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REVISED STANDARDIZED LIFE-SAVING APPLIANCE EVALUATION AND TEST REPORT FORMS (VISUAL SIGNALS)

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 III of the LSA Code, i.e. visual signals (rocket parachute flares, hand flares and buoyant smoke signals).

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.

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ANNEX

REVISED STANDARDIZED LIFE-SAVING APPLIANCE EVALUATION AND TEST REPORT FORMS (VISUAL SIGNALS)

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 the Revised recommendation, 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 the Revised recommendation 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 (VISUAL SIGNALS)

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3.1 ROCKET PARACHUTE FLARES

EVALUATION AND TEST REPORT

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

Rocket parachute flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.1.1 Submitted drawings, reports and documents

Submitted drawings and documents			**Status**
Drawing No.	**Revision No. & date**	**Title of drawing**	

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

Rocket parachute flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.1.1.1 Quality assurance	**Regulations: MSC.81(70) 2/1.2, 1.1**
Except where all appliances of a particular type are required by chapter III of the International Convention for the Safety of Life at Sea, 1974, as amended, 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 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 Standard Used: Quality Assurance Procedure: Quality Assurance Manual: Description of System: Quality Assurance System acceptable Yes/No Comments/Observations

Rocket parachute flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.1.1.2 Visual inspection		**Regulations: LSA Code I/1.2.2 & III/3.1, 1.2.3**
Test Procedure	Acceptance Criteria	Significant Test Data
Visual examination: 1. Approval markings. 2. Operating instructions. 3. Outer casing. 4. Comfort. 5. Operation. 6. Ignition System. Lifetime	Rocket Parachute Flares should: 1. be clearly marked with approval information including the Administration which approved it, date of manufacture and expiry and operational restrictions, markings are to be indelible; 2. be provided with brief instructions or diagrams clearly illustrating the use of the rocket parachute flare printed on the casing; 3. not depend on adhesive tapes or plastic envelopes for its water-resistant properties; 4. be so designed as not to cause discomfort to the person holding the casing when used in accordance with the manufacturers' operating instructions; 5. be so constructed that the end from which the rocket is ejected can be positively identified by day or night; and 6. be fitted with an integral means of ignition. The Administration should determine the period of acceptability of the unit which are subject to deterioration with age.	1. Approval markings: Pass/Fail 2. Operating Instructions: Pass/Fail 3. Outer casing: Pass/Fail 4. Comfort: Pass/Fail 5. Operation: Pass/Fail 6. Ignition system: Pass/Fail Period of acceptability: Comments/Observations

Rocket parachute flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.1.1.3 General data and specifications		**Regulations: LSA Code 1.2; MSC.81(70) Pt 1/4.6**
General Information	**Dimensions**	**Weight**
Construction Material: Casing: _____ Top cover (if applicable): _____ Bottom cover (if applicable): _____ Method of Ignition _____ Operational Safety Delay (if applicable): _____ Parachute Material _____ Acceptable life of the item yrs	Dimensions: Length of Casing: _____ Diameter of Casing: _____ Parachute Dimensions: Number of attachment Cords: _____ Diameter of Line: _____	Design Weight: _____ Weight as Tested: _____ Weight of Flare Material: _____ Weight of Rocket Charge: _____ Comments/Observations

Rocket parachute flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

TEST ITEMS CONDITIONING SEQUENCE	**SPECIMEN NUMBER**									**REFERENCES**	**REMARKS**
Specimen No. ->	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-28	MSC81(70)	
Measuring dimensions and mass	A	A	A	A	A	A	A	A	A		
Temperature cycling test (3.1.2)	B									4.2.1	
Low temperature conditioning (3.1.3)		B								4.2.2	
High temperature conditioning (3.1.4)			B							4.2.3	
Humidity conditioning (3.1.5)				B						4.2.4	
1 m immersion for 24 hours (3.1.6.1)					B					4.3.1	
100 mm for 5 minutes (3.1.6.2)						B				4.3.2	
Salt water spray (3.1.6.3)							B			4.3.3	
2 m Drop Test (3.1.7.1)								B		4.4.1	
Safety inspection (3.1.9)	C	C	C	C	C	C	C	C		4.5	
Operation at ambient temperature	D				D	D	D	D		4.2.1, 4.3.1, 4.3.2, 4.3.3 & 4.4.1	

Rocket parachute flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

Specimen No. ->	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-28	References	Remarks
Operate at conditioning Temperature		D	D	D						4.2.2, 4.2.3 & 4.2.4	
Operational test using immersion suit glove (3.1.7.2)	E				E			E		/4.4.2	Use specimens #2, #14 and #23.
Vertical firing height, descent speed, burn time. (Note 1)			E		E	E	E			4.6.1	
45° firing to horizontal. (Note 2)	E	E		E				E		4.6.3	
Rocket recoil test for hand-held only. (Note 3)	E	E	E	E	E	E	E	E		4.6.4	
Flare material test colour and luminosity (3.1.8)										4.6.2	Additional flares may be used to measure the luminous intensity and may be carried out by an independent laboratory acceptable to the administration and report submitted.
Chute examination after recovery. (Note 4)	F	F	F	F	F	F	F	F		LSA. Code Chapter III/ 3.1.2.5	
Liferaft Drop Test (4.2.4)									G	LSA Code Chapter IV/ 4.1.1.2	The liferaft manufacturer should complete this form.

Note: The letters in the above 'boxes' refer to the sequence of testing of each specimen Rocket Parachute Flare.
Note 1. Not all samples marked need to be fired at 90°. A representative sample of at least 18 specimens should be so assessed, so that a representative descent rate can be found.
Note 2. Not all samples marked need to be fired at 45°. A representative sample of at least 3 specimens should be so assessed.
Note 3. Not all samples need to be recoil tested. A representative sample of at least 3 rockets should be so assessed by hand firing.
Note 4. It is accepted that all parachutes may not be recoverable - as many as possible should be recovered and inspected for damage.

Rocket parachute flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.1.2 Temperature cycling test — **Regulations: LSA Code I/1.2 & III/3.1; MSC.81(70) 1/1.2.1, 4.2 & 4.6**

Test Procedure	Acceptance Criteria	Significant Test Data
The three specimens of parachute rocket flares should be alternately subjected to surrounding temperatures of -30°C and +65°C. These alternating cycles need not follow immediately after each other and the following procedure, repeated for a total of 10 cycles, is acceptable: .1 an 8 h exposure at a minimum temperature of +65°C to be completed in one day; .2 the specimens removed from the warm chamber that same day and left exposed under ordinary room conditions at a temperature of 20°C ± 3°C until the next day; .3 an 8 h exposure at a maximum temperature of -30°C to be completed the next day; and .4 the specimen removed from the cold chamber that same day and left exposed under ordinary room conditions at a temperature of 20°C ± 3°C until the next day. The three parachute rockets after completing temperature cycling should function effectively at ambient temperature Samples 1 and 2 should be fired vertically. Sample 3 should be fired at an angle of 45°.	After the test, each specimen should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should then function at ambient temperature. .1 It should be established by means of accurate measuring instruments that the parachute flares of specimens 1 and 2 are ejected at a height of not less than 300 m. .2 The height of which the flare burns out and the burning period should also be measured. .3 It should be established from these measurements that the rate of descent is not more than 5 m/s and the burning period is not less than 40 s. .4 Specimen 3 should function efficiently but need not reach a height of 300 metres. .5 If the rocket is hand-held when operated, it should be demonstrated that its recoil is minimal. .6 It should be determined by examination that the flare has not damaged its parachute or attachments whilst it was burning.	1 | 2 | 3 Condition after conditioning (Pass/Fail) | | | Ejection height of flare (metres) Operation 90° | | N/A Burn out height of flare (metres) | | N/A Burn time of flare (sec) | | | Descent rate of flare (m/s) | | N/A Operation at 45° (Pass/Fail) N/A | N/A | | Height reached (metres) | | N/A Parachute condition (Pass/Fail) | | | Recoil minimal (Pass/Fail) | | | Comments/Observations Passed_____Failed _____

Rocket parachute flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.1.3 Low temperature conditioning test		**Regulations: LSA Code I/1.2 & .III/3.1; MSC.81(70) 1/4.2.2**
Test Procedure	Acceptance Criteria	Significant Test Data

Three parachute rockets should be subjected to a temperature of -30°C for at least 48 h and then function effectively immediately upon removal from the cold chamber.

