ta
5.	breaking strength should I accordance with ISO 1421 the CRE or CRT method conditioning for 24 ± 0.5 temperature and should it than 200 N per 50 mm wide	:1998 using d, following h at room not be less	(5) After being tested according strength should not be width.			5. Break Passed	Strength (dry)	N: ed
6.	breaking strength should be accordance with ISO 1421 the CRE or CRT method conditioning immersed in for 24 ± 0.5 h at room temps should not be less than 50 mm width.	:1998 using d, following fresh water perature and	(6) After being tested according strength when wet s per 50 mm width.			6. Break S	Strength (wet)	N: ed
7.	elongation to break should in accordance with ISO using the CRE or CR following conditioning temperature for 24 ± 0.5 h	1421:1998 RT method at room	(7) After being tested according temperature the elongation to 60%.			7. Elonga Passed	ition (dry)Faile	%:
8.	elongation to break should in accordance with ISO using the CRE or CF following conditioning impresh water at room temper ± 0.5 h.	1421:1998 RT method nmersed in	(8) After being tested according water at room temperature the not exceed 60%.			8. Elongat Passed Comments/Obs		%:

Model:				Date: Time: Surveyor: Organization:				
2.2	2.9.1 Coated fabric test (c	continued)		Regulations:	LSA Code I/1.2	2.2.1, 1.2.2.1.4 & 1.2.2.1.5; MSC.81(70) 1/2.10.4.1.9-11		
	Test Procedure		Acceptan	ce Criteria		Significant Test Data		
when tested in accordance with ISO 105-B02: 2013.		with ISO 105 - B02:2013, the contrast between the		9. Accelerated light test Class Passed Failed				
10.	the resistance to wet and when tested in accord ISO 105-X12: 2001.		(10) After being wet and dry rubbed in accordance with ISO 105- X12:2001, the staining of the rubbed samples should not be less than class 3.			10. Wet staining after rubbing Class Passed Failed		
11.	the resistance to seawater be less than class 4 in with ISO 105 EO2: 1994.		(11) After being tested in accordar EO2:1994, the change in colour of th not less than class 4.			11. Dry staining after rubbing Class Passed Failed		
						Comments/Observations		

Inflatable lifejackets (Adults & Child) Manufacturer: Model: Lot/Serial Number:				Surveyor:	:		
2.2.2.9.2 Operating head load	l test		Regulations:	LSA Code I/1.	1.2.2.1, 1.2.2.4 & 1.2.2.5; MSC.81(70) 1/2.10.4.2		
Test Procedure		Acceptano	ce Criteria		Significant Test Data		
The operating head load test carried out using two lifeja lifejacket to be conditioned a 8 hours and the other at +65°C After mounting on the manikin form the lifejacket should be inf steady force of (220±10) N ap operating head as near as pospoint where it enters the chamber. This load should be for 5 minutes during which the dangle in which it is applied continuously varied.	ackets one t -30°C for for 8 hours. or the test lated, and a plied to the sible to the buoyancy maintained irection and	On completion of the test, intact and should hold its pres			1. Security of operating head -30°C(Jacket 1) Load applied N. 2. Visible damage Passed Failed 3. Security of operating head +65°C (Jacket 2) Load applied N. 4. Visible damage Passed Failed 5. Pressure at the beginning of the test at -30°C and after 30 min. Jacket 1 at the beginning after 30 min 6. Pressure at the beginning of the test at +65°C and after 30 min. Jacket 2 at the beginning after 30 min Comments/Observations		

inflatable lifejackets	Model:	Surveyor:			Time: :		
2.2.2.9.3 Pressure test (1)			Regulations:	LSA Code II/2	/2.2.2.2; MSC.81(70) 1/2.10.4.3.1		
Test Procedure		Acceptano	e Criteria		Significant Test Data		
Overpressure test The inflatable buoyancy chambe be capable of withstanding an interpressure at ambient temper chambers of a lifejacket should using the manual method of inflatinflation the relief valves should be and a fully charged gas cylinder to the manufacturers recommended be fitted to the same inflatiant fired. All fully charged gas used in this test should be sized to the markings on lifejacket.	ternal over rature. All be inflated ation, after be disabled according mendation tion device a cylinders	The lifejacket should remain pressure for 30 minutes. The lifejackets should show a cracking, swelling or changes that there has been no significinflation component.	no signs of dar s of mechanical	nage such as qualities and	Size of gas bottle grams. Duration of test min. 2. Chamber 1 - Pressure at the beginning of test and after 30 min.	f the	

Inflatable lifejackets (Adults & Child)	Model:	er:	Surveyor:			
	Loi/Serial N			•	00.04/70) 4/0.40.4.2.2	
2.2.2.9.3 Pressure test (2)				LSA Code; IVI	SC.81(70) 1/2.10.4.3.2	
Test Procedure		Acceptano	ce Criteria		Significant Test Data	
Relief valve test With one buoyancy chamber is operating head on the opposite chamber should be fired manual fully charged gas cylinder accommanufacturer's recommendate operation of the relief valves noted to ensure that the excess relieved.	e buoyancy ally, using a rding to the cions. The should be	The lifejacket should remain pressure for 30 minutes. The lifejackets should show cracking, swelling or changes that there has been no significinflation component.	no signs of da s of mechanica	mage such as Il qualities and	1. Chamber 1 Size of gas bottle grams. Pressure at the beginning of the test and after 30 min. after 30 min. 2. Relief valve operation. Passed Failed 3. Damage to lifejacket Passed grams. 4. Chamber 2 Size of gas bottle grams. Pressure at the beginning of the test and after 30 min. after 30 min. 5. Relief valve operation. Passed Failed 6. Damage to lifejacket Passed Failed Comments/Observations	

2.2.2.9.3 Pressure test (2) Continued	Regu	Regulations: LSA Code; MSC.81(70) 1/2.10.4.4.2			
Test Procedure	Acceptance Criteria	Significant Test Data			
		7. Chamber 3 Size of gas bottle grams. Pressure at the beginning of the test and after 30 min after 30 min. 8. Relief valve operation. Passed Failed 9. Damage to lifejacket Passed grams. Pressure at the beginning of the test and after 30 min at the beginning after 30 min. 11. Relief valve operation. Passed Failed 12. Damage to lifejacket Passed Failed 12. Damage to lifejacket Passed Failed Pressure after the test in each camber: Chamber 1: Chamber 3: Chamber 4: Comments/Observations			

Inflatable lifejackets (Adults & Child)	Model:	Number:		Surveyor: Organization:	Time:				
2.2.2.9.3 Pressure test (3)		<u> </u>	Regulations:	Regulations: LSA Code; MSC.81(70) 1/2.10.4.3.3					
Test Procedure		Acceptance Criteria		Signifi	icant Test Data				
Air retention test One inflation chamber of a lift filled with air until air escapes over-pressure valve or, if the does not have an over-pressuntil its design pressure, as staplans and specifications, is reactest is then repeated as many necessary to test a different chaeach chamber has been test manner. The pressure release valve is settled when the measurement	s from the lifejacket ure valve, ated in the ched. This r times as amber until ed in this should be	After 12 h the drop in pressure should not be greater than 10%.	2. Pressu 1. Air ret Passe 2. Pressu 1. Air ret Passe 2. Pressu 1. Air ret Passe 2. Pressu 2. Pressu 1. Air ret Passe 2. Pressu 2. Pressu	re at the beginning of the at the beginning after 12 h % drop re at the beginning of the wind at the beginning after 12 h % drop re at the beginning of the at the beginning after 12 h % drop re at the beginning of the at the beginning after 12 h % drop re at the beginning of the at the beginning after 12 h % drop re at the beginning of the wind at the beginning after 12 h % drop re at the beginning of the at the beginning after 12 h % drop re at the beginning of the at the beginning after 12 h % drop re at the beginning of the at the beginning after 12 h % drop	Failed e test and after 12 h. Failed e test and after 12 h. Failed e test and after 12 h. Failed e test and after 12 h.				
			Comments/Obs	oci vali0115					

Inflatable lifejackets (Adults & Child)	Model:	Number:		Surveyor:	Time:		
2.2.2.9.4 Compression test			Regulations: I	_SA Code; M	ISC.81(70) 1/2.10.4.4		
Test Procedure		Acceptano	ce Criteria		Significant Test Data		
The inflatable lifejacket, packed in the normal manner, should be laid on a table. A bag containing 75 kg of sand and having a base of 320 mm diameter should be lowered onto the lifejacket from a height of 150 mm in a time of 1 s. This should be repeated ten times, after which the bag should remain on the jacket for not less than 3 hours.			cket to be inspect of mechanical pr	ted to ensure operties has	Drop Height	mm mm sec hr. Failed	-
2.2.2.9.5 Test of metallic con	nponents		Regulations: LSA Code; MSC.81(70) 1/2.10.4.5				
Test Procedure		Acceptane	nce Criteria		Significant Test Data		
Metal parts and compone lifejacket should be corrosion is seawater and should be accordance with ISO 9227:2 period of 96 h.	resistant to tested in	be significantly affected by corrosion, or affect any other		Corrosion T Passed	est on ComponentsFailed	-	
Metal components should no magnetic compass of a type us boats by more than 5°, when prodistance of 500 mm from it.	ed in small	The lifejacket should not affe more than 5°.	ect the magnetic compass by		Magnetic Tes Passed Comments/Observati	_	-

Inflatable lifejackets				Date: Time:		
(Adults & Child)	Lot/Serial Number:			Organization	n:	
2.2.2.9.6 Inadvertent inflation	n test		Regulations: L	-SA Code; MS	SC.81(70) 1/2.10.4.6	
Test Procedu	re	Acce	ptance Criteria		Significant Te	st Data
The resistance of an automatic inadvertent operation should exposing the entire lifejacket to fixed period. The lifejacket should be fitted standing manikin of adult size shoulder height of 1500 mm alternatively to an appropriat shown in figure 2. The life deployed in the mode in which use but not deployed as used i is equipped with a cover whic closed, then the cover should test).	be assessed by sprays of water for correctly to a free e, with a minimum (see figure 5), or ely sized form as ejacket should be it is worn ready for n the water (i.e. if it h is normally worn	Test set-up for test of auto	1500 mm		 Inadvertent Inflation. Passed Auto inflation test. Auto inflation system operable. Passed Comments/Observations 	Failed
Two sprays should be installed water onto the lifejacket, as should be positioned 50 highest point of the lifejacket, 15° from the vertical centre line the bottom line of the lifejacket should be installed horizontall 500 mm from the bottom line of be pointed directly at the lifejacket should have a spray cone of 30° 1.5 ± 0.1 mm in diameter, and to orifice should be 50 ± 5 mm² evenly spread over the spray not should should be 50 ± 5 mm² evenly spread over the spray not should be 50 ± 5 mm² evenly spread over the spray not should be 50 ± 5 mm² evenly spread over the spray not should be 50 ± 5 mm² evenly spread over the spray not should be 50 ± 5 mm² evenly spread over the spray not should be 50 ± 5 mm² evenly spread over the spray not s	own in the diagram. On mm above the and at an angle of the manikin and the office of the other nozzle by at a distance of the lifejacket, and taket. These nozzles office being the total area of the part of the life, the orifice being	Figure 5-Test Set-up	p			

Inflatable lifejackets (Adults & Child)	Model:	er:umber:		Date: Time: Surveyor: Organization:										
2.2.2.9.6 Inadvertent inflation	test (contin	ued)	Regulations:	ons: LSA Code; MSC.81(70) 1/2.10.4.6										
Test Procedure		Acceptance Cr	iteria					Signi	ficant 7	Гest D	ata			
The air temperature should be water should be supplied to nozzles at a flow of 600 l/h, temperature of 18°C to 20°C.	the spray	The lifejacket should not inflate during the test After completing this test, the lifejacket should be immersed in water to verify that the auto-inflation			1. Passed			: Inflatio 		ailed				
·					2. Auto inflation test.									
The sprays should be turned of lifejacket should be exposed	ed to the	system is working.				Auto inflation system operable.								
following series of test to asses of the jacket to resist inadverter				Time to inflate: sec.										
.1 5 minutes with the high sp front of the lifejacket;	oray on the			F	Passed Failed									
.2 5 minutes with the high sp left side of the lifejacket;	oray on the		_ of Buryant					Comments/Observations						
.3 5 minutes with the high sp back of the lifejacket; and		N / / / i												
.4 5 minutes with the high spright side of the lifejacket.	oray on the			Figure [0	5	_	_	0			
During exposures .1, .2 the horizontal spray should be 10 periods of 3 sec each to the	applied for	F-1			Size Adult Child	A 610 508	B 114 102	C 76,2 76,2	D 127 102	E 381 279	F 432 330	G 508 406	H 25,4 22,2	J 178 152
right sides (but not back) as w spray.		Figure – Alternative form			Infant	305	63,5	38,1	63,5	191	203	241	19,1	76,2

Inflatable lifejackets (Adults & Child)	Model:	er: umber:		Surveyor: Organization:					
2.2.2.10 Strength tests - Bod	y or lifting lo	oop strength test	Regulations:	LSA Code; M	SC.81(70) 1/2.5.1, 2.10.1.1				
Test Procedure		Acc	eptance Criteria	Significant Test Data					
The lifejacket should be immers for a period of 2 min. It shouremoved from the water and cl same manner as when it is person. A force of not less that (2,400 N in the case of a child or lifejacket) should be applied for the part of the lifejacket that so the body of the wearer (see separately to the lifting loop of the test should be repeated encircling closure. The two lifejackets substemperature cycling and the heinflation test should then be ustrength test.	ald then be osed in the worn by a an 3,200 N r infant-size r 30 min to ecures it to figure) and e lifejacket. If for each jected to ot and cold	5	Voke or over-the-head-type lifejace.	type lifejacket s	Time: Slippage: Closure(s) tested		p test arrangement if		

Inflatable lifejackets (Adults & Child)	Manufacturer: Model: Lot/Serial Number:				Sur	veyor:								
2.2.2.11 Strength tests - Sho	oulder lift test	Regul	lations	: LSA	Code;	MSC.	81(70)	1/2.5	.2, 2.10	06 22,2 152				
Test I	Procedure		F	Accepta	ince C	riteria			Significant Test Data					
2.2.2.7, 2.2.2.8 and 2.2.2.10 shoulder strength test. The lifejacket should be immershould then be removed from shown in figure 2 in the same person. A force of not less than	acted to the tests in 2.2.2.5, 2.2.2.6, above should be subjected to the sed in water for a period of 2 min. It the water and closed on a form as a manner as when it is worn by a 1 900 N (700 N in the case of a child it be applied for 30 min across the of the lifejacket (see figure).	result The lif form of Figure lifejact	of this ejacke luring t	t should his test	d rema	n mm houlde	r lift te	n the	Time Sign Passe Comm	force a of dam ed	applied	r Fa	min	
	r over-the-head-type lifejacket	Size Adult	A 610	В 114	C 76,2	D 127	E 381	F 432	508					
Figure - Shoulder lift test arrang lifejackets	Child	508	102	76,2	102	279	330	406	22,2	152				
C– Cylinder; 125mm diameter 50mm diameter for infant a L– Test load		Infant	305	63,5	38,1	63,5	191	203	241	19,1	76,2			

Inflatable lifeja	ckets	Ma	anufacturer odel:			Date: Surveyor:				Time:					
(Adults & Child				mber:				Organiz	zation:						
2.2.2.12 Donn	ing Test	(Uninflate	d situation	1)		Regulations:	LSA Co	ode II/2.	2.1.5; MSC.8	1(70) 1/	2.7.1 to	2.7.4.3, 2.1	10.2		
		Test Proc	edure			Ad	cceptanc	ce Criter	ia			Significant	Test Data		
often in adverse following featur The test should who are comp	To minimize the risk of incorrect donning by uninitiated persons, often in adverse conditions, lifejackets should be examined for the following features and tested as follows: The test should be carried out with at least 12 able-bodied persons who are completely unfamiliar with the lifejacket and selected according to the heights and weights in table 2.1 and the following:					Fastenings necessary for proper performance should be few and simple and provide quick and positive closure that does not require tying of knots. Adult lifejackets should readily fit various					Comments/Observations:				
				.1 and the fo	ollowing:	sizes of adults, both lightly and heavily clad. All lifejackets should be capable of being worn inside-out, or clearly in only one way.				Subj	SEX (M/F)	HEIGHT (m)	WEIGHT (kg)	Good Swimmer? (Yes/No)	
.1 small test su .2 at least 1/3,				cubioete ek	ould bo	Wom more of	at, 01 010	any m	ing one may.	1					
										2					
the tallest he	females, including at least 1 per height category but excluding the tallest height;.3 at least one male should be from the lowest and highest weigh									3					
										4				+	
group and or and one fem															
.4 at least one s										5					
_ a "1"; and										6				+	
.5 enough add	ditional s "X" to to	ubjects sh	nould be s	selected fro	m cells					7				_	
with no more										8					
across weigh										9					
	ı	_	Test subjec	t selection f		•				10					
11(()	40.40	10 00	00.70		ight range		1440	400	100	11					
Ht range (m)	40 -43	43 – 60 X	60 -70 X	70 – 80	80 – 100	100 – 110	110 –	120	> 120	12					
< 1,5 1,5 – 1,6	X	1	1	X	Х										
1,6 – 1,7		X	X	1	X	X									
1,7 -,1,8			X	X	1	X		X	X						
1,8 – 1,9			X	X	X				X						
> 1,9					Х	X X 1									

Inflatable lifejackets (Adults & Child)	Manufacturer: Model: Lot/Serial Number:			Surveyor:	_ Time:				
2.2.2.12 Donning Test (Unin	flated situation)	the clothing specified follows: clothing, which would of a lifejacket; tire appropriate for a arctic parka and warm order is given until the ete. For assessment purposes donning is considered complete when the subject has donned and securely adjusted all methods of securing the lifejacket to the extent needed to meet the inwater performance requirements, including inflation, if needed. The lifejacket should be capable of being donned by at least 75 % of the subjects, and within 1 minute. If a subject dons the lifejacket substantially correctly but fails to secure and/or adjust all closures, the jump test in 2.8.8 of MSC.81(70)							
Each test subject should be te for the test and appropriate to 1 Normal clothing means no not normally interfere with the state of the	their size, as follows: ormal indoor clothing, we the donning of a lifejack means the attire appropring a hooded arctic park of the means the attire appropring a hooded arctic park of the means the order is given in the means the order is given in the complete. ested individually or a first attempt should demonstration. The life on, should be placed of subject. The instruction ubject and should be e THIS LIFEJACKET AS	which would et; oriate for a a and warm ten until the s a group, be with no jacket, with on the floor, on provided quivalent to a QUICKLY	complete when the securely adjusted lifejacket to the exwater performant inflation, if needed. The lifejacket should by at least 75 % 1 minute. If a subject done correctly but fails closures, the jumpand in-water per MSC.81(70) and 2 performed with the establish whether and the donning is. Each subject should within a period of 1 minute.	the subject has donned and all methods of securing the ktent needed to meet the ince requirements, including and including the secure and the subjects, and within the secure and the securing	Total number of subjects: # of subjects successful: # of subjects successful: Pass / Fail Pass / Fail				

Inflatable lifejackets (Adults & Child)	Manufacturer: Model: Lot/Serial Number:			Surveyor:	Time:	
2.2.2.12 Donning Test (Uni	nflated situation)	Regulations: LSA	Code II/2.2	.1.5; MSC.81(70) 1/2.7.1	to 2.7.4.3, 2.10.2	
Test after instruction For each subject whose fire incomplete, after demonstrate subject with the donning product on the lifejacket without clothing, using the same instruction.	tion or instruction to far cedure, the test subject assistance while wear	miliarize the should then ring normal				
Heavy-weather clothing test Each subject should then do while wearing heavy-weather and timing method as above.	clothing, using the same					

Inflatable lifejackets (Adults & Child)	Manufacturer:			Date: Time: Surveyor: Organization:				
2.2.2.13 Donning Test (Inflat	ted situation)		Regula	ations: LSA Co	ode II/2.2.1.5; MSC.81(70) 1/2.7.1 to 2.7.4.3			
Те	est Procedure	Acc	ceptanc	e Criteria	Significant Test Data			
in adverse conditions, lifejacke features and tested as follows: The test should be carried out are completely unfamiliar with the heights and weights in table. 1 small test subjects need not 2 at least 1/3, but not more that including at least 1 per he height; 3 at least one male should be female should be more than 4 at least one subject should "1"; and 5 enough additional subjects a "X" to total the required not	with at least 12 able-bodied persons who the lifejacket and selected according to le 2.1 and the following: t be adults; an 1/2 of test subjects should be females, eight category but excluding the tallest from the lowest and highest weight group from the lowest weight group and one	proper per few and quick and does not Adult lifej fit various lightly an lifejackets	erforma simple d positi require sjackets s sizes and hea s should worn i	ecessary for nce should be and provide we closure that tying of knots. should readily of adults, both avily clad. All d be capable of nside-out, or ne way.				

			Test subje	ct selection	for adult lifeja	ickets							
				We	eight range -	kg							
Ht range (m)	40 -43	43 – 60	60 -70	70 – 80	80 – 100	100 – 110	110 – 120	> 120					
< 1,5	1	1 X X X											
1,5 – 1,6	Х	X 1 1 X X											
1,6 – 1,7		Х	Х	1	Х	Х							
1,7 -,1,8			Х	Х	1	Х	X	Х					
1,8 – 1,9			Х	Х	Х	1	1	Х					
> 1,9					Х	X	Х	1					

Comments/Observations:

Subj	SEX (M/F)	HEIGHT (m)	WEIGHT (kg)	Good Swimmer? (Yes/No)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Inflatable lifejackets (Adults & Child)	Manufacturer:	Surveyor:					
2.2.2.13 Donning test (Inflat	ted situation) (Continued)	Reg	ulations: LSA Code II/2.2.1.5; MSC				
Te	est Procedure		Acceptance Criteria	Significant Test Data			
test and appropriate to their size. 1 Normal clothing means in normally interfere with the clothing means in the clothing means in the clothing means including a gloves.	normal indoor clothing, which would not donning of a lifejacket; neans the attire appropriate for a hostile hooded arctic parka and warm cotton om when the order is given until the test	complete w securely ad lifejacket to	nent purposes donning is considered hen the subject has donned and justed all methods of securing the the extent needed to meet the in cormance requirements, including eeded.	See following page for test data			
normal clothing, the first attempor prior demonstration. The condition, should be placed c subject. The instruction proviand should be equivalent to	ted individually or as a group. Wearing of should be with no assistance, guidance elifejacket, with closures in the stored on the floor, face up, in front of the test ded should be identical for each subject to the following: "PLEASE DON THIS AS POSSIBLE AND ADJUST IT TO A NDON SHIP."		et should be capable of being donned 75 % of the subjects, and within	# of subjects successful: # of subjects successful:			

2.2.2.13 Donning test (Inflated situation) (Continued)	Regulations: LSA Code II/2.2.1.5; MSC.	.81(70) 1/2.7.1 to 2.7.4.3, 2.10.2
Test Procedure	Acceptance Criteria	Significant Test Data
Test after instruction For each subject whose first attempt exceeds 1 min or is incomplete, after demonstration or instruction to familiarize the subject with the donning procedure, the test subject should then don the lifejacket without assistance while wearing normal clothing, using the same instruction and timing method as above.	If a subject dons the lifejacket substantially correctly but fails to secure and/or adjust all closures, the jump test in 2.8.8 of MSC.81(70)and in-water performance tests in 2.8.5 of MSC.81(70) and 2.8.6 of MSC.81(70) should be performed with the lifejacket as donned to establish whether the performance is acceptable and the donning is successful.	Pass / Fail
Heavy-weather clothing test Each subject should then don the lifejacket without assistance while wearing heavy-weather clothing, using the same instruction and timing method as above.	Each subject should correctly don the lifejacket within a period of 1 min.	Pass / Fail
	Each subject should don the lifejacket correctly within a period of 1 min.	Pass / Fail

	ıble lifejack s & Child)	ets	Manufac Model: _ Lot/Seria	turer: al Number: ₋			Date: Time: Surveyor: Organization:							
2.2.2.	12 – 2.2.2.1	3 Donning				Regulations: LSA Code II/2.2.1.5 – 2.2.1.7; MSC.81(70) 1/2.7.1 to 2.7.4.3								
			Uninfla	ted situatio	า	Inflated situation								
	Test without instruction Test aft instruction					Heavy weather clothing		Test without instruction Test after instruction						
Subj	Donning time (sec)	All closures secured? (Y/N)	Jump test (P/F)	In-water test (P/F)	Donning Time (sec)	Donning Time (sec)	Donning time (sec) All closures secured? (P/F) (Y/N) Jump test (P/F) test (P/F)			Donning Time (sec)	Donning Time (sec)			
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
						Comments/O	bservation	s:						

