

## **Technical regulation on the design of lights<sup>1</sup>**

The following shall be laid down pursuant to section 1(3), sections 3-5, section 17(5), and section 32(4) of the Safety at Sea Act (*lov om sikkerhed til søs*), cf. Consolidated Act no. 627 of 26 July 2002, as amended by Act no. 1173 of 19 December 2003, Act no. 1231 of 27 December 2003 and Act no. 1465 of 22 December 2004, and Decree no. 607 of 25 June 2001 on the entry into force for Greenland of the Safety at Sea Act, Decree no. 729 of 19 August 2003 on the entry into force for Greenland of section 2 of Act no. 277 of 8 May 2002, Decree no. 212 of 23 March 2005 on the entry into force for Greenland of Act no. 1173 of 19 December 2003 and Decree no. 213 of 23 March 2005 on the entry into force for Greenland of parts of Act no. 1231 of 27 December 2003 in consultation with the Greenland Home Rule and upon authorisation from the Minister for Economic and Business Affairs in accordance with Order no. 154 of 10 March 2005:

### *Scope*

**Section 1.** This Regulation shall apply to the design and approval, etc. of lights used to comply with the provisions on ships' lights in the International Regulations for Preventing Collisions at Sea, 1972, as amended.

### *Definitions*

**Section 2.** For the purposes of this Regulation, the following definitions shall apply:

- 1) A "light" is a ship's light displayed to comply with the provisions of the International Regulations for Preventing Collisions at Sea.
- 2) A ship's "length" and "width" are the maximum length and the maximum width.

### *Equivalents and recognition*

**Section 3.** Where this Regulation requires that a particular accessory, material, device or apparatus, or type thereof, be fitted or present on board a ship, or that certain measures be taken, the Danish Maritime Authority may permit another accessory, material, device or apparatus, or type thereof, which was legally produced or marketed in another EU Member State or in Turkey, or which was legally produced in another EFTA State signatory to the EEA Agreement, with a similar level of protection as Danish standards, or a different measure to be taken on the ship if it is as effective as that required in accordance with this Regulation.

*Subsection 2.* The Danish Maritime Authority shall accept tests that have been carried out by approved testing bodies, including testing bodies in other EU Member States, in EFTA States as well as in countries signatory to the EEA Agreement and in Turkey, which provide appropriate and satisfactory guarantees of the technical, professional and independent nature of the tests.

### *General*

**Section 4.** Lights on ships shall be of a type approved by the Danish Maritime Authority or on behalf of the Danish Maritime Authority by a recognised testing body, cf. however section 3(2).

*Subsection 2.* In order to obtain type approval, a light shall be designed pursuant to the provisions of this Regulation.

*Incandescent lights*

Dimensioning of the lenses

**Section 5.** The dimensions given below are minimum dimensions:

Size of the vessel length = L	Height of lens = H	
	Internal radius of lens = R	
	Top, side and aft lights	All-round lights
$L \leq 50$ m	H = 130 mm R = 70 mm	H = 130 mm R = 70 mm
$20 \text{ m} \leq L < 50$ m	H = 130 mm R = 70 mm	H = 80 mm R = 45 mm
$12 \text{ m} \leq L < 20$ m	H = 80 mm R = 45 mm	H = 80 mm R = 45 mm
$L < 12$ m	H = 60 mm R = 35 mm	H = 60 mm R = 35 mm
$L < 12$ m in domestic inner waters	H = 40 mm R = 20 mm	Only where H = 40 mm R = 20 mm

*Quality of the lights*

**Section 6.** The light shall be designed to be corrosion-resistant. When the light is lit, light must be visible only through the lens or glass. Lights shall have openings for the release of any condensation, where required. Galvanised iron plates or similar shall not be acceptable.

