IALA GUIDELINE

G1122
THE USE OF PICTOGRAMS ON AIDS TO NAVIGATION

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DOCUMENT REVISION

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

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June 2017	First issue	Council 64
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1. INTRODUCTION

A pictogram is a symbol that conveys its meaning through its pictorial resemblance to a physical object. Pictograms are often used in writing and graphic systems in which the characters are to considerable extent pictorial in appearance.

There has been a proliferation in the use of Special marks in some regions as "general purpose" aids, so it is desirable to provide the mariner with additional information to distinguish the different uses of Special marks, especially for smaller vessels, which may navigate closer to Special marks.

The use of Special marks has evolved over time, and they are used much more widely than originally intended by the IALA Maritime Buoyage System (MBS). Their yellow colour is conspicuous at sea and contributes to its versatility.

This Guideline should be considered as complementary to local regulations, which have been used for a long time. Furthermore, this guideline provides general information on the design of pictograms on Special marks. When this guideline is utilized, one should consider and follow local regulations and the competent authority's permission.

1.1. SCOPE

This Guideline is intended to provide guidance to competent authorities on the application of pictograms on Special marks. This Guideline specifies pictograms for the purposes of informing mariners on smaller vessels. The Guideline is to be used by competent authorities for Special marks installation and their further application.

This Guideline provides examples of pictograms frequently used on Special marks. Other uses of Special mark pictograms may be developed.

The competent authority should ensure that structure and design of pictograms do not conflict with marks in accordance with the MBS and local regulations.

1.2. PRINCIPLE

When a navigator approaches any Marine Aid to Navigation (AtoN) they carry out what is termed a "visual task" as defined in IALA Guideline *G1094 Daymarks for Aids to Navigation* [5].

This visual task is described in three stages as follows:

1 Detection - the observer is aware of an object. The navigator sees an object but will usually not be able to deduce its shape or colour and will not know that it is an AtoN.

2 Recognition - the observer is aware that the object is an AtoN.

3 Identification - the observer is aware which AtoN the object is. At this distance, the navigator can perfectly discern that the object is a Special Mark.

In stage 3, pictograms will assist small vessel navigators in deciding how they will use the AtoN.

A pictogram should be clear, concise and understandable, thus providing appropriate signage to ensure that the small vessel navigator understands the purpose of the Special mark. To improve the identification process, this Guideline provides examples of pictogram designs, including shape, colour, location and size.

2. AIMS AND OBJECTIVES

Pictograms that are included in this Guideline help users to easily identify specific marine circumstances by using graphics to avoid the lack of information on the original Special marks.

The aim of this Guideline is to provide competent authorities with a common approach to the application of pictograms on Special marks. This common approach identifies requirements for the size, colour, shape and location of pictograms.

The intended users of pictograms are navigators of vessels less than 300 gross tonnages which are not mandatory AIS equipped vessels according to SOLAS. They are usually domestic navigators who do not have electronic devices for safety and real time information, such as an ENC. Pictograms on Special marks should improve vessel safety.

3. GENERAL DESIGN METHODOLOGY

When designing a pictogram, the visual aspects should be considered first. The visual aspect can directly or indirectly influence the identification of pictograms.

The following paragraphs describe the factors which should be considered when designing pictograms. Local practice and knowledge should also be considered.

3.1. SHAPE

The shape of the pictogram should be a square since a square-shaped mark can be fully utilized in the limited space on buoys. It is recommended to follow the layout as shown below.

