

INTERNATIONAL MARITIME ORGANIZATION

4 ALBERT EMBANKMENT LONDON SE1 7SR Telephone: +44 (0)20 7735 7611 Fax: +44 (0)20 7587 3210

> MSC.1/Circ.1628^{*} 14 December 2020

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*.

2 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 has since adopted seven amendments to the LSA Code and eight amendments to resolution MSC.81(70). These amendments have been incorporated in the original forms which, due to their volume, are now 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).

3 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.

4 Member Governments are invited to bring the annexed revised forms to the attention of all parties concerned with approving, manufacturing and testing life-saving appliances and to encourage them to use the forms.

5 This circular supersedes MSC/Circ.980.

I:\CIRC\MSC\01\MSC.1-CIRC.1628.docx



This document has been re-issued to correct editorial errors in references to SOLAS regulations.

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 through resolution MSC.427(98), 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 customising 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)

TABLE OF CONTENTS

LSA Code chapter II (Personal life-saving appliances) – Equipment:

- 2.1 Lifebuoys and associated equipment
 - 2.1.1 Lifebuoys
 - 2.1.2 Lifebuoy self-igniting lights
 - 2.1.3 Lifebuoy self-activating smoke signals
- 2.2 Lifejackets and associated equipment
 - 2.2.1 Inherently buoyant lifejackets
 - 2.2.2 Inflatable lifejackets
 - 2.2.3 Lifejacket/immersion suit lights
 - 2.2.4 Reference Test Device (RTD)
- 2.3 Immersion suits and associated equipment
 - 2.3.1 Immersion suits (non-insulated)
 - 2.3.2 Immersion suits (insulated)
- 2.4 Anti-exposure suits
- 2.5 Thermal protective aids

2.1 LIFEBUOYS AND ASSOCIATED EQUIPMENT

2.1.1 LIFEBUOYS

EVALUATION AND TEST REPORT

- 2.1.1.1 Submitted drawings, reports and documents
- 2.1.1.2 Quality assurance
- 2.1.1.3 Visual inspection
- 2.1.1.4 Temperature cycling test
- 2.1.1.5 Drop test
- 2.1.1.6 Test for oil resistance
- 2.1.1.7 Fire test
- 2.1.1.8 Flotation test
- 2.1.1.9 Strength test
- 2.1.1.10 Test for operation with a light and smoke signal

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	j No.	Revision No. & date	Title of drawing	
			Submitted reports and documents	Status
Report/Doci	ument No.	Revision No. & date	Title of report / document	
			Maintenance Manual -	
			Operations Manual -	

Lifebueve	anufacturer: odel: ot/Serial Number:	Date: Time: Surveyor: Organization:	
2.1.1.2 Qua	lity assurance	Regulations: MSC.81(70) 2/1.1, 1.2	
the International or the Internatio	appliances of a particular type are required by chapter III of Convention for the Safety of Life at Sea, 1974, as amended, nal Life-Saving Appliance (LSA) Code, to be inspected,	Quality Assurance Standard Used: Quality Assurance Procedure:	Passed/ Failed Passed/ Failed
manufacturers to	of the Administration should make random inspection of b ensure that the quality of life-saving appliances and the comply with the specification of the approved prototype nce.	Quality Assurance Manual:	Passed/ Failed
ensure that life-sa	hould be required to institute a quality control procedure to aving appliances are produced to the same standard as the ving appliance approved by the Administration and to keep production tests carried out in accordance with the nstructions.		

Lifebuoys	Manufacturer: Model: Lot/Serial Number:	Date: Surveyor: Organization:			
2.1.1.3	Visual inspection		Regulations: LSA Co	de 1.2.2	
	Test Procedure	Acceptance C	Criteria	Signi	ificant Test Data
	pect the lifebuoy. Conduct ts and verify characteristics as	Be of international or vivid redo comparably highly visible color will assist detection at sea.		Colour(s): Passed	Failed
i oqui oui				Quantity:	Spacing:
		Fitted with approved retro-reflection compliance with resolution A.6		Passed	Failed
				Any operational restri	ictions?
		Clearly marked with approval i organization that approved it a		Passed	Failed
		restrictions.		Comments/Observati	ons

Lifebuoys	Manufacturer: Model:		Surveyor:	Time:	
Encodoys	Litebuoys Lot/Serial Number: C		Organization:		
2.1.1.3	Visual inspection (continued)		Regulations: L	SA Code 2.1.1	
	Test Procedure	Acceptance Crite	eria	Significant Test Data	
It should be established by measurement, weighing and inspection that:		it should not depend upon rushes, cork shavings or granulated cork, any other loose granulated material or any air compartment		Construction materials: Outer diameter: mm Inner diameter: mm	
Measure the	inner and outer diameter.	which depends on inflation for buoyancy. Should have an outer diameter of not more than 800 mm and an inner diameter of not		Mass: kg	
Weigh the life	ebuoy.	less than 400 mm		Type / description of quick release arrangement:	
	ed to operate the quick-release provided for a self-activated	Not designed for quick release: Should have a mass of not less than 2.5 kg		Does the lifebuoy have sufficient mass to activate the quick-release arrangement for a self-activated smoke signal and self-igniting light? Passed/ Failed	
	and self-igniting light, conduct	If it is intended to operate the quick-release arrangement provided for a self-activated smoke signal and self-igniting light, the lifebuoy has a mass of not less than 4 kg.		Weight: kg Grab-line diameter: mm	
Measure the lifebuoy grab-line diameter and length and assess how it is secured.		, , , , , , , , , , , , , , , , , , ,		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	

Lifebuoys	Manufacturer: Model: Lot/Serial Number:		Surveyor:	Time:
2.1.1.4	Femperature cycling test		Regulations: LSA Code 1.2.	
	Test Procedure	Acceptan	ce Criteria	Significant Test Data
The following two lifebuoys	test should be carried out on	Not be damaged in stowage t 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 temperatures and, after the t		(See following page for test data)
immediately	ating cycles need not follow after each other and the cedure, repeated for a total of acceptable:	temperatures and, after the tests, should show no s damage such as shrinking, cracking, swelling, dissolu change of mechanical qualities.		Lifebuoy No. 1 Observations on rigidity under high temp
	ure at a minimum temperature be completed in one day			Observations after testing for shrinking, cracking etc.
chamber tha under ordin	ens removed from the warm t 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 Observations after testing for shrinking, cracking
day				etc.
	ure at a maximum temperature e completed the next day			Intact after these tests?
chamber tha	ens removed from the cold t same day and left exposed ary room conditions at a			lifebuoy No.1: Passed/ Failed
	of 20°C \pm 3°C until the next			lifebuoy No.2: Passed/ Failed Comments/Observations

Lifebuoy					Date: Surveyor: Organization:			
2.1.1.4	Temperature cyclir				Regulations: LSA Code I/1.2.			
			OT CYCLE				D CYCLE	
Cycle 1	Date In: Time In: Temperature:	00	Date Out: Time Out: Duration:	hours	Date In: Time In: Temperature:		Date Out: Time Out: Duration:	
Cycle 2	Date In: Time In: Temperature:	C	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:	C	Date Out: Time Out: Duration:	<u> </u>	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 :	C	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:	<u> </u>
Cycle 8	Date In: Time In: Temperature:	0 ⁰ C	Date Out: Time Out: Duration:		Date In: Time In: Temperature:	0 ⁰	Date Out: Time Out: Duration:	
Cycle 9	Date In: Time In: Temperature:	0 ⁰ C	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:	D ₀	Date Out: Time Out: Duration:	

Lifebuoys	Manufacturer:		Date: Time: Surveyor: Organization:	
2.1.1.5	Drop test		Regulations: LSA Code	2.1.1.6; MSC.81(70) 1 / 1.3
	Test Procedure	Acceptance	Criteria	Significant Test Data
upper edge v lower edge o which it is inte their lightest whichever is the water with In addition, or suspended fre device so that is at a height	v should be suspended from its ia a release device so that the f the lifebuoy is at the height at ended to be stowed on ships in seagoing condition, or 30 m, the greater, and dropped into nout suffering damage. The lifebuoy should be om its upper edge via a release t the lower edge of the lifebuoy of 2 m, and dropped three concrete floor.	Be constructed to withstand a the height at which it is stowed lightest seagoing condition or greater, without impairing eithe that of its attached components The lifebuoy should withstand of 2m on to a concrete floor with	above the waterline in the 30 m, whichever is the r its operating capability or s. three drops from a height	Number of lifebuoys:

Lifebuoys	Manufacturer: Model: Lot/Serial Number:		Date: Time: 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	cceptance Criteria	Significant Test Data	
for a period o	rebuoys should be immersed horizontally f 24 h under a 100 mm head of diesel oil m temperature.	After this test the damage such as	lifebuoy should show no sign of s shrinking, cracking, swelling, je of mechanical qualities.	Lifebuoy No. Diesel oil head:mm Duration:hours Signs of damage? Passed Failed Comments/Observations	

Lifebuoys	Model:		Date: Surveyor: Organization:		
2.1.1.7	Fire test		Regulations: LSA Cod	e 2.1.1.5; MSC.81(70) 1/1.5	
	Test Procedure	Acceptance C	Criteria	Significant Test Data	
fire test. A ter should be draught-free the bottom of followed by minimum tota The petrol s allowed to bu The lifebuoy s flames in an position, with 25 cm above	Lot/Serial Number:			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:		Date: Surveyor: Organization:			
2.1.1.8 F	Flotation test		Regulations: LSA Cod	le 2.1.1.3; MSC.81(70) 1/	'1.6	
	Test Procedure	Acceptance C	Criteria	Signific	ant Test Data	
tests should I not less than 1	uoys subjected to the above be floated in fresh water with 14.5 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 9	Strength test		Regulations: LSA Cod	le 1.2.2; MSC.81(70) 1/1.	7	
	Test Procedure	Acceptance C	Criteria	Significant Test Data		
50 mm wide s passed aroun with a 90 kg r	dy should be suspended by a trap. A similar strap should be d the opposite side of the body mass suspended from it. After e lifebuoy body should be	There should be no breaks, cracks or permanent deformation.		Lifebuoy No. Suspended mass:kg Suspension duration:min Passed/Failed Comments/Observations		

	Manufacturer:		Date: Time:		
Lifebuoys	Model:		Surveyor:		
Lifebuoys	Lot/Serial Number:		Organization:		
					
2.1.1.10	Test for operation with a light	and smoke signal	Regulations: LSA Co	ode 2.1.1.7; MSC.81(70) 1/1.8	
	Test Procedure	Acceptance C	riteria	Significant Test Data	
	hould be carried out if the tended for quick release with a			Lifebuoy No.	
light and smo		-	-	Type / description of quick activating arrangement:	
	/ should be arranged in a lating its installation on a ship	The weight of the lifebuoy should be at least 4 kg.		Type of light and smoke signal:	
	om the navigating bridge.			Light activated? Passed/ Failed	
	ht and smoke signal should be the lifebuoy in the manner			Smoke activated? Passed/ Failed,	
	ed by the manufacturers.			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 assurance	ce	Regula	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 requ ensure that life-saving appliance	f a particular type are required by chapter III of or the Safety of Life at Sea, 1974, as amended, ing Appliance (LSA) Code, to be inspected, istration should make random inspection of the quality of life-saving appliances and the the specification of the approved prototype nired to institute a quality control procedure to ces are produced to the same standard as the e approved by the Administration and to keep tests carried out in accordance with the	Quality	tions: MSC.81(70) 2/1.1, 1.2 Assurance Standard Used: Assurance Procedure: Assurance Manual:	Passed/ Failed Passed/ Failed Passed/ Failed	

Lifebuoy self-igniting lights	Manufacturer: Model: Lot/Serial Number:	Surveyor:		
2.1.2.1.1 General data and	d specifications	Regulations: LSA Code; MS	SC.81(70)	
General Informati	on Lifejack	et Lifebuoy Light Dimensions	Lifejacket Lifebuoy Light Weight	
TYPE OF SWITCHING			Details of Bulb, Battery & Voltages:	
FLASHING LIGHT			Comments/Observations	
STEADY LIGHT				

	by self-igniting lights Lot/Serial Number:		r: imber:	Date: Surveyor: Organization:	
2.1.2.1.2 Submitt	ed drawi	ings, reports a	and documents		
			Submitted drawings and documer	ts	Status
Drawing No.	Revis date	ion No. &	Ti	tle of drawing	
	ļ				
	<u> </u>		Submitted reports and document		Status
Report/Document No.	Revis date	ion No. &	Title of	report / document	
			Maintenance Manual -		
			Operations Manual -		
	ļ				

Manufacturer: Model: Lot/Serial Number:	Surveyor:	Time:	
	Regulations: LSA Code 1.2	2.2.1/1.2.2.6/1.2.2.9/1.2.2.10/1.2	.3
Acceptance	Criteria	Significant T	est Data
the lifebuoy self-igniting lights shound r the	ld:	Results:	
			FAIL:
- be marked with a date of expiry;			FAIL:
The Administration should determin	e the:	<u>Results:</u>	
	 period of acceptability, owing to deterioration with age. The established life must be justified by the manufacturer. 		FAIL:
		<u>Results:</u>	
light"); serial number;	light");		FAIL:
	ronar battary dianagal by the	PASS:	FAIL: FAIL:
		PASS:	FAIL:
 be provided with electrical short damage or injury; 	 be provided with electrical short circuit protection to prevent damage or injury; 		FAIL:
	Lot/Serial Number:Acceptance of Acceptance of thts r the The lifebuoy self-igniting lights shou - be clearly marked with approve Administration which approve restrictions; - be marked with a date of expiry; The Administration should determin - period of acceptability, owing to established life must be justified Be provided the following information precise definition of intended use (e light"); serial number; identification of the manufacturer; where applicable, information on p words: "DO NOT INCINERATE / DO TAMPER"; - be provided with electrical short	Lot/Serial Number: Organization: Regulations: LSA Code 1.2 Acceptance Criteria hts The lifebuoy self-igniting lights should: - be clearly marked with approval information including the Administration which approved it, and any operational restrictions; - 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. Be provided the following information: precise definition of intended use (e.g. "Lifebuoy self- igniting light"); serial number; identification of the manufacturer; where applicable, information on proper battery disposal by the words: "DO NOT INCINERATE / DO NOT RECHARGE / DO NOT TAMPER"; - be provided with electrical short circuit protection to prevent	Organization: Regulations: LSA Code 1.2.2.1/1.2.2.6/1.2.2.9/1.2.2.10/1.2 Regulations: LSA Code 1.2.2.1/1.2.2.6/1.2.2.9/1.2.2.10/1.2 Regulations: LSA Code 1.2.2.1/1.2.2.6/1.2.2.9/1.2.2.10/1.2 Meter and the second of the seco

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	Acceptance Criteria	Significant Test Data
	The lifebuoy self-igniting lights should:	<u>Results:</u>
Construction and materials	- be constructed with proper workmanship and materials.	PASS: FAIL:
Colour of lifebuoy light	 be of an international or vivid reddish orange, or a comparably highly visible colour on all parts where this will assist detection at sea 	PASS: FAIL: Comments/Observations

	Manufacturer:		Date:					
ifebuoy self-igniting lights	Model:	Surveyor:	Surveyor:					
includy sen-igniting lights	Lot/Serial Number:	Organizati	Organization:					
ifebuoy self-igniting light te	esting flow chart							
	light 1 temp cycle test 2.1.2.3	then light 2.1.2.4	1 performs Light test (hot)	light 1 th 2.1.2.5	en performs Chromaticity Test			
	light 2 temp cycle test 2.1.2.3	then light 2.1.2.4	2 performs Light test (cold)	nt test (cold) light 2 then performs Chromatici 2.1.2.5				
	light 3 temp cycle test 2.1.2.3							
	light 4 Case Resistance Test 2.1.2.7							
	light 5 Lens Drop Test 2.1.2.8 (if fitted)							
Visual Inspection	light 6 24 hr Floatation Test 2.1.	2.9						
(all 13 lights) 2.1.2.1	light 7 30 m drop test (x 2) 2.1.2	2.10			light 7 then performs Release/Op 2.1.2.12	peration Test		
	light 8 Vibration Test 2.1.2.13							
	light 9 Mould growth test (may be waived) 2.1.2.14							
	light 10 corrosion and sea water resistance test 2.1.2.15							
	light 11 Solar radiation test (may be waived) 2.1.2.16							
	light 12 Oil resistance test 2.1.2	.17						
	light 13 Fire test 2.1.2.18							

Lifeb	uoy self-igniting lights	lights Model: Surveyor:		Surveyor:	Time: ion:		
							4 9 9 4 9 9 4 9 9 4
2.1.2.	· · ·	ng test	1		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	ce Criteria		Signific	ant Test Data
altern tempo These imme follow not le 1. 2.	e lifebuoy self-igniting ligh hately subjected to eratures - 30°C and at I e alternating cycles need odiately after each other ving procedure, repeated iss than 10 cycles, is acce an 8 h exposure at temperature of +65 completed in one day; a the specimens remove warm chamber that sat left exposed under or conditions at a tempera ± 3°C until the next day;	surrounding east +65°C. d not follow er and the for a total of eptable: a minimum °C to be and ed from the me day and dinary room ture of 20°C	The lifebuoy self-igniting light stowage throughout the air +65°C. The lifebuoy self-igniti of loss of rigidity under high ter should show no sign of damag swelling, dissolution or chang should function after the test.	ts should no temperature ng lights sho nperatures a ge such as s	e range -30°C to buld show no sign and, after the tests, hrinking, cracking,	Results:	vcling chart to record times ature. FAIL:
3.	an 8 h exposure at temperature of -30°C to the next day; and						
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					

Lifebuoy self-igniting lights Manufacturer: Lot/Serial Number:				Surveyor:				
2.1.2.3	Temperature cycli				Regulations: LSA Code I/1.2.2			
		Н	OT CYCLE			CO	LD CYCLE	
Cycle 1	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: In: Temperature:		Date Out: Time Out: Duration:	
Cycle 2	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: In: Temperature:		Date Out: Time Out: Duration:	
Cycle 3	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: In: Temperature:	Time 0C	Date Out: Time Out: Duration:	
Cycle 4	Date In: Time In: Temperature :		Date Out: Time Out: Duration:		Date In: In: Temperature:	Time	Date Out: Time Out: Duration:	
Cycle 5	Date In: Time In: Temperature :		Date Out: Time Out: Duration:		Date In: In: Temperature:	Time 0C	Date Out: Time Out: Duration:	
Cycle 6	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: In : Temperature :	Time 0C	Date Out: Time Out: Duration:	
Cycle 7	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: In: Temperature:	Time	Date Out: Time Out: Duration:	
Cycle 8	Date In: Time In: Temperature:	0	Date Out: Time Out: Duration:		Date In: In: Temperature:	Time 0C		
Cycle 9	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: In: Temperature:	Time		
Cycle 10	Date In: Time In: Temperature:	0	Date Out: Time Out: Duration:		Date In: In: Temperature:	Time	Date Out: Time Out: Duration:	

Lifebuoy self-igniting lights	f-igniting lights Manufacturer: Model: Lot/Serial Number:			Date: Time: Surveyor: Organization:		
2.1.2.4 Light tests			Regulatio	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.	
Test Procedure		Acceptance	ce Criteria		Significant Test Data	
One lifebuoy self-igniting ligh passed the temperature cycling be taken from a stowage tem 30°C and then be operated i seawater at a temperature of lifebuoy self-igniting light which the temperature cycling test taken from a stowage tem +65°C and be operated in seawater at a temperature of + third light should be taken fr room condition and operated if fresh water at ambient tempera- end of the first hour of op lifebuoy self-igniting lights immersed to a depth of 1 m for	g test should berature of - mmersed in 1°C, another has passed should be perature of nmersed in -30°C, and a om ordinary immersed in ature. At the beration the should be	After immersion, all the lifebuo be extinguished and should co hour longer. All of the lights should be of continue to provide a luminous in all directions of the upper h flashing light, flash at a rate o not more than 70 flashes p corresponding effective lumin 2 cd for at least 2 h. (see for effective luminous intensity.) The effective luminous intensity.	white colours intensity of emisphere of f not less the oer minute ous intensity ormula below	ting for at least an r and they should not less than 2 cd r, in the case of a an 50 flashes and with at least the y of not less than v to calculate the	All luminous intensity data is to be attached here. PASS: FAIL: Comments/Observations	
If the voltage at 5 min of operative than the recorded voltage at the it is permissible to use a lar same build standard for the test. Using the lowest recorder light output test can be car described below. The voltage units should be monitored con 2 h. To make sure that all the provide a luminous intensity than 2 cd in all directions of hemisphere for 2 h operation, the test should be performed:	he end of life np from the light output d voltage, a ried out as of the 3 test tinuously for he test units of not less f the upper	$\left(\frac{\int_{t_1}^{t_2} Id}{0.2 + (t_2)}\right)$ where: I is the instantaneous intensity 0.2 is the Blondel-Rey constart of integration in seconds.	, max	t2 are time - limits		

Lifebuoy self-igniting lights	ifebuoy self-igniting lights Manufacturer: Model: Lot/Serial Number:			Surveyor:	Time:
2.1.2.4 Light tests (cont	inued)		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
It must be demonstrated that allights reach the required lumination 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 may photometer directed at the calight source with the test light of table. Luminous intensity measured in a horizontal directed through the continuously recorded through the test of the light continuously recorded through the test of the light source with the test light continuously recorded through an accord of the light source with the test of the light continuously recorded through an accord of the light source at the point of the light s	bus intensity hemisphere which is standards of ate Standard 70 contains is intensity of easured by a enter of the on a rotating should be ection at the source and gh a 360° ht should be ould continue angle at 5° ment at 90° measured in at the center nt of lowest continuously	Flashing lights with a flast than 0.3 s may be considered the measurement of their lumi should provide the required directions of the upper hemis between switching on and luminous intensity (incandes spent below the required lum light switches off sho (see figure 10.4.1 "On-time" m	d as fixed/ste nous intensi luminous in sphere. The reaching cence time) ninous inten build be	eady lights for ty. Such lights ntensity in all time interval the required and all time sity when the disregarded	 PassedFailed 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 self-igniting lights continue operated for at least an hour longer: Yes/ No Comments/Observations

Lifebuoy self-igniting lights Manufacturer: Model: Lot/Serial Number:			Surveyor:		Time:	
2.1.2.5 Chromaticity tes	st		Regulatio	ns: LSA Code	2.1.2.2; MSC.81()	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 ligh passed the light tests should k chromaticity to determine that the boundaries of the area "w diagram 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 con information.). Measurement on points of the upper hemispher taken.	ented. at which has be tested for it lies within white" of the colour by the Illumination lifebuoy self- ed by means c equipment appropriate rds Institute tains further at least four	The measured chromaticity cod the boundaries of the area of th The boundaries of the area for the following corner coordinate x 0.500 0.500 0.440 0.300 y 0.382 0.440 0.433 0.344 (International Standard on Cold colour tables to be developed to	e diagram a white lights a s: 0.300 0.4 0.278 0.3 burs of Light	s per CIE. are given by 40 32	Results: All chromaticity of PASS: Comments/Obse	data is to be attached here. FAIL: ervations

Lifebuoy self-igniting lights	niting lights Manufacturer: Model: Lot/Serial Number:			Date: Surveyor: Organization:			
2.1.2.6 Rain test and Wa	atertightness	Test Regulations: LSA Code 1.2.2 10.4.7			2.8; MSC.81(70) 1/ 10.2.5,		
Test Procedure		Acceptance Criteria		Significant Test Data			
One lifebuoy self-igniting ligh passed the temperature cyclin be subjected to the rain test IEC 60945:2002, paragraph having passed the rain test, self- igniting light and its com source 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. tested its function, and if it is light, it should be disasse examined for the presence of Automatic activated version prevented from switching d tests.	g test should according to 8.8. After the lifebuoy plete power horizontally f fresh water -igniting light After having s an electric embled and water. should be	The lifebuoy self-igniting light to be used in a seaway, be ca 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.	pable of sati light should ght should j02, paragraj	sfactory operation d function after comply with the ph 8.8.2.	Results: PASS: Comments/Observations	FAIL:	

Lifebuoy self-igniting lights	-igniting lights Manufacturer: Model: Lot/Serial Number:		Surveyor	Date: Time: Surveyor: Organization:			
2.1.2.7 Case resistance	test		Regulations: MSC.8	31(70) 1/ <u>1</u>	10.2.7		
Test Procedure		Acceptance Criteria		Significant 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 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 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.		The case should not break or crack, or be distorted in a way that would affect its watertightness. The lifebuoy self-igniting light should function after the test.			Results: PASS: FAIL: Comments/Observations		
2.1.2.8 Lens drop test		Regulations: MSC.81(70) 1/			0.2.6		
Test Procedure		Acceptance Criteria			Significant Test Data		
If a lifebuoy self-igniting light h should be subjected to the dom The lifebuoy self-igniting light cooled to -18°C and dropped to height of 1 m on to a rigidly me plate or concrete surface. The should be measured from the lens to the impact surface. The self- igniting light should strike on the top centre of the lens.	t should be wice from a ounted steel he distance e top of the The lifebuoy	The lens should not break or crack. The lifebuoy self-igniting light should function after the test.		ne test.	<u>Results:</u> PASS: Comments/Observa	FAIL: ations	

2.1.2.9 Floatation test	Regulations: LSA Code 1.	Regulations: LSA Code 1.2.2.8; MSC.81(70) 1/ 10.2.4				
Test Procedure	Acceptance Criteria	Significant Test Data				
One lifebuoy self-igniting light should be subjected to the floatation test. If the unit has an automatic activation, it should be disabled during this test. The lifebuoy self-igniting light should be allowed to float in water in its normal operating position for 24 h. If the lifebuoy self-igniting light is an electric light, it should be disassembled at the end	Acceptance Criteria The lifebuoy self-igniting light should be capable of satisfactory operation in a seaway. The lifebuoy self-igniting light should function after the test and there should be no evidence of water inside the lifebuoy self-igniting light.	Significant Test Data Results: FAIL: PASS: FAIL: Comments/Observations FAIL:				
of the tests and examined for the presence of water.						

	1						
	Manufacturer:			Time:			
Lifebuoy self-igniting lights	Model:		Surveyor:				
Lifebuoy sen-igniting lights	Lot/Serial Number:		Organization:				
			.				
2.1.2.10 Drop test	Regulations: LSA Code 2.1.2.4/2.1.1.6; MSC.81(70) 1/ 1.3, 10.2.3						
Test Proce	dure	Acceptance Criteria		Significant Test Data			
One lifebuoy self-igniting light which has passed the		The lifebuoy self-igniting light should withstand		Results:			
visual inspection should be sul	pjected to the drop test.	this test without impairing either its operating capability or that of its attached components.					
The lifebuoy self-igniting light s	hould be subjected to at			5.00			
least two drop tests as follows:				PASS:	FAIL:		
		The lifebuoy self-igniting light should not suffer					
The lifebuoy self-igniting light		damage and should operate satisfactorily after each drop.		Comments/Observations			
water, such that the lower edge		each urop.					
at which it is intended to be s							
lightest sea going condition,	or 30 m, whichever is						
greater.							
The lifebourse of invitive lights	— — — — — — — — — —						
The lifebuoy self-igniting light should be dropped twice,							
first by itself and then attached to a lifebuoy.							
On sea activated lights this test should be carried out							
with the sealing plugs fitted to prevent the ingress of							
water which will cause the light to operate.							
2.1.2.11 Fitting test			Regulation	ne: MSC 81(70) 1/	10 2 8		
H		Regulations: MSC.81(70) 1/					
Test Procedure		Acceptance Criteria		Significant Test Data			
The lifebuoy self-igniting light which has passed the drop test should be subjected to the fitting test.		Neither the fitting and lanyard nor the lifebuoy self-igniting light should be damaged as a result		Results:			
	0	of this test.		PASS:	FAIL:		
A force of 225 N should be a							
lanyard that attaches the lifebuoy self-igniting light to a		The lifebuoy self-igniting light should function after		Comments/Observations			
lifebuoy.		the test.					
After having passed the fitting test the light should be							
subjected to the release and operation test.							

Lifebuoy self-igniting lights			Survey	or:		me:		
2.1.2.12 Release and ope				Ū				
2.1.2.12 Release and ope Test Proce	Regulations: LSA Code 2.1. Acceptance Criteria			Code 2.1.	Significant Test Data			
One lifebuoy intended for on lifebuoy self-igniting light whic	The lifebuoy sh self-igniting light.	•		lifebuoy	Results:	Significant rest Data		
test and a smoke signal should be given this test. The chemical material intended to produce the smoke should be substituted by an equivalent non- dangerous material. The lifebuoy should be arranged in a manner						PASS:	FAIL:	
simulating its installation on a s navigating bridge. The lifebuoy smoke signal should be attach manner recommended by t lifebuoy should be released.	v self-igniting light and a led to the lifebuoy in the					Comments/Obs	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 Procedure		Acceptance Criteria				Significant Test Data		
One lifebuoy self-igniting light which has passed the visual inspection should be subjected to a vibration test		The lifebuoy self-igniting light should be constructed with proper workmanship and materials.				<u>Results:</u>		
according to IEC 60945:2002 p	-				PASS:	FAIL:		
	The lifebuoy self-igniting light should function after the test.			function	Comments/Observations			

Lifebuoy self-igniting lights	Manufacturer: Model: Lot/Serial Number:			e:		
2.1.2.14 Mould growth te	st		Regulatior	s: LSA Code 1.2.	2.4; MSC.81(70) 1/	10.4, 10.4.2
Test Procee	dure	Acc	eptance Crite	eria	Si	ignificant Test Data
One lifebuoy self-igniting light visual inspection should be sub growth test.		The lifebuoy self-ig and not be unduly			<u>Results:</u> PASS:	FAIL:
The lifebuoy self-igniting light s spraying with an aqueous susp containing all the following cult Aspergillus niger; Aspergillus to pullulans; Paecilomyces varioti funiculosum; Penicillium ochro brevicaulis; and Trichoderma v The lifebuoy self-igniting craf placed in a mould growth cha maintained at a temperature relative humidity of not less th	erreus; Aureobasidium ii; Penicillium chloron; Scopulariopsis riride. t light should then be amber which should be of 29°C +/- 1°C and a an 95 %. The period of	and not be unduly affected by fungal attack. There should be no mould growth visible to the naked eye and the lifebuoy self-igniting light should function after the test.			Comments/Ob	servations
incubation should be 28 days lifebuoy self-igniting light shoul (Note: The mould growth test the manufacturer is able to pro external materials employed w	d be inspected. may be waived where oduce evidence that the					

Lifebuoy self-igniting lights	Manufacturer: Model: Lot/Serial Number:			Surveyor:		
2.1.2.15 Corrosion and s	eawater resistance test		Regulation	s: LSA Code 1.2.2.4; MS	C.81(70) 1/ 10.4	, 10.4.4
Test Proc	cedure		Acceptance	Criteria		Significant Test Data
 One lifebuoy self-igniting light vispection should be subje seawater resistance test acceparagraph 8.12. (Note: .1 If there are no exposed and Seawater Resist conducted. .2 The Corrosion and Sea be waived where the produce evidence that the will satisfy the test. .3 Automatic activated ve from switching during the subjement of the subjeme	The lifebuoy self-igniting light should be corrosion resistant and not be unduly affected by seawater. 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 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 cannot be done.			Results: PASS: Comments/Ob	FAIL: servations	
2.1.2.16 Solar radiation t	est	I	Regulation	s: LSA Code 1.2.2.5; MS	C.81(70) 1/ 10.4	, 10.4.5
Test Proc	cedure		Acceptance	Criteria		Significant Test Data
One lifebuoy self-igniting light inspection should be subjected according to IEC 60945:2002, (Note: The solar radiation test	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			Results: PASS: Comments/Ob	FAIL:	
manufacturer is able to pr materials employed will satisfy	oduce evidence that the	sunlight and the lifebuoy self-igniting light should function after the test.				

