

AS 1799.1:2021



STANDARDS
Australia



Small craft

Part 1: General requirements for power boats



AS 1799.1:2021

This Australian Standard® was prepared by CS-114, Small Craft up to 35m. It was approved on behalf of the Council of Standards Australia on 13 August 2021.

This Standard was published on 20 August 2021.

The following are represented on Committee CS-114:

- Australian Maritime Safety Authority
- Australian Sailing
- Boating Industry Association
- Marine & Safety Tasmania
- Maritime Safety Victoria
- NSCA Foundation
- NSW Police Force
- Qld Transport & Main Roads
- Royal Institution of Naval Architects
- Surf Life Saving Australia
- Transport for NSW

This Standard was issued in draft form for comment as DR AS 1799.1:2021.

Keeping Standards up-to-date

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:

www.standards.org.au

ISBN 978 1 76113 471 5

Small craft

Part 1: General requirements for power boats

Originated as part of AS 1799—1975.
Previous edition AS 1799.1—2009.
Fourth edition AS 1799.1:2021.

© Standards Australia Limited 2021

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth).

Preface

This Standard was prepared by the Standards Australia Committee CS-114, Small Craft up to 35m, to supersede AS 1799.1—2009, *Small craft, Part 1: General requirements for power boats*.

The objective of this Standard is to provide requirements for maximum load, persons and power capacities, reserve buoyancy, stability, fire protection, and other safety aspects for powered craft up to 15 m in length used as recreational boats.

Apart from a general update and editorial review, this edition incorporates a number of changes in requirements compared with the 2009 edition, the most significant of which are as follows:

- (a) The motor weights in [Table 2.1](#) have been revised to match actual equipment available on the Australian market.
- (b) The definition of “static float plane” has been aligned with the definition in the latest version of ABYC H-05.
- (c) The concept of “total persons mass” has been introduced in line with Edition 5 of the *National Standard for the Australian Builders Plate*.
- (d) A new warning label has been added and applies if the open waters maximum persons capacity has not been assessed.
- (e) The open waters stability requirements have been refined.
- (f) The requirements for determining maximum power capacity of outboard-powered boats have been aligned to the latest ABYC requirements, and the circumstances under which testing in accordance with [Appendix F](#) is required have been clarified.
- (g) The means by which a boat’s swamped flotation performance may be assessed have been expanded.

In addition, the use of figures and informative elements has been expanded to assist users to understand concepts within the Standard.

While AS 1799.1 is sometimes referenced in standards for commercial vessels, this Standard is intended to address the minimum safety requirements that apply when a boat is used recreationally, taking into account factors like typical patterns of usage and the anticipated competency of those on board a recreational boat.

Conformance with the following International Standards is deemed to satisfy the requirements of [Sections 2 to 6](#) of this Standard, ISO 8666, ISO 9094, ISO 11592-1, ISO 11812, ISO 12216, ISO 12217-1, ISO 12217-3, ISO 13590, ISO 14946, ISO 15084, ISO 21487. Satisfying the requirements of AS 1799.1 (this Standard) is based on conformance in full with all of the equivalent ISO standards, but not a combination of ISO standards and the requirements in this Standard. See [Clause 1.6](#) for the appropriate ISO Design Category.

The terms “normative” and “informative” are used to define the application of the appendix to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

Contents

Preface	ii
Section 1 Scope and general	1
1.1 Scope	1
1.2 Normative references	1
1.3 Terms and definitions	2
1.4 Symbols and abbreviated terms	10
1.5 Marking	12
1.5.1 Boat capacities	12
1.5.2 Open waters loading advice	12
1.5.3 Hull identification	12
1.6 ISO relationship	13
Section 2 Maximum capacities and buoyancy	14
2.1 Maximum load capacity for boats less than 6 m in length for protected waters	14
2.1.1 General	14
2.1.2 Outboard installations	14
2.1.3 Inboard installations	14
2.2 Maximum persons capacity for protected waters	15
2.2.1 General	15
2.2.2 Outboard installations	15
2.2.3 Inboard installations	16
2.3 Maximum persons capacity for open waters	16
2.4 Provision of seating and standing positions	17
2.5 Swamped flotation	17
2.5.1 Minimum swamped flotation	17
2.5.2 Use of flotation materials	17
2.5.3 Resistant flotation materials	17
2.5.4 Level flotation	18
2.5.5 Boats 6 m or more in length	18
2.5.6 Air compartments	18
2.6 Maximum power capacity	19
2.6.1 Determination of maximum power capacity for outboard installations	19
2.6.2 Determination of maximum power capacity for pontoon boats	21
2.6.3 Tiller steered outboard installations	21
2.6.4 Determination of maximum power capacity for inboard and sterndrive installations	22
2.6.5 Determination of maximum power capacity by test	22
2.6.6 Engine power rating	22
Section 3 Hull design	23
3.1 General arrangement	23
3.2 Hull drainage	23
3.2.1 Bailing devices	23
3.2.2 Compartments	23
3.2.3 Drain plugs	23
3.3 Decks	24
3.3.1 General	24
3.3.2 Footing	24
3.4 Self-draining cockpits and wells in weather decks	24
3.4.1 General design	24
3.4.2 Drain area	24
3.4.3 Drain design and construction	24
3.4.4 Drainage around hatches over engine compartments	25
3.5 Quick-draining cockpits, wells and recesses	25
3.5.1 General	25
3.5.2 Time to drain water	25