Inflatable lifejackets (Adults & Child) Manufacturer: Model: Lot/Serial Number:		Surveyor:						
2.2.2.14 Water performance tests- Preparation for water performance tests		Regulations: LSA Code II/2.2.1.2.5 & 2.2.1.3 – 2.2.1.4; MSC.81(70) 1/2.8 to 2.8.4, 2.10.3. Annex 1, MSC.1/Circ.1470						
Test Procedure		Acceptance Criteria		Significant Test Data				
This portion of the test is intended to determine the ability of the lifejacket to assist a helpless person or one in an exhausted or unconscious state and to show that the lifejacket does not unduly restrict movement. The in-water performance of a lifejacket is evaluated by comparison to the performance of a suitable size standard reference lifejacket, i.e. Reference Test Device (RTD) as specified in appendices 1 to 3. All tests should be carried out in fresh water under still conditions. Each test for a candidate lifejacket and the relevant RTD should be conducted on the same day. These tests should be carried out with at least 12 persons as mentioned in paragraph 2.2.1.15. Only good swimmers should be used, since the ability to relax in the water is rarely otherwise obtained. The test subjects should wear only swimming costumes. Each test subject should be made familiar with each of the tests in 2.2.2.15 and 2.2.2.16, particularly the requirements regarding relaxing and exhaling in the face-down position. The test subjects should don the lifejacket, unassisted, using only the instructions provided by the manufacturer. Prior to taking measurements, the proper fit, donning, and fastening of the RTD on the subject should be checked and corrected as necessary.		The RTD should be constructed according to MSC and validated according to M	.81(70), annex 1,	Validat Calibra Test su	ted by: _ ated by: _ ubjects s	•	dat 2.2.2.12?	te:

2.2.2.14 Water performance tests- Preparation for water performance tests	Regulations: LSA Code II/2.2.1.2.5 & 2.2.1.3 - MSC.1/Circ.1470	- 2.2.1.4;	MSC.8	1(70) 1/2.8	to 2.8.4, 2.1	0.3. Annex 1,
Test Procedure	Acceptance Criteria			Significant	Test Data	
After entering the water, care should be taken to ensure that there is no significant amount of air unintentionally		11				
trapped in the lifejacket or swimming costume.		12				

Inflatable lifejackets	NA. I.I			Time:					
(Adults & Child)			Organization	n:					
2.2.2.15 Water performance to			.3.2; MSC.81	(70)1/ 2.8.5, 2.10.3					
Test Procedu		Acceptance Criteria		Significant Test Data					
Each test subject should ass down position in the water, but up so the mouth is out of the v feet should be supported, should be supported.	with the head lifted vater. The subject's	The period of time until the mouth subject comes clear of the water recorded to the nearest 1/10 of a sec	should be	See following pages for test data.					
with the heels just below the s		from when the subject's feet are relea	sed.	Average candidate turn time ≤ Average RTD tu	rn time RTD +1s				
After assuming a starting posstraight and arms along the should then be instructed sequence to allow the body completely relax into a naturallow the arms and shoulders legs to relax; and then the spirithe head fall into the water vinormally. During the relaxation phase, the maintained in a stable face do Immediately after the subject he face in the water, simulating exhaustion, the subject's feet so The test should be conducted unanually, and also with one or uninflated.	sides, the subject in the following to gradually and al floating posture: to relax; allow the ne and neck, letting while breathing out the subject should be wen position. The subject should be the position with the grant at t	The test should be conducted a total and the highest and lowest times distest should then be conducted a total in the RTD and the highest and lodiscarded. Turning time: the average turn time for in the candidate lifejacket should not average time in the RTD plus 1 s. The number of "no-turns", if any, exceed the number in the RTD. The test should be repeated compartment deflated until each compared to the number in the uninflated conditions.	carded. The of six times owest times or all subjects exceed the should not with one partment has	Passed Failed Passed Chamber #1: Automatic: N	Manual: Failed Manual: Manual: Manual: Manual: Manual:				

	Inflatable lifejackets (Adults & Child) Manufacturer: Model: Lot/Serial Number: 2.2.2.15 Water performance tests – Righting test																				
2.2.2.15	Water p	erforman	ce tests	– Rightir	ng test						ns: LS	A Cod	e II/ 2.:	2.1.3.2;	MSC.	81(70)	1/ 2.8.	5, 2.1	0.3		
	1						Siç	gnifica	nt Te	st Dat	ta										
		(E TIME (se inflation)							/ICE TI		c)		REF	ERENC	CE VE	ST TIME	(sec)	
Subj	#1	#2	#3	#4	#5	#6	AVG *	#1	#2	#3	#4	#5	#6	AVG *	#1	#2	#3	#4	#5	#6	AVG *
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					
						ime (sec):		Ave				n time				Av			ırn time		
Average # of cand	# of candidate no turns (NT): # of candidate no turns (NT): # of RTD no turns (NT): * Delete highest and lowest value) * Everage candidate turn time < Average RTD turn time RTD +1s Passed Failed * of candidate no turns (NT): < # of RTD no turns (NT): Passed Failed * Comments/Observations:																				

Model:	rer:Number:	S	Surveyo	or:ation:				
2.2.2.16 Water performance tests – Sta	atic balance measurements	Regulations: L	_SA Co	ode II/2.2.2, 2.2	2.1.4; MSC.8	31(70)	1/ 2.8.6 and 2.8.7	, 2.10.3
Test Procedure	Acceptance Cri	teria			Signifi	icant Tes	st Data	
At the conclusion of the righting tests, without making any adjustments in body or lifejacket position, the following	Freeboard: The average freeboa should not be less than the a minus 10 mm			See following	pages for tes	st data.		
measurements should be made with the subject floating in the relaxed face-up position of static balance resulting from				Average freeb minus 10 mm	oard, all sub	ojects <u>></u>	average freeboar	d for RTD
the preceding tests.				All Chambers:	Automatic: Passed	Failed _		Failed
Freeboard – The distance measured perpendicularly from				Chamber #1: Chamber #2:	Automatic: Passed Automatic:	Failed _	Manual: Passed Manual:	Failed
the surface of the water to the lowest point of the subject's mouth				Chamber #3:	Passed Automatic:		Passed Manual:	Failed
where respiration may be impeded, if the mouth were not held shut. The lowest side of the mouth should be measured if the left and right sides are not level.				Chamber #4:	Passed Automatic: Passed		Manual:	Failed
Faceplane angle – The angle, relative to the surface of the water, of the plane	Faceplane angles: The average faceplane angles should be not			Average facep 10°	lane angle, a	all subjec	cts <u>></u> average for F	RTD minus
formed between the most forward part of the forehead and chin.	average for the RTD minus 10°			All Chambers:	Automatic: Passed	Failed _	Manual: Passed	Failed
or the forenead and chin.				Chamber #1:	Automatic: Passed		Manual:	Failed
				Chamber #2:	Automatic:		Manual:	
				Chamber #3:	Passed Automatic:	Failed _	Passed Manual:	Failed
					Passed	Failed _	Passed	Failed
				Chamber #4:	Automatic: Passed	Failed_	Manual: Passed	Failed

2.2.2.16 Water performance tests – Sta	atic balance measurements	Regulations: LSA C	Code II/2.2.2, 2.	2.1.4; MSC.8	31(70) 1/	2.8.6 and 2.8	3.7, 2.10.3
Test Procedure	Acceptance Cr	iteria		Signif	ficant Test	Data	
3. Torso angle – The angle, relative to vertical, of the line formed by the forward points of the shoulder and hipbone (ilium portion of the pelvis). 4. List angle – The angle relative to the surface of the water and a line between the left and right shoulder or a line through the ears if only the head is tilted.	Torso angles: the average of angles should be not less than RTD minus 10°. Lifejacket light location: the poslight should permit it to be vis segment of the upper hemispher.	sition of the lifejacket	Average torso All Chambers: Chamber #1: Chamber #2: Chamber #3: Chamber #4: Does the local as great a segood	Automatic: Passed	Failed Failed Failed Failed Failed	Manual: Passed Manual: Passed Manual: Passed Manual: Passed Manual: Passed Manual: Passed	_ Failed Failed Failed Failed Failed Failed

Inflatable lifejackets (Adults & Child)	Model	facturer: : erial Nur							Surve	yor: _	n:		Time				
2.2.2.16 Water performance									: LSA (Code	II/2.2.2,	2.2.1.4;	MSC.81(70) 1/2	2.8.6 an	d 2.8.7,	2.10.3
Test Procedure													Significa	nt Test D	ata		
The test should be repeated wit compartment deflated until	h one		Automatic Inflation					า					Mar	nual Inlfa	tion		
compartment denated until compartment has been tested uninflated condition.			Freet (m			plane eg)		angle eg)	Lig	ht	Freeb (m		Face _l (de		Torso angle (deg)		Light
			CLJ	RTD	CLJ	RTD	CLJ	RTD	Visib	le?	CLJ	RTD	CLJ	RTD	CLJ	RTD	Visible?
		1															
		2															
		3															
		4															
		5															
		6															
		7															
		8															
		9							-								
		10							-								
		11															
		12							2000	.,							2000
		Avg		(1 ' '	1 .1				XXXX	X							XXXX
			- Candidate Lifejacket - Reference Test Device														

T	14 (
Inflatable lifejackets	Manufacturer: _ Model:			Date: Time:
(Adults & Child)	Lot/Serial Numb	per:		Surveyor: Organization:
2.2.2.17 Water performance	tests – Jump a	nd drop tests	Regulatio	ns: LSA Code II/ 2.2.1.5.6; MSC.81(70)1/2.8.8 and 2.8.9, 2.10.3
Test Procedure		Acceptance Criteria	l	Significant Test Data
Without readjusting the lifejacket should jump vertically into the from a height of at least 1m w	water, feet first, hile holding the	lifejacket should:		See following page for test data 1 m Jump Average freeboard, all subjects: mm (A)
arms over the head. Upon entithe test subject should relax to sof utter exhaustion. The freebook	simulate a state ard to the mouth	position with an average from	eeboard fo	r Average freeboard for RTD (from 2.2.2.16) : mm (B) e (B) – (A)= ≤ 15 mm Pass / Fail
should be recorded after the tes to rest. The test should be reheight of at least 4.5 m.		2.2.2.16 minus 15 mm;		Did the lifejacket become dislodged or cause harm to the test subject?: Yes / No
When jumping into the water, should hold on to the lifejacket du	uring water entry	.2 not be dislodged or cause l test subject;	narm to the	Did the lifejacket have damage that would affect its in-water performance or buoyance?: Yes / No
to avoid possible injury. Upowater, the test subject should rel state of utter exhaustion. The f	lax to simulate a	.3 have no damage that wou in-water performance or but		
mouth should be recorded after comes to rest.	the test subject	.4 have no damage to its attac	hments.	4.5 m Jump
The lifejacket and its attachme	ents should be			Average freeboard, all subjects: mm (A) Average freeboard for RTD (from 2.2.2.16) : mm (B)
examined for any damage. If ir likely from any jump or drop te	st, the lifejacket	NOTE: JUMP TESTS SHOUL	D NOT BE	(B) – (A)= ≤ 15 mm Pass / Fail
should be rejected or the test d from a lower height or with addition demonstrate that the risk from t	onal precautions	REPEATED IN THE RTD.		Did the lifejacket become dislodged or cause harm to the test subject?: Yes / No
is acceptable. The test should be conducted to	using lifeiackets			Did the lifejacket have damage that would affect its in-water performance or buoyance?: Yes / No
that have been inflated both aumanually, and also with one of the	utomatically and			Did the lifejacket have damage to its attachments?: Yes / No
uninflated.				Comments/Observations

Inflatable li (Adults & 0		Manufacturer: _ Model: Lot/Serial Numb	per:			Date: Surveyor: Organization:	Time:							
2.2.2.17	Water performand					ons: LSA Cod	e II/ 2.2.1.5.6; MSC.81(70)1/2.8.8 and 2.8.9, 2.10.3							
TEST DATA	SHEET (1 m Jump	o)			•									
Subj	Subject surfaced faceup? (Yes/No)		Lifejacket became dislodged (Yes/No)	Subject was harmed? (Yes/No)	lifej: atta	mage to acket or ichments s/No)	Comments/Observations							
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														

Inflatable I (Adults & 0		Manufacturer: _ Model: Lot/Serial Numb	per:			Date: Time: Surveyor: Organization:								
2.2.2.17	Water performance	e tests – Jump a	and drop tests		Regulati		le II/ 2.2.1.5.6; MSC.81(70)1/2.8.8 and 2.8.9, 2.10.3							
TEST DATA	A SHEET (4.5 m Ju													
Subj	Subject surfaced faceup? (Yes/No)	Freeboard (mm)	Lifejacket became dislodged (Yes/No)	Subject was harmed? (Yes/No)	lifej atta	mage to acket or achments ss/No)	Comments/Observations							
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														

Inflatable lifejackets (Adults & Child)	Model:	urer:		Surveyo	r:									
2.2.2.18 Water performance	tests – Sta	bility test	Regulations	: LSA Co	ode II/2.2	2.1.4; N	1SC.81(7	70) 1/2.	8.10					
Test Procedure		Acceptance Criteria	Significant Test Data											
The test subject should attain face-up position of static balar water. The subject should be insassume a foetal position as	nce in the structed to	The candidate lifejacket should not roll any subject face down in the water.			the subj down? (the subjuble face					
"place your elbows against yo	our sides,	(a) + (b) = 0		Can	didate	R	TD	Can	didate	F	RTD			
your hands on your stomach, lifejacket if possible, and bring y		The number of subjects who are	Subj	cw	CCW	cw	ccw	cw	CCW	CW	ccw			
up as close to your chest as poon The subject should be rotated around the longitudinal axis of by grasping the subject's shouper areas of the lifejacket subject attains a 55 ± 5 degree subject should then be releasubject should return to a stab position. The test should then be conducted the subject rotated counter-close. The entire test should then be with the test subject wearing the	clockwise the torso pulders or that the elist. The lesed. The le face-up lucted with ekwise. repeated e RTD.	returned to the stable face-up foetal position in the candidate lifejacket should be at least equal to the number who are returned to the stable face-up foetal position in the RTD. (e) \leq (g) And (f) \leq (h)	1 2 3 4 5 6 7 8 9 10											
The test should be conduct lifejackets that have been inflautomatically and manually, and one of the compartments uninflation.	ated both		12 Total "No"	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)			

Inflatable lifejackets (Adults & Child) Manufacturer: Model: Let/Serial Number:		Surveyor	:								
Lot/Serial Number:		Organiza	ition:								
2.2.2.19 Water performance tests – Swimming and water emerge test	nce Regulation	ns: LSA Cod	ode II/2.2.1.4; MSC.81(70) 1/2.8.11								
Test Procedure Accepta	nce Criteria				Significant To	est Data					
All test subjects, without wearing the lifejacket, should attempt to swim 25 m and board a liferaft or rigid platform with its surface 300 mm above the water surface. All test subjects who successfully complete this task should perform it again wearing	out the lifejacket s		Liferaf	t or Rigid Pla I whether te		n successfully board liferaft					
the lifejacket.			Subj	Without lifejacket	With lifejacket						
The test should be conducted using lifejackets that have been inflated both			1			(b) - 2/3 (a)					
automatically and manually, and also with one of the compartments uninflated.			3			Passed / Failed					
			4			0					
			5 6			Comments/Observations					
			7			_					
			8			<u> </u>					
			10								
			11			_					
			12								

Inflatable lifejackets (Adults & Child)	Model:	ufacturer:el:								Surveyor:								
2.2.2.20 Infant and children'	s lifejacket t	ests – To	est s	ubjed	cts			Regu	latio	ns: L	SA (Code	II/2.2	.1.8; MSC.	81(70) 1	/2.9 – 2.9.1	, 2.10	
Test Procedure					A	Ассер	tanc	e Crit	eria						S	ignificant T	est Data	
As far as possible, similar tests (to the adult tests) should be applied for approval of lifejackets suitable for infants and		eight	Та	ble 2	.2 - S	electi			d Tes ge (kg)		jects	1		Size: I	nfant / C	hild		
of lifejackets suitable for infants ar children. For child-size lifejackets, tests should b		range (cm)	14 -	17 -	20	22	25 -	28	30 -	33	36	38	41					
For child-size lifejackets, tests carried out with at least 9 persons, and for infant-size	able-bodied	79-	17	20 X	22	25	28	30	33	36	38	41	43	Subj	SEX (M/F)	HEIGHT (m)	WEIGHT (kg)	Manikin? (Yes*/No)
tests should be carried out w		105	'	^										1			, =,	
5 able-bodied persons. All test subjects should b	e selected	90- 118		Х	1									2				
according to table 2.2 or table 2.3 a follows:		102- 130				1	Х							3				
.1 One subject should be s	selected per	112- 135					Х	1						5				
each cell containing a "1". .2 Remaining subjects should	he selected	122- 150							1	1	Х			6				
from cells containing an repeating a cell.		145- 165									Х	1	1	7				
			Та	ble 2	.3 - S	electi	on of	Infan	t Tes	t Suk	ojects	;		8				
.3 At least 40% of the subject male and at least 40% fema		Hei	ight ra	ınge				Weig	ht Rai	nge ((kg)			9				
.4 Devices for infants should be	oe tested on		(cm)	_		Les	s tha	n 11		11-1	4	14-	-17					
infants as small as 6 kg ma	SS.	Les	s tha	n 83			1			Х								
	5 A manikin or manikins may be substituted for test subjects if the		79-10	5			Х			1		1	1		1	•		
manikin or manikins h demonstrated to provide rep	nave been presentative	9	90-11	8								>	<	*Manikin	descrip	tion:		

Inflatable lifejackets	Manufacturer:				Time:				
(Adults & Child)				Surveyor:Organization:					
(talante et ettina,	Lot/Serial Number:			Organization:					
2.2.2.21 Infant and childre – Righting test	en's lifejacket – Water perfo	rmance tests	Regulation 2.10.3	ns: LSA Code II/ 2.2	2.1.8; MSC.81(70)1/ 2.9.2-2.9.3	3, Annex 2, Annex 3,			
Test Prod	A	cceptance C	riteria	Significant test data					
This portion of the test is intend the lifejacket to assist a help	oless person or one in an			and calibrated annex 2 or 3, as	RTD Size: Infant / Child				
exhausted or unconscious st lifejacket does not unduly restric		applicable to the	ne size.		RTD Constructed by:	date:			
The in-water performance of comparison to the performance					Validated by:	date:			
reference lifejacket, i.e. Refere specified in appendices 2 to 3.					Calibrated by:	date:			
All tests should be carried ou conditions. Each test for a crelevant RTD should be conducted.									
The tests may be modified for child test subjects under 12 years of age who are not comfortable in water, so as to ensure their safety and cooperation.									
Prior to taking measurements, the proper fit, donning, and fastening of the RTD on the subject should be checked and corrected as necessary.									
After entering the water, care shaper is no significant amount of the lifejacket or swimming costu									
The test should be conducted u been inflated both automatically with one of the compartments u	and manually, and also								

Inflatable lifejackets (Adults & Child)						5	Surveyo	or:			Time:										
2.2.2.21 Infant and children's Righting test (Contin		Regu 2.10.		ns: LS	SA Cod	le II/ 2	.2.1.8; N	ASC.8	1(70)	l / 2.9.2	-2.9.3	, anne	x 2, an	nex 3,							
Test Procedure							Sign	ificant T	est Da	ata											
Each test subject should assume a prone, face down	the mouth of the test			CAN	DIDA.	TE DE	VICE TI	ME (se	c)		RE	FEREN	NCE VE	EST TIN	IE (sec))					
position in the water, but with the head lifted up so the mouth is	subject comes clear of	Subj	#1	#2	#3	#4	#5	#6	AVG *	#1	#2	#3	#4	#5	#6	AVG *					
out of the water. The subject's feet should be supported,	recorded to the nearest																				
shoulder width apart, with the	1/10 of a second, starting	- ·																			
heels just below the surface of	from when the subject's feet are released.	3																			
the water.	The test should be	4																			
After assuming a starting		5																			
position with the legs straight																					
and arms along the sides, the		7																			
subject should then be instructed in the following		8											+		+						
sequence to allow the body to													+-+		+						
gradually and completely relax		9											+-+		+	-					
into a natural floating posture:	lowest times discarded.										-	<u> </u>		 	<u> </u>						
allow the arms and shoulders to														<u> </u>							
relax; allow the legs to relax; and																					
then the spine and neck, letting				I			1	1			1										
the head fall into the water while			Ave	rage c	andid	late tu	rn time	(sec):			Αv	erage F	₹TD tu	rn time	(sec):						
breathing out normally.				# of	candi	idata n	o turns	/NIT\-				# 05	PTD 1	oo turne	- /NIT\-						

2.2.2.21 Infant and children's I Righting test (Continu	lifejacket – Water performa ued)	Regulations: LSA Code II/ 2.2.1.8; MSC.81(70)1/ 2.9.2-2.9.3, annex 2, annex 3, 2.10.3
Test Procedure	Acceptance Criteria	Significant Test Data
During the relaxation phase, the subject should be maintained in a stable face down position. Immediately after the subject has relaxed, with the face in the water, simulating a state of utter exhaustion, the subject's feet should be released.	Turning time: the average turn time for all subjects in the candidate lifejacket should not exceed the average time in the RTD plus 1 s. The number of "no-turns", if any, should not exceed the number in the RTD.	Average candidate turn time ≤ Average RTD turn time RTD +1s Passed Failed # of candidate no turns (NT): ≤ # of RTD no turns (NT): Passed Failed Comments/Observations:

Inflatable lifejackets (Adults & Child)			Surveyor: _							
2.2.2.22 Infant and childre – Static balance r	sts	Regulations 2 & 3	: LSA Code	II/ 2.2.1.8; I	MSC.81(70)	1/ 2.8.6, 2.9.2	-2.9.3, 2.10.3, Ann	ex		
Test Proced	dure				Sig	nificant Tes	t Data			
At the conclusion of the rightin any adjustments in body or following measurements should	lifejacket position, the		Free	board (mm)	Faceplane (deg)		Torso angle (deg)		Light	
subject floating in the relaxed floating from the pred	ace-up position of static		CLJ	RTD	CLJ	RTD	CLJ	RTD	Visible?	
balance resulting from the prec	eding tests.	1								
Infant lifejackets should meet	t the turning time and	2								
freeboard requirements, however torso angle, faceplane and mo		3								
necessary in order to:	builty may be relaxed if	4								_
.1 contribute to the rescue of the	ne infant by a caretaker:	5								4
		6								
.2 allow the infant to be faste contribute to keeping the		7								
caretaker;		8								
.3 keep the infant dry, with free	e respiratory passages;	9								
,										
 .4 protect the infant against bu evacuation; and 	mps and joils during the									ightharpoonup
.5 allow a caretaker to monitor	and control heat loss by									_
the infant.	and control near loss by	Avg							XXXXX	4
		CLJ – Candi	date	Lifejacket						
		RTD – Refer	ence	Test Device						

	flatable lifejackets dults & Child)	Model:	nber:		Date: Time: Surveyor: Organization:				
2.2	2.2.22 Infant and children Static balance mea			Regulation Annex 2 8	ons: LSA Code II/ 2.2.1.8; MSC.81(70)1/ 2.8.6, 2.9.2-2.9.3, 2.10.3, & 3				
	Test Procedure)	Acceptance Crite	Significant Test Data					
2.	Freeboard — The distar perpendicularly from the water to the lowest point of mouth where respiration may if the mouth were not heliowest side of the mouth measured if the left and right level. Faceplane angle — The arrow the surface of the water, formed between the most the forehead and chin. Torso angle — The angivertical, of the line formed points of the shoulder and portion of the pelvis). List angle — The angle surface of the water and a	nce measured surface of the of the subject's ay be impeded, neld shut. The ath should be ht sides are not engle, relative to, of the plane forward part of the plane forward the forward the plane forward the plane forward the plane forward the plane to the plane forward the plan	Freeboard: the average freebounds subjects should not be less that for the RTD minus 10 mm. Faceplane angles: The average for the RTD faceplane angles is less than the average for the RTD minus 10 average for the RTD minus 10 Lifejacket light location: the	verage of should be RTD minus 1 less than 0°.	all not 10°.	Average freeboard, all subjects ≥ average freeboard for RTD minus 10 mm Passed Failed Average faceplane angle, all subjects ≥ average for RTD minus 10° Passed Failed Average torso angles, all subjects ≥ average for RTD minus 10° Passed Failed			
	the left and right shoulder of the ears if only the head is	or a line through	(CCII life is also t light about a permit it to be visible			Does the location of the lifejacket light permit it to be visible over as great a segment of the upper hemisphere as practicable?			
						Comments/Observations:			

