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| IALA RECOMMENDATION |

E-106

Recommendation on the use of retroreflecting material on Aids to navigation Marks within the iala maritime buoyage system

Edition 1.0

Document date

Revisions to this IALA Document are to be noted in the table prior to the issue of a revised document.

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| Date | Page / Section Revised | Requirement for Revision |
| December | aaaaa | aaaaa |
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THE COUNCIL

**NOTING** that the use of retroreflecting material on aids to navigation is becoming increasingly widespread particularly in the case of unlighted aids where by the projection of a light, which may range from a hand-held spotlight to a powerful searchlight, an aid can more easily be located and sometimes identified;

**NOTING ALSO** the need to harmonise the ways in which retroreflecting material is used so as to obviate the proliferation of different methods of use, which may be confusing to the mariner;

**NOTING FURTHER** that results of trials carried out to determine how retroflecting material could be best displayed on aids to navigation to give the optimum information to the mariner without incurring undue increased maintenance problems for the Authority;

**RECOGNISING** that some Authorities require only a method (the Standard Code) whereby an aid can be detected with a degree of identification, especially for lateral marks. Others, such as the Scandinavian countries with complicated channels and archipelagos frequented by small craft, require a method (the Comprehensive Code) giving more detailed identification of an aid;

**RECOGNISING ALSO** that, as retroreflecting material which appears as black by day shows as white when illuminated at night, blue material should be used in the Comprehensive Code as being the best compromise where black day colour is appropriate;

**ADOPTS** the standard Code and the Comprehensive Code, described in the Annex to this Recommendation, as the codes to be used for marking aids to navigation by retroreflecting material;

**RECOMMENDS** that:

* Administrations intending to mark aids to navigation with retroreflecting material use either the Standard Code or Comprehensive Code, as appropriate.

Administrations should not use both Codes unless the areas of use can be clearly defined.

* Administrations advise mariners:
* of the type of marking in use in any given area;
* that using a bright light to identify an aid to navigation, in particular the beam of a searchlight, can seriously affect the night vision of those upon whom the light is directed.

Some recover quickly from a loss of night vision but others have a much slower recovery rate and may be seriously incapacitated. To leave a light switched on for longer that is absolutely necessary is thus likely to put others at risk;

* although retroreflecting material can be of great benefit to navigation, particularly for small craft, it should be used only to enhance the efficiency of an aid to navigation and not as a substitute for a light.

1. Maritime Buoyage System, Standard Code

c : Colour of the Buoy

r : Retroreflective Material **STANDARD CODE**

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| --- | --- | --- | --- |
| *Aspect*  *By Night* | TYPE OF MARK AND CODE | *Aspect*  *By Night* | TYPE OF MARK AND CODE |
| c  r  c | *Red Lateral Marks1*  One red band or red shape: i.e. a square on Buoyage Region A or a triangle in Buoyage Region B | c  r  c | *Green Lateral Marks1&2*  One green band or green shape: i.e. a triangle on  Buoyage Region A or a square in Buoyage Region B |
| c  r  c | *Yellow Special Marks*  One yellow band or a yellow X, or yellow symbols3 |  | *Safe WaterMarks*  White bands, letters or symbols4 |
|  | Cardinal Marks  (South Cardinal Marks)  White bands, letters or symbols 4 |  | Isolated Danger Marks  White bands, letters or symbols4 |



1. Standard Code
2. MARITIME BUOYAGE SYSTEM, Comprehensive CODE



1. Comprehensive Code
2. CODE FOR MODIFIED LATERAL MARKS AND EMERGENCY MARKS



1. Code for modified lateral marks and emergency marks
2. NOTES

¹ Style format No special code for preferred channel marks is provided, the predominant colour of the buoy only being used.

² It may be difficult for the observer to discriminate between green and blue retroreflecting material, particularly where only one of these colours is being observed on its own. In principle, green buoys should carry only one green band, whereas blue is always used in combination with another colour, except in the case of East Cardinal marks which have two blue bands. However, this principle may be violated where one of the bands has become damaged.

³ It may be difficult for the observer to discriminate between yellow and white retroreflecting material particularly where only one of these colours is being observed on its own. Thus only one yellow band may be used on a special mark to avoid confusion with a West Cardinal mark in the comprehensive code.

4 Care should be taken that the amount of white retroreflecting material used on an aid does not detract from its daytime appearance.

5 The coefficient of retroreflection of blue and red is very much less than white or yellow, and to ensure proper recognition the following must be observed:

* Safe water marks: The red bands or stripes must be at least twice the width of the white bands or stripes.

The separation distance between the colours must be at least twice the width of the white bands or stripes.

* North and South Cardinal Marks: The blue bands must be at least twice the width of the yellow bands.

The separation distance must be at least twice the width of the yellow bands.

6 To ensure proper recognition of isolated danger marks the blue and red bands should be of equal width and separated by a distance at least equal to the width of a band.

1. ACRONYMS