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| IALA Guideline |

1006

On plastic buoys

Edition 3.2

Document 04/2017

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| --- | --- | --- |
| Date | Page / Section Revised | Requirement for Revision |
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| April 2008 | Entire document | Review and update at IALA Floating aids 2008 workshop and EEP11/12. |
| December 2013 | Pages 4,6,7,8 and 9 | References to Guideline 1040 deleted and replaced by Guideline 1077 |
| November 2015 | All pages, all sections | Complete revision and update of the document started |
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|  |  |  |

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# INTRODUCTION

A plastic buoy may be defined as a floating aid with at least the hull being constructed of a plastic material.

Plastic buoys have been in production since the 1980s. They are produced mainly from polyethylene materials in different designs.

Initially they were produced in small sizes, but nowadays there are several manufacturers producing plastic buoys in sizes up to and in excess of 4m diameter.

# Scope

This guideline has been developed to assist aids to navigation authorities when developing or selecting buoys for different purposes. (to be continued)

# Background

Many types of plastic buoys are available in the marketplace, ranging from small harbour or river markers to large offshore buoys.

## Points to be considered when evaluating plastic buoys

Light weight buoys need a careful design to avoid having a rapid rolling or pitching motion detracting from their navigational effectiveness in waves, wind and current.

A well-manufactured buoy using high-quality pigment within IALA chromaticity standards, and virgin material, should retain an acceptable surface colour for the design life of the buoy, which can be in excess of 20 years. However, high ultra violet and/or high temperature exposure will significantly accelerate the ageing process.

Some plastic materials may have better resistance to dense marine fouling than other buoy types. Plastic buoys must be sufficiently robust to withstand fouling being scraped off, or high pressure water jetting, regularly during the working life of the buoy.

The purchase cost of plastic buoys is dependent on the construction technology. Whole life costs may be less than steel types; however users should carefully assess their requirements with costs factors.

Plastic buoy technologies offer flexibility to incorporate new design developments.

Some plastic buoys are particularly adaptable to certain ice conditions.

The mooring eye (or eyes) will usually be metal and must thus be fastened or moulded into the buoy by some means such that the internal structure to can safely transmit loads from lifting eyes to mooring eyes and to distribute mooring loads.

Compared with steel buoys plastic buoys may require new techniques in deploying, maintenance and handling. Therefore special considerations should be given the safe working load on plastic buoys.

Sea-based maintenance can be achieved on most plastic buoys, including jet washing and other normal service tasks. Various maintenance procedures are suitable for different plastic materials. More guidance is available in IALA Guideline No. 1077 (The Maintenance of Buoys and Small Aids to Navigation Structures).

Depending from the design the metal components can require a more intensive maintenance regime, therefore the grade of steel must be considered, depending on environmental conditions (e.g. the mooring eye, either of 316L stainless steel or hot dipped galvanized steel.). Major service intervals may be governed by the life expectancy of the metals used in the buoy assembly.

It may be necessary to incorporate an earthing strap on plastic buoys to prevent the build-up of static electricity, which may cause shock or damage electronic equipment.

When the radar reflector is integrated in the plastic buoy, the polyethylene is allowed to have only low radar attenuating characteristics to avoid decreasing of the radar reflector.

## BUOY CONSTRUCTION MATERIALS

For plastic buoys the following plastics materials are used primarily:

* polyethylene
* glass reinforced plastic (GRP)
* polyurethane / elastomer coated foam
* polystyrene foam coated
* ionomer foam

Polyethylene is the most common plastic for plastic buoys. The other materials are less in use. Therefore, the present guideline mainly deals with polyethylene plastic buoys (chapter 4).

# Polyethylene plastic buoys

## Construction of polyethylene plastic buoys

### General

Manufacturers typically construct polyethylene buoys from one piece plastic moulding, modular plastic or hybrid metal/plastic designs. Generally, small buoys are made in one piece. While larger types may be modular, hybrid designs or mirror welded.

The wall thickness of the buoy body must be optimized to the size, the shape and the environmental conditions of the buoy to be sufficiently robust. The range is from 6-35mm. (add information about srd-ratio for tubes).

