

CHAPTER 12

POSITION INDICATING LIGHTS FOR LIFE-SAVING APPLIANCES

PART I

SURVIVAL CRAFT AND RESCUE BOAT LIGHTS

Section 1

Prototype tests

1 General

1.1 Lifeboat and rescue boat lights shall comply with the requirements of Paragraph 7 Part 2 of Schedule 2 and liferaft lights to the requirements of Part 9 of Schedule 4 of MSN 1676 (M) as appropriate.

1.2 The following tests should be carried out by an independent laboratory recognised by the MCA, Nominated or Notified Body:

- .1 temperature cycling;
- .2 range and endurance;
- .3 strength;
- .4 drop.

The results of verifications and tests carried out by bodies and laboratories of other European Community Member States offering suitable and satisfactory guarantees of technical and professional competence and independence may be accepted by the MCA, Nominated or Notified Body.

1.3 In cases where the quality control organisation of a manufacturer has been accepted by the Ministry of Defence to Defence Standard 05-21, the Nominated or Notified Body may allow such a manufacturer to conduct these test following due consideration and verification of any proposed procedures and may require a surveyor to witness some or all of the tests.

2 Immersion

Two complete internal and external light units in the inert condition with the terminals covered should be immersed in salt water at ambient temperature for a period of 30 days. If the internal and external light are of the same construction only two lights need be tested. On completion the lights must operate effectively.

3 Temperature cycling

3.1 Twelve liferaft canopy lights, lifeboat enclosure lights or lifeboat cover lights, as the case may be, and twelve survival craft interior lights should be alternately subjected to surrounding temperatures of -30°C and $+65^{\circ}\text{C}$. These alternating cycles need not follow immediately after each other. The following procedure, repeated for a total of 10 cycles, is acceptable:

- .1 an 8 hour half cycle at $+65^{\circ}\text{C}$ to be completed in one day; and
- .2 the specimen removed from the warm chamber that same day and left exposed under ordinary room conditions until the next day;
- .3 an 8 hour half cycle at -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 until the next day.

If the same type of light is used for both canopy and enclosure or cover and interior, only twelve lights of that type need be tested. If the lifeboat enclosure light, the lifeboat cover light or the lifeboat internal light is connected to the lifeboat's electrical network and can be supplied with electrical power from any one of the lifeboat's batteries as well as from the lifeboat's engine-driven generator set, the light should only be subject to the test as far as is practicable.

3.2 The lights should show no sign of damage such as cracking, discoloration or change of mechanical qualities.

4 Range and endurance

4.1 In the case of seawater activated power sources, four survival craft lights of each type should, following the tests described in paragraph 3 (temperature cycling), be taken from a stowage temperature of -30°C and be operated immersed in seawater at a temperature of -1°C ; four of each type should be taken from a stowage temperature of $+65^{\circ}\text{C}$ and be operated in seawater at a temperature of $+30^{\circ}\text{C}$; and four of each type should be taken from ordinary room conditions and immersed in fresh water at ambient temperature. The canopy enclosure or cover lights should be of white colour and should provide a luminous intensity of not less than 4.3 candela in all directions of the upper hemisphere for a period of not less than 12 hours. (See Part IV of this Chapter.) The interior lights should provide sufficient luminous intensity to read survival instructions and equipment instructions for a period of not less than 12 hours.

4.2 In the case of dry activated power sources (dry cells), provided that they will not come into contact with seawater, four survival craft lights of each type should, following at least ten complete temperature cycles as described in paragraph 3, be operated at an air temperature of -30°C , four of each type at an air temperature of $+65^{\circ}\text{C}$, and four of each type at ambient temperature. The canopy,

enclosure or cover lights should be white in colour and should provide a luminous intensity of not less than 4.3 candela in all directions of the upper hemisphere for a period of not less than 12 hours. (See Part IV of this Chapter.) The interior lights should provide sufficient luminous intensity to read survival instructions and equipment instructions for a period of not less than 12 hours. The voltage of each battery should be taken before and after the test and should be recorded.

4.3 In the case of a flashing light it should be established that the rate of flashing is not less than 50 and not more than 70 flashes per minute for the whole of the 12 hour operating period and the effective luminous intensity is at least 4.3 candela. (See Part IV of this Chapter.)

