



Certification procedure for recreational vessels ACOBAR/ABNT

PE-398.02

Date: Dec.2017

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0 Introduction

The construction and operation of fiberglass reinforced plastic recreational craft has been growing strongly in recent years. The safety of these vessels is directly related to the care taken during its construction, as well as to the individual safety of all persons involved and to the protection of the environment.

The creation of the ACOBAR Quality Seal program aims to highlight construction criteria that increase the safety of sports and recreational craft, since it establishes important requirements that have been improved due to the experience in service of recreational craft built in fiberglass reinforced plastic.

Therefore, the importance of its use by all the players involved in the production chain, commercialization and use of recreational craft is growing.

1 Objective

This procedure establishes parameters for the issuing of the ACOBAR seal for recreational craft built in fiberglass reinforced plastic, with a length of 24 m or less.

2 References

The following documents contain provisions which, when quoted in this text, constitute valid requirements for this procedure. For dated references, only the issues cited apply. For undated references, the latest editions of that document (including amendments) apply.

- ABNT NBR 14574 - Recreational craft in fiberglass reinforced plastic - Requirements for Construction
- ISO 13297 - Small craft - Electrical systems – Alternating current installations
- ISO 10133 - Small craft - Electrical systems – Extra-low-voltage d.c. installations
- ISO 10239 - Small craft - Liquefied petroleum gas (LPG) systems
- ISO 10088 - Small craft - Permanently installed fuel systems
- ISO 21487 - Small craft - Permanently installed petrol and diesel fuel tanks
- ISO 11105 - Small craft - Ventilation of petrol engine and/or petrol tank compartments
- ISO 14945 - Small Craft - Builder's Plate
- ISO 11192 - Small craft - Graphical symbols
- ISO 15084 - Small craft - Anchoring, mooring and towing - Strongpoints
- ISO 11812 - Small craft - Watertight cockpits and quick-draining cockpits
- ISO 9093-2 - Small craft - Seacocks and through-hull fittings - Part 2: Non-metallic
- ISO 9094 - Small craft - Fireprotection
- ISO 15083 - Small craft - Bilge-pumping systems
- ISO 13929 - Small craft - Steering gear – Geared link systems
- ISO 10240 - Small craft - Owner's Manual
- ISO 14945 - Small Craft - Builder's Plate



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N-03/ DPC - Rules of the Maritime Authority for amateurs, sports and recreational craft and for the registration and operation of marinas, clubs and nautical sports entities.

M 28/DHN - Maritime Authority standards for navigation and nautical charts.

RIPEAM - Convention on the International Regulations for Preventing Collisions in Sea 1972.

PE-004 - Certification of management systems

PG-02 - Conformity assessment

3 Definitions

For the purposes of this procedure, the definitions contained in the reference documents cited in item 2 and the other definitions below are adopted:

3.1 Structure in solid laminates

Structures in solid laminates are formed by a PRFV (plastic reinforced fiberglass) surface comprised between longitudinal and transverse PRFV reinforcements.

3.2 Structure in sandwich core material

The sandwich core laminate structures are formed in three parts, two layers of FRP are laminated on both sides of a low-density core material. The mechanical properties and proportions of the components of the structure should be such that, with the sandwich laminate being side loaded, normal forces are supported by the PRFV faces and the shear forces by the core material. There should be an efficient bonding between the faces and the core material.

4 Acronyms

The acronyms used in the text of this procedure are the following:

ABNT – Brazillian Association of Technical Norms;

NBR – Brazillian Norm;

GSI – Systems Certification Management;

RAT – Technical Activity Report;

PAT – Technical Activity Plan;

5 Requirement of the certification process

5.1 Request for technical-commercial proposal

Follows according to item 5.1 of PE-004 Certification of management systems.



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5.2 Sizing

The time required to perform the certification, maintenance and renewal audits will be calculated according to the size of the vessel (classified in families), number of sites involved, number of shifts and number of employees.

