



RULES
PUBLICATION 91/P

INLAND WATERWAYS PASSENGER SAILING VESSELS

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Publications P (Additional Rule Requirements) issued by Polski Rejestr Statków complete or extend the Rules and are mandatory where applicable.

GDAŃSK

Publication 91/P – Inland Waterways Passenger Sailing Vessels – May 2010 is an extension of the requirements contained in *Part I – Classification Regulations of the Rules for the Classification and Construction of Inland Waterways Vessels*, as well as in all other PRS Rules, in which reference to the Publication has been made.

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1 GENERAL

1.1 Application

1.1.1 *Publication 91/P – Inland Waterways Passenger Sailing Vessels* applies to inland waterways passenger sailing vessels. The inland waterways passenger sailing vessel is a day-trip or cabin vessel constructed and equipped to carry more than 12 passengers, intended solely or mainly for navigation on inland waterways, built and fitted out also with a view to propulsion under sail.

1.2 Definitions

Definitions concerning general terminology applied in the *Publication* are included in the *Rules for the Classification and Construction of Inland Waterways Vessels, Part I – Classification Regulations*. The present *Publication* introduces additional definitions applying to ships hull.

- .1 *Day-trip vessel* – a passenger vessel without overnight passenger cabins.
- .2 *Cabin vessel* – a passenger vessel with overnight passenger cabins.
- .3 *Residual safety clearance* – the vertical clearance available in the event of the vessel's heeling over, between the water level and the lowest point of the immersed side, beyond which the vessel is no longer regarded as watertight.
- .4 *Residual freeboard* – the vertical clearance available, in the event of the vessel heeling over, between the water level and the upper surface of the deck at the lowest point of the immersed side or, if there is no deck, the lowest point of the upper surface of the fixed ship's side.
- .5 *Length overall, L_{oa}* – the maximum length of the craft in [m], including all fixed installations such as parts of the steering system or power plant, mechanical or similar devices.
- .6 *Length of waterline, L_{WL}* – the length of the hull in [m], measured at the maximum draught.
- .7 *Waterplane of maximum draught* – the waterplane corresponding to the maximum draught at which the craft is authorised to navigate.

1.3 Survey and Classification

1.3.1 Beside of the documentation required in the each Part of the Rules, the following documentation shall be submitted to PRS Head Office for consideration and approval within the scope of mast and sailing equipment (3 copies of the documentation):

- sail plan indicating centres of effort of sail area and centre of lateral resistance;
- masting and standing rigging plan indicating rigging fittings;
- drawing of masts with their fittings;
- drawings of spreaders, booms and other spars;
- masting and rigging calculations;
- drawings of masts, stays and side chainplates attachment to the hull construction.

2 HULL

2.1 General

2.1.1 The inland waterways passenger sailing vessel shall fulfil the requirements specified in the *Rules for the Classification and Construction of Inland Waterways Vessels, Part II –Hull*.

3 HULL EQUIPMENT

3.1 General

3.1.1 The inland waterways passenger sailing vessel shall fulfil the requirements specified in the *Rules for the Classification and Construction of Inland Waterways Vessels, Part III – Hull Equipment*.

3.1.2 For passenger sailing vessels having an $L_{WL} \leq 45$ m and a maximum permissible number of passengers¹ not exceeding L_{WL} in whole metres, the following points shall apply:

- .1 The anchors can wholly or partly protrude beyond the side plating under condition, that they are placed in the hawsepipe.
- .2 Vessels shall be equipped with a boarding gangway at least 0.4 m wide whose side edges are defined by a brightly-coloured strip. The gangway shall be equipped with a handrail.

3.1.3 By way of derogation the steering system as a whole shall be designed for permanent lists of up to 20° and ambient temperatures from -20°C to +50°C.