Polyethylene material will expand and contract about 3 to 5%, depending on the colour and ambient temperature. Care should be taken in the design to ensure compatibility between different materials (e.g. elongated or oversized clearance holes).

Plastic buoys can be filled with polyurethane foam or polystyrene.

The polyethylene provides poor adhesion for conventional paints, but specialized hot plastic spraying processes are available and have been used successfully for black or white coatings.

### Force transmission

It is important that any high loads are distributed throughout the structure of the buoy and not concentrated in small areas of the skin. One solution to avoid these stresses may be to interconnect the mooring and lifting points with a structural core.

Some more details can be added...

### Inserts

In the manufacturing process, care should be taken to ensure that threaded inserts are fixed and aligned correctly in the material, otherwise they should be avoided.

Care must be taken when using threaded inserts to avoid detachment of the insert within the polyethylene.

### Construction demands for use of plastic buoys in ice built up areas

A year-round use of plastic buoys can save money, because special winter work is obsolete than. Some plastic buoys, especially spar/conical buoys and spars, are able to stand ice conditions. For this some construction demands have to be fulfilled:

#### Outer construction

When ice fields occur and affect the buoy, it must be strong enough to go under the ice and come up after the ice field has moved away. Buoy shape, strength, lifting- and mooring-eyes etc. must be constructed accordingly. For the width of the lifting eyes a compromise between minimum size for a good handling and reducing the points for ice accreation is necessary.

#### Top marks

When possible, top marks should be avoided in ice built up areas. If installed, for a year-round use of the plastic buoys also the top marks must be constructed ice condition optimized, for example as a brush-construction.

Also a disposible solution is possible, but environment protection is to consider.

#### Dimensioning and realising of wall thickness

The main reason for by ice destroyed plastic buoys are too thin or not homogeneously realized wall thicknesses. The wall thickness must be choosen accordingly and realized homogeneously while the production process. This should be measured and documented in order to the quality control requirements.

Refer to workshop ice conditions and guideline 1108

### Construction demands for use of plastic buoys in very hot climates

Summary of hot climate workshop...

### Construction demands for use of plastic buoys in extreme see conditions

Information from Philippe

## Polyethylene material

The polyethylene material must have a certain quality and special material specifications.

The use of recycled polyethylene is not recommended.

The polyethylene material may be linear (low, medium, high-density or ultrahigh molecular weight) or cross linked.

The linear material has the advantage that it can be melted and hence repaired by hot fusion welding. The polyethylene material used in buoy manufacturing is usually linear.

When colour is moulded-in, pigments must be of the highest quality suitable for marine use and UV exposure.

New material….

Standard xy, information from Tony and Seppo…

## Polyethylene Manufacturing processes

Components of polyethylene plastic buoys are generally made by rotational moulding or in an extrusion process hinweis auf geschweißte platten, Chinesen....

### Rotational moulding process

The rotational moulding process can be used for low, medium and high-density polyethylene. Using this process enclosed modules with wall thicknesses up to 35 mm can be manufactured.

For the production of buoys with a diameter up to approx. 1.5 m the enclosed modules become welded together. For buoys up to approx. 3 m in diameter 2, 4 or more self-contained modules are mounted as buoyancy modules on a structural core.

Pictures:

small enclosed module

big enclosed module

The composition of a buoy of several buoyancy modules offers the advantage that a reserve of buoyancy remains in case of damage to one or more segments. Furthermore handling and transport can be simplified.

### Extrusion-process

Extrusion process can provide pipes in different diameters with wall thicknesses................

Extrusion is a molding process used to make polyethylene pipes, hoses and profiles.  Pipes used for polyethylene buoys are mostly used as water lines. The most common material is HD 100 polyethylene and pressure class PN16 (allowed pressure 16 MPa).  Bottom and top of the buoy is made of same quality and thickness polyethylene plate.  Connections of separate parts are mainly made by mirror welding. The buoy can be divided into several waterproof sections.  Radar reflector and other devices can be placed inside the buoy body. Buoys can easily be customized according to specifications.