3.5.3	Freeing port area.....	26
3.5.4	Freeing port construction.....	26
3.6	Hatches and exterior doors.....	26
3.6.1	Design of hatches and exterior doors.....	26
3.6.2	Construction of hatches and exterior doors.....	26
3.6.3	Coamings and sills.....	26
3.6.4	Security of attachment of hatch covers.....	27
3.7	Exits from enclosed accommodation.....	27
3.8	Windshield and windows.....	27
3.9	Transom for outboard or sterndrive installations.....	27
3.10	Motor well.....	27
3.11	Boat hardware and fittings.....	28
3.11.1	General.....	28
3.11.2	Bow eye.....	28
3.11.3	Cleats, bollards and fairleads.....	28
3.11.4	Safety hand rails, handholds and reboarding.....	29
3.12	Lifting system.....	29
3.13	Dissimilar metals.....	29
Section 4	Cooking and heating systems.....	30
4.1	Liquefied petroleum gas (LP Gas) and compressed natural gas (CNG) systems.....	30
4.1.1	General.....	30
4.1.2	Gas detector.....	30
4.1.3	Appliances.....	30
4.2	Systems other than LP Gas or CNG.....	30
4.2.1	General.....	30
4.2.2	Appliances.....	30
4.3	Appliance design.....	30
4.3.1	Cooking appliances.....	30
4.3.2	Pilot flames.....	30
4.3.3	Water heaters.....	30
4.3.4	Cabin heaters.....	31
4.3.5	Refrigerators.....	31
Section 5	Stability.....	32
5.1	Personal water craft.....	32
5.2	Protected waters requirements for boats less than 6 m in length.....	32
5.2.1	General.....	32
5.2.2	Stability under static conditions.....	32
5.3	Protected waters requirements for boats 6 m or more in length and open waters requirements.....	33
5.3.1	General.....	33
5.3.2	Heeling test.....	33
5.3.3	Heeling moment.....	34
5.3.4	Requirements.....	34
5.4	Multihull boats.....	36
5.4.1	General.....	36
5.4.2	Freeboard.....	36
5.4.3	Heeling test.....	36
Section 6	Fire protection.....	37
6.1	Portable fire extinguishers.....	37
6.1.1	Selection.....	37
6.1.2	General.....	37
6.1.3	Large tanks.....	37
6.1.4	LP Gas or other flammable gases.....	37
6.1.5	Flammable liquids.....	37
6.1.6	Boats with accommodation.....	37
6.1.7	Location and mounting.....	37
6.2	Fixed fire extinguishing system.....	37

6.2.1	General.....	37
6.2.2	Activation.....	38
6.2.3	Test facility	38
6.3	Inboard engine compartments.....	38
Section 7	Owner's manual.....	39
7.1	General.....	39
7.2	Contents.....	39
Appendix A	(informative) Method for calculating maximum load capacity	41
Appendix B	(normative) Method for determination of required volume of flotation material	44
Appendix C	(normative) Assessment of level flotation	49
Appendix D	(normative) Bilge pumping.....	52
Appendix E	(normative) Tests for weathertightness and watertightness.....	54
Appendix F	(normative) Test for confirmation of maximum power capacity	55
Appendix G	(informative) Guide to the selection of portable fire extinguishers	59
Appendix H	(informative) Information for use with the National Standard for the Australian Builders Plate for Recreational Boats.....	61
Appendix I	(informative) Example of calculating maximum power, load and persons capacity	63
Bibliography		65

NOTES

Australian Standard®

Small craft

Part 1: General requirements for power boats

Section 1 Scope and general

1.1 Scope

This Standard sets out requirements for maximum load, persons and power capacities, reserve buoyancy, stability, fire protection, and other safety aspects for powered craft up to 15 m in length used as recreational boats. It does not apply to boats used for commercial purposes or exclusively for racing, nor to canoes, kayaks, inflatable boats, rigid inflatable boats, yachts or auxiliary yachts.

1.2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document.

NOTE Documents referenced for informative purposes are listed in the Bibliography.

AS 4594.1, *Internal combustion engines—Performance, Part 1: Standard reference conditions, declarations of power, fuel and lubricating oil consumption and test methods*

AS 4594.3, *Internal combustion engines—Performance, Part 3: Engines for land, rail-traction and marine use—Test measurements*

AS/NZS 1850, *Portable fire extinguishers—Classification, rating and performance testing*

AS/NZS 2080, *Safety glazing for land vehicles*

AS/NZS 2906, *Fuel containers—Portable—Plastics and metal*

AS/NZS 5263.0, *Gas installations, Part 0: General requirements*

AS/NZS 5601.2, *Gas installations, Part 2: LP Gas installations in caravans and boats for non-propulsive purposes*

ISO 8665, *Small craft — Marine propulsion reciprocating internal combustion engines — Power measurements and declarations*

ISO 9094, *Small craft—Fire protection*

ISO 10087, *Small craft — Craft identification — Coding system*

ISO 11592-1, *Small craft — Determination of maximum propulsion power rating using manoeuvring speed — Part 1: Craft with a length of hull less than 8 m*

ISO 11592-2, *Small craft — Determination of maximum propulsion power rating using manoeuvring speed — Part 2: Craft with a length of hull between 8 m and 24 m*

ABYC H-08, *Buoyancy in the Event of Flooding/Swamping*

Australian Maritime Safety Authority. *National Standard for Commercial Vessels (NSCV)*

International Maritime Organisation. Resolution MSC.81(70), *Revised Recommendation On Testing Of Life-Saving Appliances*

Transport and Infrastructure Council. *National Standard for the Australian Builders Plate for Recreational Boats*

1.3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

1.3.1

aft reference area

that portion of the gunwale or deck the greater value of either 600 mm or $0.1 L_H$ forward of the moulded line of the stern or transom, measured at the gunwale or deck as appropriate

Note 1 to entry: L_H is the length of the boat, in metres.

1.3.2

ancillary equipment

portable or secured items of the boat's outfitting at a given point in time, such as ground tackle and safety equipment

1.3.3

auxiliary yacht

yacht fitted with any form of mechanical propulsion

1.3.4

basic flotation

flotation system that will keep a boat carrying its maximum load from sinking when swamped, assuming the occupants of the boat have left it and are in the water clinging to it

Note 1 to entry: With basic flotation, the swamped boat may float at any attitude.

1.3.5

beam

B

distance between the outermost permanently fixed parts of the hull measured horizontally at the widest point

Note 1 to entry: The beam of the hull excludes removable parts that can be detached in a non-destructive manner and without affecting the integrity of the craft, e.g. rubbing strakes, fenders, liferails and stanchions extending beyond the boat's side, and other similar equipment.