Families	Length of the vessel	
	Feet (ft)	Meters (m)
01	16 to 26	4,88 to 7,92
02	27 to 32	8,23 to 9,75
03	33 to 42	10,05 to 12,80
04	43 to 50	13,10 to 15,24
05	51 to 78	15,54 to 23,77

Products belonging to these families make up the scope of the ACOBAR / ABNT program.

5.3 Certification Process Opening

Follows according to item 5.4 of PE-004 Certification of management systems.

The following documents are required:

- Descriptive report of the vessel (Document describing and defining, in addition to all dimensions, all components of the vessel and their characteristics, sizing, minimum and maximum engine power, capacities, etc.).
- Print/Layout of the main systems on the vessel: Hydraulic, electric, fuel, fire extinguisher;
- Hull/deck lamination schedule;
- Structural details;
- Resistance x Powering running test/calculations;
- ART (Technical Report) of the vessel from the responsible naval engineer;
- Company`s Operational and Environmental licenses, inspection report from the fire department, articles of incorporation and CNPJ (National Register of Legal Entities).

5.4 Certification Audit

The audit team, designated by ABNT, performs the certification audit at the organization's premises and at the places where the activities of the requested certification scope are performed.

The certification audit should cover the following aspects:

5.4.1 Management system requirements

If the manufacturer has the quality management system certified by the ABNT or another certification body accredited by an IAF mutual recognition agreement, an audit of the quality management system is not required. In case the certification has been granted by another certification body, ABNT shall request copies of the reports of the audits performed, treatment of the nonconformities found, as well as information on the suspension or cancellation of the certification, to confirm the maintenance of the quality management system of the manufacturer, ABNT also needs to confirm if this quality management certification covers in its scope the products subjected to the vessel certification.



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If the manufacturer's certification is accepted by ABNT, but, in the meantime, issues are detected in the quality management system during the product audit, ABNT may also point to nonconformities in the quality management system.

If the manufacturer does not have a quality management system in place, the manufacturer shall demonstrate compliance throughout the entire process with the requirements listed below:

5.4.1.1 Documents control

The manufacturer shall ensure that all documents necessary to produce the product are approved, updated, distributed and controlled, avoiding the use of obsolete documents.

5.4.1.2 Records control

The manufacturer shall keep records of the controlling tools and test reports that influence the quality of the product.

5.4.1.3 Training

The manufacturer must determine the minimum training requirements to perform the tasks inherent to the manufacturing, ensuring the quality of the product.

5.4.1.4 Corrective action

The manufacturer must take corrective action to eliminate the causes of nonconformities, ensuring that they do not occur again.

5.4.2 Process control requirements

5.4.2.1 Product receipt control

The manufacturer shall establish and implement inspection and verification upon receipt of products from its suppliers to ensure that they meet the specified requirements.

5.4.2.2 Production control

The manufacturer must execute the production using appropriate equipment, implementing measurement and monitoring tools, providing work instructions and clear information describing the characteristics of the product.

5.4.2.3 Identification and traceability of the product

The manufacturer shall establish a means of identifying the product throughout its production and after delivery, for further warranty purposes.

5.4.2.4 Inspection and testing of products

The manufacturer shall establish and implement inspection and verification during and after production to ensure that the product characteristics are being met. Nonconforming products must be retained and corrected, and the cause of nonconformity must be identified and eliminated. The product should only be released when it meets the requirements. The audited organization shall contract Laboratories accredited by Cgcre within the scope of the tests specified in the product procedure.

In the case of non-accredited laboratories, ABNT must register, through supporting documents, the reasons that led it to select the laboratory in question.



