German X-79 Class Rules
2022

X-79

These Class Rules 2022 were adopted on
9 February 2022
at the annual general meeting of the
German X-79 Class Association e.V. .
These class rules replace all previous versions and are
valid from 01.04.2022.

Content

I. Administration

A. General

The X-79 was designed and built in 1979 by Niels Jeppesen at "Nordsø Bådeværft", later "X-Yachts" Haderslev, Denmark.

A.1 Nature of the Class Rules

a. These are closed class rules. This means that any type of material or accessory is prohibited unless expressly permitted by the class rules.
b. These Class Rules may only be revised, amended or altered by resolution of a statutory General Meeting of the German X-79 Class Association.
c. The Class Rules and the original drawings (listed in Part III), together with forthcoming revisions and amendments, are intended to ensure that all boats are constructed and equipped as nearly alike as possible. The paragrafs of the Class Rules relating to construction, equipment and all hereto related are as follows
   - either bound as being identical for all X-79 equally valid
   - or left fort he individual boat owner to decide.
d. Structures, materials and equipment not described in these class rules or left to the individual decision of the boat owner are not permitted.
e. Tolerances are only given to allow insignificant dimensional deviations during construction. Purposely exploitation of given tolerances is consequently not allowed.
f. Class Racing shall from the above and to the widest extent possible take place on equal terms and thus only be settled by the skill of the individual crew and by fair sailing.

A.2 Language

a. The official language of the class rules is German. In case of disputes over translations, the German version shall prevail. In the plans and drawings of the Annex in Part III of these Class Rules, explanations are given in Danish. In the event of conflict, the terms and dimensions set out in the German text of these Rules shall also apply.
b. The terms "shall" and "must" are mandatory, the term "may" is permissive.
c. If specifically requested by another European National Class Association, an English version of these Class Rules shall be produced.

A.3 Identification

A.3.1 Construction Number

Between 1979 and 1994, 468 X79 boats were built. Additional boats may only be built by X-Yachts or another licensed owner of the moulds and must be marked with a consecutive build number. The build number (from No. 469) must be engraved on a stainless steel plaque fixed near the midship line on the cockpit side of the main bulkhead forward of the aft forecastle box.

A. 3.2 Sail Number

The sail number must be identical to the hull number, unless another 4 or more digit number has been assigned by the national federation (Deutscher Segler-Verband DSV).

B. Eligibility of the Boats

Only boats that comply with the rules of this section shall be eligible for class racing.

The owner shall have no knowing knowledge that any alterations have been made by the previous owners which are contrary to the One-Design principle and that no action has been taken during his ownership to violate this principle.

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II. Requirements and Restrictions

The crew and boat in a regatta shall comply with the provisions of this Part.

C. Racing Conditions

C.1 Maximum Wind Speeds and Use of Sails

C.1.1 Restrictions

a. No races may be started in winds exceeding 13 m/sec.
b. In the event of wind speeds of 10 m/sec or more, the race committee shall show the flag "J" 10 minutes before the announcement signal. After that time, boats shall not use the genoa.
c. If the wind drops, the race committee may show the flag "G" at the last downwind mark. From there the use of the genoa is allowed again.

C.2 Crew

C.2.1 Restrictions

a. The crew consists of 4 or 5 persons. The maximum crew weight is limited to 352kg.
b. For long distance regattas over 40 nM (as specified in the programme) the number and weight of the crew is free.
c. Foot harnesses (riding harnesses) are permitted. They must be fastened in the cockpit. No part of these harnesses may protrude above the deck level. No part of this equipment may prevent the user from freeing himself from the boat immediately.
d. When hiking, no part of a crew member may be outside of the gunwale and rubbing strakes from feet to the middle of the thighs. No part of the body may touch the hull freeboard.
e. The use of trapezes, handles or the like for balancing the boat is not allowed. If the boat is equipped with optional stanchions and lifelines, the corresponding provisions of the currently valid racing rules shall apply.

C.4 Mobile Equipment

The rules in this section set out the equipment - including life-saving appliances - which every boat is required to have on board, irrespective of the requirements of the Sailing Instructions.

C.4.1 For Possible Use During the Race

C.4.1.1 Mandatory:

The following movable equipment must be on board during the races:

- An anchor with chain or with corresponding anchor weights on the anchor line. The total weight of the anchor, chain or anchor weights and anchor line must be at least 10kg. The anchor line must have a minimum diameter of 10mm and a length in one piece of 30m.
- An approved lifejacket or buoyancy aid for each crew member on board.
- A bilge pump or at least a 5l bucket.
- A first aid kit.
- At least one magnetic compass
- An acoustic fog horn.

- An approved lantern on the masthead. A lighting duration of at least 12 hours must be ensured.
- A battery weighing at least 12.0 kg fixed and secured forward of the port main bulkhead. Alternatively, a lighter battery can be compensated for by an additional weight that must be installed in the same place and does not perform any other function).
- A buoyant throwing line of at least 15.0 m in length.
- Tools to sever the rigging from the boat (wire cutter for 5mm, metal saw with high-speed saw blade or similar).

C.4.1.2 Optional

The following items of equipment are recommended (especially on long distance and night racing) but are not mandatory (unless otherwise prescribed in the Sailing Instructions)

- Safety lines and lifelines
- Foot harnesses/riding harnesses (according to requirements C.2.1 (c))
- Round, sliced synthetic tubes on the rubbing strake in the cockpit area (according to the requirements of D.9.2 (b))
- Radar reflector
- Rescue or bathing ladder
- Rescue or signal light
- Whistles and emergency lights for each life jacket
- Fire extinguisher
- VHF radios and other radio and telephony equipment
- Electronic navigation instruments
- Approved emergency signal ammunition

C.4.2 Not for Use During Racing

The following equipment may be carried but may not be used during the race:

- Mooring lines and fenders
- Towing rope
- Outboard motor
- Paddle

C.4.3 Motorisation

The carrying of an outboard motor is permitted, but no compensation will be given in terms of correction weights or race values. It must be stowed and secured inside the boat.

C.4.4 Attached Heavy Equipment

Any heavy equipment carried on board (especially batteries, anchors, outboard motor and the like) must be secured or lashed in such a way that they cannot move even during violent boat movements.

C.5 Boat

C.5.1 Dimensions

- Length overall (LOA) 7,890 mm
- Maximum width (Bmax) 2,870 mm
- Draught 1,330 mm

C.5.2 Weight

The boat weight in dry conditions must be at least 1,552 kg.

Weighing shall be made with the boat empty, i.e. without sails and without mandatory and optional equipment as described in section C. However, the battery must remain attached in place as prescribed.

C.5.3 Correction Weights

a. Steel or lead correction weights must be permanently attached to the hull if the boat does not reach the prescribed minimum weight when weighed.
b. The necessary correction weight is divided into three equal parts and positioned and fixed as follows:

- Two pieces are attached to the underside of the deck, close to the port and starboard chocks respectively, each no more than 100mm plumb below the underside of the deck.
- The third part is placed on the bottom on the inside of the hull immediately behind the mast foot. This part is not counted as part of the keel weight.

c. No upper limit is set for the correction weight, but it must be listed in the measurement certificate.

C.6 Hull and Hull Appendages

The usual care, maintenance and repair work may be carried out on deck and hull as well as keel and rudder. Any further work must be carried out in such a way that

- the specifications for the design are respected,
- the dimensions and weights are observed
- the comparability of the boats is maintained and
- the one-design class principle is respected.

C.7 Rig

C.7.1 Restrictions

Only one set of standing rigging (mast, main and spinnaker poles and shrouds and stays) may be used during the regatta unless parts of it or the whole have been lost or so badly damaged that it cannot be repaired. The use of substitutes requires the approval of the Race Committee.

The following regulations apply for use during the race:

C. 7.2 Mast

a. The spar must be placed on the mast step in such a way that movement of the mast at the heel point is not possible. The position of the mast step in the longitudonal direction is free, but it shall be securely fastened and may not be moved or trimmed during the race.
b. The spar shall be placed on the centreline of the boat and shall be fixed against the deck only with solid blocks of wood, rubber or similar material, which shall not be moved or trimmed during the race.

C.7.3 Boom

The intersection of the aft edge of the mast spar and the extension of the top of the boom profile, when held at right angles to the mast profile, must not be below the lower limit mark on the mast.

C.7.4 Spinnaker Boom

The spinnaker pole may be used without restriction for the spinnaker and all headsails.

C.7.5 Standing Rigging

a. A profiled forestay is not permitted. A furling system may not be used during the race.
b. Hydraulics are not allowed.
c. Trimming the forestay and shrouds during the race is not permitted.
d. The attachment of the backstays is optional.
e. Running check days (controller shrouds) must be shoed on the genoa rail.
f. The layout for the trim lines for aft stay, backstays and running checkstays is optional.
g. No trim arangement may exist under deck in the aft storage room, except for the aft stay, which may be passed through the aft storage room.

C.7.6 Running Rigging

The running rigging and sheeting of sails is free within the limitations of the Racing Rules of Sailing and the following rules:

a. All use of sails and their trimming shall take place over deck. There shall be no trimming arrangements below deck.
b. All halyards and up-hauls may have only one trim line, which shall be led on clamps on the garage in front of the galley entrance.
c. No halyard or up-haul shall have a transmission except for the use of a winch.
d. Cleats or clamps for hauls and halyards , which are led to the garage, must be fixed at a position on the garage. A relief cleat for the topping lift may however be fastened to the mast spar.
e. The sheeting of the mainsail shall be to a horse/track and traveller placed in a recess in the cockpit benches.
f. Reefing lines must be led onto the garage unless trimmed on the boom.
g. Sheeting of genoa and jib shall be through a fairlead slider, which can be moved forward and aft on the foresail-tracks. The number of sliders is optional. The sliders are locked on pre-drilled holes on the rail.
h. Headsail sheets shall not be geared or trimmed except by means of a winch.
i. To sheet a headsail further out, a barberhaul is permitted, the positioning of which is free.

C.8 Sails

C.8.1 Limitations

a. All sails carried shall comply with the requirements of Chapter C.8 and Section G of these Class Rules as well as the Racing Rules and the requirements of the Race Committee.
b. The sheeting of sails is limited by the current Racing Rules and section C.7.6 of these Class Rules.
c. Only 1 mainsail, 1 genoa, 1 jib, 1 storm jib and 1 spinnaker may be on board during a race.
d. If the sails are registered before the start of a championship or regatta, they may not be replaced. No other sails may be used unless they are lost or so badly damaged that repair is not possible. A replacement may then be made, but only after informing and obtaining permission from the Race Committee.

C.8.2 Mainsail

C.8.2.1 Identification

The national identification letters and the sail number shall comply with the current Racing Rules, unless there are no further provisions in these Class Rules.