Specimen 4 and 5 should be fired vertically. Specimen 6 should be fired at an angle of 45°.

After the test, each specimen should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should then function effectively immediately.

.1 It should be established by means of accurate measuring instruments that the parachute flares of specimen 4 and 5 are ejected at a height of not less than 300 m.

.2 The height of which the flare burns out and the burning period should also be measured.

.3 It should be established from these measurements that the rate of descent is not more than 5 m/s and the burning period is not less than 40 s.

.4 Specimen 6 should function efficiently but need not reach a height of 300 metres.

.5 If the rocket is hand-held when operated, it should be demonstrated that its recoil is minimal.

.6 It should be determined by examination that the flare has not damaged its parachute or attachments whilst it was burning.

4	5	6
Condition after conditioning (Pass/Fail)		
Ejection height of flare (metres) Operation 90°		
		N/A
Burn out height of flare (metres)		
		N/A
Burn time of flare (sec)		
Descent rate of flare (m/s)		
		N/A
Operation at 45° (Pass/Fail)		
N/A	N/A	
Height reached (metres)		
		N/A
Parachute condition (Pass/Fail)		
Recoil minimal (Pass/Fail)		
Comments/Observations		
Passed_____Failed _____		

Rocket parachute flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.1.4 High temperature conditioning test	**Regulations: LSA Code I/1.2 & III/3.1; MSC.81(70) 1/4.2.3, 4.6**

Test Procedure	Acceptance Criteria	Significant Test Data		
Three parachute rockets should be subjected to a temperature of +65°C for at least 48 h and then function effectively immediately upon removal from the hot chamber. The three rockets should be fired vertically.	After the test, each specimen should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should then function effectively immediately. 1. It should be established by means of accurate measuring instruments that the parachute flares of the three rockets are ejected at a height of not less than 300 m. 2. The height of which the flare burns out and the burning period should also be measured. 3. It should be established from these measurements that the rate of descent is not more than 5 m/s and the burning period is not less than 40 s. 4. If the rocket is hand-held when operated, it should be demonstrated that its recoil is minimal. 5. It should be determined by examination that the flare has not damaged its parachute or attachments whilst it was burning.	7	8	9
		Condition after conditioning (Pass/Fail)		
		Ejection height of flare (metres) Operation 90°		
		Burn out height of flare (metres)		
		Burn time of flare (sec)		
		Descent rate of flare (m/s)		
		Parachute condition (Pass/Fail)		
		Recoil minimal (Pass/Fail)		
		Comments/Observations Passed_____Failed_____		

Rocket parachute flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.1.5 Humidity conditioning test | **Regulations: LSA Code I/1.2 & III/3.1; MSC.81(70) 1/4.2.4**

Test Procedure	Acceptance Criteria	Significant Test Data		
		10	11	12
Three specimens of parachute rockets should be subjected to a temperature of +65°C and 90% relative humidity for at least 96 h, followed by 10 days at 20°C to 25°C at 65% relative humidity. Specimen 10 and 11 should be fired vertically. Specimen 12 should be fired at an angle of 45°.	After the test, each specimen should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should then function at ambient temperature. .1 It should be established be by means of accurate measuring instruments that the parachute flares of specimens 10 and 11 are ejected at a height of not less than 300 m. .2 The height of which the flare burns out and the burning period should also be measured. .3 It should be established from these measurements that the rate of descent is not more than 5 m/s and the burning period is not less than 40 s. .4 Specimen 12 should function efficiently but need not reach a height of 300 metres. .5 If the rocket is hand-held when operated, it should be demonstrated that its recoil is minimal. .6 It should be determined by examination that the flare has not damaged its parachute or attachments whilst it was burning.	Condition after conditioning (Pass/Fail)		
		Ejection height of flare (metres) Operation 90°		
				N/A
		Burn out height of flare (metres)		
				N/A
		Burn time of flare (sec)		
		Descent rate of flare (m/s)		
				N/A
		Operation at 45° (Pass/Fail)		
		N/A	N/A	
		Height reached (metres)		
				N/A
		Parachute condition (Pass/Fail)		
		Recoil minimal (Pass/Fail)		
		Comments/Observations Passed_____Failed _____		

Rocket parachute flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.1.6.1 1 m immersion for 24 hours test | **Regulations: LSA Code I/1.2 & III/3.1; MSC.81(70) 1/4.3.1, 4.6**

Test Procedure	Acceptance Criteria	Significant Test Data		
		13	14	15
Three parachute rockets should be immersed horizontally for 24 h under 1 m of water. The three rockets should be fired vertically.	After the test, each rocket should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should then function at ambient temperature. 1. It should be established by means of accurate measuring instruments that the parachute flares of the three rockets are ejected at a height of not less than 300 m. 2. The height of which the flare burns out and the burning period should also be measured. 3. It should be established from these measurements that the rate of descent is not more than 5 m/s and the burning period is not less than 40 s. 4. If the rocket is hand-held when operated, it should be demonstrated that its recoil is minimal. 5. It should be determined by examination that the flare has not damaged its parachute or attachments whilst it was burning.	Condition after conditioning (Pass/Fail)		
		Ejection height of flare (metres) Operation 90°		
		Burn out height of flare (metres)		
		Burn time of flare (sec)		
		Descent rate of flare (m/s)		
		Parachute condition (Pass/Fail)		
		Recoil minimal (Pass/Fail)		
		Comments/Observations Passed_____Failed _____		

Rocket parachute flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.1.6.2 10 cm immersion for 5 min test | **Regulations: LSA Code I/1.2 & III/3.1; MSC.81(70) 1/4.3.2, 4.6**

Test Procedure	Acceptance Criteria	Significant Test Data

Three parachute rockets should be immersed in the ready to fire condition for 5 min under 10 cm of water.

The three rockets should be fired vertically.

After the test, each rocket should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should then function at ambient temperature.

.1 It should be established by means of accurate measuring instruments that the parachute flares of the three rockets are ejected at a height of not less than 300 m. The height of which the flare burns out and the burning period should also be measured. It should be established from these measurements that the rate of descent is not more than 5 m/s and the burning period is not less than 40 s.

.2 If the rocket is hand-held when operated, it should be demonstrated that its recoil is minimal.

.3 It should be determined by examination that the flare has not damaged its parachute or attachments whilst it was burning.

	16	17	18
Condition after conditioning (Pass/Fail)			
Ejection height of flare (metres) Operation 90°			
Burn out height of flare (metres)			
Burn time of flare (sec)			
Descent rate of flare (m/s)			
Parachute condition (Pass/Fail)			
Recoil minimal (Pass/Fail)			

Comments/Observations

Passed_____Failed_____

Rocket parachute flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.1.6.3 Salt spray test — **Regulations: LSA Code I/1.2 & III/3.1; MSC.81(70) 1/4.3.3, 4.6**

Test Procedure	Acceptance Criteria	Significant Test Data
Three specimens of parachute rockets should be subjected to a salt spray (5% Natrium Chloride solution) at a temperature of +35±3°C for at least 100 h. The three rockets should be fired vertically. Note: Natrium and Sodium are the same	After the test, each specimen should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should then function at ambient temperature. 1. It should be established by means of accurate measuring instruments that the parachute flares of the three rockets are ejected at a height of not less than 300 m. 2. The height of which the flare burns out and the burning period should also be measured. 3. It should be established from these measurements that the rate of descent is not more than 5 m/s and the burning period is not less than 40 s. 4. If the rocket is hand-held when operated, it should be demonstrated that its recoil is minimal. 5. It should be determined by examination that the flare has not damaged its parachute or attachments whilst it was burning.	19 / 20 / 21 Condition after conditioning (Pass/Fail) Ejection height of flare (metres) Operation 90° Burn out height of flare (metres) Burn time of flare (sec) Descent rate of flare (m/s) Parachute condition (Pass/Fail) Recoil minimal (Pass/Fail) Comments/Observations Passed_____Failed _____

Rocket parachute flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.1.7.1 2 m drop test — **Regulations: LSA Code I/1.2 & III/3.1; MSC.81(70) 1/4.4.1, 4.6**

Test Procedure	Acceptance Criteria	Significant Test Data

Three parachute rockets should be dropped in turn end-on and horizontally from a height of 2 m on to a steel plate about 6 mm thick cemented on to a concrete floor. They should remain in a safe condition after this test.