Inflatable lifejackets	Manufacturer: _		Date: Time:						
(Adults & Child)	Model: Lot/Serial Numb	oer:	Surveyor: Organization:						
2.2.2.23 Children's lifejacke test		mance tests – Jump and drop	Regulations: LSA Code II/2.2.1.8, 2.2.2.21; MSC.81(70) 1/ 2.9, 2.8.8, 2.8.9 2.10.3						
Test Procedure	e	Acceptance Criteria	Significant Test Data						
Without readjusting the lifej subject should jump vertically feet first, from a height of at	into the water,	Five of the nine subjects should perform the jump and drop test.	See following page for test data 1 m Jump						
holding the arms over the head. Upon entering the water, the test subject should relax to simulate a state of utter exhaustion.		When conducting water performance tests under 2.8,	Average freeboard for RTD (from 2.2.18) : mm (B)						
The freeboard to the move recorded after the test subject		infant and child-size lifejackets should meet the following	1 (D) = (A)=						
The test should be repeated from a height of at least 4.5m.		requirements for their critical flotation stability characteristics.	Did the lifejacket become dislodged or cause harm to the test subject?						
When jumping into the water, the test subject should hold on to the lifejacket during water entry to avoid possible injury. Upon entering		Following the jump and drop test, the lifejacket should:	Did the lifejacket have damage that would affect its in-water performance or buoyance?: Yes / No						
the water, the test subject simulate a state of utter e freeboard to the mouth shou after the test subject comes to	xhaustion. The lld be recorded	.1 surface the test subject in a face up position with an average freeboard for all the	Did the lifejacket have damage to its attachments?: Yes / No 4.5 m Jump						
The lifejacket and its attachm examined for any damage. If it likely from any jump or drop to should be rejected or the test from a lower height or precautions demonstrate that required test is acceptable.	nents should be njury is believed st, the lifejacket st delayed until with additional	subjects of not less than the average determined for the RTD after the turning test in accordance with 2.2.1.23 minus 15 mm; .2 not be dislodged or cause harm to the test subject;	Average freeboard, all subjects: mm (A) Average freeboard for RTD (from 2.2.18): mm (B) (B) – (A)= ≤ 15 mm Pass / Fail Did the lifejacket become dislodged or cause harm to the test subject?:						
NOTE: JUMP AND DROP TE NOT BE REPEATED IN THE			Yes / No Did the lifejacket have damage that would affect its in-water performance or buoyance?: Yes / No						

2.2.2.23 Children's lifejacket – Water performatest	mance tests – Jump and drop	Regulations: LSA Code II/2.2.1.8, 2.2.2.21; MSC.81(70) 1/ 2.9, 2.8.8, 2.8.9, 2.10.3			
Test Procedure	Acceptance Criteria	Significant Test Data			
Note: Water tests using children should avoid causing distress or risk to the child. Consideration should be taken of their age and ability. The test should be conducted using lifejackets that have been inflated both automatically and manually, and also with one of the compartments uninflated.	.3 have no damage that would affect its in-water performance or buoyance; and .4 have no damage to its attachments.	Did the lifejacket have damage to its attachments?: Yes / No Comments/Observations			

Inflatable	ifa ia alcata	Manufacturer:				Date:	Time:			
Inflatable I (Adults & 0		Model:				Surveyor:				
(Addits &	Cilia)	Lot/Serial Num	ber:			Organization	· ·			
2.2.2.23 drop tests	Children's lifejacl	ket – Water perf	ormance tests – J	ump and	Regulat 2.10.3	lations: LSA Code II/ 2.2.1.8, 2.1.5.6; MSC.81(70)1/2.9, 2.8.8, 2.8.9and				
TEST DATA	A SHEET (1 m Jum	(a			12.10.0					
Subj	Subject surfaced		poard Lifejacket Subject was		s Da	mage to	Comments/Observations			
,	faceup?	(mm)	became	harmed?		jacket or				
	(Yes/No)	,	dislodged	(Yes/No)		achments				
			(Yes/No)		(Ye	es/No)				
1										
2										
3										
4										
5										
2.2.1.23 drop tests	Children's lifejacl	ket – Water perf	ormance tests – J	ump and	Regulat 2.8.9	ions: LSA Co	de II/ 2.2.1.8, 2.2.1.2.5; MSC.81(70)1/2.9, 2.8.8 and			
TEST DATA	A SHEET (4.5 m Ju	mp)			•					
Subj	Subject surfaced	Freeboard	Lifejacket	Subject wa	s Da	mage to	Comments/Observations			
	faceup?	(mm)	became	harmed?		jacket or				
	(Yes/No)		dislodged	(Yes/No)		achments				
			(Yes/No)		(Ye	es/No)				
1										
2										
3										
4										
5										

er:lumber:						Time:				
2.2.2.24 Infant and children's lifejacket – Water performance tests – stability test				s: LSA Code II/2.2.1.8, 2.2.1.4; MSC.81(70) 1/2.8.10, 2.9.2, 2.10.3						
Acceptance Criteria				Signif	icant Te	st Data				
The candidate lifejacket should not roll any subject face down in he water.			he subj down? (the subj ble face (Ye			
(a) + (b) = 0		Cano	didate	R	TD	Can	didate	R	TD	
, , , ,	Subj	CW	CCW	CW	CCW	CW	CCW	CW	CCW	
The number of subjects who are returned to the stable face-up foetal position in the candidate lifejacket should be at least equal to the number who are returned to the stable face-up foetal position in the RTD. (e) \leq (g) And (f) \leq (h)	1 2 3 4 5 6 7 8 9	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	
at wh	least equal to the number no are returned to the stable be-up foetal position in the D. (e) ≤ (g) And	least equal to the number to are returned to the stable be-up foetal position in the DD. (e) ≤ (g) And (f) ≤ (h) Total	least equal to the number to are returned to the stable be-up foetal position in the TD. (e) ≤ (g) And (f) ≤ (h) Total 3 4 5 6 7 8 9	least equal to the number to are returned to the stable be-up foetal position in the TD. $ (e) \leq (g) $ And $ (f) \leq (h) $ $ 8 $ $ 9 $ $ Total $ $ (a) (b) $	least equal to the number no are returned to the stable be-up foetal position in the TD. $ (e) \leq (g) $ And $ (f) \leq (h) $ $ 8 $ $ 9 $ $ Total $ $ (a) (b) (c) $	least equal to the number to are returned to the stable be-up foetal position in the TD. $ (e) \leq (g) $ And $ (f) \leq (h) $ $ 8 $ $ 9 $ $ Total $ $ (a) (b) (c) (d) $	least equal to the number no are returned to the stable be-up foetal position in the TD. $ (e) \leq (g) $ And $ (f) \leq (h) $ $ 8 $ $ 9 $ $ Total $ $ (a) (b) (c) (d) (e) $	least equal to the number no are returned to the stable be-up foetal position in the TD. $ (e) \leq (g) $ And $ (f) \leq (h) $ $ 8 $ $ 9 $ $ Total $ $ (a) (b) (c) (d) (e) (f) $	least equal to the number no are returned to the stable be-up foetal position in the TD. $ (e) \leq (g) \\ And \\ (f) \leq (h) $ $ 8 \\ 9 \\ Total $ $ (a) (b) (c) (d) (e) (f) (g) $	

Inflatable lifejackets (Adults & Child)	Model:	er:lumber:		Surveyor:	Time:			
2.2.2.25 Infant and children'	s lifejacket ·	· Mobility test	Regulations	s: LSA Code II/2.	.2.1.8; MSC.81(70) 1/2.9.2.5, 2.10.3			
Test Procedure		Acceptano	Acceptance Criteria Significant Test Data					
To be considered in and out of Mobility of the subject both in the water should be given considetermining the acceptability for approval and should be combility when wearing the size RTD when climbing out o going up and down stairs, picarticle from the floor, and the from a cup.	and out of sideration in of a device ompared to appropriate f the water, sking up an	Assistance may be given to wearer mobility should not be than by the appropriate size R	reduced to an		Does the lifejacket provide for acceptable mobility of the test subjects both in and out of the water and is comparative to the mobility of wearing the RTD? YES NO Failed Method of evaluation: Comments/Observations			

2.2.3 LIFEJACKET/IMMERSION SUIT LIGHTS EVALUATION AND TEST REPORT

Remarks: If an immersion suit is designed to be worn without a lifejacket, it should be fitted with a light complying with the requirements for lifejacket lights. The immersion suit light should be treated as a lifejacket light.

2.2.3.1	General i	nformation					
	2.2.3.1.1	General data and specifications					
	2.2.3.1.2	Submitted drawings, reports and documents					
2.2.3.2	Visual ins 2.2.3.2.1 2.2.3.2.2 2.2.3.2.3 2.2.3.2.4 2.2.3.2.5 2.2.3.2.6	Approval marking Expiry marking Additional markings Electrical short circuit protection Visibility when attached to a lifejacket					
2.2.3.3	Temperat	Temperature cycling test					
2.2.3.4	Light tests	Light tests					
2.2.3.5	Chromatic	Chromaticity test					
2.2.3.6	Drop test						
2.2.3.7	2 m light o	drop test					
2.2.3.8	Switch arr	rangement test					
2.2.3.9	Vibration	test					
2.2.3.10	Mould gro	wth test					
2.2.3.11	Corrosion	and seawater resistance test					
2.2.3.12	Test for o	il resistance					
2.2.3.13	Rain test	and watertightness test					
2.2.3.14	Fire test						

2.2.3 LIFEJACKET/IMMERSION SUIT LIGHTS EVALUATION AND TEST REPORT

Manufacturer	
Туре	
Date	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

Lifejacket/immersion suit lights Manufacturer: Model: Lot/Serial Number: _		Date: Surveyor: Organization:			Time:				
2.2.3.1.1 General d	ata and	specifications		Regulations: I	ations: LSA Code; MSC.81(70)				
General In	formatio	n	Life	Lifejacket Light Dimensions		Lifejacket Light Weight			
TYPE OF SWITCHING:	Automa Manua					Details of Bulb, Battery & Voltages Comments/Observations			
FLASHING									
LIGHT STEADY									
LIGHT									

Lifejacket/immersion lights	hts Lot/Serial Nun		Date: Time: Surveyor: nber: Organization:		Time:	
2.2.3.1.2 Submitted	d drawin	ıgs, reports an				
			Submitted drawings and documents			Status
Drawing No.	Revisi	ion No. & date	Titl	e of drawing		
			Submitted reports and documents			
Report/Document No.	Revisi	ion No. & date	-	eport / document		Status
			Maintenance Manual -			
			Operations Manual -			

Lifejacket/immersion suit lights	Manufacturer:			Date: Time: Surveyor: Organization:				
2.2.3.2 Visual Inspection			Regulations: LSA	ulations: LSA Code 1.2.2.1/1.2.2.6/1.2.2.9/1.2.2.10/1.2.3/2.2.3.1.3				
Test Procedure		Acceptance Criteria			Significant Test Data			
Twenty lifejacket lights should be examined in detail for the following items:		The lifejacket lights should:			Results:			
Approval marking		- be clearly marked with the Administration who operational restrictions;	hich approved it,		PASS:	FAIL:		
Expiry marking		 be marked with a date of expiry; The Administration should determine the period of acceptability, owing to deterioration with age. The established life must be justified by the manufacturer. 			PASS: Results: PASS:	FAIL:		
Additional markings		precise definition of intended use (e.g. "Lifejacket light"); serial number; identification of the manufacturer; easily understandable symbols for on/off switching; where applicable, information on proper battery		Results: PASS: PASS: PASS: PASS: PASS: PASS:	FAIL: FAIL: FAIL: FAIL: FAIL:			

Lifejacket/immersion suit lights Manufacturer:			Surveyor:				
2.2.3.2 Visual Inspection	(continued)		Regulations	: LSA Code 1.2.2	.1/1.2.2.6/1.2.2.9/1.2	.2.10/1.2.3/2.2.3.1.3	
Test Procedure	Acceptanc	Acceptance Criteria			Significant Test Data		
		The lifejacket lights should:			Results:		
Electrical short circuit protection			be provided with electrical short circuit protection to prevent damage or injury;		PASS:	FAIL:	
Visibility when attached to a lifej	jacket		be visible over as great a segment of the upper hemisphere as is practicable when attached to a			FAIL:	
Construction and materials					PASS:	FAIL:	
		- if the light is a flashing I manually operated swite		ded with a	PASS:	FAIL:	
Colour of lifejacket light		- be of an international or comparably highly visib will assist detection at s	le colour on a		PASS:	FAIL:	
					Comments/Observa	ations	

Life is alreating me on	olon ouit	Manufacturer:			Date:	Time:
Lifejacket/immer	sion suit	Model:			Surveyor:	
lights		Lot/Serial Number:			Organization:	
Lifejacket and im	mersion suit	light test flow chart				
					lights 1 through 4:	Light test (hot) 2.2.3.3
		rature Cycling (12 light	ts in groups of	4)	lights 5 through 8:	light test (cold) 2.2.3.3
Visual	2.2.3.2				lights 9 through 12:	light test (ambient) 2.2.3.3
	Any one of	the 12 lights - Chromaticity Test 2	2.3.4		_	
	Any one of	the 12 lights - 4.5 m drop test 2.2	:: city Test			
Inspection (all 12	Any one of	the 12 lights -2.0 m drop test 2.2.	3.6 same light: Light test (ambient)	same ligh Chromati		
lights) 2.2.3.1	Any one of 2.2.3.7	the 12 lights - Switch arrangemen	ation test 2.2.3.8			
		the 12 lights - 28 day mould grow aived) 2.2.3.9				
		the 12 lights - Corrosion and seavest (may be waived) 2.2.3.10	_			
	Any one of	the 12 lights - Oil resistance test 2				
	Any one of	the 12 lights - rain test and water				
	Any one of	the 12 lights - fire test 2.2.3.13				

Lifeja lights	acket/immersion suit	Manufacturer: Model: Lot/Serial Number:	Surveyor:					
2.2.3	.3 Temperature cycling	test		Regulation	ns: LSA Code 1.2.2.2; M\$	SC.81(70) 1/ 1.2/1.2.	.1/1.2.2/10.3/10.3.1/10.3.2	
	Test F	Procedure	Acceptance Criteria			Significant Test Data		
Twelve lifejacket lights which have passed the visual inspection should be subjected to temperature cycling. The following test should be carried out on twelve lifejacket lights:								
The lifejacket lights should be alternately subjected to surrounding temperatures of -30°C and at least +65°C. These alternating cycles need not follow immediately after each other and the following procedure, repeated for a total of not less than 10 cycles, is acceptable:				rigidity under tests, should as shrinkin on or chang	should show no sign of r high temperatures and, d show no sign of damage g, cracking, swelling, e of mechanical qualities after the test.	PASS: FAIL: Attach temperature cycling chart to record times spent at each temperature. Comments/Observations		
.1	8 h exposure at a minicompleted in 1 day; and	mum temperature of +65°C to be						
.2	same day and left expos	ed from the warm chamber that sed under ordinary room conditions $C \pm 3^{\circ}C$ until the next day;						
.3	an 8 h exposure at a ma completed the next day;	ximum temperature of -30°C to be and						
.4 the specimens removed from the cold chamber that same day and left exposed under ordinary room conditions at a temperature of 20°C ± 3°C until the next day.								
	having passed the tended the subjected next to the	nperature cycling test, the lights e light tests.						

Lifoiack	et/immersion suit		ırer:					me:) :			
lights	evillillersion suit	Model:										
iigiits		Lot/Serial	Number:			Organization: _						
2.2.3.3	Temperature cycli	ing test - Te	st data		Regulations	s: LSA Code 1.2.2	2.2; MSC.81(70) 1/ 1.	2/1.2.1/1.2.2/10.3/10.3.	1/10.3.2			
		Н	OT CYCLE			COLD CYCLE						
	Date In:		Date Out:		Dat	te In:	Time	Date Out:				
Cycle 1	Time In:		Time Out:					Time Out:				
,	Temperature:	°C	Duration:	hours	Ter	mperature :	°C	Duration:	hours			
	Date In:		Date Out:		Dat	te In:	Time	Date Out:				
Cycle 2	Time In:		Time Out:					Time Out:				
	Temperature:		Duration:		Ter	mperature:		Duration:				
	Date In:		Date Out:		Dat	te In:	Time	Date Out:				
Cycle 3	Time In:		Time Out:					Time Out:				
	Temperature:		Duration:	hours		mperature:	<u>°</u> C	Duration:	hours			
	Date In:		Date Out:		Dat	te In:	Time	Date Out:				
Cycle 4	Time In:		Time Out:		In:			Time Out:				
	Temperature:		Duration:		Ter	mperature:	<u>°</u> C	Duration:				
	Date In:		Date Out:		Dat	te In:	Time	Date Out:				
Cycle 5	Time In:		Time Out:		In:			Time Out:				
,	Temperature:	<u>°C</u>	Duration:		Ter	mperature:	<u>°</u> C	Duration:				
	Date In:		Date Out:		Dat	te In:	Time	Date Out:				
Cycle 6	Time In:		Time Out:		In:			Time Out:				
	Temperature:	°C	Duration:		Ter	mperature:	<u>°</u> C	Duration:				
	Date In:		Date Out:		Dat	te In:	Time	Date Out:				
Cycle 7	Time In:		Time Out:					Time Out:				
,	Temperature:	<u>°</u> C	Duration:	hours	Ter	mperature:	<u>°</u> C	Duration:				
	Date In:		Date Out:		Dat	e In:	Time	Date Out:				
Cycle 8	Time In:		Time Out:	<u> </u>				Time Out:				
,	Temperature:	°C	Duration:	hours	Ter	mperature:	<u>°</u> C	Duration:	hours			
	Date In:		Date Out:		Dat	te In:	Time	Date Out:				
Cycle 9	Time In:		Time Out:		ln:	_		Time Out:				
ĺ	Temperature:	°C	Duration:	hours	Ter	mperature:	°C	Duration:	hours			
	Date In:		Date Out:		Dat	e In:	Time	Date Out:				
Cycle 10	Time In:		Time Out:		In:			Time Out:				
Í	Temperature:	<u> </u>	Duration:	hours	Ter	nperature:	°C	Duration:	hours			

Lifejacket/immersion suit	Manufacture	er:				ne:	
lights	Model:			Surveyor:			
	Lot/Serial N	umber:		Organization:			
2.2.3.4 Light tests		Regulations: LSA Code 1.2 10.3.2/10.3.5/ 10.3.5.2/10.3.5			2.3/2.2.3.1.1/2.2.3.1.2/2.2.3.2.2; MSC.81(70) 1/ .3/10.4/10.4.9		
Test Procedure		Acceptance Criteria			Significant Test Data		
Four lifejacket lights which have temperature cycling test should from a stowage temperature of then be operated immersed in a temperature of -1°C, four life which have passed the temper test should be taken from temperature of +65°C and immersed in seawater at a terest temperature cycling be taken from ordinary room composed the temperature cycling be taken from ordinary room composed the temperature. If the voltage at 5 min of operate than the recorded voltage at the time it is permissible to use a lar same build standard for the test. Using the lowest recorded light output test can be can described below. The voltage units should be monitored cor 8 h. To make sure that all test a luminous intensity of no 0.75 cd in all directions of	alid be taken of -30°C and a seawater at ejacket lights ature cycling a stowage be operated imperature of s which have g test should onditions and reshwater at eation is lower ne end of life imp from the light output ed voltage a rried out as of all 12 test atinuously for units provide t less than the upper	Water-activated lifejacket functioning within 2 min an intensity of not less than 0.75 freshwater a luminous intensishould have been attained withe 12 lifejacket lights should intensity of not less than 0.75 hemisphere for a period of at line the case of a flashing light it rate of flashing for the 8 h op 50 flashes and not more than the effective luminous intensicalculate the effective luminous	lights should have read within 5 minsty of not lead thin 10 min. continue to perform all direct east 8 h. should be experied to flashes perform all east 9 minsty is at lead phere. (See	ched a luminous hin in seawater. In less than 0.75 cd At least 11 out of rovide a luminous ctions of the upper stablished that the d is not less than ler minute and that lest 0.75 cd in all	Results: All luminous interpolations in terms and the polatical polations in the polatical pola	FAIL: e at the end of life: of operation: voltage: ghts selected for light output test: sity, hours of operation, flash light and Voltage data is to be each light em -30°C: em +65°C: em ordinary room conditions:	
hemisphere for 8 h operation, test should be performed.	the following						

Lifejacket/immersion suit lights	Model:	r: umber:			Time:
2.2.3.4 Light tests (continue		Regulations: LSA Code 1.2.2.3/2.2.3.1.1/2.2.3.1.2/2.2.3.2.2; MSC.81(70) 1/ 10.3.2/10.3.5/ 10.3.5.2/10.3.5.3/10.4/10.4.9			
Test Procedure		Acceptance Criteria		Significant Test Data	
It must be demonstrated that light from each of the specified ranges reaches the require intensity in all directions of hemisphere when using a which is calibrated to the standards of the appropriate State Standard Institute (Note No.70 contains further inform lowest voltage light of the cold test sample lot, the highest vothe high temperature test san the mean voltage light of temperature sample lot should These three lights must be used output tests. In the event the filament burns out during the test, a second light from performance test lot may Luminous intensity should be real photometer directed at the colight source with the test light of table. Luminous intensity measured in a horizontal direction.	temperature d luminous the upper photometer photometric National or E: CIE Publ. ation.). The temperature stage light of higher photometric land he ambient be selected. If for the light hat a lamp light output the same be used. The higher has a rotating should be action at the source and	The effective luminous intensity formula: $\begin{bmatrix} \int_{t_1}^{t_2} Idt \\ \hline 0.2 + \left(t_2\right) \end{bmatrix}$ where: I is the instantaneous intensity, 0.2 is the Blondel-Rey constant that and the limits of integral to the lim	$\left[-t_{1} ight]_{ ext{max}}$		Comments/Observations

Lifejacket/immersion suit lights	Model:	er:umber:		Date: Time: Surveyor: Organization:			
2.2.3.4 Light tests (continue	ed)		Regulations: LSA Code 1.2.2.3/2.2.3.1.1/2.2.3.1.2/2.2.3.2.2; M 10.3.2/10.3.5/ 10.3.5.2/10.3.5.3/10.4/10.4.9				
Test Procedure		Acceptano	e Criteria		Significant Test Data		
The first measurement should 0° (horizontal) and should co taken in azimuth angle at 5° is single measurement at 90 Luminous intensity should be a vertical direction, beginning of the light source at the poir recorded light output, and recorded through an arc of measured data of luminous is voltage should be documented. After having passed the light to should be subjected to the test.	ntinue to be ntervals to a of (vertical). measured in at the center of lowest continuously of 180°. All ntensity and d.	Flashing lights with a flash dumay be considered as a measurement of their luminous provide the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere and reaching the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere. The time and reaching the required luminous upper hemisphere.	ixed/steady s intensity. S intensity in a nterval betw nous intensit he required i should be urement diag	lights for the Such lights should Il directions of the reen switching on y (incandescence luminous intensity disregarded (see	Comments/Observations		

Lifejacket/immersion suit	1	Manufacturer: Model:			Time:
lights	Lot/Serial Number:				
2.2.3.5 Chromaticity test			Regulations: LSA Code 2.2.3.1.4; MSC.81(70) 1/ 10.3.2/10.4/10.4.		
Test Procedo	Acceptance Criteria			Significant Test Data	
One lifejacket light which has should be tested for chromatici lies within the boundaries of the diagram specified for each color Commission on Illumination (Cintrol Commissi	ty to determine that it the area "white" of the sur by the International IE). acket light should be metric measurement of to the appropriate Institute (Note: CIE surther information).	The measured chroma within the boundaries per CIE. The boundariare given by the follow x 0.500 0.500 0.440 y 0.382 0.440 0.433 (International Standars with colour tables to be	of the area of the	of the diagram as the ear for white lights coordinates: 0 0.440 8 0.382 S of Light Signals,	Results: All chromaticity data is to be attached here. PASS: FAIL: Comments/Observations

Lifejacket/immersion suit	Manufacture Model:	er:			Time:		
lights	Lot/Serial N	umber:		Organization:			
2.2.3.6 Drop test		Regulations: LSA Code 2.2			1.5.6; MSC.81(70) 1/	10.3.3	
Test Procedure		Acceptance Criteria		Signific	ant Test Data		
One lifejacket light which has visual inspection should be att lifejacket and then be subjecte	ached to a	The lifejacket light should not suffe dislodged from the lifejacket, shou and should be switched on and se	ıld not in en to be	jure the wearer, illuminated and	Results:		
test as follows: Without readjusting the lifejack subject should jump vertical	ly into the	conspicuous whilst the test subject			PASS:	FAIL:	
water, feet first, from a height 4.5 m. When jumping into the test subject should hold on to the during water entry to avoid pos	water, the ne lifejacket	2 min and have reached a luming than 0.75cd within 5 min in sea luminous intensity of not less than 0	ater-activated lights should commence functioning within min and have reached a luminous intensity of not less in 0.75cd within 5 min in seawater. In freshwater a ninous intensity of not less than 0.75 cd should have been ained within 10 min. The light should continue to provide				
For the approval of the lifejack test result obtained from the p subject should be acceptable provided otherwise.	articipating	a luminous intensity of not less that of the upper hemisphere for a perfurther details see Light Tests).	n 0.75 cd	d in all directions			
After this drop test the light taken from ordinary room con operate immersed in fres ambient temperature.	ditions and						
The light should then be subjectight tests (see 2.2.3.3).	ected to the						