Lifebuoy colf igniting lights Mod	anufacturer: odel: t/Serial Number:	Surveyor:	Time:				
2.1.2.17 Test for oil resistance	e	Regulations: LSA Code 1.2.2.4; MSC.81(70) 1/ 10.4, 10.4.6					
Test Procedure	Acceptanc	e Criteria	Significant Test Data				
5	unduly affected by oil and sho istance such as shrinking, cracking, sw 5:2002 of mechanical qualities.	uld show no sign of damage welling, dissolution or change	Results: PASS: FAIL: Comments/Observations				
2.1.2.18 Fire rest		Regulations: LSA Code 2.1.	1.5; MSC.81(70) 1/ 10.4, 10.4.8				
Test Procedure	Acceptanc	e Criteria	Significant Test Data				
One lifebuoy self-igniting light whi passed the visual inspection sho subjected to a fire test. A test pan r than 30 cm x 35 cm x 6 cm sho placed in an essentially draught-fre Water should be put in the bottom test pan to a depth of at least 1 cm fo by enough petrol to make a minimu depth of not less than 4 cm. The should then be ignited and allowed freely for at least 30 s. The li- self- igniting light should then be through the flames, facing them, w lifebuoy self-igniting light not mor 25 cm above the top edge of the te so that the duration of exposure flames is at least 2 s.	ould be not less continue melting after being to period of not less than 2 s and flames. The lifebuoy self-igniting light s followed um total e petrol d to burn lifebuoy e moved with the pre than test pan	tally enveloped in a fire for a after being removed from the	Results: PASS: FAIL: Comments/Observations				

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	

Lifebuoy self-activating smoke signals Manufacturer: Model: Lot/Serial Number:					Date: Surveyor: Organization:	Time:	
2.1.3.1 Submitte	ed drawings, re	eports and do	cuments				
		Su	bmitted drawings ar	nd documents	i		Status
Drawing No.	Revision No date	o. &					

Submitted reports and documents								
Report/Document No.	Revision No. & date							
		Maintenance Manual -						
	Operations Manual -							

Lifebuoy self-activating smoke signals	Manufacturer: Model: Lot/Serial Number:	Date: Time: Surveyor: Organization:					
2.1.3.1.1 Quality assurance	ce	egulations: - MSC.81(70) 2/1.1	l, 1.2				
of the International Convention amended, or the international L representatives of the Administ manufacturers to ensure that materials used comply with the saving appliance. Manufacturers should be require ensure that life-saving appliant the prototype life-saving appliant	a particular type are required by Chapter III on for the Safety of Life at Sea, 1974, as Life-Saving Appliance Code, to be inspected, stration should make random inspections of t the quality of life-saving appliances and e specification of the approved prototype life- ired to institute a quality control procedure to aces are produced to the same standard as ance approved by the Administration and to on tests carried out in accordance with the	uality Assurance Standard User uality Assurance Procedure: - uality Assurance Manual: - escription of System.	d: -				
		uality Assurance System accep	table: Yes/No				

Lifebuoy self-activating smoke signals	Model:		Surveyor:				
2.1.3.1.2 Visual inspec	tion		Regulations: LSA Code I/1	.2; MSC.81(70) 1/	1.9 and 4.5		
Test Procedure	e	Acceptance (Criteria		Significant Test Data		
Visual examination	Lifebu	Self-Activating Smoke S	Signal should: -				
Approval markings	Admin	ration which approved it nd operational restriction	l information including the , date of manufacture and ons, markings are to be		Failed		
Operating instructions.	illustra	g the use of the lifebuoy s	tions or diagrams clearly self-activating smoke signal thod of manual operation;	Passed	Failed		
Outer casing.		nd on adhesive tapes o sistant properties	or plastic envelopes for its	Passed			
Ignition System.	be fitte	with an integral means o	f ignition;	Passed	Failed		
Fitted with light		0	in accordance with the iting lights, section 10.2.	Passed			
Acceptable life		ility of the unit which a	etermine the period of re subject to deterioration				

Lifebuoy self-activating smoke signals	Model:			Surveyor:	Time:				
2.1.3.1.3 General data ar	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	Bottom Cover (If applicable):				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	A	A	A	A	А	А	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			E		E	Е	Е	E	1.9.3, 4.3.1	

Specimen No>	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22	References	Remarks
Operate at conditioning Temperature	E	E		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.

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

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:	umber:		Date: Time: Surveyor:				
2.1.3.2 Temperature cy	cling test		Regulation	ns: LSA Code I/1.2	2.2; MSC	C.81(70) I/1.2.1		
Test Procedure		Acceptanc	ce Criteria			Significant	Test Data	
Nine self-activating smoke sig be alternately subjected to temperatures of -30°C and +4 alternating cycles need immediately after each oth following procedure, repeated 10 cycles, is acceptable:	surrounding 65°C. These not follow er and the	After 10 cycles each specim should show no sign of damag swelling, dissolution or change	e such as sl	nrinking, cracking,	<u>Specim</u> 1. 2. 3.	Passed	Failed Failed Failed	
 an 8 h exposure at temperature of +65°C to b in one day; and 					4. 5.	Passed	Failed	
 the specimens removed from chamber that same date exposed under ordin conditions at a temperatur 3°C until the next day; 	iy and left ary room				5. 6. 7. 8.		Failed	
 3. an 8 h exposure at a temperature -30°C to be connext day; and 4. the specimen removed from that same dates are chamber that same dates are conditions at a temperature 3°C until the next day. 					Passed nts/ObservationsFailed	Failed		

Lifebuoy self-activating smoke signals	Model:	er: umber:	Surveyor:		me:		
2.1.3.3 Low temperature	e conditionin	g test	Regulatio	ns: LSA Code I/1.2	2.2; MSC.81(70) ⁻	1/1.9.2	
Test Procedure		Acceptano	ce Criteria			Significant Test D	lata
After at least ten complete		The 3 specimens should function effectively.		Specimen Num	ber		
cycles the first three smoke sin be subjected to a temperature		Each specimen should show	no sign of	damage such as	1	2	3
at least 48 h, then taken from temperature be activated and	this stowage	shrinking, cracking, swelling mechanical properties afte	, dissolutio	n or change of	Condition after	Conditioning (Pass	s/Fail)
seawater at a temperature of		conditioning.	ei compie	ling the -50 C			
function effectively at that tem	perature.	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 time (min/sec)	I
					Smoke emissio	n quality (Pass/Fai	11) T
		The colour of the employ should be erenge as defined by			Smoke colour (Pass/Fail)	
		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 emissions during submergence (Pass/Fail)		
		*Special Publication 440, Na		au of Standards,			
		Washington, DC 20402, USA.			Comments/Obs	servations	
		After the smoke signals have been emitting smoke for 7 minutes, the smoke-emitting ends of the smoke signals should be immersed to a depth of 25 mm for 10 s. On being released the smoke signals should continue to emit a steady quantity of smoke of a highly visible colour at a uniform rate for a period of not less than 15 minutes when floating in calm water.		Passed	Failed		

Lifebuoy self-activating smoke signals	Model:	S o		Date: Surveyor: Organization:		ne:	
2.1.3.4 High temperature conditioning test Regulations:		ns: LSA Code I/1.2	2.2 and II/2.1.3; M	SC.81(70) 1/1.9.2			
Test Procedure		Acceptanc	e Criteria			Significant Test Da	ata
After at least 10 complete		The 3 specimens should function effectively.		Specimen Numb	ber		
cycles, the next three smoke si be subjected to a temperature		Each specimen should show	no sign of	damage such as	4	5	6
at least 48 h, then taken from	this stowage	shrinking, cracking, swelling	, dissolutio	n or change of	Condition after C	Conditioning (Pass	/Fail)
	temperature be activated and operated in mechanical properties after completing the +65°C seawater at a temperature of +30°C, and conditioning.						*
function effectively at that temp		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			Smoke emission	quality (Pass/Fail)
		during the entire smoke emiss	ion time.				
		After the smoke signals have been emitting smoke for			Smoke colour (F	ass/Fail)	
		7 minutes, the smoke-emitting					
		should be immersed to a dept released the smoke signals sh			Smoke emission	during submerge	nce (Pass/Fail)
		quantity of smoke of a highly v	isible colou	r at a uniform rate			
		for a period of not less than 15 water.	minutes who	en floating in calm	Comments/Obse	ervations	
		water.					
		The colour of the smoke sho sections 34, 48, 49 or 50 of the Language and Dictionary of N	publication				
		*Special Publication 440, National Bureau of Standards, Washington, DC 20402, USA.		Passed	Failed		

Lifebuoy self-activating smoke signals	Model:	mber: Organization:			Time:			
2.1.3.5 Ambient Tempe	ioning & Drop Test	Regulatio	ns: LSA Code I/1.2	2.2 & II/2.1.1.6; M	ISC.81(70) 1/1.9.3			
Test Procedure		Acceptan	ce Criteria			Significant Test Da	ata	
After at least ten complete		The 3 specimens should function effectively for a period of at least 15 min. Each specimen should show no sign of damage such as			Specimen No.			
cycles, the last three smoke s from ordinary room cond					7	8	9	
attached by a line to a lifebu	ioy having a				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 life		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 o		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 time (min/sec)			
a quick-release fitting. The sr	noke signals							
should not be damaged function for a period of at least					Smoke emission quality (Pass/Fail)			
		The smoke signal should not b	e damaged	after the drop test.				
A lifebuoy and the smoke sign					Smoke colour (Pass/Fail)			
dropped each into the water fro at which they are intended to b		The colour of the smoke sho			Smoke signal d	amaged after drop	tost (Pass/Fail)	
ships in their lightest seagoing	condition, or	sections 34, 48, 49 or 50 of the Language and Dictionary of N		Colour: Universal	Shoke signal u	anaged alter drop		
suffering damage		*Special Publication 440, National Bureau of Standards, Washington, DC 20402, USA.		Comments/Obs	servations			
					Passed	Failed		

Lifebuoy self-activating smoke signals	Model:	er:	nber: Survo Orga			ne:	
2.1.3.6 Humidity conditioning			Regulatio	ns: LSA Code I/1.2	2.2 & II/2.1.3; MSC	.81(70) 1/4.2.4, 1	.9.4
Test Procedure		Acceptanc	ce Criteria			Significant Test D	ata
Three specimens of smoke signal be subjected to a temperatu		The 3 specimens should function effectively.		Specimen No.	44	10	
and 90% relative humidity for a followed by ten days at 20°C		Each specimen should show shrinking, cracking, swelling,	dissolution	or change of	10 Condition after C	11 Conditioning (Pass	12 s/Fail)
65% relative humidity. After the humidity test the specimens		mechanical properties after completing the temperature of +65°C and 90% relative humidity for at least 96 h, followed by ten days at 20°C to 25°C at 65% relative humidity		Smoke emission time (min/sec)			
should be subjected to the fur		conditioning.	ý				
ambient temperature.					Smoke emission	quality (Continuc	ous/Intermittent)
		The smoke signal should not ignite explosively or in a manner dangerous to persons close by nor emit any flame					
		during the entire smoke emiss			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 shou sections 34, 48, 49 or 50 Universal Language and Dictio *Special Publication 440, Nat Washington, DC 20402, USA.	of the pub onary of Nar	lication Colour: nes.*	Passed	Failed	

Lifebuoy self-activating smoke signals	Model:	el: Surveyor: erial Number: Organization: _				9:	
2.1.3.7.1 Immersed for 24 h under 1 m Regulations			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	ce Criteria			Significant Test Da	ita
Three specimens of smoke s		The three specimens should show no sign of damage such as			1		
be immersed horizontally for 1 m of water.	24 h under	under shrinking, cracking, swelling, dissolution or ch mechanical properties.		on or change of	13	14	15
				Condition after 0	Conditioning (Pass	/Fail)	
After this test the specimen subjected to the function test		The signals should establish the without injury to the operator,					
temperature.		during firing or burning.			Smoke emission	n time (min/sec)	
		The specimen signal should					
		manner dangerous to person	s close by,	nor emit any flame		n quality (Continuo I	us/Intermittent)
		during the entire smoke em smoke of a highly visible colo					
		of not less than 15 minutes w			Smoke emission	COIDUL Passed/F	
		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/Obs	ervations		
		*Special Publication 440, N Washington, DC 20402, USA		eau of Standards,			
					Passed	Failed	

Lifebuoy self-activating smoke signals	Model:		mber: Organizatio			ne:	
2.1.3.7.2 10 cm immersio	e for 5 mins. test	Regulation	ns: LSA Code I/1.2	2.2 & II/2.1.3; MS0	C.81(70) 1/4.3.2		
Test Procedure Ac		Acceptano	ce Criteria			Significant Test Da	ata
Three specimens of smoke sig		The three specimens should s	•	0	Specimen No		
be made ready-to-fire, sub 10 cm of water for 5 min.	omerged in	 as shrinking, cracking, swelling, dissolution or ch mechanical properties. 		ion or change of	16	17	18
			The signals should establish that it can be operated			Conditioning (Pass	/Fail)
The three signals should be ambient temperature in acco		I he 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 during the entire smoke emission time. They should emit			Smoke emissior	n quality (Continuo	us/Intermittent)
		smoke of a highly visible colou	ır at a uniforı	m rate for a period	Smoke emission colour: Passed/Failed		
		of not less than 15 minutes wh	nen floating i	n calm water.			
		The colour of the smoke sho sections 34, 48, 49 or 50 of the Language and Dictionary of N	e publication				
		*Special Publication 440, Na Washington, DC 20402, USA.		au of Standards,			
					Passed	Failed	

Lifebuoy self-activating smoke signals	Model:		ber: Organization:			Time:			
2.1.3.7.3 Salt spray cond	itioning		Regulation	ns: LSA Code I/1.2	2.2 & II/2.1.3; MS0	C.81(70) 1/1.9.4, 4	.3.3		
Test Procedure Acceptance		ce Criteria			Significant Test D	ata			
Three specimens of smoke signals should		The three specimens should s			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.		mechanical properties.			Condition after 0	Conditioning (Pass	s/Fail)		
The signals should be activated at ambient temperature in accordance with close proximity, during firing or burning.									
				or any percent in	Smoke emission time (min/sec)				
the manufacturer's operating i	nstructions.	The specimen signal should not ignite explosively or in a							
		manner dangerous to persons	Smoke emission	n quality (Continuo	us/Intermittent)				
		during the entire smoke emission time. They should emit smoke of a highly visible colour at a uniform rate for a period					<u> </u>		
		of not less than 15 minutes wh			Smoke emission	colour: Passed/F	alled		
		The colour of the smoke sho sections 34, 48, 49 or 50 of the Language and Dictionary of N	e publication		Comments/Observations				
		*Special Publication 440, Na Washington, DC 20402, USA.		au of Standards,					
					Passed	Failed			

Lifebuoy self-activating smoke signals	Model:	er: umber:		Surveyor:		me:	
2.1.3.8 Heptane test	3.8 Heptane test Regulations: LSA			ns: LSA Code I/1.2	2.2 & II/2.1.3.1; M	SC.81(70) 1/4.8.2,	1.9.4
Test Procedure		Acceptanc	e Criteria			Significant Test Da	ata
Three smoke signals should water covered by 2 mm layer		The three specimens should not ignite the heptane.		Specimen No	1		
floating on a layer of water.		The specimen signal should	not ignite e	xplosively or in a	22	23	24
signal should be allowed completely.	d to burn	manner dangerous to persons during the entire smoke emiss		or emit any flame	Heptane ignitior	n (Passed/Failed)	
		They 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.		Smoke emission	n time (min/sec)		
				15 minutes when	Smalka amianin		ue/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.*		SINOKE EINISSIO	n quality (Continuo	us/internittent)	
				Smoke emission colour: (Passed/Failed)			
		*Special Publication 440, Na Washington, DC 20402, USA.	tional Bure	au of Standards,	Comments/Observations		
					Passed	Failed	

Lifebuoy self-activating smoke signals	.ifebuoy self-activating Model:			Surveyor:	Time:
2.1.3.9 Laboratory smo	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)	Acceptance Criteria			Significant Test Data
The smoke density and colousignal should be determined testing conducted at a water +20°C to +25°C as follows: The smoke should be draw apparatus consisting of a 19 duct with a fan capable of entrance air flow of 18.4 m3/m a light source with at least 10 of the tunnel and a photoeled other side the density of the should be recorded. If the phy the total emitted light from the then the smoke density is zero means that no smoke is pass tunnel. The smoke density is to to be 100% when the photoced pick up any light of the light sour passing smoke in the tunnel. F of light which the photocell is the smoke density should Before each measurement, th of the 100% value should be measurement should be recor	temperature of wn through an 0 mm diameter producing an in. By means of cd on one side ctric cell on the passing smoke otocell picks up he light source, o percent which ing through the hen considered ell is not able to urce through the rom the amount able to pick up be calculated. ie light intensity checked. Each	Smoke density should be minimum emission time. The colour of the orange s means of visual comparis comparison chart contain orange colours. The colour a gloss or matte finish, and five orange colour chips, co orange (Munsell notation orange (Munsell notation orange (Munsell notation orange (Munsell notation orange (Munsell notation secured adjacent to one ar from reddish orange to yel at least one side to the edge should be at least 50 mm x Note 1: A typical acceptable 6/14; 10 R 6/14; 1.25 YR 6/ Note 2: ASTM D1535-97 s between Munsell notation a	moke should son, in dayl ing the ran comparison comparison consist of a overing the ra 8.75 R 6/ 5 YR MAX) in s. The colour tother, in ord lowish orang e of the chart a 100 mm in e progressio (14; 3.75 YR specifies a r	d be evaluated by light, to a colour ge of acceptable chart should have a series of at least ange from reddish (14) to yellowish n gradual steps of r chips should be der of progression ge, and extend on t. Each colour chip size. n would be 8.75 R MAX; 5 YR MAX. nethod 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 Passed Failed

Lifebuoy self-activating Model: Su			E Time: eyor: nization:
2.1.3.10 Wave test		Regulations: LS	A Code I/1.2.2 & II/2.1.3; MSC.81(70) 1/1.9.5
Test Procedure		Acceptance Criteria	Significant Test Data
A smoke signal should be tested at least 300 mm high.	swamped. The smoke manner dar during the e It should en rate for a pe to waves of The colour means of comparison colours. Th or matte fini colour chip (Munsell no notation 5 lightness. one anothe yellowish or of the chart 100 mm in s	nen should function effectively a e signal should not ignite explosive agerous to persons close by, nor emi- entire smoke emission time. Init smoke of a highly visible colour a eriod of not less than 15 minutes whe at least 300 mm high. of the orange smoke should be ev- visual comparison, in daylight, to chart containing the range of accepta- te colour comparison chart should his sh, and consist of a series of at least os, covering the range from redd tation 8.75 R 6/14) to yellowish orang YR MAX) in gradual steps of hue, c The colour chips should be secured r, in order of progression from reddis ange, and extend on at least one side the colour chip should be at least	Ind not be Specimen No. 25 By or in a trany flame Smoke emission timesec Smoke emission quality Smoke emission quality t a uniform in subjected (Continuous/Intermittent) valuated by o a colour able orange ave a gloss five orange sh orange ge (Munsell nroma, and adjacent to in orange to to the edge st 50 mm x Smoke emission colour: Passed/Failed Deceed Eailed

Lifebuoy self-activating smoke signals	Model:	al Number: Organization			Time:
2.1.3.11 Attachment fittin	ng strength te	est	Regulatio	ns: LSA Code I/1.	2.2, II/2.1.3 & II/2.1.1.6; MSC.81(70) 1/1.9.6 & 10.2.8
Test Procedure Accep		Acceptan	ce Criteria		Significant Test Data
A force of 225 N should be ap fitting that attaches the self-ac smoke signal to the lifebuoy. T be carried out at temperatures and +65°C.	tivating The test is to	The smoke signal or the fitting result of the test.		be damaged as a	Load applied to fittingN Strength test Passed Failed 2. Test at +65°C (specimen 4) Load applied to fittingN Strength test Passed Failed Comments/Observations
					Passed Failed

Lifebuoy self-activating smoke signals	Model:	umber: Organization:			Time:		
2.1.3.12 Safety inspectio	n		Regulation	ns: LSA Code I/1.2	2.2, MSC.81(70) 1/ 1.9.4/ 4.5		
Test Procedure		Acceptanc	ce 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	Clear and precise operating an marked on the smoke signal.	nd mounting	instructions are	Markings and identification of signal: Passed Failed		
		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 dat on the outside.	te of expiry i	ndelible 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 o	Model:		Surveyor: Organization:	
		Submitted drawings and do		Status
Drawing No.	Revision No. & date		Title of drawing	
		Submitted reports and doc	uments	Status
Report/Document No.	Revision No. & date	Т	itle of report / document	
		Maintenance Manual -		
		Operations Manual -		

Inherently buoyant lifejackets	Manufacturer: Model: Lot/Serial Number:		Date: Time: Surveyor:			
2.2.1.2 Quality assurance	Regulations	s: - MSC.81(70) 2/1.1, 1.2				
III of the International Convention for the Safety of Life at Sea, 1974,			Quality Assurance Standard Used:			
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 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 Procedure:				
		Quality Assurance Manual:				
		Description of System.				
		Quality Assurance System acceptable				
		Yes	No			
		Comments/Observations				

Inherently buoyant Manufacturer: Iifejackets Model: Lot/Serial Number: Model:				Surveyor:		
2.2.*	1.3 Visual inspection		Regulations: LSA Code I/1.2.2.1, 1.2.2.6, 1.2.2.7, 1.2.2.9, 1.2.3; LSA Code II/ 2.2.1.5.5, 2.2.1.10, 2.2.1.13, 2.2.1.16 &2.2.1.17		Code II/ 2.2.1.14, 2.2.1.5.3 &	
	Test Procedure		Acceptance Criteria		Signifi	cant Test Data
.1	Approval markings Retro-reflective tape	be cle Admin operat the ap	ntly buoyant lifejackets should: arly marked with approval informa istration which approved it, date of ional restrictions, and (if an infant propriate symbol according to resc ed with approved patches of retro-	manufacturer any or child lifejacket) olution A.760(18).	Passed	Failed
.2	Retro-reflective tape	with a resolu the ar way th	a total area of at least 400 c tion A.658(16). In the case of a re- rangement should be complied with e lifejacket is put on. Such material n on the lifejacket as possible.	m ² according to versible lifejacket, h no matter which		
.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 bein clearly capable of being worn in d incorrectly, it is not injurious to the e comfortable to wear;	one way and, if	Passed	Failed
.5	Whistle	be fitte lifejac	ed with a whistle firmly secured by ket.	y a lanyard to the	Passed	Failed
.6	Colour of lifejacket		nternational or vivid reddish orange visible colour.	e or a comparably	Passed	Failed

.7 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 water into a survival craft or a rescue boat.	Passed	Failed
.8	Oversized lifejacket	If an adult lifejacket is not designed to fit persons weighing 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.		Failed

Inherently buoyant lifejackets	Manufacturer: Model: Lot/Serial Number:			Date: Time: Surveyor: Organization:		
2.2.1.4 General data and specifications			Regulation	s: LSA Code / M	SC.81(70)	
Construction Material:		Additional equipment	Additional equipment:		Donning instructions:	
Fabric produced by: Type: Buoyant material produced by:		Retro reflective materia Type: Whistle: - Type:	YES	□NO	□ YES	□NO
Туре:		Light (if fitted): Type:		□NO		
					Passed	Failed

Inherently buoyant lifejackets	Model:		Surveyor:			
2.2.1.5 Temperature cyclin	ng test		Regulation	s: LSA Code I/1.	2.2.2; MSC.81(70) 1/2.1	
Test Procedu	re	Accept	ance Criteria		Significant Test Data	
A lifejacket should be subjected to a temperature cycling test of 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:		damage such as shrinking, cracking, swelling, dissolution or changes of mechanical qualities.		(See following page for test data) Passed Failed		
 an 8 h exposure at a minim +65°C to be completed in a 						
 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 max of -30°C to be completed th						
 the specimen removed from that same day and lef ordinary room conditions a 20°C ± 3°C until the next d 	t exposed under at a temperature of					
The lifejacket should then be e examined.	externally					

2.2.1.5	Temperature cycling test – Test of	lata Re	gulations: LSA Code I/1.2.2.2; MSC.81	ntions: LSA Code I/1.2.2.2; MSC.81(70) 1/2.1			
	НОТ	CYCLE	CO	COLD CYCLE			
Cycle 1	Date In: Time In: Temperature:°C	Date Out: Time Out: Duration: ho	Date In: Time In: Irs Temperature:°C	Date Out: Time Out: Duration: hours			
Cycle 2	Date In: Time In: Temperature:°C	Date Out:	Date In: Time In: Irs Temperature:°C	Date Out: Time Out: Duration: hours			
Cycle 3	Date In: Time In: Temperature: °C	Date Out: Time Out: Duration: hor	Date In: Time In: Irs Temperature:°C	Date Out:			
Cycle 4	Date In: Time In: Temperature:°C	Date Out:	Date In:	Date Out: Time Out: Duration: hours			
Cycle 5	Date In: Time In: Temperature:°C	Date Out: Time Out: Duration: hor	Date In:	Date Out: Time Out: Duration: hours			
Cycle 6	Date In: Time In: Temperature:°C	Date Out:	Time In:	Date Out:			
Cycle 7	Date In: Time In: Temperature:°C	Date Out:	Date In: Time In: Irs Temperature:°C	Date Out:			
Cycle 8	Date In: Time In: Temperature:°C	Date Out: Time Out: Duration: hot	Date In: Time In: Irs Temperature:°C	Date Out:			
Cycle 9	Date In: Time In: Temperature:°C	Date Out: Time Out: Duration: hot	Date In: Time In: Irs Temperature:°C	Date Out: Time Out: Duration: hours			
Cycle 10	Date In: Time In: Temperature:°C	Date Out: Time Out: Duration: hot	Date In:	Date Out:			

Inherently buoyant lifejackets	• •			Surveyor:			
2.2.1.6 Buoyancy test			Regulation	s: LSA Code II	/2.2.1.11; MSC.8	31(70) 1/2.2	
Test Procedu	ire	Accepta	ance Criteria			Significant Test	Data
The two lifejackets subjected cycling and the hot and cold in then be used for the buoyancy The buoyancy of the two lifej measured before and after submersion to just below the water. The test to be repeate as necessary to perform the te compartment in the uninflated	flation test should y test. ackets should be 24 h complete surface in fresh ed as many times est once with each	The difference betwee the final buoyancy sho initial buoyancy.			Start (time): Temperature: Finish (time): Temperature: Buoyancy 1	Buoyancy 2 kg Fai	

Inherently buoyant lifejackets	• •			Surveyor:		
2.2.1.7 Fire test	4		Regulations	s: LSA Code II/2	.2.1.1; MSC.81(70) 1/1.5,	2.3
Test Procedu	re	Accept	ance Criteria		Significa	ant Test Data
A test pan 30 cm x 35 cm x 6 cm should be placed in an essentially draught-free area. Water should be put into the bottom of the test pan to a depth of 1 cm followed by enough petrol to make a minimum total depth of 4 cm. The petrol should then be ignited and allowed to burn freely for 30s. The lifejacket should then be moved through the flames in an upright, forward, free-hanging position, with the bottom of the lifejacket 25 cm above the top edge of the test pan so that the duration of exposure to the flames is 2 s.				Passed	Failed	
2.2.1.8 Oil resistance test			Regulations	s: LSA Code II/1	.2.2; MSC.81(70) 1/1.4	
Test Procedu	re	Acceptance Criteria		Significant Test Data		
The lifejacket should be immersed horizontally for a period of 24 h under 100 mm head of diesel oil at normal room temperature.		After this test, the lifeja damage such as sh dissolution or change o	rinking, crac	king, swelling,	Passed	Failed

Inherently buoyant lifejackets	Manufacturer: Model: Lot/Serial Number:		Surveyor:									
2.2.1.9 Tests of components	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, se and closures should be teste establish that they are: .1 rot-proof, .2 colour-fast and .3 resistant to deterioration f exposure to sunlight and that they are not unduly affected by .4 seawater, .5 oil or .6 fungal attack	cket 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)	Tensile stren (new materia Tear strength .1 Tensil Metho (N/25 (% ret .2 Resist Cycles .3 Tensil Weath (N/25 (% ret Acceptable: .4 Tensil Metho (N/25	ecify):									

.5 Tensile strength after exposure to oil Type of oil: Duration: (N/25 mm width) (% retained strength)
.6 Tensile strength after fungal attach. Type of oil: Duration: (N/25 mm width) (% retained strength)
Acceptable: 4) 🗆 Yes 🗆 No 5) 🗆 Yes 🗆 No 6) 🗆 Yes 🗆 No

Inherently buoyant lifejackets		Surveyor:			Time:				
2.2.1.10 Strength tests - Bo	dy or lifting loop strength	tests	Regulations	: LSA Code I/1.	2.2; MSC.81(70)	1/2.5.1			
Test Proc	Ac	ceptance Crite	eria		Significant Tes	t Data			
	moved from the water and as when it is worn by a an 3,200 N (2,400 N in the rejacket) should be applied jacket that secures it to the e 1) and separately to the a 1) a 1)	result of this te	st. uld be repe	damaged as a ated for each	Force applied: Time: Slippage: Closure(s) teste Illustration of life tested: Test results Closure system Lifting loop:	ed:ejacket lifting lo : Passed_	op test arrangement if		

Inherently buoyant lifejackets	Model:	anufacturer: odel: t/Serial Number:						Surveyor:				
2.2.1.11 Strength tests - Sho	ulder lift test					Regu	ulation	s: LS/	A Cod	e I/1.2.	2; MSC	C.81(70) 1/2.5.2
Test Procedure					Acc	eptanc	ce Crite	eria				Significant Test Data
Vest-type lifejacket Yoke o	hould then be osed on a form me manner as A force of not case of a child be applied for the shoulder gure 3).	Size Adult Child Infant	A 610 508 305	B 114 63,5	d rema	of Bayert default	иred or	F 432 330 203	G 508 406	H 25,4 22,2 19,1	J 178 152 76,2	Force applied: Shoulder tested: Test result: Passed Failed Comments/Observations

Inherently buoyant lifejackets	Model:	r:		Date: Surveyor: Organization:						
2.2.1.12 Tests for lifejack temperature cycling	et buoyancy mat	erial – Stability under	Regula	ations:	LSA Code I/1.2.2; MSC	.81(70) 1/2.6	6 (2.6.1-	2.6.4)		
Test Procedure	Э	Acceptance Criter	ia		S	ignificant Tes	t Data			
The following tests should be of specimens of each lifejacket b A further four specimens of buoyancy material should be tensile strength test in 2.2.1.14 The specimens should be at lea and be of the same thickness lifejacket. The specimen should be dimension should be recorded the case of kapok, the entire li subjected to the test. The dim recorded at the beginning and Where multiple layers of mate achieve the total thickness lifejacket, the specimens sh thinnest material used.	buoyancy material. f each lifejacket- prepared for the ast 300mm square as as used in the labelled and the prior to the test. In fejacket should be ensions should be end of these tests. erials are used to desired for the hould be of the	The specimens should not s of internal and external chan structure or of mechanical qu	how any ge of	sign	Dimensions prior to test Specimen No. 1 Specimen No. 2 Specimen No. 3 Specimen No. 4 Specimen No. 5 Specimen No. 6 Dimensions after test Specimen No. 1 Specimen No. 2 Specimen No. 3 Specimen No. 3 Specimen No. 5 Specimen No. 5 Specimen No. 6	Length	Widt	h Height		
 ← Six specimens should temperature cycling as prescrii ↑ The dimensions of the s kapok) should be recorded at cycle. The specimens sho examined. 	pecimens (except the end of the last				Specimen No.1 Specimen No.2 Specimen No.3 Specimen No.5 Specimen No.6 Mechanical qualities		and	procedure		

2.2.1.12 Tests for lifejacket buoyancy mate temperature cycling	erial – Stability under Reç	gulations:	ulations: LSA Code I/1.2.2; MSC.81(70) 1/2.6 (2.6.1-2.6.4)				
Test Procedure	Acceptance Criteria	ia Significant Test Data					
			 ↑ Passed → Passed ↓ Passed 				
			Comments/Observations				
			(See following page for test	data)			
 →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 show of internal change of structure.	v any sign	 Passed Passed Passed Comments/Observations 	Failed Failed Failed			

Inherentl lifejacket	y buoyant s	Model:	nber:		Surveyor:		Time:					
2.2.1.12	Temperature cy	cling test – Test d	ata	Regulations: LSA Code I/1.2.2; MSC.81(70) 1/2.1								
		НОТ	CYCLE			CO	LD 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:					

Inherently buoyant lifejackets		er:	Date: Time: Surveyor: Organization:					
2.2.1.13 Tests for lifejacket I		– Compression and water absorption	tions: LSA Code I/1.2.2; MSC.81(70) 1/2.6 (2.6.5-2.6.7)					
Test Procedur	e	Acceptance Criteria	Significant Test Data					
The following tests should be specimens of each type of life material. The tests should b fresh water and the specir immersed for a period of sev	ejacket buoyancy be carried out in nens should be	The specimens should show no sign such as shrinking, cracking, swelling, change of mechanical qualities. The results should state the buoyar	<u>Test results</u> :	(As supplied sp After 1 day	,	ays %diff.		
1.25 m head of water. The tests should be carried o	ut:	which each specimen exerts when s water after 1 and 7 days immersion.			<u>Test results</u> :	(Specimens su cycling)	bjected to	temperature
.1 on two specimens as s .2 on two specimens w		The reduction of buoyancy should not exceed 10% for specimens which have been exposed to the diesel oil conditioning and should not exceed 5% for			Specimen No.			_N %
subjected to the tempe prescribed in 2.2.1.12;	rature cycling as	all specimens.			Specimen No.	4	N	_ N %
.3 on two specimens w	hich have been				Passed		Failed _	
subjected to the tempe prescribed in 2.2.1.12 diesel oil test as prescr	followed by the				<u>Test results</u> :	(Specimens su cycling and o		
					Specimen No.	5 <u> N</u>		N %
					Passed		Failed _	
					Specimen No.	6N		N %
					Passed		Failed _	
					Comments/Obs	servations		

Inherently buoyant lifejackets	Model:	cturer: ial Number:		Date: Surveyor: Organization:
2.2.1.14 Tests for lifejacke	et buoyar	ncy material – Tensile strength test	Regu	llations: LSA Code I/1.2.2; MSC.81(70) 1/ 2.6.8
Test Procedure		Acceptance Criteria		Significant Test Data
Four specimens of each life buoyancy material should be t The tensile strength at break material should be measured and after the combined ex described in 2.6.6.3. of MSC.8	of the before	When tested according to an internat standard, ISO 12402-7:2006 Pers flotation devices – Part 7: Materials components – Safety requirements and methods, acceptable to the Organization materials should have a minimum te strength of 140 kPa before exposure, w should not be reduced by more than following the combined exposures. In the case of kapok, the protective of should have a minimum breaking streng 13 kPa before exposure, which should not reduced by more than 25% following combined exposures.	sonal and test t, the nsile /hich 25% sover th of ot be	Test Results: (Specimens before exposure) 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 $\leq 25\%$ Specimen No 1 Yes No Passed Failed Specimen No 2 Yes No Passed Failed Test Results: (Protective cover for kapok before exposure) Min. Breaking Strength =13 kPa (?) Specimen No 1 Yes No Passed Failed Specimen No 2 Yes No Passed Failed Specimen No 2 Yes No Passed Failed Test Results: (Protective cover for kapok after combined exposure) Reduction in Breaking Strength $\leq 25\%$ Specimen No 1 Yes No Passed Failed Test Results: (Protective cover for kapok after combined exposure) Reduction in Breaking Strength $\leq 25\%$ Specimen No 1 Yes No Passed Failed Specimen No 2 Yes No Passed Failed Specimen No 2 Yes No Passed Failed Specimen No 2 Yes No Passed Failed Comments/Observations

	rently buoyant ckets	Manufacturer: Model: Lot/Serial Number:		Date: Time: Surveyor: Organization:						
2.2.1	.15 Donning Test			Regulations: LSA Code II/2.2.1.5; MSC.81(70) 1/2.7.1 to 2.7.4						
	Tes	at Procedure	Acc	eptance Cr	teria	Significant Te	est Data			
ofte the	n in adverse conditions following features and t	rrect donning by uninitiated persons, , lifejackets should be examined for ested as follows:	performance simple and	e should l d provide	for proper be few and quick and does not					
	t subjects		require tying							
pers sele	e test should be carried sons who are complete acted according to the h following:	various size and heavil should be	es of adults y clad. A capable of	d readily fit , both lightly I lifejackets being worn in only one						
.1	small test subjects nee	ed not be adults;	way.	-	-					
.2		ore than 1/2 of test subjects should at least 1 per height category but eight;								
.3	weight group and one	ould be from the lowest and highest e female should be from the lowest e female should be more than 80 kg								
.4	at least one subject s containing a "1"; and									
.5	containing a "X" to subjects, with no more	bjects should be selected from cells total the required number of test than one subject per cell. A uniform ight ranges should be maintained.								