Specimen 22 and 23 should be fired vertically. Specimen 24 should be fired at an angle of 45°.

After the test, each specimen should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should then function at ambient temperature.

.1 It should be established by means of accurate measuring instruments that the parachute flares of specimens 22 and 23 are ejected at a height of not less than 300 m.

.2 The height of which the flare burns out and the burning period should also be measured.

.3 It should be established from these measurements that the rate of descent is not more than 5 m/s and the burning period is not less than 40 s.

.4 Specimen 24 should function efficiently but need not reach a height of 300 metres.

.5 If the rocket is hand-held when operated, it should be demonstrated that its recoil is minimal.

.6 It should be determined by examination that the flare has not damaged its parachute or attachments whilst it was burning.

22	23	24
Condition after conditioning (Pass/Fail)		
Ejection height of flare (metres) Operation 90°		
		N/A
Burn out height of flare (metres)		
		N/A
Burn time of flare (sec)		
Descent rate of flare (m/s)		
		N/A
Operation at 45° (Pass/Fail)		
N/A	N/A	
Height reached (metres)		
		N/A
Parachute condition (Pass/Fail)		
Recoil minimal (Pass/Fail)		
Comments/Observations Passed_____Failed _____		

Rocket parachute flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.1.7.2 Immersion suit glove test | **Regulations: LSA Code I/1.2 & III/3.1; MSC.81(70) 1/4.4.2, 4.6**

Test Procedure	Acceptance Criteria	Significant Test Data
Three parachute rockets should be activated in accordance with the manufacturer's operating instructions by an operator wearing an insulated buoyant immersion suit or the gloves taken from an insulated buoyant immersion suit to establish that they can be operated effectively without injury to the operator, or any person in close proximity during firing or burning. The three rockets should be fired vertically.	After the test, each specimen should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should then function at ambient temperature. .1 It should be established by means of accurate measuring instruments that the parachute flares of the three rockets are ejected at a height of not less than 300 m. .2 The height of which the flare burns out and the burning period should also be measured. .3 It should be established from these measurements that the rate of descent is not more than 5 m/s and the burning period is not less than 40 s. .4 If the rocket is hand-held when operated, it should be demonstrated that its recoil is minimal. .5 It should be determined by examination that the flare has not damaged its parachute or attachments whilst it was burning.	2 | 14 | 23 Condition after conditioning (Pass/Fail) Ejection height of flare (metres) Operation 90° Burn out height of flare (metres) Burn time of flare (sec) Descent rate of flare (m/s) Parachute condition (Pass/Fail) Recoil minimal (Pass/Fail) Comments/Observations Passed_____Failed _____

Rocket parachute flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.1.8 Luminous intensity test	**Regulations: LSA Code I/1.2 & III/3.1.2; MSC.81(70) 1/4.6.2**	
Test Procedure	Acceptance Criteria	Significant Test Data
Laboratory testing of the rocket parachute flare should establish that it will burn with the required luminous intensity and colour.	Laboratory testing of the flare material should establish: .1 that it will burn uniformly with an average luminous intensity of not less than 30,000 cd for a period of not less than 40 seconds, at temperatures from -30°C to +65°C; and .2 that the colour of the flame is a vivid red with CIE coordinates x = 0.61 to 0.69 and y = 0.3 to 0.39, or computed from these coordinates: a wavelength of 608 + 11 nm. The measured chromaticity coordinates should be within the boundaries of the area of the diagram as per CIE.	Laboratory Testing report Report acceptable (Yes/No) Luminous intensity levels at -30°C: _____ KCd Burning time of Flare_____sec Colour coordinates: x.....y..... Luminous intensity levels at +20°C:_____ KCd Burning time of Flare_____sec Colour coordinates: x.....y..... Luminous intensity levels at +65°C _____ KCd Burning time of Flare_____sec Colour coordinates: x.....y..... Comments/Observations. Passed_____Failed _____

Rocket parachute flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.1.9 Safety inspection	**Regulations: LSA Code I/1.2 & III/3.1; MSC.81(70) 1/4.5**	
Test Procedure	Acceptance Criteria	Significant Test Data
It should be established by visual inspection that the rocket parachute flare:		
.1 is indelibly marked with clear and precise instructions on how it should be operated and that the danger end can be identified by day or night;	Clear and precise operating instructions are marked on the parachute rocket flare and the parachute rocket flare clearly identifies the danger end.	Markings and identification of ends acceptable Passed_____Failed _____
.2 can, if hand operated, be operated from the bottom (safe end) or that it contains an operational safety delay of 2 seconds;	If operated from the top the time delay is not to be less than 2 s.	Time delay if operated from the top_____sec
.3 has a simple and integral means of ignition which requires the minimum of preparation and can be readily operated in adverse conditions without external aid and with wet, cold or gloved hands;	It has a simple and integral means of ignition and can be operated by cold, wet and gloved hands.	Operation of specimen when wet, cold and gloved hands. Passed_____Failed _____
.4 does not depend on adhesive tapes or plastic envelopes for its water-resistant properties; and	Adhesive tapes or plastic envelopes are not used to maintain water-resistant properties.	Water resistant without the use of envelopes or adhesive tape. Passed_____Failed _____
.5 can be indelibly marked with means of determining its age.	Date of manufacturing and date of expiry indelible printed on the outside.	Indelible date stamped Passed_____Failed _____ Comments/Observations

Rocket parachute flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.1.10 Liferaft drop test — **Regulations: LSA Code 1.2 & 4.1.1.2, MSC.81(70) I/5.1.2**

Test Procedure	Acceptance Criteria	Significant Test Data
The liferaft in the operationally packed condition should be suspended and then dropped from a height of 18 m into the water. If the liferaft is to be stowed at a height greater than 18 m above the waterline in the lightest seagoing condition, it should be dropped from the height at which it is to be stowed. Note: This test sheet should be completed by the liferaft manufacturer. Reference should be made to the test sheet 4.2.4.	Damage to any item of equipment is acceptable subject to the administration being satisfied that the operational efficiency has not been impaired. After the test, each rocket parachute flare should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities.	25 | 26 | 27 | 28 Condition of units (Pass/Fail) Passed_____ Failed _____ Comments/Observations

3.2 HAND FLARES

EVALUATION AND TEST REPORT

3.2.1 Submitted drawings, reports and documents

- 3.2.1.1 Quality assurance
- 3.2.1.2 Visual inspection
- 3.2.1.3 General data and specifications

3.2.2 Temperature cycling test

3.2.3 Low temperature conditioning test

3.2.4 High temperature conditioning test

3.2.5 Humidity conditioning test

3.2.6 Water and corrosion resistance test

- 3.2.6.1 1 metre immersion for 24 hours test
- 3.2.6.2 100 mm immersion for 5 minutes test
- 3.2.6.3 Salt spray test

3.2.7 Handling safety

- 3.2.7.1 2 m drop test
- 3.2.7.2 Immersion suit glove test
- 3.2.7.3 Handling safety immersion test

3.2.8 Heptane test

3.2.9 Luminous intensity test

3.2.10 Liferaft drop test

3.2.11 Safety inspection

3.2 HAND FLARES

EVALUATION AND TEST REPORT

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

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.2.1 Submitted drawings, reports and documents

Submitted drawings and documents			**Status**
Drawing No.	**Revision No. & date**	**Title of drawing**	