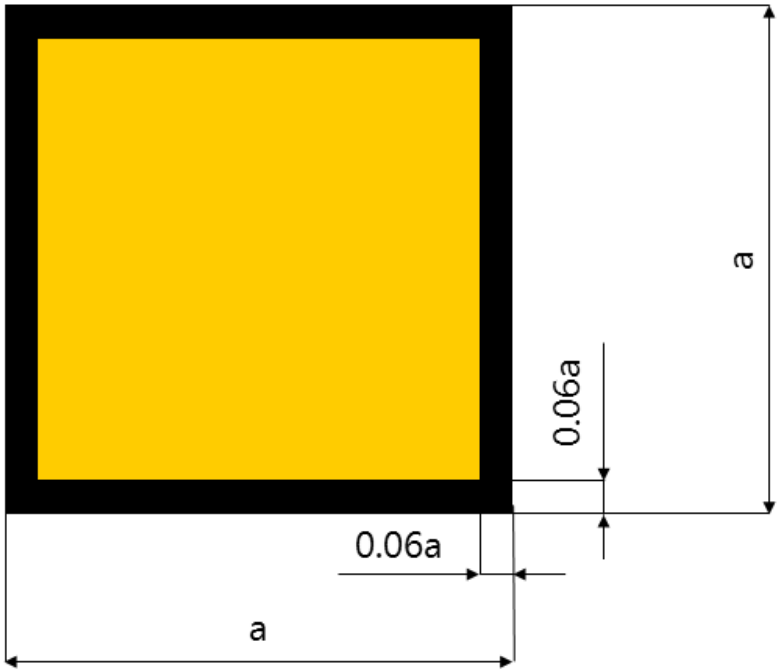


Figure 1 Layout of a pictogram

3.2. COLOUR

Standard colours should be specified when ordering pictograms from manufacturers. Manufacturers will normally use a pantone reference for the appropriate colour (black and yellow). The colour is described by a luminance factor

β and two chromaticity coordinates x, y (see IALA Recommendation *R0108 (E-108) Surface Colours Used as Visual Signals on Marine Aids to Navigation*). The background colour (yellow) should occupy over 50% of the whole area.

Colour recognition depends on:

- Brightness of the colour
- Hue
- Contrast with the background
- Colour difference to the background

Colours used in pictogram must fall within the colour boundaries defined in Table 1 and Figure 2.

Table 1 Specific standard of pictogram colours based on ISO 7001:2007 Graphical Symbols – Public Information Symbols

Yellow		**Black**	
Name of the colour	Yellow	**Name of the colour**	Black
L*a*b*	85.84 -2.62 88.68	**L*a*b***	2.86 - -
$Y_DX_Dy_D$	67.67 0.4572 0.4748	**$Y_DX_Dy_D$**	0.43 - -
sRGB	251 212 0	**sRGB**	14 14 14
CMYK	0 0 100 0	**CMYK**	0 0 0 100