3.1.4 By way of derogation the inspection body may, in the case of passenger sailing vessels not more than 25 m long, authorise:

- the connecting corridors shall have a clear width less than 0.8 m; however the clear width shall be at least 0.6 m;
- the stairs and their landings in the passenger areas shall have a clear width less than 0.8 m; however the clear width shall be at least 0.6 m.

3.1.5 By the way of derogation the inspection body may, in specific cases, where this is necessary for controlling the sails, authorise the use of removable guard rails in parts of the deck intended for passengers.

3.1.6 If there is possibility of the propeller idling while the vessel is under sail, any endangered parts of the propulsion system shall be protected against potential damage.

3.1.7 The passenger vessels with a length not exceeding 45 m and authorised to carry at most a number of passengers corresponding to the length of the vessel in meters are allowed to have on board, in the passenger area, a manually controlled bulkhead door without remote control in the bulkheads, which are taken into account in the damage stability calculation, in case, where the lower edge of the door opening may be reduced to 0.2 m above the floor of the passenger area. Once opened, the door shall close and lock automatically.

3.2 Masts

3.2.1 Rigging

- .1 The parts of the rigging shall be arranged in such way as to prevent un-acceptable chafing.
- .2 If a material other than wood is used or if special types of rigging are used, such a design shall guarantee equivalent levels of safety with the dimensions and strength values laid down in this Chapter. As evidence of the strength:
 - a) a strength calculation shall be carried out, or

¹ By way of derogation the number of passengers may be raised to 1.5 times the L_{WL} in whole meters if sails, rigging and deck fittings so permit

- b) confirmation of sufficient strength shall be obtained from an approved classification society, or
- c) dimensioning shall be based on the procedures set out in a recognised regulatory framework (e.g. Middendorf, Kusk-Jensen).

The evidence shall be presented to the inspection body.

3.2.2 Masts and Spars – General

- .1 All spars shall be made of high-quality material.
- .2 Wood for masts shall:
 - a) be free of knot concentrations,
 - b) be free of sapwood within the required dimensions,
 - c) as far as possible be straight-grained,
 - d) contain as little as possible twisted growth.
- .3 If the chosen timber is either pitch pine or Oregon pine of quality level “clear and better”, the diameters in the tables 3.2.3 ÷ 3.2.8 can be reduced by 5%.
- .4 If the timbers used for masts, topmasts, yardarms, booms and bowsprits are not round in cross-section, such timbers must be of equivalent strength.
- .5 Mast pedestals, mast trunks and fastenings on deck, on floor-plates and on stem or stern shall be constructed in such a way that they can either absorb the forces they are subjected to or transfer them to the other connected parts of the structure.
- .6 Depending on the stability of the vessel and the external forces it is subjected to and also the distribution of the available sail area, the inspection body may, on the basis of the dimensions laid down in paragraphs 3.2.3 ÷ 3.2.8, allow reductions in the cross-sections of the spars and, where appropriate, of the rigging. Evidence shall be submitted in accordance with paragraph 3.2.1.2.
- .7 If the vessel’s period of oscillation /period of roll, in seconds, is less than three quarters of its breadth, in meters, the dimensions set out in paragraphs 3.2.3 ÷ 3.2.8 shall be increased. Evidence shall be submitted in accordance with paragraph 3.2.1.2.
- .8 In the tables 3.2.3 ÷ 3.2.8 and 3.2.10, possible intermediate values shall be interpolated.

3.2.3 Masts – Special Requirements

- .1 Wooden masts shall meet the following minimum requirements (see table 3.2.3):

Table 3.2.3

Length (*) [m]	Diameter on deck [cm]	Diameter on the cross-tree [cm]	Diameter on the mast cap [cm]
10	20	17	15
11	22	17	15
12	24	19	17
13	26	21	18
14	28	23	19
15	30	25	21
16	32	26	22
17	34	28	23
18	36	29	24
19	39	31	25

Length (*) [m]	Diameter on deck [cm]	Diameter on the cross-tree [cm]	Diameter on the mast cap [cm]
20	41	33	26
21	43	34	28
22	44	35	29
23	46	37	30
24	49	39	32
25	51	41	33

(*) Distance from the cross-tree to the deck

- .2 If a mast has two yards, the diameters shall be increased by at least 10%.
- .3 If a mast has more than two yards, the diameters shall be increased by at least 15%.
- .4 In the case of masts fitted through the deck, the diameter at the mast foot shall be at least 75% of the diameter of the mast at deck level.
- .5 Mast fittings, mast bands, cross-trees and mast caps shall be sufficiently strongly dimensioned and attached.