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

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.2.1.1 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 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 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 Standard Used: _____ Quality Assurance Procedure: _____ Quality Assurance Manual: _____ Description of System. Quality Assurance System acceptable Yes/No Comments/Observations

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.2.1.2 Visual inspection		**Regulations: LSA Code I/1.2.2, 1.2.3 & III/3.2**
Test Procedure	Acceptance Criteria	Significant Test Data
Visual examination:	Red hand flares should:	
Approval markings	.1 be clearly marked with approval information including the Administration which approved it, date of manufacture and expiry and operational restrictions, markings are to be indelible;	Passed _____ Failed _____
Operating instructions	.2 be provided with brief instructions or diagrams clearly illustrating the use of the hand flare printed on the casing;	Passed _____ Failed _____
Outer casing	.3 not depend on adhesive tapes or plastic envelopes for its water-resistant properties;	Passed _____Failed _____
Comfort	.4 be so designed as not to cause discomfort to the person holding the casing when used in accordance with the manufacturers' operating instructions;	Passed _____ Failed _____
Operation	.5 be so constructed that the end from which the flare is burning can be positively identified by day or night; and	Passed _____ Failed _____
Ignition System	.6 be fitted with an integral means of ignition.	Passed _____ Failed _____
Life of Hand Flare	The Administration should determine the period of acceptability of the unit which are subject to deterioration with age.	Passed _____ Failed _____
		Comments/Observations

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.2.1.3 General data and specifications	**Regulations: LSA Code 1.2; MSC.81(70) 1/4.7**

General Information	**Dimensions**	**Weight**
Construction Material: Casing: _____ Top cover (if applicable): _____ Bottom Cover (if applicable): _____ Method of Ignition _____ Operational Safety Delay (if applicable) _____ Acceptable life of the item yrs	Dimensions: Length of Casing: _____ Diameter of Casing: _____	Design Weight: _____ Weight as Tested: _____ Weight of Flare Material _____ Comments/Observations

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

TEST ITEMS CONDITIONING SEQUENCE	**SPECIMEN NUMBER**									**REFERENCES**	**REMARKS**
Specimen No. ->	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	MSC81(70)	
Measuring dimensions and mass	A	A	A	A	A	A	A	A			
Temperature cycling test (3.2.2)	B									4.2.1	
Low temperature conditioning (3.2.3)		B								4.2.2	
High temperature conditioning (3.2.4)			B							4.2.3	
Humidity conditioning (3.2.5)				B						4.2.4	
1 metre immersion for 24 hours (3.2.7.1)					B					4.3.1	
100 mm for 5 min (3.2.7.2)						B				4.3.2	
Salt water spray (3.2.7.3)							B			4.3.3	
2 m Drop Test (3.2.8.1)								B		4.4.1	
Safety inspection (3.2.12)	C	C	C	C	C	C	C	C	C	4.5	
Operation at ambient temperature	D				D	D	D	D	D	4.2.1, 4.3.1, 4.3.2, 4.3.3 & 4.4.1	

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

Specimen No. ->	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-30	References	Remarks
Operate at conditioning Temperature		D	D	D						4.2.2, 4.2.3 & 4.2.4	
Operational test using immersion suit glove (3.2.8.2)								E		/4.4.2	
Burning time of flare	E	E	E	E	E	E	E	E		4.7.1	
Flare immersion test under water (3.2.8.3)			E							4.7.1	
Heptane test (3.2.9)								E		4.7.3	
Flare material test Colour and luminosity (3.2.10)									F	4.7.2	May be carried out by an independent laboratory acceptable to the Administration & report submitted. Use specimens 29 to 30.
Liferaft Drop Test (3.2.11)									G	LSA Code Chapter IV/4.1.1.2	The liferaft manufacturer should complete this form.

Note: The letters in the above 'boxes' refer to the sequence of testing of each specimen Hand Flare.

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.2.2 Temperature cycling test — **Regulations: LSA Code I/1.2 & III/3.2; MSC.81(70) 1/1.2.1 & 4.2.1**

Test Procedure	Acceptance Criteria	Significant Test Data
The three specimens of hand flares should be alternately subjected to surrounding temperatures of -30°C and +65°C. These alternating cycles need not follow immediately after each other and the following procedure, repeated for a total of 10 cycles, is acceptable: .1 an 8 h exposure at a minimum temperature of +65°C to be completed in one day; .2 the specimens removed from the warm chamber that same day and left exposed under ordinary room conditions at a temperature of 20°C ± 3°C until the next day; .3 an 8 h exposure at a maximum temperature of -30°C to be completed the next day; and .4 the specimen removed from the cold chamber that same day and left exposed under ordinary room conditions at a temperature of 20°C ± 3°C until the next day. The three hand flares after completing temperature cycling should function effectively at ambient temperature.	After the test, each specimen should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should then function at ambient temperature. The three flares should burn for a period of not less than 1 minute. The hand flare should not cause discomfort to the person holding the casing and not endanger the survival craft by burning or glowing residues when used in accordance with the manufacturer's operating instructions.	1 / 2 / 3 Condition (Pass/Fail) Burn time (sec) Time delay (if applicable) (sec) Comments/Observations Passed _____ Failed _____

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.2.3 Low temperature conditioning test		**Regulations: LSA Code I/1.2 & III/3.2; MSC.81(70) 1/4.2.2**		
Test Procedure	Acceptance Criteria	Significant Test Data		
Three specimens of hand flare should be subjected to a temperature of -30°C for at least 48 h and should then function immediately upon removal from the cold chamber.	After the test, each specimen should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should then function effectively immediately. The three flares should burn for a period of not less than 1 minute. The hand flare should not cause discomfort to the person holding the casing and not endanger the survival craft by burning or glowing residues when used in accordance with the manufacturer's operating instructions.	4	5	6
		Condition (Pass/Fail)		
		Burn time (sec)		
		Time delay (if applicable) (sec)		
		Comments/Observations Passed_____ Failed _____		

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.2.4 High temperature conditioning test		**Regulations: LSA Code I/1.2 & III/3.2; MSC.81(70) 1/4.3**
Test Procedure	Acceptance Criteria	Significant Test Data
Three specimens of hand flares should be subjected to a temperature of +65°C for at least 48 h and then function effectively immediately upon removal from the hot chamber.	After the test, each specimen should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should then function effectively immediately. The three flares should burn for a period of not less than 1 minute. The hand flare should not cause discomfort to the person holding the casing and not endanger the survival craft by burning or glowing residues when used in accordance with the manufacturer's operating instructions.	7 | 8 | 9 Condition (Pass/Fail) | | | Burn time (sec) | | | Time delay (if applicable) (sec) | | | Comments/Observations Passed_____ Failed _____

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.2.5 Humidity conditioning test — **Regulations: LSA Code I/1.2 & III/3.2; MSC.81(70) 1/4.2.4**

Test Procedure	Acceptance Criteria	Significant Test Data
Three specimens of hand flares should be subjected to a temperature of +65°C and 90% relative humidity for at least 96 h, followed by 10 days at 20°C to 25°C at 65% relative humidity.	After the test, each specimen should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should then function effectively. The three flares should burn for a period of not less than 1 minute. The hand flare should not cause discomfort to the person holding the casing and not endanger the survival craft by burning or glowing residues when used in accordance with the manufacturer's operating instructions.	10 | 11 | 12 Condition (Pass/Fail) Burn time (sec) Time delay (if applicable) (sec) Comments/Observations Passed_____ Failed _____

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.2.6.1 1 metre immersion for 24 hours test | **Regulations: LSA Code I/1.2 & III/3.2; MSC.81(70) 1/4.3.1**

Test Procedure	Acceptance Criteria	Significant Test Data		
Three specimens of hand flares should be immersed horizontally for 24 h under 1 m of water.	After the test, each specimen should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should then function at ambient temperature. The three flares should burn for a period of not less than 1 minute. The hand flare should not cause discomfort to the person holding the casing and not endanger the survival craft by burning or glowing residues when used in accordance with the manufacturer's operating instructions.	13	14	15
		Condition (Pass/Fail)		
		Burn time (sec)		
		Time delay (if applicable) (sec)		
		Comments/Observations Passed_____ Failed _____		