2.2.1.15 Donning Test Regulation						ons: LSA Co	de II/2.2.1	.5; MS	C.81(70) 1/2	2.7.1 to 2.7.4	3				
		Test Pro	cedure			Ac	Acceptance Criteria			Significant Test Data					
				Weight	range - kg										
Height range (m)	40 -43	43 - 60	60 -70	70 – 80	80 - 100	100 – 110	110 – 120	> 120	Comments/Observations:						
< 1,5	1	Х	Х	Х											
1,5 – 1,6	Х	1	1	Х	Х										
1,6 – 1,7		Х	Х	1	Х	Х									
1,7 -,1,8			Х	Х	1	Х	Х	Х							
1,8 – 1,9			Х	Х	Х	1	1	Х	41						
> 1,9					Х	Х	Х	1							
Т	able – Tes	t subject sel	lection for a	dult lifejacke	ets				Subj	SEX (M/F)	HEIGHT (m)	WEIGHT (kg)	Good Swimmer? (Yes/No)		
									1						
									2						
									3						
									4						
									5						
									6						
									7						
									8						
									9						
									10						
									11						
									12						
									14	l		l	1		

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 <i>Normal clothing</i> means normal indoor clothing, which would not normally interfere with the donning of a lifejacket; .2 <i>Heavy-weather clothing</i> 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.	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.	
Test without instruction 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.	Total number of subjects: # 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.	within	subject should correctly don the lifejacket 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.		subject should don the lifejacket correctly a period of 1 min.	Pass / Fail		

Inherently b lifejackets	ouoyant	Manufacturer: Model: Lot/Serial Number:			Date: Time: Surveyor: Organization:						
2.2.1.15 De	onning Test – Tes				Regulations: LSA Code II/2.2.1.5; MSC.81(70) 1/2.7.1 to 2.7.4.3						
		Tes	st without inst	ruction		Heavy weather clothing test					
Subject	Donning time (se	ec) All closures (Y/N)	secured?	Jump test (P/F)) In-	water test (P/F)	Donning Time (sec)	Donning time (sec)			
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
Comments/C	Observations:										

Inherently buoyant lifejackets	Manufacturer: Model: Lot/Serial Number:	Date: Time: Surveyor: Organization:								
2.2.1.16 Water performance	tests- Preparation for water pe	erformance tests			LSA Code II/2.2.1.2.5 & 2.2.1.3 – 2.2.1.4; /2.8 to 2.8.4, Annex 1, MSC.1/Circ.1470					
Test Pr	rocedure	Acceptance Criteria			Significant Test Data					
This portion of the test is inter the lifejacket to assist a he exhausted or unconscious stat does not unduly restrict mover The in-water performance of	The RTD should and calibrated			Validat	ate: te:					
reference lifejacket, i.e. Refe specified in appendices 1 to 3.	ce of a suitable size standard erence Test Device (RTD) as out in fresh water under still	MSC.81(70), an validated acc MSC.1/Circ.1470.	1, and	Calibrated by: date:						
	candidate lifejacket and the				Subj	SEX (M/F)	HEIGHT (m)	WEIGHT (kg)	Good Swimmer? (Yes/No)	
mentioned in paragraph 2.2.1.	out with at least 12 persons as 15. Only good swimmers should p relax in the water is rarely				1 2					
The test subjects should wear	only swimming costumes.				3 4					
Each test subject should be r tests in 2.2.1.17 and 2.2.1.18 regarding relaxing and exhalin				5 6 7						
only the instructions provided taking measurements, the prop					7 8 9					
the RTD on the subject should necessary.	king measurements, the proper fit, donning, and fastening of e RTD on the subject should be checked and corrected as ecessary.				10					

2.2.1.16 Water performance tests- Preparation for water pe	Regulations: MSC.81(70) 1/			II/2.2.1.2.5 ex 1, MSC.1			-	2.2.1.4;			
Test Procedure	Acceptance	e Criteria	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								

Inherently buoyant lifejackets	Manufacturer: Model: Lot/Serial Number:					Date: Surveyor: Organization:										
2.2.1.17 Water performance t	ests – Righting test			Regu	Ilatio	ns: LS	A Cod	le II/ 2	.2.1.6.2;	; MSC	.81(70)1/ 2.8	5.5			
Test Procedure	Acceptance Criteria							Signifi	icant Te	st Dat	а					
Each test subject should assu a prone, face down position in	the the mouth of the test			CAN	DIDA	TE DEN TRI	/ICE TI	ME (se	c)		REF	ERENO	CE VE TRIA	ST TIME	E (sec)	
water, but with the head lifted so the mouth is out of the wa The subject's feet should	ter. ter. the water should be	oubj	#1	#2	#3	#4	#5	#6	AVG *	#1	#2	#3	#4	#5	#6	AV G *
supported, shoulder width ap with the heels just below	art, 1/10 of a second, starting	-														
surface of the water.	from when the subject's feet are released.	2														
After assuming a starting position with the legs straight and arms along the sides, the subject should then be instructed in the																
	ect times, and the highest times	5														
following sequence to allow body to gradually and comple	the discarded. The test	-														
relax into a natural floa posture: allow the arms	ing a total of six times in the	8														
shoulders to relax; allow the l to relax; and then the spine	egs lowest times discarded.	9 10														
neck, letting the head fall into water while breathing	out Turning time: the average	11														
normally.	turn time for all subjects in the candidate lifejacket															
During the relaxation phase, subject should be maintained	n a average time in the RTD		Ave	rage c	andid	ate tur	n time	(sec):			Av	erage F	RTD tu	rn time	(sec):	
stable face down position.	plus 1 s.			# of	cand	date n	o turns	(NT):				# of	RTD	no turns	5 (NT):	
Immediately after the subject relaxed, with the face in the was simulating a state of us exhaustion, the subject's should be released.	ter, if any, should not exceed tter the number in the RTD.	(* Delete Average # of cand	# of candidate no turns (NT): # of RTD no turns (NT): (* Delete highest and lowest value) 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: Comments/Observations:													

Inherently buoyant lifejackets	Manufacturer: Model: Lot/Serial Number:				Date: Surveyor: Organization:						
2.2.1.18 Water performanc	e tests-Static balance	measuremen	its	Regulations	ons: LSA Code II/ 2.2.1.4; MSC.81(70) 1/ 2.8.6 and 2.8.7						
Test Proced	lure	Acc	eptanc	e Criteria			Significant Test Data				
At the conclusion of the ri making any adjustments in	n body or lifejacket		Freeboa	ard (mm)	Facep	plane (deg)	Torso ang	gle (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								_	
		9								_	
		10								_	
		11 12								_	
		Avg							xxxxx		
	CLJ – Candid RTD – Refere		•			_					

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	Acceptan	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 RTI	not be less than the	Average freeboard, all subjects <u>></u> 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 a minus 10º.	angles should be	Average faceplane angle, all subjects <u>></u> 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).		e average of all gles should be not erage for the RTD	Average torso angles, all subjects \geq average for RTD minus 10° Passed Failed
 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. 		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
			Comments/Observations

Inherently buoyant lifejackets	Model:	: mber:		Date: Surveyor: Organization:						
2.2.1.19 Water performance	ce tests – Jum	p and drop tests	Regulati	ions: 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 lifejac subject should jump vertically i feet first, from a height of at le holding the arms over the entering the water, the test s relax to simulate a state of utter The freeboard to the mout recorded after the test subject of The test should be repeated fro at least 4.5 m. When jumping into the water, th should hold on to the lifejacker entry to avoid possible injury. the water, the test subject sh simulate a state of utter exh freeboard to the mouth should after the test subject comes to The lifejacket and its attachme examined for any damage. believed likely from any jump on lifejacket should be rejected delayed until test from a lower additional precautions demons risk from the required test is ac	into the water, east 1m while head. Upon subject should er exhaustion. h should be comes to rest. om a height of he test subject t during water Upon entering hould relax to austion. The d be recorded rest. ents should be If injury is r drop test, the I or the test height or with strate that the cceptable.	 Following the jump and drop test the lifejacket should: .1 surface the test subject in a face up position with an average freeboard for all the subjects of not less than the average determined for the RTD after the turning test in accordance with 2.2.1.18 minus 15 mm; .2 not be dislodged or cause harm to the test subject; .3 have no damage that would affect its in-wate performance or buoyance and .4 have no damage to its attachments. 	1 m Ju Averaç Averaç (B) – (Did the Yes / Did the buoyat Averaç (B) – (Averaç Averaç (B) – (Did the buoyat							
NOTE: JUMP TESTS <u>SHOU</u> REPEATED IN THE RTD.	J <u>LD NOT</u> BE			e lifejacket have damage to its attachments?: Yes / No ents/Observations						

Inherently lifejackets	y buoyant s	Manufacturer: Model: Lot/Serial Nur			Date: Time: Surveyor: Organization:							
2.2.1.19	Water performan				Regulations: LSA Code II/ 2.2.1.5.6; MSC.81(70)1/2.8.8 and 2.8.9							
TEST DAT	TA SHEET (1 m Jum	ıp)										
Subj	Subject surfaced faceup? (Yes/No)	Freeboard (mm)	Lifejacket became dislodged (Yes/No)	Subject wa harmed? (Yes/No)	vas Damage to Comments/ Observations lifejacket or attachments (Yes/No)							
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

Inherently lifejackets		Manufacturer: _ Model: Lot/Serial Numb	Der:		Surveyor:	Time:						
2.2.1.19	Water performan	ce tests – Jump a	and drop tests (Co	ontinued)		gulations: LSA Code II/ 2.2.1.5.6; MSC.81(70)1/2.8.8 and 2.8.9						
TEST DATA	A SHEET (4.5 m Ju	imp)										
Subj	Subject surfaced faceup? (Yes/No)	Freeboard (mm)	Lifejacket became dislodged (Yes/No)	Subject was harmed? (Yes/No)	lifeja	hage to acket or chments s/No)	Comments/ Observations					
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

Inherently buoyant lifejackets	Model:	urer: Number:		Surveyo	or:								
2.2.1.20 Water performance	ce tests – Sta	ability test	Regulations: LSA Code II/2.2.1.4; MSC.81(70) 1/2.8.10										
Test Procedure		Acceptance Criteria	Significant Test Data										
face-up position of static balance in the not rol	The candidate lifejacket should not roll any subject face down in the water.		Did	the subj down?				the subj Ible face (Ye					
		(a) + (b) = 0		Can	didate	R	TD	Can	didate	F	RTD		
your hands on your stomach lifejacket if possible, and knees up as close to you	bring your	The number of subjects who	Subj	CW	ccw	CW	ccw	CW	ccw	cw	ccw		
possible."	a chest as	are returned to the stable face- up foetal position in the candidate lifejacket should be	2										
The subject should be rotated clockwise at least equa	at least equal to the number who are returned to the stable	3											
by grasping the subject's s upper areas of the lifejacket	houlders or	face-up foetal position in the RTD.	4										
subject attains a 55 ± 5 deg	ree list. The	(e) ≤ (g)	5										
subject should then be rel subject should return to a sta		And	6										
position.		(f) ≤ (h)	7										
The test should then be con the subject rotated counter-o			8										
The entire test should then			10										
with the test subject wearing			11			1							
			12										
			Total "No"	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)		

2.2.1.21 Water performance te	octo owim			Date: Time: Surveyor: Organization:						
test	ming and water emergence	Regulations	s: LSA Co	de II/2.2	2.1.4; MSC.8	31(70) 1/2.8.11				
Test Procedure		Acceptance C	Criteria		Significant Test Data					
All test subjects, without wea lifejacket, should attempt to sw and board a liferaft or rigid plat its surface 300 mm above th surface. All test subjects who suc complete this task should perform	At least two-thirds of the accomplish the task without also be able to perform it with $(b) \ge 2/3$ (a)	the lifejacke	t should	Liferaf	t or Rigid Pla I whether tes		n successfully board liferaft			
wearing the lifejacket.					Subj 1 2 3 4 5 6 7 8 9 10 11 12 Total	Without lifejacket	With lifejacket	(b) 2/3 (a) Passed / Failed		

Inherently buoyant lifejackets	Manufactur Model: Lot/Serial N										Date: Surve Drgan	yor: _ iizatio	on:		Tir	ne:		
2.2.1.22 Infant and children									latio		: LSA Code II/2.2.1.8; MSC.81(70) 1/2.9 – 2.9.1							
Test Procedure					A	ccep	tance	e Crit	eria						S	ignificant To	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	t 14 17 20 22 25 28 30 33						36	38		Size: Infant / Child						
For child-size lifejackets, tes		range (cm) 79-	- 17 1	- 20 X	- 22	- 25	- 28	- 30	- 33	36	38	41	43	Subj	SEX (M/F)	HEIGHT (m)	WEIGHT (kg)	Manikin? (Yes*/No)
be carried out with at least 9 able- bodied persons, and for infant-size lifejackets, tests should be carried out with at least 5 able-bodied persons.		105 90- 118		x	1									1				
All test subjects should be selected		102- 130				1	Х							3				
according to table 2.2 or tab follows:	Jie 2.5 as	112- 135					Х	1						5				
.1 One subject should be se each cell containing a "1".		122- 150							1	1	х			6				
.2 Remaining subjects sl	hould be	145- 165									Х	1	1	7 8				
selected from cells containing an "X", without repeating a cell.														9				
.3 At least 40% of the subjects should be male and at least 40% female.																		
.4 Devices for infants should	he tested																	
on infants as small as 6 kg														*Manikir	n descrip	tion:		

2.2.1.22 Infant and children's lifejacket	2.2.1.22 Infant and children's lifejacket - Test subjects selection				Regulations: LSA Code II/2.2.1.8; MSC.81(70) 1/2.9 – 2.9.1								
Test Procedure		Acceptance	ce Criteri	а		Significant Test Data							
.5 A manikin or manikins may be substituted for test subjects if the	Table 2.3 -	Selection of	of Infant T	est Subjec									
manikin or manikins have been	Height range		Weight F	Range (kg)									
demonstrated to provide representative results compared to human subjects.	(cm)	Less the	an 11	11-14	14-17								
	Less than 83	1		Х									
	79-105	х		1	1								
	90-118				Х								

Inherently buoyant lifejackets	Manufacturer: Model: Lot/Serial Number:			Date: Time: Surveyor: Organization:						
	ldren's lifejacket – nance tests – Righting test		Regulations: LSA Code II/ 2.2.1.8; MSC.81(70)1/ 2.9.2-2.9.3, Annex							
Test Pro	ocedure	A	cceptance Cri	teria	Significant test	data				
This portion of the test is inte of the lifejacket to assist a h exhausted or unconscious lifejacket does not unduly re	elpless person or one in an state and to show that the	calibrated	according	constructed and to resolution sapplicable to the	RTD Size: Infant / Child RTD Constructed by:	date:				
The in-water performance o comparison to the perform standard reference lifejacket (RTD) as specified in appen	t, i.e. Reference Test Device				Validated by:					
All tests should be carried of conditions. Each test for a relevant RTD should be con	candidate lifejacket and the									
The tests may be modified to 12 years of age who are not to ensure their safety and co	comfortable in water, so as									
Prior to taking measurement and fastening of the RTD checked and corrected as no	on the subject should be									
After entering the water, car that there is no significant a trapped in the lifejacket or sy	amount of air unintentionally									

Inherently buoyant lifejackets	Manufacturer: Model: Lot/Serial Number:					_ Surveyor:										
2.2.1.23 Infant and children's Righting test (Contin		ance tes	sts –	Regu	Iatio	ns: LS	SA Coo	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								ata					
Each test subject should assum a prone, face down position in th	The period of time until the mouth of the test subject comes clear of the water should be	Subj		CAN	DIDA	TE DEN TRI	/ICE TI AL	ME (se	ec)		RE	EFERE		EST TIN	ME (sec)
water, but with the head lifted up so the mouth is out of the water. The subject's feet should be supported, shoulder width apart, with the heels just below the		Subj	#1	#2	#3	#4	#5	#6	AVG *	#1	#2	#3	#4	#5	#6	AVG *
	recorded to the hearest	1														ļ
with the heels just below th surface of the water.	starting from when the	2														
	n released. Is The test should be ct conducted a total of six	3														
with the legs straight and arms along the sides, the subject		4														
		5 6														
following sequence to allow th		7														
body to gradually and complete		8														
relax into a natural floatin posture: allow the arms an		9														
shoulders to relax; allow the leg	s times in the RTD and the															
to relax; and then the spine an neck, letting the head fall into th																
water while breathing o																
normally. During the relaxation phase, the subject should be maintained in a stable face down position.	Turning time: the average turn time for all		Aver	age ca	andid	ate tur	n time	(sec):			Ave	erage R	RTD tu	rn time	(sec):	
	subjects in the candidate			# of o	candi	date n	o turns	(NT):				# of	RTD r	o turns	; (NT):	
	lifejacket should not exceed the average time in the RTD plus 1 s.	(* Delet	e high	est an	d lowe	est valu	ie)									
		Averag	e canc	lidate t	urn tir	ne <u><</u> A	verage	RTD tu	urn time	RTD +	1s Pa	assed _		Fai	led	
		# of car	ndidate	e no tu	rns (N	IT): <u><</u> #	of RTE	D no tui	rns (NT):		Pa	assed _		Fai	led	

2.2.1.23 Infant and children's lit 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:	Manufacturer: Model: Lot/Serial Number:								-		
2.2.1.24 Infant and children – Static balance		formance tes	rmance tests Regulations: LSA Code II/ 2.2.1.8; MSC.81(70)1/ 2.8.6, 2.9.2-2.9.3, Annex 2 & 3									
Test Proce	dure		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 subject floating in the relaxed face-up position of static balance resulting from the preceding tests.		F	-reebc	oard (mm)	Facepla	ane (deg)	Torso angle (deg)		Light			
		(CLJ	RTD	CLJ	RTD	CLJ	RTD	Visible?			
C 1	°	1										
Infant lifejackets should mee freeboard requirements, howey	2											
torso angle, faceplane and mobility may be relaxed if		3										
necessary in order to:	ecessary in order to:											
.1 contribute to the rescue	e of the infant by a	5										
caretaker;		6										
.2 allow the infant to be faste contribute to keeping th		7										
caretaker;		8										
.3 keep the infant dry, with free	e respiratory passages:	9										
.4 protect the infant against the evacuation; and	bumps and jolts during											
.5 allow a caretaker to monitor and control heat loss by the infant.		Avg							XXXXX			
		fejacket est Device										

Inherently buoyant Manufacturer:					Date: Time: Surveyor: Organization:						
2.2.1.24 Infant and children's Static balance mea			Regulatio 3	ons: L	s: 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 Crite	ria		Significant Test Data						
 Test Procedure Freeboard – The distance perpendicularly from the water to the lowest point of mouth where respiration mains if the mouth were not held side of the mouth should held the left and right sides are and the surface of the water formed between the most the forehead and chin. Torso angle – The angle vertical, of the line formed points of the shoulder and portion of the pelvis). List angle – The angle surface of the water and a li left and right shoulder or a lears if only the head is tilter 	nce measured surface of the of the subject's ay be impeded, shut. The lowest be measured if not level. ngle, relative to , of the plane forward part of gle, relative to by the forward I hipbone (ilium relative to the ine between the line through the	Acceptance Crite Freeboard: the average freeb subjects should not be less tha for the RTD minus 10 mm Faceplane Angles: The average less than the average for the R Torso Angles: the average of torso angles should be not average for the RTD minus 10 Lifejacket light location: the lifejacket light should permit over as great a segment hemisphere as is practicable.	poard of all an the aver verage of should be RTD minus of all subje less than position of it to be vis	age all not 10° ects' the the	Significant Test Data 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 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:						

test Acceptance Criteria Significant Test Data Without readjusting the lifejacket, the test subject should jump vertically into the water, feet first, from a height of at least 1m while holding the arms over the head. Upon entering the water, the test subject should be recorded after the test subject comes to rest. The test should be recorded after the test subject comes to rest. The test should be repeated from a height of at least 4.5m. Five of the nine subjects part of the nine subjects should the recorded after the test subject comes to rest. The test should be repeated from a height of at least 4.5m. See following page for test data 1 m Jump When conducting water should be recorded after the test subject comes to rest. The test should be repeated from a height of at least 4.5m. When conducting water for the inflejacket during water entry to avoid possible injury. Upon entering the water, the test subject should relax to simulate a state of utter exhaustion. The freeboard to the mouth should be recorded after the test subject comes to rest. Following the jump and drop test, the lifejacket should: 1 Surface the test subject is hould relax to simulate a state of utter exhaustion. The freeboard to the mouth should be recorded after the test subject comes to rest. Following the jump and drop test, the lifejacket should: Did the lifejacket have damage that would affect its in-water per or buoyance?: Yes / No The lifejacket and its attachments should be recorded sheet be eigeded or the test delayed until test from an jump or drop test, the lifejacket should: 1 surface the test subject for all the subjects of not less than the average freeboard for all the subjects of not less than the a	Inherently buoyant lifejackets	Model:	Der:	Date: Time: Surveyor: Organization:
Without readjusting the lifejacket, the test subject should jump vertically into the water, feet first, from a height of at least 1m while holding the arms over the head. Upon entering 	-	et – 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
Without readjusting the integracket, the test subject should jump vertically into the water, the test subject should relax to simulate a state of utter exhaustion. The freeboard to the mouth should be recorded after the test subject comes to rest. The test should not be repeated from a height of at least 4.5m. When jumping into the water, the test subject should relax to should hold on to the lifejacket during water the test subject should be recorded after the test subject comes to rest. The test subject as tate of utter exhaustion. The freeboard to the mouth should be recorded after the test subject comes to rest. The test subject should hold on to the lifejacket during water should hold on to the lifejacket during water the test subject should be recorded after the test subject comes to rest. The test subject comes to rest. The lifejacket and its attachments should be recorded likely from any jump or drop test, the lifejacket should be rejected or the test delayed until test from a lower height or with additional precautions demonstrate that the risk from the inter extension. The precautions demonstrate that the risk from the lifejacket hand the rest comes to rest. The lifejacket and its attachments should be recorded likely from any jump or drop test, the lifejacket should be rejected or the test delayed until test from a lower height or with additional precautions demonstrate that the risk from the life acket that the risk from the life a	Test Procedur	e	Acceptance Criteria	Significant Test Data
Should hold on to the lifejacket during water entry to avoid possible injury. Upon entering the water, the test subject should relax to simulate a state of utter exhaustion. The freeboard to the mouth should be recorded after the test subject comes to rest. The lifejacket and its attachments should be examined for any damage. If injury is believed likely from any jump or drop test, the lifejacket should be rejected or the test delayed until test from a lower height or with additional precautions demonstrate that the risk from the	subject should jump vertical feet first, from a height of a holding the arms over the hea the water, the test subject simulate a state of utter e freeboard to the mouth sho after the test subject comes should be repeated from a	ly into the water, at least 1m while ad. Upon entering should relax to exhaustion. The build be recorded to rest. The test	perform the jump and drop test. When conducting water performance tests under 2.8, infant and child-size lifejackets should meet the following requirements for their critical	1 m Jump Average freeboard, all subjects: mm (A) Average freeboard for RTD (from 2.2.18) : mm (B) (B) – (A)= \leq 15 mm Pass / Fail Did the lifejacket become dislodged or cause harm to the test subject?:
required test is acceptable.	should hold on to the lifejace entry to avoid possible injur the water, the test subject simulate a state of utter freeboard to the mouth sho after the test subject comes to The lifejacket and its attach examined for any damage. If 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.	ket during water y. Upon entering should relax to exhaustion. The buld be recorded o rest. ments should be injury is believed test, the lifejacket delayed until test with additional t the risk from the	test, the lifejacket should: .1 surface the test subject in a face up position with an average freeboard for all the 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;	Did the lifejacket have damage to its attachments?: Yes / No 4.5 m Jump Average freeboard, all subjects: mm (A) Average freeboard for RTD (from 2.2.18) : mm (B) (B) – (A)= \leq 15 mm Pass / Fail 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

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. 	Did the lifejacket have damage to its attachments?: Yes / No Comments/Observations

Inherently buoyant Manufacturer: lifejackets Model: Lot/Serial Number:						Surveyor:						
Ju	hildren's lifejacket Imp and drop tests	-	mance tests – R	egulations: L	ulations: 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							
	A SHEET (1 m Jump											
Subj	Subject surfaced faceup? (Yes/No)	Freeboard (mm)	Lifejacket became dislodged (Yes/No)	Subject was harmed? (Yes/No)	armed? attachments (Yes/		Comments/ Observations					
1												
2												
3												
4												
5												
	hildren's lifejacket - Imp and drop tests		nance tests – R	egulations: L	SA Co	ode 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 (4.5 m Jun	np)										
Subj	Subject surfaced faceup? (Yes/No)	Freeboard (mm)	Lifejacket became dislodged (Yes/No)	Subject was harmed? (Yes/No)		hage to lifejacket or chments (Yes/No)	Comments/ Observations					
1												
2												
3												
4												
5												

Inherently buoyant lifejackets	Model:	l Number:		Surveyo	or:							
2.2.1.26 Infant and children Stability test	n's lifejacke	et – 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 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:						ibject roll face- ? (Yes/No)		stable face		ject return to a e-up position? es/No)		
	(a) + (b) = 0 (a) + (b) = 0 (a) + (b) = 0 (b) = 0 (c) + (b) = 0 (c) + (b) = 0 (c) + (c) +		Can	didate	R	TD	Can	didate	F	RTD		
lifejacket if possible, and		Subj	CW	CCW	CW	CCW	CW	CCW	CW	CCW		
possible."		up foetal position in the candidate lifejacket should be	2									
The subject should be rotated around the longitudinal axis o	of the torso	at least equal to the number who are returned to the stable	3									
by grasping the subject's sh upper areas of the lifejacket	so that the	face-up foetal position in the RTD.	4 5									
subject attains a 55 ± 5 degre subject should then be rele subject should return to a stal	ased. The	(e) ≤ (g) And	6									
position.	bie lace-up	(f) ≤ (h)	7									
The test should then be conc the subject rotated counter-c			8									
The entire test should then b with the test subject wearing												
				(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	
			Total "No"							(9)		

Inherently buoyant lifejackets	Manufactur Model: Lot/Serial N	er:		Surveyor:	Time:			
2.2.1.27 Infant and children	's lifejacket ·	- Mobility test	Regulation	s: LSA Code II/2	2.1.8; MSC.81(70) 1/2.9.2.5			
Test Procedure		Acceptanc	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 for approval and should be of mobility when wearing the size RTD when climbing out of going up and down stairs, pid article from the floor, and the from a cup.	n and out of sideration in of a device compared to appropriate of the water, cking up an	Assistance may be given to wearer mobility should not be than by the appropriate size R	reduced to ar		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			Su	rveyor:	Time:	
(Adults & Child)	Lot/Serial N	umber:	Or	ganization:		
2.2.2.1 Submitted	drawings, reports and	d documents				
	Status					
Drawing No. Revision No. & date			Title of dra	awing		
		Submitted reports an	nd documents			Status
Report/Document No.	Revision No. & date		Title of report /	document		
		Maintenance Manual -				
		Operations Manual -				

Inflatable lifejackets (Adults & Child)	Manufacturer: Model: Lot/Serial Number:		Date: Surveyor: Organization:	Time:
2.2.2.2 Quality assurance			: - 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 us approved prototype life-saving Manufacturers should be requised to ensure that life-saving appliances applied to the second to ensure that life-saving appliances applied to the second as the prototype life-saving appliances applied to the second the second to the second to the second to the second to the second to the second to the second	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 ed comply with the specification of the appliance. ired to institute a quality control procedure iances are produced to the same standard pliance approved by the Administration and ion tests carried out in accordance with the	Quality Assu Standard Use Quality Assu Quality Assu Description c	rance ed: rance Procedure: rance Manual: of System: rance System acceptable	Yes/No
to ensure that life-saving appl as the prototype life-saving ap to keep records of any product	iances are produced to the same standard pliance approved by the Administration and	Description of Quality Assu	of System: rance System acceptable	Yes/No