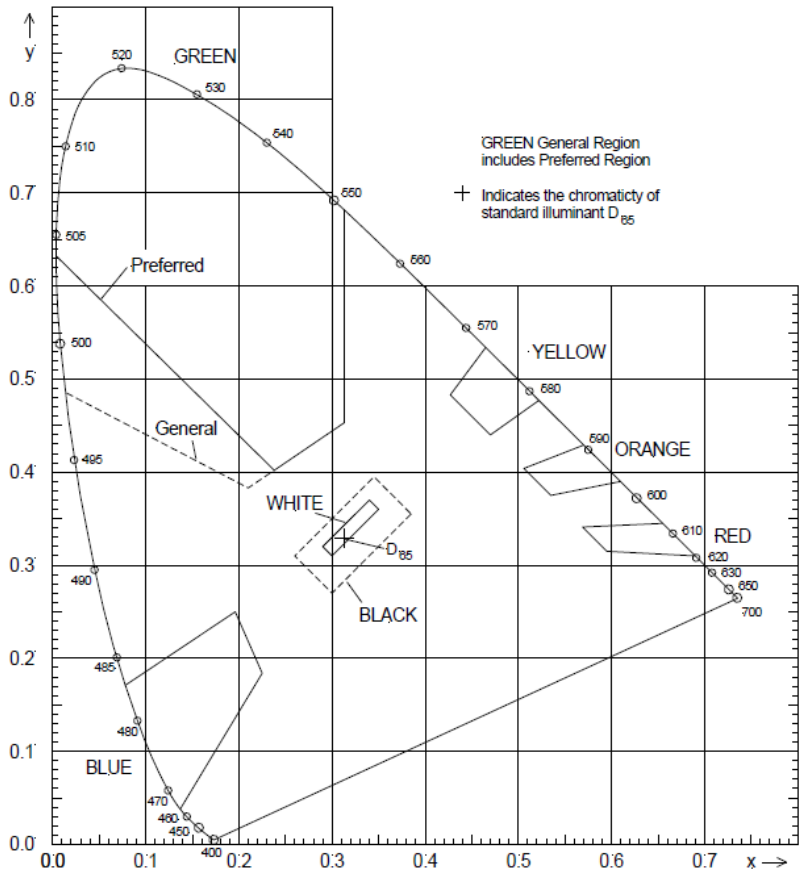


Figure 2 Chromaticity regions for ordinary colours

3.3. SIZE

The readability/size of a pictogram can be tailored for use in different locations. For example, a pictogram for use on a narrow waterway may only need a readable distance of 30m. However, a pictogram for use on a wide or open waterway may require a readable distance in excess of 200m to allow for the width of the navigation/length of vessel.

The size of the pictogram used will vary depending on location, background conditions/colours, ambient light and required readable distance. The following table is used for calculating the size of pictogram and readable distances in average daylight. When a vessel transits a certain waterway or area at night, the pictogram may need to be reflective or use retroreflective materials – alternatively, it may require lighting.

Table 2 Viewing distance and pictogram size

Viewing distance (m)	Pictogram length and width (mm)
30	600
50	1000
100	1950
200	3900

However, due to the lack of installation space on buoys, these standard sizes can be modified by the competent authority.

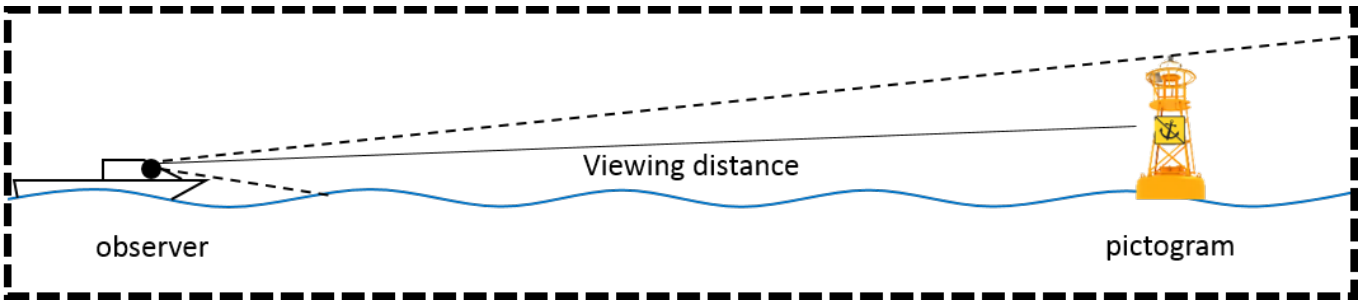


Figure 3 Simplified demonstration of pictogram size followed by viewing distance (not to scale)

3.4. INSTALLATION LOCATION

Pictograms are recommended to be installed at an easy-to-identify position which is above the freeboard and avoiding existing essential attachments (top-mark, number plate, lanterns etc.) and should be placed on more than one side.

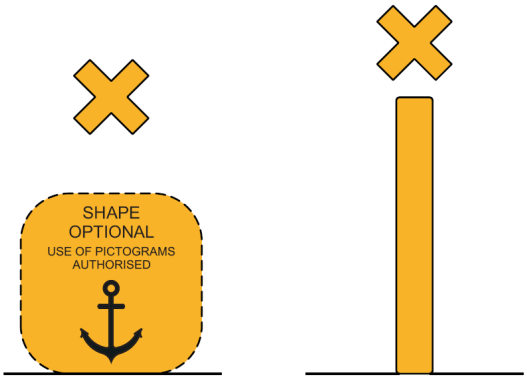


Figure 4 Example pictogram of Special Mark (taken from MBS)