C.8.2.2 Use

a. The sail shall be set with a halyard. The halyard shall be led above deck in such a way that the hoisting and dropping of the sail at sea is possible.
b. The highest visible point of the sail, projected at an angle of 90° to the mast profile, must not be set above the lower edge of the upper limit mark (see drawing No.3 "Begrænsningsmærke II").
c. The intersection of the extension of the leech and the upper edge of the boom profile must not be behind the front edge of the outer limit mark.
d. The luff sliders must be driven in the mast track.
e. Any method of reducing sail area is permitted, with a minimum of two rows of reef eyes/reef loop/low friction rings, with one eye each on luff and leech.
f. The use of marker lines to control the depth of the sail is permitted.
g. The use of wind threads/telltales to indicate the wind flow over the sail surface is permitted. Type, number and positioning are optional.

C.8.3 Headsails

C.8.3.1 Identification

a. No specific identification is required.
b. National identification letters and sail numbers are permitted in the genoa but shall comply with the requirements of the Racing Rules.

C.8.3.2 Use

a. The sail shall be hoisted using a halyard. The halyard shall be led above deck in such a way that the hoisting and dropping of the sail at sea is possible.
b. Headsails shall be mounted onto the forestay using hanks.
c. Trimming the tension of the luff, leech and foot of all headsails is free.
d. The jib can be fitted with a set of reefing cringles, allowing reduction oft he effectivejib area.
e. The use of marker lines to control the depth of the sail is permitted.
f. The use of wind threads/telltales to indicate the wind flow over the sail surface is permitted. Type, number and positioning are optional.

C.8.4 Spinnaker

C.8.4.1 Identification

National identification letters and sail number are permittet in the spinnaker but shall comply with the requirements of the Racing Rules.

C.8.4.2 Use

a. The sail shall be hoisted using a halyard. The halyard shall be led above deck in such a way that the hoisting and dropping of the sail at sea is possible.
b. The use of marker lines to control the depth of the sail is permitted.
c. The use of wind threads/telltales to indicate the wind flow over the sail surface is permitted. Type, number and positioning are optional.

D. Hull

D.1 Components

D.1.1 Mandatory

a. Hull shell
b. Deck
c. Gunwale rubbing strakes
d. Bulkheads and accomodation

D.1.2 Optional

Any additional accomodation.

D.2 General

Hull shell, deck, hatches, sliding hatch and garage to sliding hatch shall be manufactured to comply with the official drawings and specifications of these class rules. The dimensions shall comply with the given tolerances listed on the drawings and in the fibreglass laminate specifications. An additional hinged hatch may be mounted in the foredeck.

D.2.1 Maintenance, Care and Repair

Regular maintenance and care are optional. The use of epoxy resin for repairs is permitted without restriction. Repair and replacement of components are permitted with carbon fibre and aramid up to a maximum contiguous area of 0.5m² each. All repair work must be carried out in accordance with the specifications of C.6.

D.3 Measurement and Certification

The hull must comply with the class rules. A measurement is not required.

D.4 Identification

The hull shall bear a metal plate with the production number as specified in A.11.3 of these class rules.

D.5 Manufacturer

The hull must be built by "Nordsø Bådeværft" or the later "X-Yachts" Haderslev, Denmark or its licensee.

D.6 Hull Shell

D.6.1 Materials

The hull shell must be made of glass fibre reinforced polyester. Other materials with deviating strength, stiffness or density such as carbon fibre or aramid are not permitted.

D.6.2 Construction

D.6.2.1 General

The hull shell shall be constructed in accordance with the fibreglass laminate specifications using a monolithic mould.[1]

D.6.2.2 Specification

The fibreglass laminate specifications[2] are:

[1] According to *construction drawing No. 8.1.A of the X.Yachts shipyard, not part of these class rules.*
[2] *According to construction drawing No. 7.1 of the X-Yachts shipyard, not part of these class rules.*

a. 2 layers gelcoat
b. 1 layer of 300g/m² powder-bonded glass fibre mat over the entire section with an overlap of at least 10cm in the centre line.
c. 1 layer of 300g/m² glass fibre mat for the forecastle up to 1m behind the keel flange.
d. 1 layer of 450g/m² glass fibre mat over the entire floor up to the waterline with an overlap of at least 10cm in the centre line.
e. 2x1 layer of 450g/m² glass fibre mat over the keel flange
f. 2-3 layers of 450g/m² glass fibre mat reinforcement around the rudder stock opening and the aftstay and backstay chainplates.
g. 1 layer of 450g/m² fibreglass matting over the entire section, followed by 10mm "Divinycell" (closed cell rigid PVC foam), or 10mm balsa and/or plywood reinforcements. 1 layer of 450g/m² fibreglass matting over the entire floor up to the waterline with an overlap of at least 10cm in the centreline.
h. 1 layer of 450g/m² fibreglass mat for the forecastle up to 15cm above the keel flange.
i. 2 layers of 450g/m² fibreglass reinforcement around the rudder stock opening and the aftstay and backstay chainplates.
j. 2x2 layers of 450g/m² glass fibre mat as reinforcement over the keel flange
k. 2 layers of 10cm wide strips of 450g/m² glass fibre mat reinforcement bands along the sheerline.
l. 1 layer of 300g/m² glass fibre mat over the entire section with an overlap of at least 10cm at the centre line.
m. 1 layer of 300g/m² glass fibre fabric ("roving") over the entire section, laid parallel to the sheer line and with 10cm bands of 300g/m² glass fibre mat over the “Roving“ edges.
n. 5 bottom flanges above the keel flange, covered with 6 layers of 450g/m² glass fibre mat, followed by 4 layers of 450g/m² glass fibre mat between each floor timber.
o. 2 floor timber at the rudder stock opening, covered by 8 layers of 459g/m² glass fibre mat.
p. Fastening of accomodation parts using respectively 2 or 3 layers of 450g/m² glass fibre mat.
q. Treatment of the entire surface of the section with topcoat.

D.7 Deck

D.7.1 Materials

The deck must be made of glass fibre reinforced polyester. Other materials with different strength, stiffness or density, such as carbon fibre or aramid, are not permitted. Bonded deck coverings are permitted.

D.7.1 Construction

D.7.1.1 General

The deck shall be constructed in accordance with the fibreglass laminate specifications using a monolithic mould[3].

D.7.1.2 Specification

The fibreglass laminate specifications are[4]:

a. 2 layers gelcoat
b. 1 layer of 300g/m² powder-bonded glass fibre mat over the entire section with an overlap of at least 10cm in the centre line.

[33] *According to construction drawing No. 8.1.B of the X-Yachts shipyard, not part of these class rules.*

[44] *According to construction drawing No. 7. of 2the X-Yachts shipyard, not part of these class rules.*

c. 1 layer of 300g/m² fibreglass mat for the foredeck up to the cockpit.
d. 1 layer of 10cm wide strips of 450g/m² fibreglass mat over all edges in the cockpit area.
e. 2 layers of 450g/m² glass fibre mat reinforcement at the rudder stock opening, sliding hatch edges and cleat attachment points.
f. 1 layer of 450g/m² glass fibre mat over the entire section, followed by 10mm "Divinycell" (closed-cell PVC rigid foam), or 10mm balsa wood and/or plywood reinforcements.
g. 1 layer of 450g/m² glass fibre mat over the entire section.
h. 1 Layer 10cm wide strips of 450g/m² fibreglass matting over all edges in the cockpit area, winch attachments, chainplate openings and cleat attachment points.
i. 1 layer of 300g/m² glass fibre mat with colour paste in the entire cockpit area
j. 4mm plywood reinforcement around the foreship hatch and sliding hatch, inlaid into the final fibreglass mat.
k. Surface treatment of the entire section using structural topcoat, except at the attachment points for the main bulkheads and the aft bulkhead.
l. Garage:
   - 2 layers gelcoat
   - 3 layers of 450g/m² glass fibre mat
   - 1 panel of 6mm plywood
   - 3 layers of 450g/m² glass fibre mat
   - Surface treatment with topcoat
m. Sliding hatch:
   - 2 layers gelcoat
   - 2 layers of 450g/m² glass fibre mat
   - 1 layer of „firret“
   - 1 layer of 450g/m² glass fibre mat
   - 3 layers of 5cm wide strips of 450g/m² glass fibre mat over the edges
   - Surface treatment with topcoat
n. Both aft storage room hatches:
   - 2 layers gelcoat
   - 2 layers of 450g/m² glass fibre mat
   - 1 layer of 10mm "Divinycell" (closed cell rigid PVC foam) with plywood and aluminium reinforcements.
   - 1 layer 450g/m² glass fibre mat.
   - Surface treatment with topcoat
o. An additional folding hatch can be fitted in the foredeck.

D.8 Joining of Hull Shell and Deck

D.8.1 Construction

D.8.1.1 General

The joining of the hull and deck to be carried out while in the moulds.

D.8.1.2 Specification

Glass fibre laminate Specification:

a. Hull shell and deck are glued and covered with a bolted rubbing strake.
b. Transom and deck are joined with adhesive sealant and 6mm bolts.

D.9 Gunwale and Rubbing Strakes

D.9.1 Materials

The rubbing strakes must be made of an aluminium alloy. They may be fitted with a round, sliced tube of synthetic material.

D.9.2 Construction

a. The rubbing strakes shall be of standard profile and shall run the full length of each gunwale without interruption. The rub rails shall be fixed with 6mm diameter stainless bolts every 100mm + 20mm.
b. A round, sliced tube of synthetic material with a maximum diameter of 75mm may be attached to the rubbing strake in the cockpit area. The maximum permitted distance from the rubbing strake to the outside of the tube is 50mm. The length of the tube is free, but the maximum width of the boat may not be exceeded at any point.

D.10 Bulkheads and Accomodation

D.10.1 General

The hull shall be equipped with the standard equipment (see drawing 11). All parts of the accomodation must have the same dimensions and density as the standard accomodation. The end pieces and edges of each device must be provided with wooden garnish moulding.

D.10.2 Scope

The accomodation must include at least:

- Foreship: 2 longitudinal stringers/ bulkheads extending from the main bulkheads to each side of the foresheet. For the battery, a retaining shell must be built directly in front of the port main bulkhead.
- Galley: The galley shall hold the main bulkheads and from there aft two longitudinal "bunk front plates", extending under the cockpit to the aft bulkhead and supporting the cockpit. The bunk front plates are supported by two knees.
- The starboard pantry section must be in place. The port pantry section shall include space for a cooker.
- Shelves are mounted above each galley (below deck). Further, two longitudinal bulkheads behind the bunks, equipped with upholstered bolsters, and each bulkhead with a shelve between the bulkhead and the hull interior.
- Also: 4 tubular metal bunk frames with fabric cover, floor boards, 2 thwarts as entrance steps, shutters for closing of galley entrace, at least 5 installed lamps.
- Stern: aft bulkhead separating the cockpit from the aft storage room.
- Any other furnishings such as fore bunk, galley table etc. are optional.