	Inflatable lifejackets Manufacturer: (Adults & Child) Model:			Date: Surveyor: Organization:			
2.2	2.3 Visual inspection			LSA Code I/1.2			
	Test Procedure	Acceptance	ce Criteria		Signi	ficant Test Data	
1.	Approval markings	Inflatable lifejackets should: be clearly marked with approved Administration which approved		Passed	Failed		
2.	Retro-reflective tape	any operational restrictions be fitted with approved patch with a total area of at le resolution A.658(16). In the c the arrangement should be co way the lifejacket is put on. Su as high on the lifejacket as pos	east 400 cm ² ase of a revers omplied with ne uch material sh	according to sible lifejacket, o matter which	Passed	Failed	
3.	Lifejacket light	have provision to be fitted with	n 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;	vorn 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 rec highly visible colour	ldish 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	Passod	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
		1 83560	
9. 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	

Inflatable lifejackets (Adults & Child)	Model:	Manufacturer: Model: Lot/Serial Number:				ne:			
2.2.2.4 General data and specifications			Regulation	Regulations: LSA Code II/2.2; MSC.81(70)					
Construction Material:		Additional equipment:			Donning instruction	ons:			
Fabric produced by:		Retro reflective material: -		□NO		□NO			
		Туре:							
Туре:		Whistle: -		□NO					
		Туре:							
Inflation system produced by:		Light (if fitted):		□NO					
Туре:		Туре:							
Cover fabric produced by:		Marked	size	range:					
Туре:									
Fabric for the inflatable of Produced by:	chamber	Proper marking for infants a lifejacket:	nd children's	□NO	Passed	_ Failed			
Туре:									
Size and type of gas:									
Means of activating the inflation system:									

Inflatable lifejackets (Adults & Child)	Manufacturer: Model: Lot/Serial Number		Date: Surveyor: Organization:		
2.2.2.5 Temperature cycling	g test		Regulations:	LSA Code I/1.2.	2.2 & 1.2.2.3; MSC.81(70) 1/2.10.1.1
Test Procedur	e	Accep	otance 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 acceptable 1. an 8 h exposure at a minimut +65°C to be completed in or 2. the specimens removed chamber that same day under ordinary room of temperature of 20°C ± 3°C to 3. an 8 h exposure at a maximut-30°C to be completed the r 4. the specimen removed from that same day and left exposion conditions at a tem ± 3°C until the next day; 	t of surrounding I +65°C in the ilternating cycles after each other , repeated for a le: um temperature of ne day; and from the warm and left exposed conditions at a until the next day; um temperature of next day; and the cold chamber sed under ordinary	Two uninflated inflatal 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 PassedFailed 4. Cold inflation test, manual inflation Temperature of water°C. Time to inflate and relief valves blowing sec Manual inflation Passed Failed

Inflatable lifejackets (Adults & Child)	Model: Sur			Surveyor:	Time:
2.2.2.5.1 Temperature cycling	g test - Inflation s	ystem function	Regulations:		2.2 & 1.2.2.3; MSC.81(70) 1/2.10.1.1 - 2.10.1.3
Test Procedur	e	Acce	otance Criteria		Significant Test Data
 The automatic and manual should each be tested immediated temperature cycling test as foll 1. After a high temperature inflatable lifejackets should be stowage temperature of + 60 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 lifejactivated using the manual inflation fully inflate. After exposure to a temperature should fully inflate. 	diately after each lows: cycle, the two be taken from the 55°C. One should utomatic inflation seawater at a ne other should be inflation system. cycle, the two be taken from the C. One should be c inflation system a temperature of - e activated using ure of -15°C for a ejacket should be lation system and re of +40 °C for a jackets should be	The lifejackets should f tests. Each should fully The lifejackets should f tests. Each should fully	y 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 Passed°C. Time to inflate and relief valves blowing sec Manual inflation Passed°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 lifejackets (Adults & Child) Manufacturer: Model: Lot/Serial Number:			Date: Surveyor: Organization:		Time:			
2.2.2.5.2 Temperature cycling test – Test data Regulations: LSA Code I/1.2.2.2 & 1.2.2.3; MSC.8						MSC.81(70) 1/2.10.	1.1	
		HO	T CYCLE			CO	LD 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	Manufacturer: Model:				Time:		
(Adults & Child)			Organization:				
2.2.2.6 Buoyancy test			Regulatio	ns: LSA Code	II/2.2.2.3, 2.2.2; MSC.81(70) 1/2.2, 2.10.1.1		
Test Pr	ocedure	Aco	ceptance Cr	iteria	Significant Test Data		
 and cold inflation test should test. The buoyancy of the two lifejac and after 24 h complete submin fresh water. The test to be necessary to perform the test the uninflated condition. A lifejacket subjected to automatically with one compasion should be repeated until each of the uninflated condition. (The following equipment alternatives may be used to califejacket: 1. a mesh basket or tray large and adequate weights to califejacket; 2. a tank of fresh water large basket or tray and the lifejacket 50 mm below 3. a spring balance accurate to the uninflated condition. 	cket with the uppermost part of the surface of the water; and $p \pm 0.015$ kg. corded at the start of each test	buoyancy a should not buoyancy.	and the fir exceed 5% er should I	en the initial hal buoyancy of the initial be fitted with	1. Lifejacket No.1 Weight of the mesh basket with the lifejacket:Kg Buoyancy of front chamber at startKg. Buoyancy of front chamber at 24 hrKg. Difference in buoyancy < 5%Kg		

Inflatable lifejackets (Adults & Child)	Manufacturer: Model: Lot/Serial Number:			Surveyor:	Time:	
2.2.2.7 Fire test			Regulatio	-	2.1.1; MSC.81(70) 1/2.3, 2.10.1	
Test Pr	rocedure	ļ	Acceptance	Criteria	Significant Test	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 dep petrol to make a minimum total then be ignited and allowed to lifejackets, one inflated the of moved through the flames in a position, with the bottom of the	with correct gas cylinder: temperature cycling and the hot hen be used for the fire test. One d one uninflated during the test. 6 cm should be placed in an Water should be put into the pth of 1 cm followed by enough depth of 4 cm. The petrol should o burn freely for 30 s. The two ther uninflated, should then be an upright, forward, free-hanging e lifejacket 25 cm above the top the duration of exposure to the	burning for melting after The inflated a result of pa	more than being remo lifejacket sh assing throu	hould not sustain 6 s or continue ved from the flame. nould not deflate as gh the flames. ould remain inflated t.	Size of pan x 1. Lifejacket No.1 Passed 2. Lifejacket No.2 Passed Comments/Observations	x cm. Failed

Inflatable lifejackets (Adults & Child)	Manufacturer: Model: Lot/Serial Number:			Surveyor:	Time:
2.2.2.8 Oil resistance test			Regulatio	ons: LSA Code I/1.2	.2.4; MSC.81(70) 1/2.4
Test P	rocedure		Acceptance	Criteria	Significant Test Data
resistance test. The lifejacket should be imme	s should be subjected to the oil rsed horizontally for a period of of diesel oil at normal room	examined e sign of dama	xternally an age such as dissolution	ejacket should be ad should show no shrinking, cracking, or change of	Condition of Lifejacket No.1 after 24 hours. Passed Failed Condition of Lifejacket No.2 after 24 hours. Passed Failed Comments/Observations

Inflatable lifejackets Model:	cturer: al Number:									
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 construction of the lifejacket, including the cover, tapes, seams and closures, inflatable bladders, inflation systems & components should be tested to establish that they are: .1 rot – proof, .2 colour-fast; and .3 resistant to deterioration from exposure to sunlight, and that they are not unduly affected by .4 seawater; .5 oil; or .6 fungal attack	the International Organization for Standardization, in particular	<u>Cover:</u>		<u>Seams:</u>	Additional					

	latable lifejackets dults & Child)	Model:	er: umber:		Surveyor:	Time:							
2.2	2.2.9.1 Coated fabrics test			Regulations:	LSA Code I/1.	.2.2.1, 1.:	2.2.1, 1.2.2.4 & 1.2.2.5; MSC.81(70) 1/2.10.4.1.1-4						
	Test Procedure		Acceptance Criteria			Significant Test Data							
Coated fabrics used in the construction of inflatable buoyancy chambers should comply with the following requirements:													
1.	 Coating adhesion should be tested in accordance with ISO 2411:2000 using the method described at paragraph 5.1 at 100mm/min Coating adhesion should not be less than 5 width. 						Coating Adhes	N,	- Test Results ir Weft Failed				
2.	coating adhesion should when wet following ageing a ISO 188:2007 with an expo \pm 0.5 h in fresh water at (70 following which the meth 2411:2000, paragraph 5.1 applied at 100mm/min.	according to osure of 336 $0.0 \pm 1.0)^{\circ C}$ ood at ISO					Coating Adhes	N,	- Test Results i Weft Failed				
3.	tear strength should be accordance with ISO 4674- ISO 4674-2:1998 using me	-1:2003 and	(3) After being tested accord ISO 4674-2:1998, method A1 be less than 35 N.			3. Passec 4.	Tear strength:		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.				- ons	Failed				

Inflatable lifejackets (Adults & Child) Model: Surve Dot/Serial Number: Surve						Time:					
2.2	.2.9.1 Coated fabric test (c	continued)		Regulations: LSA Code I/1.2.2.1, 1.2.2.4 & 1.2.2.5; MSC.81(70) 1/2.10.4.1.5-8							
	Test Procedure		Acceptanc	ce Criteria		Significant Test Data					
 5. breaking strength should be tested in accordance with ISO 1421:1998 using the CRE or CRT method, following conditioning for 24 ± 0.5 h at room temperature and should not be less than 200 N per 50 mm width. (5) After being tested according breaking strength should not width. 					5. Break Strength (dry)N: Passed Failed						
6.	breaking strength should breaking strength should breaking accordance with ISO 1421 the CRE or CRT method conditioning immersed in for 24 ± 0.5 h at room temp should not be less than 50 mm width.	:1998 using d, following fresh water perature and	(6) After being tested according to ISO 1421:1998, the			6. Break Strength (wet)N: Passed Failed					
7.	elongation to break shoul in accordance with ISO using the CRE or CF following conditioning temperature for 24 ± 0.5 h	1421:1998 RT method at room	(7) After being tested accordir temperature the elongation 60%.			7. Elongation (dry)%: Passed Failed					
8.	elongation to break shoul in accordance with ISO using the CRE or CF following conditioning in fresh water at room temper ± 0.5 h.	1421:1998 RT method nmersed in	(8) After being tested accordir water at room temperature th not exceed 60%.			8. Elongation (wet) %: Passed Failed Comments/Observations					

(Adults & Child) Model: Surveyor Organiza				Surveyor:	Time: on:						
2.2	.2.9.1 Coated fabric test (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		Acceptance Criteria			Significant Test Data					
 the resistance to exposure to light when tested in accordance with ISO 105-B02: 2013. 			with ISO 105 – B02:2013, the contrast between the unexposed and exposed samples should not be less than C		9. Accelerated light test Class Passed Failed						
ISO 105-X12: 2001. 105- X			(10) After being wet and dry r 105- X12:2001, the staining not be less than class 3.			10. Wet staining after rubbing Class . . Passed Failed					
11.	the resistance to seawate be less than class 4 in with ISO 105 EO2: 1994.		(11) After being tested in EO2:1994, the change in control of the change in control less than class 4.			 11. Dry staining after rubbing Class Passed Failed Comments/Observations 					

Inflatable lifejackets (Adults & Child)	Model:	er: lumber:		Surveyor:	n:						
2.2.2.9.2 Operating head load	d test		Regulations	LSA Code I/1.	I.2.2.1, 1.2.2.4 & 1.2.2.5; MSC.81(70) 1/2.10.4.2						
Test Procedure		Acceptance Criteria			Significant Test Data						
The operating head load tes carried out using two lifej lifejacket to be conditioned a 8 hours and the other at +65°C After mounting on the manikir form the lifejacket should be in steady force of (220±10) N ap operating head as near as po point where it enters the chamber. This load should be for 5 minutes during which the of angle in which it is applied continuously varied.	ackets one at -30°C for c for 8 hours. n or the test flated, and a oplied to the ssible to the e buoyancy e maintained direction and	On completion of the test, intact and should hold its pres			 Security of operating head -30°C(Jacket 1) Load applied N. Visible damage Passed Failed						

Inflatable lifejackets (Adults & Child)	Model:	er:			Time:						
2.2.2.9.3 Pressure test (1)			Regulations	LSA Code II/2	2.2.2; MSC.81(70) 1/2.10.4.3.1						
Test Procedure		Acceptance Criteria			Significant Test Data						
Overpressure test The inflatable buoyancy cham be capable of withstanding an in pressure at ambient tempe chambers of a lifejacket should using the manual method of in inflation the relief valves should and a fully charged gas cylinde to the manufacturers recon- should be fitted to the same infl and fired. All fully charged gas used in this test should be size to the markings on lifejacket.	internal over erature. All d be inflated flation, after I be disabled er according mmendation lation device as cylinders	The lifejacket should remain pressure for 30 minutes. The lifejackets should show a cracking, swelling or changes that there has been no signifi inflation component.	no signs of dai s of mechanica	mage such as I qualities and	Duration 2. (t 3. (t 4. t 5. t 6.	Double charge test. as bottle grams. of test min. Chamber 1 - Pressure at the beginning of the est and after 30 min. at the beginning after 30 min Chamber 2 - Pressure at the beginning of the est and after 30 min. at the beginning after 30 min Chambers 3- Pressure at the beginning of the est and after 30 min. at the beginning after 30 min Chamber 4 - Pressure at the beginning of the est and after 30 min. at the beginning after 30 min Chamber 4 - Pressure at the beginning of the est and after 30 min. at the beginning after 30 min Damage to lifejacket Passed Failed nts/Observations					

Inflatable lifejackets (Adults & Child)	Model:	Surveyor:	Time:								
Inflatable infejackets (Adults & Child) Model: Lot/Serial Number: 2.2.2.9.3 Pressure test (2)			Regulations		SC.81(70) 1/2.10.4.3.2						
Test Procedure		Acceptanc	ce Criteria		Significant Test Data						
With one buoyancy chamber is operating head on the opposit chamber should be fired manua fully charged gas cylinder acco manufacturer's recommendat operation of the relief valves noted to ensure that the excess	Induct. Lot/Serial Number: Jobson Lot/Serial Number: 9.3 Pressure test (2) Test Procedure Test Procedure Acceptar ivalve test The lifejacket should remains one buoyancy chamber inflated, the tring head on the opposite buoyancy ber should be fired manually, using a charged gas cylinder according to the facturer's recommendations. The tion of the relief valves should be to ensure that the excess pressure is The lifejackets should show cracking, swelling or change that there has been no signification component.	no signs of da s of mechanica	mage such as I qualities and	1. Chamber 1 Size of gas bottle grams. Pressure at the beginning of the test and after 30 min.							

2.2.2.9.3 Pressure test (2) Continued		Regulations: LSA Code; MSC.81(70) 1/2.10.4.4.2						
Test Procedure	Acceptance C	riteria	Significant Test Data					
Test Procedure	Acceptance C	riteria	Significant Test Data 7. Chamber 3 Size of gas bottle grams. Pressure at the beginning of the test and after 30 min.					
			Comments/Observations					

Inflatable lifejackets Model	cturer: ial Number:	Surveyor:	Time:						
2.2.2.9.3 Pressure test (3)		Regulations: LSA Code; MSC.81(70) 1/2.10.4.3.3							
Test Procedure	Acceptance Criteria	Significant Test Data							
Air retention test One inflation chamber of a lifejacket filled with air until air escapes from to over-pressure valve or, if the lifejach does not have an over-pressure valve until its design pressure, as stated in to plans and specifications, is reached. The test is then repeated as many times necessary to test a different chamber un- each chamber has been tested in the manner. The pressure release valve should settled when the measurement starts.	e et s, e is is til is	 Air retention test Chamber 1: Passed	Failed Failed test and after 12 h. Failed test and after 12 h. Failed test and after 12 h.						

Inflatable lifejackets (Adults & Child)	Model:	Number:		Surveyor:	n:					
2.2.2.9.4 Compression test			Regulations:	LSA Code; M	MSC.81(70) 1/2.10.4.4					
Test Procedure		Acceptance	ce Criteria		Significant Test Data					
The inflatable lifejacket, pac normal manner, should be table. A bag containing 75 I and having a base of 320 mr should be lowered onto the from a height of 150 mm in a This should be repeated ten t which the bag should rema jacket for not less than 3 hou	The lifejacket should be infla and should inflate fully, the jac that no swelling or change o occurred, the jacket should b	cket to be inspec of mechanical pr	ted to ensure operties has	Weight of sand bag Kg. Area of sand bag mm Drop Height mm Drop Time sec No. of Drops sec Length of test hr. Passed Failed Comments/Observations						
2.2.2.9.5 Test of metallic con	nponents		Regulations: LSA Code; MSC.81(70) 1/2.10.4.5							
Test Procedure		Acceptano	ce Criteria		Significant Test Data					
Metal parts and compone lifejacket should be corrosion seawater and should be accordance with ISO 9227:2 period of 96 b	resistant to tested in	The metal components should be significantly affected by c parts of the lifejacket ar performance of the lifejacket.	corrosion, or affend	ect any other						
period of 96 h. Metal components should not affect a magnetic compass of a type used in small boats by more than 5°, when placed at a distance of 500 mm from it. The lifejacket should not affe more than 5°.			ect the magnetic	compass by	2. Magnetic Test on Components. Passed Failed Comments/Observations					

Model:	er:		Surveyor:	Time: :			
2.2.2.9.6 Inadvertent inflation test		Regulations: LSA Code; MSC.81(70) 1/2.10.4.6					
Test Procedure	Acce	eptance Criteria	Significant Test Data				
The resistance of an automatic inflation device in indivertent operation should be assessed to exposing the entire lifejacket to sprays of water for fixed period. The lifejacket should be fitted correctly to a free standing manikin of adult size, with a minimul shoulder height of 1500 mm (see figure 5), or alternatively to an appropriately sized form a shown in figure 2. The lifejacket should the deployed in the mode in which it is worn ready for use but not deployed as used in the water (i.e. if is equipped with a cover which is normally would closed, then the cover should be closed for the test). Two sprays should be installed so as to spray frees water onto the lifejacket, as shown in the diagrar. One should be positioned 500 mm above the highest point of the lifejacket. The other nozz should be installed horizontally at a distance of 500 mm from the bottom line of the lifejacket. These nozzle should have a spray cone of 30°, each orifice beir 1.5 ± 0.1 mm in diameter, and the total area of the orifice should be 50 ± 5 mm ² , the orifice beir evenly spread over the spray nozzle area.	Test set-up for test of aut Figure 5-Test Set-u	-	n	1. Inadvertent Inflation. Passed Failed 2. Auto inflation test. Auto inflation system operable. Passed Failed Comments/Observations			

Inflatable lifejackets (Adults & Child)	Model:	acturer: rial Number:			ate: Time: urveyor: rganization:									
2.2.2.9.6 Inadvertent inflation	n test (contin	ued)	Regulations:	gulations: LSA Code; MSC.81(70) 1/2.10.4.6										
Test Procedure Acceptance C			iteria					Sign	ificant ⁻	Test D	Data			
The air temperature should be 20°C, and water should be supplied to the spray nozzles at a flow of 600 l/h, and at a temperature of 18°C to 20°C.			nflate during the test Passed Failed											
The sprays should be turned on, and the lifejacket should be exposed to the following series of test to assess the ability					2. Auto in	flation		n opera						
 of the jacket to resist inadvertent inflation: .1 5 minutes with the high spray on the front of the lifejacket; .2 5 minutes with the high spray on the 					Time to inflate: sec. Passed Failed Comments/Observations									
 left side of the lifejacket; .3 5 minutes with the high s back of the lifejacket; and .4 5 minutes with the high s right side of the lifejacket. During exposures .1, .2 the horizontal spray should be 	spray on the 2 and .4				Figure Size Adult Child	А	sions: 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
10 periods of 3 sec each to the right sides (but not back) as v spray.	e front, left or	Figure – Alternative form			Infant	305	63,5	76,2 38,1	63,5	191	203		19,1	-

Inflatable lifejackets (Adults & Child)	Model:	er: lumber:			Surveyor:							
2.2.2.10 Strength tests - Boo	ly or lifting lo	oop strength test		Regulations:	LSA Code; M	SC.81(70) 1/2.5.1, 2.10.1.1						
Test Procedure		A	cceptanc	ce Criteria			Significant Test Data					
The lifejacket should be immerator for a period of 2 min. It should removed from the water and c same manner as when it is person. A force of not less the (2,400 N in the case of a child c 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 The test should be repeated encircling closure. The two lifejackets sub temperature cycling and the h inflation test should then be u strength test.	uld then be losed in the worn by a an 3,200 N or infant-size or 30 min to secures it to figure) and he lifejacket. d for each ojected to not and cold	,	Yoke or rrangeme 125 mm	r over-the-head ent for lifejacker diameter for a	type lifejacket ts dult sizes		Passed_	op test arrangement if				

Inflatable lifejackets (Adults & Child)	Manufacturer: Model: Lot/Serial Number:		Surveyor:				Time:				
2.2.2.11 Strength tests - Sh	noulder lift test	Regulations: LSA Code; MSC.81(70) 1/2.5.2, 2.10.1.1									
Tes	t Procedure	Accepta	nce Criteria					Signifi	cant Test	Data	
2.2.2.7, 2.2.2.8 and 2.2.2.10 shoulder strength test. The lifejacket should be imme should then be removed from shown in figure 2 in the sar person. A force of not less that or infant-size lifejacket) should	jected to the tests in 2.2.2.5, 2.2.2.6, above should be subjected to the ersed in water for a period of 2 min. It in the water and closed on a form as ne manner as when it is worn by a an 900 N (700 N in the case of a child hd be applied for 30 min across the nof the lifejacket. (see figure).	Figure 2 – Test form lifejackets	I remain sector	er lift te	n the st for	Time Sign Pass Com	force a of dam ed ments/	applied _ nage Observa			_
Vest-type lifejacket Yoke Figure - Shoulder lift test arran lifejackets C– Cylinder; 125mm diamete 50mm diameter for infant L– Test load	Size A B Adult 610 114 Child 508 102 Infant 305 63,5	C D 76,2 127 76,2 102 38,1 63,5	E 381 279 191	F 432 330 203	G 508 406 241	H 25,4 22,2 19,1	J 178 152 76,2				

Inflatable lifejackets (Adults & Child)	Model:			Date: Time: Surveyor: Organization:								
2.2.2.12 Donning Test (Unin	lated situation	ו)		Regulations: LSA Code II/2.2.1.5; MSC.81(70) 1/2.7.1 to 2.7.4.3, 2.10.2								
Test I	Procedure			Ac	ceptance (Criteria	a			Significant	Test Data	
To minimize the risk of incorre often in adverse conditions, life following features and tested a The test should be carried out w who are completely unfamilia	jackets should s follows: vith at least 12 a r with the lifej	d for the persons selected	Fastenings performance s provide quick a not require tyir Adult lifejacke	and positive ng of knots ets should	ew and e closu readil	ure that does y fit various						
according to the heights and we	0	, in the second s	sizes of adults All lifejackets worn inside-ou	should be	capal	ble of being	Subj	SEX (M/F)	HEIGHT (m)	WEIGHT (kg)	Good Swimmer? (Yes/No)	
.1 small test subjects need not .2 at least 1/3, but not more t		cubicete et			it, or clean	y in On	ny one way.	1				(100,110)
females, including at least '								2				
the tallest height;								3				
.3 at least one male should be group and one female shou								4				
and one female should be n	hore than 80 kg	and 1.8 m;	U ,					5				
.4 at least one subject should b a "1"; and	e selected from	each cell co	ntaining					6				
.5 enough additional subject	s should be s	selected fro	m cells					7				
containing a "X" to total the	required num	ber of test s	subjects,					8				
with no more than one sub across weight ranges shoul			tribution					9				
	Test subject		or adult life	jackets				10				
			ight range -					11				
Ht range (m) 40 -43 43 -		70 – 80	80 – 100	100 – 110	110 – 12	20	> 120	12				
< 1,5 1 X 1,5 - 1,6 X 1		X X	v									
1,5 – 1,6 X 1 1,6 – 1,7 X		× 1	X X	X								
1,7 -,1,8	X	X	1	X	X		Х					
1,8 – 1,9	X	Х	Х	1	1		Х					
> 1,9			Х	Х	Х		1					

Inflatable lifejackets (Adults & Child)	Manufacturer: Model: Lot/Serial Number:			Surveyor:		Time:				
2.2.2.12 Donning Test (Uni	nflated situation)	Regulation	s: LSA Code II/2.2.1.5; MSC.81(70) 1/2.7.1 to 2.7.4.3, 2.10.2							
Clothing Each test subject should be t for the test and appropriate to .1 <i>Normal clothing</i> means r not normally interfere with	o their size, as follows: normal indoor clothing, v	which would	complete when t securely adjusted lifejacket to the ex	urposes donning is contract the subject has don all methods of secont all needed to mee ce requirements,	nned and curing the et the in -	See following page for test data				
.2 Heavy-weather clothing n hostile environment, includ cotton gloves.				The lifejacket should be capable of being donned by at least 75 % of the subjects, and within 1 minute.						
Each test should be timed from test subject declares that dor <i>Test without instruction</i> The test subjects may be Wearing normal clothing, the assistance, guidance or prior closures in the stored condition face up, in front of the test should be identical for each as the following: "PLEASE DON AS POSSIBLE AND ADJUST ABANDON SHIP."	correctly but fails closures, the jump and in-water per MSC.81(70) and 2 performed with t establish whether and the donning is Each subject show within a period of	uld correctly don the I min. uld don the lifejacket	adjust all SC.81(70) 2.8.5 of should be onned to cceptable lifejacket	Total number of subjects: # of subjects successful: # of subjects successful: Pass / Fail Pass / Fail						

Inflatable lifejackets (Adults & Child)	Manufacturer: Model: Lot/Serial Number:			Date: Surveyor: Organization:	
2.2.2.12 Donning Test (Uni	inflated situation)	Regulations	s: 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 fi incomplete, after demonstrat subject with the donning prod don the lifejacket without clothing, using the same instr	tion or instruction to far cedure, the test subject assistance while wear	niliarize the should then ing 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: Model: Lot/Serial Number:			Time:					
2.2.2.13 Donning Test (In	flated situation)	R	Regulations: LSA Code II/2.2.1.5; MSC.81(70) 1/2.7.1 to 2.7.4.3						
	Test Procedure	Acce	eptance Criteria	Significant Test Data					
 in adverse conditions, lifeja features and tested as follo The test should be carried of are completely unfamiliar with the heights and weights in the .1 small test subjects need .2 at least 1/3, but not more including at least 1 per height; .3 at least one male should and one female should female should be more the .4 at least one subject sho "1"; and .5 enough additional subject a "X" to total the required 	but with at least 12 able-bodied persons who with the lifejacket and selected according to table 2.1 and the following: not be adults; than 1/2 of test subjects should be females, height category but excluding the tallest be from the lowest and highest weight group be from the lowest weight group and one	proper per few and s quick and does not re Adult lifeja fit various lightly and lifejackets being wo	s necessary for formance should be simple and provide positive closure that equire tying of knots. ckets should readily sizes of adults, both d heavily clad. All should be capable of orn inside-out, or only one way.						

			Test subje	ect selection f					0				
	Weight lange its									ients/O	bservations		
Ht range (m)	40 -43	43 – 60	60 -70	70 – 80	80 – 100	100 – 110	110 – 120	> 120					
< 1,5	1	Х	Х	Х									
1,5 – 1,6	Х	1	1	Х	Х								
1,6 – 1,7		Х	Х	1	Х	Х						T	
1,7 -,1,8			X X	X X	1 X	X 1	X 1	X X	Subj	SEX (M/F)	HEIGHT (m)	WEIGHT (kg)	Good Swimmer?
1,8 – 1,9			^	~	X	X	X	1	┨╞────	. ,	()	(5)	(Yes/No)
> 1,9					Λ	^	^		1				
									2				
									3				
									4				
									5				
									6				
									7				
									8				
									9				
									10				
									11				
									12				
													•

Inflatable lifejackets (Adults & Child)	Manufacturer: Model: Lot/Serial Number:		Surveyor:	Time:
2.2.2.13 Donning test (Inf	lated situation) (Continued)	Regu	lations: LSA Code II/2.2.1.5; MS	C.81(70) 1/2.7.1 to 2.7.4.3, 2.10.2
	Test Procedure		Acceptance Criteria	Significant Test Data
 test and appropriate to their .1 Normal clothing means normally interfere with the .2 Heavy-weather clothing environment, including gloves. 	s normal indoor clothing, which would not e donning of a lifejacket; means the attire appropriate for a hostile a hooded arctic parka and warm cotton from when the order is given until the test	complete wh securely adju lifejacket to t	ent purposes donning is considered en the subject has donned an isted all methods of securing the he extent needed to meet the in rmance requirements, including eded.	d e -
normal clothing, the first atte or prior demonstration. T condition, should be placed subject. The instruction pro and should be equivalent	ested individually or as a group. Wearing empt should be with no assistance, guidance The lifejacket, with closures in the stored d on the floor, face up, in front of the test ovided should be identical for each subject to the following: "PLEASE DON THIS Y AS POSSIBLE AND ADJUST IT TO A BANDON SHIP."		should be capable of being donne 75 % of the subjects, and within	

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			
<i>Test after instruction</i> 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.	correctly closures in-water MSC.81 performe establish	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.				
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.		ubject should correctly don the lifejacket period of 1 min.	Pass / Fail			
		ubject should don the lifejacket correctly period of 1 min.	Pass / Fail			

	ible lifejack s & Child)	tets	Manufac Model: _ Lot/Seria	turer: al Number: ₋				Date: 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	n				Inflated	situation				
	Test without instruction Test after instruction					Heavy weather clothing		Test withou	it instruction	_	Test after instruction	Heavy weather clothing		
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)	g All closures secured? (Y/N)	Jump test (P/F)	In-water test (P/F)	Donning Time (sec)	Donning Time (sec)		
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
						Comments/O	bservatior	าร:						

Inflatable lifejackets (Adults & Child)	Manufacturer: Model: Lot/Serial Number:		Surveyor:	Time:					
2.2.2.14 Water performance water performance		Regulations: LSA Code II/2 MSC.1/Circ.1470	2.2.1.2.5 & 2.2.1.3 -	.3 – 2.2.1.4; MSC.81(70) 1/2.8 to 2.8.4, 2.10.3. A				0.3. Annex 1,	
Test Proc	edure	Acceptance Cri	teria			Significant ⁻	Test Data		
This portion of the test is inten of the lifejacket to assist a he exhausted or unconscious st lifejacket does not unduly restric The in-water performance of a comparison to the performance reference lifejacket, i.e. Refere specified in appendices 1 to 3. All tests should be carried ou conditions. Each test for a ca relevant RTD should be conduct These tests should be carried ou conditioned in paragraph 2.2 should be used, since the abi rarely otherwise obtained. The test subjects should wear of Each test subject should be ma tests in 2.2.2.15 and 2.2.2.16, p regarding relaxing and exhaling The test subjects should don using only the instructions pro Prior to taking measurements, fastening of the RTD on the sub corrected as necessary.	Ipless person or one in an ate and to show that the ict movement. a lifejacket is evaluated by e of a suitable size standard ence Test Device (RTD) as at in fresh water under still andidate lifejacket and the cted on the same day. but with at least 12 persons .1.15. Only good swimmers lity to relax in the water is only swimming costumes. ade familiar with each of the particularly the requirements g in the face-down position. the lifejacket, unassisted, vided by the manufacturer. the proper fit, donning, and	The RTD should be construct calibrated according to MSC and validated according to M	.81(70), annex 1,	Validat Calibra Test st	ted by: _ ated by: ₋ ubjects s	·		ite:	

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 trapped in the lifejacket or swimming costume.		11 12				