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.2.6.2 100 mm immersion for 5 min test | **Regulations: LSA Code I/1.2 & III/3.2; MSC.81(70) 1/4.3.2**

Test Procedure	Acceptance Criteria	Significant Test Data		
		16	17	18
Three specimens of hand flares should be immersed horizontally in the ready to fire condition for 5 min under 100 mm of water.	After the test, each specimen should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should then function at ambient temperature. The three flares should burn for a period of not less than 1 minute. The hand flare should not cause discomfort to the person holding the casing and not endanger the survival craft by burning or glowing residues when used in accordance with the manufacturer's operating instructions.	Condition (Pass/Fail)		
		Burn time (sec)		
		Time delay (if applicable) (sec)		
		Comments/Observations Passed_____ Failed _____		

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.2.6.3 Salt spray test — **Regulations: LSA Code I/1.2 & III/3.2; MSC.81(70) 1/4.3.3**

Test Procedure	Acceptance Criteria	Significant Test Data		
		19	20	21
Three specimens of hand flares should be subjected to a salt spray (5% natrium chloride solution) at a temperature of +35±3°C for at least 100 h.	After the test, each specimen should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and should then function effectively.	Condition (Pass/Fail)		
		Burn time (sec)		
	The three flares should burn for a period of not less than 1 minute.			
		Time delay (if applicable) (sec)		
	The hand flare should not cause discomfort to the person holding the casing and not endanger the survival craft by burning or glowing residues when used in accordance with the manufacturer's operating instructions.	Comments/Observations		
Note: Natrium and Sodium are the same compound		Passed_____ Failed _____		

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.2.7.1 2 m drop test — **Regulations: LSA Code I/1.2 & III/3.2; MSC.81(70) 1/4.4.1**

Test Procedure	Acceptance Criteria	Significant Test Data		
Three specimens of hand flare should be dropped in turn on both ends and horizontally from a height of 2 m on to a steel plate about 6 mm thick cemented on to a concrete floor.	After the test each hand flare should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities and remain operable and should subsequently be operated and function effectively. They should burn for a period of not less than 1 minute. The hand flare should not cause discomfort to the person holding the casing and not endanger the survival craft by burning or glowing residues when used in accordance with the manufacturer's operating instructions.	22	23	24
		Condition (Pass/Fail)		
		Burn time (sec)		
		Time delay (if applicable) (sec)		
		Comments/Observations Passed_____ Failed _____		

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.2.7.2 Immersion suit glove test — **Regulations: LSA Code I/1.2 & III/3.2; MSC.81(70) 1/4.2.2**

Test Procedure	Acceptance Criteria	Significant Test Data
Three specimens of hand flare should be activated in accordance with the manufacturer's operating instructions by an operator wearing an insulated buoyant immersion suit or the gloves taken from an insulated buoyant immersion suit.	The three specimens should be capable of being operated effectively without injury to the operator, or any person in close proximity during firing or burning, they must burn for a period of not less than 1 minute. The hand flare should not cause discomfort to the person holding the casing and not endanger the survival craft by burning or glowing residues when used in accordance with the manufacturer's operating instructions.	19 | 20 | 21 Operation using glove (Pass/Fail) Burn time (sec) Time delay (if applicable) (sec) Type of Glove used _____ Comments/Observations Passed_____ Failed _____

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.2.7.3 Handling safety immersion test | **Regulations: LSA Code I/1.2 & III/3.2; MSC.81(70) 1/4.7.1**

Test Procedure	Acceptance Criteria	Significant Test Data		
		7	8	9
Three hand flares should be activated and should burn for a period of not less than 1 min. After burning for 30 s each flare should be immersed horizontally under 100 mm of water for a period of 10 s and should continue to burn for at least a further 20 s.	The three specimens should operate effectively under water without injury to the operator for a period of 10 s, the flare should burn for a period of not less than 1 min. The hand flare should not cause discomfort to the person holding the casing and not endanger the survival craft by burning or glowing residues when used in accordance with the manufacturer's operating instructions.	Under-water operation (Pass/Fail)		
		Burn time (sec)		
		Time delay (if applicable) (sec)		
		Comments/Observations Passed_____ Failed _____		

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.2.8 Heptane test — **Regulations: LSA Code I/1.2 & III/3.2; MSC.81(70) 1/4.7.3**

Test Procedure	Acceptance Criteria	Significant Test Data		
		22	23	24
Three hand flares should be activated at 1.2 m above a test pan 1 m square containing 2 litres of heptane floating on a layer of water. The test should be conducted at an ambient temperature of +20°C to +25°C. The flare should be allowed to burn completely.	The three specimens should not ignite the heptane. The flare should burn for a period of not less than 1 minute. The hand flare should not cause discomfort to the person holding the casing and not endanger the survival craft by burning or glowing residues when used in accordance with the manufacturer's operating instructions.	Heptane ignition (Pass/Fail)		
		Burn time (sec)		
		Time delay (if applicable) (sec)		
		Comments/Observations		
		Passed_____ Failed _____		

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.2.9 Luminous intensity test		**Regulations: LSA Code I/1.2 & III/3.2.2; MSC.81(70) 1/4.7.2**
Test Procedure	Acceptance Criteria	Significant Test Data
Laboratory testing of the flare should establish that it will burn with the required luminous intensity and colour.	Laboratory testing of the flare material should establish: .1 that it will burn with an average luminous intensity of at least 15,000 cd for a period of not less than 1 minute, at temperatures from -30°C to +65°C; and .2 that the colour of the flame is vivid red with CIE coordinates x = 0.61 to 0.69 and y = 0.3 to 0.39, or computed from these coordinates: a wavelength of 608 + 11 nm. The testing laboratory report should confirm that the average luminous intensity of the flare is at least 15,000 Cd. The measured chromaticity coordinates should be within the boundaries of the area of the diagram as per CIE.	Laboratory Testing report No.:_____ Report acceptable (Yes/No):_____ Luminous intensity levels at -30°C_____KCd Burning time of Flare_____sec Colour coordinates: x.....y..... Luminous intensity levels at +20°C_____KCd Burning time of Flare_____sec Colour coordinates: x.....y..... Luminous intensity levels at + 65°C _____KCd Burning time of Flare_____sec Colour coordinates: x.....y..... Comments/Observations Passed_____ Failed _____

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.2.10 Liferaft drop test		**Regulations: LSA Code 1.2 & 4.1.1.2, MSC.81(70) I/5.1.2**
Test Procedure	Acceptance Criteria	Significant Test Data
The liferaft in the operationally packed condition should be suspended and then dropped from a height of 18 m into the water. If the liferaft is to be stowed at a height greater than 18 m above the waterline in the lightest seagoing condition, it should be dropped from the height at which it is to be stowed. Note: This test sheet should be completed by the liferaft manufacturer. Reference should be made to the test sheet 4.2.4.	Damage to any item of equipment is acceptable subject to the administration being satisfied that the operational efficiency has not been impaired. After the test, each hand flare should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities.	25 | 26 | 27 | 28 Condition of units (Pass/Fail) | | | | Comments/Observations

Hand flares	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.2.11 Safety inspection		**Regulations: LSA Code I/1.2 & III/3.2; MSC.81(70) 1/4.5**
Test Procedure	Acceptance Criteria	Significant Test Data
It should be established by visual inspection that the hand flare:		
.1 is indelibly marked with clear and precise instructions on how it should be operated and that the danger end can be identified by day or night;	Clear and precise operating instructions are marked on the hand flare and the hand flare clearly identifies the danger end.	Markings and identification of ends acceptable Passed _____ Failed _____
.2 can, if hand operated, be operated from the bottom (safe end) or that it contains an operational safety delay of 2 seconds;	If operated from the top the time delay is not to be less than 2 s.	Time delay if operated from the top_____sec Operation of specimen when wet, cold and gloved hands. Passed_____Failed _____
.3 has a simple and integral means of ignition which requires the minimum of preparation and can be readily operated in adverse conditions without external aid and with wet, cold or gloved hands;	It has a simple and integral means of ignition and can be operated by cold, wet and gloved hands.	Water resistant without the use of envelopes or adhesive tape. Passed_____Failed _____
.4 does not depend on adhesive tapes or plastic envelopes for its water-resistant properties; and	Adhesive tapes or plastic envelopes are not used to maintain water-resistant properties.	Hand flare indelible date stamped. Passed_____Failed _____
.5 can be indelibly marked with means of determining its age.	Date of manufacturing and date of expiry indelible printed on the outside.	Comments/Observations