 For ultrahigh molecular weight material an extrusion-process is needed……..

Picture:

Extrusion made module

## Common types and sizes of polyethylene plastic buoys (check the position of this chapter)

Available on the market is a great variety of are different types and sizes of polyethylene plastic buoys. The following chapters give an overview about the most common buoys.

The main difference is the design:

* One piece buoys (Unibody construction)
* Buoys made of 2 or more modules: welded/assembled

### typical spar- and conical-buoys up to 1.5m diameter

Those buoys consist of 3 or 4 elements, which are made by rotational-moulding-process. They become welded together by mirror welding.

The material is LD PE.

The wall thickness of the lower elements is bigger than from the upper elements because of stability and ballast reasons. The following sizes are common:

|  |  |  |  |
| --- | --- | --- | --- |
|  | big spar/conical buoy | middle spar/conical buoy | small spar/conical buoy |
| Application area | see, coast, estuary | river | shallow water |
| Visible coloured area (m²) | ≥ 3,0 | ≈ 2,0 | ≈ 1,0 |
| Height above water line (m) | ≈ 4,0 | ≈ 3,0 | ≈ 2,0 |
| Biggest diameter in the water line (m) | ≈ 1,5 | ≈ 1,0 | ≈ 0,7 |
| Height over all (m) | 5,4 | 4.4 | 2.8 |
| Total weight (kg) | 1000 | 400 | 200 |
| Buoyancy (kg/cm) |  |  |  |
| Äquivalent radar reflection area (m²) | ≈ 30 | ≈ 30 | ≈ 15 |
| Average wall thickness (mm) | ~ 25 | ~ 25 | ~15 |



### Spars

The most spars consist mainly of a plastic pipe which is made by extruding-process. The material is high-density or ultra-high-density polyethylene.

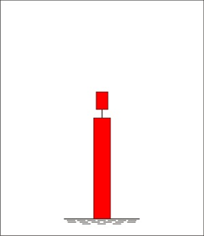
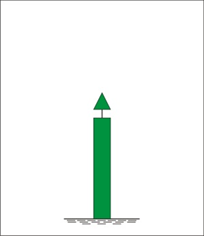
The top and the bottom parts are also made of plastic and become welded on the tube.

Some of them are equipped with a light-unit and a battery compartment (primary battery).

The buoy can be filled with polystyrene foam.

Spars with the following characteristics are common:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Big spar | Medium spar | Small spar |
| Application area | Offshore, Coastal | Coastal, Ports, Inland waters | Marinas, Inland waters |
| Visible coloured area (m²) | 2,4 – 3,2 | 1,0-1,7 | 0,4-0,6 |
| Height above water line (m) | 3,0- 4,0 | 2,5 – 3,5 | 2,0 – 3,0 |
| Diameter (m) | 0,8 – 1,0 | 0,4 – 0,5 | 0,16 – 0,225 |
| Height over all (m) | 8,0 – 11,0 | 6,0 – 9,0 | 2,5 – 6,0 |
| Total weight (kg) | 1000-1200 | 200 - 500 | 40 - 100 |
| Equivalent radar reflection area (m²) | 120,0 | 20,0 | 9,0 |
| Buoyancy at MSL (kg) | 1500- 3000 | 350 -600 | 40 - 120 |
| Lettering size | Big | Medium | Small |
| Wall thickness (mm) | 32 | 15 - 20 | 6 - 9 |
| Top mark | As required | As required | As required |



### Modular buoys with enclosed modules used as floats

For bigger buoys (diameter more than 1.5m up to 4m) floats are used. The floats are mounted on a core structure, which consists of plastic pipes or a metal construction.