Lifejacket/immersion suit lights	Manufacturer:		\$	1.0		
2.2.3.7 2 m light drop test		Regulations: MSC.81(70) 1/			10.3.4	
Test Procedure		Acceptance	e Criteria		Siç	gnificant Test Data
One lifejacket light which has passed the visual inspection should be dropped from a height of 2 m onto a rigidly mounted steel plate or concrete surface.		capable of providing a luminous intensity of not less than 0.75 cd for a period of at least 8 h when operated immersed		Results: PASS:	FAIL:	
After this test the light should be taken from ordinary room conditions and operate immersed in freshwater at ambient temperature.		C ,			Comments/Observ	rations
The light should be subjected light tests (see 2.2.3.3).	next to the	_				
2.2.3.8 Switch arrangement	test	Regulations: MSC.81(70) 1/ 10.3.5/10.3.5.1/10.4/10.4.3				
Test Procedure		Acceptance Criteria		Significant Test Data		
If a manual switch is fitted, arrangement test should be call		The light must function properly	y.		Results:	
One lifejacket light which has visual inspection should be sub switch arrangement test.					PASS: Comments/Observ	FAIL:
A test person wearing imm gloves, must be able to switch t light in its normal operational and off three times.	the lifejacket				Comments/Observ	rations
After having passed the arrangement test the light subjected next to the vibration						

Lifejacket/immersion suit lights	Manufacturer:			Surveyor:		
2.2.3.9 Vibration test			Regulation	s: LSA Code 1.2.	2.1/1.2.2.8; MSC.81(70) 1	/ 10.4/10.4.1
Test Procedure		Acceptano	e Criteria		Significa	nt Test Data
The lifejacket light which has switch arrangement test subjected to a vibration test a	should be	workmanship and materials.		Results:		
IEC 60945:2002, paragraph 8.		The lifejacket light should function after the test.			PASS:	FAIL:
					Comments/Observations	3

Lifejacket/immersion suit lights	Model:	er: umber:		Surveyor:		me:
2.2.3.10 Mould growth test	1		Regulation	s: LSA Code 1.2.	2.4; MSC.81(70)	1/ 10.4/10.4.2
Test Procedure		Acceptano	e Criteria		Significant Test Data	
One lifejacket light which has visual inspection should be the mould growth test. The life	subjected to	affected by fungal attack.		Results:		
should be inoculated by spraying with an aqueous suspension of mould spores containing all the following cultures:		There should be no mould growth visible to the naked eye		PASS:	FAIL:	
Aspergillus niger; Aspergil Aureobasidium pullulans; I variotii; Penicillium Penicillium ochro- chloron; S brevicaulis; and Trichodern The lifejacket light should then a mould growth chamber which maintained at a temporal 29°C +/- 1°C and a relative hulless than 95 %. The period of should be 28 days. After this lifejacket light should be inspectively in the maintained where the manufacture produce evidence that the materials employed will satisfy	Paecilomyces funiculosum, scopulariopsis na viride. be placed in the should be erature of midity of not of incubation is period the cted. est may be er is able to the external				Comments/Obse	ervations

Lifois			Date: Time:					
lights		Model:				Surveyor: Organization:		
2.2.3	11 Corrosion and se	eawater resi	stance test	Regulation	s: LSA Code 1.2.	2.4; MSC.81(70) 1/ 10.4/10).4.4	
	Test Procedure		Acceptano	ce Criteria		Significar	nt Test Data	
visua	lifejacket light which has I inspection should be sul sion and seawater resi	bjected to a	The lifejacket light should be ounduly affected by seawater.	corrosion res	istant and not be	Results:		
accor parag	ding to IEC 6 graph 8.12.	60945:2002,	Furthermore, the lifejacket li requirements of IEC 60945:20			PASS:	FAIL:	
(Note	: If there are no exposed the Corrosion and Resistance Test nee conducted.	Seawater	There should be no undue de the lifejacket light should funct		•	Comments/Observations		
.2	The Corrosion and Resistance Test may where the manufacture produce evidence that t metals employed will test.	r is able to the external						
.3	Automatic activated ver be prevented from switch the test.)							
.4	Where the exposed met the automatic switch s function test after the cannot be done.	sensor, the						

Lifejacket/immersion suit	Manufacture	er:		Date:	Time	:	
lights	Lot/Serial N	umber: Surveyor: Organization:					
2.2.3.12 Test for oil resis	•			ns: LSA Code 1.2.	2.4; MSC.81(70) 1/	10.4/10.4.6	
Test Procedure		Acceptano	ce Criteria		Si	gnificant Test Data	
One lifejacket light which has passed the visual inspection should be subjected to the test for oil resistance according to IEC 60945:2002, paragraph 8.11. Automatic activated version should be		by oil and should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities.		Results: PASS: Comments/Observ	FAIL:		
prevented from switching during		The lifejacket light should fund	ction after the	e test.	Comments/Observ	alions	
2.2.3.13 Rain test and wa	ntertightness	Regulations: LSA Code 1.2.2		2.4/1.2.2.8; MSC.81(70) 1/ 10.4/10.4.7			
Test Procedure		Acceptance Criteria		Significant Test Data			
One lifejacket light which has visual inspection should be surain test according to IEC paragraph 8.8.	which has passed the buld be subjected to a to IEC 60945:2002, The lifejacket light should con		·		Results: PASS:	FAIL:	
After having passed the ralifejacket light and the comsource should be immersed under not less than 300 mm of or at least 24 h. Automatic activated version prevented from switching during	plete power horizontally f fresh water should be	After the water-tightness test the lifejacket light should function and there should be no evidence of water inside the lifejacket light.		Comments/Observ	vations		

Lifejacket/immersion suit lights	Model:	er:lumber:	Surveyor:		ne:
2.2.3.14 Fire Test		Regulations	: LSA Code 2.	2.1.1; MSC.81(70)	1/ 10.4/10.4.8
Test Procedure		Acceptance Criteria		Sig	gnificant Test Data
One lifejacket light which has passed the visual inspection should be subjected to a fire test. A test pan not less than 30 cm x 35 cm x 6 cm should be placed in an		The lifejacket light should not sustain burn melting after being totally enveloped in a fire at least 2 s and after being removed from the	e for a period of ne flames.	Results: PASS:	FAIL:
essentially draught-free are should be put in the bottom of to to a depth of at least 1 cm for enough petrol to make a mindepth of not less than 4 cm. should then be ignited and allow freely for at least 30 s. The life should then be moved through facing them, with the lifejacked more than 25 cm above the to the test pan so that the exposure to the flames is at least should be put in the part of the should the part of the test pan so that the control of the part of the flames is at least should be put in the bottom of the part o	he test pan ollowed by imum total The petrol ved to burn jacket light the flames, et light not op edge of luration of	The lifejacket light should function after the	test.	Comments/Observa	ations

2.2.4 REFERENCE TEST DEVICE (RTD) CONSTRUCTION VALIDATION AND CALIBRATION

2.2.4.1	Adult Lifej	acket RTD
	2.2.4.1.2	Buoyancy calibration Construction validation – General Construction Validation – Fabric and Webbing measurements
2.2.4.2	Child Lifeja	acket RTD
	2.2.4.2.1	Buoyancy calibration
2.2.4.3	Infant Lifej	acket RTD
	2.2.4.3.1	Buoyancy calibration

2.2.4 REFERENCE TEST DEVICE (RTD) CONSTRUCTION VALIDATION AND CALIBRATION

Manufacturer	
Serial number	
Size (Adult/Child/Infant)	
Date of construction	
Place of construction	
Date of validation/calibration	
Place of validation/calibration	
Signature	

Reference test device	Manufacturer: Model:					Time:
(RTD)						
(11.12)	Lot/Serial Number:			Organization		
2.2.4.1.1 Buoyancy calibr	ation	Re	gulations: LS	A Code 2.2.1.	4; MSC.81(70) A	Annex 1, Appendix
Test Procedu	ıre		Acceptance	Criteria		Significant Test Data
To achieve repeatability in hur the overall buoyancy and distr between the front and back o	ibution of buoyancy		Design Max Min Left front buoya			
maintained within a tight tolera The buoyancy of a new RTI	ince.	Front Buoyancy ¹	103 N	107 N	100 N	Right front buoyancy: N
allowable tolerance range shrinkage or compression or	until the normal f the foam inserts	Back Buoyancy	46 N	48 N	45 N	Total front buoyancy: N
stabilizes. Until the buoyancies have stabilized, buoyancy and be checked at regular intervals	Total Buoyancy	149 N	155 N	145 N	Total back buoyancy: N Total buoyancy: N	
and then at least monthly then used for testing, whichever is least may require more frequent of	onger (frequent use	Buoyancy Distribution ²	69% in front	70.5% in front	67.5% in front	Buoyancy distribution: % in front
with buoyancies within tolerar for certification testing.		values at or corrected to standard temperature and pressure				
At the time of manufacture distribution of buoyancy in the adjusted to be within 1.3 N achieve this tolerance, thin lay	e front inserts was of each other. To	buoyancy distribution is calculated by dividing the front buoyancy by the total buoyancy				Make-up inserts added/removed:
-up" inserts) may have been in front and inside front foam inserts may need to increase the size inserts from time to time to kee within tolerance, or may need	nserted between the erts. The test house e of these make-up these parameters	After a full sheet of 6.5 mm thick foam is required in any one of the four major areas, an inside front or back insert probably needs to be replaced. If the front buoyancy is under the minimum value, measure the buoyancy of the right and left sides so that the proper distribution of buoyancy (no				Foam inserts replaced:
the back or collar inserts (or to back insert has not shrunk as a		more than a 1.3 N panels can be mai		ween the right	and left front	Comments:

Reference test device (RTD)	I MODEL		Date: Time: Surveyor: Organization:		
2.2.4.1.2 Construction validation –		General Regulations: LSA	Code 2.2.1.4	4; MSC.81(70), annex 1, table A.4; MSC.1/Circ.1470, 2.1	
Test Procedure		Acceptance Criteria		Significant Test Data	
Spot check foam inserts. While necessary to conduct a full check the dimensions of the foam, a sof one out of every five RTDs made of a representative sa foam pieces against the dimensional the appropriate annex to the recommendation on testing of appliances (resolution MSC.81).	neck of all pot check should be mpling of ensions in a Revised ife-saving	The values should be within ± 6 mm.		 a. Front foam insert (figure A.27) Pass Fail b. Inside front foam insert (figure A.28) Pass Fail c. Collar foam insert (figure A.29) Pass Fail d. Back foam insert (figure A.30) Pass Fail Comments/observations: 	

Reference test device (RTD)	Manufacturer: Model: Lot/Serial Number:	Surveyor:		Surveyor: _	Time:		
(KTD)	_			on:			
2.2.4.1.3 Construction Valida measurements	ation – Fabric and Webbing		Regulations:	LSA Code 2	2.2.1.4; MSC.81(70) Annex 1; MSC.1/Circ.1470, 3		
Test Prod	cedure	Acc	ceptance Criter	ia	Significant Test Data		
Establish reference point on the shoulder seam. Place a small mark on the shoulder seam 44.5 mm from the inside edge of the neck seam.		This mark will be the reference point for measuring distances on the front and back panels.					
Vertical webbing. Measure from vertical webbing.	± 6.5 mm of this point.		d be within	Vertical webbing distance: mm Pass Fail			
Shoulder loop. Measure the distance from the reference point to the location where the inside edge of the yellow webbing first passes under the black shoulder loop.				± 6 mm.	Shoulder loop distance: mm Pass Fail		
Chest strap. Measure the dista to the top of the chest strap.	nce from the reference point	This distance	e should be 168	3 ± 6 mm.	Chest strap distance: mm Pass Fail		
Waist belt. Measure the distanto the top of the waist belt.	ce from the reference point	This distance	e should be 416	6 ± 3 mm.	Waist belt distance: mm Pass Fail		
Front panel length. Measur reference point to the bottom of		This distance	e should be 489	9 ± 6 mm.	Front panel length mm Pass Fail		
Back panel length. Measur reference point to the bottom of		This distance	e should be 550) ± 6 mm.	Back panel length mm Pass Fail		

2.2.4.1.3 Construction Validation – Fabric and Webbing measurements	Regulations: LSA Code 2.2.1.4; MSC.81(70) Annex 1; MSC.1/Circ.1470, 3				
Test Procedure	Acceptance Criteria	Significant Test Data			
Collar attachment location. To check the collar attachment location, hold the RTD by the collar, keeping the collar level so the RTD hangs freely. Measure from the top back edge of the foam down to the centre of the neck seam.	This distance should be 342 ± 6 mm.	Collar attachment location: mm Pass Fail			
Webbing attachment to collar. To check the location of the vertical webbing attachment to the collar, measure the distance from the edge of the foam (at the end opposite from the zipper) to the front seams of the box-X stitching.	This distance should be 111 ± 6 mm.	Webbing attachment to collar location: mm Pass Fail			
Webbing length (chest strap to collar attachment). To check the length of the vertical webbing from the top of the chest strap to the attachment at the collar, measure the inside distance between the box-X stitches located on the chest strap (front panel) and on the underside of the collar.	This distance should be 263 ± 6 mm.	Webbing length: mm Pass Fail			
Finished waist belt assembly length. To check the finished length of the waist belt assembly, measure the overall length with the buckle unfastened and the adjustments in the full open position (maximum length). Lay the RTD on a flat surface and measure the fully extended length of the assembly. For consistency, measure the distance from where the snap hook fastens in the D-Ring.	This distance should be 1700 ± 12 mm.	Finished waist belt assembly length: mm Pass Fail			

2.2.4.1.3 Construction Validation – Fabric and Webbing measurements	Regulation	ns: LSA Code 2	2.2.1.4; MSC.81(70) Annex 1; MSC.1/Circ.1470, 3
Test Procedure	Acceptance C	riteria	Significant Test Data
Finished neck size. A suitably sized cone (such as a traffic cone) should be used to check the finished neck size. The cone should be rigid, have a slope of $8.5^{\circ} \pm 1.5^{\circ}$, and be tall enough to allow the RTD to fit snugly. If a flexible cone (such as a plastic traffic safety cone) is used it should be filled with rigid foam, concrete, or similar substance to make it rigid.	The circumference 395 ± 6 mm.	should be	Finished neck size: mm Pass Fail
With both chest and waist belt buckles fastened and the waist belt adjusted to the full open position, place the RTD on the cone with just enough force so it will fit snug to the cone, but not forcing it down.			
Place a mark on both sides of the cone where the shoulder seam contacts the cone. This mark may be used to facilitate subsequent validations. Measure the circumference around the cone at the mark.			

Reference test device (RTD)	Model:	Manufacturer: Model: Lot/Serial Number:				Date: Time: Surveyor: Organization:			
2.2.4.2.1 Buoyancy calibr	ation		Regulation	ns: LS	SA Code	e 2.2.1.4; MSC.81	(70) Annex 3, Appendix		
Test Procedure		_	Acceptano	ce Cri	teria		Significant Test Data		
To achieve repeatability in I			Design	M	ax	Min			
testing, the overall buoyancy a of buoyancy between the front RTD must be maintained	and back of the	Front Buoyancy ¹	63 N	65.	4 N	60.6 N	Left front buoyancy: N		
tolerance.	within a tight	Back	25 N	26.	2 N	23.8 N	Right front buoyancy: N		
The buoyancy of a new RTD n		Buoyancy					Total front buoyancy: N		
allowable tolerance range until the normal shrinkage or compression of the foam inserts stabilizes. Until the buoyancies of the foam		Total Buoyancy	88 N	38 N 91.		84.4 N	Total back buoyancy: N		
inserts have stabilized, be distribution should be check	ouoyancy and	Buoyancy Distribution ²	71.5% in front	73% 70% in front			Total buoyancy: N		
intervals (perhaps weekly), an monthly thereafter or when testing, whichever is longer (free require more frequent check with buoyancies within tolera used for certification testing. To check buoyancy tolerance need to be removed from the	ever used for equent use may s). Only RTDs nce should be s, foam inserts	 values at or corrected to standard temperature and pressure buoyancy distribution is calculated by dividing the front buoyancy by the total buoyancy At the time of manufacture the left-to-right distribution of buoyancy in the front inserts was adjusted to be within 1.3 N of each other. To achieve this tolerance, the layers were individually selected to achieve the cumulative insert buoyancy. If buoyancy of a new 					Make-up inserts added/removed:		
care that all trapped air is a checking buoyancy and the maintained in their proper sometimes reinstalled (considerable effective needed to remove entrapped a intact device).	at layers are equence when ort would be	device exceeds the be altered or repla house may need a maintain the front-t front buoyancy is buoyancy of the rig of buoyancy (no m and left front panels	ced to bring the to add make - o-back and side under the right and left side ore than a 1.3	e unit up la e-to-s minim es so N dif	into con yers fro ide inse um val that the ference)	mpliance. The test me time to time to the total transfer the total measure the proper distribution	Foam inserts replaced:		

Infant Lifejacket	Madal.						Time:
Reference test device (RTD)		lumber:			ization:		
2.2.4.3.1 Buoyancy calibr				Ü			nnex 3, Appendix
Test Procedure	!		Accepta	ance Criteria			Significant Test Data
To achieve repeatability in testing, the overall buoyancy			Design	Max	Min		Left front buoyancy: N
of buoyancy between the front RTD must be maintained tolerance.		Front Buoyancy ¹	Design 42 N	44.4 N	39.6 N		Right front buoyancy: N
The buoyancy of a new RTD may exceed the allowable tolerance range until the normal shrinkage or compression of the foam inserts stabilizes. Until the buoyancies of the foam inserts have stabilized, buoyancy and distribution should be checked at regular intervals (perhaps weekly), and then at least monthly thereafter or whenever used for		Back Buoyancy	29 N	30.2 N	27.8 N		Total front buoyancy: N
		Total Buoyancy	71 N	74.6 N	67.4 N		Total back buoyancy: N Total buoyancy: N
		Buoyancy Distribution ²	59.2 % in front	60.7 % in front	57.7 % in front		Buoyancy distribution:
testing, whichever is longer (fre require more frequent check with buoyancies within tolera	equent use may s). Only RTDs	 values at or corrected to standard temperature and pressure buoyancy distribution is calculated by dividing the front buoyancy by 					
used for certification testing.	nioc snodia be	the total buoyancy At the time of manufacture the left-to-right distribution of buoyancy in					Make-up inserts added/removed:
To check buoyancy tolerance	s foam inserts	the front inserts was adjusted to be within 1.3 N of each other. To achieve this tolerance, the layers were individually selected to achieve					
need to be removed from the care that all trapped air is checking buoyancy and the maintained in their proper serinstalled (considerable effected to remove entrapped at the case of the c	e device. Take removed when at layers are equence when fort would be	the cumulative insert buoyancy. If buoyancy of a new device exceeds the upper limits, one layer per compartment may be altered or replaced to bring the unit into compliance. The test house may need to add make -up layers from time to time to maintain the front-to-back and side -to-side insert tolerances. If the front buoyancy is under the minimum value, measure the buoyancy of the right and left sides so				Foam inserts replaced: Comments:	
intact device).	that the proper distribution of buoyancy (no more than a 1.3 N difference) between the right and left front panels can be maintained.						

2.3 IMMERSION SUITS AND ASSOCIATED EQUIPMENT

2.3.1 IMMERSION SUITS (NON-INSULATED) EVALUATION AND TEST REPORT

2.3.1.1	General data and specifications
2.3.1.2	Submitted drawings, reports and documents
2.3.1.3	Quality assurance
2.3.1.4	Visual inspection
2.3.1.5	Test subjects
2.3.1.6	Test with a lifejacket
2.3.1.7	Test clothing
2.3.1.8	Donning tests 1 & 2
2.3.1.9	Ergonomic test
2.3.1.10	Field of vision test
2.3.1.11	Flotation test
2.3.1.12	Righting test
2.3.1.13	Water ingress and jump test
2.3.1.14	Jump test
2.3.1.15	Leak test
2.3.1.16	Swimming and water emergence test
2.3.1.17	Oil resistance test
2.3.1.18	Alternative oil resistance test
2.3.1.19	Fire test
2.3.1.20	Temperature cycling test
2.3.1.21	Temperature cycling test – Test data
2.3.1.22	Buoyancy test
2.3.1.23	Strength test
2.3.1.24	Thermal protective test (General)
2.3.1.25	Thermal protective test (Continued)
2.3.1.26	Test sheets for temperatures during immersion tests

2.3.1 IMMERSION SUITS (NON-INSULATED) EVALUATION AND TEST REPORT

Manufacturer	
Туре	
Date	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

Immersion suits (non-insulated)	Model:	er:		Surveyor:		
2.3.1.1 General data an	d specifications				MSC.81(70) I/3.1 & 3	
Construction Material:		Additional equipment:				Donning instructions:
Fabric produced by:		Retro reflective material produced by:		Ту	/pe:	□ YES □ NO
Туре:		Whistle produced by (if fitted):		Ту	/pe:	
Buoyant material produced by:		Life-line produced by (if fit	ted):	Тур	pe	
Туре:	-	Light produced by (if fitted):	Тур	pe:	

Immersion suits (non-insulated)	Model:	l S	I Surveyor:				
2.3.1.2 Submitted drawings, reports and documents							
		Submitted drawings and documents		Status			
Drawing No.	Drawing No. Revision No. & Title of drawing date						
		Submitted reports and documents		Otatus			
Report/Document No.	Revision No. & date	Title of report / document		Status			
		Maintenance Manual -					
		Operations Manual -					

Immersion suits (non-insulated)	Manufacturer:	Surveyor:					
2.3.1.3 Quality assurance	ce	Regulation	ns: - MSC.81(70) 2/1.1, 1.2				
of the International Conventi as amended, or the internation inspected, representatives of inspections of manufacturers appliances and materials us approved prototype life-saving	f a particular type are required by chapter III ion for the Safety of Life at Sea, 1974, hal Life-Saving Appliance (LSA) Code, to be the Administration should make random to ensure that the quality of life-saving sed comply with the specification of the appliance.	Quality Ass	surance Jsed: surance Procedure: surance Manual:				
to ensure that life-saving appliances are produced to the same standard as the prototype life- saving appliance approved by the Administration and to keep records of any production tests carried out in accordance with the Administration's instructions.			Description of System:				
		Quality Ass	surance System acceptable Yes	No			
		Comments	/Observations				

Immersion s (non-insulate	Model:	al Number:	Survey	or: Time: or: zation:		
2.3.1.4 Vis	ual inspection		Regulations: LS/	A Code I/1.2.2, II/2.3.1.1.3 & 2.3	3.1.1.4	
	Test Procedure	Acceptance Ci	riteria	Significa	ant Test Data	
.1 be clea informat which ap	d immersion suit should: arly marked with appion including the Administroproved it, date of manufactoperational restrictions;	ation		Passed	Failed	
instruction	ded with labels giving oper ons, general information cturers details as approp	and		Passed	Failed	
reflective least 40 back if t turn the	with approved patches of a material with a total area of cm ² and with 100 cm ² of he suit does not automat wearer face up according A.658(16).	of at n the cally		Passed	Failed	
				Comments/Observations		

Immersion suits (non-insulated)	Model:			Survey	ate: Time: Irveyor: ganization:		
2.3.1.4 Visual inspection (Co	ntinued)	Reg	ulations: LSA Code I/1.2.2, II/2.	3.1.1.3	<u>8</u> 2.3.1.1.4, 2.3.1.4, 2.3.1.5,	, 2.3.1.6	
Test Procedure	Э		Acceptance Criteria		Signit	ficant Test Data	
Does the non-insulated immediately whole body with the exception		the	Be of an international or vivid reddish		Passed	Failed	
Are the hands covered, or is the non-insulated co			orange, or a comparably highly visible colour on all parts where this will assist detection at sea.		Passed	Failed	
Are their arrangements to previn the legs?	vent excessive free	air			Passed	Failed	
Is the non-insulated immersion suit of highly visible colour?					Passed	_ Failed	
Is the non-insulated immersion worn without a lifejacket? If yes Is the non-insulated immersion complying with paragraph 2.2.3	suit fitted with a l	ight			Passed		
Is the non-insulated immersi whistle complying with paragra Code?					Passed		
Fitted with releasable buoyant to secure it to a suit worn by water and provided with a su rescuer to lift the wearer from	another person in itable means to al	the llow			Passed	_ Failed	
rescuer to lift the wearer from the water into survival or rescue craft.					Comments/Observations		

Immersion suits (non-insulated)	Manufacturer: Model: Lot/Serial Number:			Surveyor:	te: I ime: rveyor: ganization:				
2.3.1.5 Test subjects		Regulations: LS	A Code II/2.3.1.1.5	I.5, 2.3.1.3.14; MSC.81(70) 1/3.1.1 & 2.8.2					
Test Procedu	re	Acc	eptance Criteria		Significant Test Data				
At least six able-bodied personal females of the following heighbours should be used. At least one two of the persons should be more than one female in the same than the	ons both male and ights and weights and not more than be females with not	Height 1.4 m - 1.6 m; 1.6 m - 1.8 m over 1.8 m	Weight 1 person under 6 1 person under 7 1 person under 7 1 person over 70 1 person under 8 1 person over 80	0 kg 70 kg) kg 80 kg	Male/Female Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations	<u>Height</u>	Weight		