3.3 BUOYANT SMOKE SIGNALS

EVALUATION AND TEST REPORT

3.3.1 Submitted drawings, reports and documents

- 3.3.1.1 Quality assurance
- 3.3.1.2 Visual inspection
- 3.3.1.3 General data and specifications

3.3.2 Temperature cycling test

3.3.3 Low temperature conditioning test

3.3.4 High temperature conditioning test

3.3.5 Ambient temperature conditioning test

3.3.6 Humidity conditioning test

3.3.7 Water and corrosion resistance test

- 3.3.7.1 1 metre immersion for 24 hours test
- 3.3.7.2 100 mm immersion for 5 min test
- 3.3.7.3 Salt spray test

3.3.8 Handling safety

- 3.3.8.1 2 m drop test
- 3.3.8.2 Immersion suit glove test

3.3.9 Heptane test

3.3.10 Laboratory smoke obscuration test

3.3.11 Wave test

3.3.12 Liferaft drop test

3.3.13 Safety inspection

3.3 BUOYANT SMOKE SIGNALS

EVALUATION AND TEST REPORT

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

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.1 Submitted drawings, reports and documents

Submitted drawings and documents			**Status**
Drawing No.	**Revision No. & date**	**Title of drawing**	

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

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.1.1 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 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 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 Standard Used: Quality Assurance Procedure: Quality Assurance Manual: Description of System: Quality Assurance System acceptable Yes/No Comments/Observations

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.1.2 Visual inspection	**Regulations: LSA Code I/1.2.2, 1.2.3 & III/3.3**	
Test Procedure	Acceptance Criteria	Significant Test Data
Visual examination:	Buoyant Smoke Signals should:	
Approval markings	.1 be clearly marked with approval information including the Administration which approved it, date of manufacture and expiry and operational restrictions, markings are to be indelible;	Passed _____ Failed _____
Operating instructions	.2 be provided with brief instructions or diagrams clearly illustrating the use of the buoyant smoke signal printed on the casing;	Passed _____ Failed _____
Outer casing	.3 not depend on adhesive tapes or plastic envelopes for its water-resistant properties;	Passed _____ Failed _____
Comfort	.4 be so designed not to ignite explosively when used in accordance with the manufacturers' operating instructions;	Passed _____ Failed _____
Operation	.5 be so constructed that the end from which the smoke is emitted can be positively identified by day or night, it should not emit flame during the entire emission time or be swamped in a seaway; and	Passed _____ Failed _____
Ignition System	.6 has a simple means of ignition which requires the minimum of preparation.	Passed _____ Failed _____
Life of Smoke Signal	The Administration should determine the period of acceptability of the unit which are subject to deterioration with age.	Comments/Observations

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.1.3 General data and specifications		**Regulations: LSA Code 1.2; MSC.81(70) 1/4.5**
General Information	**Dimensions**	**Weight**
Construction Material: Casing: _____ Top cover (if applicable): _____ Bottom cover (if applicable): _____ Method of Ignition _____ Operational Safety Delay (if applicable) _____ Acceptable life of the item yrs	Dimensions: Length of Casing: _____ Diameter of Casing: _____	Design Weight: _____ Weight as Tested: _____ Weight of smoke-generating Material _____ Comments/Observations

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

TEST ITEMS **CONDITIONING** **SEQUENCE**	**SPECIMEN NUMBER**									**REFERENCES**	**REMARKS**
Specimen No. ->	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	MSC81(70)	
Measuring dimensions and mass	A	A	A	A	A	A	A	A	A		
Temperature cycling test (3.3.2)	B	B	B							4.8.1	
Low temperature conditioning (3.3.3)	C									4.8.1	
High temperature conditioning (3.3.4)		C								4.8.1	
Ambient temperature conditioning. (3.3.5)			C							4.8.1	
Humidity conditioning (3.3.6)				C						4.2.4	
1 metre immersion for 24 hours (3.2.7.1)					C					4.3.1	
100 mm for 5 minutes (3.2.7.2)						C				4.3.2	
Salt water spray (3.2.7.3)							C			4.3.3	
2 m Drop Test (3.3.8.1)								C		4.4.1	
Safety inspection (3.3.13)	D	D	D	D	D	D	D	D		4.5	

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

Specimen No. ->	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-26	References	Remarks
Operation at ambient temperature			E		E	E	E	E		4.3.1, 4.3.2, 4.3.3 & 4.4.1, 4.8.1	
Operate at conditioning Temperature	E	E		E						4.2.4 4.8.1	
Operational test using immersion suit glove (3.3.8.2)							F			4.4.2	
Heptane test (3.3.9)								F		4.8.2	
Smoke material test Smoke obscuration (3.3.10)										4.8.3	Additional smoke signals may be submitted to an independent laboratory acceptable to the Administration and report submitted.
Wave height test (3.3.11)				G						4.8.4	
Smoke emission time: 3 min minimum, Smoke colour	H	H	H	H	H	H	H	H		4.8.1	
Drop Test (3.3.12) & (4.2.4)									I	LSA Code Chapter IV/ 4.1.1.2	The liferaft manufacturer should complete this form.

Note: The letters in the above 'boxes' refer to the sequence of testing of each specimen Buoyant Smoke Signal.

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.2 Temperature cycling test — **Regulations: LSA Code I/1.2 & III/3.3; MSC.81(70) 1/1.2.1 & 4.8.1**

Test Procedure	Acceptance Criteria	Significant Test Data
The 9 specimens of smoke signals should be alternately subjected to surrounding temperatures of -30°C and +65°C. These alternating cycles need not follow immediately after each other and the following procedure, repeated for a total of 10 cycles, is acceptable: .1 an 8 h exposure at a minimum temperature of +65°C to be completed in one day; .2 the specimens removed from the warm chamber that same day and left exposed under ordinary room conditions at a temperature of 20°C ± 3°C until the next day; .3 an 8 h exposure at a maximum temperature of -30°C to be completed the next day; and .4 the specimen removed from the cold chamber that same day and left exposed under ordinary room conditions at a temperature of 20°C ± 3°C until the next day.	After 10 alternating cycles each specimen should no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical properties and should function effectively immediately.	1 | 2 | 3 Condition (Pass/Fail) | | | 4 | 5 | 6 Condition (Pass/Fail) | | | 7 | 8 | 9 Condition (Pass/Fail) | | | Comments/Observations Passed_____ Failed _____

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.3 Low temperature conditioning test		**Regulations: LSA Code I/1.2 & III/3.3; MSC.81(70) 1/4.8.1**		
Test Procedure	Acceptance Criteria	Significant Test Data		
		1	2	3
Three smoke signals that have undergone temperature cycling should be taken from a stowage temperature of -30°C, be activated and operate in seawater at a temperature of -1°C.	After conditioning each specimen should no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical properties. The 3 specimens of smoke signals should function effectively, they should emit smoke of a highly visible colour at a uniform rate for a period of not less than 3 minutes when floating in calm water. The buoyant smoke signal should not ignite explosively when used in accordance with the manufacturer's operating instructions, nor emit any flame during the entire smoke emission time. The colour of the orange smoke should be evaluated by means of visual comparison, in daylight, to a colour comparison chart containing the range of acceptable orange colours. Refer to the acceptance criteria on test form 3.3.10 Acceptance Criteria.	Condition (Pass/Fail)		
		Smoke emission time (min/sec)		
		Smoke colour (Pass/Fail)		
		Time delay (if applicable) (sec)		
		Smoke emission quality (Continuous/Intermittent)		
		Comments/Observations Passed_____ Failed _____		