Modular buoys with a plastic core structure (complete plastic design) are consisting of the following elements:

* Enclosed modules as floats
* polyethylene tail tube
* polyethylene top structure
* mooring and lifting eye made of steel
* cast iron ballast weight

add sample picture

Modular buoys with hybrid metal/plastic design are consisting of the following elements:

* Enclosed modules as floats
* steel tail tube
* aluminium or plastic top structure
* mooring and lifting eye made of steel
* cast iron ballast weight

add sample picture

The following sizes of modular buoys with polyethylene floats are typical:

|  |  |  |  |
| --- | --- | --- | --- |
|  | big modular spar/conical buoy | middle modular spar/conical buoy | small modular spar/conical buoy |
| Application area | open sea  estuary | Open sea, coastal, estuary | coastal, shelter, rivers, ports |
| Visible coloured area (m²) |  |  |  |
| Height above water line (m) |  |  |  |
| Typical diameter in the water line (m) | 3 | 2.4 -2.6 | 1.5/1.8/2 |
| Height over all (m) | ? | ? | ? |
| Total weight (kg) | ? | ? | ? |
| Äquivalent radar reflection area (m²) | ? | ? | ? |
| Buoyancy (kg/cm) | ? | ? | ? |
| Average wall thickness (mm) | ? | ? | ? |

Sample pictures

Region A/B

## Multi-colour possibilities

The possibilities to produce multi-colour plastic buoys according to the IALA maritime buoyage system (MBS) depend from the buoy type.

### Welded spar- and conical-buoys up to 1.5m diameter according to chapter 4.1.4.1 and Spars according to chapter 4.1.4.2

Rotational moulded parts: The enclosed modules can be made of different colours. They can be welded according to the needed colour combination.

Extruded parts: pipes can be manufactured in colour combinations (for example red-white). The different plastic pipes become welded.

Plastic plates: Different coloured plastic plates can be welded on the buoy body.

Another possibility is the mounting of a cap with the needed colour combination on the buoy body.

### Modular buoys with polyethylene floats according to chapter 4.1.4.3

Modular buoys with a plastic core structure (complete plastic design): The floats can be made of different colours and be combined according to the needed colour combination. On the polyethylene top structure coloured polyethylene plates can be mounted.

Modular buoys with hybrid metal/plastic: An aluminium top structure can be painted with different colours, on a polyethylene top structure coloured polyethylene plates can be mounted.

Another possibility is the mounting of a cap with the needed colour combination on the buoy body.

## Filling the buoy with polystyrene or polyurethane foam

If applicable, filling a buoy can have the following advantages:

* Filling can increase the impact stability/shock resistance of a float.
* In case of leakage the filling can secure the buoy from sinking.

If filling is used, it must be of the highest quality closed-cell specification to prevent water absorption. Filling material should be of sufficient quality to survive the expected lifetime of the buoy.

Some disadvantages may exist in the use of filling:

* Some polyurethane foam types may not be recyclable. Furthermore the combination of polyethylene and foam is not easy to separate.
* For filling in foam into the floats additional holes are necessary. Theses are weak spots and must be closed carefully after the filling.

## Metal parts

### General

A common plastic buoy includes at least the following metal parts:

* Lifting eye
* Mooring eye
* Standard parts
* Ballast (in case of cast iron or steel)

The metal parts of a buoy must be selected in such way, that no galvanic element is produced. Sometimes it is necessary to insulate metal parts (paint, insulating hull, bitumen coat..).

It is desirable to use non corrosive standard parts, for example from hot-dipped galvanized steel, marine-grade aluminium, marine grade stainless steel or bronze.

### Lifting eye and mooring eye

Depending on the buoy type according to chapter 4.1.4 the lifting eye and the mooring eye can be made as follows:

* part of the plastic body
* inserts of plastic
* additionally mounted stainless-steel-part
* additionally mounted galvanized-steel-part

It also can be a part of the metallic structure (buoy core).

The safe working load should be optimized regarding the handling, deploying and recovering of the buoy in order to insure safe operation.

Mooring eye: Because of the wear an appropriate reserve is needed, which depends on the maintenance intervals. With measurements during the maintenance process the wear can be determined. It should be changeable in case of wear.