Inflatable lifejackets (Adults & Child)	Model:		Date: Time: Surveyor: Organization:							
2.2.2.15 Water performance to	ests – Righting test	Regulations: LSA Code II/ 2.2.1	.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, sh with the heels just below the su	with the head lifted vater. The subject's oulder width apart,	The period of time until the mouth subject comes clear of the water recorded to the nearest 1/10 of a sec from when the subject's feet are relea	should be ond, starting	See following pages for test data. Average candidate turn time <u><</u> Average RTD turn time RTE	D +1s					
After assuming a starting pos straight and arms along the should then be instructed sequence to allow the body completely relax into a natur- allow the arms and shoulders legs to relax; and then the spir the head fall into the water y normally.	sition with the legs sides, the subject in the following to gradually and al floating posture: to relax; allow the ne and neck, letting	The test should be conducted a total and the highest and lowest times dis test should then be conducted a total in the RTD and the highest and lo discarded. Turning time: the average turn time for in the candidate lifejacket should not average time in the RTD plus 1 s.	r all subjects	All Chambers: Automatic: Manual: Passed Failed Passed Faile Chamber #1: Automatic: Manual: Manual: Passed Failed Passed Faile Chamber #2: Automatic: Manual: Passed Faile Chamber #2: Automatic: Manual: Passed Faile Chamber #3: Automatic: Manual: Manual: Passed Failed Passed Faile Chamber #4: Automatic: Manual: Manual: Passed Failed Passed Faile Chamber #4: Automatic: Manual: Passed Passed Failed Passed	ed ed ed					
During the relaxation phase, th maintained in a stable face do Immediately after the subject h face in the water, simulating exhaustion, the subject's feet s The test should be conducted u have been inflated both manually, and also with one of uninflated.	wn position. as relaxed, with the g a state of utter should be released. using lifejackets that automatically and	The number of "no-turns", if any, exceed the number in the RTD. The test should be repeated compartment deflated until each comp been tested in the uninflated condition	with one partment has	<pre># of candidate no turns (NT): ≤ # of RTD no turns (NT): All Chambers: Automatic: Manual: Passed Failed Passed Faile Chamber #1: Automatic: Manual: Passed Failed Passed Faile Chamber #2: Automatic: Manual: Passed Failed Passed Faile Chamber #3: Automatic: Manual: Passed Failed Passed Faile Chamber #4: Passed Faile Passed Faile Chamber #4: Passed Faile Passed Faile Chamber #4: Passed Faile Passed Faile Passed Faile Chamber #4: Passed Faile Passed Faile Passed Faile Passed Faile Passed Faile Passed Faile Passed F</pre>	ed ed ed					

											& Child) Nodel: Surveyor: Lot/Serial Number: Organization:											
2.2.2.15	Water p	performar	ce tests	– Rightir	ng test							A Cod	le II/ 2.	2.1.3.2;	MSC.	81(70)	1/ 2.8.	5, 2.1	0.3			
							Się	gnifica	nt Te	st Da	ta											
		I			E TIME (se c inflation)							VICE TI al inlfla		c)		REF	ERENO	CE VE TRIA				
Subj	#1	#2	#3	#3 #4 #5 #6 AVG* #							#4	#5	#6	AVG *	#1	#2	#3	#4	#5	#6	AVG *	
1																						
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						
					date turn ti lidate no ti			Ave				rn time Io turns				Av			urn time no turns			
		and lowest e turn time		RTD turn	time RTD +	+1s Pass	ed	Fa	ailed _												_	
# of can	didate no	turns (NT):	<u><</u>) no turns	(NT):	Pass	ed	F	ailed _													
Commer	nts/Obser	vations:																				

Inflatable lifejackets (Adults & Child)	Model:	Irer: Number:		Survey	/or:									
2.2.2.16 Water performance				Ũ				/ 2.8.6 and 2.8.						
Test Procedure		Acceptance Cr	iteria		Significant Test Data									
At the conclusion of the righ without making any adjustments lifejacket position, the		Freeboard: The average freebo should not be less than the a minus 10 mm			See following	pages for te	st data.							
measurements should be made subject floating in the relaxe position of static balance res	ed face-up				Average freet minus 10 mm	ooard, all sul	bjects <u>></u> a	verage freeboa	rd for RTD					
the preceding tests.					All Chambers:	Automatic: Passed	Failed		Failed					
1. Freeboard – The	distance				Chamber #1:	Automatic: Passed	Failed		Failed					
measured perpendicute the surface of the wa					Chamber #2:	Automatic: Passed	Failed	Manual: Passed	Failed					
lowest point of the subj	ect's mouth				Chamber #3:	Automatic: Passed		Manual:	Failed					
where respiration impeded, if the mouth held shut. The lowest mouth should be meas left and right sides are	were not side of the sured if the				Chamber #4:	Automatic: Passed		Manual:	Failed					
 Faceplane angle – The ang to the surface of the water, of 	gle, relative of the plane	Faceplane angles: The average faceplane angles should be not average for the RTD minus 10°		s'	Average facer 10º All Chambers:	blane angle, a	all subject	s <u>></u> average for Manual:	RTD minus					
formed between the most for of the forehead and chin.	orward part					Passed	Failed	Passed	Failed					
					Chamber #1:	Automatic: Passed	Failed	Manual: Passed	Failed					
					Chamber #2:	Automatic:		Manual:						
					Chamber #3:	Passed Automatic:	Failed	_ Passed Manual:	Failed					
					Champer #3:	Passed	Failed		Failed					
					Chamber #4:	Automatic:		Manual:						
						Passed	Failed	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	81(70) 1/	2.8.6 and 2.8	.7, 2.10.3
Test Procedure	Acceptance Cr	iteria		Signi	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 o angles should be not less than RTD minus 10º.	f all subjects' torso	Average torso All Chambers: Chamber #1: Chamber #2: Chamber #3: Chamber #4:	-	ubjects <u>></u> a Failed Failed Failed	Verage for RT Manual: Passed Manual: Passed Manual: Passed Manual: Passed Manual:	_ Failed _ Failed _ Failed _ Failed
	Lifejacket light location: the pos light should permit it to be vis segment of the upper hemisphe	ible over as great a	Does the loca as great a sec Comments/O	gment of the		t permit it to be isphere as pra	e visible over

Inflatable lifejackets (Adults & Child)		facturer: l: erial Nur							Survey	or: _			Time:				
2.2.2.16 Water performance	e tests-	Static b	alance	measui	rement	S	Regu	lations					MSC.81(7				2.10.3
Test Procedure										Significant Test Data							
The test should be repeated with							Inflatior	ו					Man	ual Inlfa	tion		
compartment deflated until compartment has been tested i uninflated condition.			Freeboard Faceplane Torso and (mm) (deg) (deg)				•	Ligh	nt	Freeboard (mm)		Facep (de		Torso (de		Light	
			CLJ	RTD	CLJ	RTD	CLJ	RTD	Visible	e?	CLJ	RTD	CLJ	RTD	CLJ	RTD	Visible?
		1															
		2															
		3															
		4															
		5															
		6															
		7															
		8															
		9															
		10															
		11															
		12								,							
		Avg	9													XXXX	
				-		_											
		KID-	Referen	ice Lest	Device	e											

Inflatable lifejackets (Adults & Child)	Model:	er:		Date: Time: Surveyor: Organization:
2.2.2.17 Water performance	ce 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 Procedur	e	Acceptance Criteria	l	Significant Test Data
Without readjusting the lifejacker should jump vertically into the from a height of at least 1m f arms over the head. Upon ere the test subject should relax to of utter exhaustion. The freebor should be recorded after the ter to rest. The test should be height of at least 4.5 m. When jumping into the water, should hold on to the lifejacket of to avoid possible injury. Up water, the test subject should re- state of utter exhaustion. The mouth should be recorded after comes to rest. The lifejacket and its attachre examined for any damage. If likely from any jump or drop t should be rejected or the test from a lower height or with addir demonstrate that the risk from is acceptable. The test should be conducted that have been inflated both a manually, and also with one of t uninflated.	e water, feet first, while holding the ntering the water, o simulate a state oard to the mouth est subject comes repeated from a , the test subject during water entry pon entering the elax to simulate a e freeboard to the er the test subject ments should be injury is believed delayed until test tional precautions the required test automatically and	lifejacket should: .1 surface the test subject in position with an average free all the subjects of not less average determined for the the turning test in accord 2.2.2.16 minus 15 mm;	a face up eeboard for s than the e RTD after dance with narm to the ld affect its oyance; and hments.	 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 Did the lifejacket have damage to its attachments?: Yes / No

Inflatable (Adults &	lifejackets Child)	Manufacturer: Model: Lot/Serial Num				Time:	
2.2.2.17	Water performance						le II/ 2.2.1.5.6; MSC.81(70)1/2.8.8 and 2.8.9, 2.10.3
TEST DAT	TA SHEET (1 m Jum	p)					
Subj	Subject surfaced faceup? (Yes/No)	Freeboard (mm)	Lifejacket became dislodged (Yes/No)	Subject was harmed? (Yes/No)	lifej atta	nage to acket or chments s/No)	Comments/ Observations
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							

Inflatable (Adults &	e lifejackets a Child)	Manufacturer: Model: Lot/Serial Nun			Date: Time: Surveyor: Organization:
2.2.2.17	Water performanc				Regulations: LSA Code II/ 2.2.1.5.6; MSC.81(70)1/2.8.8 and 2.8.9, 2.10.3
TEST DAT	TA SHEET (4.5 m Ju				
Subj	Subject surfaced faceup? (Yes/No)	Freeboard (mm)	Lifejacket became dislodged (Yes/No)	Subject wa harmed? (Yes/No)	as Damage to Comments/Observations lifejacket or attachments (Yes/No)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Inflatable lifejackets (Adults & Child)	Model:	nrer: Number:		Surveyo	or:						
2.2.2.18 Water performance	tests – Sta	bility test	Regulation	s: LSA Co	ode II/2.2	2.1.4; N	/ISC.81()	70) 1/2.	.8.10		
Test Procedure		Acceptance Criteria	а								
The test subject should attain face-up position of static balar water. The subject should be ins assume 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 subj able face (Ye		
"place your elbows against yo your hands on your stomach,		(a) + (b) = 0		Can	didate	R	TD	Can	didate	F	RTD
lifejacket if possible, and bring y up as close to your chest as po The subject should be rotated around the longitudinal axis of by grasping the subject's sho upper areas of the lifejacket s subject attains a 55 ± 5 degree subject should then be relea subject should return to a stab position.	our knees ssible." clockwise the torso bulders or o that the e list. The lsed. The le face-up	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)				CW				CW	
The entire test should then be with the test subject wearing the The test should be conduct lifejackets that have been infl automatically and manually, and one of the compartments uninfle	e repeated e RTD. ted using ated both d also with		9 10 11 12 Total "No"	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)

Inflatable lifejackets (Adults & Child)	Model:	er: lumber:	Surveyor:										
2.2.2.19 Water performance t test	ests – Swin	nming and water emergence	Regulations: LS	A Code II/2	ode II/2.2.1.4; MSC.81(70) 1/2.8.11								
Test Procedure		Acceptance C	Criteria			Significant Te	est Data						
All test subjects, without w lifejacket, should attempt to swi board a liferaft or rigid platfo surface 300 mm above the wa All test subjects who successful this task should perform it aga the lifejacket. The test should be condu lifejackets that have been in automatically and manually, ar one of the compartments uninfl	m 25 m and rm with its ter surface. Ily complete ain wearing cted using flated both ad also with	At least two-thirds of the accomplish the task without th be able to perform it with the lit $(b) \ge 2/3$ (a)	e subjects who ne lifejacket should a	also Life	atform: j Without lifejacket	atform	(b) Passed / Failed Comments/Observations						

Inflatable lifejackets (Adults & Child)	Manufactur Model: Lot/Serial N									D S O	ate: urve)rgan	yor: _ izatic	on:		Tim	e:		
2.2.2.20 Infant and children's	lifejacket t	ests – To	est s	ubjec	cts		I	Regu	latio							/2.9 – 2.9.1		
Test Procedure					Α	lccep	tance	e Crit	eria						S	ignificant T	est Data	
As far as possible, similar tes adult tests) should be applied fo of lifejackets suitable for in children.	or approval fants and	eight range (cm)	14	17	20	22	Weigh 25 -	t Ranç 28 -	ge (kg) 30 -	33	36 -	38	41	Size: I	nfant / C	hild		
For child-size lifejackets, tests carried out with at least 9 a	ble-bodied		17	20	22	25	28	30	33	36	38	41	43	Subj	SEX (M/F)	HEIGHT (m)	WEIGHT (kg)	Manikin? (Yes*/No)
persons, and for infant-size tests should be carried out wit		79- 105	1	Х										1	(11.71)		(rg)	(165/100)
5 able-bodied persons. All test subjects should be	selected	90- 118		х	1									2				
according to table 2.2 or tab follows:		102- 130				1	х							3				
.1 One subject should be se	elected per	112- 135					х	1						4				
each cell containing a "1".		122-							1	1	х			5 6				
.2 Remaining subjects should b from cells containing an ">		150 145-									Х	1	1	7				
repeating a cell.		165	Та	ble 2.	.3 - S	electi	on of	Infan	t Tes	t Sub	jects			8				
.3 At least 40% of the subjects		·						Weig	ht Rai	nge (kg)			9				
male and at least 40% femal	-	Hei	ight ra (cm)	•		Les	s tha			11-14		14-	·17					
.4 Devices for infants should be infants as small as 6 kg mas		Les	s that	n 83			1			Х								
.5 A manikin or manikins may be			79-10	5			Х			1		1			1	1		<u> </u>
substituted for test subjects if the manikin or manikins have been demonstrated to provide representative results compared to human subjects.			90-11	8								Х	(*Manikir	ı descrip	tion:		

Inflatable lifejackets (Adults & Child)	Manufacturer: Model: Lot/Serial Number:			Surveyor:	Time:			
2.2.2.21 Infant and childr – Righting test	ormance tests	mance tests Regulations: LSA Code II/ 2.2.1.8; MSC.81(70)1/ 2.9.2-2.9.3, Anne. 2.10.3						
Test Pro	ocedure	ŀ	Acceptance (Criteria	Significant test data			
This portion of the test is intend the lifejacket to assist a hell exhausted or unconscious s lifejacket does not unduly restr		MSC.81(70)	ucted and calibrated , annex 2 or 3, as	RTD Size: Infant / Child RTD Constructed by:	date:			
The in-water performance of comparison to the performance reference lifejacket, i.e. Refer specified in appendices 2 to 3.				Validated by:				
All tests should be carried o conditions. Each test for a relevant RTD should be condu	candidate lifejacket and the							
The tests may be modified for years of age who are not co ensure their safety and cooper	mfortable in water, so as to							
Prior to taking measurements, fastening of the RTD on the su corrected as necessary.								
After entering the water, care s there is no significant amount o the lifejacket or swimming cost								
The test should be conducted a been inflated both automaticall with one of the compartments	y and manually, and also							

Manufacturer: Model: Lot/Serial Number:					5	Date: Time: Surveyor: Organization:									
lifejacket – Water performa			Regu	Ilatio											nex 3,
Acceptance Criteria							Sign	ificant T	est Da	ata					
The period of time until the mouth of the test subject comes clear of the water should be			CAN	DIDA		· · · ·				RE	FERE			IE (sec)	1
	Subj	#1	#2	#3	#4	#5	#6	AVG *	#1	#2	#3	#4	#5	#6	AVG *
	1 2														
	3 4														
	7 8														
	9														
		Ave							Average RTD turn time (sec):						
	Model:	Model:	Model: Lot/Serial Number: Lot/Serial Number: Ilifejacket – Water performance tests – ued) Acceptance Criteria The period of time until the mouth of the test subject comes clear of the water should be recorded to the nearest 1/10 of a second, starting from when the subject's feet are released. The test should be conducted a total of six times, and the highest and lowest times discarded. The test should be conducted a total of six times in the RTD and the highest and lowest times discarded.	Model: Lot/Serial Number: Lifejacket – Water performance tests – ued) Reguent Acceptance Criteria The period of time until the mouth of the test subject comes clear of the water should be recorded to the nearest 1/10 of a second, starting from when the subject's feet are released. The test should be conducted a total of six times, and the highest and lowest times discarded. Action of the test should be conducted a total of six times in the RTD and the highest and lowest times discarded. Action of the test should the highest and lowest times discarded.	Model: Lot/Serial Number: Regulation Lifejacket – Water performance tests – ued) Regulation Acceptance Criteria Acceptance Criteria The period of time until the mouth of the test subject comes clear of the water should be recorded to the nearest 1/10 of a second, starting from when the subject's feet are released. Subj The test should be conducted a total of six times, and the highest and lowest times discarded. The test should then be conducted a total of six times in the RTD and the highest and lowest times discarded. 4 Mathematical field of times discarded. The test should the highest and lowest times discarded. 9 Average candid Average candid	Model: State Lot/Serial Number: Regulations: LS Lifejacket – Water performance tests – ued) Regulations: LS Acceptance Criteria Acceptance Criteria The period of time until the mouth of the test subject comes clear of the water should be recorded to the nearest 1/10 of a second, starting from when the subject's feet are released. Subj CANDIDATE DE'TRI 1 1 1 1 1 1 2 2 1 1 1 1 1 1/10 of a second, starting from when the subject's feet are released. 3 1 </td <td>Model: </td> <td>Model: Surveyor: Lot/Serial Number: Organization: lifejacket – Water performance tests – ued) Regulations: LSA Code II/ 2. Acceptance Criteria Signi The period of time until the mouth of the test subject comes clear of the water should be recorded to the nearest 1/10 of a second, starting from when the subject's feet are released. Subj CANDIDATE DEVICE TIME (se TRIAL 2 Image: starting from when the subject's feet are released. 1 Image: starting from when the subject's feet are released. 3 The test should be conducted a total of six times, and the highest and lowest times discarded. The test should then be conducted a total of six times in the RTD and the highest and 9 Image: starter are are are are are are are are are a</td> <td>Model: Surveyor: Lot/Serial Number: Organization: lifejacket – Water performance tests – ued) Regulations: LSA Code II/ 2.2.1.8; N 2.10.3 Acceptance Criteria Significant T The period of time until the mouth of the test subject comes clear of the water should be recorded to the nearest 1/10 of a second, starting from when the subject's feet are released. Subj The test should be conducted a total of six times, and the highest and lowest times discarded. 4 4 9 4 4 4 9 4 4 4 9 4 4 4 9 4 4 4 9 4 4 4 1 4 4 4 1 4 4 4 1 4 4 4 1 4 4 4 1 4 4 4 1 4 4 4 1 4 4 4 1 4 4 4 1 4 4 4 1 4</td> <td>Model: </td> <td>Model: </td> <td>Model: </td> <td>Model: </td> <td>Model: </td> <td>Model: </td>	Model:	Model: Surveyor: Lot/Serial Number: Organization: lifejacket – Water performance tests – ued) Regulations: LSA Code II/ 2. Acceptance Criteria Signi The period of time until the mouth of the test subject comes clear of the water should be recorded to the nearest 1/10 of a second, starting from when the subject's feet are released. Subj CANDIDATE DEVICE TIME (se TRIAL 2 Image: starting from when the subject's feet are released. 1 Image: starting from when the subject's feet are released. 3 The test should be conducted a total of six times, and the highest and lowest times discarded. The test should then be conducted a total of six times in the RTD and the highest and 9 Image: starter are are are are are are are are are a	Model: Surveyor: Lot/Serial Number: Organization: lifejacket – Water performance tests – ued) Regulations: LSA Code II/ 2.2.1.8; N 2.10.3 Acceptance Criteria Significant T The period of time until the mouth of the test subject comes clear of the water should be recorded to the nearest 1/10 of a second, starting from when the subject's feet are released. Subj The test should be conducted a total of six times, and the highest and lowest times discarded. 4 4 9 4 4 4 9 4 4 4 9 4 4 4 9 4 4 4 9 4 4 4 1 4 4 4 1 4 4 4 1 4 4 4 1 4 4 4 1 4 4 4 1 4 4 4 1 4 4 4 1 4 4 4 1 4 4 4 1 4	Model:	Model:	Model:	Model:	Model:	Model:

2.2.2.21 Infant and children's I Righting test (Continu	lifejacket – Water performa ued)		nce tests – 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	a					
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 cand	est and lowest value) idate turn time \leq Average RTD turn time RTD +1s in turns (NT): \leq # of RTD no turns (NT): oservations:	Passed Failed Passed Failed					

Inflatable lifejackets (Adults & Child)						Date: Surveyor: Organization:					
2.2.2.22 Infant and childre – Static balance	formance tes	sts	Regula 2 & 3	ations					2-2.9.3, 2.10.3, Anno		
Test Proce	dure					Sig	nificant Tes	t 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 subject floating in the relaxed face-up position of static balance resulting from the preceding tests.			Free	board (mm)		Facepla	Faceplane (deg)		gle (deg)	Light	
			CLJ		RTD	CLJ	RTD	CLJ	RTD	Visible?	
balance resulting nom the prec	Jeung lesis.	1									
Infant lifejackets should meet the turning time and freeboard requirements, however, the requirements for torso angle, faceplane and mobility may be relaxed if		2									
		3						_			
necessary in order to:	builty may be relaxed in	4									
.1 contribute to the rescue of t	he infant by a caretaker:	5									
	•	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										
		Avg								XXXXX	
		CLJ – Candio RTD – Refere									

Inflatable lifejackets (Adults & Child)	Model:	nber:		Date: Time: Surveyor: Organization:
2.2.2.22 Infant and children Static balance mea			Regulation Annex 2 &	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	Э	Acceptance Crite	eria	Significant Test Data
 Freeboard – The dista perpendicularly from the water to the lowest point mouth where respiration m if the mouth were not h lowest side of the mou measured if the left and rig level. Faceplane angle – The an the surface of the water formed between the most the forehead and chin. Torso angle – The ang vertical, of the line formed points of the shoulder and portion of the pelvis). List angle – The angle 	surface of the of the subject's hay be impeded, held shut. The uth should be the sides are not ngle, relative to r, of the plane forward part of gle, relative to by the forward d hipbone (ilium relative to the	Freeboard: the average freek subjects should not be less th for the RTD minus 10 mm. Faceplane angles: The a subjects' faceplane angles less than the average for the R Torso angles: the average torso angles should be not average for the RTD minus 10	verage of should be r RTD minus 1 of all subject less than t 0º.	Average freeboard, all subjects \geq average freeboard for RTD minus 10 mmf all e not a 10°.f verage faceplane angle, all subjects \geq average for RTD minus 10°.Passedpects' n theAverage torso angles, all subjects \geq average for RTD minus 10° Passed
surface of the water and the left and right shoulder of the ears if only the head is	a line between or a line through	Lifejacket light location: the lifejacket light should permit over as great a segment hemisphere as is practicable.	it to be visil of the upp	isible Does the location of the lifejacket light permit it to be visible over

Inflatable lifejackets (Adults & Child)	Model:	Der:	Date: Time: Surveyor: Organization:					
2.2.2.23 Children's lifejac test	:ket – Water perfor	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					
Without readjusting the li subject should jump vertica feet first, from a height of holding the arms over t entering the water, the te relax to simulate a state o The freeboard to the r recorded after the test subj The test should be repeate at least 4.5m.	ally into the water, at least 1m while he head. Upon est subject should f utter exhaustion. nouth should be ject comes to rest.	Five of the nine subjects should perform the jump and drop test. When conducting water performance tests under 2.8, infant and child-size lifejackets should meet the following requirements for their critical flotation stability characteristics.	See following page for test data 1 m Jump Average freeboard, all subjects: mm (A) Average freeboard for RTD (from 2.2.18) : mm (B) (B) – (A)= \leq 15 mm Pass / Fail Did the lifejacket become dislodged or cause harm to the test subject?: Yes / No					
When jumping into the wat should hold on to the lifeja entry to avoid possible inju the water, the test subject simulate a state of utter freeboard to the mouth sh after the test subject comes The lifejacket and its attact examined for any damage. likely from any jump or drop should be rejected or the test from a lower height precautions demonstrate the required test is acceptable.	acket during water ury. Upon entering ct should relax to exhaustion. The hould be recorded s to rest. chments should be If injury is believed o test, the lifejacket test delayed until or with additional hat the risk from the	 Following the jump and drop test, the lifejacket should: .1 surface the test subject in a face up position with an average freeboard for all the 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; 	Did the lifejacket have damage that would affect its in-water performance or buoyance?: Yes / No Did the lifejacket have damage to its attachments?: Yes / No 4.5 m Jump Average freeboard, all subjects: mm (A) Average freeboard for RTD (from 2.2.18): mm (B) $(B) - (A) = \ \leq 15 \text{ mm} \text{ Pass } / \text{ Fail}$ Did the lifejacket become dislodged or cause harm to the test subject?: Yes / No					
<u>NOTE</u> : JUMP AND DROP <u>NOT</u> BE REPEATED IN TH		.3 have no damage that would affect its in-water performance or buoyance;	Did the lifejacket have damage that would affect its in-water performance or buoyance?: Yes / No					

2.2.2.23 Children's lifejacket – Water perfore test	nance 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.	and .4 have no damage to its attachments.	Did the lifejacket have damage to its attachments?: Yes / No Comments/Observations				

(Adults	le lifejackets & Child)	Model: Lot/Serial Nu	r: ımber:		Surveyor: Organizat	Time:
2.2.2.23 drop tes	Children's lifejac	ket – Water pe	erformance tests	 Jump and 	Regulations: LSA	Code II/ 2.2.1.8, 2.1.5.6; MSC.81(70)1/2.9, 2.8.8, 2.8.9and
	ATA SHEET (1 m Jur	מו)				
Subj	Subject surfaced faceup? (Yes/No)		Lifejacket became dislodged (Yes/No)	Subject wa harmed? (Yes/No)	Damage to lifejacket or attachments (Yes/No)	Comments/ Observations
1						
2						
3						
4						
5						
2.2.1.23 drop tes	Children's lifejac ts ATA SHEET (4.5 m Ju	-	rformance tests	– Jump and	Regulations: LSA 2.8.9	Code II/ 2.2.1.8, 2.2.1.2.5; MSC.81(70)1/2.9, 2.8.8 and
Subj	Subject surfaced faceup? (Yes/No)		Lifejacket became dislodged (Yes/No)	Subject wa harmed? (Yes/No)	as Damage to lifejacket or attachments (Yes/No)	Comments/ Observations
1					, , ,, , ,, , ,, , ,, , ,, , , , , , , , , , , , , , , , , , , ,	
2						
3						
4						
5						

Inflatable lifejackets (Adults & Child)	Model: _	urer:		Surveyo	or:						
2.2.2.24 Infant and children' stability test	Regulations: LSA Code II/2.2.1.8, 2.2.1.4; MSC.81(70) 1/2.8.10, 2.9.2, 2.10.3										
Test Procedure		Acceptance Criteria				Signi	ficant Te	est Data	ì		
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: "place your elbows against your sides,		The candidate lifejacket should not roll any subject face down in the water. (a) + (b) = 0			the subj down? (Did the subject return stable face-up positi (Yes/No)			
				Can	didate	R	TD	Can	didate	F	RTD
your hands on your stomach,	under the		Subj	CW	CCW	CW	CCW	CW	CCW	cw	ccw
lifejacket if possible, and bi knees up as close to your possible." The subject should be rotated a around the longitudinal axis of by grasping the subject's sho upper areas of the lifejacket s subject attains a 55 ± 5 degree subject should then be releas subject should return to a stabl position. The test should then be conduct the subject rotated counter-clo The entire test should then be with the test subject wearing the The test should be conduct lifejackets that have been infla automatically and manually, with one of the comp uninflated.	chest as clockwise the torso bulders or o that the e list. The ised. The le face-up ucted with ockwise. repeated ne RTD.	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 9 	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)

Inflatable lifejackets (Adults & Child)	Model:	er: Number:		Surveyor:	Time:		
2.2.2.25 Infant and children	's lifejacket	- Mobility test	Regulation	s: LSA Code II/2	2.1.8; MSC.81(70) 1/2.9.2.5, 2.10.3		
Test Procedure		Acceptanc	ce Criteria	Significant Test Data			
To be considered in and out of Mobility of the subject both in the water should be given con- determining the acceptability for approval and should be of mobility when wearing the size RTD when climbing out of going up and down stairs, pic article from the floor, and the from a cup.	and out of sideration in of a device compared to appropriate of the water, cking up an	Assistance may be given to wearer mobility should not be than by the appropriate size F	reduced to ar		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		

2.2.3 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 information2.2.3.1.1 General data and specifications2.2.3.1.2 Submitted drawings, reports and documents					
2.2.3.2	Visual insp 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				
2.2.3.3	Temperature cycling test					
2.2.3.4	Light tests					
2.2.3.5	Chromatici	ity test				
2.2.3.6	Drop test					
2.2.3.7	2 m light d	rop test				
2.2.3.8	Switch arra	angement test				
2.2.3.9	Vibration te	est				
2.2.3.10	Mould grow	wth test				
2.2.3.11	Corrosion	and seawater resistance test				
2.2.3.12	Test for oil	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 Model:		Jacket/Immersion suit Model: Surveyor:				Time:		
2.2.3.1.1 General data and specifications				Regulations: LSA Code; MSC.81(70)				
General Inf	formatio	n	Life	jacket Light D	imensions	Lifejacket Light Weight		
TYPE OF SWITCHING:	Autom Manua					Detail of Buld, Battery & Voltages Comments/Observations		
FLASHING								
LIGHT STEADY								
LIGHT								

SSE 7/21/Add.1 Annex 7, page 168

Lifejacket/immersion lights	suit	Model:	ber:		Date: Surveyor: Organization:					
2.2.3.1.2 Submitted drawings, reports and documents										
			Submitted drawings and d	locuments			Status			
Drawing No.	Revisi	ion No. & date		Title	e of drawing					

Submitted reports and documents					
Report/Document No.	Revision No. & date	Title of report / document	Status		
		Maintenance Manual -			
		Operations Manual -			

Lifejacket/immersion suit lights	Model:	umber:	Surveyor:	Surveyor:			
2.2.3.2 Visual Inspection	า		Regulations: LSA Co	ode 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		Acceptano	ce Criteria		Significant Test Data		
Twenty lifejacket lights should in detail for the following items:		The lifejacket lights should:		Results:			
Approval marking		 be clearly marked with the Administration w operational restrictions 	approval information ir hich approved it, ar	ncluding PASS: nd any	FAIL:		
Expiry marking		Administration should determine the period of acceptability, owing to deterioration with age. The established life must be justified by the		PASS: The <u>Results:</u> PASS:	FAIL: FAIL:		
Additional markings		light"); serial number; identification of the mai easily understandable s where applicable, in	ended use (e.g. "Lifejac nufacturer; symbols for on/off switc formation on proper : "DO NOT INCINERAT	PASS: PASS: hing; PASS: battery PASS:	FAIL: FAIL: FAIL: FAIL: FAIL:		
				Comments/Obs	servations		

SSE 7/21/Add.1 Annex 7, page 170

Model:		r: mber:	Surveyor:		
2.2.3.2 Visual Inspection	n (continued)	Re	egulations: LSA Code 1.2.2	2.1/1.2.2.6/1.2.2.9/1.2.2	2.10/1.2.3/2.2.3.1.3
Test Procedure		Acceptance C	Criteria	Sigr	ificant Test Data
		The lifejacket lights should:		<u>Results:</u>	
Electrical short circuit protectio	n	- be provided with electrical prevent damage or injury;	short circuit protection to	PASS:	FAIL:
Visibility when attached to a lifejacket Construction and materials		 be visible over as great a s hemisphere as is practicab lifejacket; 		PASS:	FAIL:
		 be constructed with proper materials; and 	workmanship and	PASS:	FAIL:
		 if the light is a flashing light manually operated switch; 	t, be provided with a	PASS:	FAIL:
Colour of lifejacket light		 be of an international or viv comparably highly visible c will assist detection at sea. 	olour on all parts where this	PASS:	FAIL:
				Comments/Observat	ions

Ineracted immersion suit Model:	2.2.3.3
lights 1 through 4: Light test (hot)	
Temperature Cycling (12 lights in groups of 4) lights 5 through 8: light test (cold)	2.2.3.3
2.2.3.2: lights 9 through 12:light test (ambie	ent) 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 2.2.3.5 Same light: Light same light: Visual Light same light: Chromaticity Test	
Inspection (all 12 Jights) Any one of the 12 lights -2.0 m drop test 2.2.3.6 same light: Light test (ambient) Same light: Chromaticity test	
lights)Any one of the 12 lights - Switch arrangement testsame light subjected to Vibration test 2.2.3.82.2.3.7	
Any one of the 12 lights - 28 day mould growth test (may be waived) 2.2.3.9	
Any one of the 12 lights - Corrosion and seawater resistance test (may be waived) 2.2.3.10	
Any one of the 12 lights - Oil resistance test 2.2.3.11	
Any one of the 12 lights - rain test and watertightness test 2.2.3.12	
Any one of the 12 lights - fire test 2.2.3.13	

Lifejacket/immersion suit lights	Manufacturer: Model: Lot/Serial Number:			Date: Surveyor: Organization:		
2.2.3.3 Temperature cycling	test		Regulatio	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	Procedure		Accept	ance Criteria	Sig	nificant 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:				should not be damaged in the air temperature range		FAIL:
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 unde tests, shoul as shrinkii ion or chang	should show no sign of er high temperatures and, d show no sign of damage ng, cracking, swelling, ge of mechanical qualities after the test.	Attach temperature times spent at each	cycling chart to record temperature.
.1 8 h exposure at a min completed in 1 day; an	imum temperature of +65°C to be d					
same day and left expo	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 maximum temperature of -30°C to be completed the next day; and					
day and left exposed u	the specimens removed from the cold chamber that same day and left exposed under ordinary room conditions at a temperature of 20°C \pm 3°C until the next day.					
After having passed the temper be subjected next to the light	erature cycling test the lights should tests.					