Immersion suits (non-insulated)	Manufacturer: Model: Lot/Serial Number:		Date: Time: Surveyor: Organization:		
2.3.1.6 Test with a lif	ejacket	Regulations: LSA Code II/2.3.1.5;	MSC.81(70) 1/3.1.2		
Test Proce	edure	Acceptance Criteria	Significant Test Data		
If the suit is to be worn lifejacket, the lifejacket sho suit for the tests prescribed	ould be worn over the		Manufacturer of lifejacket: Type:		
			Manufacturer of lifejacket:		
			Type:		
			Manufacturer of lifejacket: Type:		
			Comments/Observations		
2.3.1.7 Test clothing		Regulations: LSA Code II/2.3.1.1.	1; MSC.81(70) 1/3.2.6 to 3.2.8		
Test Proce	edure	Acceptance Criteria	Significant Test Data		
The test subjects should we clothing consisting of	ear a standard range		Did all test subject use the specified test clothing		
 underwear (short sleeved) shirt (long sleeved) trousers (not woollen) a in addition to the cloth should wear two woolle thermal protective tests If a suit is to be worn lifejacket, the lifejacket the thermal protective to 	and woollen socks ning, the test subject on pullovers during the in conjunction with a should be worn during		□ YES □ NO Comments/Observations		

Immersion suits (non-insulated)	Model:	ber:	Date: Time: Surveyor: Organization:					
2.3.1.8 Donning test (1)		Regulations: LSA Cod	Regulations: LSA Code II/2.3.1.1.1; MSC.81(70) 1/3.1.3					
Test Procedu	re	Acceptano	ce Criteria		Significant T	est Data		
Following a demonstration, should be able to unpack, do immersion suit over their test assistance in less than 2 min include the time to don any a inflate any orally inflated chadon a lifejacket, if such is to be with the immersion suit, and should be able to don such assistance.	on and secure the st clothing without a. This time shout associated clothing mbers if fitted ar worn in conjunction the test subjection.	don and secure the imut test clothing (see 2.3.1.1) less than 2 min. This time to don any association orally inflated chamber lifejacket, if such is to life with the immersion suit.	Each test subjects should be able to unpack, don and secure the immersion suit over their test clothing (see 2.3.1.7) without assistance in less than 2 min. This time should include the time to don any associated clothing, inflate any orally inflated chambers if fitted, and don a lifejacket, if such is to be worn in conjunction with the immersion suit. Donning time Subject No.1sec Subject No.2sec Subject No.3sec Subject No.4sec Subject No.5sec Subject No.6sec Comments/Observations			Fail		
2.3.1.8 Donning test (2)	<u> </u>		Regulations: LSA Code I/2.3.1.1.1; MSC.81(70) 1/3.1.4					
Test Procedure		Acceptano	ce Criteria		Signit	ficant Test Da	ıta	
The immersion suit should be being donned in 5 min at temperature as low as -30°C donning test the packed immediately should be kept in a refrigerated a temperature of -30°C for 24	an ambient 5. Before the mersion suit d chamber at	he test subject should be a min.	able to complete t	this task ir	Time Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5	Passe sec sec sec sec sec	ed Failed	

Model:		er:		Date: Survevor:	Time:		
(non-insulated)		umber:		Organization:	ation:		
2.3.1.9 Ergonomic Te	st	Regulations: LSA Code II/2.3			3.1.3.1, 2.3.1.3.2; MSC.81(70) 1/3.1.5		
Test Procedure	е	Acceptanc	e Criteria		Significant Test Data		
When wearing the immersion suit, the test subjects should be able to:		There should be no restriction arm movement. The diamete 8-10 mm.			movement:	walking, bending over or arm	
.1 climb up and down a vertical ladder of at least 5 m in length;		0-10 111111.			□YES	□NO	
					All the test sub	pjects were able to pick up a pencil	
.2 perform all duties as abandonment; and	ssociated with				□YES	□ NO	
.3 to pick up a pencil and	d write.						
					All the test sub lifejacket withou	ojects were able to put on the out assistance:	
					□YES	□NO	
						pjects were able to perform all duties h abandonment, assist others and cue boat:	
					□YES	□ NO	
						pjects were able to climb up and al ladder of 5 meter in length:	
					□YES	□NO	
					Comments/Ob	servations	

Immersion suits (non-insulated)	Manufacturer:		Date: Time: Surveyor: Organization:					
2.3.1.10 Field of vision test	Regulations: LSA Code II/2.3.1.1.3; MSC.	81(70) 1/3.1.						
Test Procedure	Acceptance Criteria		Significant Test Data					
Each test subject should be	The lateral field of vision should be at least		F	ield of vision angle: ≥	120°			
seated with the head in a fixed position, and the lateral field of vision measured.		Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6		Passed		Failed	ı	
		Comments/	Observations					
2.3.1.11 Flotation test	Regulations: LSA Code II/2.3.1.1; MSC.8	1(70) 1/3.1.7						
Test Procedure	Acceptance Criteria		Significant		L			
With the test subject floating at rest, wearing the suit in conjunction with a lifejacket if required, the freeboard should be measured from the water surface to the nose or mouth.	The position of the lifejacket light should permit it to be visible over as great a segment of the upper hemisphere as is	Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6		Mouth Freeboard	Nose Freeboard	Light (Y/N)	Postion	ok?
		Comments/O	bservations					

Immersion suits (non-insulated)	Model:	er: umber:	{	Date: Time: Surveyor: Organization:			
2.3.1.12 Righting test			Regulations: LSA Code II/2.3.1.2; MSC.81(70) 1/3.1.8				
Test Procedure		Acceptano	ce Criteria		Significant Test Data		
The test subjects in fresh was either a non-insulated immersion in sulficial subjects in fresh was either a non-insulated immersion in subject in subject in subject in subject in subject in fresh was either a non-insulated immersion in subject in fresh was either a non-insulated immersion. It is subject to a face-up position in fresh was either a non-insulated immersion in fresh was eith	sion suit or a uit with a onstrate that a face-down	Except where it has been non-insulated immersion suit with 5 s, the test subjects should eaturn themselves from a face-domore than 5 s.	will right the tes ach demonstra	at subjects within ate that they can	Subject No.1 Subject No.2		
2.3.1.13 Water ingress and		Regulations: MSC.81(70) 1/3.1.9					
Test Procedure		Acceptano	ce Criteria		Significant Test Data		
The test subjects should p non-insulated immersion suit weighed. Following a jump in from a height sufficient to tota the body, each test subject weighed again. Weighing should be performachine accurate to ± 100g.	and then be to the water ally immerse t should be	The difference in the combined the suit should not exceed 500		test subject and	Pass Fail Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations		

Immersion suits (non-insulated)	Model:	er:umber:		Surveyor:				
2.3.1.14 Jump test		F	Regulation	tions: LSA Code II/2.3.1.3.3; MSC.81(70) 1/3.1.10				
Test Procedure		Acceptance	Criteria			Significant Te	st Data	
The test subjects should jump and lifejacket if required from 4.5m vertically into the wate jump, the suit and its attachm be examined for damage or dist the test subject should be concerning whether the suit injury to the wearer.	a height of r. After the ents should odging, and questioned	The suit and its attachments sho dislodged in any way. The test injured by the suit.			Subject No.2 Subject No.3 Subject No.4	Passed	Fail	led
2.3.1.15 Leak test		F	Regulation	s: LSA Code II/2	2.3.1.1.1; MSC.81((70) 1/3.1.11		
Test Procedure		Acceptance	Criteria			Significant Te	st Data	
The test subject should p immersion suit and be weight subject should then be instructed of the following:	ed. The test	The ingress of water into the pre exceed a mass of 200g.	-wetted su	it should not	Water ingress ≤ :	native 1 □Alterr		ilad
.1 a period of flotation in calm 1h; or	water of				Subject No.1		——————————————————————————————————————	
.2 swimming for 20 min for a cat least 200 m	distance of				Subject No.3 Subject No.4			
The test subject should be we after the task.	ighed again				•			
The weighing machine should l to ± 100g.	be accurate							

Immersion suits (non-insulated)	Model:	umber:		Date: Surveyor: Organization:		Time:		
2.3.1.16 Swimming and w	ater emerge	ence test	Regulation	ations: LSA Code II/2.3.1.3.4; MSC.81(70) 1/3.1.12				
Test Procedure		Acceptano	ce Criteria			Significant Test D	Data	
All test subjects, each wearing	a lifejacket	All qualified test subjects shou	ld be able to	board the liferaft	1) 25m s	swim and boarding v	vithout lifejacket.	
but not the suit, should atten 25 m and board a liferaft or ri with its surface 300 mm abov surface.	gid platform	or platform while wearing the r	non-insulated	d immersion suit.	Subject No.1 Subject No.2 Subject No.3 Subject No.4	Passed	Failed 	
Test subjects who successful this task should also perform it					Subject No.5 Subject No.6			
suit.	Ü				2) 25 r	n swim and boardin	g with suit	
If designed to be used with a life non-insulated immersion suit tested with the subject also lifejacket.	should be				Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 3) 25 m swim if required		Failed	
					Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Obs	Passed servations	Failed	

Immersion suits (non-insulated) Manufacturer: Model: Lot/Serial Number:				Date: Time: Surveyor: Organization:			
2.3.1.17 Oil resistance te		umber.	Regulations: LSA Code; MSC.81(70) 1/3.1.13				
Test Procedure		Acceptano		,	Significant Test Data		
After all its apertures have be non- insulated immersion suitimmersed for a period of 2 100 mm head of diesel oil at retemperature. The surface oil should then be and the immersion suit subjects prescribed in 2.3.1.15.	t should be 24 h under normal room be wiped off	The ingress of water should no	ot exceed a r	mass of 200g.	Indicate which alternative is used. □Alternative 1 □Alternative 2 Water ingress ≤ 200g Passed Failed Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations		

Immersion suits (non-insulated)	Model:			Date: Time: Surveyor: Organization:				
2.3.1.18 Alternative oil resis	stance test	Regulations: LSA Code; MS			SC.81(70) 1/3.1.14.1 & .2			
Test Proced	ure	Accep	otance Criter	ria	Significant Test Data			
In lieu of the test for oil resized. 3.3.1.17 either of the follow conducted. After all apertures have non-insulated immersion suit for a period of 24 h under 100 at normal room temperature weights to keep suit submershould then be wiped off arimmersion suit turned inside then be laid on a table suital draining off any leakage and neck aperture by a suitable disuit should then be filled with which should be 300mm above. Representative samples of the seams should be immersed undiesel oil for 24 h. After remeamples should be wiped off be to the following tests: 1. a hydrostatic test of a 1 m. 2. a tensile test of representation.	been sealed, the should be immersed mm head of diesel oil if necessary using ged. Any surface oil and the non-insulated out. The suit should ble for collecting and be supported at the lesigned hanger. The n water to neck level is the table. The exterior fabric and ander 100mm head of oval from the oil the efore being subjected in water head; and	After 1h in this position exceeding a mass of the seam strength shape of the samples should soft water	200g nould be not	less than 150 N	Water ingress ≤ 2	Passed	rative 2 Failed	

Immersion suits (non-insulated)	Model:	Surveyor:			Time:		
2.3.1.19 Fire test		Regulations: LSA Code II/2.3			3.1.1.2; MSC.81(70) 1/3.1.15		
Test Procedure		Acceptano	e Criteria		Significant Test Data		
A test pan 30 cm x 35 cm x 6 cd placed in an essentially draugh Water should be put in the bottest pan to make a minimum to 1 cm followed by enough petrominimum depth of 4 cm. The puthen be ignited and allowed to for 30 s. If necessary the improved he whole of the suit is envel flames, with the bottom of the above the top edge of the test the duration of exposure to is 2 s.	ottom of the otal depth of ol to make a setrol should oburn freely mersion suiter to ensure oped in the suit 25 cm pan so that	The non-insulated immersion s for more than 6 s or continue from exposure to the flames.		er being removed	Did the immersion suit sustain burning for more than 6 s or continue melting after being removed from the flames? □YES □NO Comments/Observations		

(non-insulated) Lot/Serial Number: Organization:	Date: Time: Surveyor: Organization:		
2.3.1.20 Temperature cycling test Regulations: LSA Code I/1.2.2.2; MSC.81(70) 1/3.1.16	2.2.2; MSC.81(70) 1/3.1.16		
Test Procedure Acceptance Criteria Significant Test Data			
The following test should be carried out on two immersion suits should be alternately subjected to surrounding temperatures of -30°C and +65°C. These alternating cycles need not follow immediately after each other and the following procedure, repeated for a total of 10 cycles, is acceptable: 1. an 8 h exposure at a minimum temperature of +65°C to be completed in one day; and 2. the specimens removed from the warm chamber that same day and left exposed under ordinary room conditions at a temperature of -30°C to be completed the next day; and 3. the specimens removed from the cold chamber that same day and left exposed under ordinary room conditions at a temperature of -30°C to be completed the next day; and 4. the specimens removed from the cold chamber that same day and left exposed under ordinary room conditions at a temperature of -30°C to be completed the next day; and 5. the specimens removed from the cold chamber that same day and left exposed under ordinary room conditions at a temperature of -30°C to be completed the next day; and 6. the specimens removed from the cold chamber that same day and left exposed under ordinary room conditions at a temperature of -30°C to be completed the next day; and the specimens removed from the cold chamber that same day and left exposed under ordinary room conditions at a temperature of -30°C to be completed the next day.			

	Manufacturer:					Date:		Time:	
	on suits	Model:				Surveyor:			
(non-ins	sulated)	Lot/Se	rial Number:						
2.3.1.21	Temperature cyclin	g test -	Test Data		Regulation	tions: LSA Code I/1.2.1; MSC.81(70) 1/3.1.16			
			HOT CYCLE			COLD CYCLE			
	Date In:		Date Out:		Date	In:		Date Out:	
Cycle 1	Time In:		Time Out:	ne Out:		Time In:		Time Out:	
- 7	Temperature:	°C	Duration:	hours		Temperature: 0C		Duration:	
	Date In:		Date Out:			In:		Date Out:	
Cycle 2	Time In:		Time Out:			In:		Time Out:	
,	Temperature:	0C	Duration:	hours	Temp	oerature:	oC	Duration:	hours
	Date In:		Date Out:		Date	In:		Date Out:	
Cycle 3 Time In: _	Time In:		Time Out:			In:		Time Out:	
,	Temperature:	oC	Duration:	hours	Temp	oerature:	0C	Duration:	hours
	Date In:		Date Out:		Date	In:		Date Out:	
	Time In:		Time Out:		Time	In:		Time Out:	
,	Temperature:	°C	Duration:	hours	Temp	oerature:	0C	Duration:	hours
	Date In:		Date Out:		Date	In:		Date Out:	
Cycle 5	Time In:		Time Out:			In:		Time Out:	
	Temperature:	°C	Duration:		Temp	oerature:	0C	Duration:	
	Date In:		Date Out:		Date	In:		Date Out:	
Cycle 6	Time In:		Time Out:		Time	In:		Time Out:	
	Temperature:	°C	Duration:			oerature:		Duration:	hours
	Date In:		Date Out:		Date	In:		Date Out:	
Cycle 7	Time In:		Time Out:		Time	In:		Time Out:	
	Temperature:	0C	Duration:		Temp	oerature:	oC	Duration:	
	Date In:		Date Out:		Date	In:		Date Out:	
Cycle 8	Time In:		Time Out:		Time	In:		Time Out:	
	Temperature:	0C				oerature:	0C	Duration:	hours
	Date In:		Date Out:		Date	In:		Date Out:	
Cycle 9	Time In:		Time Out:		Time	In:		Time Out:	
_	Temperature:	0C	· · · · · · · · · · · · · · · · · · ·			perature:	oC	Duration:	
	Date In:		Date Out:		Date	In:		Date Out:	
Cycle 10	Time In:		Time Out:			In:		Time Out:	
-	Temperature:	0C	Duration:	hours	Temp	perature:	0C	Duration:	hours

Immersion suits (non-insulated)	Model:	umber:		Surveyor:	:			
2.3.1.22 Buoyancy test		Regulations: LSA Code II/2.			3.1.8; MSC.81(70) 1/3.1.17			
Test Procedure		Acceptano	e Criteria		Significant Test Data			
The buoyancy of a non-insulated immersion suit designed to be worn without a lifejacket should be measured before and after 24 h complete submersion to just below the surface in fresh water.		The difference between the initial buoyancy and the final buoyancy should not exceed 5% of the initial buoyancy		Buoyancy 1 Buoyancy 2 %difference kg kg % Passed				
The buoyancy shall not depend of loose granulated materials	d on the use				Failed Comments/Observations			
2.3.1.23 Strength test Regulations: LSA Code II					ISC.81(70) 1/3.1.18			
Test Procedure		Acceptano	e Criteria		Significant Test Data			
The non-insulated immersion be immersed in water for a per It should then be removed from and closed in the same mann worn by a person A force of n 3200 N should be applied to the and a force of not less than 13 be applied to the parts other the loop for 30 min.	iod of 2 min. m the water her as when ot less than e lifting loop 50 N should	The non-insulated immersion sas a result of this test.	suit should n	ot be damaged	Passed Failed Comments/Observations			
The non-inflated immersion sui if necessary to accommodate device.		Vest-type lifejacket Yoke or over-the	e-head type lifejacket					

Immersion suits (non-insulated)	Manufacturer:			
,	Lot/Serial Number:		Organization:	
2.3.1.24 Thermal protect	tive test (General)	Regulation	ns: LSA Code II/2.	3.2.1; MSC.81(70) 1/3.2.1 – 3.2.4
Tes	t Procedure	Acceptan	ce Criteria	Significant Test Data
The thermal protective qualiti manikin, when such a method has been demonstrated to satisfactorily in all aspects to			Comments/Observations	
	they should be medically examined tests. Each design of immersion suit s specified in 2.3.1.5			
conducted under the sup resuscitation equipment show safety reasons, ECG should be should be stopped at the wi- temperature of hand, foot or	used, the tests should always be ervision of physician. Emergency all be available during all tests. For see monitored during every test. Testing sh of the test subjects, or if the skin lumbar region should fall below 10°C if the attending physician considers it			
temperature (rectal temperat region, both hands, calves, for measured. The accuracy of	subjects, continuous body core ure) and skin temperature of lumbar bot (foot instep) and heels, should be f the measuring system should be nding measurements should be taken numan subjects.			

Immersion suits		er:		Date:	Time:		
(non-insulated)	Model: Lot/Serial Number:			Surveyor:Organization:			
2.3.1.25 Thermal Protecti			Regulation		3.2.1.2; MSC.81(70) 1/3.2		
Test Procedure	(1)	Acceptano				ant Test Dat	
Prior to tests, the same amount resulting from the water ingrest test in 2.3.1.13 should be pour dry suit worn over the dry to specified in 2.3.1.7 by the test shown. Each test subject should within the subjected to the jump test following a 1 h period of immersion of the subject of the su	ess and jump ired into the est clothing subject lying ear a non- previously in 2.3.1.14.	Following immersion each temperature should not fall molevel of the subject's temperate	re than 2°C		Same amount of wate ingress and jump test in be poured into the dry so Beginning of test Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6	n paragraph	
hands gloved, in circulating call 5° C, each test subject's temperature should not fall mobelow the normal level of the temperature.	m water at + body core ore than 2°C				Passed Pick up a pencil and immersion:	Failed write after	
The non-insulated immersion provide sufficient thermal pressure that immediately on water after completion of prescribed above each test pick up a pencil as specified in write.	rotection to leaving the the test subject can				Subject No 1 YES Subject No 2 YES Subject No 3 YES Subject No 4 YES Subject No 5 YES Subject No 6 YES Passed YES Comments/Observations See attached test sheets the immersion tests.		atures during

Immersion suits (non-insulated) Manufacturer: Model: Lot/Serial Number:					Date: Time: Surveyor: Organization:			
2.1.3.26 Test sheets for to	emperatures during imme	ersion tests	Regu	ulations:	LSA Code II/2.	3.2.1.2; MSC.81(70) 1/3.2.9	& 3.2.10	
SUBJECT 1	SUBJECT 2	SUBJECT 3			BJECT 4	SUBJECT 5	SUBJECT 6	
Rectal temp after 1 hr:	Rectal temp after 1 hr:	Rectal temp after 1	hr:_	Rectal te	mp after 1 hr:_	Rectal temp after 1 hr:	Rectal temp after 1 hr:	
Skin temp at lumbar region after 1 hr:	Skin temp at lumbar region after 1 hr:	Skin temp at lumba region after 1 hr:		Skin tem region af	p at lumbar ter 1 hr:	Skin temp at lumbar region after 1 hr:	Skin temp at lumbar region after 1 hr:	
Skin temp at left hand after 1 hr:	Skin temp at left hand after 1 hr:	Skin temp at left hand		Skin temp at left hand		Skin temp at left hand after 1 hr:	Skin temp at left hand after 1 hr:	
Skin temp at right hand after 1 hr:	Skin temp at right hand after 1 hr:	Skin temp at right h	nand	Skin tem	e at right hand	Skin temp at right hand after 1 hr:	Skin temp at right hand after 1 hr:	
Skin temp at calves after 1 hr:	Skin temp at calves after 1 hr:	after 1 hr: Skin temp at calves	s	Skin tem	e at calves	Skin temp at calves after 1 hr:	Skin temp at calves after 1 hr:	
Skin temp at left foot (foot instep) after 1 hr:	Skin temp at left foot (foot instep) after 1 hr:	Skin temp at left foot (foot instep) after 1 hr:		Skin tem foot (foot after 1 hi	instep)	Skin temp at left foot (foot instep) after 1 hr:	Skin temp at left foot (foot instep) after 1 hr:	
Skin temp at right foot (foot instep) after 1 hr: Skin temp at left heel after	Skin temp at right foot (foot instep) after 1 hr: Skin temp at left heel	Skin temp at right foot (foot instep) after 1 hr:		Skin tem foot (foot after 1 hr	p at right instep)	Skin temp at right foot (foot instep) after 1 hr: Skin temp at left heel after	Skin temp at right foot (foot instep) after 1 hr:	
1 hr:	after 1 hr:	Skin temp at left he after 1 hr:		Skin tem after 1 hr	p at left heel ::	1 hr:	Skin temp at left heel after 1 hr:	

2.3.2 IMMERSION SUITS (INSULATED)

EVALUATION AND TEST REPORT

2.3.2.1	General data and specifications
2.3.2.2	Submitted drawings, reports and documents
2.3.2.3	Quality assurance
2.3.2.4	Visual inspection
2.3.2.5	Test subjects
2.3.2.6	Test with a lifejacket
2.3.2.7	Test clothing
2.3.2.8	Donning tests 1 & 2
2.3.2.9	Ergonomic test
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2.3.2.11	Flotation test
2.3.2.12	Righting test
2.3.2.13	Water ingress and jump test
2.3.2.14	Jump test
2.3.2.15	Leak test
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2.3.2.17	Oil resistance test
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2.3.2.19	Fire test
2.3.2.20	Temperature cycling test
2.3.2.21	Temperature cycling test - Test data
2.3.2.22	Buoyancy test
2.3.2.23	Strength test
2.3.2.24	Thermal protective test (General)
2.3.2.25	Thermal protective test (Continued)
2.3.2.26	Test sheets for temperatures during immersion tests

2.3.2 IMMERSION SUITS (INSULATED)

EVALUATION AND TEST REPORT

Manufacturer	
Туре	
Date	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

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Immersion suits (insulated)	Model:	Manufacturer:		Date: Surveyor: Organization:			
2.3.2.1 General data and	d specifications		Regulation	ns: LSA Code 2.3; MS	C.81(70) 1/3.1 & 3.	2	
Construction Material:		Additional equipment:				Donning in	structions:
Fabric produced by:		Retro reflective material produced by:		Туре:		□YES	□NO
Type:		Whistle produced by (if fitted):		Туре:			
Buoyant material produced by:		Life-line produced by (if fitte	ed):	Type			
Туре:		Light produced by (if fitted):		Туре: _			

Immersion suits (insulated)	Manufacture Model: Lot/Serial Nu	r:	Date: Surveyor: Organization:		
2.3.2.2 Submitted di	rawings, reports and	documents			
		Submitted drawings and do	ocuments		Status
Drawing No.	Revision No. & date	Title of drawing			
		Submitted reports and doc	cuments		
Report/Document No.	Revision No. & date		Title of report / document		Status
		Maintenance Manual -			
		Operations Manual -			

Immersion suits (insulated)	Manufacturer: Model: Lot/Serial Number:	1.0					
			ns: MSC.81(70) 2/1				
of the International Conventic amended, or the international inspected, representatives of inspections of manufacturers	a particular type are required by Chapter III on for the Safety of Life at Sea, 1974, as Life-Saving Appliance (LSA) Code, to be the Administration should make random to ensure that the quality of life-saving sed comply with the specification of the appliance.	Quality Assurance Standard Used: - Quality Assurance Procedure: - Quality Assurance Manual: -					
Manufacturers should be required to institute a quality control procedure to ensure that life-saving appliances are produced to the same standard as the prototype life- saving appliance approved by the Administration and to keep records of any production tests carried out in accordance with the Administration's instructions.			Quality Assurance Manual: - Description of System. Quality Assurance System acceptable Yes/No Comments/Observations				

Immersion suits (insulated) Manufacturer: Model: Lot/Serial Number:			Surveyor:		
2.3.2.4 Visual inspection		Regulations	s: LSA Code I/1.2.2	2, & II/2.3.1.1.3 & 2.3.1.1.4	
Insulated Immersion suit sho	uld:				
.1 be clearly marked wit information including the Adwhich approved it, date of nand any operational restrict	dministration nanufacturer			Passed	Failed
2 ha provided with labele sivi	ng anarating			Passed	Failed
be provided with labels givi instructions, general infor manufacturers details as and be fitted with approved page.	mation and appropriate;			Passed	Failed
.3 be fitted with approved pate reflective material with a to least 400 cm ² and with 100 back if the suit does not a turn the wearer face up a resolution A.658(16).	tal area of at 0 cm² on the automatically			Comments/Observations	