*Subsection 2.* For side, top and aft lights for ships of 20 metres in length and above and for all-round lights for ships of 50 metres in length and above, the manufacturer shall provide documentation from a recognised testing institute verifying that the lights has successfully undergone a vibration test as per the following. The test shall be carried out vertically and horizontally for at least 2 hours in each direction with a frequency change of approximately 1 octave per minute within the 5-80 Hz frequency range. Within the range 5-16 Hz, a constant amplitude equal to 2.0 mm shall be maintained. Within the range 16-80 Hz, a constant acceleration equal to 2 g shall be maintained.

*Subsection 3.* Where approval is granted for 110 and 220 volts, the lights and their electrical parts shall comply with IP.56 protection rating.

*Subsection 4.* Surveyors from the Danish Maritime Authority may demand to be shown certification of testing insofar as this is deemed necessary.

#### *Incandescent lamps and lamp sockets*

**Section 7.** Electrical incandescent lamps shall be of an approved type and be marked “NK lights”. This provision shall not apply to lights approved for ships of less than 12 metres in length in domestic inner waters. The light source shall stand vertically in the light and its axis shall be coincident with the axis of the lens or glass. The light source shall be placed so that it cannot be displaced in any direction. Lamp sockets shall be of an approved type.

#### *Lenses and glass*

**Section 8.** Lenses and glass shall be made of a sufficiently resistant material with no defects that affect the optical properties. Only circular, cylinder-shaped lenses or glass shall be approved for lights on ships of 12 metres in length and above. Coloured lenses or cylinder-shaped colour filters made of glass or other equally resistant material may be used to produce coloured light. Loose glass slides shall be fitted into frames, which shall not block the light.

#### *Frames*

**Section 9.** The lens or glass in side lights shall be framed such that a straight line from the inside of the filament to the shielding at the front is parallel with the marking on the diametral plane. In lights with a single strand filament, the overhead light at the head shall be at least of a level to achieve maximum luminosity in this direction

#### *Stays and detached parts*

**Section 10.** Where stays are used in the aperture, the width of the stay shall be less than half the width of the light source. In lights with a single strand lamp, a stay may not cover the light source at an angle of more than 3 degrees. Detached parts, if any, shall be secured in such a way that the incandescent lamp can be replaced easily, even under difficult conditions. The mounting of detached parts shall be precise and unambiguous.

### *Marking*

**Section 11.** The light shall be clearly and indelibly marked with:

- 1) The manufacturer's name or mark.
- 2) Designation according to use (cf. Regulation 21 of the International Regulations for Preventing Collisions at Sea) for portable lights.
- 3) Type description (manufacturer's type description).
- 4) Production or certificate number (also on any detached parts) or type approval marks if the light is type approved.

**Section 12.** Electrical fittings shall have an equipment control stamp (110-volt and 220-volt fittings only) or equivalent mark and any other marks required in order to obtain the approval of the national equipment control institute.

### *LED lights*

**Section 13.** Lights illuminated by means of light-emitting diodes shall comply with the same provisions as lights illuminated by means of incandescent lamps. However, the following deviations shall be permitted:

- 1) Re. section 5. The requirement for lenses to have a particular internal radius is intended to ensure adequate cooling of an incandescent lamp filament. It is possible to waive this requirement in the case of light-emitting diode-based light sources, and the lamp may be of cast construction.
- 2) Re. section 5. The lens height is intended to ensure adequate light penetration in the event of the lens becoming dirty. In the case of LED lights, the requirement for the light source to be in the centre may be deviated from if the same effect can be achieved by other means.
- 3) Re. section 7. Provisions concerning incandescent lamps and lamp sockets shall not apply to LED lights.
- 4) Re. section 8. Provisions concerning lenses and glass may be deviated from if colours are generated by the light source directly, making the rules concerning colour filters, etc. irrelevant.
- 5) Re. section 9. Provisions concerning frames shall not apply to non-centred light sources.
- 6) Re. section 10. Provisions concerning stays and detached parts shall not apply to non-centred light sources.

### *Gas lights (for unmanned barges only)*

**Section 14.** As regards lighting, gas lights shall comply with the provisions for electric lights where possible.

*Subsection 2.* The lights and the certificate shall be clearly and indelibly marked with:

- The discharge pressure of the pressure-reducing valve
- The size or type and make, where applicable, of the burner jet
- The make and number of the incandescent gas mantle
- “For unmanned barges only”.