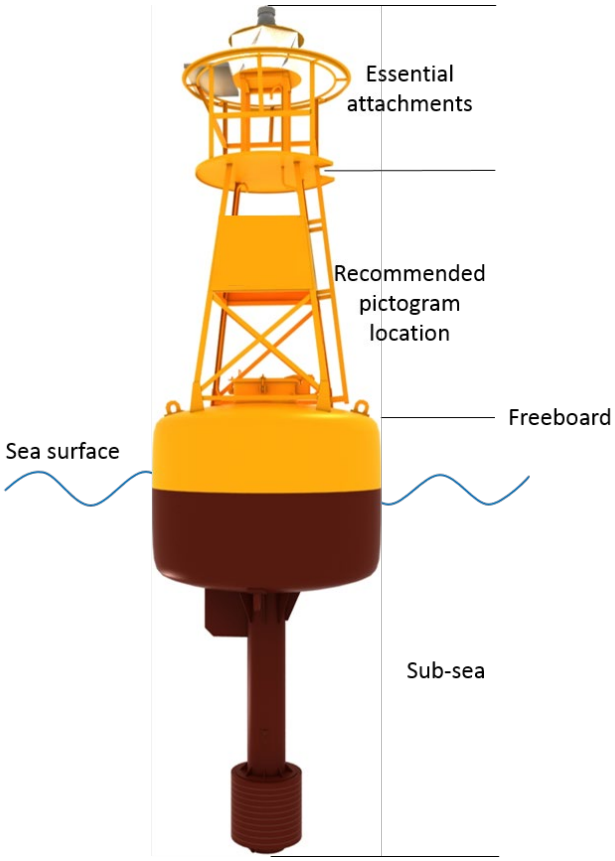


Figure 5 Example of an installation location of a pictogram

4. DEFINITIONS

The definitions of terms used in this Guideline can be found in the *International Dictionary of Marine Aids to Navigation* (IALA Dictionary) and were checked as correct at the time of going to print. Where conflict arises, the IALA Dictionary should be considered as the authoritative source of definitions used in IALA documents.

In addition, for this Guideline:

Pictogram A pictogram is a pictorial symbol which conveys its meaning through a pictorial resemblance to a physical object. This resemblance makes the meaning of a pictogram easily interpreted by mariners. Pictograms maybe regarded as public information symbols specified in ISO 7001 Graphical Symbols-Public information symbols (2007).

5. ABBREVIATIONS

AINA	Association of Inland Navigation Authorities (UK)
AIS	Automatic Identification System
AtoN	Marine Aid(s) to Navigation
CEVNI	European Code for Inland Waterways (UN Economic Commission for Europe)
CMYK	Cyan, Magenta, Yellow, Black (Key colour)
ENC	Electronic Nautical Chart
IMO	International Maritime Organization
ISO	International Standard Organization
m	metre
MBS	IALA Maritime Buoyage System
ODAS	Ocean Data Acquisition Systems
RGB	Red-Green-Blue
SIGNI	Signs and Signals on Inland waterways (UN Economic Commission for Europe)
SOLAS	International Convention for the Safety of Life at Sea (IMO 1974 as amended)
TSS	Traffic Separation Scheme (IMO)

6. REFERENCES

[1] IALA. NAVGUIDE

[2] IALA. Recommendation R1001 The IALA Maritime Buoyage System

[3] IMO. (1974) International Convention for the Safety of Life at Sea (SOLAS)

[4] IALA. Recommendation R0108 (E-108) Surface Colours Used as Visual Signals on Aids to Navigation

[5] IALA. Guideline G1094 Daymarks for Aids to Navigation

[6] CEVNI(European Code for Inland Waterways), UN Economic Commission for Europe

[7] SIGNI(Signs and Signals on Inland waterways), UN Economic Commission for Europe

[8] Guideline for Waterway Signs and Marking, UN Economic Commission for Europe

[9] Navigation signs and symbols: An industry standard for UK inland waterways, Association of Inland Navigation Authorities (AINA)

[10] ISO. (2011) ISO 3864-1, 2, 3:2011 Graphic symbols

[11] ISO. 20712-1, 2, 3 Water safety signs and beach safety flags

[12] ISO (2011) 7010:2011 Graphic symbols – Safety colours and safety signs

[13] ISO (2007) 7001:2007 Graphical Symbols – Public Information Symbols

ANNEX A EXAMPLES OF PICTOGRAMS

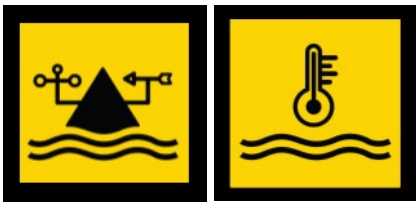
Examples of pictograms are shown below.