D.10.3 Materials

The material for the bulkheads and accomodation parts shall be marine plywood or other material with similar strength and weight. The minimum density shall be 650kg/m³. The following diameters are prescribed:
All transverse bulkheads: at least 12mm
All longitudinal bulkheads (longitudinal stringers/bunk fronts): at least 9mm

D.10.4 Specification

a. The entire interior is mounted and fastened to the hull shellwith 2 respectively3 layers of 450g/m² fibreglass matting before the deck section is joined.

b. In the following connection of the hull shell to the deck, the transverse bulkheads are fixed with 3 layers of 450g/m² glass fibre mat.
c. All surfaces of fastening are treated with topcoat.

D.11 Hull

D.11.1 Fittings

D.11.1.1 Mandatory

The following fittings shall be positioned in accordance with the measurement diagram:

a. Integrated stemhead fitting with forestay chainplate (forestay attachment hole)
b. Chocks for upper and lower shrouds
c. Mast step
d. Mast collar (around the mast hole in the deck)
e. Mainsail horse / track with traveller
f. Foresail tracks and fairleads.
g. 2 winches on the cockpit coaming
h. 1 halyard winch on the garage
i. Fore pulpit with lifelines
j. 3 mooring cleats

D.11.1.2 Optional

a. Foot straps according to C.2.1.d and the racing rules
b. Barberhauls
c. Blocks/Deflection blocks
d. Cleats
e. Storage fittings
f. Aft pulpits, stanchions and life lines.

D.11.2 Dimensions

	Minimum	Maximum
Hull length overall (LoA)	7,870mm	7.890mm
Beam of Hull, excluding rubbing strakes, at sheerline; at station SBmax, 4,720mm from bow front.	2,840mm	2,870mm
Fore foretriangle basis (J)		2,780mm
Shroud chainplates, fastened tot he main bulkheads with 10 pieces of 8mm bolts		
Distance from the forestay fastening hole to the center between the two bows of the shroud above deck.	2,880mm	2,920mm
Transverse distance between the centre of the two bends of the two shroud chainplates over deck	1.330mm	1.390mm
Headsail rails fitted in recesses in the deck tread: Distance from the centre of the headsail rails to the end of the thread pattern	15mm	35mm
Length of the headsail rails within the recesses in the deck thread pattern	Free	Recess
Height of mainsheet horse/track above cockpit benches		150mm
backstay chainplates, distance from transom line	Free	
Fore pulpit height	430mm	
Tensioned wire/dyneema (min. 4mm) from the pulpit to the attachment point on the rubbing strake (lifeline), length	2.000mm	

E. Keel and Rudder (Appendices)

E.1 General

E.1.2 Maintenance, care and repair

Regular maintenance and care are optional. The use of epoxy resin for repairs is permitted without restriction. Repair and replacement of components are permitted with carbon fibre and aramid up to a maximum contiguous area of 0.5m² each. All repair work must be carried out in accordance with the specifications of C.6. n.

E.2 Kiel

E.2.1 Certification

The keel must be in accordance with the class rules.

E.2.2 Identification

The keel does not need to be provided with an identification number.

E.2.3 Manufacturer

The keel must have been built by "Nordsø Bådeværft" or later "X-Yachts" Haderslev, Denmark or its licensee. Newbuildings must have been manufactured by X-Yachts or another licensed owner of the moulds.

E.2.4 Materials

a. The keel must be made of cast iron.
b. The keel may be galvanised or coated with a synthetic material such as glass fibre reinforced plastic or topcoat/gelcoat.

E.2.5 Construction

The keel must be manufactured in accordance with the drawing No. 1and the specified dimensions. In case of contradictions of the Danish text and the specified terms and dimensions with the German text, the specifications in German shall apply.

E.2.6 Positioning and Mounting

a. The keel must be placed in the opening of the hull shell and fixed with 6 pieces of 16mm diameter stainless steel bolts as shown in drawing No. 1 for profile A and B. The tolerated deviations from the specified profiles A and B are -0 / +15mm. Profiles C and D define the radius of the underside of the keel.
b. The vertical height of the aft edge of the keel must be 1,030 + 15mm.
c. The distance from the aftmost point of the transom at the centreline (reference point HDP, see drawing 1, "Agterspejls Centerlinje") to the lowest point of the aft edge of the keel shall be 3.910 + 20mm.
d. The distance from the aft point of the transom at the centreline (reference point HDP) to the highest point of the aft edge of the keel, excluding rounding, measured at the hull bottom and in the centreplane, shall be 3.790 + 20mm.

E.2.7 Weights

	Minimum	Maximum
Keel weight including bolts and, if applicable, outer coating	650kg	680kg

E.3 Rudder Blade, Rudder Stock and Tiller

E.3.1 Certification

The rudder blade and rudder stock must comply with the class rules.

E.3.2 Identification

The rudder blade and rudder stock do not need to be provided with an identification number.

E.3.3 Manufacturer

Manufacturers for rudder blade and rudder stock are free.

E.3.4 Materials

a. The rudder blade must be made of glass fibre reinforced polyester or epoxy resin. Other materials with different strength, stiffness and density, such as carbon fibre or Kevlar, are not permitted.
b. The rudder stock shall be solid stainless steel 25mm in diameter.
c. Materials for tiller and tiller extension are free.

E.3.5 Construction

a. The rudder stock shall be formed and placed in the rudder blade according to the drawing No.2.
b. The rudder blade shall be manufactured according to drawing No.2.

E.3.6 Fittings

a. The rudder stock shall be fastened on the skeg of the hull shell by 3 pieces of stainless steel bolts and stainless steel fitting in accordance with the drawing No.2.
b. Fittings for tiller and tiller extension are free.

E.3.7 Dimensions

a. The vertical height of the aft edge of the rudder blade is 1,030 + 10mm.
b. The distance from the rearmost point of the transom at the centreline (reference point HDP) to the lowest point of the aft edge of the rudder blade must be 1,200 + 10mm.

E.3.8 Weights

	Minimum	Maximum
Total combined weight of rudder blade with rudder stock	16kg	20kg

F. Rig

F.1 Components

F.1.1 Mandatory

a. Mast
b. Boom
c. Spinnaker pole
d. Standing rigging
e. Running rigging

F.2 General

E.2.1 Maintenance and Care

Routine maintenance and care are optional. Further repair work must be carried out in accordance with the specifications of C.6.

F.3 Mast

F.3.1 Certification

The mast and fittings must comply with the class rules and the drawing No.3 and the dimensions given there. Measurement is not required.

E.3.2 Identification

The mast does not need to be provided with an identification number.

E.3.3 Manufacturer

The choice of manufacturer is free.

F.3.4 Materials

a. The spar and spreader shall be of aluminium alloy with an aluminium content of at least 90%. They may be anodised.
b. Bolts, sheaves and hook terminals are free.
c. Mast spreader fittings must be made of stainless steel and contain a through-going guide.

F.3.5 Construction

a. The mast profile shall contain a fixed sail track integrated into the profile. The track may only be interrupted for the mounting of fittings or to insert the mainsail luff plastic slides into the groove.
b. The mast profile must have a conical shape at the top. The cone must reach down to the height of the spinnaker halyard, as shown in drawing no. 5, with dimensions given.
c. Limit marks shall be painted in a contrast colour. Alternatively, tape may be used, in which case engraved / incised marks must be present on the mast profile on the measurement side of the mark.

F.3.6 Fittings

F.3.6.1 Mandatory

d. Masthead fitting with horn for the aftstay
a. Hook terminals for the shrouds
b. Hook terminal for the forestay
c. Hook terminals for the backstays
d. A set of fixed spreaders and fittings/guide
e. Mainsail halyard sheave box
f. Headsail halyard sheave box
g. Spinnaker halyard sheave box and possible crane
h. Spinnaker pole fitting, maximum 2 eyes
i. Spinnaker pole lift block block or similar sheave box
j. Gooseneck
k. kicking strap attachment
l. Mast step
m. lantern in the masthead

F.3.6.2 Optional

a. Spinnaker pole downhaul block or similar sheave box.
b. Topping lift
c. Mechanical wind direction indicator. An additional electronic wind indicator is permitted
d. Aftstay jacks are permitted
e. Holder for compass and other display devices.

f. Fittings for storing the spinnaker pole

F.3.7 Dimensions

	Minimum	Maximum
Mast length		Free
Mast profile cross section From mast base to 8,200mm above mast Data point M I		
Longitudinal	120mm	
Moment of inertia longitudinal	130cm^4	
Across	80mm	
Moment of inertia transverse	75cm^4	
Mast profile cross section At the highest point		
Longitudinal	65mm	
Across	52mm	
Masthead cone, height above measuring mark I	8,200mm	
Width of the measuring marks	15mm	
Mast Data point = lower point MI (see drawing 3, "Mast-Begrænsningsmærke")		
About Footpoint	2.125mm	2.165mm
Above deck jump line	1.130mm	1.190mm
Upper measuring point MII (P)		10.000mm
Bending of the mast profile without load		50mm
Height of forestay above M I	7,980mm	8.020mm
Height upper shroud above M I	8.180mm	8.220mm
Height centre shroud above M I	5,840mm	5,880mm
Spinnaker boom fitting (eyes)		
Height		950mm
Maximum board		55mm
Spinnaker halyard Height above M I		8.260mm
Spinnaker halyard outrigger board		110mm
Salinge		
Length within the upper shrouds	1.400mm	1.430mm
Height above M I	3,480mm	3,520mm
Height lower shrouds		Not above the salings
Height baking days		Not above forestay
Amount Current Check Days		Not above centre shrouds

F.3.8 Weights

	Minimum	Maximum
Weight mast profile	2.3kg/m	
Saling, including shroud fitting	0,6kg	
Peak weight: (*The weighing must be carried out with the rigging complete and the standing rigging tied up to the foot of the mast so that it does not touch the ground. The running rigging must be fully hauled to the top and also tied up to the foot of the mast so that it does not touch the ground).*		14,5kg

F.4 Boom

F.4.1 Certification

The boom profile must comply with the class rules, as well as the drawing and3 the dimensions given there.

F.4.2 Identification

The boom profile does not need to be provided with an identification number.

F.4.3 Manufacturer

The choice of manufacturer is free.

F.4.4 Materials

The boom profile must be made of aluminium alloy with an aluminium content of at least 90%. It may be anodised.

F.4.5 Construction

The boom profile must contain a fixed sail groove integrated into the profile and corresponding to the drawing No.3 and the specified dimensions.
Limit marks must be painted in a contrast colour.

F.4.6 Fittings

F.4.6.1 Mandatory:

a. 2 mounting brackets for mainsheet blocks
b. Outhaul and sheaves
c. At least 2 reefing lines, sheaves and fittings for reefing lines
d. Kicking strap fitting
e. Gooseneck attachment

F.4.6.2 Optional

All other equipment and fittings for the boom profile are free.