3.2.4 Topmasts – Special Requirements

- .1 Wooden topmasts shall meet the following minimum requirements (see table 3.2.4):

Table 3.2.4

Length (*) [m]	Diameter at the foot [cm]	Half-length diameter [cm]	Diameter at fitting (**) [cm]
4	8	7	6
5	10	9	7
6	13	11	8
7	14	13	10
8	16	15	11
9	18	16	13
10	20	18	15
11	23	20	16
12	25	22	17
13	26	24	18
14	28	25	20
15	31	27	21

(*) Total length of the topmast, without the masthead
(**) Diameter of the topmast at the level of the masthead fitting

- .2 If square sails are attached to a topmast, the dimensions set out in the table shall be increased by 10%.
- .3 The overlap between the topmast and the mast shall be at least 10 times the required foot diameter of the topmast.

3.2.5 Bowsprits – Special Requirements

- .1 Wooden bowsprits shall meet the following minimum requirements (see table 3.2.5):

Table 3.2.5

Length (*) [m]	Diameter at stem [cm]	Half-length diameter [cm]
4	14.5	12.5
5	18	16
6	22	19
7	25	23
8	29	25
9	32	29
10	36	32
11	39	35
12	43	39
(*) Total length of the bowsprit		

- .2 The inboard section of the bowsprit shall have a length of at least four times the diameter of the bowsprit at the stem.
.3 The diameter of the bowsprit at its head shall be at least 60% of the diameter of the bowsprit at the stem.

3.2.6 Jib-Booms – Special Requirements

- .1 Wooden jib-booms shall meet the following requirements (see table 3.2.6):

Table 3.2.6

Length (*) [m]	2	3	4	5	6	7	8	9	10
Diameter at the stem [cm]	7	10	14	17	21	24	28	31	35
(*) Total length of the jib-boom									

- .2 The diameter of the jib-boom at its head shall be at least 60% of the diameter at the stem.

3.2.7 Main Booms – Special Requirements

- .1 Wooden main booms shall meet the following minimum requirements (see table 3.2.7):

Table 3.2.7

Length (*) [m]	5	6	7	8	9	10	11	12	13	14	15	16
Diameter [cm]	14	15	16	17	18	20	21	23	24	25	26	27
(*) Total length of the main boom												

- .2 The diameter at the swivel pin shall be at least 72% of the diameter specified in the table 3.2.7.
.3 The diameter at the clew shall be at least 85% of the diameter specified in table 3.2.7.
.4 Measured from the mast, the greatest diameter shall be at two thirds of the length.
.5 Where:
a) there is an angle of less than 65° between the main boom and the after leech and the main sheet is attached to the end of the boom, or

- b) the attachment point of the sheet is not abreast of the clew, the inspection body may, according to paragraph 3.2.1.2, require a greater diameter.
- .6 For sail areas of less than 50 m², the inspection body may authorise reductions in the dimensions set out in the table 3.2.7.

3.2.8 Gaffs – Special Requirements

- .1 Wooden gaffs shall meet the following minimum requirements (see table 3.2.8):

Table 3.2.8

Length (*) [m]	4	5	6	7	8	9	10
Diameter [cm]	10	12	14	16	17	18	20
(*) Total length of the gaff							

- .2 The unsupported length of the gaff shall be not more than 75%.
- .3 The breaking strength of the crowfoot shall be at least equal to 1.2 times the breaking strength of the peak halyard.
- .4 The top angle of the crowfoot shall be a maximum of 60°.
- .5 If, by way of derogation from paragraph 3.2.8.4, the top angle of the crowfoot is greater than 60°, the tensile strength shall be adjusted to accommodate the forces that will then occur.
- .6 For sail areas less than 50 m², the inspection body may authorise reductions in the dimensions set out in the table 3.2.8.