5 Drop

5.1 Four lights of each type should be dropped six times from a height of two metres on to a rigidly mounted steel plate or concrete surface. If the same type is used for both the canopy, enclosure or cover lights and the interior lights only four lights need be tested. On completion of the test the lights should be undamaged and show no signs of cracking or fracture.

5.2 A complete set of canopy and interior lights should be fitted on two MCA approved inflatable liferafts. The rafts should then be operationally packed into a container and subjected to a drop test from a height of not less than 18m. If the liferaft is to be stowed at a height of more than 18m above the waterline in the lightest seagoing condition, the lights should be subjected to a drop test from at least that height when stowed in an operationally packed liferaft. On being dropped the liferaft rafts must float in their containers for a period of 30 minutes before being inflated. On inflation, both the internal and external lamps must light automatically. The rafts should then be examined to ensure that the lamps, fittings, wiring and power source have not been damaged by the drop.

Section 2 Production tests

1 General

Manufacturers of survival craft lights should institute quality control procedures to ensure that they are produced to the same standard as the prototype approved by the Nominated or Notified Body. Manufacturers should keep records of production tests for examination by a Nominated or Notified Body surveyor during inspections at a manufacturer's premises.

2 Quality during manufacture

2.1 A complete check should be made on all items, batteries, bulbs etc. supplied by sub-contractors.

2.2 The acceptable quality level for every production batch should conform to the requirements of BS 6001, Part 1: 1991 (ISO 2859 - 1:1989) or other equivalent international standard.

2.3 Every light produced prior to packing should be activated to confirm that it is operating in a satisfactory manner.

2.4 The overall quality control arrangements during manufacture should be to the satisfaction of the Nominated or Notified Body. Manufacturers' quality control arrangements approved to Defence Standard AQUAP/1, BS 5750, BS EN ISO 9000: 1994 to BS EN ISO 9004: 1994 or other equivalent standards will normally be acceptable.

3 MCA, Nominated or Notified Body inspections

The manufacturer's premises will be visited by a Nominated or Notified Body surveyor on a random basis at least once a year. The visit will include examination of quality control records and checking performances of sample lights.

3.1 As part of the monitoring process of Nominated or Notified Bodies, appointed by the MCA, a MCA surveyor may make random inspections of the manufacturers premises to ensure that the appointed bodies are carrying out their duties in accordance with the bodies instructions.

PART II

LIFEBUOY SELF-IGNITING LIGHTS

Section 1

Prototype tests

1 General

1.1 Lifebuoy self-igniting lights shall comply with the requirements of Part 4 of Schedule 8 of MSN 1676 (M).

1.2 The following tests should be carried out by an independent laboratory recognised by the MCA, Nominated or Notified Body:

- .1 temperature cycling;
- .2 performance;
- .3 watertightness (immersed);
- .4 watertightness (floating);
- .5 salt spray;
- .6 lens strength;
- .7 body strength;

.8 attachment fitting strength.

The results of verifications and tests carried out by bodies and laboratories of other European Community Member States offering suitable and satisfactory guarantees of technical and professional competence and independence may be accepted by the MCA, Nominated or Notified Body.

1.3 In cases where the quality control organisation of a manufacturer has been accepted by the Ministry of Defence to Defence Standard 05-21, the Nominated or Notified Body may allow such a manufacturer to conduct these tests following due consideration and verification of any proposed procedures and may require a surveyor to witness some or all of the tests.

2 Temperature cycling

2.1 Three self-igniting lights should be alternately submitted to surrounding temperatures of -30°C and $+65^{\circ}\text{C}$. These alternating cycles need not follow immediately after each other. The following procedure, repeated for a total of 10 cycles, is acceptable:

- .1 an 8 hour half cycle at $+65^{\circ}\text{C}$ to be completed in one day; and
- .2 the specimens removed from the warm chamber that same day and left exposed under ordinary room conditions until the next day;
- .3 an 8 hour half cycle at -30°C to be completed in one day; and
- .4 the specimens removed from the cold chamber that same day and left exposed under ordinary room conditions until the next day.

2.2 On completion of the above cycling the lights should then be externally examined. The lights should show no sign of damage such as shrinking, cracking, swelling, dissolution or change in mechanical qualities.