1.3.6

buoyancy

force that causes a boat to float, expressed in newtons

1.3.7

cabin sole

internal cabin deck

1.3.8

camber

athwartships curve of a boat's deck

1.3.9

calculation beam

widest part of the boat at each station measured at the static float plane, excluding rub rails, fenders or other extensions

1.3.10

calculation length

horizontal length from the most forward part of the boat below the static float plane to the vertical midpoint of the transom below the static float plane, expressed in metres

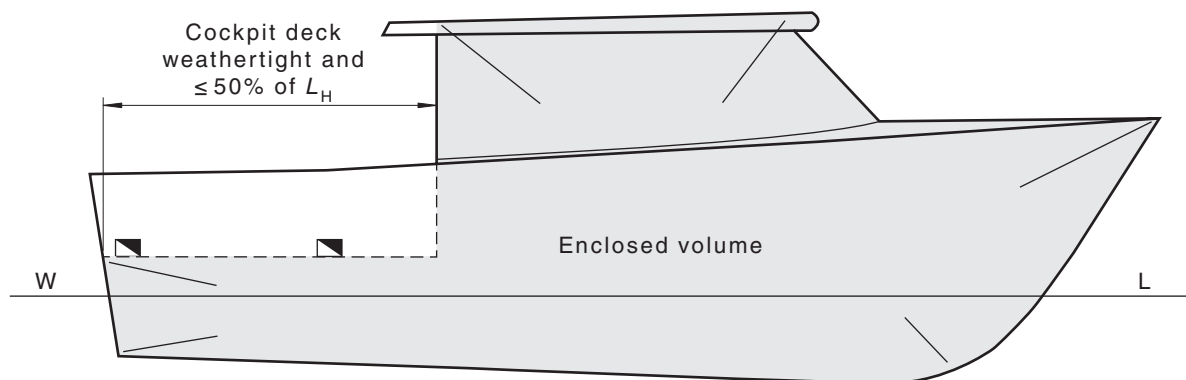
Note 1 to entry: See [Figure A.1](#) for an example of how calculation length is measured.

**1.3.11
cockpit**
exposed recess in the weather deck

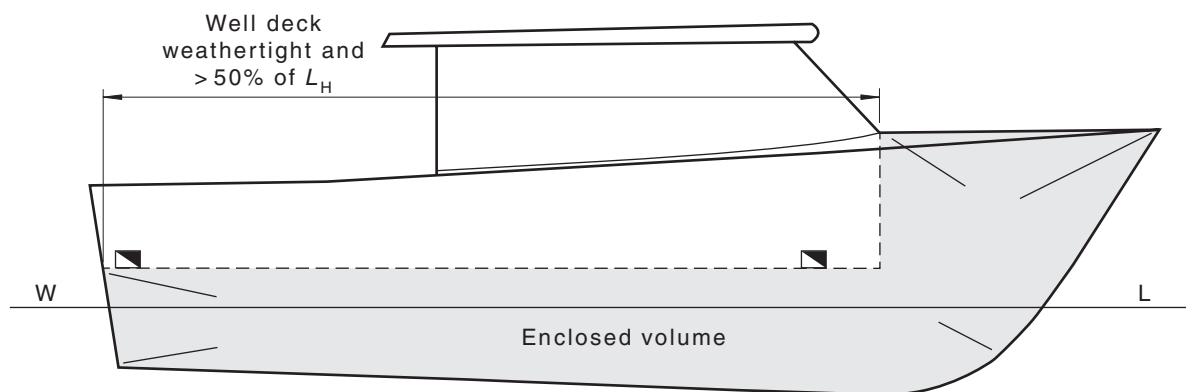
**1.3.12
cockpit deck**
weather deck in a cockpit

**1.3.13
cockpit boat**
boat having an exposed recess —

- (a) not within the forward 10 % of the length of the boat from the stem; and
- (b) extending not more than 50 % of the length of the boat (see [Figure 1.1](#))



(a) Example of cockpit boat



(b) Example of well deck boat

Figure 1.1 — Difference between cockpit and well deck boats

**1.3.14
deck**
area of a boat that may be walked upon

**1.3.15
drain**
pipe or tube from a deck or cockpit to drain water overboard

1.3.16**flotation material**

material with a density less than water, used to provide buoyancy when the boat is swamped

Note 1 to entry: The density of flotation material is expressed in kilograms per cubic metre.

1.3.17**forward reference area**

that portion of the gunwale or deck the greater value of either 600 mm or $0.1 L_H$ aft of the moulded line of the stem, measured at the gunwale or deck as appropriate (see [Figure C.1](#))

Note 1 to entry: L_H is the length of the boat, in metres.

1.3.18**freeboard**

minimum distance between the waterline and the weather deck at the maximum load capacity

1.3.19**freeing port**

any direct opening through a boat's bulwarks above the weather deck to rapidly drain water overboard

1.3.20**fully decked boat**

boat in which the horizontal projection of the sheer line comprises any combination of —

- (a) watertight deck and superstructure;
- (b) quick-draining recesses in accordance with [Clause 3.5](#); and
- (c) small watertight recesses in accordance with [Clause 3.5](#);

all closing appliances being watertight (see [Figure 1.2](#))

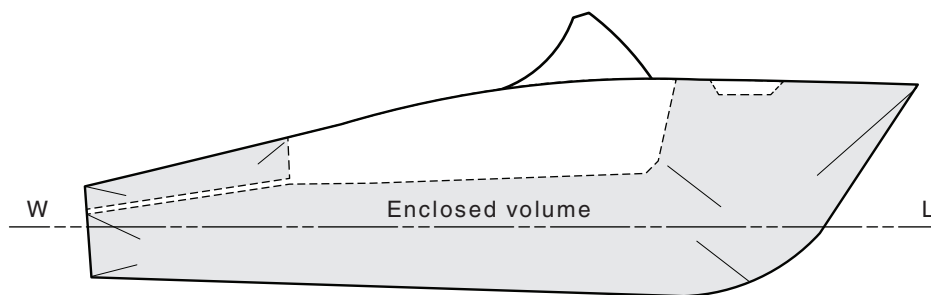


Figure 1.2 — Example of fully decked boat

1.3.22**gear**

personal equipment including clothing, provisions and water

Note 1 to entry: An allowance is made for personal gear (see [Section 2](#)).