A.1. MBS LISTED SPECIAL MARK

In the IALA MBS, Special marks are not generally intended to mark channels or obstructions where other marks are more suitable. Some examples of uses of Special marks are:

- Ocean Data Acquisition Systems (ODAS) marks
- Traffic Separation Scheme (TSS) marks where uses of conventional channel marking may cause confusion
- Spoil Ground marks
- Military exercise zone marks
- Cable or pipeline marks
- Recreation zone marks
- Boundaries of anchorage areas
- Structure such as offshore renewable energy installations
- Aquaculture

A.1.1. ODAS MARK



A.1.2. TSS MARK

A.1.3. SPOIL GROUND MARK

A.1.4. MILITARY EXERCISE ZONE MARK

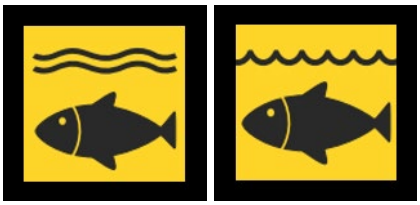
A.1.5. CABLE OR PIPELINE MARK

A.1.6. RECREATION ZONE MARK

A.1.7. BOUNDARIES OF ANCHORAGE AREAS

A.1.8. STRUCTURES SUCH AS OFFSHORE RENEWABLE ENERGY INSTALLATIONS

A.1.9. AQUACULTURE



A.2. OTHER SPECIAL MARKS

There are many other uses of Special marks globally. This guideline does not cover all kinds of Special mark however, some examples are shown below:

A.2.1. WORK IN PROGRESS (CONSTRUCTION) MARK

A.2.2. SPEED LIMITATION MARK

A.2.3. TARGET MARK

A.2.4. DEGAUSSING RANGE MARK

A.2.5. BARGE MARK

A.2.6. PRIVATE MARK

A.2.7. MOORING MARK

A.2.8. LEADING MARK

A.2.9. MEASURING DISTANCE MARK

A.2.10. NOTICE MARK

A.2.11. ANCHORING PROHIBITED MARK

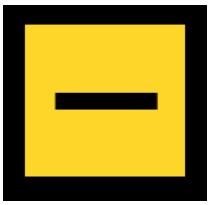
A.2.12. BERTHING PROHIBITION MARK

A.2.13. OVERTAKING PROHIBITED MARK

A.2.14. TWO –WAY TRAFFIC PROHIBITED MARK

A.2.15. REDUCE WAKE MARK

A.2.16. STOP MARK



A.2.17. GENERAL WARNING MARK

A.2.18. SOUND SHIPS SIREN MARK

A.2.19. RESTRICTED VERTICAL CLEARANCE MARK

A.2.20. VESSEL'S MAXIMUM DRAUGHT MARK

A.2.21. RESTRICTED HORIZONTAL CLEARANCE MARK

A.2.22. STRONG CURRENT WARNING MARK

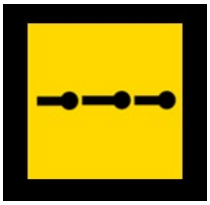
A.2.23. OVERHEAD POWER CABLE MARK

A.2.24. CHANNEL EDGE GRADIENT MARK

A.2.25. TELEPHONE MARK

A.2.26. FERRY CROSSING MARK

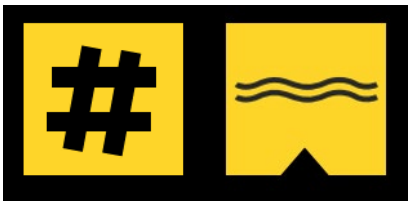
A.2.27. PIPELINE MARK



A.2.28. DIVING MARK

A.2.29. REFUGE MARK

A.2.30. FOUL GROUND MARK



A.2.31. YACHTING MARK

A.2.32. HELIPORT MARK

A.2.33. SEAPLANE LANDING MARK

A.2.34. ENTRY PROHIBITED MARK

A.2.35. WELLHEAD MARK

A.2.36. ARTIFICIAL REEF MARK

A.2.37. NATURE RESERVE MARK

A.2.38. WRECK MARK