3 Performance

3.1 After at least ten complete temperature cycles as described in paragraph 2 one self-igniting light should then be taken from a stowage temperature of -30°C and operated immersed in seawater at a temperature of -1°C , and another should be taken from a stowage temperature of $+65^{\circ}\text{C}$ and operated immersed in seawater at a temperature of $+30^{\circ}\text{C}$. Both lights should be of white colour and should continue to provide a luminous intensity of not less than 2 candela in all directions of the upper hemisphere or, in the case of a flashing light, flash at a rate of not less than 50 flashes and not more than 70 flashes per minute with at least the corresponding effective luminous intensity for a period of not less than 2 hours. (See Part IV of this Chapter.)

4 Drop

A self-igniting light should be dropped into the water from the height at which it is intended to be stowed on ships at their lightest sea-going condition, or 30m, whichever is the greater without suffering damage. The light should be dropped twice, first by itself and then attached to a lifebuoy. The light should operate satisfactorily after each drop.

5 Salt spray

A self-igniting light should be subjected to a salt spray (5% sodium chloride solution) at a temperature of $+35^{\circ}\text{C} \pm 3^{\circ}\text{C}$ for at least 100 hours. The light should operate satisfactorily after this spray test.

6 Watertightness (floating)

A self-igniting light should be allowed to float in water in its normal operating position for 24 hours. If the light is an electric light it should be disassembled at the end of the test and examined. There should be no evidence of water inside the light.

7 Watertightness (immersed)

The remaining self-igniting light which has been subjected to test in paragraph 2 (temperature cycling) should be immersed horizontally under 300 mm of water for 24 hours. If the light is an electric light it should be disassembled at the end of the test and examined for the presence of water. There should be no evidence of water inside the light.

8 Lens strength

If a self-igniting light has a lens, the light should be cooled to -18°C and dropped twice from a height of 1m on to a rigidly mounted steel plate or concrete surface. The distance should be measured from the top of the lens to the impact surface. The light should strike the surface on the top centre of the lens. The lens should not break or crack.

9 Body strength

A self-igniting light should be placed on its side on a rigid surface and a steel sphere having a mass of 500g should be dropped from a height of 1.3m on to the case 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.

10 Attachment fitting strength

A force of 225 N should be applied to the fitting that attaches the light to a lifebuoy. Neither the fitting nor the light should be damaged as a result of this test.

Section 2 Production tests

1 General

Manufacturers of lifebuoy self-igniting lights should institute quality control procedures to ensure that they are produced to the same standard as the prototype approved by the Nominated or Notified Body. Manufacturers should keep records of production tests for examination by a Nominated or Notified Body surveyor during inspections at a manufacturer's premises.

2 Manufacturer's production testing

The manufacturer's quality control procedure should include performance testing of sample lights.

3 MCA, Nominated or Notified Body inspections

The manufacturer's premises will be visited by a surveyor on a random basis at least once per year. The visit will include examination of quality control records and checking performances of sample lights.

3.1 As part of the monitoring process of Nominated or Notified Bodies, appointed by the MCA, a MCA surveyor may make random inspections of the manufacturers premises to ensure that the appointed bodies are carrying out their duties in accordance with the bodies instructions.

PART III LIFEJACKET LIGHTS

Section 1 Prototype tests

1 General

1.1 Lifejacket lights shall comply with the requirements of Paragraph 5 Part 1 of Schedule 9 of MSN 1676 (M).

1.2 The following tests should be carried out by an independent laboratory recognised by the MCA, Nominated or Notified Body:

- .1 Temperature cycling;
- .2 Performance;
- .3 Drop.

The results of verifications and tests carried out by bodies and laboratories of other European Member States offering suitable and satisfactory guarantees of technical and professional competence and independence will be accepted by the MCA, Nominated or Notified Body.

1.3 In cases where the quality control organisation of a manufacturer has been accepted by the Ministry of Defence Standard 05-21, the Nominated or Notified Body may allow such a manufacturer to conduct these tests following due consideration and verification of any proposed procedures and may require a surveyor to witness some or all of these tests.

1.4 The jump tests should be carried out in a location mutually acceptable to the manufacturer and the Nominated or Notified Body, and should be witnessed by a Nominated or Notified Body surveyor.