*Subsection 3.* The gas installation shall be approved by a national gas testing institute or equivalent.

*Subsection 4.* The following dimensions are minimum dimensions for gas lights:

- Internal height to the roof 32 cm
- Internal width 24 cm
- Lens: height free of frame 16 cm
- Lens: internal radius 9.5 cm

*Penalties and entry into force, etc.*

**Section 15.** Any person violating sections 4-14 shall be liable to a fine or imprisonment of up to one year.

*Subsection 2.* The penalty may increase to imprisonment of up to 2 years if

- 1) the violation has resulted in damage to life or health, or risk of such damage,
- 2) an injunction or order has previously been issued in connection with the same or equivalent situations, or
- 3) the violation has given or has been intended to give financial benefits to the transgressor or others.

*Subsection 3.* It shall be considered especially aggravating circumstances if the violation has resulted in damage to the life or health or risk of such damage to young persons below the age of 18, cf. subsection 2 (1).

*Subsection 4.* If the benefit obtained through the violation is not confiscated, the size of such financial benefit obtained shall be taken into account when determining the fine, including supplementary fines.

*Subsection 5.* Companies, etc. (legal persons) may incur criminal liability according to the regulations in chapter 5 of the Criminal Code (*straffeloven*).

**Section 16.** If the contravention is covered by the Decree on the entry into force for Greenland of the Act on Safety at Sea (*lov om sikkerhed til søs*), measures may be ordered in accordance with the Penal Code for Greenland.

*Subsection 2.* The conditions stipulated in section 15(2) and (3) shall be considered aggravating circumstances.

*Subsection 3.* If the financial benefit achieved is not confiscated, cf. section 116(1) of the Penal Code, special consideration shall be given to the size of the achieved or intended financial benefit when determining the size of the fine, including supplementary fine.

*Subsection 4.* If the violator is a company, etc. (legal person), the legal person may be liable to a fine. If the violator is the state, the Greenland Home Rule, a municipality, an inter-municipal enterprise covered by Section 64 of the *Landstingslov om kommunalbestyrelser og bygdebestyrelser m.v.* (Greenland Parliament Act on municipal councils and settlement councils, etc.) or a settlement council, the relevant public authority shall be liable to a fine.

*Subsection 5.* If the person in question is not resident in Greenland, or if his attachment to Greenland society is of such a loose nature that the preconditions for the application of the measures are not present, legal proceedings may be instituted in Denmark or the case may be sent for trial in Denmark.

*Entry into force, etc.*

**Section 17.** This regulation shall enter into force on 1 December 2005.

*Subsection 2.* The following regulations shall be repealed:

- 1) Order No. 81 of 21 March 1968 on lights on small vessels (*bekendtgørelse om lanterner i mindre fartøjer*).
- 2) Regulations of 30 December 1983 on the design of lights (*forskrifter for konstruktion af lanterner*).

*The Danish Maritime Authority, 28 September 2005*

Anne Skov Strüver / Peter Lauridsen

## **Remarks on the technical regulation on the design of lights**

The design of lights is currently undergoing technological development. Light-emitting diodes, which are inexpensive, do not generate heat, are lightweight and have low power consumption and a very long lifetime, are gaining ground as light sources in more and more contexts, including as the light source in lights. At the same time, some of the older types of technology, such as kerosene lights, are disappearing. The reasons for this are that it requires a lot of work, knowledge and skill to make them light correctly, they can be blown out and they pose a fire risk. Therefore, the rules of the previous Regulation concerning kerosene lights are being replaced in this Regulation by rules concerning light-emitting diodes. Existing kerosene lights may continue to be used.

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<sup>1</sup> This regulation has been notified in draft form in accordance with European Parliament and Council Directive 98/34/EC (the Information Procedure Directive), as amended most recently by Directive 98/48/EC.