Immersion suits (insulated) Manufacturer: Model: Lot/Serial Number:		Commencer:				
2.3.2.4 Visual Inspection (continued)			Regulations	: LSA Code I/1.2.2	2, & II/2.3.1.1.3 & 2.3.1.1.4, 2.3	3.1.4-6
Test Procedure		Acceptar	nce Criteria		Significant Test Data	
Does the immersion suit cover body with the exception of the		Be of an international or comparably highly visible collassist detection at sea.		0 1	Passed	Failed
Are the hands covered, or is the immersion suit equipped with pattached gloves?		assist detection at sea.			Passed	Failed
Are their arrangements excessive free air in the legs?	to prevent				Passed	Failed
Is the immersion suit of hicolour?	ghly visible				Passed	Failed
Is the immersion suit designed without a lifejacket?	d to be worn					
If yes,					Passed	Failed
Is the immersion suit fitted complying with paragraph 2.2.					Passed	Failed
Is the immersion suit fitted with complying with paragraph 2.2. Code?						
Fitted with releasable buoyar other means to secure it to a another person in the water & p a suitable means to allow resc wearer from the water into rescue craft.	suit worn by provided with uer to lift the				Passed Comments/Observations	Failed

Immersion suits (insulated)	Model:			Date: Time: Surveyor: Organization:		
2.3.2.5 Test subjects			Regulation	ns: LSA Code I/; N	MSC.81(70) 1/3.1.1	
Test Procedure			Acceptance Criteria		Significant Test Data	
At least six able-bodied person and females of the following weights should be used. At least more than two of the person females with not more than or the same height range.	heights and ast one and as should be	Height 1.4 m - 1.6 m; 1.6 m - 1.8 m	Weight 1 person under 60kg 1 person over 60kg 1 person under 70kg 1 person over 70kg		Male/FemaleHeight Weight Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6	
		over 1.8 m	1 person under 80kg 1 person over 80kg		Comments/Observations	
2.3.2.6 Test with a lifejacket		Regulations: LSA Code 2.3.1.7; MSC.81(70) 1/3.1.2				
Test Procedure			Acceptance Criteria		Significant Test Data	
If the suit is to be worn in conj a lifejacket, the lifejacket show over the suit for the tests por 2.3.2.8 to 2.3.2.16.	uld be worn				Manufacturer of lifejacket: Type:	
					Manufacturer of lifejacket: Type: Manufacturer of lifejacket: Type:	

Immersion suits (insulated)	I Model:			Surveyor:	Time:	
2.3.2.7 Test clothing			Regulation		3.1.1.1; MSC.81(70) 1/3.2.6, 3.2.7	
Test Procedure		Acceptano	ce Criteria		Significant Test Data	
The test subjects should wear range clothing consisting of .1 underwear (short sleet legged) .2 shirt (long sleeved) .3 trousers (not woollen) a socks .4 If a suit is to be worn in with a lifejacket, the lifejacket, the lifejackets.	eved, short and woollen conjunction acket should				Did all test subject use the specified test clothing? YES NO Comments/Observations	
2.3.2.8 Donning test (1)			Regulation	ns: LSA Code II/2.	3.1.1.1; MSC.81(70) 1/3.1.3	
Test Procedure		Acceptance Criteria			Significant Test Data	
Following a demonstration, subject should be able to unpase secure the suit over their twithout assistance in less than time should include the time associated clothing, inflate inflated chambers if fitted, lifejacket, if such is to be conjunction with the suit, a subjects should be able to lifejacket without assistance.	ack, don and test clothing n 2 min. This to don any any orally and don a be worn in and the test	Each test subjects should be at the immersion suit over the without assistance in less the include the time to don any lifejacket, if such is to be wimmersion suit.	ir test cloth nan 2 min. ⁄ associatec	ing (see 2.3.2.7) This time should clothing, and a	Donning time normal clothing Time Pass Fail Subject No.1sec Subject No.2sec Subject No.3sec Subject No.4sec Subject No.5sec Subject No.6sec Comments/Observations	

Imme	ersion suits	Manufacturer:				Date:	Time:	
	lated)	Model:	umber:			Surveyor:		
222	9 Denning toot (2)	Lot/ Contain	diliboi:					
2.3.2.	.8 Donning test (2)		1			is: LSA Code II/2	.3.1.1.1; MSC.81(70) 1/3.1.4	
	Test Procedure		Ac	ceptano	e Criteria		Significant Test Data	
The immersion suit should be capable of being donned in 5 min at an ambient temperature as low as -30°C. Before the donning test the packed immersion suit should be kept in a refrigerated chamber at a temperature of -30°C for 24 h.			The test subject should 5 min.	d be abl	e to complet	e this task in	Donning time at - 30°C Time Pass Fail Subject No.1 sec Subject No.2 sec Subject No.3 sec Subject No.4 sec Subject No.5 sec Subject No.6 sec Comments/Observations	
2.3.2.	.9 Ergonomic Test				Regulation	s: LSA Code II/2.	3.1.3.2; MSC.81(70) 1/3.1.5	
	Test Procedure		Acceptance Criteria	Significant Test Data				
Wher	n wearing the immersion	suit, the test	There should be no	Restriction in walking, bending over			or arm movement:	
subje	cts should be able to:		restriction in walking, bending over or arm	□YES	S □NO			
.1	Climb up and down a ve of at least 5 m in length		movement.		All the test subjects were able to pick up a pencil and write: YES NO NO NO NO NO NO NO NO NO N			
.2	Perform all duties asso	ociated with	☐YES ☐NO All the test subjects were able to perform all duties associated with abandonmen				form all duties associated with abandonment, assist	
.3	To pick up a pencil and	d write. The		others	and operate	a rescue boat:	□YES □NO	
.ى	diameter of the pencil 8-10 mm.			All the length:	•	s were able to clim	nb up and down a vertical ladder of 5 meter in	
				□YES Comr	S □NO ments/Obse	vations		

Immersion suits (insulated)	Model:	er:umber:		Surveyor:			
2.3.2.10 Field of vision test		Regulations: LSA Code II/2.3			3.1.1.3; MSC.81(70) 1/3.1.6		
Test Procedure		Acceptano	e Criteria		Significan	t Test Data	
Each test subject should be se head in a fixed position, and th of vision measured.					Field of vision angle Passed Failed Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations		
2.3.2.11 Flotation test		Regulations: LSA Code II/2.			3.1.1; MSC.81(70) 1/3.1.7	,	
Test Procedure		Acceptance Criteria			Significant Test Data		
With the test subject floating at rest, wearing the suit in conjunction with a lifejacket if required, the freeboard should be measured from the water surface to the nose or mouth. For a buoyant insulated implification of the water by at least 120mm. For a buoyant insulated implification or ally inflated bladder behind used to obtain this freeboard, obtained without the auxiliar least 50 mm. The position of the lifejacket visible over as great a segment as is practicable.			and be stab mersion suit as of buoya d the weare , provided the ry means of	ole in that position. worn without a ncy such as an r's head may be nat the freeboard f buoyancy is at d permit it to be	Mouth Freeboard Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations		

Immersion suits		:			Time:		
(insulated)		mber:		Surveyor:Organization:			
2.3.2.12 Righting test		Regulations: LSA Code II/2.			3.1.2; MSC.81(70) 1/3.1.8		
Test Procedure		Acceptano	ce Criteria		Significant Test D	Data	
The test subjects, in fresh veither an immersion suit or an iwith lifejacket, should each deithey can turn themselves fron to a face-up position in not mo	immersion suit monstrate that a face-down	Except where it has been demonstrated that the insulated immersion suit will right the test subjects within 5 s, the test subjects should each demonstrate that they can turn themselves from a face-down to a face-up position in not more than 5 s.			Righting time = ≤ 5 s Passed Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations	Failed	
2.3.2.13 Water ingress and	jump test		Regulati	ons: MSC.81(70) 1/3	3.1.9		
Test Procedure		Acceptance Criteria			Significant Test Data		
The test subjects should immersion suit and then Following a jump into the wate sufficient to totally immerse the test subject should be weighed. Weighing should be performed accurate to ± 100g.	be weighed. r from a height ne body, each d again.	The difference in the combine the suit should not exceed 500		the test subject and	Mass difference ≤ 500g Passed Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations	Failed	

Immersion suits (insulated)	Model:		Time:						
2.3.2.14 Jump test	LowSenai Number: _								
2.3.2.14 Jump test		Regulations: LSA Code II/2.3.1.3.3; MSC.81(70) 1/3.1.10							
Test Proced	ure	Acceptance Criter	ria		Significant Test D	Data			
The test subjects should jurn lifejacket if required from a hei into the water. After the jump and its attachments should damage or dislodging, and the be questioned concerning who any injury to the wearer.	ght of 4.5m vertically b, the immersion suit d be examined for e test subject should	The immersion suit and its attachm damaged or dislodged in any way. The test subject should not be inju	Subject No.1 _ Subject No.2 _ Subject No.3 _ Subject No.4 _ Subject No.5 _ Subject No.6 _ Comments/Obs		Failed				
2.3.2.15 Leak test		Regulations: LSA Code II/2.3.1.1.1; MSC.81(70) 1/3.1.11							
Test Proce	dure	Acceptance Crite		Significant Test D	Data				
The test subject should pre-w and be weighed. The test su instructed to do one of the follow. 1 a period of flotation in calm. 2 swimming for 20 min for a 200 m. The test subject should be we task. The weighing machine shou 100g.	bject should then be bwing: water of 1h; or distance of at least sighed again after the	The ingress of water into the pre- not exceed a mass of 200g.			rnative 1 □Alternat ≤ 200g Passed				

Immersion suits Model:				Date: Time: Surveyor: Organization:				
2.3.2.16 Swimming and	water emerge	ence test	: LSA Code II/2.	3.1.3.4; MSC.81	(70) 1/3.1.12			
Test Procedure)	Acceptar	ce Criteria			Significant Test Data		
All test subjects, each weari but not the immersion suit, see to swim 25 m and board a platform with its surface 300 water surface. Test subjects who successes this task should also perform immersion suit. If designed to be used with a immersion suit should be to subject also wearing a lifejace.	ng a lifejacket should attempt liferaft or rigid mm above the fully complete it wearing the lifejacket, then ested with the	Acceptar All qualified test subjects sho or platform while wearing the	uld be able to		Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6	and boarding without Pass	put lifejacket. Fail	
					Comments/Ob	servations		

Immersion suits (insulated)	Model:	r:		Date: Surveyor:		
(IIISulateu)	Lot/Serial Nu	ımber:		Organization:		
2.3.2.17 Oil resistance test		Regulations: LSA Code; MS6			C.81(70) 1/3.1.13	
Test Procedure		Acceptano	e Criteria		Significant Test Data	
After all its apertures have been immersion suit should be immorperiod of 24 h under 100 mm hoil at normal room temperature. The surface oil should then been the immersion suit subjected prescribed in 2.3.1.15.	mersed for a lead of diesel e. wiped off and	The ingress of water should no	t exceed a	mass of 200g.	Subject No.1Subject No.3Subject No.4	Fail

Immersion suits (insulated)	Model:	9		Date: Surveyor: Organization:			
2.3.2.18 Alternative oil resis					de; MSC.81(70) 1/3.1.14		
Test Procedure		Acceptance C	Criteria		Significant 7	Test Data	
In lieu of the test for oil prescribed in 2.3.2.17 eith following tests may be conducted. After all apertures have been immersion suit should be immersion of 24 h under 100 mm have oil at normal room temperature using weights to keep suit submountained oil should then be wipe immersion suit turned inside a should then be laid on a table collecting and draining off any be supported at the neck apsuitable designed hanger. The then be filled with water to neck should be 300mm above the table to the should be 300mm above the table table to the should be 300mm above the table t	sealed, the nersed for a ead of diesel if necessary merged. Any d off and the out. The suit is suitable for leakage and perture by a esuit should is level which able.	After 1h in this position there sexceeding a mass of 200g. The samples should successful of water.		ū	Indicate which alternative is use □ Alternative 1 □ Alter Water ingress ≤ 200g Pass Subject No.1 □ □ □ □ Subject No.2 □ □ □ □ Subject No.3 □ □ □ □ □ Subject No.4 □ □ □ □ □ Subject No.5 □ □ □ □ Subject No.6 □ □ □ Strength > 150N Pass The samples should support at □ □ □ □ □ Pass □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	rnative 2 Fail	
After removal from the oil the samples should be wiped off before being subjected to the following tests:		The seam strength should be not less than 150 N.					
.1 a hydrostatic test of a 1m and	water head						
.2 a tensile test of representa	tive seams						

Immersion suits (insulated)	Model:	er:umber:		Date: Time: Surveyor: Organization:		
2.3.2.19 Fire test			Regulation	ns: LSA Code II/2.	3.1.1.2; MSC.81(70) 1/3.1.15	
Test Procedure		Acceptano	e Criteria		Significant Test Data	
A test pan 30 cm x 35 cm x 6 cd placed in an essentially draugh Water should be put in the bottest pan to make a minimum to 1 cm followed by enough petrominimum depth of 4 cm. The put then be ignited and allowed to for 30 s. If necessary, the imposhould be draped over a hange the whole of the suit is envertished the duration of exposure to is 2 s.	ottom of the otal depth of ol to make a petrol should oburn freely mersion suit er to ensure loped in the e suit 25 cm pan so that	The immersion suit should not 6 s or continue melting after b to the flames.			Did the immersion suit continue to burn for more than 6 s or continue melting after being removed from the flames? □YES □NO Comments/Observations	

Immersion suits		Manufacture Model:	er:	Date: Surveyor:	Time:		
(insu	(insulated) Lot/S		umber:	Organization:	Organization:		
2.3.2	.20 Temperature cyc	ling test	Regulation	ons: LSA Code I/1.	2.2.2; MSC.81(70) 1/3.1.16		
	Test Procedure		Acceptance Criteria		Significant	Test Data	
	ollowing test should be ca o immersion suits.	arried out	The immersion suits should show no signs of damage such as shrinking, swelling dissolution or changes of mechanical		(See following page for tes	t data)	
The immersion suits should be alternately subjected to surrounding temperatures of -30°C and +65°C. These alternating cycles need not follow immediately after each other and the following procedure, repeated for a total of 10 cycles, is acceptable:			qualities.		Passed Comments/Observations	Failed	
.1	an 8 h exposure at temperature of +65° completed in one day; a	°C to be					
.2	the specimens remove warm chamber that sai left exposed under ord conditions at a tempera ± 3°C until the next day;	me day and dinary room ture of 20°C					
.3	an 8 h exposure at a temperature of -30° completed the next day;	°C to be					
.4	the specimens remove cold chamber that same exposed under ordi conditions at a tempera ± 3°C until the next day.	day and left nary room ture of 20°C					

Immersion suits (insulated)	Model:	Manufacturer: Model: Lot/Serial Number:			Date: Time: Surveyor: Organization:				
2.3.2.21 Tempe	erature cycling test - Test				Regulations: LSA Code I/1.2.1.2; MSC.81(70) 1/3.1.16				
•		HOT CYCLE			,		COLD CYCLE		
	Date In:				Date In:		Date Out:		
Cycle 1	Time In:		Time Out:		Time In:		Time Out:		
	Temperature:	oC	Duration:	hours	Temperature:		Duration:		
	Date In:		Date Out:		Date In:		Date Out:		
Cycle 2	Time In :		Time Out:		Time In:		Time Out:		
	Temperature :	oC	Duration:	hours	Temperature:	°C	Duration:	hours	
	Date In:		Date Out:		Date In:		Date Out:		
Cycle 3	Time In:		Time Out:		Time In:		Time Out:		
	Temperature:	oC	Duration :	hours	Temperature:	oC	Duration:		
	Date In:		Date Out:		Date In:		Date Out:		
Cycle 4	Time In:		Time Out:		Time In:		Time Out:		
	Temperature:	oC	Duration:	hours	Temperature:		Duration:	hours	
	Date In:		Date Out:		Date In:		Date Out:		
Cycle 5	Time In:		Time Out:		Time In:		Time Out:		
	Temperature:	oC	Duration :	hours	Temperature:		Duration:	hours	
	Date In:		Date Out:		Date In:		Date Out:		
Cycle 6	Time In:		Time Out:		Time In:		Time Out:		
	Temperature:	<u>°</u> C	Duration:		Temperature:	<u>°</u> C	Duration:		
	Date In:		Date Out:		Date In:		Date Out:		
Cycle 7	Time In:		Time Out:		Time In:		Time Out:		
	Temperature:	<u>°</u> C	Duration :	hours	Temperature:	<u>°</u> C	Duration:	hours	
	Date In:		Date Out:		Date In:		Date Out:		
Cycle 8	Time In:		Time Out:		Time In:		Time Out:		
	Temperature:	°C	Duration :		Temperature:	°C	Duration:		
	Date In:		Date Out:		Date In:		Date Out:		
Cycle 9	Time In:		Time Out:		Time In:		Time Out:		
	Temperature:		Duration:		Temperature:		Duration:	hours	
	Date In:		Date Out:		Date In:		Date Out:		
Cycle 10	Time In:		Time Out:		Time In:		Time Out:		
	Temperature:	oC	Duration:	hours	Temperature:	°C	Duration:	hours	

Immersion suits (insulated)	Model:	umber:	Date: Time: Surveyor: Organization:				
2.3.2.22 Buoyancy test			Regulation	3.1.8; MSC.81(70) 1/3.1.17			
Test Procedure		Acceptano	e Criteria		Significant Test Data		
The buoyancy of an imm designed to be worn without should be measured before ar complete submersion to just surface in fresh water.	a lifejacket nd after 24 h	buoyancy should not exceed 5% of the initial buoyancy			% Passe	oyancy 2 %differencekg ed Comments/Observations	
2.3.2.23 Strength test		Regulations: LSA Code; MS			C.81(70) 1/3.1.18		
Test Procedure		Acceptance Criteria			Sig	nificant Test Data	
The immersion suit should be water for a period of 2 min. It be removed from the water at the same manner as when person. A force of not less the should be applied to the lifting force of not less than 1350N applied to the parts other the loop for 30 min. The immersion suit may be cut to accommodate to the test de	should then and closed in worn by a shan 3200 N g loop and a N should be an the lifting	The immersion suit should not test. Vest-type lifejacket Yoke or over	be damage		PassedComments/Observa	Failed	

Immersion suits (insulated)	Manufacturer: Model: Lot/Serial Number:	Surveyor:				
2.3.2.24 Thermal protecti	ve test (General)	Regulations: LSA Code II/2.3.2.2; MSC.81(70) 1/3.2.1 – 3.2.5				
Test F	Procedure	Acceptance	e Criteria	Significant Test Data		
The thermal protective qualities manikin, when such a method is has been demonstrated to presatisfactorily in all aspects to tell for human subjects are used, the before being accepted for the tell is to be tested by test subjects. Where human subjects are used conducted under the super resuscitation equipment should safety reasons, ECG should. Testing should be stopped at falling rate of the core temper after the first half hour, if the sklumbar region should fall below or if the attending physician co. When testing with human temperature (rectal temperaturegion, both hands, calves, foo measured. The accuracy of	s may be measured using a thermal is required by an Administration and rovide test results which correlate est results using human subjects. They should be medically examined ests. Each design of immersion suit specified in 2.3.2.5. The sed, the tests should always be evision of physician. Emergency in the dest available during all tests. For in the monitored during every test, the wish of the test subjects, if the ature is more than 1.5°C per hour kin temperature of the hand, foot or av 10° C for more than 15 minutes, insiders it advisable. Subjects, continuous body core in the subjects, continuous body core in the subjects, should be the measuring system should be anding measurements should be			Comments/Observations Comments / Observations		

Immersion suits	Manufacturer:			Date:	Ti	me:	
(insulated)	Model:			Surveyor:	or:		
(ilisulated)	Lot/Serial Number:		Organization:				
2.3.2.25 Thermal Protective test (Continued)			Regulations: LSA Code II/2.3.2.2; MSC.81(70) 1/, 3.2.11 & 3.2.12			3.2.12	
Test Proced	ure	Acceptar	nce Criteria		Sigr	nificant Test D	ata
Prior to tests, the same amo from the water ingress paragraph 2.3.2.13 should be pworn over the dry test clothing the test subject lying down. Each test subject wearing previously subjected to paragraph 2.3.2.14. Following immersion, with hands glove water at between 0°C and +2° body core temperature should	and jump test in poured into the dry suit specified in 2.3.2.7 by an immersion suit the jump test in g a 6 h period of d, in circulating calm CC, each test subject's not fall more than 2°C	Same mass of water from test 2.3.2.13, so the immersion suit. Following immersion body core temperate than 2°C below the subject's temperature.	nould be poun n each test are should no e normal le	red into subject's of fall more	Same mass of water w should be poured into Beginning of test Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Passed	the immersion End of test Failed	n suit normal temperature
The immersion suit should pro protection to ensure that immersion at the manufacture of the same water after a 1 hr period of in hands, in water circulating at the manufacture of the same with the manufacture of the same water at the manufacture of the same water	vide sufficient thermal ediately on leaving the nmersion, with gloved 5°C each test subject d in paragraph 2.3.2.9	The test subjects sh a pencil and write.	ould be able	to pick up	Pick up a pencil and w Subject No 1	□NO □NO □NO □NO □NO □NO □NO	eriod of immersion.
Alternatively, at the manufactur to pick up a pencil and very paragraph 2.3.2.9 above mainmediately after leaving the very of the above (6 hr) test.	vrite as specified in ay be demonstrated	See attached test she during the immersion Comments/Observa	n tests:	peratures	Pick up a pencil and w Subject No 1	rite after 6 h p NO NO NO NO NO NO NO NO TO Failed	period of immersion:

2.3.2.25	Thermal Protective test (Continued)	Regulations: LSA Co	de II/2.3.2.2; MSC.81(70) 1/, 3.2.11 & 3.2.12
	Test Procedure	Acceptance Criteria	Significant Test Data
			See attached test sheets for temperatures during the immersion tests: Comments/Observations

Manufacturer: Date: Time:	
Lot/Serial Number: Organization:	
2.3.2.26 Test sheets for temperatures during immersion Regulations: LSA Code II/2.3.2.2; MSC.81(70) 1/, 3.2.11 & 3.2.12	
tests	
Rectal temp after 1 hr: Rectal temp after 2 hr: Rectal temp after 3 hr: Rectal temp after 4 hr: Rectal temp after 5 hr:_ Rectal temp after 6	
Skin temp at lumbar Skin temp at lumbar region Skin temp at lumbar region Skin temp at lumbar Skin temp at lumbar Skin temp at lumbar	
Subject 1 region after 1 hr: after 2 hr: after 3 hr: region after 4 hr: region after 5 hr: region after 5 hr: skin temp at left hand after 5 kin temp at left hand after 5 hr: Skin temp at left hand after 5 hr: Skin temp at left hand skin temp at left hand 5 kin temp at left hand 6 kin temp at left	
Skin temp at left hand Skin temp at left hand after Skin temp at left hand after Skin temp at left hand Skin temp	
after 1 hr: 2 hr: 3 hr: after 4 hr: after 5 hr: after 6 hr: Skin temp at right hand after Skin temp at right hand after Skin temp at right hand after Skin temp at right hand after Skin temp at right hand after Skin temp at right hand after Skin temp at right hand Skin temp at rig	hand
after 1 hr: 2 hr: 3 hr: after 4 hr: after 5 hr: after 6 hr:	lailu
Skin temp at calves after	s after
1 hr: 2 hr: 3 hr: 4 hr: 5 hr: 6 hr:	
Skin temp at left foot Skin temp at left foot (foot Skin temp at left foot (foot Skin temp at left foot (foot Skin temp at left foot Skin	
(foot instep) after 1 hr: instep) after 2 hr: instep) after 3 hr: instep) after 3 hr: (foot instep) after 5 hr: (foot instep) after 6	
Skin temp at right foot Skin temp at right foot (foot Skin temp at right Skin temp at r	
(foot instep) after 1 hr: instep) after 2 hr: instep) after 3 hr: foot(foot instep) after foot(foot instep) after 5 hr: Skin temp at left heel after	
Skin temp at left heel after 2 hr: Skin temp at left heel after 2 hr: Skin temp at left heel after 3 hr: Skin temp at left heel after 5 kin temp at left heel after 5 kin temp at left heel after 6 hr: Skin temp at left heel aft	
4 hr: after	
5 hr:	
Rectal temp after 1 hr: Rectal temp after 2 hr: Rectal temp after 3 hr: Rectal temp after 4 hr: Rectal temp after 5 hr:_ Rectal temp after 6	o hr:
Skin temp at lumbar Skin temp at lumbar region Skin temp at lumbar region Skin temp at lumbar Skin temp at lumbar	
region after 1 hr: after 2 hr: after 3 hr: region after 4 hr: region after 5 hr: region after 5 hr: Skin temp at left hand after Skin temp at left hand after Skin temp at left hand after Skin temp at left hand Skin temp a	
Skin temp at left hand Skin temp at left hand after Skin temp at left hand after Skin temp at left hand Skin temp	
Subject 2 after 1 hr: 2 hr: 3 hr: 3 hr: 5 kin temp at right hand after 3 kin temp at right hand 3 kin temp at right	hand
after 1 hr: 2 hr: 3 hr: after 4 hr: after 5 hr: after 6 hr:	lanu
after 1 hr: 2 hr: 3 hr: after 4 hr: after 5 hr: after 6 hr: Skin temp at calves after Skin temp at calves afte	s after
1 hr: 2 hr: 3 hr: 4 hr: 5 hr: 6 hr:	
Skin temp at left foot Skin temp at left foot (foot Skin temp at left Skin temp at left foot (foot Skin temp at left Skin temp at left foot (foot Skin temp at left Skin temp at left foot (foot Skin temp at left Skin temp at left foot (foot Skin temp at left Skin temp at left foot (foot Skin temp at left Skin temp at left foot (foot Skin temp at left Skin temp at left foot (foot Skin temp at left Skin temp at left foot (foot Skin temp at left Skin temp at left foot (foot Skin temp at left Skin temp at left foot (foot Skin temp at left Skin temp at left Skin temp at left foot (foot Skin temp at left Skin te	ot
(foot instep) after 1 hr: instep) after 2 hr: instep) after 3 hr: instep) after 4 hr: foot(foot instep) after 5 (foot instep) after 6	
Skin temp at right foot Skin temp at right foot (foot Skin temp at right foot Skin temp at	
(foot instep) after 1 hr: instep) after 2 hr: instep) after 3 hr: (foot instep) after 5 kin temp at right foot (foot instep) after 6	
Skin temp at left heel after	
after 1 hr: 2hr: 3 hr: Skin temp at left heel after 5 hr: after 6 hr:	