1.3.23 length

L_H

overall length of the boat's hull, measured parallel to the waterline at maximum load capacity and including all structural and integral parts of the boat such as stems or sterns, bulwarks and hull/deck joints, but excluding any parts that can be detached in a non-destructive manner and without compromising the watertight structural integrity of the craft (see [Figure 1.3](#))

Note 1 to entry: Examples of parts that can be detached in a non-destructive manner include spars, bowsprits, pulpits at either end of the craft, bow rollers, stemhead fittings, rudders, outdrives, outboard motors and their mounting brackets and plates, diving platforms, boarding platforms, rubbing strakes, and fenders if they do not act as hydrostatic support when the craft is at rest or underway.

Note 2 to entry: This is intended to be equivalent to L_H as defined in ISO 8666. Where there is any doubt about the length of a particular boat, more detailed measurement advice can be found in ISO 8666.

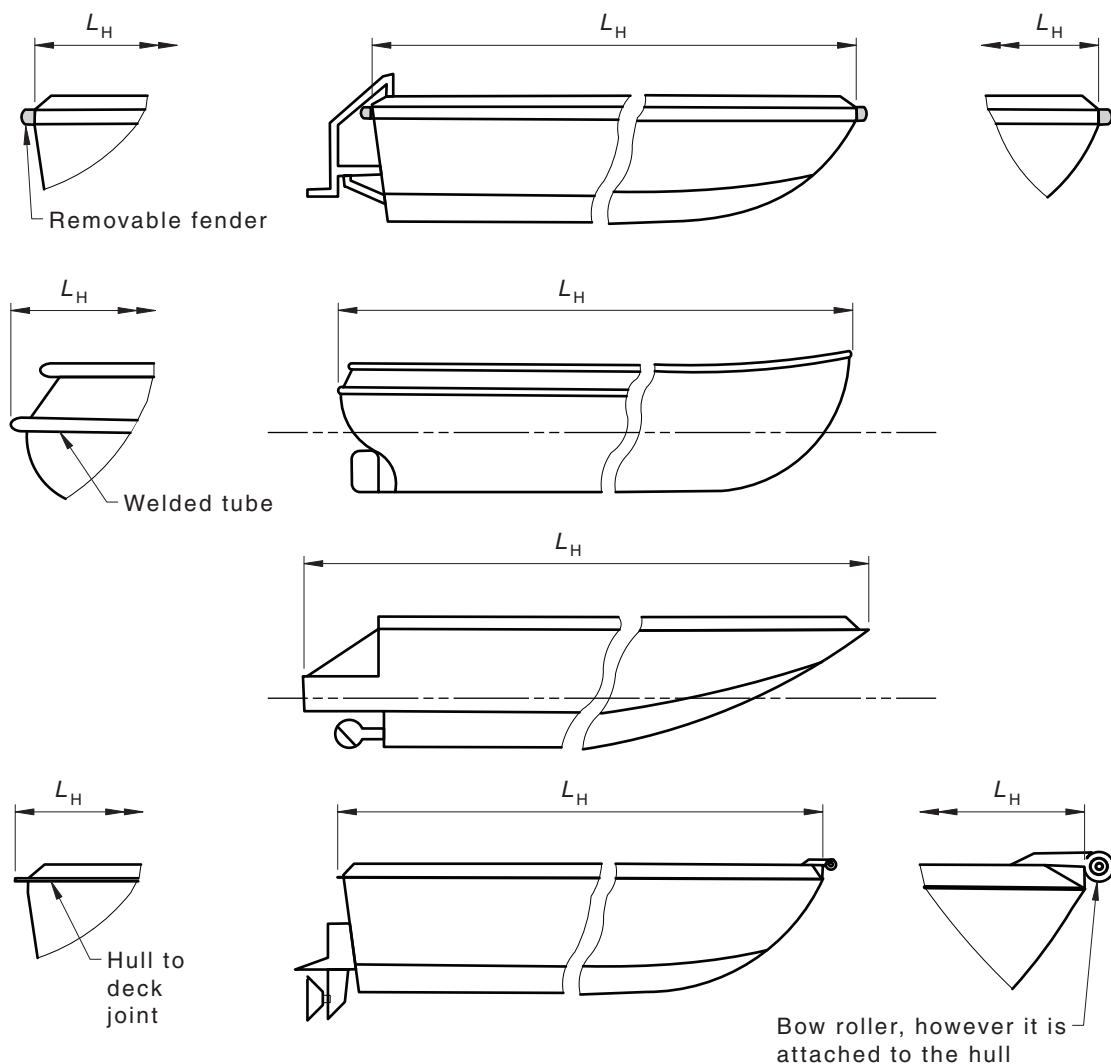


Figure 1.3 — Determination of hull length

1.3.24 level flotation

flotation system that will keep a boat carrying its maximum load from sinking when swamped, assuming the occupants remain within the boat and supported by the flotation system

Note 1 to entry: Level flotation implies that the swamped boat will float level and not capsize in calm water, but level flotation does not imply a self-righting capacity.

1.3.25**maximum load capacity**

<*inboard installations*> maximum mass, including accessories, ancillary equipment, persons and gear that the boat is designed to carry, expressed in kilograms

Note 1 to entry: Ancillary equipment may include options, such as winches, trolling motors, trolling motor batteries and jacking plates.

<*outboard installations*> maximum mass, including motor, accessories and portable fuel tanks, ancillary equipment, persons and personal gear that the boat is designed to carry, expressed in kilograms

Note 2 to entry: Ancillary equipment may include options, such as winches, trolling motors, trolling motor batteries and jacking plates.