1.5 A total of 13 lights will be required for the laboratory tests, that is, 12 for temperature cycling and performance, and one for the drop test. A further light will be required in the case of flashing lights to establish the endurance of the electronic components and light source.

2 Temperature cycling

2.1 Twelve lifejacket lights should be alternately submitted to surrounding temperatures of -30°C and $+65^{\circ}\text{C}$. These alternating cycles need not follow immediately after each other. The following procedure, repeated for a total of 10 cycles, is acceptable:

- .1 an 8 hour half cycle at $+65^{\circ}\text{C}$ to be completed in one day; and
- .2 the specimens removed from the warm chamber that same day and left exposed under ordinary room conditions until the next day;
- .3 an 8 hour half cycle at -30°C to be completed in one day; and
- .4 the specimens removed from the cold chamber that same day and left exposed under ordinary room conditions until the next day.

2.2 On completion of the above cycling the lights should then be externally examined. The lights should show no sign of damage such as shrinking, cracking, swelling, dissolution or change in mechanical qualities.

3 Performance

3.1 After at least ten temperature complete cycles as described in paragraph 2, four of these lifejacket lights should be taken from a stowage temperature of -30°C and then be operated immersed in seawater at a temperature of -1°C . Four should be taken from a stowage temperature of $+65^{\circ}\text{C}$ and then immersed in seawater at a temperature of $+30^{\circ}\text{C}$ and four should be taken from ordinary room conditions and immersed in fresh water at ambient temperature. The depth of immersion should be not less than 300 mm.

3.2 Water activated lights should commence functioning within 2 minutes of immersion and have reached a luminous intensity of 0.75 candela within 5 minutes in seawater. In fresh water, water activated lights should attain a luminous intensity of 0.75 candela within 10 minutes of immersion.

3.3 At least 11 out of the 12 lights which should all be of white colour should continue to provide a luminous intensity of not less than 0.75 candela in all directions of the upper hemisphere for a period of at least 8 hours.

3.4 In the case of a flashing light it should be established that:

- .1 the light can be operated by a manual switch;
- .2 the rate of flashing is not less than 50 flashes and not more than 75 flashes per minute; and
- .3 at least 11 of the 12 lights which should all be of white colour should continue to give an effective luminous intensity of not less than 0.75 candela. (See Part IV of this Chapter.)

4 Drop

One light should be dropped from a height of 2m onto a rigidly mounted steel plate or concrete surface. The light should not suffer damage and should be capable of providing a luminous intensity of not less than 0.75 candela for a period of at least eight hours when immersed in fresh water at ambient temperature.

5 Jump

5.1 A person wearing a lifejacket with a light attached should jump vertically into the water, feet first, from a height of at least 4.5m. When jumping into the water the test subject should be allowed to hold on to the lifejacket during water entry to avoid possible injury as shown in the MCA's publication 'Personal Survival at Sea'. The light should not suffer damage, should not be dislodged from the lifejacket and must be capable of providing a luminous intensity of not less than 0.75 candela for a period of at least 8 hours.

5.2 Where it is intended that the light is to be fitted to a lifejacket to which it was not attached when the lifejacket was being tested, a jump test should be carried out with a light attached to the lifejacket to establish that the light is not damaged or

dislodged following the jump. In the case of new designs of lifejacket the attachment and location of the light should be considered during the testing of the prototype lifejacket.

Section 2

Production tests

1 General

Manufacturers of lifejacket lights should institute quality control procedures to ensure that they are produced to the same standard as the prototype approved by the Nominated or Notified Body. Manufacturers should keep records of production tests for examination by a Nominated or Notified Body surveyor during inspections at a manufacturer's premises.

2 Manufacturer's production testing

2.1 The manufacturer's quality control procedures should include testing of a random sample of 9 lights chosen from each lot. A lot should not exceed 1000 lights.

2.2 The 9 lights should be subjected to the performance test (without prior temperature cycling) and at least 8 out of 9 lights should meet the requirements of that test. If less than 8 lights meet the test requirements then another random sample of 9 lights should be tested. If less than 8 of the second random sample meet the test requirements then none of the lights in that lot may be sold as approved equipment and a report should be sent to the approval Body.