F.4.7 Dimensions

	Minimum	Maximum
Boom length		Free
Cross-section of boom profile between gooseneck fitting and outermost point of measuring mark M III (see drawing 3, "Begrænsningsmærke III"):		
Height	75mm	115mm
Wide	45mm	85mm
Boom profile pre-bending without load		20mm
Width measuring marks	15mm	
Distance to outer measuring mark M III (E)		3.500mm

F.4.8 Weights

	Minimum	Maximum
Boom weight	1.9kg/m	Free

F.5 Spinnaker Pole

F.5.1 Certification

The spar and fittings must comply with the class rules, as well as the drawing and the dimensions given.

F.5.2 Identification

The spar does not need to be provided with an identification number.

F.5.3 Manufacturer

The choice of manufacturer is free.

F.5.4 Material

The profile shall be made of aluminium alloy with a minimum aluminium content of 90%. They may be anodised.

F.5.5 Construction

The spar profile and layout are free.

F.5.6 Fittings

a. Fittings are free.
b. The spinnaker pole is attached to the mast profile with a maximum of two stainless steel eyes. Both must be permanently fixed at the front in the middle of the mast profile.

F.5.7 Dimensions

	Minimum	Maximum
Cross section of the spinnaker pole is free		
Length spinnaker pole (SPL)		2.750m

F.5.8 Weight

	Minimum	Maximum
Weight spinnaker pole, including fittings	2,3kg	

F.5.9 Stowage

Stowage of the spinnaker pole is free when not in use.

F.6 Standing Rigging

F.6.1 Certification

a. The standing rigging must comply with the class rules as well as the drawing No.3 and the dimensions given there.
b. Certification is not required.

F.6.2 Manufacturer

The choice of manufacturer is free.

F.6.3 Materials

The standing rigging must be made of stainless steel. Exceptions apply to mobile stays such as backstays, check stays (controller shrouds) and aftstay.
"Dyform" or similar wire is not allowed.

F.6.4 Construction

The following listed components of the standing rigging are mandatory:

a. 1 forestay made of 1x19 wire with min. 5mm diameter
b. 2 main shrouds made of 1x19 wire with min. 5mm diameter
c. 2 intermediate shrouds made of 1x19 wire with min. 4mm diameter
d. 2 lower shrouds made of 1x19 wire with min. 5mm diameter
e. 2 running check stays / controller shrouds made of 1x19 wire or polyethylene with ultra-high molecular weight (like Dyneema) with min. 4mm diameter.

f. 1 aftstay of 1x19 wire or polyethylene with ultra-high molecular weight (like Dyneema) with min. 3mm diameter.
g. 2 running backstays made of 1x19 wire or polyethylene with ultra-high molecular weight (like Dyneema) with min. 4mm diameter

F.6.5 Fittings

F.6.5.1 Mandatory:

a. Forestay toggles and terminals
b. Rigging screws and terminals
c. Aft stay, fastened to top point
d. Forestay, main, intermediate and lower shrouds, attached to the mast spar

F.6.5.2 Optional

a. The type of rigging screws and terminals are free.
b. The devices for trimming the tension of the aft stay and backstays are free, provided they comply with the specifications in C.8.5.

F.7 Running Rigging

F.7.1 Certification

The running rigging must be in accordance with the current class rules.
Certification is not required.

F.7.2 Manufacturer

The choice of manufacturer is free.

F.7.3 Materials

The choice of material is free.

F.7.4 Construction

The running rigging is free within the limits as defined in the Racing Rules. The use of sails and sail trim shall be above deck. Usually the halyards and sheets designated as "mandatory" shall be considered as a minimum.

F.7.4.1 Mandatory:

a. Mainsail halyard
b. Mainsail sheet
c. Kicking strap
d. Headsail halyard
e. Headsail sheets
f. Spinnaker halyard
g. Spinnaker sheet and guy
h. Spinnaker pole lift

F.7.4.2 Optional:

a. Mainsail cunningham
b. Mainsail outhaul
c. Headsail cunningham
d. Headsail barberhauls without transmission to change the sheet's angle of attack outwards only.
e. Spinnaker barberhauls without transmission to change the sheet's angle of attack in one direction only.

f. Topping lift
g. Spinnaker downhaul

F.7.5 Fittings

F.7.5.1 Mandatory

a. 3 winches (1 on the garage and 1 on each cockpit coaming)
b. The headsail halyard must run under the forestay
c. The number of blocks / guide rollers on slides on the headsail rail is free. The sliders must be fixed in the pre-drilled holes in the rails.
d. The height of the spinnaker halyard above the deck spring line shall not exceed 9,450mm (ISP measurement), this means the height from the measurement mark MI on the mast profile shall not exceed 8,260mm.
e. A spinnaker halyard crane is permitted, but the halyard block must not be attached more than 110mm forward of the front of the mast profile.

F.7.5.2 Optional:

a. Clamps for securing halyards and sheets
b. A block or eye in each headsail barberhaul where the sheet runs
c. A block or eye in each spinnaker barberhaul where the sheet or backhaul runs.

F.7.6 Dimensions

The dimensions of sheets and halyards are free

F.7.7 Weights

The weight of sheets and halyards is free

G. Sails

G.1 Components

On sails may be used:

- Mainsail
- Headsails (genoa, jib, storm jib)
- Spinnaker

G.2 General

G.2.1 Maintenance and care

Regular maintenance and care are optional. Further repair work must be carried out in accordance with the specifications of C.6.

G.2.2 Certification

Sails must be in accordance with the current class rules.
A measurement is not required unless otherwise requested by the respective race committee.

G.2.3 Manufacturer

The choice of manufacturer is free.

G.3 Mainsail

G.3.1 Identification

G.3.1.1 Class Insignia

The class insignia shall be placed on both sides of the sail above the nationality mark.

G.3.1.2 Sail Numbers

The nationality mark and sail number must be in accordance with the Racing Rules and the Class Rules.

G.3.2 Construction

G.3.2.1 Structure

The construction must be:
Soft, single-ply sail. There are no restrictions on the width, direction and weight of parts of the sails, however the minimum weight must be respected.

G.3.2.2 Material

The sail material shall consist of

- A woven cloth made of fibres and / or
- A laminate of fibre yarns and polyester film (e.g. Mylar).

The fabric fibres may be polyester, Pentex, aramid (e.g. Kevlar), ultra-high molecular weight polyester (e.g. Spectra), Vectran or carbon fibre-based material.

G.3.2.3 Equipment

The sail must contain:

- At least 1 plastic slider every 1.000mm on the luff
- 4 batten pockets in the leech (of which only the top one may reach the luff)
- The sail sign
- At least 2 reefing rows with eyes
- Nationality letters and sail number

G.3.2.4 Limitations

The leech must not extend beyond

- a straight line from the aft head point to the intersection of the leech and the upper edge of the upper batten pocket
- a straight line from the clew point to the intersection of the leech and the lower edge of the lower batten pocket.

G.3.2.5 Optional

The following is permitted:
Stiching, glues, tapes, (luff) ropes, corner eyes, headboard with fixings, mini reef, Cunningham eye or pulley, batten pocket patches, batten pocket elastic, batten pocket end caps, mast and boom slides, leech line with cleat, windows, support bands from luff to leech, tell-tales, sail shape indicator stripes, sail identification, sailmaker labels, sail button, certification mark.

G.3.3 Dimensions

	Minimum	Maximum
Luff length (P=10.000mm, see F.3.7)		Free
Foot length (E=3,500mm, see F.4.7)		Free
Leech length		10.750mm
Half width (MGM)		2.240mm
Three-quarter width (MGU)		1.300
Upper width 500mm from head point		330mm
Top width (see drawing 5, "Faldbarmsbredde")		140mm
Ply, average weight of the body oft he sail	250g/m²	

Primary reinforcement (from clew point)		450mm
Secondary reinforcement (from clew point)		1.350mm
Flutter Patches		Free
chafing patches		Free
Batten pocket patches diameter		400mm
seam width		Free
Support strap from luff to leech		
Number		4
Width		Free
Weight		250g/m
Windows (total area)		1,0m²
Weight window material		Free
Distance window to sail edge	150mm	
Length top batten pocket, inside		Free
Length lower 3 batten pockets, inside		930mm
Width batten pockets, inside		70mm
Distance head point (see drawing 5 "Faldbarmspunkt") to intersection of leech and centreline of top batten pocket.	2.100mm	
Distance clew point (see drawing 5, "Skødebarmspunkt") to intersection of leech and centreline lowest batten pocket	2.100mm	
Distance to reef cringles 2nd reef, perpendicular to the boom	2.200mm	

G.4 Genoa

G.4.1 Construction

G.4.1.1. Structure

The construction must be:
Soft, single-ply cloth sail. There are no restrictions on the width, direction and weight of parts of the sails, but the minimum weight must be respected.

G.4.1.2 Material

The sail material shall consist of

- a woven cloth made of fibres and / or
- a laminate ply fibre threads and polyester film (e.g. Mylar).

The fabric fibres may be polyester, Pentex, aramid (e.g. Kevlar), ultra-high molecular weight polyethylene (e.g. Spectra), Vectran or carbon fibre-based material.

G.4.1.3 Limitations

The sail may have the maximum permitted lengths for luff, leech and foot and must comply with the racing rules.

G.4.1.4 Mandatory

The sail must contain:
At least one hank for every 1,000mm on the luff.

G. 4.1.5 Optional

The following is permitted:
Bolt rope of wire, spectra, Kevlar or similar rope, Cunningham eye or roller, stiching, glues, tapes, corner eyes, windows, leech and foot lines with cleat, tell-tales, sail shape indicator strips, sailmaker labels.

G.4.2 Dimensions

	Minimum	Maximum
Luff length (Tmax)		9.000mm
Luff perpendicular (LP)		4.140mm
Leech length		8.350mm
Foot length		4.500mm
Foot median		8,700mm
Top width		45mm
Fott irregularity		40mm
Ply, average weight of the body oft he sail	210g/m²	
Primary reinforcement, distance from clew point)		420mm
Secondary reinforcement, distance from clew point)		1.260mm
Flutter Patches		Free
Chafing patches		Free
Batten pocket patches diameter		400mm
Tape width and seam width		Free
Windows (total area)		1,0m²
Weight window material		Free
Distance window to sail edge	150mm	

G.5 Fock

G.5.1 Construction

G.5.1.1 Structure

The construction must be: Soft, single-ply cloth sail. There are no restrictions on the width, direction and weight of parts of the sails, but the minimum weight must be respected.

G.5.1.2 Material

The sail material shall consist of

- A woven cloth made of fibres and / or
- A laminate of fibre yarns and polyester film (e.g. Mylar).

The fabric fibres may be polyester, Pentex, aramid (e.g. Kevlar), ultra-high molecular weight polyethylene (e.g. Spectra), Vectran or carbon fibre-based material.

G.5.1.3 Limitations

The sail may have the maximum permitted lengths for luff and leech. However, the foot of the jib must not exceed 2,900mm.

G.5.1.4 Mandatory

The sail must contain:
At least one hank every 1,000mm on the luff.