1.3.26**maximum persons capacity**

C

maximum load of persons, expressed as the number of average size adults, that the boat is designed to carry

1.3.27**maximum power capacity**

power rating of the largest outboard motor suitable for use with the boat, expressed in kilowatts or horsepower

1.3.28**may**

indicates the existence of an option

1.3.29**mid-length****amidships**

mid-point of the boat's length

1.3.30**open boat**

boat not protected from the entry of water by means of a complete weather deck or a partial weather deck and a weathertight or watertight cabin, such that the deck, cockpit or well bottom is open to the bilge and cannot drain overboard

1.3.31**open waters**

bodies of water other than protected waters

1.3.32**outboard motor**

self-contained propulsion unit, usually mounted over the stern of a boat

1.3.33**power boat**

mechanically powered boat

1.3.34**protected waters**

lakes, rivers, bays, estuaries and similar bodies of water protected from the full force of the weather in most prevailing weather conditions

1.3.35**reserve buoyancy**

force that causes a boat to float when swamped, expressed in newtons

1.3.36**self-draining cockpit**

cockpit that is watertight to the hull interior and drains overboard through drains or freeing ports

1.3.37**shall**

indicates that a statement is mandatory

1.3.38**sheer**

topmost line in a boat's side that intersects the vertical centreline of the boat at the forward end and the transom (or stern) at the aft end, and is defined by the series of points of contact with the boat structure when straight lines at 45 degree angles to the horizontal, and in a plane normal to the outside edge of the boat as seen from above, are brought into contact with the outside of the horizontal boat, as shown in [Figure 1.4](#)

Note 1 to entry: For the purposes of this definition, a boat is horizontal when it is transversely level and when the lowest points at 40 % and 75 % of boat's length behind the forward-most point of the boat are level.

Note 2 to entry: For the purposes of this definition, a swim platform is not considered to be the transom of the boat.

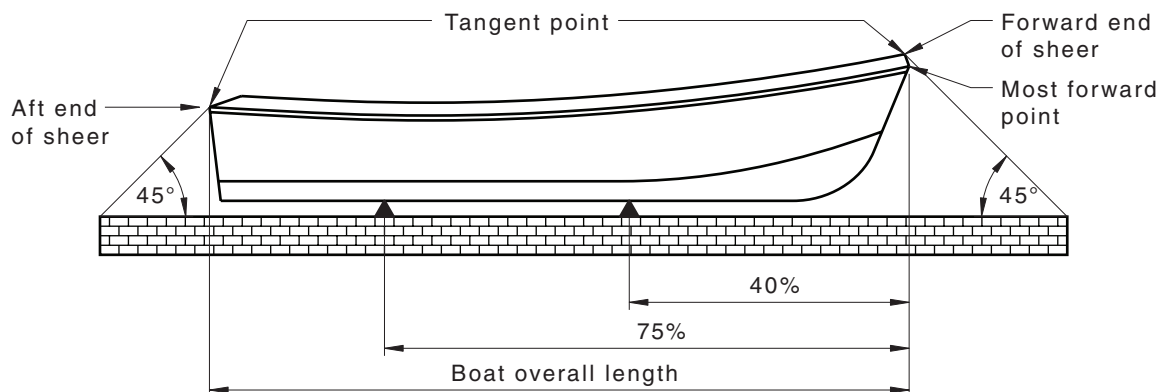


Figure 1.4 — Determining sheer location

1.3.39**should**

indicates a recommendation

1.3.40**static float plane**

plane below the most forward point of the boat and through which the maximum displacement of the boat exists without water coming aboard, when all openings, such as drains, scuppers or centreboard trunks are considered sealed (see [Figure 1.5](#))

Note 1 to entry: The static float plane may be located at or below the sheer line as long as it is equidistant above or below the forward end of the sheer and the aft end of the sheer (see [Figure 1.6](#)).

Note 2 to entry: Scuppers, freeing ports, drains, overboard discharge and centreboard trunk openings may be located below the static float plane, and not considered as points where water can come aboard a cockpit or well-deck boat.

Note 3 to entry: Ventilation openings may become points of major leakage.