3.2.9 Standing and Running Rigging – General

- .1 Standing and running rigging shall comply with the strength requirements set out in paragraphs 3.2.10 and 3.2.11.
- .2 Wire cable connections may take the form of:
- splicings,
 - compression sleeves, or
 - sealing sleeves.
- Splicings shall be marled and ends shall be whipped.
- .3 Eye splices shall be provided with thimbles.
- .4 Ropes shall be routed in such a way as not to obstruct entrances and companionways.

3.2.10 Standing Rigging – Special Requirements

- .1 Forestays and shrouds shall meet the following minimum requirements (see table 3.2.10-1):

Table 3.2.10-1

Mast length (*) [m]	11	12	13	14	15	16	17	18
Tensile strength of the forestay [kN]	160	172	185	200	220	244	269	294
Tensile strength of the shrouds [kN]	355	415	450	485	525	540	630	720
Number of shroud cables and ropes per side	3	3	3	3	3	3	4	4
(*) Distance from the top or cross-tree to the deck								

- .2 Backstays, topmasts, flying jib-stays and bowsprit shrouds shall meet the following minimum requirements (see table 3.2.10-2):

Table 3.2.10-2

Mast length (*) [m]	< 13	13 – 18	> 18
Tensile strength of the backstay [kN]	89	119	159
Tensile strength of the topmast [kN]	89	119	159
Length of topmast [m]	< 6	6 – 8	> 8
Tensile strength of the flying jib-stay [kN]	58	89	119
Length of the jib-boom [m]	< 5	5 – 7	> 7
Tensile strength of the bow sprit shrouds [kN]	58	89	119
(*) Distance from the top or cross-tree to the deck			

- .3 The preferred rope design shall be based on Rope Construction Method $6 \times 7 + A_0$ in the strength class 1550 N/mm^2 . Alternatively, at the same strength class, Construction Method $T6 \times 37 + A_0$ or $T6 \times 19 + A_0$ may be used. Because of the higher elasticity of Construction Method 6×19 , the tensile strengths given in the table 3.2.10-2 shall be increased by 10%. Use of a different rope design shall be permitted provided it has comparable properties.
- .4 If rigging is used, the tensile strengths shown in the table 3.2.10-2 shall be increased by 30%.
- .5 For rigging, only approved forks, round eyes and bolts may be used.
- .6 Bolts, forks, round eyes and turnbuckles shall be capable of being properly secured.
- .7 The tensile strength of the bobstay shall be at least 1.2 times the tensile strength of the respective jib-stay and flying jib-stay.
- .8 For vessels with less than 30 m^3 water displacement, the inspection body may permit the reductions in tensile strengths shown in the table 3.2.10-3:

Table 3.2.10-3

Water displacement divided by the number of masts [m^3]	Reduction [%]
> 20 to 30	20
10 to 20	35
< 10	60

3.2.11 Running rigging – special requirements

- .1 For running rigging, fibre ropes or steel wire ropes shall be used. The minimum tensile strength and the diameter for running rigging shall, in relation to the sail area, meet the following minimum requirements (see table 3.2.11):

Table 3.2.11

Type of running rigging	Rope material	Sail area [m^2]	Minimum tensile strength [kN]	Diameter of rope [mm]
Staysail halyards	Steel wire	Up to 35	20	6
		> 35	38	8
	Fibre (polypropylene – PP)	Rope diameter of at least 14 mm and one rope sheave for every 25 m^2 or part thereof		
Gaff sail halyards Top sail halyards	Steel wire	Up to 50	20	6
		> 50 to 80	30	8
		> 80 to 120	60	10
		> 120 to 160	80	12
	Fibre (PP)	Rope diameter of at least 18 mm and one rope sheave for every 30 m^2 or part thereof		