Lifejack lights	et/immersion suit	Model:	urer:		Surveyor:		ime:	
2.2.3.3	Temperature cyc		est data OT CYCLE		Regulations: LSA Code 1.2.2	2.2; MSC.81(70) 1/ 1. COLD (1/10.3.2
Cycle 1	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: In : Temperature :	Time	Date Out: Time Out: Duration:	
Cycle 2	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: In: Temperature:		Date Out: Time Out: Duration:	
Cycle 3	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: In: Temperature:	Time C	Date Out: Time Out: Duration:	
Cycle 4	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: In: Temperature:		Date Out: Time Out: Duration:	
Cycle 5	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: In: Temperature:		Date Out: Time Out: Duration:	
Cycle 6	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: In: Temperature:		Date Out: Time Out: Duration:	
Cycle 7	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: In: Temperature:		Date Out: Time Out: Duration:	
Cycle 8	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: In: Temperature:		Date Out: Time Out: Duration:	
Cycle 9	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: In: Temperature:		Date Out: Time Out: Duration:	
Cycle 10	Date In: Time In: Temperature:	C	Date Out: Time Out: Duration:	hours	Date In: In: Temperature:	Time °C	Date Out: Time Out: Duration:	hours

Lifejacket/immersion suit lights	Model:	er: umber:		Date: Surveyor: Organization:	
2.2.3.4 Light tests				ns: LSA Code 1.2 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/ 5.3/10.4/10.4.9
Test Procedure		Acceptan	ce Criteria		Significant Test Data
Four lifejacket lights which have temperature cycling test sho from a stowage temperature then be operated immersed in a temperature of -1°C, four lif which have passed the tempe test should be taken from temperature of +65°C and immersed in seawater at a te +30°C, and four lifejacket light passed the temperature cyclin be taken from ordinary room c be operated immersed in f ambient temperature. If the voltage at 5 min of oper than the recorded voltage at t it is permissible to use a la same build standard for the test. Using the lowest record light output test can be ca described below. The voltage units should be monitored con 8 h. To make sure that all test a luminous intensity of no 0.75 cd in all directions o hemisphere for 8 h operation, test should be performed.	uid be taken of -30°C and o seawater at ejacket lights rature cycling a stowage be operated mperature of s which have g test should onditions and reshwater at ation is lower he end of life mp from the light output ed voltage a rried out as of all 12 test ntinuously for units provide ot less than f the upper	Water-activated lifejacket functioning within 2 min an intensity of not less than 0.75 freshwater a luminous intens should have been attained wi the 12 lifejacket lights should of intensity of not less than 0.75 hemisphere for a period of at l In the case of a flashing light it rate of flashing for the 8 h op 50 flashes and not more than the effective luminous intens directions of the upper hemis calculate the effective luminou	d have read cd within 5 n sity of not le thin 10 min. continue to p cd in all direct east 8 h. should be ea erative period 70 flashes p sity is at lea phere. (See	ched a luminous nin in seawater. In ess than 0.75 cd At least 11 out of rovide a luminous ctions of the upper stablished that the id is not less than er minute and that ast 0.75 cd in all	Results: All luminous intensity data is to be attached here. PASS: FAIL: Recorded voltage at the end of life: Voltage at 5 min of operation: Lowest recorded voltage: Details of three lights selected for light output test: Al luminous intensity, hours of operation, flash detai8ls, color of light and Voltage data is to be attached here for each light a) Taken form -30°C: b) Taken from +65°C: c) Taken from ordinary room conditions: Comments/Observations

Lifejacket/immersion suit lights	Model:	Manufacturer: Model: Lot/Serial Number:			Time:
2.2.3.4 Light tests (continu	ed)	-		ns: LSA Code 1.2 3.5/ 10.3.5.2/10.3.	2.2.3/2.2.3.1.1/2.2.3.1.2/2.2.3.2.2; MSC.81(70) 1/ 5.3/10.4/10.4.9
Test Procedure		Acceptan	ce Criteria		Significant Test Data
It must be demonstrated that light from each of the specified ranges reaches the requir intensity in all directions of hemisphere when using a which is calibrated to the standards of the appropriate State Standard Institute (No No.70 contains further inform lowest voltage light of the cold test sample lot, the highest with high temperature test sat the mean voltage light of temperature sample lot should These three lights must be use output tests. In the event filament burns out during the test, a second light from performance test lot may Luminous intensity should be a photometer directed at the light source with the test light table. Luminous intensity measured in a horizontal dir level of the center of the light continuously recorded thro rotation.	d temperature ed luminous of the upper photometer photometer photometric e National or te: CIE Publ. mation.). The d temperature oltage light of imple lot and the ambient d be selected. ed for the light that a lamp e light output n the same / be used. measured by center of the on a rotating should be rection at the nt source and	The effective luminous intensiformula: $\begin{bmatrix} \int_{t_1}^{t_2} Id \\ 0.2 + (t_2) \end{bmatrix}$ where: I is the instantaneous intensity 0.2 is the Blondel-Rey constant t_1 and t_2 are time limits of integrations of the second s	$\left[\frac{t}{t}-t_{1}\right]_{max}$		Comments/Observations

Lifejacket/immersion suit lights	Model:	er:			Time:
2.2.3.4 Light tests (continue	ed)			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		Acceptano	ce Criteria		Significant Test Data
The first measurement should 0° (horizontal) and should co taken in azimuth angle at 5° single measurement at 90 Luminous intensity should be a vertical direction, beginning of the light source at the po recorded light output, and recorded through an arc measured data of luminous voltage should be documente After having passed the light t should be subjected to the test.	ontinue to be intervals to a D° (vertical). measured in at the center int of lowest continuously of 180°. All intensity and d.	Flashing lights with a flash du may be considered as f measurement of their luminous provide the required luminous upper hemisphere. The time and reaching the required lumi time) and all time spent below to when the light switches off figure 10.4.1.) Figure 10.4.1 "On time" measure REGURED RECORDED FIGURED	fixed/steady s intensity. S intensity in a interval betw nous intensit the required I should be urement diag	lights for the Buch lights should Il directions of the een switching on y (incandescence uminous intensity disregarded (see	Comments/Observations

Lifejacket/immersion suit lights	Manufacturer: Model: Lot/Serial Number:			Surveyor:	Time:
2.2.3.5 Chromaticity test			Regulation	ns: LSA Code 2.2.	3.1.4; MSC.81(70) 1/ 10.3.2/10.4/10.4.10
Test Proced		Accer	otance Criter	а	Significant Test Data
One lifejacket light which has should be tested for chromatic lies within the boundaries of th diagram specified for each colo Commission on Illumination (C The chromaticities of the lifeja measured by means of colori equipment which is calibrate National or State Standards Publ. No.15.2 contains f Measurement on at least fou hemisphere should be taken.	ity to determine that it be area "white" of the ur by the International IE). acket light should be metric measurement d to the appropriate Institute (Note: CIE urther information).	The measured chroma within the boundaries per CIE. The boundar are given by the follow x 0.500 0.500 0.440 y 0.382 0.440 0.433 (International Standar with colour tables to b	of the area of ies of the are ving corner of 0.300 0.300 0.344 0.278 of on Colours	f the diagram as a for white lights oordinates: 0 0.440 3 0.382 of Light Signals,	Results: All chromaticity data is to be attached here. PASS: FAIL: Comments/Observations

Lifejacket/immersion suit lights	Manufacturer: Model: Lot/Serial Number:			Date: Surveyor: Organization:		
2.2.3.6 Drop test		Regulation	egulations: LSA Code 2.2.1.5.6; MSC.81(70) 1/ 10.3.3			
Test Procedure		Acceptance Criteria		Significant Test Data		
•		• •		njure the wearer, e illuminated and n the water. unctioning within ensity of not less In freshwater a should have been ntinue to provide d in all directions	Results: PASS: Comments/Observati	FAIL:

Lifejacket/immersion suit		er:		Date:	Time:	
lights	Model: Lot/Serial Number:			Surveyor: Organization:		
2.2.3.7 2 m light drop test			Regulation	ns: MSC.81(70) 1/	10.3.4	
Test Procedure		Acceptanc	ce Criteria		Signifi	icant 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.		a capable of providing a luminous intensity of not less than I 0.75 cd for a period of at least 8 h when operated immersed		<u>Results:</u> PASS:	FAIL:	
After this test the light should b ordinary room conditions a immersed in freshwater temperature.	ind operate	,			Comments/Observatio	ons
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 ca		The light must function proper	ly.		<u>Results:</u>	
One lifejacket light which has visual inspection should be sub switch arrangement test.					PASS:	FAIL:
A test person wearing imm gloves, must be able to switch light in its normal operational and off three times. After having passed t arrangement test the light subjected next to the vibration	the lifejacket position on he switch should be				Comments/Observatio	ins

Lifejacket/immersion suit lights	Manufacturer: Model: Lot/Serial Number:		Surveyor:	Date: Time: Surveyor: Organization:		
2.2.3.9 Vibration test		Regu	lations: LSA Code 1	.2.2.1/1.2.2.8; MSC.81	(70) 1/ 10.4/10.4.1	
Test Procedure		Acceptance Crite	ria	Sig	nificant Test Data	
The lifejacket light which has switch arrangement test subjected to a vibration test	should be	The lifejacket light should be construe workmanship and materials	cted with proper	<u>Results:</u>		
IEC 60945:2002, paragraph 8	.7.	The lifejacket light should function aft	er the test.	PASS:	FAIL:	
				Comments/Observa	ations	

Lifejacket/immersion suit lights	Manufacturer:			Date: Surveyor: Organization:		ne:
2.2.3.10 Mould growth test			Regulatior	s: LSA Code 1.2.	2.4; MSC.81(70) 1	/ 10.4/10.4.2
Test Procedure		Acceptanc	ce Criteria		S	Significant Test Data
One lifejacket light which has visual inspection should be s the mould growth test. The lif	subjected to	The lifejacket light should be affected by fungal attack.	rot-proof ar	nd not be unduly	<u>Results:</u>	
the mould growth test. The lifejacket light 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 and the lifejacket light should function after the test.		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 whic maintained at a tempe 29°C +/- 1°C and a relative hu less than 95 %. The period of should be 28 days. After this lifejacket light should be inspe (Note: The mould growth te waived where the manufactur produce evidence that th materials employed will satisfy	Paecilomyces funiculosum, copulariopsis na viride. be placed in ch should be erature of midity of not of incubation s period the cted. est may be er is able to ne external				Comments/Obser	rvations

Lifeja lights	acket/immersion suit S	Model:	er: umber:		Surveyor:		:
2.2.3	.11 Corrosion and s	seawater resi	stance test	Regulation	ns: LSA Code 1.2.	2.4; MSC.81(70) 1/ 1	10.4/10.4.4
	Test Procedure		Acceptance	ce Criteria		Sig	gnificant Test Data
visua	lifejacket light which has I inspection should be su sion and seawater res	ubjected to a	The lifejacket light should be ounduly affected by seawater.	corrosion res	istant and not be	<u>Results:</u>	
	rding to IEC graph 8.12.	60945:2002,	Furthermore, the lifejacket li requirements of IEC 60945:20			PASS:	FAIL:
(Note .1	e: If there are no exposed the Corrosion and Resistance Test new conducted.	Seawater	There should be no undue de the lifejacket light should funct			Comments/Observ	ations
.2	The Corrosion and Resistance Test may where the manufacture produce evidence that metals employed will test.	be waived er is able to the external					
.3	Automatic activated ve be prevented from swit the test.)						
.4	Where the exposed me the automatic switch function test after the cannot be done.	sensor, the					

Lifejacket/immersion suit lights				Surveyor:		
2.2.3.12 Test for oil resis	stance		Regulation	ns: LSA Code 1.2.	2.4; MSC.81(70) 1/ 1	0.4/10.4.6
Test Procedure		Acceptance	ce Criteria		Sig	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 prevented from switching during the test.		by oil and should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities.		<u>Results:</u> PASS: Comments/Observa	FAIL: ations	
2.2.3.13 Rain test and wa	atertightness	test 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		
visual inspection should be su rain test according to IEC paragraph 8.8. After having passed the ra	One lifejacket light which has passed the isual inspection should be subjected to a ain test according to IEC 60945:2002, baragraph 8.8. After having passed the rain test the		omply with the requirements of 8.8.2 and should function after		<u>Results:</u> PASS: Comments/Observa	FAIL:
lifejacket light and the complete power source should be immersed horizontally under not less than 300 mm of fresh water for at least 24 h. Automatic activated version should be prevented from switching during the test.				Comments/Observa	alions	

Lifejacket/immersion suit lights Manufacturer: Model: Lot/Serial Number:		er:		Tim	
2.2.3.14 Fire Test		Regulat	ions: LSA Code 2.	2.1.1; MSC.81(70)	1/ 10.4/10.4.8
Test Procedure		Acceptance Criteria	a	Sig	nificant Test Data
One lifejacket light which has visual inspection should be su fire test. A test pan not less th	bjected to a nan 30 cm x	The lifejacket light should not sustain melting after being totally enveloped in at least 2 s and after being removed from the state of	a fire for a period of	Results:	EAU ·
35 cm x 6 cm should be p essentially draught-free ar should be put in the bottom of to a depth of at least 1 cm enough petrol to make a mi depth of not less than 4 cm should then be ignited and allo freely for at least 30 s. The lif should then be moved through facing them, with the lifejach more than 25 cm above the the test pan so that the exposure to the flames is at le	ea. Water the test pan followed by nimum total . The petrol wed to burn ejacket light o the flames, ket light not top edge of duration of	The lifejacket light should function after	r the test.	PASS: Comments/Observa	FAIL:

2.2.4 REFERENCE TEST DEVICE (RTD) CONSTRUCTION VALIDATION AND CALIBRATION

2.2.4.1 Adult Lifejacket RTD

2.2.4.1.1 Buoyancy calibration
2.2.4.1.2 Construction validation – General
2.2.4.1.3 Construction Validation – Fabric and Webbing measurements

- 2.2.4.2 Child Lifejacket RTD
 - 2.2.4.2.1 Buoyancy calibration
- 2.2.4.3 Infant Lifejacket 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 (RTD) Manufacturer: Model: Lot/Serial Number: _				Time:			
2.2.4.1.1 Buo	yancy calil		R	egulations: L	SA Code 2.2.1	.4; MSC.81(70)	Annex 1, Appendix
	Test Proced	dure		Acceptance	e Criteria		Significant Test Data
the overall buoya between the from maintained within The buoyancy of allowable tolera shrinkage or co stabilizes. Until th have stabilized, th be checked at re and then at least used for testing, may require mon with buoyancies for certification te At the time of distribution of bu adjusted to be achieve this toler -up" inserts) may front and inside fi may need to incluinserts from time within tolerance,	ancy and dis an a tight tole of a new R ance range ompression be buoyanci buoyancy an egular interv t monthly th whichever is re frequent within toler esting. f manufact uoyancy in within 1.3 I rance, thin la rance, thin la rease the s to time to ke or may nee r inserts (or	TD may exceed the e until the normal of the foam inserts es of the foam inserts nd distribution should als (perhaps weekly), hereafter or whenever is longer (frequent use checks). Only RTDs ance should be used ture the left-to-right the front inserts was N of each other. To ayers of foam ("make inserted between the here is these make-up eep these parameters ed to add buoyancy to trim buoyancy, if the	² buoyancy dis	tribution is cal the total buoyar of 6.5 mm thick or areas, an i o be replaced. I ue, measure th t the proper d N difference) be	culated by div ncy foam is requir inside front of f the front buoy le buoyancy of listribution of b	r back insert vancy is under the right and buoyancy (no	Left front buoyancy: N Right front buoyancy: N Total front buoyancy: N Total back buoyancy: N Total buoyancy: N Total buoyancy: N Buoyancy distribution: % in front Make-up inserts added/removed: Foam inserts replaced: Comments: Comments:

Reference test device (RTD)	Model:	nber:	Surveyor: Organization	n:
2.2.4.1.2 Construction va	alidation – Gene	ral Regulations: L	SA 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. Whenecessary to conduct a full of the dimensions of the foam, a of one out of every five RTDs made of a representative stream pieces against the dimension of the appropriate annex to the recommendation on testing of appliances (resolution MSC.8)	check of all spot check s should be ampling of nensions in ne Revised f life-saving	e 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:	Time: on:	
2.2.4.1.3 Construction Va measurements	lidation – Fabric and Webbing	Regulations	LSA Code 2	2.2.1.4; MSC.81(70) Annex 1; MSC.1/Circ.1470, 3	
Test P	Procedure	Acceptance Crite	eria	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 vertical webbing.	from the reference point to the	The vertical webbing should be within \pm 6.5 mm of this point.		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.		This distance should be 73 \pm 6 mm.		Shoulder loop distance: mm	
Chest strap. Measure the distance from the reference point to the top of the chest strap.		This distance should be 168 ± 6 mm.		Chest strap distance: mm Pass Fail	
Waist belt. Measure the distance from the reference point to the top of the waist belt.		This distance should be 416 \pm 3 mm.		Waist belt distance: mm Pass Fail	
Front panel length. Measure the distance from the reference point to the bottom of the foam.		This distance should be 489 ± 6 mm.		Front panel length mm Pass Fail	
Back panel length. Measure the distance from the reference point to the bottom of the back panel.		This distance 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	2.2.1.4; 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	Regulatio	Regulations: LSA Code 2.2.1.4; MSC.81(70) Annex 1; MSC.1/Circ.1470, 3				
Test Procedure	Acceptance C	riteria	Significa	int 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: Pass Fail	mm		
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:	Der:		Surve	yor:	Time:
2.2.4.2.1 Buoyancy calib	ration		Regulatio	ons: LSA Cod	e 2.2.1.4; MSC.81(7	70) Annex 3, Appendix
Test Procedure	e		Accepta	nce Criteria		Significant Test Data
To achieve repeatability in	human subject		Design	Max	Min	
testing, the overall buoyancy of buoyancy between the from RTD must be maintained	t 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		Buoyancy				Total front buoyancy: N
allowable tolerance range until the normal shrinkage or compression of the foam inserts		Total Buoyancy	88 N	91.6 N	84.4 N	Total back buoyancy: N
stabilizes. Until the buoyanc inserts have stabilized, distribution should be chec	buoyancy and	Buoyancy Distribution ²	Total buoyancy: N			
intervals (perhaps weekly), a monthly thereafter or when	nd then at least	¹ values at or co	rrected to stan	Buoyancy distribution: % in front		
testing, whichever is longer (fir require more frequent check	requent use may	² buoyancy distribute by the total bud		У		
with buoyancies within toler, used for certification testing.		At the time of man in the front inserts	was adjusted	Make-up inserts added/removed:		
To check buoyancy tolerance need to be removed from the		To achieve this to achieve the cum	ulative insert b			
care that all trapped air is checking buoyancy and the maintained in their proper s	device exceeds th be altered or repla house may need maintain the front-	aced to bring t to add make	Foam inserts replaced:			
reinstalled (considerable e needed to remove entrapped intact device).	front buoyancy i buoyancy of the ri	is under the ght and left sid nore than a 1.	minimum val les so that the 3 N difference	lue, measure the proper distribution) between the right	Comments:	

	Manufacturer: Model: Lot/Serial Number:			yor:	Time:		
2.4.3.1 Buoyancy calibration		Regulatio	ons: LSA Cod	le 2.2.1.4; MSC.81(7	0) Annex 3, Appendix		
Test Procedure		Accept	ance Criteria		Significant Test Data		
achieve repeatability in human subject sting, the overall buoyancy and distribution buoyancy between the front and back of the D must be maintained within a tigh erance. e buoyancy of a new RTD may exceed the owable tolerance range until the normal rinkage or compression of the foam inserts abilizes. Until the buoyancies of the foam serts have stabilized, buoyancy and stribution should be checked at regula ervals (perhaps weekly), and then at leas onthly thereafter or whenever used fo sting, whichever is longer (frequent use may quire more frequent checks). Only RTDs the buoyancies within tolerance should be ed for certification testing.	Front Buoyancy ¹ Back Buoyancy Total Buoyancy Distribution ² ¹ values at or co ² buoyancy dist the total buoy At the time of ma the front inserts achieve this toler the cumulative in the upper limits replaced to bring to add make -up and side -to-side	Design 42 N 29 N 71 N 59.2 % in front 59.2 % in front corrected to stand ribution is calcu vancy anufacture the left was adjusted to ance, the layers isert buoyancy. ance, the layers isert buoyancy. buoyancy. ance, the layers isert buoyancy. bu	Max 44.4 N 30.2 N 74.6 N 60.7 % in front dard temperatu lated by dividir eft-to-right distriction be within 1.3 were individual f buoyancy of or compartmer ompliance. The e to time to ma es. If the front	ng the front buoyancy ribution of buoyancy 3 N of each other. T ally selected to achiev a new device exceed at may be altered test house may nee intain the front-to-bac buoyancy is under th	Left front buoyancy: N Right front buoyancy: N Total front buoyancy: N Total back buoyancy: N Total buoyancy: N Buoyancy distribution: N Buoyancy distribution: N Buoyancy distribution: N Make-up inserts added/removed: in To y by Make-up inserts replaced: Comments: ck		
rinkage or compression of the foam in abilizes. Until the buoyancies of the serts have stabilized, buoyancy stribution should be checked at r ervals (perhaps weekly), and then a porthly thereafter or whenever use sting, whichever is longer (frequent us quire more frequent checks). Only the buoyancies within tolerance should be for certification testing.	nserts foam and egular t least ed for e may RTDs uld be nserts Take when s are when Id be	InsertsTotal Buoyancyand egular t leastBuoyancy Distribution2and egular t leastBuoyancy Distribution2and egular t leastBuoyancy Distribution2and egular t leastBuoyancy Distribution2and egular t least1 values at or ca the total buoyand be and side2 buoyancy dist the total buoy At the time of ma the front inserts achieve this toler the upper limits replaced to bring to add make -up and side -to-side minimum value, that the proper	Inserts Total 71 N and Buoyancy 59.2 % in front Distribution ² in front ad for 1 values at or corrected to stand and 2 buoyancy distribution is calcu and 2 buoyancy distribution is calcu and 2 buoyancy distribution is calcu and and and Buoyancy and buoyancy and and and and and buoyancy and and corrected to stand and and corrected to stand and and corrected to stand and side -torely and side -to-side insert buoyancy. At the time of manufacture the lefthe and side -to-side insert buoyancy. the upper limits, one layer per and side -to-side insert tolerance and side -to-side insert tolerance and side -to-side insert tolerance minimum value, measure the buo that the proper distribution of and	Inserts Total 71 N 74.6 N and Buoyancy 59.2 % 60.7 % in front in front in front and Buoyancy 59.2 % 60.7 % bistribution ² in front in front arborner ¹ values at or corrected to standard temperate arborner ² buoyancy distribution is calculated by dividir the total buoyancy At the time of manufacture the left-to-right distribution is calculated by dividir the front inserts was adjusted to be within 1.3 achieve this tolerance, the layers were individual the cumulative insert buoyancy. If buoyancy of the upper limits, one layer per compartment replaced to bring the unit into compliance. The to add make -up layers from time to time to mat and side -to-side insert tolerances. If the front minimum value, measure the buoyancy of the that the proper distribution of buoyancy (not fully for the	Inserts Total 71 N 74.6 N 67.4 N Buoyancy 59.2 % 60.7 % 57.7 % It least Buoyancy 59.2 % 60.7 % 57.7 % It least It least It least It least It least It least Buoyancy 59.2 % 60.7 % 57.7 % It least It		

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-isolated)	r:		Surveyor:					
2.3.1.1 General data an	d specifications	Regulations: LSA Code II/2.3; MSC.81(70) I/3.1 & 3.2						
Construction Material:		Additional equipment:					Donning instructions:	
Fabric produced by:		Retro reflective material produced by:			Туре:		□ YES □ NO	
Туре:	N	Whistle produced by (if fitted):			_Туре:			
Buoyant material produced by:	I	Life-line produced by (if fitt	ed):		_Type			
Туре:		Light produced by (if fitted)	:		_ Туре:			

Immersion suits (non-isolated)	Manufacturer Model: Lot/Serial Nu	: mber:	Date: Surveyor: Organization:							
2.3.1.2 Submitted drawings, reports and documents										
		Submitted drawings and documer	nts		Status					
Drawing No.	Revision No. & date	т	itle of drawing							
		Submitted reports and document	s							
Report/Document No.	Revision No. & date	Title o	f report / document		Status					
		Maintenance Manual -								
		Operations Manual -								

	l						
Immersion suits	Manufacturer:		Date: Time:				
(non-isolated)	Model:		Surveyor:				
(non-isolated)	Lot/Serial Number:		Organization:				
2.3.1.3 Quality assurance	ce	Regulations: - MSC.81(70) 2/1.1, 1.2					
of the International Convent as amended, or the internation inspected, representatives of inspections of manufacturers appliances and materials us approved prototype life-saving		Quality Assurance Standard Used: Quality Assurance Procedure:					
to ensure that life-saving appli as the prototype life- saving ap	ired to institute a quality control procedure iances are produced to the same standard pliance approved by the Administration and ion tests carried out in accordance with the	-	surance Manual:				
		Quality As	surance System acceptable Yes No				
		Comments/Observations					

Immersion suits Manufacturer: (non-isolated) Model: Lot/Serial Number: Model:			Date: Time: Surveyor: Organization:			
2.3.1.4 Visual inspection		Regulat	ions: LSA Code I/1.2.2, II/2.3.1	.1.3 & 2.3.1.1.4		
Test Procedure		Acceptance Criteria		Significant Test Data		
Non-insulated immersion suit a .1 be clearly marked w information including the which approved it, date of and any operational restric	vith approval Administration ^f manufacturer		Passed	Failed		
.2 be provided with labels giving operating instructions, general information and manufacturers details as appropriate; and			Passed	Failed		
.3 be fitted with approved patches of retro- reflective material with a total area of at least 400 cm ² and with 100 cm ² on the back if the suit does not automatically turn the wearer face up according to resolution A.658(16).			Passed	Failed		
			Comments/Obser	vations		

Immersion suits (non-isolated)	Manufacturer:			Survey	Tim /or: zation:	e:
2.3.1.4 Visual inspection (C	ontinued)	Reg	gulations: LSA Code I/1.2.2, II/2.			
Test Procedu	re		Acceptance Criteria		Signific	ant Test Data
Does the non-insulated imm whole body with the exception		the	Be of an international or vivid orange, or a comparably highly		Passed	Failed
Are the hands covered, or is the non-insulated immersion suit equipped with permanently attached gloves?			colour on all parts where this will detection at sea.		Passed	Failed
Are their arrangements to pre in the legs?	event excessive free	air			Passed	Failed
Is the non-insulated immersion colour?	on suit of highly vis	ible			Passed	Failed
Is the non-insulated immersion worn without a lifejacket? If yes Is the non-insulated immersion complying with paragraph 2.2.	n suit fitted with a l	ight			Passed	Failed
Is the non-insulated immersion suit fitted with a whistle complying with paragraph 2.2.1.14 of the LSA Code?					Passed Passed	Failed
Fitted with releasable buoyant lifeline or other means to secure it to a suit worn by another person in the water and provided with a suitable means to allow		the low			Passed	Failed
or rescue craft.	rescuer to lift the wearer from the water into survival				Comments/Observations	

Immersion suits (non-isolated)	Manufacturer: Model: Lot/Serial Number:			Date: Time: Surveyor: Organization:				
2.3.1.5 Test subjects		Regulations: L	SA Code II/2.3.1.1.	5, 2.3.1.3.1	4; MSC.81(70) 1/3.1.1 & 2	2.8.2		
Test Procedu	ire	Ac	ceptance Criteria		Significan	t Test Data		
At least six able-bodied perse females of the following he should be used. At least one two of the persons should be more than one female in the s	ights and weights and not more than e females with not	<u>Height</u> 1.4m - 1.6m; 1.6m - 1.8m over 1.8m	Weight 1 person under 1 person over 6 1 person under 1 person over 7 1 person under 1 person over 8	0kg 70kg	Male/Female			

Model:		·	Time: on:				
2.3.1	.6 Test with a lifeja	acket	Regulations: LSA Code II/2.3.1.5; MSC.81(70) 1/3.1.2				
	Test Procedu	ıre	Acceptance Criteria		Significant Test Data		
lifejad	e suit is to be worn in cket, the lifejacket should or the tests prescribed in	d be worn over the			Manufacturer of lifejacket:	Туре:	
					Manufacturer of lifejacket:	_	
					Туре:	_	
					Manufacturer of lifejacket:	Туре:	
					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 Procedu	ure	Acceptance Criteria		Significant Test Data		
	est subjects should wear ng consisting of	a standard range			Did all test subject use the specified test clothing		
 .1 underwear (short sleeved, short legged) .2 shirt (long sleeved) .3 trousers (not woollen, and .4 woollen socks 				□ YES □ NO			
.5 in addition to the clothing the test subject should wear two woollen pullovers during the thermal protective tests..6 If suit is to be worn in conjunction with a lifejacket, the lifejacket should be worn during				Comments/Observations			
	ne thermal protective test	u					

Immersion suits (non-isolated)	Model:		Date: Time: Surveyor:				
2.3.1.8 Donning test (1)		Regulations: LSA Cod	le II/2.3.1.1.1; MSC.81(7				
Test Procedu	re	Acceptanc	ce Criteria		Significant Test Data		
Following a demonstration, each test subject should be able to unpack, don and secure the immersion suit over their test clothing 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, and the test subjects should be able to don such lifejacket without assistance.		he don and secure the im test clothing (see 2.3.1.1 less than 2 min. This ti time to don any associa orally inflated chamber lifejacket, if such is to 1 with the immersion suit.	time to don any associated clothing, inflate any S orally inflated chambers if fitted, and don a S lifejacket, if such is to be worn in conjunction S with the immersion suit.		Donning time Time Pass Fail ct No.1sec ct No.3sec ct No.4sec ct No.5sec ct No.6sec ct No.6sec nents/Observations Sec Sec		
2.3.1.8 Donning test (2)			Regulations: LSA Code I/2.3.1.1.1; MSC.81(70) 1/3.1.4				
Test Procedure		Acceptan	ce Criteria		Significant Test Data		
The immersion suit should be being donned in 5 min at temperature as low as -30° C donning test the packed imm should be kept in a refrigerated a temperature of -30° C for 24	an ambient 5 C. Before the mersion suit d chamber at	he test subject should be a min.	able to complete this ta	ask in	Donning time at - 30°C Time Passed Failed Subject No.1sec Subject No.2sec Subject No.4sec Subject No.5sec Subject No.6sec Comments/Observations		

Model:				Surveyor:		Time:		
2.3.1.9	Ergonomic Test			Regulation	ns: LSA Code II/2.	3.1.3.1, 2.3.1.3	.2; MSC.81(70) 1/3.1.5	
	Test Procedure		Acceptanc	ce Criteria			Significant Test Data	
subjects .1 cli of .2 pe ab	Test Procedure earing the immersion should be able to: imb up and down a ve f at least 5 m in length erform all duties ass bandonment; and pick up a pencil and v	ertical ladder ; ociated with	Acceptance There should be no restriction arm movement. The diamet 8-10 mm.	n in walking		movement: YES All the test su and write: YES All the test su lifejacket with YES All the test su associated wi operate a reso YES All the test su	walking, bending over or arm INO bjects were able to pick up a pencil NO bjects were able to put on the out assistance: NO bjects were able to perform all duties th abandonment, assist others and	
						Comments/Ol	bservations	

Immersion suits (non-isolated)	Manufacturer: Model: Lot/Serial Number:		Date: Surveyor: Organization:				
2.3.1.10 Field of vision test	Regulations: LSA Code II/2.3.1.1.3; MSC						
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.	120°.	Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6		Passed		Failed	
		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				
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 test subject should float face-up with their mouths clear of the water by at least 120mm and be stable in that position. The position of the lifejacket light should permit it to be visible over as great a segment of the upper hemisphere as is practicable.	Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/O		Mouth Freeboard	Nose Freeboard	Light Post (Y/N)	on ok?