G.5.1.5 Optional

The following is permitted:
Bolt rope of wire, spectra, Kevlar or similar rope, Cunningham eye or roller, stiching, glues, tapes, corner eyes, leech and foot lines with cleat, tell-tales, sail shape indicator strips, sailmaker labels.
In addition, for the jib is allowed:
One reef, windows, a maximum of 3 batten pockets in the leech, batten pocket patches, batten pocket elastic and batten pocket end caps.

G.5.2 Dimensions

	Minimum	Maximum
Luff length (Tmax)		9.000mm
Luff perpendicular (LP)		2.700mm
Leech length		8,400mm
Foot length		2.900mm
Top width		45mm
Quarter-width		2.040mm
Half-width		1.380mm
Three-quarter width		720mm
Foot irregularity		40mm
Ply, average weight of the body oft he sail	250g/m²	
Primary reinforcement, (distance from clew point)		420mm
Secondary reinforcement, (distance from clew point)		1.260mm
Flutter Patches		Free
Chafing patches		Free
Batten pocket patches diameter		400mm
Tape width and seam width		Free
Windows (total area)		1,0m²
Weight window material		Free
Distance window to sail edge	150mm	
Length top batten pocket, inside		Free
Length lower max. 2 batten pockets, inside		550mm
Wide batten pockets		70mm
Distance head point ("folding boom point") to intersection of leech and centreline top batten pocket	2.150mm	
Distance clew point ("Skødebarm") to intersection of leech and centreline lowest batten pocket	2.150mm	

G.6 Storm Jib

G.6.1 Construction

G.6.1.1 Structure

The construction must be: Soft, single-ply cloth sail. There are no restrictions on the width, direction and weight of parts of the sails, but the minimum weight must be respected.

G.6.1.2 Material

The sail material shall consist of:

- a woven cloth made of fibres and / or
- a laminate of fibre yarns and polyester film (e.g. Mylar).

The fabric fibres may be polyester, Pentex, aramid (e.g. Kevlar), ultra-high molecular weight polyethylene (e.g. Spectra), Vectran or carbon fibre-based material.

G.6.1.3 Limitations

The sail may have the maximum permitted lengths for luff, leech and foot. However, the area of the storm jib must not exceed 7m². (Calculated as the product of half the measured height over luff and the measured luff length).

G.6.1.4 Mandatory

The sail must contain:

At least stay riders every 1,000mm on the luff.

G.6.1.5 Optional

The following is permitted

Bolt Rope of wire, spectra, Kevlar or similar rope, Cunningham eye or roller, stiching, glues, tapes, corner eyes, leech and foot lines with cleat, tell-tales, sail shape indicator strips, sailmaker labels.

G.6.2 Dimensions

	Minimum	Maximum
Luff length (Tmax)		9.000mm
Luff perpendicular (LP)		2.700mm
Leech length		free
Foot length		free
Top width		45mm
Ply, average weight of the body oft he sail	270g/m²	
Primary reinforcement, distance from clew point)		420mm
Secondary reinforcement, distance from clew point)		1.260mm
Flutter Patches		Free
Chafing patches		Free
Tape width and seam width		Free

G.7 Spinnaker

G.7.1 Identification

The nationality mark and sail number shall be in accordance with the Racing Rules and the Class Rules (C.9.4.a.).

G.7.2 Construction

G.7.2.1 Structure

The construction must be:

Soft, single-ply cloth sail. There are no restrictions on the width, direction and weight of parts of the sails, but the minimum weight must be respected.

G.7.2.2 Material

The whole sail material shall be made of the same woven cloth of fibres of polyester or polyamide.

G.7.2.3 Optional

The following are permitted:

Stitching, glues, tapes, corner eyes, tell-tales, sail shape indicator stripes, sailmaker's marks.

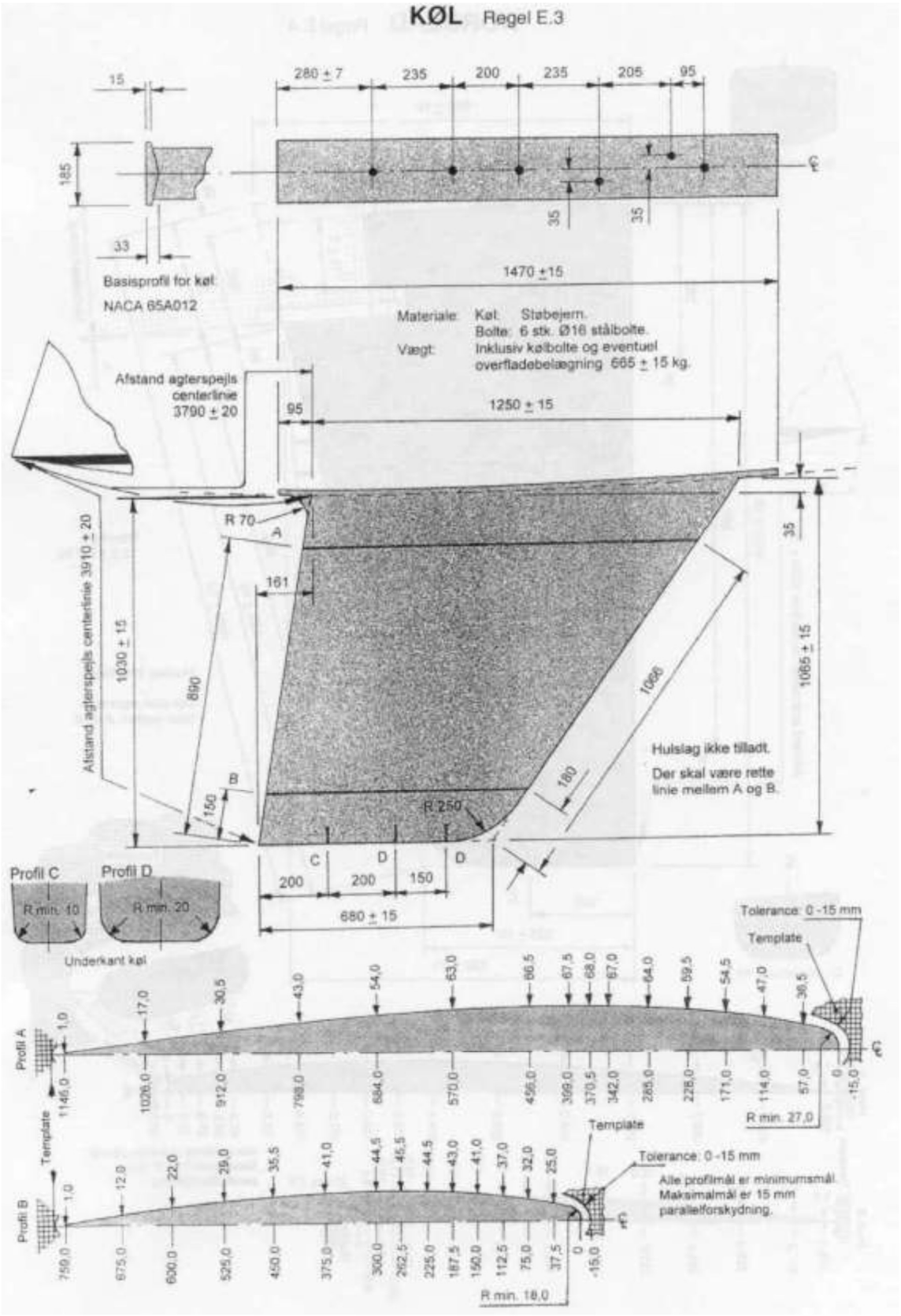
G.7.3 Dimensions

	Minimum	Maximum
Leech length (SL)		9.250mm
Foot length (SF)		4,950mm
Foot median		11,100mm
Half width, measured between half leech points at 4,625 mm from the head point (SMW/SMG).		6,680mm
Difference between the diagonals		50mm
Ply, average weight of the body oft he sail	40g/m²	
Primary reinforcement, distance from clew point)		430mm
Secondary reinforcement, distance from clew point)		1.290mm
Tape width and seam width		Free

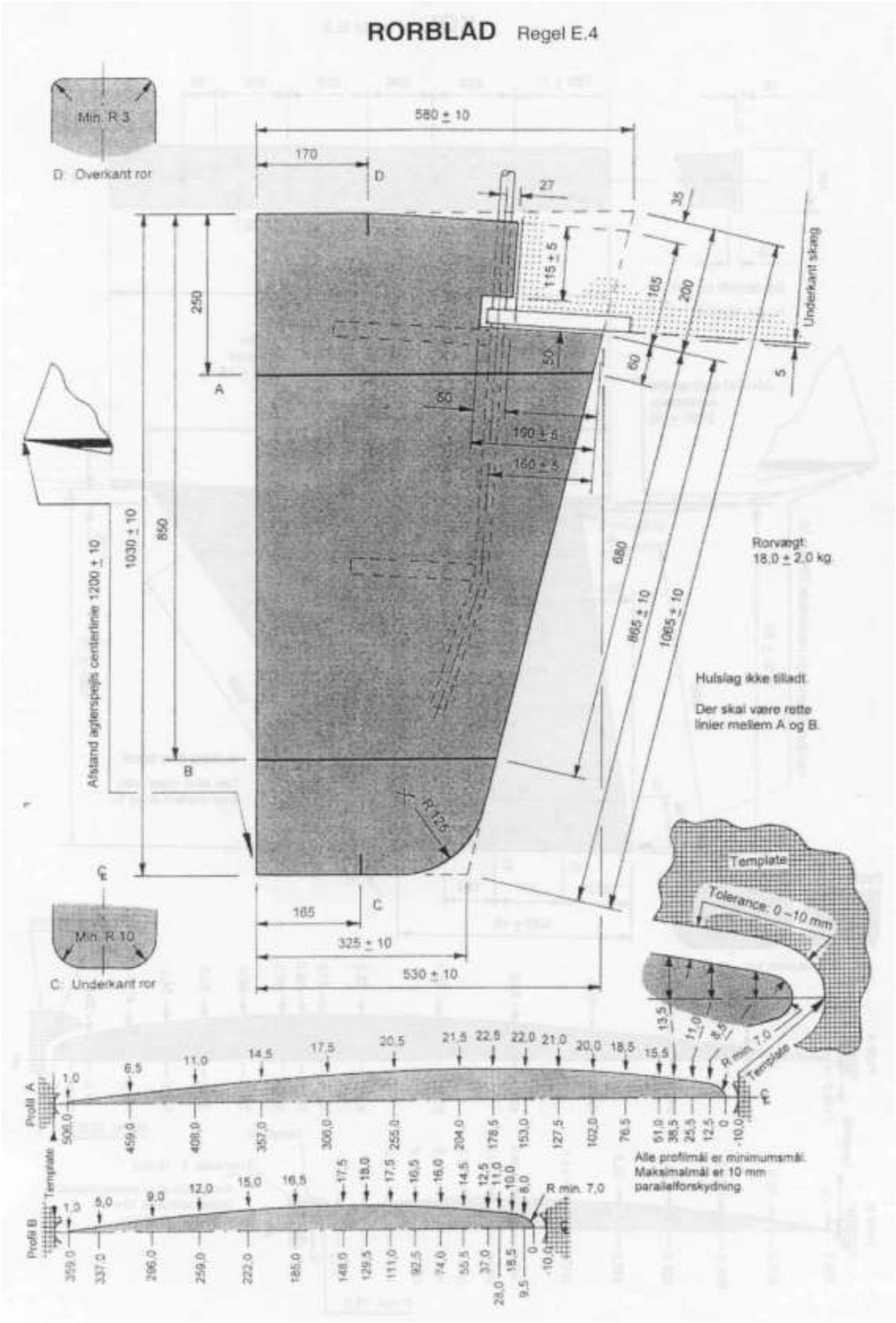
III. Annexes (drawings)