## Lettering methods

Most administrations apply the position name/number on the buoy body. Appropriate methods have to be found to achieve a long term stability of the lettering. Solutions could be:

* Painting
* Adhesive foils
* Mounted plates (welded or fixed by screws)
* Scaring/engraving
* Plastic spray method

## Stability

To ensure adequate stability information regarding current, tidal range, wave height, wave interval, wind speed and water depth at the deployment location is needed.

The IALA guideline “1099 on the hydrostatic design of buoys” gives detail information.

## Ballast

Ballast could be needed to achieve good buoy stability. The ballast is a result of 4.1.9. For using a buoy type in different conditions the ballast may be adjustable.

## Handling

The handling of a plastic buoy generally does not differ from steel buoy handling.

The weight of plastic buoys is lower than from steel buoys. Therefore they are easier to manoeuvre. The devices for manoeuvring could be from less capacity.

Long term storage:

* The storage should be done according to the manufacturer instructions.
* When plastic buoys are stored outside for a long time (for example on a buoy yard) they should be protected against UV to prevent them from premature aging.

## Repair & Maintenance

* Linear polyethylene can be easily repaired by trained technicians using hot fusion welding equipment in required colours.
* Maintenance procedures are outlined in IALA Guideline “No.1077. on Maintenance of Aids to Navigation”, chapter 2 synthetic buoys.

## Quality control

### General

The buoy handling on the buoy tender or in the buoy yard includes work safety danger for the personnel. The risk of work safety danger can be minimized by appropriate work safety precautions and well-designed plastic buoys of equal and lasting quality.

Furthermore the buoy lifecycle can be fulfilled for a longer period, for example concerning the degradation of colours.

Similar to steel buoys on plastic buoys the wear and tear of the buoy body, for example the plastic material condition (aging, overload) can not be seen at the first sight.

Corresponding measurements can lead to the destruction of the buoy. During the manufacturing process of the buoy body and the metal parts some important quality control mechanisms should be applied.

* The manufacturer should have an internal quality control principle, for example ISO 9001 or comparable.
* If required, each buoy can be delivered with an according quality control report. The content of the report has to be determined according to the customer requirements.
* The customer should establish an internal system to monitor the history of the buoy.

### Quality of the buoy body

To accomplish a long lifecycle quality of the buoy body the following tests can be applied.

#### Tests before series production

After manufacturing the first samples of plastic parts these should be checked according to the requirements:

* Measurement of the overall dimensions of each part
* Measurement of the weight of each part
* Measurement of the wall thickness on different points (rotational moulded parts)
* Check the water tightness of the enclosed modules by pressure tests
* Check the surface
* Chromaticity measurements
* Mechanical tests
* Sawing of the compartments to get detail information

#### Tests on completed sample buoys

In addition to the measurements described above, the following, destructive quality controls should be carried out on at multiple plastic buoys from each production batch.

* Ultrasonic measurements of welded joints
* Tension tests up to the break load (welded buoys)

#### Tests during the manufacturing process of the buoy body

Depending from the customer requirements the tests can be done on each buoy body or batch tested.

* Measurement the overall dimensions
* Measurement of the weight
* Measurement of the wall thickness on different points
* Check the water tightness
* Tension tests up to a specified work load
* Check the surface
* Chromaticity measurements

#### Special tests during the lifecycle of buoys

According to 1077, xXXXXXX: On some sample buoys from different waterway areas the following tests can be done periodically:

* Chromaticity measurement
* Tension tests up to a specified work load

## Chromaticity stability

The manufacturing materials must be carefully specified and certification obtained from the manufacturer to ensure that correct quality virgin materials and UV stabilizers (in both the pigment and the polyethylene) have been used.

The manufacturer of the buoy should give information about the expected material behaviour during aging. The parameters of the new material must be accomplished after 12 years.

## Colour Aging

### colour in new condition

The colours are defined in the Surface colours used as visual signals on aids to navigation E-108

question: is it possible to enlarge the given colour areas?

### colour aging

Tthe colour should still be in the specified areas...

Insert values for aged material ???