		Manufacturer:		Date:	Time:			
Immersion	suits	Model:		Surveyor:				
(insulated)		Lot/Serial Number:		Organization:				
2.3.2.26 Te	est sheets for tem			e II/2.3.2.2; MSC.81(70) 1	1/, 3.2.11 & 3.2.12			
in	nmersion tests (co	ntinued)		, , , , , , , , , , , , , , , , , , ,				
Subject 3	Rectal temp after 1 hr: Skin temp at lumbar region after 1 hr: Skin temp at left hand after 1 hr: Skin temp at right hand after 1 hr: Skin temp at calves aft 1 hr: Skin temp at left foot (foot instep) after 1 hr: Skin temp at right foot (foot instep) after 1 hr: Skin temp at left heel after 1 hr:	Skin temp at lumbar region after 2 hr: Skin temp at left hand after 2 hr: Skin temp at right hand after 2 hr: Skin temp at calves after 2 hr: Skin temp at left foot (foot instep) after 2 hr: Skin temp at right foot (foot instep) after 2 hr: Skin temp at right foot (foot instep) after 2 hr: Skin temp at left heel after	Rectal temp after 3 hr: Skin temp at lumbar region after 3 hr: Skin temp at left hand after 3 hr: Skin temp at right hand after 3 hr: Skin temp at calves after 3 hr: Skin temp at left foot (foot instep) after 3 hr: Skin temp at right foot (foot instep) after 3 hr: Skin temp at left heel after 3 hr:	Rectal temp after 4 hr:Skin temp at lumbar region after 4 hr:Skin temp at left hand after 4 hr:Skin temp at right hand after 4 hr:_ Skin temp at calves after 4 hr:_ Skin temp at left foot (foot instep) after 4 hr:_ Skin temp at right foot(foot instep) after 4 hr: Skin temp at left heel after 4 hr:	Rectal temp after 5 hr:Skin temp at lumbar region after 5 hr :Skin temp at left hand after 5 hr:Skin temp at right hand after 5 hr:_Skin temp at calves after 5 hr:_Skin temp at left foot (foot instep) after 5 hr:_Skin temp at right foot(foot instep) after 5 hr:_Skin temp at left heel after 5 hr:_Skin temp at left heel after 5 hr:_	Rectal temp after 6 hr: Skin temp at lumbar region after 6 hr : Skin temp at left hand after 6 hr:_ Skin temp at right hand after 6 hr:_ Skin temp at calves after 6 hr:_ Skin temp at left foot (foot instep) after 6 hr:_ Skin temp at right foot(foot instep) after 6 hr:_ Skin temp at left heel after 6 hr:		
Subject 4	Rectal temp after 1 hr: Skin temp at lumbar region after 1 hr: Skin temp at left hand after 1 hr: Skin temp at right hand after 1 hr: Skin temp at calves aft 1 hr: Skin temp at left foot (foot instep) after 1 hr: Skin temp at right foot (foot instep) after 1 hr: Skin temp at left heel after 1 hr:	Skin temp at lumbar region after 2 hr: Skin temp at left hand after 2 hr: Skin temp at right hand after 2 hr: Skin temp at calves after 2 hr: Skin temp at left foot (foot instep) after 2 hr: Skin temp at right foot (foot instep) after 2 hr: Skin temp at right foot (foot instep) after 2 hr: Skin temp at left heel after	Rectal temp after 3 hr: Skin temp at lumbar region after 3 hr: Skin temp at left hand after 3 hr: Skin temp at right hand after 3 hr: Skin temp at calves after 3 hr: Skin temp at left foot (foot instep) after 3 hr: Skin temp at right foot(foot instep) after 3 hr: Skin temp at left heel after 3 hr:	Rectal temp after 4 hr:Skin temp at lumbar region after 4 hr:Skin temp at left hand after 4 hr:_Skin temp at right hand after 4 hr:_Skin temp at calves after 4 hr:_Skin temp at left foot (foot instep) after 4 hr:_Skin temp at right foot(foot instep) after 4 hr:_Skin temp at left heel after	Rectal temp after 5 hr: Skin temp at lumbar region after 5 hr : Skin temp at left hand after 5 hr:_ Skin temp at right hand after 5 hr:_ Skin temp at calves after 5 hr:_ Skin temp at left foot (foot instep) after 5 hr:_ Skin temp at right foot(foot instep) after 5 hr:_ Skin temp at left heel after 5 hr:	Rectal temp after 6 hr: Skin temp at lumbar region after 6 hr : Skin temp at left hand after 6 hr:_ Skin temp at right hand after 6 hr:_ Skin temp at calves after 6 hr:_ Skin temp at left foot (foot instep) after 6 hr:_ Skin temp at right foot(foot instep) after 6 hr: Skin temp at left heel after 6 hr:		

Immersion	ouito	Manufacturer:		Date:	Time:		
	SuitS	Model:		Surveyor:			
(insulated)		Lot/Serial Number:		Organization:			
	st sheets for temp mersion tests (cor		Regulations: LSA Cod	Regulations: LSA Code II/2.3.2.2; MSC.81(70) 1/, 3.2.11 & 3.2.12			
Subject 5	Rectal temp after 1 hr: Skin temp at lumbar region after 1 hr: Skin temp at left hand after 1 hr: Skin temp at right hand after 1 hr: Skin temp at calves aff 1 hr: Skin temp at left foot (foot instep) after 1 hr: Skin temp at right foot (foot instep) after 1 hr: Skin temp at left heel after 1 hr:	Skin temp at lumbar region after 2 hr: Skin temp at left hand after 2 hr: Skin temp at right hand after 2 hr: Skin temp at calves after 2 hr: Skin temp at left foot (foot instep) after 2 hr: Skin temp at right foot(foot instep) after 2 hr:	Rectal temp after 3 hr: Skin temp at lumbar region after 3 hr: Skin temp at left hand after 3 hr: Skin temp at right hand after 3 hr: Skin temp at calves after 3 hr: Skin temp at left foot (foot instep) after 3 hr: Skin temp at right foot (foot instep) after 3 hr: Skin temp at right foot (foot instep) after 3 hr: Skin temp at left heel after 3 hr:	Rectal temp after 4 hr:Skin temp at lumbar region after 4 hr :Skin temp at left hand after 4 hr:Skin temp at right hand after 4 hr:_ Skin temp at calves after 4 hr:_ Skin temp at left foot(foot instep) after 4 hr:_ Skin temp at right foot(foot instep) after 4 hr:_ Skin temp at left heel after 4 hr:_ Skin temp at left heel after 4 hr:_	Rectal temp after 5 hr:Skin temp at lumbar region after 5 hr :Skin temp at left hand after 5 hr:_Skin temp at right hand after 5 hr:_Skin temp at calves after 5 hr:_Skin temp at left foot (foot instep) after 5 hr:_Skin temp at right foot(foot instep) after 5 hr:_Skin temp at left heel after 5 hr:_Skin temp at left heel after 5 hr:_	Rectal temp after 6 hr:Skin temp at lumbar region after 6 hr :Skin temp at left hand after 6 hr:_Skin temp at right hand after 6 hr:_Skin temp at calves after 6 hr:_Skin temp at left foot (foot instep) after 6 hr:_Skin temp at right foot (foot instep) after 6 hr:_Skin temp at left heel after 6 hr:_Skin temp at left heel after 6 hr:_	
Subject 6	Rectal temp after 1 hr: Skin temp at lumbar region after 1 hr: Skin temp at left hand after 1 hr: Skin temp at right hand after 1 hr: Skin temp at calves aff 1 hr: Skin temp at left foot (foot instep) after 1 hr: Skin temp at right foot (foot instep) after 1 hr: Skin temp at left heel after 1 hr:	Skin temp at lumbar region after 2 hr: Skin temp at left hand after 2 hr: Skin temp at right hand after 2 hr: Skin temp at calves after 2 hr: Skin temp at left foot (foot instep) after 2 hr: Skin temp at right foot (foot	Rectal temp after 3 hr: Skin temp at lumbar region after 3 hr: Skin temp at left hand after 3 hr: Skin temp at right hand after 3 hr: Skin temp at calves after 3 hr: Skin temp at left foot (foot instep) after 3 hr: Skin temp at right foot (foot instep) after 3 hr: Skin temp at left heel after 3 hr:	Rectal temp after 4 hr:Skin temp at lumbar region after 4 hr:Skin temp at left hand after 4 hr:Skin temp at right hand after 4 hr:_Skin temp at calves after 4 hr:_Skin temp at left foot (foot instep) after 4 hr:_Skin temp at right foot(foot instep) after 4 hr:_Skin temp at left heel after 4 hr:_Skin temp at left heel after 4 hr:	Rectal temp after 5 hr:Skin temp at lumbar region after 5 hr :Skin temp at left hand after 5 hr:Skin temp at right hand after 5 hr:Skin temp at calves after 5 hr:Skin temp at left foot (foot instep) after 5 hr:_Skin temp at right foot (foot instep) after 5 hr:_Skin temp at left heel after 5 hr:_Skin temp at left heel after 5 hr:_	Rectal temp after 6 hr: Skin temp at lumbar region after 6 hr : Skin temp at left hand after 6 hr: Skin temp at right hand after 6 hr: Skin temp at calves after 6 hr:_ Skin temp at left foot (foot instep) after 6 hr:_ Skin temp at right foot(foot instep) after 6 hr:_ Skin temp at left heel after 6 hr:_	

2.4 ANTI-EXPOSURE SUITS

EVALUATION AND TEST REPORT

2.4.1	General data and specifications
2.4.2	Submitted drawings, reports and documents
2.4.3	Quality assurance
2.4.4	Visual inspection
2.4.5	Test subjects
2.4.6	Test with a lifejacket
2.4.7	Test clothing
2.4.8	Donning tests 1 & 2
2.4.9	Ergonomic test
2.4.10	Field of vision test
2.4.11	Flotation test
2.4.12	Righting test
2.4.13	Water ingress and jump test
2.4.14	Jump test
2.4.15	Leak test
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2.4.22	Buoyancy test
2.4.23	Strength test
2.4.24	Thermal protective test (General)
2.4.25	Thermal protective test (Continued)
2.4.26	Test sheets for temperatures during immersion tests

2.4 ANTI-EXPOSURE SUITS EVALUATION AND TEST REPORT

Manufacturer	
Туре	
Date	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

Anti-exposure suits Manufacturer: Model: Lot/Serial Number:			Surveyor:		Time:	·	
2.4.1 General data and sp	ecifications		Regulations: LSA Code 2.3; MSC.81(70);				
Construction Material:		Additional equipment:				Donning instruction	ns:
Fabric produced by:		Retro reflective material	:	□YES	□NO	□YES	□NO
Type:		Whistle produced:		□YES	□NO		
Buoyant material		Life-line:		□YES	□NO		
produced by:		Light:		□YES	□NO		
Type:							

Anti-exposure suits	Manufacturer: Date: Time:				
2.4.2 Submitted di	rawings, reports and o				
	Submitted drawings and documents				
Drawing No.	Revision No. & date		Title of drawing		
		Submitted reports and docume	ents		
Report/Document No.	Revision No. & date	Title	of report / document	Status	
		Maintenance Manual -			
		Operations Manual -			

	Manufacturer:		Date: Time:		
Anti-exposure suits	Model:		Surveyor:		
	Lot/Serial Number:	Organization:			
2.4.3 Quality assurance		Regulation	tions: - MSC.81(70) 2/1.1, 1.2		
of the International Convent amended, or the international inspected, representatives of inspections of manufacturer appliances and materials upproved prototype life-savin Manufacturers should be required to ensure that life-saving applies the prototype life-saving applies.	puired to institute a quality control procedure bliances are produced to the same standard ppliance approved by the Administration and ction tests carried out in accordance with the	Standard L Quality Ass Quality Ass Description Quality Ass Yes/No	Assurance rd Used: Assurance Procedure: Assurance Manual: ption of System. Assurance System acceptable ents/Observations		

2.4.4 Visual inspection Regulations: LSA Code I/1.2.2, II/2.4.1.1.3 & 2.4.1.1.4 Test Procedure Acceptance Criteria Significant Test Data Acceptance Significant Test Data Anti-Exposure suit should: Be clearly marked with approval information including the Administration which approved it, date of manufacturer and any operational restrictions.	Anti-exposure suits	Manufacturer: Model: Lot/Serial Number:		
Anti-Exposure suit should: Be clearly marked with approval information including the Administration which approved it, date of manufacturer and any operational Be clearly marked with approval information including the Administration which approved it, date of manufacturer and any operational	2.4.4 Visual inspection			
Be clearly marked with approval information including the Administration which approved it, date of manufacturer and any operational	Test Procedure	Accepta	Criteria Significant Test Data	
Be provided with labels giving servicing details and intervals between servicing, operating instructions, general information and manufacturers details. Be fitted with approved patches of retroreflective material with a total area of at least 400 cm² and with 100 cm² on the back if the suit does not automatically turn the wearer face up according to resolution A.658(16).	Anti-Exposure suit should: Be clearly marked with approincluding the Administration vit, date of manufacturer and restrictions. Be provided with labels goteails and intervals betwo perating instructions, generated and manufacturers details. Be fitted with approved pareflective material with a total 400 cm² and with 100 cm² or suit does not automatically for the suit and the suit should be s	I information ch approved roperational ag servicing a servicing, information es of retroea of at least e back if the a the wearer	Passed Failed Passed Failed Passed Failed	

2.4.4 Visual Inspection (continued)	Regulations: LSA Code I/1.2.	.2, II/2.4.1.3
Test Procedure	Acceptance Criteria	Significant Test Data
Is the anti-exposure suit of highly visible colour?	Covers the whole body except where the Administration so permits, the feet; covering for the hands and head may be provided by separate gloves and a hood, both of which shall be permanently attached to the suit.	Passed Failed
Is the anti-exposure suit designed to be worn without a lifejacket?	be permanently attached to the suit.	Passed Failed
If yes,	Be of international or vivid reddish orange, or a comparably highly visible colour on all parts where this will assist detection	
Is the anti-exposure suit fitted with a light complying with paragraph 2.2.3 of LSA Code?	at sea.	Passed Failed
Is the anti-exposure suit fitted with a whistle complying with paragraph 2.2.1.14 of LSA Code?		TES LINO
Is the anti-exposure suit specified as must be worn in conjunction with a lifejacket?		Passed Failed
Is the anti-exposure suit equipped with a pocket for a portable VHF telephone?		Passed Failed
		Passed Failed
		Passed Failed
		Comments/Observations

Anti-exposure suits	Model:	er: umber:			Date: Time: Surveyor: Organization:					
2.4.5 Test subjects	Lot/Ochariv	<u> </u>		· ·	ons: LSA Code II/2.3.1.1.5 & 2.3.1.3.14; MSC.81(70) 1/3.1.1 & 2.8.2					
Test Procedure	Acceptance Criteria			Criteria		Significant Test Data				
At least six able-bodied persons both male and females of the following heights and weights should be used. At least one and not more than two of the persons should be females with not more than one female in the same height range.		Height Weight 1.40m - 1.60m; 1 person under 60kg 1 person over 60kg 1.60m - 1.80m 1 person under 70kg 1 person over 70kg over 1.80m 1 person under 80kg 1 person over 80kg				Male/Female Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations				
2.4.6 Test with a lifejacke	et		Regulations: LSA Code II/2.3.1.5; MSC.81(70) 1/3.1.2							
Test Procedure		А	cceptance C	Criteria		Significant Test Data				
If the anti-exposure suit is to conjunction with a lifejacket, t should be worn over the anti-e for the tests prescribed in 2.4.8	he lifejacket xposure suit					Manufacturer of lifejacket: Type: Manufacturer of lifejacket: Type: Manufacturer of lifejacket: Type: Comments/Observations				

Anti-exposure suits	Anti-exposure suits Manufacturer: Model: Lot/Serial Number:			Surveyor:				
2.4.7 Test clothing	•		Regulations: LSA Code II/; MSC.81(70) 1/3.2.6 & 3.2.7					
Test Procedure		Acceptano	ce Criteria		Significant Test Data			
The test subjects should wearange clothing consisting of 1 underwear (short sleet legged) 2 shirt (long sleeved) 3 trousers (not woollen) a socks 5 If a suit is to be worn in with a lifejacket, the lifejacket, the lifejacket.	eved, short and woollen conjunction acket should				Did all test subject use the specified □YES □NO Comments/Observations	test clothing		
2.4.8 Donning test (1)			Regulation	ns: LSA Code II/2.	4.1.1.4; MSC.81(70) 1/3.1.3			
Test Procedure		Acceptance Criteria			Significant Test Data			
It can be unpacked and don assistance within 2 min, taking test clothing 2.4.7 and a life anti-exposure suit is to be conjunction with a lifejacket.	into account jacket if the	Following a demonstration, the to unpack, don and secure the test clothing (see 2.4.7) withou This time should include the clothing, inflate any orally inflat a lifejacket, if such is to be anti-exposure suit.	e anti-expos t assistance time to doi ted chamber	ure suit over their in less than 2 min. n any associated s if fitted, and don	Donning time with normal clothing Time Pass Subject No.1 sec Subject No.2 sec Subject No.3 sec Subject No.4 sec Subject No.5 sec Subject No.6 sec Comments/Observations			

	Manufacture	er:	Date:	Time:			
Anti-exposure suits	Model:		Surveyor:				
•	Lot/Serial N	umber:	Organization:				
2.4.8 Donning test (2)		Regulation	ns: LSA Code I/2.4	1.1.1.4; MSC.81(70) 1/3.1.4			
Test Procedure		Acceptance Criteria		Significant Test Data			
The test subjects should be ab		The test subject should be able to comp	Donning time at - 30°C				
and don in 5 mins the anti-exp		5 min.	iele lilis lask ili	Time	Pass	Fail	
ambient temperature of -30°C		o min.	Subject No.1 sec				
donning test the anti-exposure				Subject No.2 sec			
be kept in a refrigerated character and harmonic and harm	amber at a			Subject No.3 sec			
temperature of -30°C for 24 h.				Subject No.4 sec Subject No.5 sec			
				Subject No.6sec			
				Subject No.o sec			
				Comments/Observations			

Anti-exposure suits Model:			Surveyor:			Time:		
2.4.9	Ergonomic test			Regulatio	4.1.2; MSC.81(70) 1/3.1.5			
	Test Procedure		Acceptano	e Criteria		Significant Test Data		
Wher		ertical ladder ociated with other and and write. The	Acceptance There should be no restriction arm movement. The diamet 8-10 mm.	e Criteria	g, bending over or	Significant Test Data Restriction in walking, bending over or arm movement: □YES □NO All the test subjects were able to pick up a pencil and write: □YES □NO All the test subjects were able to put on the lifejacket without assistance: □YES □NO All the test subjects were able to perform all duties associated with abandonment, assist others and operate a rescue boat: □YES □NO All the test subjects were able to climb up and down a vertical ladder of 5 meter in length: □YES □NO		
						Comments/Observations		

Anti-exposure suits	Model:	rer:		Survey	e: Time:					
2.4.10 Field of vision test	Lot/Serial I	Number:		Organization: gulations: LSA Code II/2.4.1.7; MSC.81(70) 1/3.1.6						
Test Procedure Each test subject should be seated with the head in a fixed position, and the lateral field of vision measured.		Acceptance Criteria The lateral field of vision should be at least 120°.			Significant Test Data Field of vision angle ≥ 120° Angle(degs.) Pass Fail Subject No.1					
2.4.11 Flotation test			Regulations	s: LSA (Subject No.4 Subject No.5 Subject No.6 Comments/Ob	 servations				
Test Procedure		Acceptance C	riteria		Significant Test Data					
		When wearing the anti- conjunction with a lifejacket subject should float face-up w of the water by at least 120r that position. The freeboard of from the water surface to the the test subject at rest. The f exposure suit without a lifejact 50 mm. The position of the lifejacket to be visible over as great a s hemisphere as is practicable.	if required, the ith their mouth and be stone and moureeboard of the ket should be a light should p	ne test as clear able in asured ath with he anti- at least ermit it	Freeboard Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Ob		Nose (mm)	(n 		Nose (mm)

		r:	Date:	Tir	me:				
Anti-exposure suits	Model:		Surveyor:						
	Lot/Serial Nu	umber:	Organization:	Organization:					
2.4.12 Righting test		Regulation	s: LSA Code II/2.4.	3; MSC.81(70) 1	/3.1.8				
Test Procedure		Acceptance Criteria	Significant Test Data						
Test subjects in fresh water anti-exposure suit complying requirements of this section she to turn from a face-down to position in not more than 5 s ar stable face-up. The suit shoutendency to turn the wearer famoderate sea condition.	g with the ould be able or a face-up and should be all did have no	Except where it has been demon anti-exposure suit will right the test subject		Righting time = Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Obs	Time (s)		Fail		
2.4.13 Water ingress and j	ump test	Regulations: MSC.81(70) 1/3.1.9							
Test Procedure	•	Acceptance Criteria	· /		Significant Tes	st Data			
The test subjects should pre-w Exposure suit and then be	e weighed.	The difference in the combined mass of the suit should not exceed 500 g.	he test subject and	Mass difference	e ≤ 500g				
Following a jump into the washeight sufficient to totally in body, each test subject should again.	nmerse the be weighed			Subject No.1 Subject No.2 Subject No.3 Subject No.4					
Weighing should be performachine accurate to ± 100g.	med on a			Subject No.5 Subject No.6 Comments/Obs			_		

Anti-exposure suits	Model:	turer: Date: Surveyor: I Number: Organization:			Time:			
2.4.14 Jump test			Regulatio	ations: LSA Code II/2.4.1.1.2; MSC.81(70) 1/3.1.10				
Test Procedure Accepta			ce Criteria	e Criteria Significant Test Da			st Data	
The test subjects should jump Exposure suit and lifejacket if ra height of 4.5m vertically int After the jump, the anti-exposits attachments should be edamage or dislodging, and the should be questioned concern the suit caused any injury to the	equired from to the water. Sure suit and examined for the test subject and whether	The Anti - Exposure suit and its attachments should not be damaged or dislodged in any way. The test subject should not be injured by the suit. The light, if fitted, should not injure the test subject.			Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Obs		Fail	
2.4.15 Leak test			Regulations: LSA Code II/2.4.1.1; MSC.81(70) 1/3.1.11					
Test Procedure		Acceptano	ce Criteria		9	Significant Te	st Data	
The test subject should anti-exposure suit and be we test subject should then be instance of the following: .1 a period of flotation in calmor .2 swimming for 20 min for a colleast 200 m The test subject should be we after the task. The weighing machine should to ± 100g.	eighed. The tructed to do water of 1h; distance of at eighed again	The ingress of water into the exceed a mass of 200g.	e pre-wette	d suit should not	Indicate which a □Alter Water ingress ≤ Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Obs	native 1 □Alt		

	Manufacture	er:		Date:		me:			
Anti-exposure suits	Model:			Surveyor:					
-	Lot/Serial N	umber:		Organization:					
2.4.16 Swimming and wa	ater emergent	test	Regulations: LSA Code II/2.4.1.2.3 MSC.81(70) 1/3.1.12						
Test Procedure Accepta		Acceptano	nce Criteria			Significant Te	st Data		
All test subjects, each wearing but not the anti-exposure attempt to swim 25 m and boarigid platform with its surface. Test subjects who successful this task should also perform anti-exposure suit. If designed to be used with a lanti-exposure suit should be to subject also wearing a lifejact.	suit, should and a liferaft or ace 300 mm fully complete it wearing the lifejacket, then tested with the	All qualified test subjects show or platform while wearing the a			Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6	Pass and boarding Pass ————————————————————————————————	without lifejacket. Fail		