Drawing no.	Title	Original title Danish	To rule
1	Keel	Køl	E.2
2	Rudder blade and rudder stock	Rørblad	E.3
3	Rig	Rig	F
4	Sail plan		G
5	Mainsail	Storsejl	G.3
6	Class insignia	Klassemærke	G.
7	Genoa	Genoa	G.4
8	Jib and storm jib	Fok og Stormfok	G.5, G.6
9	Foresail measurement	Forsejlsmåling	G.4, G.5, G.6
10	Spinnaker	Spiler	G.7
11	Profile Deck Layout and accomodation		D

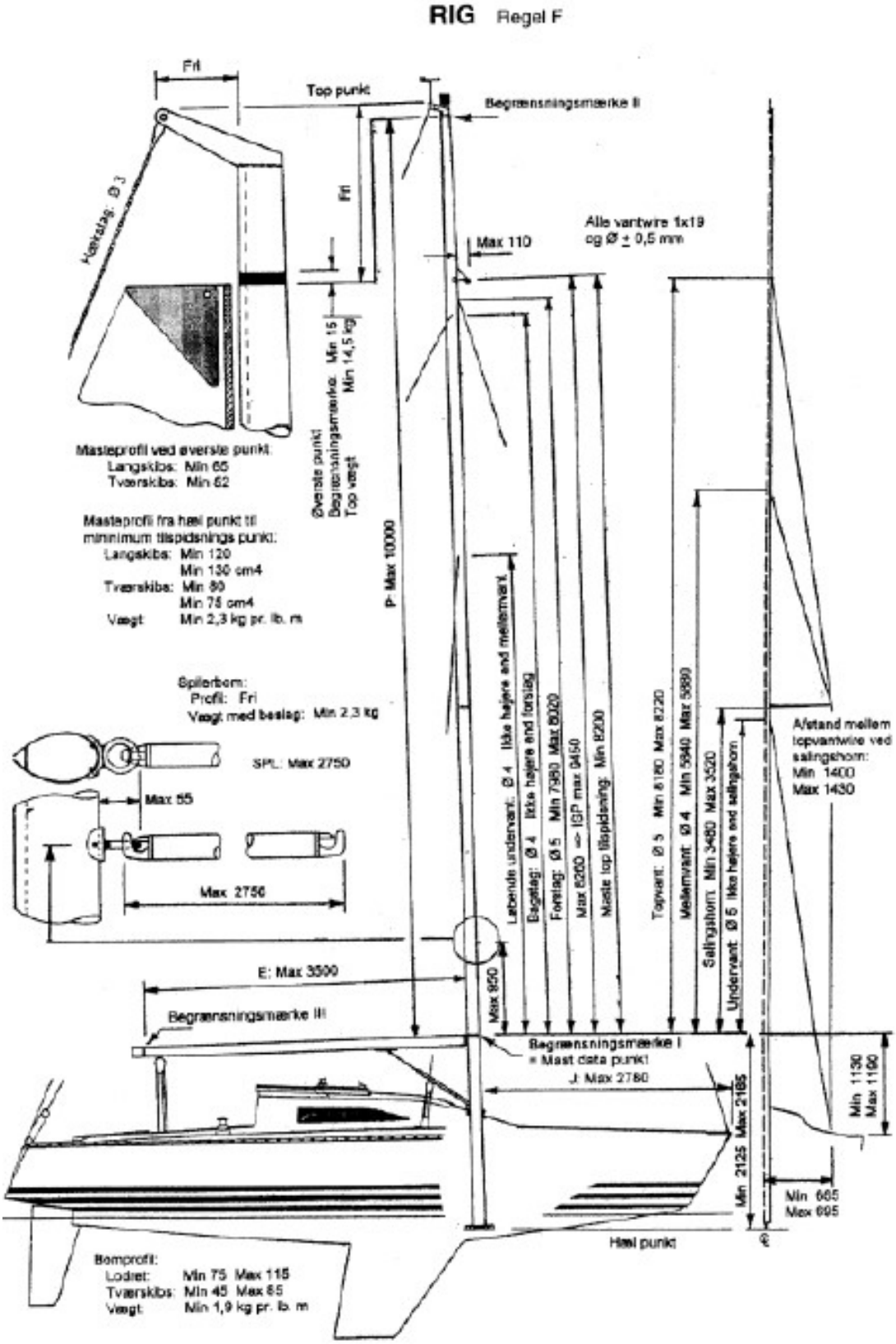
Drawing 1: Keel (to E.2)



Drawing 2: Rudder blade and rudder stock (to E.3)

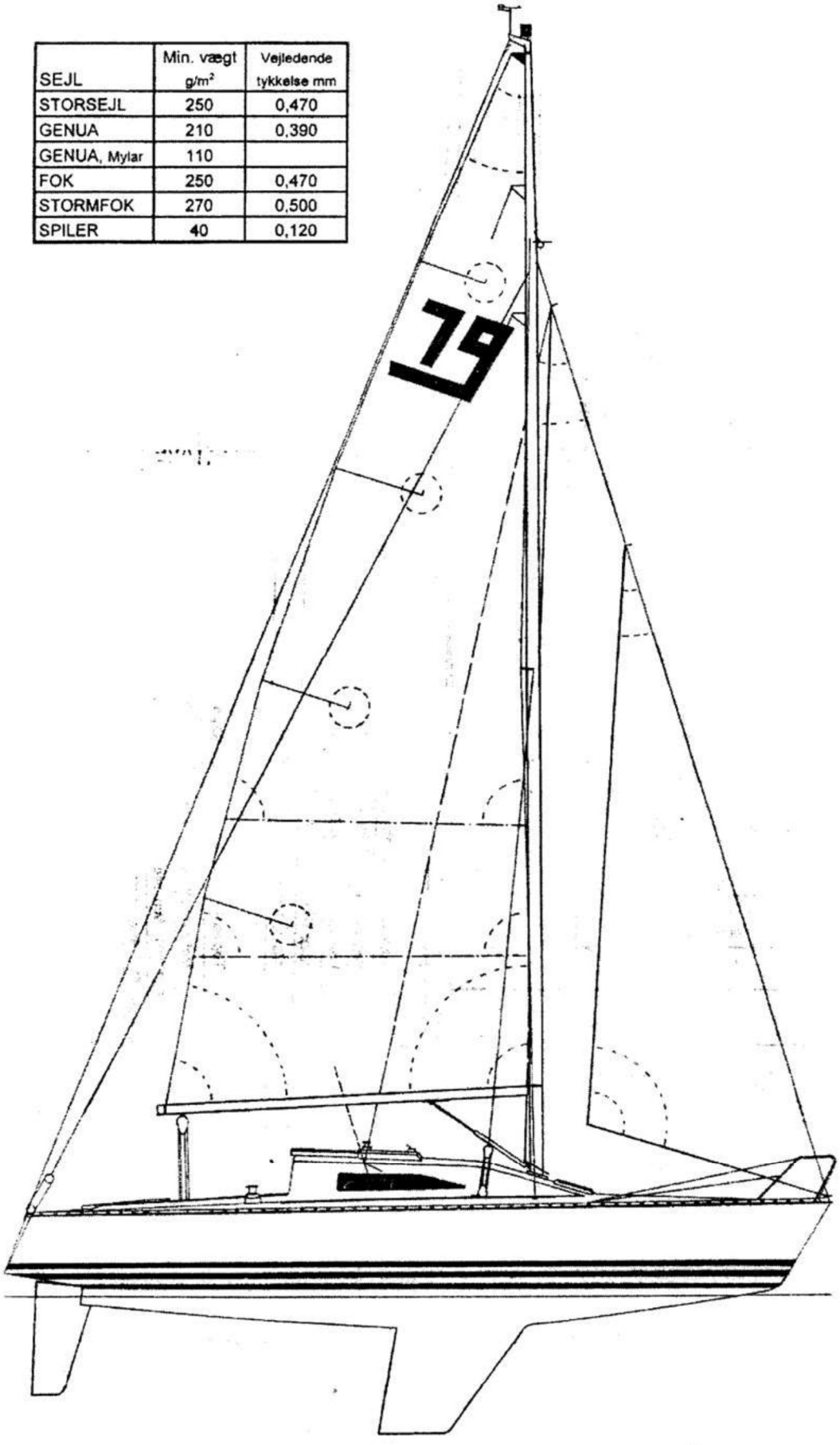


Drawing 3: Rig (to F)