Immersion suits (non-isolated)	Model:	er: umber:		Date: Surveyor: Organization:	Time:
2.3.1.12 Righting test			Regulations		1.2; MSC.81(70) 1/3.1.8
Test Procedure		Acceptar	nce Criteria		Significant Test Data
either a non-insulated immersion suit or a non-insulated immersion s non-insulated immersion suit with a 5 s, the test subjects shou		Except where it has be non-insulated immersion suit 5 s, the test subjects should turn themselves from a face-o more than 5 s.	will right the te each demons	Subject No.2	
2.3.1.13 Water ingress and	jump test	Regulations: MSC.81(70) 1/3.1.9			.1.9
Test Procedure		Acceptar	tance Criteria		Significant Test Data
The test subjects should pre-w non-insulated immersion suit a weighed. Following a jump into from a height sufficient to total the body, each test subject sho weighed again. Weighing should be perfor machine accurate to ± 100g.	and then be o the water ly immerse ould be	The difference in the combin the suit should not exceed 50		e test subject and	Mass difference ≤ 500g Pass Fail Subject No.1

Immersion suits (non-isolated)	Model:	er:		Surveyor:	Time:		
2.3.1.14 Jump test	Lot/Ocharin	umber			2.3.1.3.3; MSC.81(70) 1/3.1.10		
Test Procedure		Acceptanc			Significant Test Data		
The test subjects should jump with the suit and lifejacket if required from a height of 4.5m vertically into the water. After the jump, the suit and its attachments should be examined for damage or dislodging, and the test subject should be questioned concerning whether the suit caused any injury to the wearer.		The suit and its attachments s dislodged in any way. The te injured by the suit.			Passed Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations	Failed	
2.3.1.15 Leak test			Regulatio	ns: LSA Code II/	2.3.1.1.1; MSC.81(70) 1/3.1.11		
Test Procedure		Acceptanc	ce Criteria		Significant Test Data		
The test subject should immersion suit and be weigh subject should then be instruct of the following: .1 a period of flotation in calm 1h; or .2 swimming for 20 min for a at least 200 m The test subject should be we after the task.	ed. The test ed to do one n water of distance of eighed again	The ingress of water into the p exceed a mass of 200g.	pre-wetted s	uit should not	Indicate which alternative is used. □Alternative 1 □Alternative 2 Water ingress ≤ 200g Passed Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Observations	Failed	
The weighing machine should to \pm 100g.	be accurate						

Immersion suits (non-isolated)	Model:	er:		Date: Time: Surveyor: Organization:			
2.3.1.16 Swimming and w	vater emerge	nce test	Regulatio	ns: LSA Code II/2	.3.1.3.4; MSC.	81(70) 1/3.1.12	
Test Procedure		Acceptanc	ce Criteria			Significant Test	
All test subjects, each wearing	g a lifejacket	All qualified test subjects shou	ld be able to	board the liferaft	1) 25m	swim and boarding	g without lifejacket.
but not the suit, should atten 25 m and board a liferaft or ri		or platform while wearing the r	non-insulated	d immersion suit.	Subject No.1	Passed	Failed
with its surface 300 mm abov					Subject No.2		
surface.					Subject No.3		
					Subject No.4		
Test subjects who successful this task should also perform it					Subject No.5 Subject No.6		
suit.	wearing the						
					2) 25	m swim and board	ing with suit
If designed to be used with a life						Passed	Failed
non-insulated immersion suit					Subject No.1		
tested with the subject also lifejacket.	wearing a				Subject No.2		
inejacitet.					Subject No.3		
					Subject No.4		
					Subject No.5 Subject No.6		
					-		
					3) 25 m swin if required	5	n suit and a lifejacket,
						Passed	Failed
					Subject No.1		
					Subject No.2		
					Subject No.3 Subject No.4		
					Subject No.4		
					Subject No.6		
					Comments/Ol	oservations	

Immersion suits (non-isolated)	Model:	er: umber:	Date: Surveyor: Organization:		
2.3.1.17 Oil resistance t	est	Regulatio	ons: LSA Code; M	ISC.81(70) 1/3.1.13	
Test Procedure		Acceptance Criteria		Significant Test Data	
After all its apertures have b non- insulated immersion so immersed for a period of 100 mm head of diesel oil at temperature. The surface oil should then and the immersion suit subject prescribed in 2.3.1.15.	uit should be 24 h under normal room be wiped off	The ingress of water should not exceed a	a mass of 200g.	Indicate which alternative is used. □Alternative 1 □Alternative 2 Water ingress ≤ 200g Passed Failed Subject No.1	

Immersion suits (non-isolated)	Manufacturer: Model: Lot/Serial Number:		Surveyor:	Time:	
2.3.1.18 Alternative oil resis	stance test		Regulation	ns: LSA Code; MS	SC.81(70) 1/3.1.14.1 & .2
Test Proced	lure	Acce	otance Criter	ia	Significant Test Data
In lieu of the test for oil res 2.3.1.17 either of the follo 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 submer should then be wiped off a immersion suit turned inside then be laid on a table suita draining off any leakage and neck aperture by a suitable of suit should then be filled with which should be 300mm abov Representative samples of th seams should be immersed u diesel oil for 24 h. After rem samples should be wiped off b to the following tests: .1 a hydrostatic test of a 1r .2 a tensile test of represent	been sealed, the should be immersed mm head of diesel oil if necessary using ged. Any surface oil nd the non-insulated out. The suit should ble for collecting and be supported at the designed hanger. The n water to neck level e the table. The exterior fabric and inder 100mm head of ioval from the oil the before being subjected m water head; and	After 1h in this position exceeding a mass of The seam strength sl The samples should so of water	200g nould be not	less than 150 N	Indicate which alternative is used. □Alternative 1 □Alternative 2 Water ingress ≤ 200g Passed Failed Subject No.1

Immersion suits (non-isolated)	Model:	rer:		Surveyor:	Time:		
. ,							
2.3.1.19 Fire test			Regulatio	ns: LSA Code II/2.	3.1.1.2; MSC.81(70) 1/3.1.15		
Test Procedure		Acceptanc	ce Criteria		Significant Test Data		
A test pan 30 cm x 35 cm x 6 cr placed in an essentially draugh Water should be put in the bo test pan to make a minimum to 1 cm followed by enough petro minimum depth of 4 cm. The p then be ignited and allowed to for 30 s. If necessary the imm should be draped over a hange the whole of the suit is envelo flames, with the bottom of the above the top edge of the test the duration of exposure to is 2 s.	nt-free area. bttom of the btal depth of ol to make a etrol should b burn freely mersion suit er 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.			Did the immersion suit sustain burning for more than 6 s or continue melting after being removed from the flames? □YES □NO Comments/Observations		

Immersion suits (non-isolated)	Model:	er:		Surveyor:	Time:
2.3.1.20 Temperature cyclin			Regulation		2.2.2; MSC.81(70) 1/3.1.16
Test Procedure		Acceptano			Significant Test Data
The following test should be c two immersion suits The non-insulated immersion be alternately subjected to temperatures of -30°C and +4 alternating cycles need immediately after each oth following procedure, repeated 10 cycles, is acceptable: .1 an 8 h exposure at temperature of +65°C to b in one day; and .2 the specimens remove warm chamber that same exposed under ordi conditions at a tem 20°C ± 3°C until the next .3 an 8 h exposure at temperature of -30°C to b the next day; and .4 the specimens removed f chamber that same d exposed under ordi conditions at a tem 20°C ± 3°C until the next	suits should surrounding 65°C. These not follow er and the for a total of a minimum be completed ad from the e day and left nary room perature of day; a maximum be completed from the cold ay and left nary room perature of	The non-insulated immersion damage such as shrinking, su of mechanical qualities.	suits should		(See following page for test data) Passed Failed Comments/Observations

Immersion suits Manufacturer: (non-isolated) Model: Lot/Serial Number:						Surveyor:	· · · · · · · · · · · · · · · · · · ·		
2.3.1.21	Temperature cy				Regulatio	ns: LSA Code		31(70) 1/3.1.16	
	Date In:		HOT CYCLE Date Out:		Date	In:		Date Out:	
Cycle 1	Time In:		Time Out: Duration:		Time	e In: perature:		Time Out: Duration:	
Cycle 2	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Time	e In: e In: perature:		Date Out: Time Out: Duration:	
Cycle 3	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Time	e In: e In: perature:		Date Out: Time Out: Duration:	
Cycle 4	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Time	e In: e In: perature:	0 <mark>0</mark> C	Date Out: Time Out: Duration:	
Cycle 5	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Time	e In: e In: perature:		Date Out: Time Out: Duration:	
Cycle 6	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Time	e In: e In: perature:		Date Out: Time Out: Duration:	
Cycle 7	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Time	e In: e In: perature:		Date Out: Time Out: Duration:	
Cycle 8	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date Time	e In: e In: perature:		Date Out: Time Out: Duration:	
Cycle 9	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date Time	e In: e In: perature:		Date Out: Time Out: Duration:	
Cycle 10	Date In:	0	Date Out: Time Out: Duration:		Time	e In: e In: perature:	0C	Date Out: Time Out: Duration:	

Immersion suits (non-isolated)	Model:	er: umber:		Date: Surveyor: Organization:	Time:	
2.3.1.22 Buoyancy test			Regulatio	ns: 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 buoyancy shall not depend on the use of loose granulated materials		The difference between the in buoyancy should not exceed 5			Buoyancy 1 Buoyancy 2 %difference kg kg % Passed Failed Comments/Observations	
2.3.1.23 Strength test		Regulations: LSA Code II; N			ASC.81(70) 1/3.1.18	
Test Procedure		Acceptance Criteria		Significant Test Data		
The non-insulated immersion be immersed in water for a per It should then be removed fro and closed in the same many worn by a person A force of r 3200 N should be applied to th and a force of not less than 13 be applied to the parts other th loop for 30 min. The non-inflated immersion su if necessary to accommodate device.	riod of 2 min. om the water her as when hot less than he lifting loop 350 N should han the lifting it may be cut	The non-insulated immersion is as a result of this test.	suit should n		Passed Failed Comments/Observations	
		Vest-type lifejacket Yoke or over-the	-head type lifejacke	t		

Immersion suits (non-isolated)	Manufacturer: Model: Lot/Serial Number:	Surveyor:	n:
2.3.1.24 Thermal protec	tive test (General)	Regulations: LSA Cod	e II/2.3.2.1; MSC.81(70) 1/3.2.1 – 3.2.4
Tes	st Procedure	Acceptance Criteria	Significant Test Data
manikin, when such a method has been demonstrated to satisfactorily in all aspects to If human subjects are used, before being accepted for the is to be tested by test subject Where human subjects are conducted under the sup resuscitation equipment sho safety reasons, ECG should be should be stopped at the wi temperature of hand, foot or or if the attending physician c When testing with humar temperature (rectal temperat region, both hands, calves, f measured. The accuracy o	e used, the tests should always be bervision of physician. Emergency uld be available during all tests. For be monitored during every test. Testing ish of the test subjects, or if the skin lumbar region should fall below 10° C, considers it advisable. In subjects, continuous body core ture) and skin temperature of lumbar oot (foot instep) and heels, should be of the measuring system should be unding measurements should be taken		Comments/Observations

Immersion suits (non-isolated)	Manufacturer: Model: Lot/Serial Number:			Surveyor:	Time:	
2.3.1.25 Thermal Protect	ive test (Cont	inued)	Regulation	ns: LSA Code II/2.	3.2.1.2; MSC.81(70) 1/3	.2.9 & 3.2.10
Test Procedure		Acceptanc	e Criteria		Signific	cant Test Data
Prior to tests, the same amount of water resulting from the water ingress and jump test in 2.3.1.13 should be poured into the		Following immersion each test subject's body core			er resulting from the water n paragraph 2.3.1.13 should suit.	
dry suit worn over the dry specified in 2.3.1.7 by the test down.					Beginning of test Subject No.1 Subject No.2	End normal of test temperature
Each test subject should w insulated immersion suit subjected to the jump test Following a 1 h period of imm hands gloved, in circulating ca	previously in 2.3.1.14. nersion, with				Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6	
5° C, each test subject's temperature should not fall mobelow the normal level of the temperature.	body core ore than 2° C				Passed Pick up a pencil and immersion:	Failed write after 1 h period of
The non-insulated immersion provide sufficient thermal p ensure that immediately on water after completion of prescribed above each test pick up a pencil as specified in write.	protection to leaving the f the test subject can				Subject No 1 UYES Subject No 2 YES Subject No 3 YES Subject No 4 YES Subject No 5 YES Subject No 6 YES	NO NO NO NO NO
					Passed Comments/Observation See attached test sheet the immersion tests.	

Immersion suits (non-isolated) Manufacturer:				Date: Time: Surveyor: Organization:					
2.1.3.26 Test sheets for te	emperatures during imme	ersion tests	Regu	lations:	LSA Code II/2.	3.2.1.2; MSC.81(70) 1/3.2.9	& 3.2.10		
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	emp 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:		bar Skin temp at lumbar region after 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					p 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 hand		Skin tem	p 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 after 1 hr:		Skin tem	p 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 (foo after 1 h	p at left t 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 right foot (foot instep) after 1 hr:		Skin tem foot (foo after 1 h		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 h	p at left heel r:	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
- 2.3.2.10 Field of vision test
- 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
- 2.3.2.16 Swimming and water emergence test
- 2.3.2.17 Oil resistance test
- 2.3.2.18 Alternative oil resistance test
- 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	

Immersion suits (insulated)	Model:			Surveyor:		Time:	
2.3.2.1 General data and sp	pecifications		Regulation	ns: LSA Code 2.3	3; MSC.81(70) 1/	/3.1 & 3.2	
Construction Material:		Additional equipment:				Donning	instructions:
Fabric produced by:		Retro reflective material produced by:			Туре:	□YES	□NO
Туре:		Whistle produced by (if fitted):			Туре:		
Buoyant material produced by:		Life-line produced by (if fitte	ed):	т	ype		
Туре:		Light produced by (if fitted):		т	ype:		

Immersion suits (insulated)	Lot/Serial Nu	:: mber:	Date: Surveyor: Organization:				
2.3.2.2 Submitted dr	awings, reports and o	locuments					
Submitted drawings and documents							
Drawing No.	Revision No. & date	Title of drawing					
		Submitted reports and document	S		0		
Report/Document No.	Revision No. & date	Title of	f report / document		Status		
		Maintenance Manual -					
		Operations Manual -					

Immersion suits (insulated)	Manufacturer: Model: Lot/Serial Number:	Date: Time: Surveyor: Organization:					
2.3.2.3 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 us approved prototype life-saving Manufacturers should be requised to ensure that life-saving appliances appliances and materials us approved prototype life-saving appliances appliances and materials us approved prototype life-saving appliances appliances appliances appliances appliances appliances approved prototype life-saving appliances appliances appliances appliances appliances application applica	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 and comply with the specification of the appliance. ired to institute a quality control procedure ances are produced to the same standard pliance approved by the Administration and ion tests carried out in accordance with the	Quality Assurance Standard Used: - Quality Assurance Procedure: - Quality Assurance Manual: - Description of System. Quality Assurance System acceptable Yes/No Comments/Observations					

Immersion suits (insulated)	Manufacturer: Model: Lot/Serial Number:		Surveyor:	Time:	
2.3.2.4 Visual inspection		Regulations	-	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 Ad which approved it, date of n and any operational restrict	dministration nanufacturer			Passed	Failed
.2 be provided with labels givi instructions, general infor manufacturers details as	mation and			Passed	Failed
and .3 be fitted with approved patc 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 cm ² on the automatically			Comments/Observations	Failed

Immersion suits (insulated)	Manufacturer: Model: Lot/Serial Number:			Surveyor:	Time:	
2.3.2.4 Visual Inspection	on (continued)		Regulations	s: LSA Code I/1.2.2	2, & II/2.3.1.1.3 & 2.3.1.1.4,	2.3.1.4-6
Test Procedure		Acceptan	ce Criteria		Significant	Test Data
Does the immersion suit cover body with the exception of the			Be of an international or vivid reddish orange, comparably highly visible colour on all parts where the		Passed	Failed
Are the hands covered, or is t immersion suit equipped with attached gloves?					Passed	Failed
Are their arrangements excessive free air in the legs?					Passed	Failed
Is the immersion suit of h					Passed	Failed
colour?					Passed	Failed
Is the immersion suit designe without a lifejacket?	ed to be worn					
If yes,					Passed	Failed
Is the immersion suit fitted complying with paragraph 2.2					Passed	Failed
Is the immersion suit fitted v complying with paragraph 2.2 Code?						
Fitted with releasable buoya other means to secure it to a					Passed	Failed
another person in the water & a suitable means to allow reso wearer from the water into rescue craft.	provided with cuer to lift the				Comments/Observations	

Immersion suits (insulated)	Model:	er: umber:		Surveyor:	Time:	
2.3.2.5 Test subjects			Regula	ions: LSA Code I/;	MSC.81(70) 1/3.1.1	
Test Procedure			Acceptance Criteria	l	Signific	ant 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		<u>Height</u> 1.4 m - 1.6 m;	<u>Weight</u> 1 person under 60 1 person over 60k	g	Male/FemaleHeight Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6	· ·
the same height range.		1.6 m - 1.8 m over 1.8 m	1 person under 70 1 person over 70k 1 person under 80 1 person over 80k	y kg	Subject No.5 Subject No.6 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 con a lifejacket, the lifejacket sho over the suit for the tests p 2.3.2.8 to 2.3.2.16.	uld be worn				Manufacturer of lifejacke	
					Manufacturer of lifejacke	et:
					Туре:	
					Manufacturer of lifejacke	et:
					Туре:	

Immersion suits (insulated)	Model:	er: umber:		Date: Surveyor: Organization:	Time:	
2.3.2.7 Test clothing	-		Regulation	ns: LSA Code II/2.	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 a standard range clothing consisting of .1 underwear (short sleeved, short legged) .2 shirt(long sleeved) .3 trousers(not woollen, and .4 woollen socks .5 If suit is to be worn in conjunction with a lifejacket, the lifejacket should be worn during the thermal protective tests.					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, each test subject should be able to unpack, don and secure the suit over their test clothing 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 suit, and the test subjects should be able to don such lifejacket without assistance.		ir test cloth nan 2 min. / associated	ing (see 2.3.2.7) This time should I clothing, and a	Donning time normal clothing TimePassFailSubject No.1secSubject No.2secSubject No.3secSubject No.5secSubject No.6secSubject No.6secComments/Observations		

Immersion suits (insulated)	Model:	er: umber:		Surveyor:	Time:	
2.3.2.8 Donning test (2)			Regulati	ons: LSA Code II	/2.3.1.1.1; MSC.81(70) 1/3.1.4	
Test Proced	lure	Ac	ceptance 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.		be able to compl	ete this task in	Donning time at - 30 ^o C Time Pass Fail Subject No.1sec Subject No.2sec Subject No.3sec Subject No.4sec Subject No.5sec Subject No.6sec Comments/Observations		
2.3.2.9 Ergonomic Test			Regulations: LSA Code II/2.3.1.3.2; MSC.81(70) 1/3.1.5			
Test Proced	ure	Acceptance Criteria		Significant Test D	Data	
 When wearing the immer subjects should be able to able to a should be able to	o: a vertical ladder ngth; associated with il and write. The	There should be no restriction in walking, bending over or arm movement.	□YES □NO All the test subject All the test subject UYES □NO All the test subject others and opera	cts were able to pi cts were able to pi cts were able to pi ite a rescue boat: cts were able to cl	ver or arm movement: ick up a pencil and write: □YES □NO ut on the lifejacket without assistance: erform all duties associated with abandonment, assist □YES □NO limb up and down a vertical ladder of 5 meter in	

Immersion suits (insulated)	Model:	er: umber:		Surveyor:		Time:		
2.3.2.10 Field of vision test			Regulations: LSA Code II/2.3.1.1.3; MSC.81(70) 1/3.1.6					
Test Procedure		Acceptanc	ce Criteria			Significant Test E	Data	
Each test subject should be seated with the head in a fixed position, and the lateral field of vision measured.				Field of vision angle ② 120° Passed Failed Subject No.1				
2.3.2.11 Flotation test			Regulatio	ns: LSA Code II/2.	3.1.1; MSC.81	(70) 1/3.1.7		
Test Procedure		Acceptanc	Acceptance Criteria			Significant Test Data		
With the test subject floati wearing the suit in conjunc lifejacket if required, the freeb be measured from the water s nose or mouth.	tion with a oard should		ace-up with their mouths clear and be stable in that position. mersion suit worn without a as of buoyancy such as an d the wearer's head may be , provided that the freeboard ry means of buoyancy is at t light should permit it to be		Subject No.3 Subject No.4 Subject No.5		Nose Freeboard = ↓ 	

Immersion suits (insulated)	Model:	:mber:		Date: 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		Acceptanc	ce Criteria			Significant Test D	ata	
The test subjects, in fresh water wearing either an immersion suit or an immersion suit with lifejacket, should each demonstrate that they can turn themselves from a face-down to a face-up position in not more than 5 s.		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 Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Ot	Passed	Failed		
2.3.2.13 Water ingress and	jump test		Regulati	ons: MSC.81(70) 1/3	.1.9			
Test Procedure		Acceptance Criteria			Significant Test Data			
The test subjects should immersion suit and then Following a jump into the water sufficient to totally immerse th test subject should be weighed Weighing should be performed accurate to ± 100g.	be weighed. r from a height he body, each d again.	The difference in the combined the suit should not exceed 500		the test subject and	Mass differend Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Ot	Passed	Failed	

Immersion suits (insulated)	Model:		Surveyor:		Time:				
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	ia		Significant Test Data	a			
The test subjects should jump with the suit and lifejacket if required from a height of 4.5m vertically into the water. After the jump, the immersion suit and its attachments should be examined for damage or dislodging, and the test subject should be questioned concerning whether the suit caused any injury to the wearer.		The test subject should not be injured by the suit.		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	3.1.11					
Test Proced	dure	Acceptance Crite	Acceptance Criteria Significant Test Data						
 The test subject should pre-we and be weighed. The test subject instructed to do one of the following for 20 min for a 200 m The test subject should be we task. The weighing machine should 100g. 	bject should then be owing: water of 1h; or distance of at least ighed again after the	The ingress of water into the pre- not exceed a mass of 200g.			rnative 1 ⊡Alternative ≤ 200g Passed	Failed			

(insulated) Model: Si O				Date: Surveyor: Organization:					
2.3.2.16 Swimming and v	water emerge	ence test	Regulations	ulations: LSA Code II/2.3.1.3.4; MSC.81(70) 1/3.1.12					
Test Procedure		Acceptan	ce Criteria			Significant Test Da	ata		
All test subjects, each wearing a lifejacket but not the immersion suit, should attempt to swim 25 m and board a liferaft or rigid platform with its surface 300 mm above the		All qualified test subjects sho or platform while wearing the				and boarding witho Pass	ut lifejacket. Fail		
water surface.					Subject No.1 Subject No.2 Subject No.3				
Test subjects who successfu this task should also perform it immersion suit.					Subject No.4 Subject No.5 Subject No.6				
If designed to be used with a life immersion suit should be tes					2) 25 m swim	and boarding with i	mmersion suit		
subject also wearing a lifejack	et.				Subject No.1 Subject No.2 Subject No.3 Subject No.4 Subject No.5 Subject No.6 Comments/Ob		Fail		

MSC.1/Circ.1628 Annex, page 232

Immersion suits (insulated)	Model:	r: umber:		Date: Time: Surveyor: Organization:			
2.3.2.17 Oil resistance test				ons: LSA Code; MS	SC.81(70) 1/3.1.13		
Test Procedure Acceptance			e Criteria		Significant Test Data		
After all its apertures have be immersion suit should be im period of 24 h under 100 mm h oil at normal room temperature The surface oil should then be the immersion suit subjected prescribed in 2.3.1.15.	mersed for a head of diesel e. wiped off and	The ingress of water should no	ot exceed a	mass of 200g.	Indicate which alternative is used. □Alternative 1 □Alternative 2 Water ingress ≤ 200g Pass Fail Subject No.1		

Immersion suits (insulated)	Model:	Gerial Number:			Time: : tion:				
2.3.2.18 Alternative oil resis	stance test		Regulatio	ns: LSA Co	ode; MSC.81(70) 1/3.1.14				
Test Procedure		Acceptance (Criteria		Significant Test Data				
In lieu of the test for oi prescribed in 2.3.2.17 eith following tests may be conduct After all apertures have been immersion suit should be immersion suit should be immersion of 24 h under 100 mm h oil at normal room temperature using weights to keep suit sub surface oil should then be wipe immersion suit turned inside of should then be laid on a table collecting and draining off any be supported at the neck ap suitable designed hanger. The then be filled with water to nec should be 300mm above the ta Representative samples of fabric and seams should b under 100mm head of diesel After removal from the oil to should be wiped off before bei to the following tests: .1 a hydrostatic test of a 1m and .2 a tensile test of representation	her of the ted. a sealed, the mersed for a ead of diesel e if necessary merged. Any ed off and the out. The suit e suitable for leakage and berture by a e suit should k level which able. the exterior e immersed oil for 24 h. the samples ng subjected water head	After 1h in this position there s exceeding a mass of 200g. The samples should successfu of water. The seam strength should be	ully support	1 m head	Indicate which alternative 1 □Alternative 2 Water ingress ≤ 200g Pass Fa Subject No.1	ail			

Immersion suits (insulated)	Model:	umber:		Surveyor:	Time:
2.3.2.19 Fire test			3.1.1.2; MSC.81(70) 1/3.1.15		
Test Procedure		Acceptanc	ce Criteria		Significant Test Data
A test pan 30 cm x 35 cm x 6 placed in an essentially draw Water should be put in the fit test pan to make a minimum 1 cm followed by enough pet minimum depth of 4 cm. The then be ignited and allowed if for 30 s. If necessary, the in should be draped over a han the whole of the suit is enve flames, with the bottom of th above the top edge of the test the duration of exposure to is 2 s.	ght-free area. bottom of the total depth of rol to make a petrol should to burn freely nmersion suit ger to ensure eloped in the se suit 25 cm st 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

_	ersion suits lated)	Model:	er:		Date: Surveyor: Organization:			
2.3.2	20 Temperature cyc	cling test	Regulations: LSA Code I/1.2.			.2.2; MSC.81(70) 1/3.1.16		
	Test Procedure		Acceptanc	e Criteria		Significant Test Data		
	The following test should be carried out on two immersion suits.		The immersion suits should show no signs of damage such as shrinking, swelling dissolution or changes of mechanical qualities.		(See following page for test data) Passed Failed			
subje 30°C need other	mmersion suits should b cted to surrounding temp and +65°C. These alterr not follow immediately and the following procedu total of 10 cycles, is acce	beratures of - nating cycles / after each ure, repeated				Comments/Observations		
.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 ature 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 ± 3°C until the next day.	e day and left inary room ature of 20°C						

Immersion suits (insulated)	nsulated) Lot/Serial Number:			Sur	e: veyor: janization:		e:		
2.3.2.21 Tem	perature cycling test - Tes	t data		Regulations: LSA Code I/1.2.1.2; MSC.81(70) 1/3.1.16					
		НО	T CYCLE		COLD CYCLE				
	Date In:		Date Out:		Date In:		Date Out:		
Cycle 1	Time In:		Time Out:		Time In:		Time Out:		
	Temperature:	0C	Duration:	hours	Temperature:	0C	Duration:	hours	
	Date In:		Date Out:		Date In:		Date Out:		
Cycle 2	Time In :		Time Out:		Time In:		Time Out:		
1	Temperature :		Duration:	hours	Temperature:	0C	Duration:	hours	
	Date In:				Date In:		Date Out:		
Cycle 3	Time In:		Time Out:		Time In:		Time Out:		
-	Temperature:		Duration :	hours	Temperature:	°C	Duration:	hours	
	Date In:				Date In:	-	Date Out:		
Cycle 4	Time In:		Time Out:		Time In:		Time Out:		
	Temperature:	⁰ C	Duration:		Temperature:		Duration:		
	Date In:		Date Out:		Date In:		Date Out:		
Cycle 5	Time In:		Time Out:		Time In:		Time Out:		
	Temperature:	°C	Duration :		Temperature:		Duration:		
	Date In:		Date Out:		Date In:		Date Out:		
Cycle 6	Time In:		Time Out:		Time In:		Time Out:		
	Temperature:		Duration:		Temperature:		Duration:	hours	
	Date In:		Date Out:		Date In:		Date Out:		
Cycle 7	Time In:		Time Out:	_	Time In:		Time Out:		
,	Temperature:	⁰ C	Duration :		Temperature:	⁰ C	Duration:		
	Date In:				Date In:		Date Out:		
Cycle 8	Time In:		Time Out:		Time In:		Time Out:		
,	Temperature:	⁰ C	Duration :		Temperature:	⁰ C	Duration:		
	Date In:				Date In:		Date Out:		
Cycle 9	Time In:		Time Out:	_	Time In:		Time Out:		
, -	Temperature:		Duration:		Temperature:		Duration:	hours	
	Date In:				Date In:	_	Date Out:		
Cycle 10	Time In:		Time Out:		Time In:		Time Out:		
- ,	Temperature:	<u></u>	Duration:	hours	Temperature:	<u></u>	Duration:	hours	

Immersion suits (insulated)	Model:	er: umber:	Tim					
2.3.2.22 Buoyancy test			Regulations: LSA Code II/2.3.1.8; MSC.81(70) 1/3.1.17					
Test Procedure		Acceptanc	e Criteria		(Significant Test	Data	
The buoyancy of an imm designed to be worn without should be measured before an complete submersion to jus surface in fresh water.	a lifejacket nd after 24 h	The difference between the ini buoyancy should not exceed 5			kg % Pa	Buoyancy 2 kg ssed d Comments/Ob	%difference	
2.3.2.23 Strength test			Regulation	ns: LSA Code; MSC.81(70) 1/3.1.18				
Test Procedure		Acceptance Criteria			Significant Test Data			
The immersion suit should be immersed in water for a period of 2 min. It should then be removed from the water and closed in 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 1350N should be applied to the parts other than the lifting loop for 30 min. The immersion suit may be cut if necessary to accommodate to the test device.		The immersion suit should not test.	be damage		Passed		iled	

Immersion suits Manufacturer: (insulated) Model: Lot/Serial Number: Model:		Date: Time: Surveyor: Organization:					
2.3.2.24 Thermal protect	ctive test (General)	Regulations: LSA Code II/2.3.2.2; MSC.81(70) 1/3.2.1 – 3.2.5					
Tes	t Procedure	Acceptance Criteria	Significant Test Data				
manikin, when such a method has been demonstrated to satisfactorily in all aspects to If human subjects are used, before being accepted for the is to be tested by test subject Where human subjects are conducted under the sup resuscitation equipment sho safety reasons, ECG shou Testing should be stopped a falling rate of the core temp after the first half hour, if the lumbar region should fall belo considers it advisable. When testing with human temperature (rectal temperat region, both hands, calves, for measured. The accuracy o	a used, the tests should always be ervision of physician. Emergency uld be available during all tests. For ld be monitored during every test. at the wish of the test subjects, if the erature is more than 1.5° C per hour skin temperature of the hand, foot or bw 10° C, or if the attending physician a subjects, continuous body core ture) and skin temperature of lumbar bot (foot instep) and heels, should be f the measuring system should be ponding measurements should be		Comments/Observations				