Anti-exposure suits	Model:			Date: Time: Surveyor: Organization:		
2.4.17 Oil resistance to				s: LSA Code; MSC		
Test Procedure		Acceptan	nce Criteria	,	Significant Test Data	
After all its apertures have been anti-exposure suit should be in a period of 24 hounder 100 diesel oil at normal room temporal. The surface oil should then and the suit subjected to the termin 2.4.15.	immersed for mm head of perature.	The ingress of water should r	not exceed a	mass of 200g.	Subject No.2 Subject No.3 Subject No.4	Fail ————————————————————————————————————

					Time:		
Anti-exposure suits	Model: Lot/Serial Number:			Surveyor: Organization:			
2.4.18 Alternative oil re				ns: LSA Code; MS	C.81(70) 1/3.1.14		
Test Procedure		Accept	tance Criteri		Significant Test Data		
	After 1h in this position there should be no leakage exceeding a mass of 200g.			Indicate which alternative is used. □Alternative 1 □Alternative 2			
After all apertures have the anti-exposure suit should be period of 24 h under 100 mm h normal room temperature if weights to keep suit submerge should then be wiped off and suit turned inside out. The suit on a table suitable for collecting any leakage and be supposite aperture by a suitable designer.				Water ingress ≤ 200g Pass Fail Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6			
The suit should then be filled level which should be 300mm		The seam strength sho	uld be not le	ss than 150 N.	Strength > 150N		
Representative samples of the exterior fabric and seams should be immersed under 100mm head of diesel oil for 24 h. After removal from the oil the samples should be wiped off before being subjected to the following tests: -			iccessfully s	upport 1 m head	The samples should support a 1 m head of water Pass Fail Comments/Observations		
.1 a hydrostatic test of a 1m.2 a tensile test of representation							

Anti-exposure suits	Model:	er:umber:		Date: Time: Surveyor: Organization:			
2.4.19 Fire test	•		Regulation	ns: LSA Code II/2.	4.1.1.5; MSC.81(70) 1/3.1.15		
Test Procedure		Acceptano	ce Criteria		Significant Test Data		
A test pan 30 cm x 35 cm x 6 cd placed in an essentially draugh Water should be put in the bottest pan to make a minimum to 1 cm followed by enough petrominimum depth of 4 cm. The puthen be ignited and allowed to for 30 s. If necessary the anties should be draped over a hange the whole of the suit is envertiames, with the bottom of the above the top edge of the test the duration of exposure to the 2 s.	ht-free area. ottom of the otal depth of ol to make a petrol should o burn freely exposure suit er to ensure loped in the e suit 25 cm apan so that	The anti-exposure suit should than 6 s or continue melting a flames.			Did the anti-exposure suit continue to burn for more than 6 s or continue melting after being removed from the flames? □ YES □ NO Comments/Observations		

Anti-	exposure suits	Model:	er:umber:		Date: Surveyor: Organization:	Time:		
2.4.20	Temperature cyc	cling test		Regulation	egulations: LSA Code I/1.2.2.2; MSC.81(70) 1/3.1.16			
	Test Procedure		Acceptano	e Criteria		Significant Test Data		
The following test should be carried out on two immersion suits The anti-exposure suits should be alternately subjected to surrounding temperatures of -30°C and +65°C. These alternating cycles need not follow immediately after each other and the		The anti-exposure suit's shou such as shrinking, swelling mechanical qualities.			(See following page for test data) PassedFailed Comments/Observations			
	ving procedure, repeated rcles, is acceptable:	for a total of						
.1	an 8 h exposure at temperature of +65 completed in one day; a	°C to be						
.2	the specimens remove warm chamber that sa left exposed under or conditions at a tempera ± 3°C until the next day;	me day and dinary room ture of 20°C						
.3	an 8 h exposure at temperature of -30° completed the next day;	°C to be						
.4	the specimens remove cold chamber that same exposed under ordi conditions at a tempera	day and left nary room						

±	3°C until the next day	y .							
Anti-ex	posure suits	Model:	cturer:ial Number:			Surveyor:		Time:	
2.4.21	Temperature cy		t – Test Data HOT CYCLE		Regulation	ations: LSA Code I/1.2.1; MSC.81(70) 1/3.1.16			
Cycle 1	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Time	e In: e In: perature:		Date Out: Time Out: Duration:	
Cycle 2	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Time	Date In: Time In: Temperature:		Date Out: Time Out: Duration:	
Cycle 3	Date In: Time In: Temperature:		Date Out: Time Out: Duration:	hours	Time	e In: e In: perature:		Date Out: Time Out: Duration:	
Cycle 4	Date In: Time In: Temperature:	o_C	Date Out: Time Out: Duration:	hours	Time Tem	e In: e In: perature:	0 <u>C</u>	Date Out: Time Out: Duration:	hours
Cycle 5	Date In: Time In: Temperature:	o_	Date Out: Time Out: Duration:	hours	Time	e In: e In: perature:		Date Out: Time Out: Duration:	
Cycle 6	Date In: Time In: Temperature:	o_C	Date Out: Time Out: Duration:	hours	Time Tem	e In: e In: perature:	oC	Date Out: Time Out: Duration:	hours
Cycle 7	Date In: Time In: Temperature:		Date Out: Time Out: Duration:	hours	Time	e In: e In: perature:	<u>_</u> 0C	Date Out: Time Out: Duration:	hours
Cycle 8	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Time	e In: e In: perature:	<u>_</u> 0C	Date Out: Time Out: Duration:	
Cycle 9	Date In:		Date Out: Time Out: Duration:		Time Tem	e In: e In: perature:	0C	Date Out: Time Out: Duration:	
	Date In:		Date Out:		Date	e in:		Date Out:	

Cycle 10 Time In:	Time	Out:		Time	In:		Time Out:		
Temperature:	0C Dura	tion: ho	urs	Temp	oerature:	°C	Duration:	hoursh	
Anti-exposure suits	Manufacture Model:	r: umber:			Date: Time: Surveyor: Organization:				
2.4.22 Buoyancy test		Regulations: LSA Code II/2.				4.1.1.1; MSC.	4.1.1.1; MSC.81(70) 1/3.1.17		
Test Procedure		,	Acceptanc			Significant Test Data			
The Anti-exposure suit si inherent buoyancy of at least 7	70 N	The difference between the initial buoyancy and the final buoyancy should not exceed 5% of the initial buoyancy.			k	1 Buoyancy 2 kgkg	%difference %		
The buoyancy of an anti-ex- designed to be worn without should be measured before a complete submersion to jus surface in fresh water.	a lifejacket nd after 24 h					Passed _ Comments/0	Faile	ed	
2.4.23 Strength test		Regulations: LSA Code II; MSC.81(70) 1/3.1.18							
Test Procedure		Acceptance Criteria				Significant Tes	st Data		
The anti-exposure suit should in water for a period of 2 min. I be removed from the water a	t should then	The anti-exposure su this test.	uit should ı	not be dama	ged as a result of	Passed	Failed		
the same manner as when worn by a person. A force of not less than 3200 N should be applied to the lifting loop and a force of not less than 1350 N should be applied to the parts other than the lifting loop for 30 min. The anti-exposure suit may be cut if		Voct two lifeiacket	Voka or ove	or the head two	o lifojoekot	Comments/0	Observations		
necessary to accommodate device.		Vest-type lifejacket	YOKE OF OVE	er-the-head typ	е шејаскет				

	Manufacturer:		Date:		
Anti-exposure suits	Model: Lot/Serial Number:		Surveyor:Organization:		
2.4.24 Thermal protecti	ve test (General)	Regulat		2.4.2; MSC.81(70) 1/3.2.1 – 3.2.5	
· · · · · · · · · · · · · · · · · · ·	ocedure	•	ce Criteria	Significant Test Data	
thermal manikin, when such Administration and has been	es may be measured using a a method is required by an demonstrated to provide test torily in all aspects to test results			Comments/Observations	
	y should be medically examined ests. Each design of immersion ects specified in 2.4.5				
conducted under the superviresuscitation equipment shoul For safety reasons, ECG shotest. Testing should be stopped if the falling rate of the core to per hour after the first half how hand, foot or lumbar region should be supervised.	sed, the tests should always be sion of physician. Emergency d be available during all tests. all the wish of the test subjects, emperature is more than 1.5° C ur. or if the skin temperature of hould fall below 10° C for more ttending physician considers it				
When testing with human so temperature (rectal temperature lumbar region, both hands, calcabould be measured. The accashould be +/- 0.2°C. Appropriate should be taken if a manikin is					
test in paragraph 2.4.15 should	of water resulting from the jump be poured into the dry suit worn ified in 2.4.7 by the test subject				

Anti-exposure suits	Manufacture Model:		Dat Sui	Pate: Time: Surveyor:			
And exposure suits	Lot/Serial N		Organization:				
2.4.25 Thermal Protecti	tive test (Continued) Regulation				: LSA Code II/2.4.2; MSC.81(70) 1/3.2.13, 3.2.14		
Test Procedure		Acceptance Criteri	ia		Significant Test Data		
Each test subject should we exposure suit previously subject water ingress and jump test in 2.4.13. Following a 1 h immersion, with hands gloved donned, in circulating calm was each test subject's body core should not fall more than 2°C normal level of the subject's tell lmmediately on leaving the completion of the test prescribe each test subject should be ab a pencil as specified in paragrawrite. The anti-exposure suit should constructed, that when worn the suit continues to provious thermal protection following on the water which totally submer subject and should ensure the worn in calm water at a temperative test subject's body core does not fall at a rate of more per hour, after the first 0.5 h.	ected to the n paragraph period of d and hood ter at + 5°C, temperature C below the mperature. water after red in 2.4.24 rile to pick up ph 2.4.9 and rould be so as marked, de sufficient the jump into reges the test at when it is ature of 5°C, temperature	Same mass of water which from test 2.4.15, should be primmersion suit. See attached test sheets for during the immersion tests: Comments/Observations	ooured into t	he	of test of test temperature Subject No.2 Subject No.3 Subject No.4		

2.4.25 Thermal Protective test (Continued)			Regulations: LSA Code II/2.4.2; MSC.81(70) 1/3.2.13, 3.2.14				
Test Procedure		Acceptance Criteria	Significant Test Data				
			Passed Failed				
			See attached test sheets for temperatures during the immersion tests:				
			Comments/Observations				

	Manufacturer:			Date:	Time:		
Anti-exposure suits	I N / I - I -			Surveyor:			
•	Lot/Serial Number:			Organization:			
2.4.26 Test sheets for tel	mperatures during immer	sion tests	Regulations: LSA Code II/2.4.2.1.2; MSC.81(70) 1/3.2.13 & 3.2.14				
SUBJECT 1	SUBJECT 2	SUBJECT 3	SU	BJECT 4	SUBJECT 5	SUBJECT 6	
Rectal temp after 1 hr:	Rectal temp after 1 hr:	Rectal temp after 1 hr:	Rectal te	mp after 1 hr:	Rectal temp after 1 hr:	Rectal temp after 1 hr:	
Skin temp at lumbar region after 1 hr :	Skin temp at lumbar region after 1 hr :	Skin temp at lumbar region after 1 hr :		p at lumbar ter 1 hr :	Skin temp at lumbar region after 1 hr :	Skin temp at lumbar region after 1 hr :	
Skin temp at left hand after 1 hr:	Skin temp at left hand after 1 hr:	Skin temp at left ha after 1 hr:	nd Skin ter after 1 hr:		Skin temp at left hand after 1 hr:	Skin temp at left hand after 1 hr:	
Skin temp at right hand after 1 hr:	Skin temp at right hand after 1 hr:	d Skin temp at right hand			Skin temp at right hand after 1 hr:	Skin temp at right hand after 1 hr:	
Skin temp at calves after 1 hr:	Skin temp at calves after 1 hr:	Skin temp at calves aft	ter	p at calves after	Skin temp at calves after 1 hr:	Skin temp at calves after 1 hr:	
Skin temp at left foot (foot instep) after 1 hr:	Skin temp at left foot (foot instep) after 1 hr:	Skin temp at left foot (foot instep) after 1 hr:	1 hr:	p at left foot	Skin temp at left foot (foot instep) after 1 hr:	Skin temp at left foot (foot instep) after 1 hr:	
Skin temp at right foot (foot instep) after 1 hr:	Skin temp at right foot (foot instep) after 1 hr:	Skin temp at right foot (foot instep) after 1 hr:	(foot inst	foot instep) after 1 hr: Skin temp at right foot (foot instep) after 1 hr: Skin temp at right foot		Skin temp at right foot (foot instep) after 1 hr:	
Skin temp at left heel after 1 hr:	Skin temp at left heel after 1 hr:	Skin temp at left he	(foot inst	ep) after 1 hr: np at left heel	Skin temp at left heel after 1 hr:	Skin temp at left heel after 1 hr:	
Did the wearer's body core temperature fall at a rate more than 1,5°C per hour, after the first 0,5 h? ☐ Yes ☐ No	Did the wearer's body core temperature fall at a rate more than 1,5°C per hour, after the first 0,5 h? ☐ Yes ☐ No	1 hr:	dy ta Did the core tem	perature fall at a e than 1,5°C per er the first 0,5 h?		temperature fall at a rate	

2.5 THERMAL PROTECTIVE AIDS

EVALUATION AND TEST REPORT

2.5.1	General data and specifications
2.5.2	Submitted drawings, reports and documents
2.5.3	Quality assurance
2.5.4	Visual inspection
2.5.5	Fabric test – Water resistance
2.5.6	Fabric test – Thermal conductance
2.5.7	Temperature cycling test
2.5.8	Test subjects
2.5.9	Test clothing
2.5.10	Donning test 1
2.5.11	Donning test 2 at low temperature
2.5.12	Discarding test
2513	Oil resistance test

2.5 THERMAL PROTECTIVE AIDS EVALUATION AND TEST REPORT

Manufacturer	
Туре	
Date	
Place	
Name Surveyor printed	
Signature	
Approving Organization	

Thermal protective aids Model:		Surveyor:		Surveyor:	Time:	
0.54		umber:	1	5 NOO 04/70\ 4/0 0		
2.5.1 General data and sp			Regulation	is: LSA Code II/2.:	5; MSC.81(70) 1/ 3.3	
General Informat	ion					
Construction Material:					Donning instructions:	
Fabric manufactured by:					□YES	□NO
Type:						
Is the TPA of highly visible co	lour?				□YES	□NO

Thermal protective aids Model:		Model:	mber:	Date: Time: Surveyor: Organization:					
2.5.2 Submitted dra									
			Submitted drawings and documents	s	Status				
Drawing No.	Revis date	ion No. &	Titl						
			Submitted reports and documents		2				
Report/Document No.	Revis date	ion No. &	Title of r	report / document	Status				
			Maintenance Manual -						
			Operations Manual -						

	Manufacturer:		Date:	Time:		
Thermal protective aids	Model:		Surveyor:			
•	Lot/Serial Number:	Organization:				
2.5.3 Quality Assurance		Regulation	ns: - MSC.81(70) 2/1.1, 1.2			
Except where all appliances of a particular type are required by Chapter III of the International Convention for the Safety of Life at Sea, 1974, as amended, of the international Life-Saving Appliances (LSA) Code, to be inspected, representatives of the Administration should make random inspections of manufacturers to ensure that the quality of life-saving appliances and materials used comply with the specification of the approved prototype life-saving appliance. Manufacturers should be required to institute a quality control procedure to ensure that life-saving appliances are produced to the same standard			Quality Assurance Standard Used: - Quality Assurance Procedure: - Quality Assurance Manual: - Description of System.			
as the prototype life-saving appliance approved by the Administration and to keep records of any production tests carried out in accordance with the Administration's instructions.		Quality Assurance System acceptable: Yes/No				
		Comments	s/Observations			

		er:		Date:		Time:
Thermal protective aids	Model:			Surveyor:		
-	Lot/Serial N	umber: Organization:				
2.5.4 Visual Inspection			Regulation	ns: LSA Code I/1.2	.2, II/2.5; MS(C. 81(70);
Test Procedure		Acceptance	e Criteria			Significant Test Data
Is the thermal protection aid o colour?	f high visible	Be of an international or vivid reddish orange, or a comparably high visible colour on all parts where this will assist detection at sea.		□Yes	□No	
Does the thermal protection a		Cover the whole body of per	sons of al	l sizes wearing a	□Yes	□No
whole body of the weare exception of the face?	r with the	lifejacket with the exception of the face.		□Yes	□No	
If provided with arms, are covered, or are permanent gloves provided? Be clearly marked with information including the Adwhich approved it, date of man any operational restrictions. with labels giving servicing intervals between servicing instructions, general informanufacturer's details.	ly attached a approval dministration ufacture and Be provided details and , operating					

Thermal protective aids	Model:	Surveyor: _			Time:		
2.5.5 Fabric Test - Water r		Regulations: LSA Code ; MS					
	esistance			is: LSA Code ; IVIS	· ·		
Test Procedure		Acceptano	ce Criteria		Significant Test Data		
The fabric from which the thermal protective aid is constructed should be tested to determine its resistance to		supporting a column of water 2 m high.		high			
penetration by a 2m head of w	ater.				□YES □ NO		
					Test method used:		
					Comments/Observations		
2.5.6 Fabric test - Therma	conductanc	Regulations: LSA Code II/2.			5.1; MSC.81(70) 1/3.3.2		
Test Procedure		Acceptance Criteria		Significant Test Data			
which the thermal protective aid is than 78 manufactured should be measured. used to		The fabric should have a thermal conductance of not more than 7800 W/m²K and shall be so constructed that, when used to enclose a person, it shall reduce both the convective and evaporative heat loss from the wearer's body.		ructed that, when oth the convective	Passed Failed All data is to be attached here. Comments/Observations		

Thermal protective aids Model:		er:umber:		Surveyor:	Time:			
2.5.7 Temperature cycling test		Regulations: LSA Code II/1.2						
	Test Procedure		Acceptano			Significant Test Data		
A thermal protective aid should be subjected to surrounding temperatures of -30°C and +65°C. These alternating cycles need not follow immediately after each other and the following procedure, repeated for a total of 10 cycles, is		The thermal protective aid sho such as shrinking, swelling mechanical qualities						
	otable:	,						
.1	an 8 h exposure at temperature of +65 completed in one day; a	°C to be				Comments/Observations		
.2	the specimens remove warm chamber that sai left exposed under ord conditions at a tempera ± 3°C until the next day;	me day and dinary room ture of 20°C						
.3	an 8 h exposure at a temperature of -30° completed the next day;	°C to be						
.4	the specimen removed f chamber that same d exposed under ordi conditions at a tempera ± 3°C until the next day;	ay and left nary room ture of 20°C						

		Manufa	acturer:			Date:		Time:			
Thermal protective aids Model:					Surveyor: _						
	. р. стости с ш.ш.с	Lot/Se	rial Number:			Organization	n:				
2.5.7 Temperature cycling test – Test data Regula					Regulations	s: LSA Code	l/1.2.2.2; MS	SC.81(70) 1/3.3.3			
		Н	OT CYCLE			COLD CYCLE					
	Date In:		Date Out:		Date In:			Date Out:			
Cycle 1	Time In:		Time Out:		Time In:	ure:		Time Out:			
	Temperature:		Duration:	hours	Temperatu	ure:	°C	Duration:			
	Date In:		Date Out:					Date Out:			
Cycle 2	Time In:		Time Out:		Time In: _			Time Out:			
	Temperature:	°C	Duration:	hours	Temperatu	ure:	°C	Duration:	hours		
	Date In:		Date Out:		Date In: _			Date Out:			
Cycle 3	Time In:		Time Out:		Time In: _			Time Out:			
	Temperature:		Duration:	hours	Temperati		<u>°C</u>	Duration:	hours		
	Date In:		Date Out:		Date In: _			Date Out:			
Cycle 4	Time In:		Time Out:					Time Out:			
	Temperature:	°C	Duration:	hours		ure:	°C	Duration:	hourshours		
	Date In:		Date Out:		Date In:			Date Out:			
Cycle 5	Time In:		Time Out:		Time In: _			Time Out:			
	Temperature:		Duration:	hours		ure:		Duration:	hours		
	Date In:		Date Out:		Date In:			Date Out:			
Cycle 6	Time In:		Time Out:					Time Out:			
	Temperature:		Duration:	hours		ure:		Duration:			
	Date In:		Date Out:		Date In:			Date Out:			
Cycle 7	Time In:		Time Out:		Time In: _			Time Out:			
	Temperature:		Duration:	hours		ure:	<u>°C</u>	Duration	110015		
	Date In:		Date Out:		Date In:			Date Out:			
Cycle 8	Time In:		Time Out:		Time In: _			Time Out:			
	Temperature:	°C	Duration:	hours	Temperatu	ure:	°C	Duration:	hours		
	Date In:		Date Out:		Date In:			Date Out:	<u> </u>		
Cycle 9	Time In:		Time Out:		Time In: _			Time Out:			
	Temperature:	<u>°</u> C	Duration:	hours		ure:		Duration:	hours		
	Date In:		Date Out:		Date In:			Date Out:			
Cycle 10	Time In:		Time Out:		Time In:			Time Out:			
	Temperature:	°C	Duration:	hours	Temperati		oC	Duration:	hourshours		

Manufacti					Time:		
Thermal protective aids	Model:			Surveyor:			
Lot/Seri		umber:		Organization:			
2.5.8 Test subjects			Regulation	ns: LSA Code II/2.	5.2; MSC.81(70) 1/3.3.4		
Test Procedure		Acceptar	nce Criteria		Significant Test Data		
For these tests a group of at least six test subjects of different ages, both male and female in the large, medium and small size range should be selected.		Test subject range: Height Weight 1.4 m – 1.6 m 1 person under 60 kg 1 person over 60 kg 1.6 m – 1.8 m 1 person under 70 kg 1 person over 70 kg over 1.8 m 1 person under 80 kg 1 person over 80 kg		J	Comments/Observations Male/Female Subject 1		
2.5.9 Test clothing			Regulatio	ns: LSA Code II/2.	5; MSC.81(70) 1/3.3.5, 3.2.6	& 3.2.8	
Test Procedure		Acceptar	nce Criteria		Significant T	est Data	
The test subjects should wear range clothing consisting of .1 underwear (short sleeved, s.2 shirt (long sleeved) .3 trousers (not woollen) a socks .4 in addition to the clothin subjects should wear to pullovers during the tests p 2.5.10; 2.5.11 and 2.5.12.	short legged) and woollen ag, the test wo woollen				Did all test subject use the	specified tes	t clothing

	Manufacture	er:			Time:	
Thermal protective aids	Model:			Surveyor:	<u> </u>	
	Lot/Serial Number:			Organization:		
2.5.10 Donning test (1)		Regulations: LSA Code I		ns: LSA Code	II/2.5.2.; MSC.81(70) 1/3.3.6	
Test Procedure		Acceptance	Criteria		Significant Test Data	
Following a demonstration, the test subjects should be able to unpack and don the thermal protection aids over a lifejacket when seated in a survival craft or a rescue boat.		thermal protection aid.		k and don the	TimePassed Failed Subject No.1 sec Subject No.2 sec Subject No.3 sec Subject No.4 sec Subject No.5 sec Subject No.6 sec Comments/Observations	
2.5.11 Donning test (2) at	low temperat	ture	II/2.5.3; MSC.81(70) 1/3.3.7			
Test Procedure		Acceptance Criteria			Significant Test Data	
The thermal protective aid capable of being unpacked an an ambient temperature of -3 the donning test the thermal p should be kept in a refrigerated a temperature of -30°C for 24	d donned at 80°C. Before rotective aid d chamber at	The test subjects should be able to successful and don the thermal protective aid without ass a survival craft or rescue boat. The thermal protective aid shall function throughout an air temperature range of -30°C states.		assistance in	TimePassed Failed Subject No.1 sec Subject No.2 sec Subject No.3 sec Subject No.4 sec Subject No.5 sec Subject No.6 sec Subject No.6 comments/Observations	

Thermal protective aids	Model:	ufacturer:el: el: Serial Number:		Surveyor:	Time:	
2.5.12 Discarding Test			Regulation	ns: LSA Code	II/2.5; MSC.81(70) 1/3.3.8	
Test Procedure		Acceptance	Criteria		Significant Test Data	
If the thermal protective aid impairs the ability of the test subjects to swim, it should be demonstrated that it can be discarded by the test subjects, when immersed in water, in not more than 2 min.		less than 2 min.		te this task in	TimePassed Failed Subject No.1 sec	
2.5.13 Oil resistance test			I/1.2.2.4; MSC.81(70) 1/3.3.9			
Test Procedure		Acceptance Criteria			Significant Test Data	
After all its apertures have been thermal protective aid should be under 100 mm head of diesel of the surface oil should then be and it should be established conductance of the material.	be immersed bil for 24 h.	After this test the thermal protective aid signs of damage, such as shrinking, cradissolution or change of mechanical thermal conductance should be no 7800 W/m² K.		king, swelling, qualities. The	Is the thermal conductance of the thermal protective aid not more than 7800 W/m² K?	