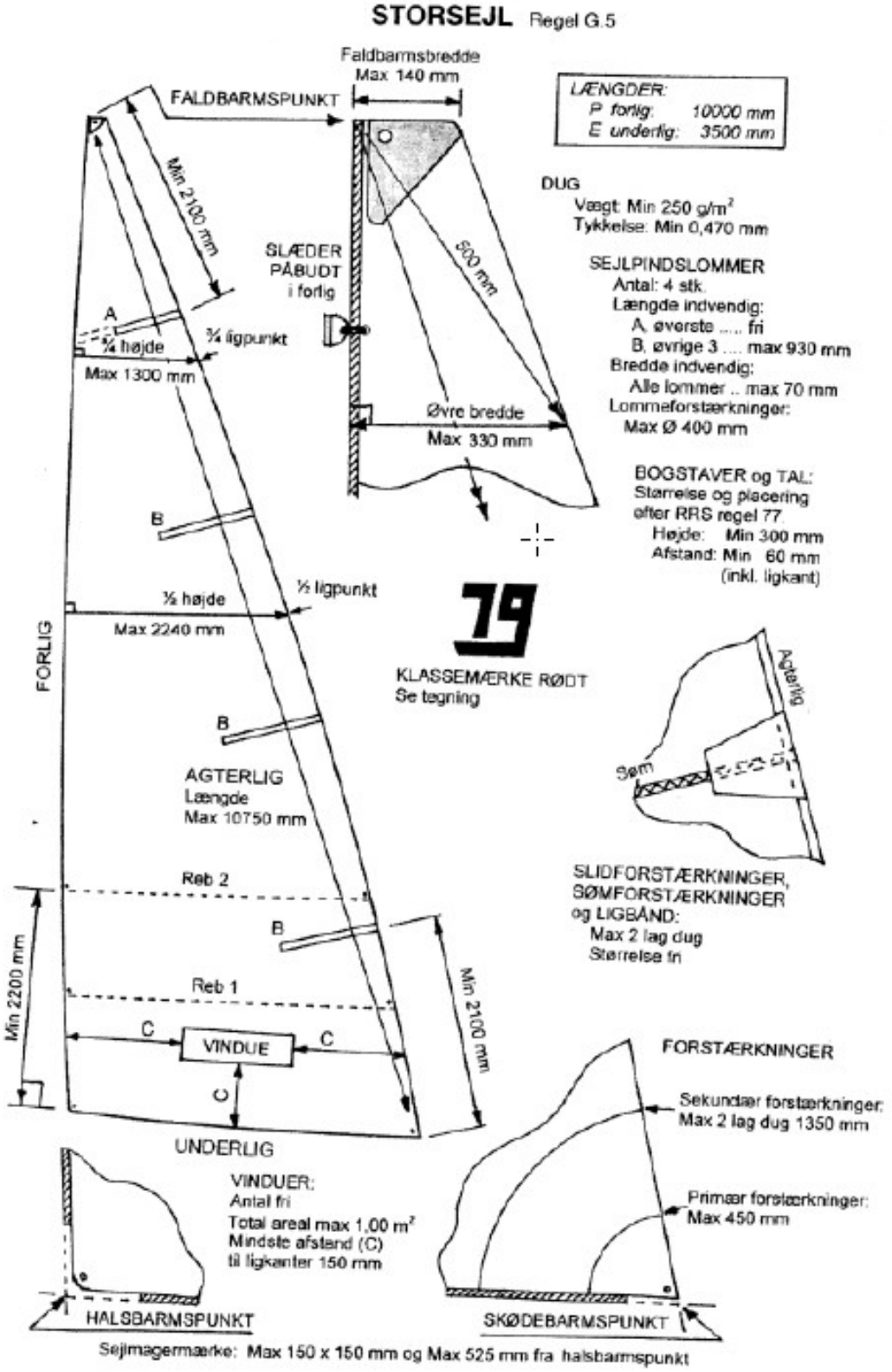


Drawing 4: Sail plan (for G)

SEJL	Min. vægt g/m²	Vejledende tykkelse mm
STORSEJL	250	0,470
GENUA	210	0,390
GENUA, Mylar	110	
FOK	250	0,470
STORMFOK	270	0,500
SPILER	40	0,120

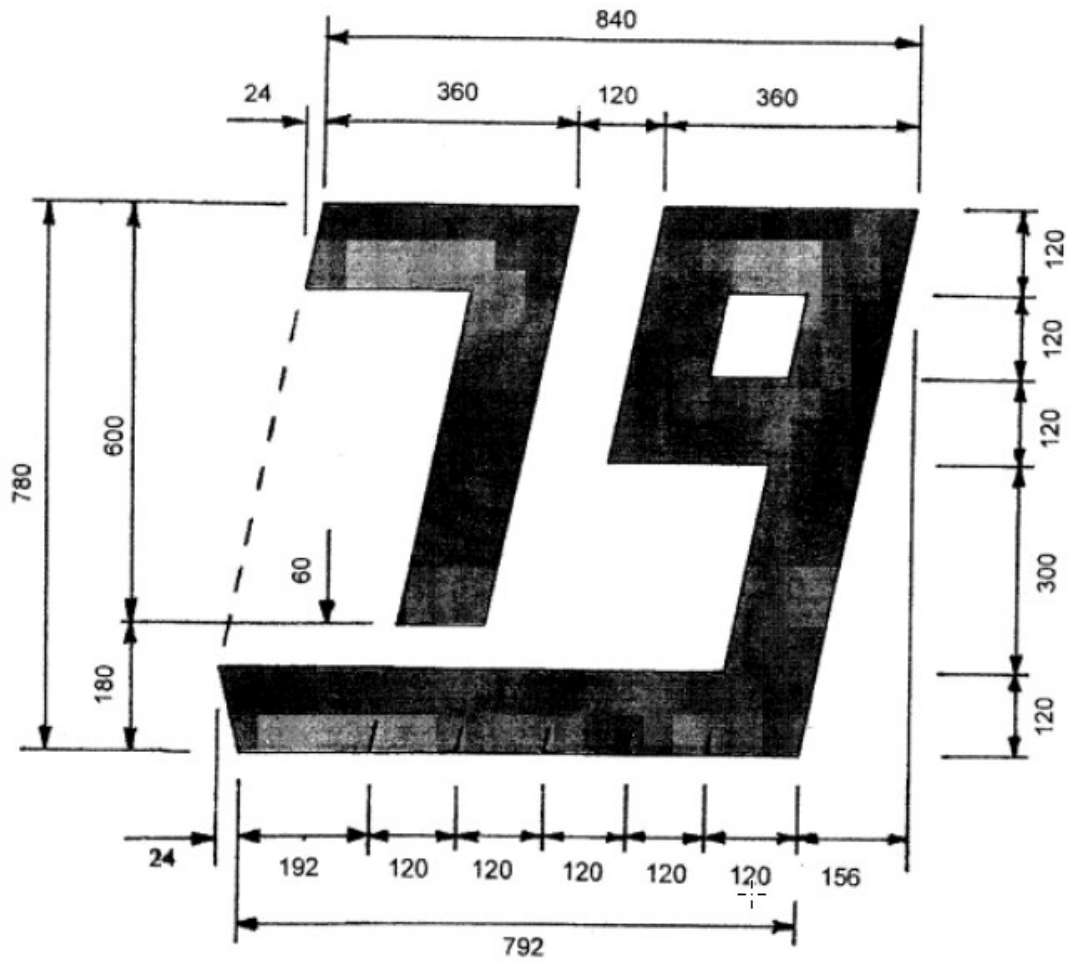


Drawing 5: Mainsail (to G.3.)



Drawing 6: Class insignia (for G.3.1)