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.4 High temperature conditioning test — **Regulations: LSA Code I/1.2 & III/3.3; MSC.81(70) 1/4.8.1**

Test Procedure	Acceptance Criteria	Significant Test Data		
		4	5	6
Three smoke signals that have undergone temperature cycling should be taken from a stowage temperature of +65°C, be activated and operate in seawater at a temperature of +30°C.	After conditioning each specimen should no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical properties. The 3 specimens of smoke signals function effectively, they should emit smoke of a highly visible colour at a uniform rate for a period of not less than 3 minutes when floating in calm water. The buoyant smoke signal should not ignite explosively when used in accordance with the manufacturers' operating instructions, not emit any flame during the entire smoke emission time. The colour of the orange smoke should be evaluated by means of visual comparison, in daylight, to a colour comparison chart containing the range of acceptable orange colours. Refer to the acceptance criteria on test form 3.3.10 Acceptance Criteria.	Condition (Pass/Fail)		
		Smoke emission time (min/sec)		
		Smoke colour (Pass/Fail)		
		Time delay (if applicable) (sec)		
		Smoke emission quality (Continuous/Intermittent)		
		Comments/Observations Passed_____ Failed _____		

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.5 Ambient temperature conditioning test | **Regulations: LSA Code I/1.2 & III/3.3; MSC.81(70) 1/4.8.1**

Test Procedure	Acceptance Criteria	Significant Test Data		
		7	8	9
Three smoke signals that have undergone temperature cycling should be taken from ordinary room conditions and activated. After emitting smoke for 1 minute they should be fully submerged for a period of not less than 10 seconds.	After conditioning each specimen should no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical properties. The 3 specimens of smoke signals should function effectively, they should emit smoke of a highly visible colour at a uniform rate for a period of not less than 3 minutes when floating in calm water. The buoyant smoke signal should not ignite explosively when used in accordance with the manufacturer's operating instructions, not emit any flame during the entire smoke emission time. The colour of the orange smoke should be evaluated by means of visual comparison, in daylight, to a colour comparison chart containing the range of acceptable orange colours. Refer to the acceptance criteria on test form 3.3.10.	Condition (Pass/Fail)		
		Smoke emission time (min/sec)		
		Smoke colour (Pass/Fail)		
		Time delay (if applicable) (sec)		
		Smoke emission during submerge test (Pass/Fail)		
		Comments/Observations Passed_____ Failed _____		

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.6 Humidity conditioning test — **Regulations: LSA Code I/1.2 & III/3.3; MSC.81(70) 1/4.2.4**

Test Procedure	Acceptance Criteria	Significant Test Data		
		10	11	12
Three specimens of smoke signals should be subjected to a 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.	After conditioning each specimen should no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical properties. The 3 specimens should function effectively, they should emit smoke of a highly visible colour at a uniform rate for a period of not less than 3 minutes when floating in calm water. The buoyant smoke signal should not ignite explosively when used in accordance with the manufacturers' operating instructions, not emit any flame during the entire smoke emission time. The colour of the orange smoke should be evaluated by means of visual comparison, in daylight, to a colour comparison chart containing the range of acceptable orange colours. Refer to the acceptance criteria on test form 3.3.10.	Condition (Pass/Fail)		
		Smoke emission time (min/sec)		
		Smoke colour(Pass/Fail)		
		Time delay (if applicable) (sec)		
		Smoke emission quality (continuous/intermittent)		
		Comments/Observations Passed_____ Failed _____		

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.7.1 1 metre immersion for 24 hours test	**Regulations: LSA Code I/1.2 & III/3.3; MSC.81(70) 1/4.3.1**

Test Procedure	Acceptance Criteria	Significant Test Data		
Three specimens of smoke signals should be immersed horizontally for 24 h under 1 m of water and then subjected to the function test at ambient temperature.	After conditioning each specimen should no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical properties. The three specimens should function effectively, they should emit smoke of a highly visible colour at a uniform rate for a period of not less than 3 minutes when floating in calm water. The buoyant smoke signal should not ignite explosively when used in accordance with the manufacturer's operating instructions, not emit any flame during the entire smoke emission time. The colour of the orange smoke should be evaluated by means of visual comparison, in daylight, to a colour comparison chart containing the range of acceptable orange colours. Refer to the acceptance criteria on test form 3.3.10.	13	14	15
		Condition (Pass/Fail)		
		Smoke emission time (min/sec)		
		Smoke colour (Pass/Fail)		
		Time delay (if applicable) (sec)		
		Smoke emission (Continuous/Intermittent)		
		Comments/Observations Passed_____ Failed _____		

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.7.2 100 mm immersion for 5 min test | **Regulations: LSA Code I/1.2 & III/3.3; MSC.81(70) 1/4.3.2**

Test Procedure	Acceptance Criteria	Significant Test Data		
		16	17	18
Three specimens of smoke signals should be immersed in the ready to fire condition for 5 minutes under 10 cm of water and then subjected to the function test at ambient temperature.	After conditioning each specimen should no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical properties. The three specimens should function correctly, they should emit smoke of a highly visible colour at a uniform rate for a period of not less than 3 minutes when floating in calm water. The buoyant smoke signal should not ignite explosively when used in accordance with the manufacturers' operating instructions, not emit any flame during the entire smoke emission time. The colour of the orange smoke should be evaluated by means of visual comparison, in daylight, to a colour comparison chart containing the range of acceptable orange colours. Refer to the acceptance criteria on test form 3.3.10.	Condition (Pass/Fail)		
		Smoke emission time (min/sec)		
		Smoke colour (Pass/Fail)		
		Time delay (if applicable) (sec)		
		Smoke emission (continuous/Intermittent)		
		Comments/Observations Passed_____ Failed _____		

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.7.3 Salt spray test — **Regulations: LSA Code I/1.2 & III/3.3; MSC.81(70) 1/4.3.3, 4.4.1**

Test Procedure	Acceptance Criteria	Significant Test Data		
		19	20	21
Three specimens of smoke signal should be subjected to a salt spray (5% natrium* chloride solution) at a temperature of +35±3°C for at least 100 h and then subjected to the function test at ambient temperature.	After conditioning each specimen should no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical properties.	Condition (Pass/Fail)		
	The three specimens should function correctly, they should emit smoke of a highly visible colour at a uniform rate for a period of not less than 3 minutes when floating in calm water.	Smoke emission time (min/sec)		
		Smoke colour (Pass/Fail)		
	The buoyant smoke signal should not ignite explosively when used in accordance with the manufacturer's operating instructions, nor emit any flame during the entire smoke emission time.	Time delay (if applicable) (sec)		
		Smoke emission (Continuous/Intermittent)		
	The colour of the orange smoke should be evaluated by means of visual comparison, in daylight, to a colour comparison chart containing the range of acceptable orange colours. Refer to the acceptance criteria on test form 3.3.10.	Comments/Observations		
*Note: Natrium and sodium are the same compound.		Passed_____ Failed _____		

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.8.1 2 m drop test — **Regulations: LSA Code I/1.2 & III/3.3; MSC.81(70) 1/4.4.1**

Test Procedure	Acceptance Criteria	Significant Test Data

Three specimens of buoyant smoke signal should be dropped in turn end-on and horizontally from a height of 2 m on to a steel plate about 6 mm thick cemented on to a concrete floor.

The three specimens should remain in a safe condition after the 2 m Drop Test and should function effectively.

The three specimens should function correctly, they should emit smoke of a highly visible colour at a uniform rate for a period of not less than 3 minutes when floating in calm water.

The buoyant smoke signal should not ignite explosively when used in accordance with the manufacturer's operating instructions, nor emit any flame during the entire smoke emission time.

The colour of the orange smoke should be evaluated by means of visual comparison, in daylight, to a colour comparison chart containing the range of acceptable orange colours. Refer to the acceptance criteria on test form 3.3.10.