3 MCA, Nominated or Notified Body inspections

The manufacturer's premises will be visited by a surveyor on a random basis at least once per year. The visit will include examination of quality control records and checking the performance of sample lights.

4 As part of the monitoring process of Nominated or Notified Bodies, appointed by the MCA, a MCA surveyor may make random inspections of the manufacturers premises to ensure that the appointed bodies are carrying out their duties in accordance with the bodies instructions.

PART IV

COMMON TESTS FOR ALL POSITION INDICATING LIGHTS (ADDITIONAL LIGHTS ARE REQUIRED TO CARRY OUT THE ENVIRONMENTAL TESTS)

1. Vibration Test

Regulations: IEC 945: 3rd edition (Nov. 1996), paragraph 8.7

1.1 Test Procedure

One unit shall be subjected to a vibration test according to IEC 945: 3rd edition (Nov. 1996), paragraph 8.7.

1.2 Acceptance Criteria

The survival craft lights shall function after the test.

2. Mould Growth Test

Regulations: LSA Code 1.2.2.4

2.1 Test Procedure

.1 One unit should be subjected to the mould growth test.

(Note: The mould growth test may be waived where the manufacturer is able to produce evidence that the external materials employed will satisfy the test.)

.2 The light shall be inoculated by spraying with an aqueous suspension of mould spores containing all the following cultures:

Aspergillus niger;
Aspergillus terreus;
Aureobasidium pullulans;
Paecilomyces variotii;
Penicillium funiculosum;
Penicillium ochro chloron;
Scopulariopsis brevicaulis; and
Trichoderma viride.

.3 The light shall then be placed in a mould growth chamber which shall be maintained at a temperature of 29°C \pm 1°C and a relative humidity of not less than

95%. The period of incubation shall be 28 days. After this period the light shall be inspected.

2.2 Acceptance Criteria

The light shall be rot-proof and not be unduly affected by fungal attack. There shall be no mould growth visible to the naked eye and the light shall function after the test.

3. **Switch Arrangement Test**

3.1 Test Procedure

One unit shall be subjected to the switch arrangement test. A test person, wearing immersion suit gloves, must be able to switch the light in its normal operational position on and off three times.

3.2 Acceptance Criteria

The light must function properly.

4. **Corrosion and Seawater Resistance Test**

4.1 Test Procedure

One unit shall be subjected to a corrosion and seawater resistance test according to IEC 945: 3rd edition (Nov. 1996), paragraph 8.12.

(Note: .1 If there are no exposed metal parts the Corrosion and Seawater Resistance Test need not be conducted.

.2 The Corrosion and Seawater Resistance Test may be waived where the manufacturer is able to produce evidence that the external metals employed will satisfy the test.)

4.2 Acceptance Criteria

There shall be no undue deterioration of metal parts and the unit shall function.

5. **Solar Radiation Test (not for Survival Craft Interior and Lifejacket Lights)**

5.1 Test Procedure

One unit shall be subjected to a solar radiation test according to IEC 945: 3rd edition (Nov. 1996), paragraph 8.10.

(Note: The Solar Radiation test may be waived where the manufacturer is able to produce evidence that the materials employed will satisfy the test, i.e. UV stabilised.)

5.2 Acceptance Criteria

The mechanical properties and labels of the unit shall be resistant to harmful deterioration by sunlight. The unit shall function after the test.

6. **Test for Oil Resistance (not for Survival Craft Interior Lights)**

6.1 Test Procedure

One unit shall be subjected to the Oil Resistance test according to IEC 945 : 3rd edition 1996), paragraph 8.11.

6.2 Acceptance Criteria

After this test the unit shall not be unduly affected by oil and shall show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities. The light shall function after the test.

7. **Rain Test, and Water-Tightness Test**

7.1 Test Procedure

One unit shall be subjected to a rain test according to IEC 945 3rd edition (Nov. 1996) paragraph 8.8. After having passed the rain test, the unit and the complete power source shall be immersed horizontally under not less than 300 mm of fresh water for at least 24 h.

7.2 Acceptance Criteria

The unit shall comply with the requirements of IEC 945 : 3rd edition (Nov. 1996), paragraph 8.8.2, and shall function after the rain test. Additionally, after the water-tightness test the unit shall function and there shall be no evidence of water inside the unit.