### typical lifetime for the colours in different regions:

North Europe: 8 12

South Europe: 8

Asia: 8

Africa 5

North America 10

South America 8

## Recycling / Disposal

* Linear thermoplastics can be recycled, however it must be possible to separate any metal components and impurities (marine growth / paint etc) from the plastic, and remove any internal filling.
* Professional company specialised on recycling
* Difference between filling polystyrene (easy) and polyurethane (difficult)
* Costs?

Identification (manufacturer/year/batch/ etc/RFID?)

**Here the other plastic types (GRP, ionomer foam,...) should be described. Add some chapters**

# Buoy equipment

Analogue to steel buoys additional equipment can be mounted in or on the plastic buoy body. These are mainly components which generate an additional visibility, e.g. in radar- or RF-systems.

Furthermore remote control- and monitoring devices can be added.

## Light units

Plastic buoys can be equipped with LED-lanterns (powered by solar-, wind- or wave energy respectively by a primary battery) or self-contained lanterns.

Compact self-contained lanterns become increasingly smaller. At the same time, the amount of their functions increases. Chapter 3.2.8 “Integrated Power Supply Lanterns” of the IALA Navguide and the IALA guideline 1064 “Integrated Power Systems Lanterns” give information in detail.

If the plastic buoy is used under ice conditions according to chapter 4.1.3.2, the self-contained lantern or the stand alone lantern must also be designed to be ice-resistant. At some plastic buoys (especially spars) a primary battery instead of a solar power supply is used then.

## Monitoring systems

Modern self-contained lanterns can be equipped with a remote monitoring and remote control system. Depending from the buoy location different communication ways for the data transfer can be used.

The status of the lantern, the power supply and other devices as well as buoy related data can be determined, transferred and displayed. This enables further optimization of the technical maintenance operation, especially with regard to the cost intensive buoy tender fleet.

The IALA Guideline 1008 “Remote monitoring and control of aids to navigation” gives information in detail.

## Radar reflector

A radar reflector is a passive device designed to enhance the radar conspicuity of aids to navigation. Chapter 4.9.1 “Radar Reflectors” of the IALA Navguide provides more information. (more information: paper of Dr. Speckter and VV-WSV 2406).

Most plastic buoys are equipped with a radar reflector.

Internal radar reflector

The advantage is, that the radar reflector is protected from environment conditions. The disadvantageous effects are:

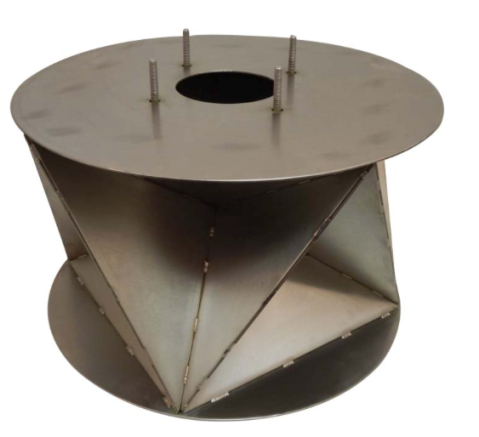
* The retrofitting of a radar reflector is not possible.
* The surrounding polyethylene wall reduces the reflection performance.
* The radar reflector has to be smaller (compared with a steel buoy radar reflector).

When designing a plastic buoy a compromise between the needed wall thickness, the RF-attenuation factor of the plastic and the diameter of the radar reflector has to be found.

Radar reflector

Hint for external radar reflectors....

Pictures...



Echomax, firdell

## Active Radar reflector

Add information

## Racon

A Radar beacon (racon) enhances the radar detection and identification of the object on which it is mounted. For detail information look at chapter 4.9.3 “Radar Beacon” in the IALA-Navguide and the “IALA Guideline No. 1010 on Racon Range Performance”.

## AIS

Buoys can be equipped with AIS-transponders to transmit different messages. Also remote monitoring is possible. For detail information look at the IALA Guideline “1098 the application of AIS - AtoN on buoys”. A126

## Top marks

The shape and the dimensions of top marks are described in the IALA guideline 1094. Top marks can also be designed to enhance the radar response.