Immersion suits (insulated)	Manufacturer: Model: Lot/Serial Number:			Surveyor:	on: T		
2.3.2.25 Thermal Protec	tive test (Continued)	Regulations: LSA Code II/2.3.2.2; MSC.81(70) 1/, 3.2.11 & 3.2.12					& 3.2.12
Test Proce	dure	Acceptar	nce Criteria		Sigi	nificant Test D	Data
Prior to tests, the same and from the water ingress paragraph 2.3.2.13 should be worn over the dry test clothing the test subject lying down. Each test subject wearing previously subjected to paragraph 2.3.2.14. Followir immersion, with hands glove water at between 0°C and +2 body core temperature should below the normal level of the	from test 2.3.2.13, should be poured into the immersion suit. Following immersion each test subject's body core temperature should not fall more than 2°C below the normal level of the subject's temperature. Subject No.3 Subject No.4 Subject No.5 Subject No.6 Passed			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	End normal		
The immersion suit should pr protection to ensure that imm water after a 1 hr period of i hands, in water circulating at can pick up a pencil as specifi and write. Alternatively, at the manufact to pick up a pencil and	nediately on leaving the immersion, with gloved +5°C each test subject ied in paragraph 2.3.2.9 curers' option, the ability	The test subjects sha a pencil and write.	ould be able	to pick up	Subject No 1 UYES Subject No 2 YES Subject No 3 YES Subject No 4 YES Subject No 5 YES Subject No 6 YES Passed Pick up a pencil and w		period of immersion:
to pick up a pencil and write as specified in paragraph 2.3.2.9 above may be demonstrated immediately after leaving the water upon completion of the above (6 hr) test.		See attached test sh during the immersior		peratures	Subject No 1 □YES Subject No 2 □YES Subject No 3 □YES	□NO □NO □NO	
		Comments/Observat	tions		Subject No 4	□NO □NO □NO Failed	

2.3.2.25 Thermal Protective test (Continued)	Code 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

	Immersion suits Manufacturer: (insulated) Model: Lot/Serial Number:		Surveyor:			
2.3.2.26 Test sheets for temperatures during immersion tests			Regulations: LSA Code II/2.3.2.2; MSC.81(70) 1/, 3.2.11 & 3.2.12			
Subject 1	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 afte 1 hr: Skin temp at left 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: r Skin temp at right hand after 2 hr: r 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 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:	Skin temp at lumbar region after 4 hr : Skin temp at left hand after 4 hr: Skin temp at right hand	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:
Subject 2	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 afte 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 heel after 1 hr:	Skin temp at lumbar region after 2 hr : Skin temp at left hand after 2 hr: r 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 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:	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	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:	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 left foot (foot instep) after 6 hr: Skin temp at left heel after 6 hr:

	Immersion suits Manufacturer: (insulated) Model: Lot/Serial Number:			Surveyor:		
	est sheets for temp nmersion tests (co		Regulations: LSA Coc	ie II/2.3.2.2; MSC.81(70)	1/, 3.2.11 & 3.2.12	
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: er 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 left foot (foot Skin temp at right foot (foot 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 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:	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: er 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 left foot (foot Skin temp at right foot (foot 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: 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:	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 (insulated)	mmersion suits Manufacturer: (insulated) Model: Lot/Serial Number:		Surveyor:			
	2.3.2.26 Test sheets for temperatures during immersion tests (continued)		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 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 1 hr:	Rectal temp after 2 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 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 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 left foot(foot Skin temp at left foot(foot Skin temp at left foot(foot 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:	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 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 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 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 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:	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 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
2.4.16	Swimming and water emergency test
2.4.17	Oil resistance test
2.4.18	Alternative oil resistance test
2.4.19	Fire test
2.4.20	Temperature cycling test
2.4.21	Temperature cycling test – Test data
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:				
2.4.1 General data and specifications		Regulations: LSA Code 2.3; MSC.81(70);					
Construction Material:		Additional equipment:				Donning instructio	ns:
Fabric produced by:		Retro reflective material	:	□YES		□YES	
Туре:		Whistle produced:		□YES			
Buoyant material produced by:		Life-line:		□YES			
		Light:		□YES			
Туре:							

Anti-exposure suits Manufacturer: Model: Lot/Serial Number: 2.4.2 Submitted drawings, reports and documents			Date: Ti Surveyor: Organization:	
2.4.2 Submitted dr	awings, reports and o	Submitted drawings and d	ocuments	
				Status
Drawing No.	Revision No. & date		Title of drawing	
		Submitted reports and do	cuments	Chatara
Report/Document No.	Revision No. & date		Title of report / document	Status
		Maintenance Manual -		
		Operations Manual -		

Anti-exposure suits	Manufacturer:		Surveyor:	Time:		
	Lot/Serial Number:		-			
2.4.3 Quality assurance		Regulations: - 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			surance			
amended, or the international Life-Saving Appliance (LSA) Code, to be inspected, representatives of the Administration should make random inspections of manufacturers to ensure that the quality of life-saving		Standard Used: Quality Assurance Procedure:				
appliances and materials used comply with the specification of the approved prototype life-saving appliance.						
	ired to institute a quality control procedure	Quality Assurance Manual: -				
as the prototype life-saving ap	iances are produced to the same standard pliance approved by the Administration and ion tests carried out in accordance with the	Description of System.				
		Quality Assurance System acceptable				
		Yes/No				
		Comments	/Observations			

Anti-exposure suits	Manufacturer: Model: Lot/Serial Number:	Surveyor:	Time:
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	Accepta	nce Criteria	Significant Test Data
Anti-Exposure suit should:			
Be clearly marked with appro including the Administration w it, date of manufacturer and a restrictions.	/hich approved		Passed Failed
Be provided with labels gi details and intervals betwee operating instructions, gener and manufacturers details.	een servicing,		Passed Failed
Be fitted with approved pat reflective material with a total 400 cm ² and with 100 cm ² on suit does not automatically to face up according to resolutio	area of at least the back if the urn the wearer		Passed Failed Comments/Observations

MSC.1/Circ.1628 Annex, page 250

2.4.4 Visual Inspection (continued)		Regulations: LSA Code I/1.2	.2, II/2.4.1.3	
Test Procedure	Acceptanc	e Criteria	Significant Te	st Data
Is the anti-exposure suit of highly visible colour?	Covers the whole body except permits, the feet; covering for provided by separate gloves ar be permanently attached to the	the hands and head may be nd a hood, both of which shall	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 red highly visible colour on all parts			
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?			□YES □NO	
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:			Date: Time: Surveyor: Organization:				
2.4.5 Test subjects				Regulation	ns: LSA Co	ode II/2.3.1.1.5 & 2.3.1.3.14; MSC.81(70) 1/3.1.1 & 2.8.2		
Test Procedure		Δ	cceptance C	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.		Acceptance CriteriaHeightWeight1.40m - 1.60m;1 person under 60kg 1 person over 60kg1.60m - 1.80m1 person under 70kg 1 person over 70kgover 1.80m1 person under 80kg 1 person over 80kg			Male/FemaleHeightWeightSubject No.1Subject No.2Subject No.3Subject No.4Subject No.5Subject No.6Comments/Observations			
2.4.6 Test with a lifejack	et			Regulation	ns: LSA Co	ode II/2.3.1.5; MSC.81(70) 1/3.1.2		
Test Procedure		Д	cceptance C	Criteria		Significant Test Data		
If the anti-exposure suit is to conjunction with a lifejacket, should be worn over the anti-e for the tests prescribed in 2.4.	the lifejacket exposure suit					Manufacturer of lifejacket:		

Anti-exposure suits	Model:	er: umber:		Surveyor:	Time:		
2.4.7 Test clothing	Lot/Senari	umber		_	MSC.81(70) 1/3.2.6 & 3.2.7		
Test Procedure		Acceptance	ce Criteria		Significant Test Data		
The test subjects should wear a standard range clothing consisting of .1 underwear (short sleeved, short legged) .2 shirt (long sleeved) .3 trousers (not woollen, and .4 woollen socks .5 if suits to be worn in conjunction with a lifejacket, the lifejacket should be worn during the thermal protective test.					Did all test subject use the specified test clothing YES NO Comments/Observations		
2.4.8 Donning test (1)			Regulatio	ns: LSA Code II/2.	4.1.1.4; MSC.81(70) 1/3.1.3		
Test Procedure		Acceptance	ce Criteria		Significant Test Data		
It can be unpacked and dor assistance within 2 min, taking test clothing 2.4.7 and a life anti-exposure suit is to b 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 infla a lifejacket, if such is to be anti-exposure suit.	e anti-expos t assistance time to do ted chambei	ure suit over their in less than 2 min. n any associated rs if fitted, and don	Donning time with normal clothing Time Pass Fail Subject No.1		

Anti-exp	oosure suits	Model:	er:	Date: Surveyor: Organization:	Time:				
2.4.8	Donning test (2)		Regulations: LSA Code I/2.4.1.1.4; MSC.81(70) 1/3.1.4						
	Test Procedure)	Acceptance Criteria Significant Test Data						
and don ambient donning be kept	subjects should be a in 5 mins the anti-ex temperature of -30° test the anti-exposu in a refrigerated o ture of -30°C for 24 h	cposure suit in C. Before the re suit should chamber at a	The test subject should be able to 5 min.		Donning time at - 30°C				

Anti-exposure suits Model:		umber:		Surveyor:	Time:	
2.4.9	Ergonomic test			Regulation	ns: LSA Code II/2.4	4.1.2; MSC.81(70) 1/3.1.5
	Test Procedure		Acceptanc	e Criteria		Significant Test Data
	a wearing the anti-expose ubjects should be able to climb up and down a ve of at least 5 m in length perform all duties ass abandonment, assist operate a rescue boat;	ertical ladder a; sociated with other and	There should be no restriction arm movement. The diamete 8-10 mm.			Restriction in walking, bending over or arm movement: PYES DNO All the test subjects were able to pick up a pencil and write: PYES DNO All the test subjects were able to put on the lifejacket without assistance:
.3	pick up a pencil and diameter of the penc 8-10 mm.					□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:	er:		Survey	Time: yor: iization:				
2.4.10 Field of vision test		Regulations: LSA			Code II/2.4.1.7; I	MSC.81(70) 1/3.1.6		
Test Procedure		Acceptance C	riteria			Sigr	nificant Te	est Data	
Each test subject should be seated with the head in a fixed position, and the lateral field of vision measured.		The lateral field of vision should be at least 120°.		Field of vision angle ≥ 120° Angle(degs.) Pass Fail Subject No.1					
2.4.11 Flotation test			Regulations	s: LSA (Code; MSC.81(70) 1/3.1.7				
Test Procedure		Acceptance Criteria		Significant Test Data					
		When wearing the anti-			With lifejacket Without lifejacket				et
		conjunction with a lifejacket if required, the test subject should float face-up with their mouths clear of the water by at least 120mm and be stable in		Freedoard	Mouth (mm)	· · ·	Mouth (mm)	Nose (mm)	
		that position. The freeboard s from the water surface to the	nose and mou	ith with	Subject No.2				
		the test subject at rest. The fire exposure suit without a lifejact			Subject No.4				
		50 mm.			Subject No.5 Subject No.6				
		The position of the lifejacket to be visible over as great a s hemisphere as is practicable.	egment of the	ermit it		oservations	;		

Anti-exposure suits	Model:	er:	Date: Surveyor: Organization:	Time:			
2.4.12 Righting test		Regulation	Regulations: 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 wearing an anti-exposure suit complying with the requirements of this section should be able to turn from a face-down to a face-up position in not more than 5 s and should be stable face-up. The suit should have no tendency to turn the wearer face-down in moderate sea condition.		anti-exposure suit will right the test subjects within 5 s.			Fail		
2.4.13 Water ingress and	jump test	Regulatio	ons: MSC.81(70) 1/3	3.1.9			
Test Procedure		Acceptance Criteria		Significant Test Data			
The test subjects should pre-w Exposure suit and then b Following a jump into the w height sufficient to totally in body, each test subject should again. Weighing should be perfor machine accurate to ± 100g.	e weighed. /ater from a mmerse the I be weighed	The difference in the combined mass of t the suit should not exceed 500 g.	ne test subject and	Mass difference ≤ 500g Pass Fail Subject No.1			

Anti-exposure suits	Model [.]	er:		Date: Surveyor:	Tir	me:	
2.4.14 Jump test	Lot/Serial N	umber:			4.1.1.2; MSC.81(70) 1/3.1.10		
Test Procedure		Acceptanc	ce Criteria		S	Significant Te	st Data
The test subjects should jump with the Anti- Exposure suit and lifejacket if required from a height of 4.5m vertically into the water. After the jump, the anti-exposure suit and its attachments should be examined for damage or dislodging, and the test subject should be questioned concerning whether the suit caused any injury to the wearer.		The test subject should not be injured by the suit. The light, if fitted, should not injure the test subject.		PassFailSubject No.1Subject No.2Subject No.3Subject No.4Subject No.5Subject No.6Comments/Observations			
2.4.15 Leak test		Regulations: LSA Code II/2.4.1.1; MSC.81(70) 1/3.1.11					
Test Procedure		Acceptance Criteria		5	Significant Te	st Data	
 The test subject should p anti-exposure suit and be we test subject should then be instone of the following: .1 a period of flotation in calm or .2 swimming for 20 min for a c least 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; listance 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 □Alte	

Anti-exposure suits Mo	anufacturer: odel: bt/Serial Number:	Surveyor:	Time:
2.4.16 Swimming and water er	emergent test	Regulations: LSA Code II/2	.4.1.2.3 MSC.81(70) 1/3.1.12
Test Procedure	Acceptar	ce Criteria	Significant Test Data
All test subjects, each wearing a li but not the anti-exposure suit, attempt to swim 25 m and board a li rigid platform with its surface 3 above the water surface. Test subjects who successfully of this task should also perform it weat anti-exposure suit. If designed to be used with a lifejack anti-exposure suit should be tested subject also wearing a lifejacket.	Lifejacket , should Liferaft or 300 mm complete baring the cket, then	uld be able to board the liferaft	

Anti-exposure suits	Manufacturer:		Date: Time: Surveyor: Organization:		
2.4.17 Oil resistance t	est	Regulations: LSA Code; MS		: LSA Code; MSC	C.81(70) 1/3.1.13
Test Procedure		Acceptar	nce Criteria		Significant Test Data
After all its apertures have be anti-exposure suit should be a period of 24 h under 100 diesel oil at normal room tem The surface oil should then and the suit subjected to the te in 2.4.15.	immersed for mm head of perature. be wiped off	The ingress of water should i	not exceed a r	nass of 200g.	Indicate which alternative is used. □Alternative 1 □Alternative 2 Water ingress ≤ 200g Pass Fail Subject No.1

Anti-exposure suits Model:			Surveyor:	Time:
2.4.18 Alternative oil r	esistance test	R	egulations: LSA Code;	
Test Proced	ure	Acceptan	ce Criteria	Significant Test Data
In lieu of the test for oil res 2.4.17 either of the follow conducted.				Indicate which alternative is used. □Alternative 1 □Alternative 2
After all apertures have anti-exposure suit should b period of 24 h under 100 mm normal room temperature i weights to keep suit submerg should then be wiped off an suit turned inside out. The sui on a table suitable for collect any leakage and be supp aperture by a suitable designed	be immersed for a head of diesel oil at f necessary, using ged. Any surface oil d the anti-exposure t should then be laid ting and draining off orted at the neck			Water ingress ≤ 200g Pass Fail Subject No.1
The suit should then be filled level which should be 300mm		The seam strength should	be not less than 150 N.	Strength > 150N Pass Fail The samples should support a 1 m head of water
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: -		The samples should successfully support 1 m head of water.		
.1 a hydrostatic test of a 1m .2 a tensile test of represent				

Anti-exposure suits Model:		er: umber:	Date: Surveyor: Organization:	Time:				
2.4.19 Fire test		Regulatio	Regulations: LSA Code II/2.4.1.1.5; MSC.81(70) 1/3.1.15					
Test Procedure		Acceptance Criteria		Significant Test Data				
A test pan 30 cm x 35 cm x 6 c placed in an essentially draug Water should be put in the b test pan to make a minimum t 1 cm followed by enough petr minimum depth of 4 cm. The p then be ignited and allowed to for 30 s. If necessary the anti- should be draped over a hang the whole of the suit is enve flames , with the bottom of th above the top edge of the tes the duration of exposure to t 2 s.	ht-free area. ottom of the otal depth of ol to make a petrol should o burn freely exposure suit ger to ensure eloped in the e suit 25 cm t pan so that	The anti-exposure suit should not sustain than 6 s or continue melting after being of flames.		Did the anti-exposure suit continue to burn for more than 6 s or continue melting after being removed from the flames?				

Anti-exposure suits Model:			er:			Time:		
		Lot/Serial N	umber:		Organization:			
2.4.2	0 Temperature cyc	cling test		Regulations: LSA Code I/1.2.2.2; MSC.81(70) 1/3.1.16				
	Test Procedure		Acceptanc	e Criteria		Significant Test Data		
	ollowing test should be ca o immersion suits	arried out	The anti-exposure suit's shou such as shrinking, swelling			(See following page for test data)		
	anti-exposure suits		mechanical qualities.			PassedFailed		
temp alterr imme follov	nately subjected to eratures of -30°C and +6 nating cycles need ediately after each other ving procedure, repeated rcles, is acceptable:	65°C. These not follow er and the				Comments/Observations		
.1	an 8 h exposure at temperature of +65' completed in one day; a	°C to be						
.2	the specimens remove warm chamber that sat left exposed under or conditions at a tempera ± 3°C until the next day;	me day and dinary room iture 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	a day and left nary room						

±	3°C until the next	day.						
Anti-ex	posure suits	Model:	acturer: rial Number:	 	Surveyor:		Time:	
2.4.21	Temperature		t – Test Data HOT CYCLE	 Regulation	s: LSA Code I	/1.2.1; MSC.81 CO	(70) 1/3.1.16 LD CYCLE	
Cycle 1	Date In: Time In: Temperature:		Date Out: Time Out: Duration:	 Time	In: In: perature:		Date Out: Time Out: Duration:	
Cycle 2	Date In: Time In: Temperature:		Date Out: Time Out: Duration:	 Time	In: In: perature:	C	Date Out: Time Out: Duration:	
Cycle 3	Date In: Time In: Temperature:		Date Out: Time Out: Duration:	 Date Time	In: In: perature:		Date Out: Time Out: Duration:	
Cycle 4	Date In: Time In: Temperature:		Date Out: Time Out: Duration:	 Time	In: n: perature:		Date Out: Time Out: Duration:	
Cycle 5	Date In: Time In: Temperature:		Date Out: Time Out: Duration:	 Time	In: e In: perature:	0C	Date Out: Time Out: Duration:	hours
Cycle 6	Date In: Time In: Temperature:	0C	Date Out: Time Out: Duration:	Time	In: n: perature:	0C	Date Out: Time Out: Duration:	
Cycle 7	Date In: Time In: Temperature:		Date Out: Time Out: Duration:	 Time	In: e In: perature:	0C	Date Out: Time Out: Duration:	
Cycle 8	Date In: Time In: Temperature:		Date Out: Time Out: Duration:	 Time	In: e In: perature:		Date Out: Time Out: Duration:	
Cycle 9	Date In: Time In : Temperature:	0C	Date Out: Time Out: Duration:	 Time	In: e In: perature:	0	Date Out: Time Out: Duration:	
	Date In:		Date Out:	Date	In:		Date Out:	

Cycle 10	Time In:	Time	e Out: htion: hours	Time	e In:	0	Time Out:	
	Temperature:		tion:hours		perature: Date:		Duration: Time:	
Anti-ex	oosure suits	Model:			Surveyor:			
		Lot/Serial N	umber:		Organization:			
2.4.22	Buoyancy test		1	Regulatio	ns: LSA Code II/2.	4.1.1.1; MSC.	81(70) 1/3.1.17	
	Test Procedure		Accepta	nce Criteria			Significant Tes	t Data
	nti-exposure suit sl buoyancy of at least 7		The difference between the buoyancy should not exceed				I Buoyancy 2 .gkg	%difference %
designe	oyancy of an anti-e» d to be worn without be measured before ar	a lifejacket				Passed _	Faile	d
	e submersion to just in fresh water.	t below the		-		Comments/C	Observations	
2.4.23	Strength test		Regulations: LSA Code II; MSC.81(70) 1/3.1.18					
	Test Procedure		Acceptance Criteria			Significant Test Data		
in water	-exposure suit should t for a period of 2 min. It oved from the water a	should then	The anti-exposure suit shoul this test.	d not be dam	aged as a result of	Passed	Failed	
the san person.	A force of not less to applied to the lifting	worn by a han 3200 N				Comments/C	Observations	
	not less than 1350 to the parts other that 30 min.			$\overline{\mathbb{O}}$				
	ti-exposure suit may ary to accommodate		Vest-type lifejacket Yoke or	over-the-head ty	oe lifejacket			

Anti-exposure suits Manufacturer: Model: Lot/Serial Number:		Surveyor:				
2.4.24 Thermal prote	ective test (General)	Regulations: LSA Code II/2.4.2; MSC.81(70) 1/3.2.1 – 3.2.5				
	t Procedure	Acceptance Criteria	Significant Test Data			
thermal manikin, when su Administration and has be	alities may be measured using a uch a method is required by an een demonstrated to provide test factorily in all aspects to test results		Comments/Observations			
	they should be medically examined he tests. Each design of immersion ubjects specified in 2.4.5					
conducted under the sup resuscitation equipment sh For safety reasons, ECG test. Testing should be stop if the falling rate of the cor per hour after the first half	e used, the tests should always be ervision of physician. Emergency nould be available during all tests. should be monitored during every ped at the wish of the test subjects, e temperature is more than 1.5° C hour. or if the skin temperature of n should fall below 10° C, or if the ers it advisable.					
temperature (rectal temperature lumbar region, both hands, should be measured. The should be +/- 0.2°C. Appropriate the should be the should b	a subjects, continuous body core erature) and skin temperature of calves, foot (foot instep) and heels, accuracy of the measuring system priate corresponding measurements in is used in lieu of human subjects.					
jump test in paragraph 2.4.	ount of water resulting from the 15 should be poured into the dry clothing specified in 2.4.7 by the					

Anti-exposure suits	Model:	Su		Date: Surveyor: Organization:		
2.4.25 Thermal Protec	tive test (Conti	inued)		LSA Code II/2.4.2; MSC.81(70) 1/3.2.13, 3.2.14		
Test Procedure		Acceptance Criteri	а	Significant Test Data		
Each test subject should we exposure suit previously sub- water ingress and jump test 2.4.13. Following a 1 h immersion, with hands glowd donned, in circulating calm we each test subject's body core should not fall more than 2° normal level of the subject's the Immediately on leaving the completion of the test prescrite each test subject should be a a pencil as specified in paragrawrite. The anti-exposure suit sh constructed, that when worr the suit continues to provious thermal protection following of the water which totally submets subject and should ensure the worn in calm water at a tempe the test subject's body core does not fall at a rate of more per hour, after the first 0.5 h.	bjected to the in paragraph n period of ed and hood ater at $+$ 5°C, e temperature °C below the emperature. e water after ibed in 2.4.24 ble to pick up aph 2.4.9 and hould be so n as marked, ide sufficient one jump into erges the test nat when it is erature of 5°C, e temperature	Same mass of water which w from test 2.4.15, should be p immersion suit. See attached test sheets for during the immersion tests: Comments/Observations	oured into the	Beginning of test End of test Normal temperature Subject No.1		

2.4.25 Thermal Protective tes	st (Continued)	Regulat	ions: 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

Anti-exposure suits		Date: Time: Surveyor:					
2.4.26 Test sheets for te	mperatures during immer	rsion 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 h	r: Rectal te	emp 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 :		np at lumbar fter 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 h after 1 hr:	after	mp 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:	after	after	and Skin ter		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 a 1 hr:	1 hr: ifter	np 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 hi	1 hr:	np 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	Skin temp at right foo (foot instep) after 1 hi	(foot inst	tep) 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 left heel after 1 hr:	Skin temp at left heel after		(foot ins	tep) after 1 hr: mp 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?	Did the wearer's body core temperature fall at a rate more than 1,5°C per	Did the wearer's bo	after 1 hr: ody at a Did the per core tem		temperature fall at a rate more than 1,5°C per hour, after the first 0,5 h?		
□ Yes □ No	🗆 Yes 🗆 No	□ Yes □ No		er the first 0,5 h? □ No			

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
- 2.5.13 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	Manufacturer: Model: Lot/Serial Number:	Surveyor:	Time:	
2.5.1 General data and sp	pecifications	Regulations: LSA Code II/2	.5; MSC.81(70) 1/ 3.3	
General Informa	ation			
Construction Material:			Donning instructions:	
Fabric manufactured by:			□YES	
Туре:				
Is the TPA of highly visible co	plour?		□YES	

Thermal protective aids Manufacturer: Model: Lot/Serial Num		Manufacturer Model: Lot/Serial Nu	r: mber:	Date: Time: Surveyor: Organization:					
2.5.2 Submitted dr									
			Submitted drawings and documents	5	Status				
Drawing No.	Revis date	ion No. &	Title	e of drawing					
	-		Submitted reports and documents		Otatura				
Report/Document No.	Revis date	ion No. &	Title of r	eport / document	Status				
			Maintenance Manual -						
			Operations Manual -						

Thermal protective aids	Manufacturer: Model: Lot/Serial Number:	Surveyor:				
2.5.3 Quality Assurance		Regulations: - MSC.81(70) 2/1.1, 1.2				
of the International Conventi amended, of the international inspected, representatives of inspections of manufacturer appliances and materials u approved prototype life-saving Manufacturers should be requ to ensure that life-saving app as the prototype life-saving app	of a particular type are required by Chapter III ion for the Safety of Life at Sea, 1974, as il Life-Saving Appliances (LSA) Code, to be of the Administration should make random is to ensure that the quality of life-saving used comply with the specification of the gappliance. uired to institute a quality control procedure liances are produced to the same standard opliance approved by the Administration and ction tests carried out in accordance with the	Quality Assurance Standard Used: - Quality Assurance Procedure: - Quality Assurance Manual: - Description of System. Quality Assurance System acceptable: Yes/No Comments/Observations				

Thermal protective aids	Model:	er:				Time:	
2.5.4 Visual Inspection			Regulatio	ns: LSA Code I/1.2.2	2, II/2.5; MS	SC. 81(70);	
Test Procedure		Acceptano	ce Criteria			Significant Test Data	
Is the thermal protection aid o colour?	f high visible	Be of an international or vivid re high visible colour on all parts at sea.			□Yes	□No	
Does the thermal protection a		Cover the whole body of pe		ll sizes wearing a	□Yes	□No	
whole body of the weare exception of the face?	er with the	lifejacket with the exception of	the face.		□Yes	□No	
If provided with arms, are covered, or are permanen gloves provided? Be clearly marked with information including the A which approved it, date of man any operational restrictions. with labels giving servicing intervals between servicing instructions, general inform manufacturer's details.	tly attached n approval dministration pufacture and Be provided details and g, operating						

Thermal protective aids	mal protective aids Manufacturer: Model: Lot/Serial Number:			Surveyor:	Time:		
2.5.5 Fabric Test - Water r	esistance		Regulatio	ns: LSA Code ; M	ISC.81(70) 1/3.3.1		
Test Procedure		Acceptano			Significant Test Data		
The fabric from which the thermal protective aid is constructed should be tested to determine its resistance to penetration by a 2m head of water.		supporting a column of water 2 m high.		Does the material support a column of water high PYES INO Test method used: Comments/Observations	of 2 m		
2.5.6 Fabric test - Therma	l conductanc	e	Regulation	gulations: LSA Code II/2.5.1; MSC.81(70) 1/3.3.2			
Test Procedure		Acceptano	nce Criteria Significant Test Da				
			be so const all reduce be	ructed that, when oth the convective			

Theri	Thermal protective aids Model:		er: umber:		Surveyor:	Time:	
2.5.7	Temperature cy	cling test		Regulatio	2.2.2; MSC.81(70) 1/3.3.3		
	Test Procedure		Acceptance Criteria			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 acceptable:			The thermal protective aid sho such as shrinking, swelling mechanical qualities				
.1	.1 an 8 h exposure at a minimum temperature of +65°C to be completed in one day; and					Comments/Observations	
.2	the specimens remove warm chamber that sate left exposed under of conditions at a temperate ± 3°C until the next day	ame day and rdinary room ature of 20°C					
.3	an 8 h exposure at temperature of -30 completed the next day	°C to be					
.4	the specimen removed chamber that same exposed under ord conditions at a tempera ± 3°C until the next day	day and left linary room ature of 20°C					

Therma	al protective aids	Manufacturer: Model: Lot/Serial Number:				Surveyor: _		Time:		
2.5.7	Temperature c	ycling test – Test data Reg				egulations: LSA Code I/1.2.2.2; MSC.81(70) 1/3.3.3				
			COLD CYCLE							
Cycle 1	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Time In:	ure:		Date Out: Time Out: Duration:		
Cycle 2	Date In: Time In: Temperature:	0C	Date Out: Time Out: Duration:	hours	Date In: Time In: Temperat	ure:	0C	Date Out: Time Out: Duration:	hours	
Cycle 3	Date In: Time In: Temperature:		Date Out: Time Out: Duration:	hours	Date In: Time In: Temperat	ure:	°C	Date Out: Time Out: Duration:	hours	
Cycle 4	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Time In:	ure:		Date Out: Time Out: Duration:		
Cycle 5	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: Time In:	ure:	C	Date Out: Time Out: Duration:		
Cycle 6	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		lime In:	ure:	0 ⁰	Date Out: Time Out: Duration:		
Cycle 7	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: Time In: Temperat	ure:	C	Date Out: Time Out: Duration:		
Cycle 8	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: Time In:	ure:		Date Out: Time Out: Duration:		
Cycle 9	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In: Time In:	ure:		Date Out: Time Out: Duration:		
Cycle 10	Date In: Time In: Temperature:		Date Out: Time Out: Duration:		Date In:			Date Out: Time Out: Duration:		

Thermal protective aids	Manufacturer: Model: Lot/Serial Number:			Date: Surveyor: Organization:					
2.5.8 Test subjects				Regulation	ons: LSA Code II/2.5.2; MSC.81(70) 1/3.3.4				
Test Procedure	Acceptance 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:HeightWeight1.4 m - 1.6 m1 person under 60 kg1.6 m - 1.8 m1 person over 60 kg1.6 m - 1.8 m1 person under 70 kgover 1.8 m1 person over 80 kg		I	Subject 1 Subject 2 Subject 3 Subject 4 Subject 5	Male/Female Height Weight Subject 1			
2.5.9 Test clothing				Regulatio	ns: LSA Code I	/2.5; MSC.81	(70) 1/3.3.5, 3.2.6	& 3.2.8	
Test Procedure	Acceptance Criteria				Significant Test Data				
The test subjects should we range clothing consisting of .1 underwear (short sleeved, .2 shirt (long sleeved) .3 trousers (not woollen, socks .4 in addition to the cloth subjects should wear pullovers during the tests 2.5.10; 2.5.11 and 2.5.12.					□YES	at subject use the ⊡NO s/Observations	specified te:	st clothing	

Thermal protective aids	Model:	urer: Number:		Date: Surveyor: Organization:			
2.5.10 Donning test (1)					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.		The test subjects should be able to unpack and		k and don the	TimePassedFailedSubject No.1secSubject No.2secSubject No.3secSubject No.4secSubject No.5secSubject No.6secSubject No.6sec		
2.5.11 Donning test (2) at	low temperat	ure	Regulatio	ns: LSA Code	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 ar an ambient temperature of -3 the donning test the thermal p should be kept in a refrigerated a temperature of -30°C for 24	nd donned at 0° C. Before protective aid d chamber at	The test subjects should be all and don the thermal protective a survival craft or rescue boat. The thermal protective aid throughout an air temperature	e aid withou shall fund	t assistance in	TimePassed Failed Subject No.1 sec		

Thermal protective aids	Model:	ər:		Surveyor:			
	Lot/Serial Number:		Organization:				
2.5.12 Discarding Test			Regulatio	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 ability of the test subjects to sw be demonstrated that it can b by the test subjects, when water, in not more than 2 min.	vim, it should be discarded immersed in	less than 2 min.			TimePassed Failed Subject No.1 sec		
2.5.13 Oil resistance test		Regulations: LSA Code I/1.2.2.4; MSC.81(70) 1/3.3.9					
Test Procedure		Acceptance Criteria			Significant Test Data		
After all its apertures have be thermal protective aid should under 100 mm head of diesel	be immersed	After this test the thermal prot signs of damage, such as shr dissolution or change of m	inking, crac	king, swelling, qualities. The	Is the thermal conductance of the thermal protective aid not more than 7800 W/m ² K?		
The surface oil should then be wiped off and it should be established the thermal conductance of the material.		thermal conductance shou 7800 W/m ² K.	ld be not	more than	□YES □NO		
					Is there any sign of damage, such as shrinking, cracking, swelling, dissolution or change of mechanical qualities?		
					□YES □NO		
					Comments/Observations		