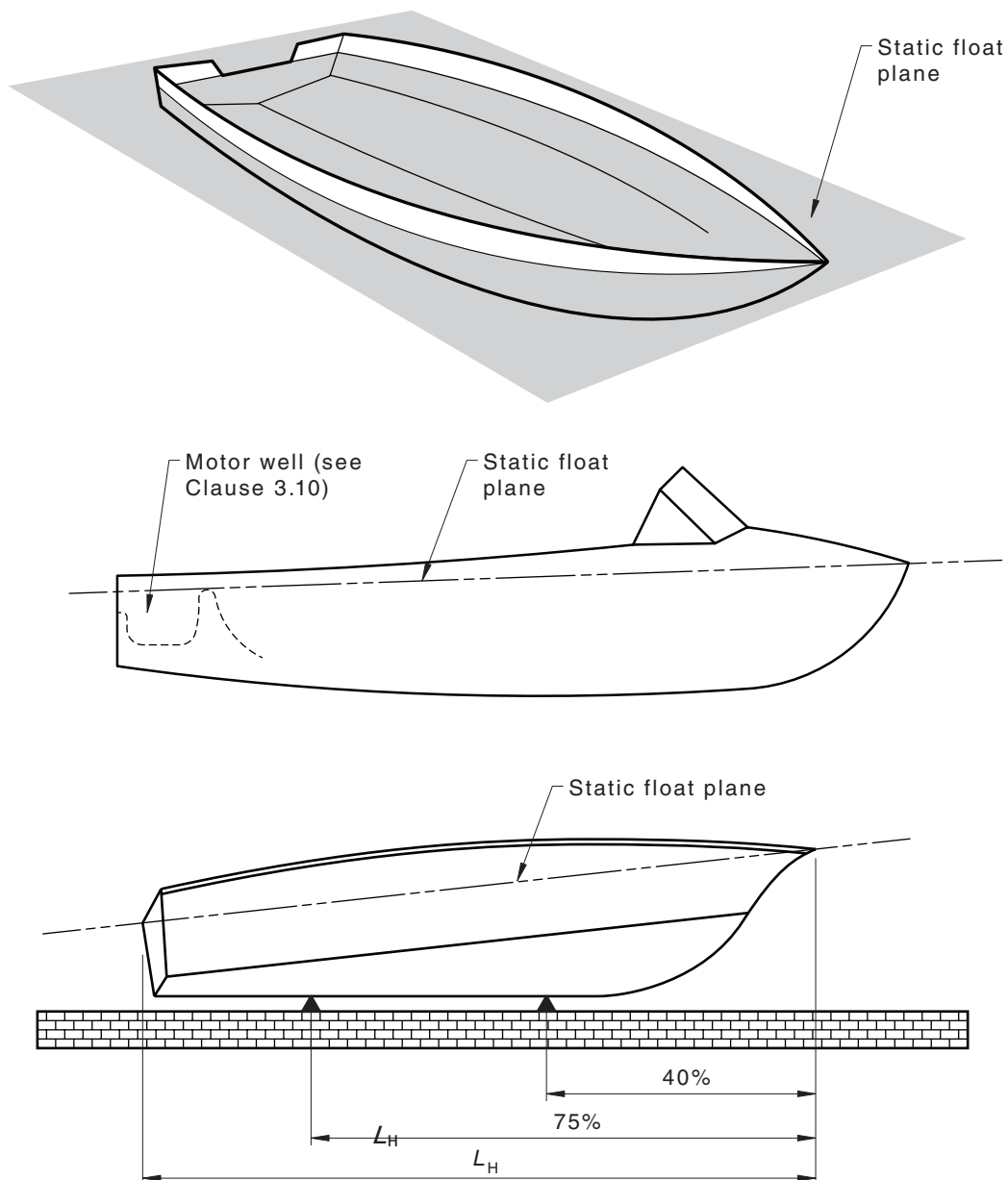


Figure 1.5 — Static float plane

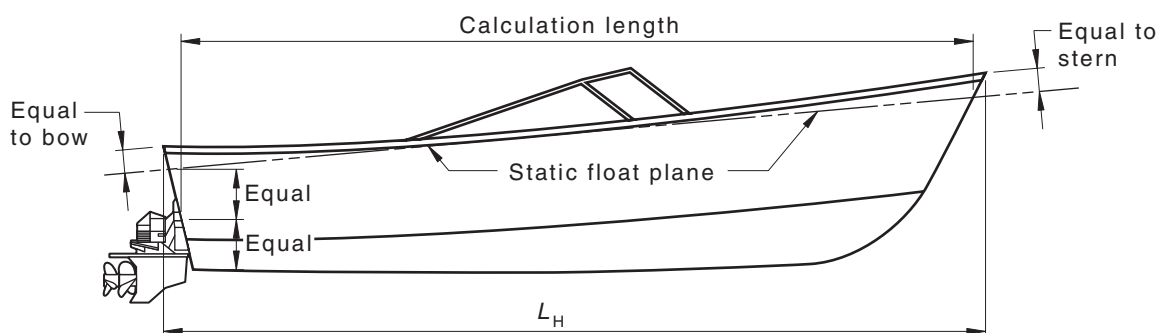


Figure 1.6 — Static float plane — Alternative

1.3.41**stability**

ability of the boat to return to its normal attitude

1.3.42**superstructure**

housing located above and attached structurally to weather decks, e.g. cabin sides, ends and tops

1.3.43**total persons mass**

maximum total body mass of persons that the boat is designed to carry, expressed in kilograms

Note 1 to entry: The total persons mass does not include ancillary equipment and personal gear.

Note 2 to entry: The total persons mass allows for the maximum number of persons that can be carried on board to be determined based on the actual body mass of each individual, rather than relying on an average adult body mass.

1.3.44**transom height**

vertical distance measured at the centreline of the boat from the top of the transom to a line representing a longitudinal extension of the boat's bottom surface, excluding keels (see [Figure 1.7](#))

1.3.45**watertight**

constructed to provide effective protection against water seepage when closed and exposed to continuous driving rain or waves

Note 1 to entry: See [Appendix E](#) for a test for watertightness.

1.3.46**weather deck**

uppermost continuous deck exposed to the weather or, if the boat is not fully decked, the uppermost partial deck exposed to the weather

Note 1 to entry: In a typical cabin cruiser, weather decks would be the bow, side and stern decks. Trunk cabin roofs should be considered weather decks on boats designed for off-shore service.

1.3.47**weathertight**

constructed to provide effective protection against water seepage when closed and exposed to ordinary rain or spray

Note 1 to entry: See [Appendix E](#) for a test for weathertightness

1.3.48**well deck boat**

boat having an exposed recess, which extends for more than 50 % of the length of the boat (see [Figure 1.1](#))