## Letteringposition??????

## Retroreflective sheeting

Plastic buoys can be equipped with retroreflective sheeting, so the mariner can detect the position and colour at night by use of a searchlight. For detail information look at the IALA Guideline 1094.



Body text

## (Example Heading level 2)

Body text



1. Geographical range

Where:

Rg is the geographical range (nautical miles

ho is the elevation of observer’s eye (metres)

Hm is the elevation of the mark (metres)

### (Example heading level 3)

Body text

1. Theory of Special Relativity

Where:

E is the kinetic energy (Joules)

m is the mass (kilograms)

c is the speed of light (metres/second)

#### (Example heading level 4)

Body text

# OVERVIEW (Example Heading level 1)[[1]](#footnote-1)

Body text. Bullets have only one sentence. Anything further needs to appear in the relevant 'bullet text' style.

* Bullet 1;
* Bullet 1;
* Bullet 1.

## TABLES

Body text

1. Example of a table with the significant information in the first column

|  |  |
| --- | --- |
| Table heading | Table text |
| Table heading | Table text |
| Table heading | Table text |
| Table heading | Table text |
| Table heading | Table text |
| Table heading | Table text |

1. Example of a table with the significant information in the first row[[2]](#footnote-2)

|  |  |  |
| --- | --- | --- |
| Table heading | Table heading | Table heading |
| Table text | Table text | Table text |
| Table text | Table text | Table text |
| Table text | Table text | Table text |
| Table text | Table text | Table text |

1. Example of a table with coloured rows

|  |  |  |
| --- | --- | --- |
| Table heading | Table heading | Table heading |
| Table text | Table text | Table text |
| Table text | Table text | Table text |
| Table text | Table text | Table text |
| Table text | Table text | Table text |
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| Table text | Table text | Table text |

Note: Colours for cells in tables need to be selected from the permitted palette (see ANNEX C)

# FIGURES



1. Example figure



1. Another example figure

# ACRONYMS & Definitions

## Acronyms

IMO International Maritime Organization (Acronym style)

## Definitions

Abcde (Body text)

# REFERENCES

Body text

1. Abcd
2. Efgh
4. GUIDANCE (EXAMPLE OF AN ANNEX ON A LANDSCAPE PAGE)

Body text

1. An example of an ANNEX heading level 1

Body text

* 1. an example of an annex heading level 2

Body text

* + 1. An example of an annex heading level 3

Body text

* + - 1. An example of an annex heading level 4

Body text

1. Example table

| No | Title/Topic | IMO References | Requirements | Possible Audit Questions | Remarks |
| --- | --- | --- | --- | --- | --- |
| 1 | Table text | Table text | Table text | Table text | Table text |
| Table text | Table text |
| Table text | Table text |

1. Example of an Appendix Title
2. APPENDIX HEADING 1

Body text

* 1. APPENDIX HEADING 2

Body text

* + 1. APPENDIX HEADING 3

Body text

* + - 1. Appendix Heading 4

Body text

1. CHECKLIST FOR (Example Annex Title)
2. Introduction (Example Annex Heading 1)

Body text.

* 1. Example of an ANNEX HEADING Level 2

Body text

* + 1. Example of an annex heading level 3

Body text

* + - 1. Example of an annex heading level 4

Body text

1. PERMITTED COLOUR PALETTE

Guidelines

Model Courses

Recommendations

|  |  |
| --- | --- |
| The IALA colour palette is divided in 3 palettes of different level of hierarchy that has to be respected.  Corporate colours  IALA’s corporate colour palette is directly inspired from the colours in our logotype:  - dark blue  - white  - yellow  - gradient blue  **Primary and secondary colours**  The primary colours are to be applied in complement  with the corporate colours.  This second level of colours gives rhythm and helps  to segment our publications.  The secondary colours are used to highlight  information, titles in a minor proportion only.  **Note: Corporate colours are not shown** | /Users/Mike/Desktop/Brand Guideline for template 1.jpg |

1. [↑](#footnote-ref-1)
2. Example of footnote text [↑](#footnote-ref-2)