8. **Fire Test (not for Survival Craft Interior Lights)**

8.1 Test Procedure

One unit shall be subjected to a fire test. A test pan at least 30 cm x 35 cm x 6 cm shall be placed in an essentially draught-free area. Water shall be put in the bottom of the test pan to a depth of not less than 1 cm followed by enough petrol to make a minimum total depth of not less than 4 cm. The petrol shall then be ignited and allowed to burn freely for at least 30 s. The unit shall then be moved through the

flames, facing them, with the unit's light not more than 25 cm above the top edge of the test pan so that the duration of exposure to the flames is at least 2 s.

8.2 Acceptance Criteria

The unit shall not sustain burning or continue melting after being totally enveloped in a fire for a period of at least 2 s and after being removed from the flames. The unit shall function after the test.

9. **Measurement of Luminous Intensity**

9.1 Test Procedure

.1 If the voltage at five minutes of operation is lower than the recorded voltage at the end of life it is permissible to use a lamp from the same build standard for the light output test. Using the lowest recorded voltage a light output test can be carried out as described below. The voltage of the specified number of test units should be monitored continuously for the specified time. To make sure that all the test units provide a luminous intensity of not less than the specified luminous intensity in all directions of the upper hemisphere after the specified time of operation, the following test shall be performed.

.2 It must be demonstrated that at least one light from each of the specified temperature ranges reaches the required luminous intensity in all directions of the upper hemisphere when using a photometer which is calibrated to the photometric standards of the appropriate National or State Standards Institute. (Note: CIE Publication No. 70 contains further information.) The lowest voltage light of the cold temperature test sample lot, the highest voltage light of the high temperature test sample lot and the mean voltage light of the ambient temperature sample lot should be selected. These three lights must be used for the light output tests. In the event that a lamp filament burns out during the light output test, a second light from the same performance test lot may be used.

.3 Luminous intensity should be measured by a photometer directed at the centre of the light source with the test light on a rotating table. Luminous intensity should be measured in a horizontal direction at the level of the centre of the light source and continuously recorded through a 360 degree rotation. These measurements should be taken in the azimuth angles at 5 degree intervals above the horizon up to the single measurement at 90 degrees, (vertical). Luminous intensity should then be measured in a vertical direction, beginning at the centre of the light source at the point of lowest recorded light output, and continuously recorded through an arc of 180 degrees.

9.2 Acceptance Criteria

The test lights shall continue to provide a luminous intensity of not less than the specified intensity in all directions of the upper hemisphere for a period of at least the specified time. All measured data of luminous intensity and voltage shall be documented. In the case of a flashing light, it shall be established that the rate of flashing for the specified operating period is not less than 50 flashes and not more than 70 flashes per minute and that the effective luminous intensity is at least the minimum specified intensity in all directions of the upper hemisphere. The effective luminous intensity is to be found from the formula:

$$\left[\frac{\int_{t_1}^{t_2} I dt}{0.2 + (t_2 - t_1)} \right]_{\max}$$

where:

I is the instantaneous intensity

0.2 is the Blondel-Rey constant

and t_1 and t_2 are time limits of integration in seconds

Note: Flashing lights with a flash duration of not less than 0.3 seconds, not including incandescence time, may be considered as fixed lights for the measurement of luminous intensity. Such lights shall provide the required luminous intensity in all directions of the upper hemisphere. (Incandescence time is the time interval between switch on and the luminous intensity reaching the required minimum luminous intensity.)

10. Chromaticity

10.1 Test Procedure

One unit shall be tested for chromaticity to determine that it lies within the boundaries of the area "white" of the diagram specified for each colour by the international commission on Illumination, (CIE). The chromaticity of the light shall be measured by means of colormetric measurement equipment which is calibrated to the appropriate National or State Standards Institute. (Note: CIE Publ. No. 15.2 contains further information.) Measurements on at least four points of the upper hemisphere shall be taken.

10.2 Acceptance Criteria

The measured chromaticity co-ordinates should fall within the boundaries of the area of the diagram, as per CIE. The boundaries of the area for white lights are given by the following corner co-ordinates:

x	0.500	0.500	0.440	0.300	0.300	0.440
y	0.382	0.440	0.433	0.344	0.278	0.382

(International standard on Colours of Light Signals, with colour tables to be developed by CIE.)