Type of running rigging	Rope material	Sail area [m ²]	Minimum tensile strength [kN]	Diameter of rope [mm]
Staysail sheets	Fibre (PP)	Up to 40	14	
		> 40	18	
	For sail areas of more than 30 m ² the sheet shall take the form of a tackle or shall be capable of being operated by a winch			
Gaff-/Top-sail sheets	Steel wire	< 100	60	10
		100 to 150	85	12
		> 150	116	14
	For top sail sheets, elastic connection elements (fore runners) are necessary			
	Fibre (PP)	Rope diameter of at least 18 mm and at least three rope sheaves. Where the sail area is greater than 60 m ² , one rope sheaves per 20 m ² .		

- .2 Running rigging forming part of the staying shall have a tensile strength which corresponds to that of the respective stay or shrouds.
- .3 If materials other than those stated in points 3.2.11.1 are used, the strength values given in the table 3.2.11 shall be complied with.
- .4 Fibre ropes of polyethylene shall not be used.

3.2.12 Fittings and parts of the rigging

- .1 If steel wire ropes or fibre ropes are used, the diameters of the rope sheaves (measured from centre of rope to centre of rope) shall meet the following minimum requirements (see table 3.2.12):

Table 3.2.12

Steel wire [mm]	6	7	8	9	10	11	12
Fibre[mm]	16	18	20	22	24	26	28
Rope sheave [mm]	100	110	120	130	145	155	165

- .2 By way of derogation from paragraph 3.2.12.1, the diameter of the rope sheaves may be equal to six times the diameter of the steel wire, provided that the steel wire does not constantly run over sheaves.
- .3 The tensile strength of the fittings (e.g. forks, round eyes, turnbuckles, eye-plates, bolts, rings and shackles) shall be compatible with the tensile strength of the standing or running rigging that is attached to them.
- .4 The fastenings of stay and shroud futtocks shall be designed to take up the forces they are subjected to.
- .5 Only one shackle, along with the relevant stay or shroud, may be attached to each eye.
- .6 Blocks of halyards and topping lifts shall be securely fastened to the mast, and the revolving crowfeet used for this purpose shall be in good condition.
- .7 Attachments of eye-bolts, cleats, belaying pins and fife-rails shall be designed to cope with the forces they are subjected to.

3.2.13 Sails

- .1 It shall be ensured that sails can be taken in simply, swiftly and safely.
- .2 The sail area shall be appropriate for the type of vessel and the water displacement.

3.2.14 Equipment

- .1 Vessels that are fitted with a jib-boom or bowsprit shall have a jib-net and an adequate number of appropriate holding and tensioning devices.
- .2 The equipment according to paragraph 3.2.14.1 may be dispensed with if the jib-boom or bowsprit is equipped with a hand becket and a foot rope adequately dimensioned to allow for the attachment of a safety harness to be carried on board.
- .3 For work on the rigging, a boatswain's chair shall be provided.

3.2.15 Testing

- .1 The rigging shall be tested by the inspection body every 2.5 years. As a minimum, the test shall cover the following:
 - a) the sails, including leeches, clews and reef eyes;
 - b) the state of the masts and spars;
 - c) the state of the standing and running rigging together with cable wire connections;
 - d) facilities for taking in the sail swiftly and safely;
 - e) the secure fastening of blocks of halyards and topping lifts;
 - f) the fastening of mast trunks and other fastening points for standing and running rigging that are attached to the vessel;
 - g) the winches for operating the sails;
 - h) other facilities fitted for the purposes of sailing, such as lee-boards and the fittings for operating them;
 - i) the measures taken to prevent the chafing of the spars, the running and standing rigging and the sails;
 - j) the equipment according to paragraph 3.2.14.
- .2 That part of the wooden mast passing through the deck and located below the deck shall be re-examined at intervals to be determined by the inspection body, but at the very least on the occasion of each periodical inspection before expiry of their Community certificate. The mast shall be extracted for this purpose.
- .3 A certificate of the last inspection carried out in accordance with paragraph 3.2.15.1 and issued, dated and signed by the inspection body, shall be carried on board.

