

(1) On a vessel of 20 meters in length or more such lights shall be spaced not less than 1 meter apart, and the lowest of these lights shall, except where a towing light is required, be placed at a height of not less than 4 meters above the hull;

(2) On a vessel of less than 20 meters in length such lights shall be spaced not less than 1 meter apart and the lowest of these lights shall, except where a towing light is required, be placed at a height of not less than 2 meters above the gunwale;

(3) When three lights are carried they shall be equally spaced.

(j) The lower of the two all-round lights prescribed for a vessel when engaged in fishing shall be a height above the sidelights not less than twice the distance between the two vertical lights.

(k) The forward anchor light prescribed in Rule 30(a)(i), when two are carried, shall not be less than 4.5 meters above the after one. On a vessel of 50 meters or more in length this forward anchor light shall be placed at a height or not less than 6 meters above the hull.

[CGD 81-008, 46 FR 62447, Dec. 24, 1981, as amended by CGD 89-024, 55 FR 3947, Feb. 6, 1990]

§ 84.05 Horizontal positioning and spacing of lights.

(a) Except as specified in paragraph (e) of this section, when two masthead lights are prescribed for a power-driven vessel, the horizontal distance between them must not be less than one quarter of the length of the vessel but need not be more than 50 meters. The forward light must be placed not more than one half of the length of the vessel from the stem.

(b) On a power-driven vessel of 20 meters or more in length the sidelights shall not be placed in front of the forward masthead lights. They shall be placed at or near the side of the vessel.

(c) When the lights prescribed in Rule 27(b)(i) are placed vertically between the forward masthead light(s) and the after masthead light(s) these all-round lights shall be placed at a horizontal distance of not less than 2 meters from the fore and aft centerline of the vessel in the athwartship direction.

(d) When only one masthead light is prescribed for a power-driven vessel, this light must be exhibited forward of amidships. For a vessel of less than 20 meters in length, the vessel shall exhibit one masthead light as far forward as is practicable.

(e) On power-driven vessels 50 meters but less than 60 meters in length operated on the Western Rivers, and those waters specified in § 89.25, the horizontal distance between masthead lights shall not be less than 10 meters.

[CGD 81-008, 46 FR 62447, Dec. 24, 1981, as amended by CGD 88-07, 53 FR 10533, April 1, 1988; CGD 94-011, 63 FR 5731, Feb. 4, 1998]

§ 84.07 Details of location of direction-indicating lights for fishing vessels, dredgers and vessels engaged in underwater operations.

(a) The light indicating the direction of the outlying gear from a vessel engaged in fishing as prescribed in Rule 26(c)(ii) shall be placed at a horizontal distance of not less than 2 meters and not more than 6 meters away from the two all-round red and white lights. This light shall be placed not higher than the all-round white light prescribed in Rule 26(c)(i) and not lower than the sidelights.

(b) The lights and shapes on a vessel engaged in dredging or underwater operations to indicate the obstructed side and/or the side on which it is safe to pass, as prescribed in Rule 27(d)(i) and (ii), shall be placed at the maximum practical horizontal distance, but in no case less than 2 meters, from the lights or shapes prescribed in Rule 27(b)(i) and (ii). In no case shall the upper of these lights or shapes be at a greater height than the lower of the three lights or shapes prescribed in Rule 27(b)(i) and (ii).

§ 84.09 Screens.

(a) The sidelights of vessels of 20 meters or more in length shall be fitted with mat black inboard screens and meet the requirements of § 84.17. On vessels of less than 20 meters in length, the sidelights, if necessary to meet the requirements of § 84.17, shall be fitted with mat black inboard screens. With a combined lantern, using a single

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vertical filament and a very narrow division between the green and red sections, external screens need not be fitted.

(b) On power-driven vessels less than 12 meters in length constructed after July 31, 1983, the masthead light, or the all-round light described in Rule 23(c) shall be screened to prevent direct illumination of the vessel forward of the operator's position.

§ 84.11 Shapes.

(a) Shapes shall be black and of the following sizes:

(1) A ball shall have a diameter of not less than 0.6 meter;

(2) A cone shall have a base diameter of not less than 0.6 meter and a height equal to its diameter;

(3) A diamond shape shall consist of two cones (as defined in paragraph (a)(2) of this section) having a common base.

(b) The vertical distance between shapes shall be at least 1.5 meter.

(c) In a vessel of less than 20 meters in length shapes of lesser dimensions but commensurate with the size of the vessel may be used and the distance apart may be correspondingly reduced.

§ 84.13 Color specification of lights.

(a) The chromaticity of all navigation lights shall conform to the following standards, which lie within the boundaries of the area of the diagram specified for each color by the International Commission on Illumination (CIE), in the "Colors of Light Signals", which is incorporated by reference. It is Publication CIE No. 2.2. (TC-1.6), 1975, and is available from the Illumination Engineering Society, 345 East 47th Street, New York, NY 10017 and is available for inspection at the Coast Guard, Ocean Engineering Division (CG-432), (CG-432), 2100 2nd St., SW., Stop 7901, Washington, DC 20593-7901. It is also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html. This incorporation by reference was approved by the Director of the Federal Register.

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(b) The boundaries of the area for each color are given by indicating the corner co-ordinates, which are as follows:

(1) *White:*

x 0.525 0.525 0.452 0.310 0.310 0.443
y 0.382 0.440 0.440 0.348 0.283 0.382

(2) *Green:*

x 0.028 0.009 0.300 0.203
y 0.385 0.723 0.511 0.356

(3) *Red:*

x 0.680 0.660 0.735 0.721
y 0.320 0.320 0.265 0.259

(4) *Yellow:*

x 0.612 0.618 0.575 0.575
y 0.382 0.382 0.425 0.406

[CGD81-008, 46 FR 62447, Dec. 24, 1981, as amended at 69 FR 18803, Apr. 9, 2004; USCG-2004-18057, 69 FR 34925, June 23, 2004; USCG-2008-0179, 73 FR 35002, June 19, 2008; USCG-2010-0351, 75 FR 36281, June 25, 2010]

§ 84.15 Intensity of lights.

(a) The minimum luminous intensity of lights shall be calculated by using the formula:

$$I=3.43 \times 10^6 \times T \times D^2 \times K^{-D}$$

where I is luminous intensity in candelas under service conditions,
T is threshold factor 2×10^{-7} lux,
D is range of visibility (luminous range) of the light in nautical miles,
K is atmospheric transmissivity. For prescribed lights the value of K shall be 0.8, corresponding to a meteorological visibility of approximately 13 nautical miles.

(b) A selection of figures derived from the formula is given in Table 84.15(b):

TABLE 84.15(B)

Range of visibility (luminous range) of light in nautical miles D	Minimum luminous intensity of light in candelas for K=0.8 I
1	0.9
2	4.3
3	12
4	27
5	52
6	94

§ 84.17 Horizontal sectors.

(a)(1) In the forward direction, sidelights as fitted on the vessel shall show the minimum required intensities. The intensities shall decrease to