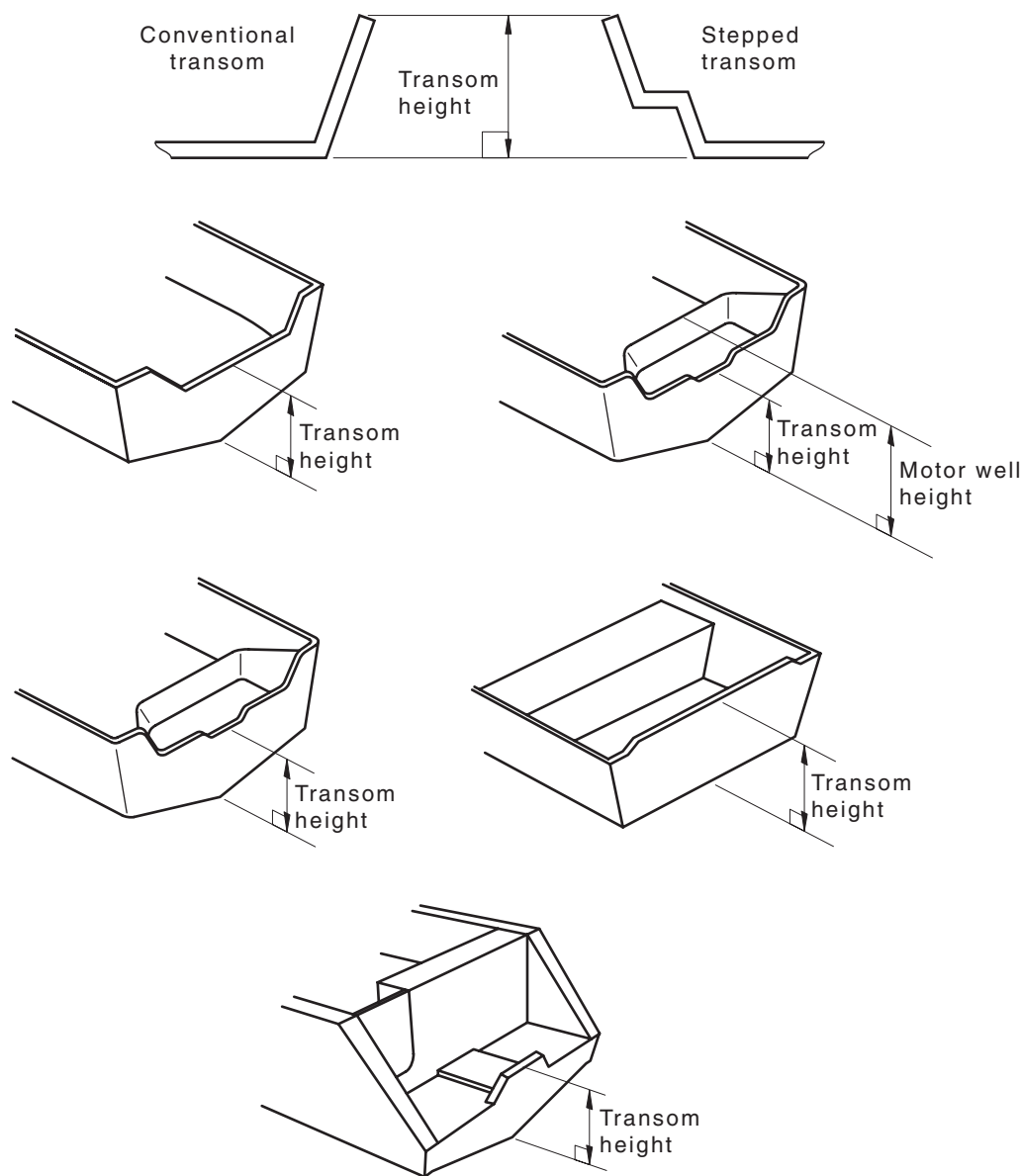


Figure 1.7 — Measuring transom height

1.3.49
yacht
boat designed primarily for sailing

1.4 Symbols and abbreviated terms

For the purpose of this document, the following symbols are used to represent the quantities indicated.

Symbol	Quantity
A	lateral area of the boat above the waterline, including all bridges, flying bridges and masts, in square metres
B	distance between the outer sides of the hull measured horizontally at the widest point, in metres
b	height of bulwark or depth of cockpit, in metres
C	maximum persons capacity, expressed as a whole number
D	(1 000 — density of flotation material to be used), in kilograms per cubic metre

Symbol	Quantity
F	volume of flotation material or air chambers required for basic flotation, in cubic metres
F_a	volume of flotation material to be placed in the aft 30 % of the boat, in cubic metres
F_f	volume of flotation material to be placed in the forward 30 % of the boat, in cubic metres
F_s	volume of flotation material to be placed at the sides of the boat, in cubic metres
f	freeboard when upright, in metres
G	submerged weight of the engine and related equipment, in kilograms
H_p	passenger heeling moment, in newton metres
H_w	wind heeling moment, in newton metres
h	vertical distance from the centre of lateral area of the boat above the waterline to the centre of lateral area of the boat below the waterline, in metres
k	conversion factor for construction material density
L_H	length of boat, in metres
L_C	calculation length, in metres
M_A	dry mass of factory installed equipment, hardware and accessories, in kilograms
M_B outboard installations	mass of boat (including installed fuel tanks and fuel, but excluding engine, controls and portable fuel tanks), in kilograms
M_B inboard installations	mass of boat (excluding engine, installed fuel tanks and fuel), in kilograms
M_C	maximum load capacity, in kilograms
M_D	dry mass of deck, in kilograms
M_E	mass of engine, installed fuel tanks and fuel, in kilograms
M_G	gross load capacity, in kilograms
M_H	dry mass of hull, in kilograms
M_O	mass of outboard motor and controls, in kilograms
M_P	total persons mass, in kilograms
M_R	dry mass of superstructure, in kilograms
M_S	submerged weight of the boat, in kilograms
M_T	total weight that has to be supported by the buoyancy material, in kilograms
P	wind pressure, in pascals
Q	combined volume of all non-quick-draining watertight recesses, in cubic metres
R	area of freeing ports, in square metres
S_b	maximum breadth of space in the boat that is accessible to occupants, in metres
S_l	length of cockpit, in metres
T	nominal transom width, in metres
t	allowable time to drain a quick draining recess on a fully decked boat, in minutes
V_C	volume of cockpit, in cubic metres
V_{hull}	hull volume, in cubic metres
W	dry mass of steel weights used in testing, in kilograms

1.5 Marking

1.5.1 Boat capacities

1.5.1.1 Capacity plate

Boats shall be fitted with a capacity plate that identifies the maximum power capacity, the maximum load capacity, the maximum persons capacity and the total persons mass. An Australian Builders Plate (ABP) conforming to the *National Standard for the Australian Builders Plate for Recreational Boats* shall be deemed to satisfy this requirement. The maximum power capacity, the maximum load capacity, the maximum persons capacity and the total persons mass of persons shown on the plate shall not be greater than that determined in accordance with this Standard.

NOTE 1 Requirements for the Australian Builders Plate are outlined in the *National Standard for the Australian Builders Plate for Recreational Boats*. See [Appendix H](#) for more details.

NOTE 2 The manufacturer may nominate a lower maximum load and persons capacity than the value calculated in accordance with [Sections 2](#) and [5](#), as appropriate. This reduction may be desirable for a range of reasons, such as limitations on seating and accommodation or a decision that it would be prudent not to approach the boat's limits. A similar situation would apply with outboard boats and the nominated maximum power capacity.

NOTE 3 An example of how the information to go onto the capacity plate may be calculated is given in [Appendix I](#).

1.5.1.2 Plates restricting numbers of persons in particular places

In addition to the capacity plate, boats incorporating flying bridges and other features that could affect the stability of the boat shall carry a plate restricting the number of persons on each such deck or place.

NOTE These restrictions may be taken into account when performing the heeling test set out in [Clause 5.3](#).

