International Standard

ISO 7460

Shipbuilding — Shiplines — Identification of geometric data

Construction navale — Formes et lignes de navires — Identification des données géométriques

First edition — 1983-12-15

UDC 629.12.011.1

Ref. No. ISO 7460-1983 (E)

Descriptors : shipbuilding, ship hulls, lines, geometric characteristics, information.

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 7460 was developed by Technical Committee ISO/TC 8, *Shipbuilding and marine structures*, and was circulated to the member bodies in January 1983.

It has been approved by the member bodies of the following countries :

Austria	Germany, F.R.	Mexico
Brazil	India	Netherlands
Bulgaria	Italy	Poland
Czechoslovakia	Japan	Romania
Finland	Korea, Dem. P. Rep. of	Spain
France	Korea, Rep. of	Sweden

No member body expressed disapproval of the document.

Shipbuilding — Shiplines — Identification of geometric data

1 Scope and field of application

This International Standard identifies the data relating to the geometry of ship hull lines required for the transfer of information between organizations.

Methods of representing the geometry in numerical form and the data formats to be used are specified in ISO 7461 and ISO 7838 respectively.

2 References

ISO 31/1, *Quantities and units of space and time.*

ISO 1000, *SI units and recommendations for the use of their multiples and of certain other units.*

ISO 7461, *Shipbuilding — Shiplines — Numerical representation of hull geometry parts.* [1]

ISO 7462, *Shipbuilding — Terminology and definitions for computer applications — Principal ship dimensions.* [1]

ISO 7838, *Shipbuilding — Shiplines — Formats and data organization.* [1]

3 Definitions

The terminology and definitions used in this International Standard are in accordance with ISO 7462.

The information mentioned in clause 1 covers the following :

3.1 dimensional characteristics : Geometric properties of the ship hull which can be expressed in units of length, area or volume, or a combination of these values, independently of the axis system or frame of reference used.

3.2 lines :

1) Any space curve lying in the moulded surface used to assist in the definition or description of the surface.

2) One of a series of plane curves defining sections through the surface.

A ship's hull lines make up the set of lines which, together with other information specified in this International Standard, serve to define the hull form geometry to the level required for a particular application.

3.3 non-dimensional characteristics; coefficients : Non-dimensional values obtained by means of mathematical formulae using dimensional characteristics.

NOTE — For further details of the dimensional characteristics, see 3.1.

3.4 axis system : A fixed system of orthogonal axes to which geometric data are referred.

A right-handed orthogonal system of axes shall be used, with the baseline as x axis and origin at the intersection with the after perpendicular :

x axis positive forward;

y axis positive to port;

z axis positive upwards.

The directions of angles, rotations and translations shall be consistent with the established mathematical conventions for a right-handed axis system.

The baseline adopted shall be specified, for example through the top of the keel plate.

If any other system of axes is used, or if a local reference axis system is required for the definition of a particular part of, or appendage to, the hull form, the transformation relations between this and the above axis system shall be specified.

---

1) At present at the stage of draft.

4 Units of measurement

All input and output data shall be expressed in SI units (see ISO 31/1 and ISO 1000) shown in the table.

Table

Parameter	Recommended unit
length	m
breadth	m
depth	m
draught	m
deck camber	mm
plate thickness	mm
offsets and other co-ordinate data	m or mm[1]
volume	m³

1) The units adopted shall be specified. Millimetres are preferred for production applications.

5 Selection of lines

The selection of lines for defining the moulded surface of the hull will depend on the level of the application and on the relevance of each line to the application.

Parts of the surface having a simple analytic form, for example plane, cylindrical or conical, shall be specified and the lines defining the limits of such parts of the surface shall be given.

Parts of the surface for which explicit analytic forms are not specified shall be defined by sufficient lines to enable any point on the surface to be determined to the degree of accuracy appropriate to the application by the use of standard second order interpolation procedures.

The definitions and terminology of these lines shall be in accordance with ISO 7462.

5.1 List of lines :

— keel line;

— maximum area transverse section;

— limit of parallel body;

— limit of flat bottom;

— lines defining limits of areas of pre-defined geometry (for example radiused stem);

— stem and stern contours;

— transverse sections (frame lines);

— longitudinal-vertical sections (buttock lines);

— waterlines;

— deck-at-side lines;

— deck-at-centre line;

— camber line;

— lines of intersection of appendages (bossing, rudder, horn, etc.) with moulded surface;

— bulwark line;

— gunwale line;

— diagonal lines;

— line of half-siding of keel;

— rabbet line;

— knuckle or chine lines.

5.2 Application levels

Two application levels should be considered :

a) design applications;

b) production applications.

5.3 Classification of lines

Among the lines listed in 5.1, the following classification should be made :

a) *mandatory lines* — those lines which should necessarily be used for a given application;

b) *optional lines* — any other lines which could be useful for the corresponding application.

5.3.1 Mandatory lines for design applications :

— keel line;

— maximum area transverse section;

— stem and stern contours;

— transverse sections at design stations;

— longitudinal vertical sections;

— waterlines;

— either deck-at-centre or deck-at-side lines;

— knuckle or chine lines.

5.3.2 Mandatory lines for production applications :

— keel line;

— maximum area transverse section;

— limits of parallel body;

— limit of flat bottom;

— stem and stern contours;

— frame sections;

— waterlines;

— deck-at-centre lines;

— lines of intersection of appendages with moulded surface;

— knuckle or chine lines.

6 Additional information to be provided

6.1 Application

The intended applications of the geometric data shall be specified, for example design, model testing, production.

6.2 Ship particulars

The numerical representation of the geometry of the ship's hull lines should be supplemented by a listing of the principal particulars of the hull and other critical dimensions.

6.2.1 The following particulars are mandatory for design applications :

— length between perpendiculars (LPP);

— maximum breadth moulded (B);

— longitudinal and vertical position at which maximum moulded breadth occurs. In the case of a ship with parallel middle body, the range shall be specified;

— depth moulded to upper deck and amidships (DEP);

— draught moulded to design waterline amidships and at perpendiculars (T);

— rake of keel;

— bilge radius (when applicable).

6.2.2 The following additional data are mandatory for production applications :

— breadth extreme;

— depth extreme to upper deck amidships;

— draught extreme;

— thickness of keel;

— half-siding of keel;

— rise of floor or dead rise;

— sheer at forward perpendicular;

— sheer at after perpendicular;

— longitudinal position of minimum sheer;

— type of sheer (for example parabolic).

6.3 Non-dimensional characteristics; coefficients

The following coefficients referred to the design draught and moulded displacement shall be specified :

— block coefficient (CB);

— maximum transverse section coefficient (CX);

— prismatic coefficient fore body (CPF);

— prismatic coefficient after body (CPA).

6.4 Volume of displacement

The volume of displacement (moulded) at the design waterline shall be specified. Appendages included in the volume shall be specified.

6.5 Moulded surface

The moulded surface to which the data refer shall be specified, for example "to inside of plating".

This page intentionally left blank