	22	23	24
Condition (Pass/Fail)			
Smoke emission time (min/sec)			
Smoke colour (Pass/Fail)			
Time delay (if applicable) (sec)			
Smoke emission (Continuous/Intermittent)			

Comments/Observations

Passed_____ Failed _____

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.8.2 Immersion suit glove test — **Regulations: LSA Code I/1.2 & III/3.3; MSC.81(70) 1/4.4.2**

Test Procedure	Acceptance Criteria	Significant Test Data		
		19	20	21
Three specimens of buoyant smoke signals should be activated in accordance with the manufacturer's operating instructions by an operator wearing an insulated buoyant immersion suit or the gloves taken from an insulated buoyant suit.	The three specimens should be capable of being operated effectively without injury to the operator, or any person in close proximity, during firing or burning. The three specimens should function correctly, they should emit smoke of a highly visible colour at a uniform rate for a period of not less than 3 minutes when floating in calm water. The buoyant smoke signal should not ignite explosively when used in accordance with the manufacturer's operating instructions, nor emit any flame during the entire smoke emission time. The colour of the orange smoke should be evaluated by means of visual comparison, in daylight, to a colour comparison chart containing the range of acceptable orange colours. Refer to the acceptance criteria on test form 3.3.10.	Condition (Pass/Fail)		
		Glove operation (Pass/Fail)		
		Smoke emission time (min/sec)		
		Smoke colour (Pass/Fail)		
		Time delay (if applicable) (sec)		
		Smoke emission (Continuous/Intermittent)		
		Comments/Observations Passed_____ Failed _____		

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.9 Heptane test — **Regulations: LSA Code I/1.2 & III/3.3; MSC.81(70) 1/4.8.2**

Test Procedure	Acceptance Criteria	Significant Test Data		
		22	23	24
Three smoke signals should function in water covered by 2 mm layer of heptane.	The three specimens should not ignite the heptane, they should emit smoke of a highly visible colour at a uniform rate for a period of not less than 3 minutes when floating in calm water. The buoyant smoke signal should not ignite explosively when used in accordance with the manufacturer's operating instructions, nor emit any flame during the entire smoke emission time. The colour of the orange smoke should be evaluated by means of visual comparison, in daylight, to a colour comparison chart containing the range of acceptable orange colours. Refer to the acceptance criteria on test form 3.3.10.			
		Heptane ignition (Pass/Fail)		
		Smoke emission time (min/sec)		
		Smoke colour (Pass/Fail)		
		Time delay (if applicable) (sec)		
		Smoke emission (continuous/Intermittent)		
		Comments/Observations Passed_____ Failed _____		

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.10 Laboratory smoke obscuration test		**Regulations: LSA Code I/1.2 & III/3.3; MSC.81(70) 1/4.8.3**
Test Procedure	Acceptance Criteria	Significant Test Data
Three additional specimens from the same lot should be used. The smoke density and colour of the smoke signal should be determined by laboratory testing conducted at a water temperature of +20°C to +25°C as follows: The smoke should be drawn through an apparatus consisting of a 190 mm diameter duct with a fan capable of producing an entrance air flow of 18.4 m^3/min. By means of a light source with at least 10 cd on one side of the tunnel and a photoelectric cell on the other side the density of the passing smoke should be recorded. If the photocell picks up the total emitted light from the light source, then the smoke density is zero percent which means that no smoke is passing through the tunnel. The smoke density is then considered to be 100% when the photocell is not able to pick up any light of the light source through the passing smoke in the tunnel. From the amount of light which the photocell is able to pick up the smoke density should be calculated. Before each measurement, the light intensity of the 100% value should be checked. Each measurement should be recorded.	Smoke density should be at least 70% throughout the minimum emission time. The colour of the orange smoke should be evaluated by means of visual comparison, in daylight, to a colour comparison chart containing the range of acceptable orange colours. The colour comparison chart should have a gloss or matte finish, and consist of a series of at least five orange colour chips, covering the range from reddish orange (Munsell notation 8.75 R 6/14) to yellowish orange (Munsell notation 5 YR MAX) in gradual steps of hue, chroma, and lightness. The colour chips should be secured adjacent to one another, in order of progression from reddish orange to yellowish orange, and extend on at least one side to the edge of the chart. Each colour chip should be at least 50 mm x 100 mm in size. Note: 1. A typical acceptable progression would be 8.75 R 6/14; 10 R 6/14; 1.25 YR 6/14; 3.75 YR MAX; 5 YR MAX. 2. ASTM D1535-97 specifies a method to convert between Munsell notation and CIE coordinates.	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 Comments/Observations Passed_____Failed _____

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.11 Wave test	**Regulations: LSA Code I/1.2 & III/3.3; MSC.81(70) 1/4.8.4**

Test Procedure	Acceptance Criteria	Significant Test Data
A smoke signal should be tested in waves at least 300 mm high and should be allowed to burn completely.	The three specimens should function correctly, they should emit smoke of a highly visible colour at a uniform rate for a period of not less than 3 minutes. The buoyant smoke signal should not ignite explosively when used in accordance with the manufacturer's operating instructions, nor emit any flame during the entire smoke emission time. The colour of the orange smoke should be evaluated by means of visual comparison, in daylight, to a colour comparison chart containing the range of acceptable orange colours. Refer to the acceptance criteria on test form 3.3.10.	10 | 11 | 12 Smoke emission time (min/sec) Smoke colour (Pass/Fail) Time delay (if applicable) (sec) Smoke emission (continuous/Intermittent) Comments/Observations Passed_____ Failed _____

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.12 Liferaft drop test		**Regulations: LSA Code 1.2 & 4.1.1.2, MSC.81(70) I/5.1.2**
Test Procedure	Acceptance Criteria	Significant Test Data
The liferaft in the operationally packed condition should be suspended and then dropped from a height of 18 m into the water. If the liferaft is to be stowed at a height greater than 18 m above the waterline in the lightest seagoing condition, it should be dropped from the height at which it is to be stowed. Note: This test sheet should be completed by the liferaft manufacturer. Reference should be made to the test sheet 4.2.4.	Damage to any item of equipment is acceptable subject to the administration being satisfied that the operational efficiency has not been impaired. After the test, each buoyant smoke signal should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities.	25 | 26 | | Condition of units (Pass/Fail) | | | Comments/Observations

Buoyant smoke signals	Manufacturer: _____ Model: _____ Lot/Serial Number: _____	Date: _____ Time: _____ Surveyor: _____ Organization: _____

3.3.13 Safety inspection	**Regulations: LSA Code I/1.2 & III/3.3; MSC.81(70) 1/4.5**	
Test Procedure	Acceptance Criteria	Significant Test Data
It should be established by visual inspection that the buoyant smoke signal:		
.1 is indelibly marked with clear and precise instructions on how it should be operated and that the danger end can be identified by day or night;	Clear and precise operating instructions are marked on the buoyant smoke signal and the buoyant smoke signal clearly identifies the danger end.	Markings and identification of ends acceptable Passed _____ Failed _____
.2 can, if hand operated, be operated from the bottom (safe end) or that it contains an operational safety delay of 2 seconds;	It operated from the top the time delay is not to be less than 2 s.	Time delay if operated from the top _____ sec
.3 has a simple means of ignition which requires the minimum of preparation and can be readily operated in adverse conditions without external aid and with wet, cold or gloved hands;	It has a simple means of ignition and can be operated by cold, wet and gloved hands.	Operation of specimen when wet, cold and gloved hands. Passed _____ Failed _____
.4 does not depend on adhesive tapes or plastic envelopes for its water-resistant properties; and	Adhesive tapes or plastic envelopes are not used to maintain water-resistant properties.	Water resistant without the use of envelopes or adhesive tape. Passed _____ Failed _____
5. can be indelibly marked with means of determining its age.	Date of manufacturing and date of expiry indelible printed on the outside.	Buoyant smoke signal indelible date stamped. Passed _____ Failed _____ Comments/Observations

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