1.5.2 Open waters loading advice

If a boat's maximum persons capacity has not been assessed for open waters in accordance with [Clause 5.3](#), the boat shall display the warning shown in [Figure 1.8](#) in a prominent position, near the capacity plate:

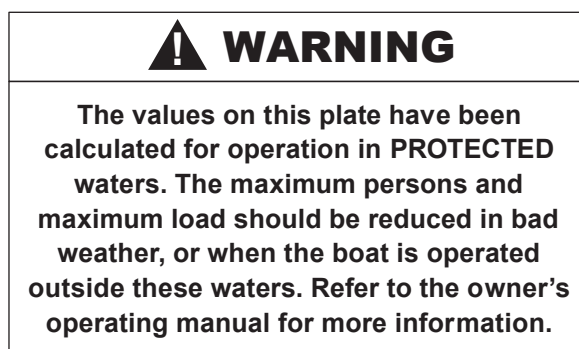


Figure 1.8 — Open waters warning

1.5.3 Hull identification

The hull shall be marked with a unique identification number in accordance with ISO 10087.

NOTE Details of the system used in Australia to uniquely identify boats are available from State Marine Authorities.

1.6 ISO relationship

Where reference is made to ISO standards in AS 1799.1 (this Standard), requirements applying to recreational boats operating in protected waters shall be considered as indicating ISO Design Category C *Inshore*. Requirements applying to recreational boats operating in open waters shall be considered as indicating ISO Design Category B *Offshore*.

Section 2 Maximum capacities and buoyancy

2.1 Maximum load capacity for boats less than 6 m in length for protected waters

2.1.1 General

The maximum load capacity (M_C) shall be determined in accordance with [Clause 2.1.2](#) or [2.1.3](#) for boats less than 6 m in length operating in protected waters.

NOTE 1 There may be occasions where the boat will be required to carry a load other than passengers (e.g. a tender carrying supplies from shore to a larger vessel on a mooring), or an ancillary motor may be carried (e.g. a trolling motor); and for these reasons, the maximum load capacity of the boat is the key consideration.

NOTE 2 The maximum load capacity determined in accordance with [Clause 2.1](#) is for protected waters only and makes no allowance for stability considerations or prevailing conditions.

NOTE 3 The loading requirements for boats 6 m or more in length, and boats operating in open waters, are set out in [Clauses 5.3](#) and [5.4](#).

2.1.2 Outboard installations

The maximum load capacity for boats less than 6 m in length shall be calculated in kilograms. It shall be determined by calculating or measuring the cubic capacity below the static float plane, converting this volume to the mass of water it would displace, subtracting the mass of the boat, including the filled mass of any installed fuel tanks, and allowing 1 kg of load capacity for each 5 kg of remaining displacement.

For boats with a maximum power capacity not greater than 1.5 kW (2 HP), an allowance of 1 kg of load capacity for each 3 kg of remaining displacement may be used.

The cubic capacity of the boat below the static float plane may be obtained by using any one of the following methods:

- (a) Calculation using 3D design software.
- (b) Calculation using 3D scanning tools.
- (c) Calculation based on a series of physical measurements, using a method such as the one set out in [Appendix A](#).
- (d) Direct physical measurement using any method that does not overstate the actual cubic capacity, e.g. by filling the hull with water.
- (e) Any equivalent method of calculation or measurement.

2.1.3 Inboard installations

The maximum load capacity for boats less than 6 m in length shall be calculated in kilograms. It shall be determined by calculating or measuring the cubic capacity of the boat below the static float plane, converting this volume to the mass of water it would displace, subtracting the mass of the boat, excluding the mass of the engine, installed fuel tanks and fuel contained therein, allowing 1 kg of boat load capacity for each 5 kg of remaining displacement, and finally subtracting both the mass of the engine and the filled mass of any installed fuel tanks to obtain the maximum load capacity.

The cubic capacity of the boat below the static float plane may be obtained by using any one of the following methods:

- (a) Calculation using 3D design software.
- (b) Calculation using 3D scanning tools.

- (c) Calculation based on a series of physical measurements, using a method such as the one set out in [Appendix A](#).
- (d) Direct physical measurement using any method that does not overstate the actual cubic capacity, e.g. by filling the hull with water.
- (e) Any equivalent method of calculation or measurement.

2.2 Maximum persons capacity for protected waters

2.2.1 General

The maximum persons capacity (C) shall be stated on the capacity plate and provides a quick guide to the number of adults that can be safely carried when operating in protected waters. In addition, the maximum total mass of persons for the boat shall be stated on the capacity plate, derived by multiplying C by 80 kg.

The maximum persons capacity is based on adult passengers of a specified mass and it should therefore be treated with some caution. Where children or other passengers who do not correspond to the 80 kg body mass are carried, the maximum total mass of persons should be used as the indicator of how many people can be safely carried.

The maximum persons capacity for protected waters shall be determined as follows:

- (a) For boats less than 6 m in length, by using the method set out in [Clause 2.2.2](#) or [Clause 2.2.3](#) with reduction in capacity, if necessary, to conform to the protected waters stability requirements in [Clause 5.2](#) or [Clause 5.4](#).
- (b) For boats 6 m or more in length, by estimating the persons capacity and modifying this value, as necessary, to conform to the protected waters stability requirements of [Clause 5.3](#) or [Clause 5.4](#).

NOTE 1 The maximum persons capacity is calculated based on an allowance of 80 kg for the body mass of each adult with an additional allowance of 10 kg per person for ancillary equipment and personal gear.

NOTE 2 The total mass of persons is calculated on body mass only, on the basis that those on board will be able to easily relate to this figure. The allowance for ancillary equipment and personal gear includes communal resources, such as a drinks cooler, and is assumed to remain roughly constant for a given size of boat, regardless of whether adults or children are on board.

2.2.2 Outboard installations

The maximum persons capacity shall be determined by the following method:

- (a) Take the maximum load capacity and subtract the assumed mass, obtained from Column 2 of [Table 2.1](#), of the largest outboard motor (including controls) for which the boat is rated, and the mass of batteries, obtained from Column 3 of [Table 2.1](#). For boats without installed fuel tanks, also subtract the mass of the portable fuel tank and fuel as shown in Column 4 of [Table 2.1](#).
- (b) Divide the result by 90 kg, and take the lower whole number, thus obtaining the maximum number of average size adults, including the allowance for their ancillary equipment and personal gear.

NOTE The largest outboard motor for which the boat is rated refers to the maximum power capacity as nominated on the capacity plate.