4 STABILITY AND SUBDIVISION

4.1 Stability, Subdivision and Freeboard

4.1.1 The inland waterways passenger sailing vessels shall fulfil the requirements specified in the *Rules for the Classification and Construction of Inland Waterways Vessels, Part IV – Stability and Freeboard*.

4.1.2 Stability of passenger sailing vessels shall be checked for loading conditions specified in sub-chapter 3.1.1 of *Part IV – Stability and Freeboard* of the *Rules for the Classification and Construction of Inland Waterways Vessels*.

4.1.3 Stability of passenger sailing vessels is considered as sufficient if for each of the considered loading conditions the following criteria are fulfilled:

- .1 For a vessel with furled sails, the requirements specified in sub-chapter 3.1.2 of *Part IV – Stability and Freeboard* of the *Rules for the Classification and Construction of Inland Waterways Vessels*, shall be fulfilled.
- .2 For a vessel using a standard arrangement of sails, the heeling moment caused by wind pressure shall not be so high to cause the angle of heel exceeding 20° for a steady wind pressure

$q_s = 0.07$ kPa. The residual safety clearance of openings shall not be less than 0.1 m and the residual freeboard shall be positive.

- .3 The righting lever of static stability, GZ , shall:
 - reach its maximum value at a heeling angle of 25° or over;
 - amount to at least 0.2 m at an angle of heel of 30° and over;
 - be positive at an angle of heel of up to at least 60°.
- .4 The area under the righting lever curve shall not be less than:
 - 0.055 mrad up to 30°;
 - 0.09 mrad up to 40°, or at the angle at which an unprotected opening reaches the water surface and which is less than 40°;
 - 0.03 mrad between 30° and 40°, or 30° and the angle at which an unprotected opening reaches the water surface and which is less than 40°.

5 FIRE PROTECTION

5.1 General

5.1.1 The inland waterways passenger sailing vessel shall fulfil the requirements specified in the *Rules for the Classification and Construction of Inland Waterways Vessels, Part V – Fire Protection*.

5.1.2 For passenger sailing vessels having $L_{WL} \leq 45$ m and a maximum permissible number of passengers¹ not exceeding L_{WL} in whole meters, the vessel shall be equipped with an alarm system, but the system need not include an alarm system enabling passengers, crew members and ship-board personnel to alert the vessel's command and crew.

6 MACHINERY AND PIPING SYSTEM

6.1 General

6.1.1 The inland waterways passenger sailing vessel shall fulfil the requirements specified in the *Rules for the Classification and Construction of Inland Waterways Vessels, Part VI – Machinery and Piping Systems*.

6.1.2 Within the meaning of sub-chapter 29.5 of *Part VI – Machinery and Piping Systems* of the *Rules for the Classification and Construction of Inland Waterways Vessels*, sails rank is a main propulsion system.

7 ELECTRICAL EQUIPMENT AND AUTOMATION

7.1 General

7.1.1 The inland waterways passenger sailing vessel shall fulfil the requirements specified in the *Rules for the Classification and Construction of Inland Waterways Vessels, Part VII – Electrical Equipment and Automation*.

7.1.2 By way of derogation, the equipment shall be designed for permanent lists of up to 20° and ambient inside temperatures of between 0°C and +40°C, and on the deck between –20°C and +40°C. It shall function perfectly within those limits.

¹ By way of derogation the number of passengers may be raised to 1.5 times the L_{WL} in whole meters if sails, rigging and deck fittings so permit.