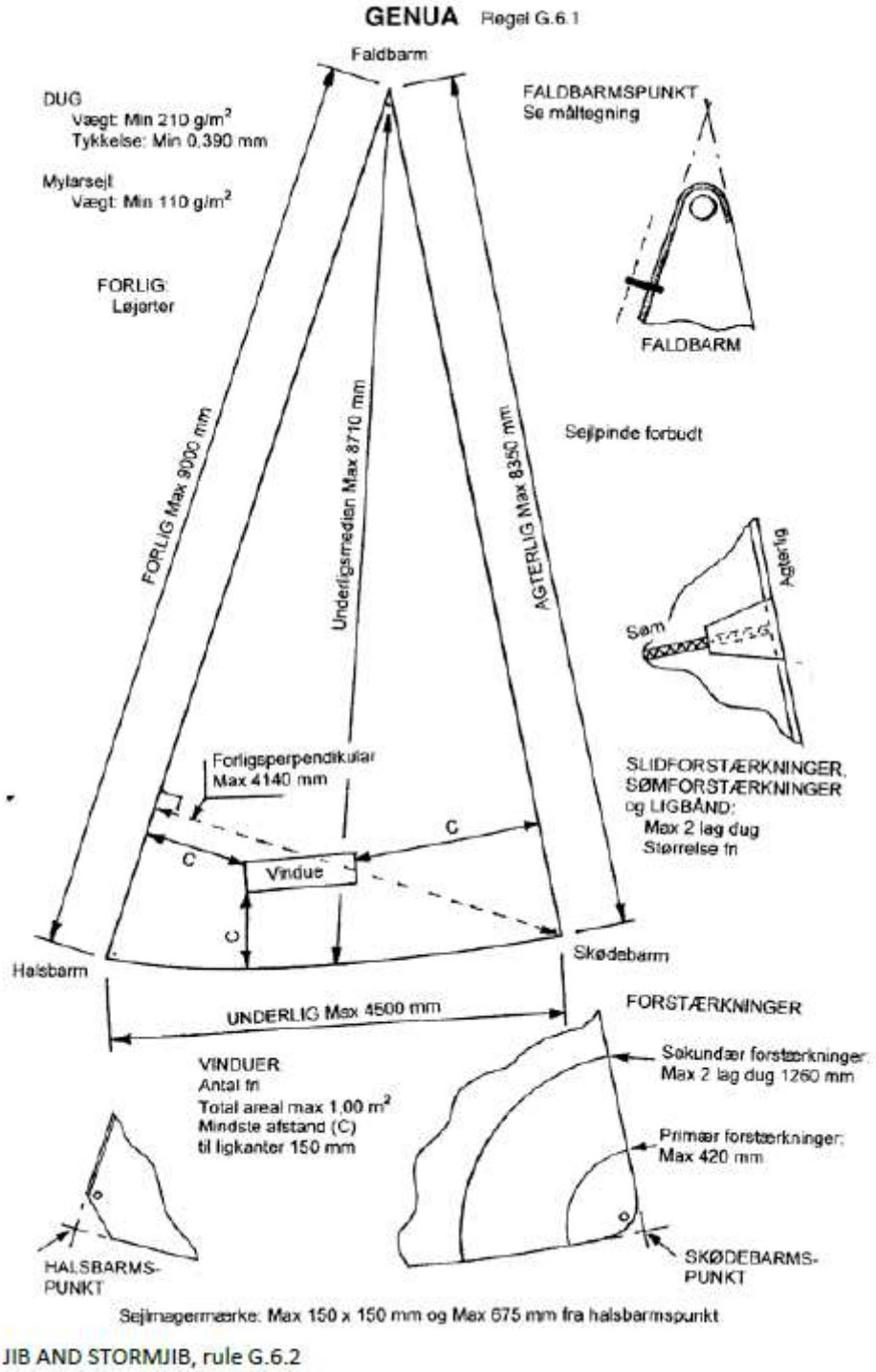
KLASSEMÆRKE Regel G.5.1



KLASSEMÆRKER RØDE

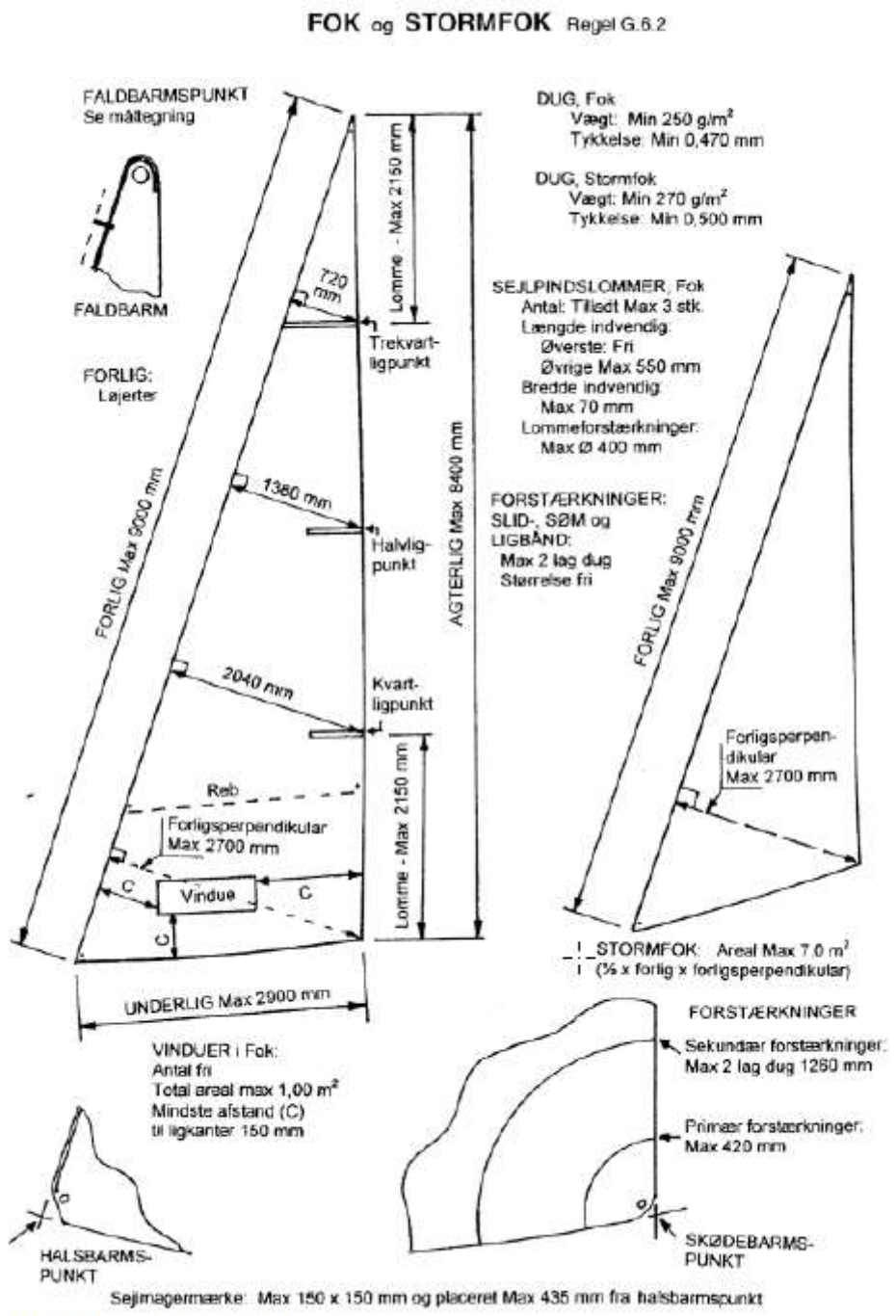
De skal anbringes med et på hver side af sejlet og begge over nationsbogstaver.

Drawing 7: Genoa (to G.4.)



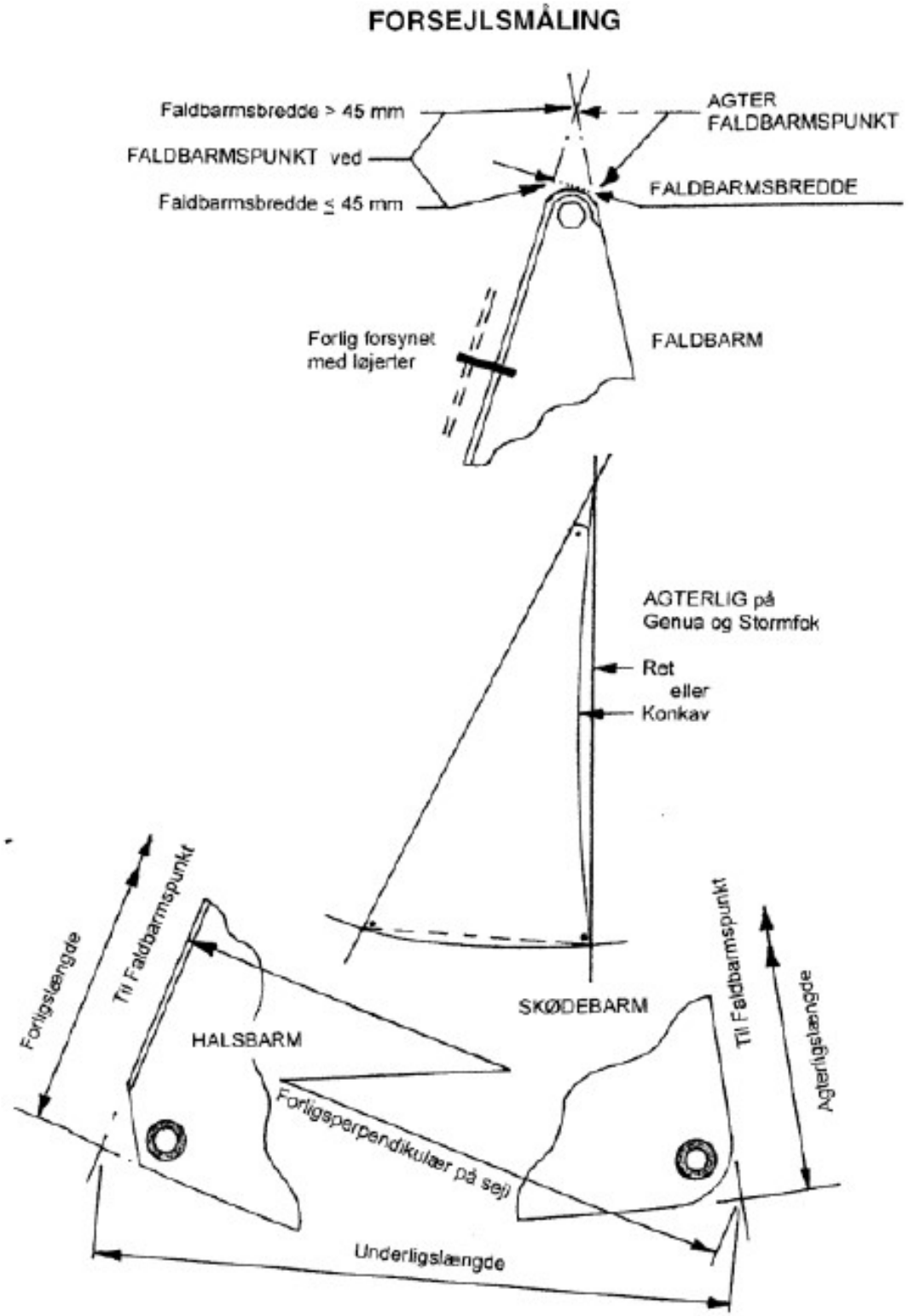
JIB AND STORMJIB, rule G.6.2

Drawing 8: Jib and storm jib (to paragraph G.5. and G.6.)

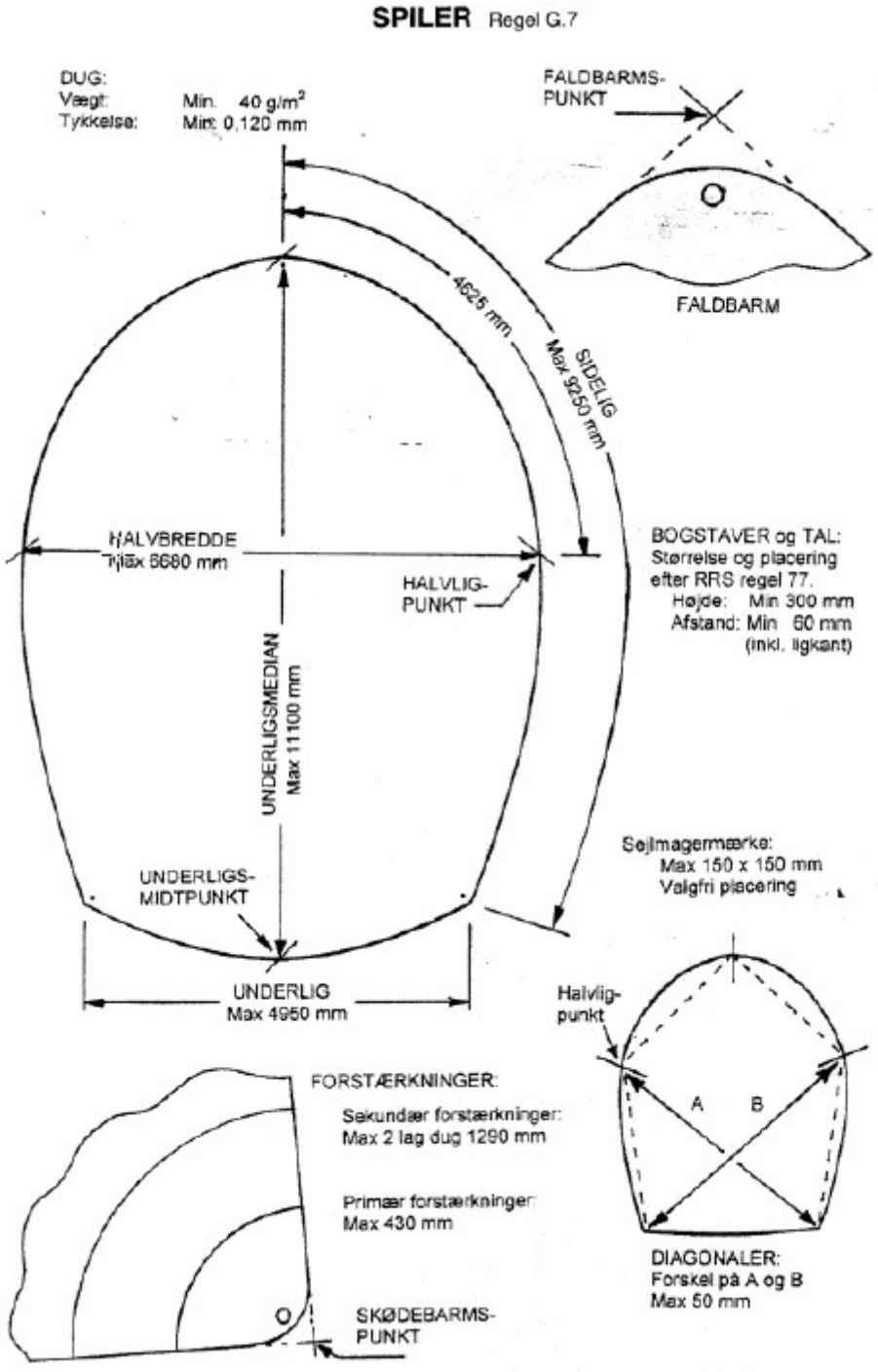


HEADSAILS MEASUREMENT

Drawing 9: Measurement of headsail (to paragraph G.4, G.5 and G.6)



Drawing 10: Spinnaker (to chapter G.7)



Drawing 11: Profile deck layout and accomodation (to section D)