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For the definition of the laboratories, the order of priority below must be considered:

1- laboratory designated by Inmetro;
2- laboratory of 3rd part, domestic or out of the country, accredited by Inmetro/Cgcre or signatory to mutual recognition agreements ILAC or IACC, entirely in the specific scope;
3- laboratory of 1st part, domestic or out of the country, accredited by Inmetro/Cgcre or signatory to mutual recognition agreements ILAC or IACC, entirely in the specific scope;
4- laboratory of 3rd part, domestic or out of the country, accredited by Inmetro/Cgcre or signatory to mutual recognition agreements ILAC or IACC, partially (70% of the tests, at least) in the specific scope;
5- laboratory of 1st part, domestic or out of the country, accredited by Inmetro/Cgcre or signatory to mutual recognition agreements ILAC or IACC, partially (70% of the tests, at least) in the specific scope;
6- laboratory of 3rd part, domestic or out of the country, accredited by Inmetro/Cgcre or signatory to mutual recognition agreements ILAC or IACC, in a different scope, but in the same activity area of the specific scope;
7- laboratory of 1st part, domestic or out of the country, accredited by Inmetro/Cgcre or signatory to mutual recognition agreements ILAC or IACC, in a different scope, but in the same activity area of the specific scope;
8- laboratory of 3rd part, domestic or out of the country, accredited by Inmetro/Cgcre or signatory to mutual recognition agreements ILAC or IACC, in a different scope;
9- laboratory of 1st part, domestic or out of the country, accredited by Inmetro/Cgcre or signatory to mutual recognition agreements ILAC or IACC, in a different scope;
10- laboratory of 3rd part, domestic or out of the country, not accredited;
11- laboratory of 3rd part, domestic or out of the country, not accredited.
3rd part is an external laboratory
1st part is internal evaluation

5.4.2.5 Control of measuring and monitoring devices

The manufacturer shall determine the measurements and monitoring to be carried out on the products as well as the necessary devices, ensuring that they are properly calibrated and used correctly.

Results should be recorded and maintained, and appropriate action must be taken on any affected product or device.

5.4.2.6 Control of nonconforming product

The manufacturer shall ensure that products which do not comply with the specified requirements are identified and controlled to prevent their use or delivery and the manufacturer shall also define the person responsible for taking the necessary action.

5.4.3 Certification

Follows according to item 5.6 of PE-004 Certification of management systems.

The certified organization may only make use of the ACOBAR seal after the formal favorable letter from ABNT.

The ACOBAR seal is associated with the information obtained from the boat manufacturer during the period of validity of the certificate.

5.5 Maintenance of the certification



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Maintenance audits are on-site audits and are necessarily complete audits, where all requirements of the attached checklist to this procedure must be verified. These audits must be carried out to enable ABNT to maintain confidence that the vessels produced during the certification cycle period continue to meet the requirements of this procedure.

The date of the first maintenance audit will be based on the last day of the certification audit. This will be the reference date for scheduling maintenance and renewal audits. Maintenance audits should take place annually.

It is necessary for organizations to formally communicate to ABNT any changes in the conditions of the organization, production process, projects or other issues that gave rise to the certification so that maintenance is evaluated and approved.

During the maintenance audit, the auditor should verify information about the ACOBAR seal granted to the certified boat manufacturer, such as: year in which possible seals were issued, which models were certified, and how many seals were distributed.

5.6 Extraordinary Audits

ABNT may perform extraordinary audits, at any time, based on objective evidence. An extraordinary audit may occur in the following cases:

- a) Follow-up any corrective actions previously agreed, as a result of objective evidences that justify them.
- b) In case of an accident or occurrences reported that may affect the safety of navigation or safety of the users, ACOBAR may, at any time, request a new audit of the product, with the costs/charges being paid by the manufacturer.

5.7 Extension of the scope

Upon receiving the formal request to extend the scope of the certified organization, ABNT will conduct a critical review of the request and determine the required activities to decide whether or not the extension can be granted.

Depending on the result of the review, an audit may be required to verify the implementation of the requirements attached to this procedure for the new intended scope.

5.8 Certification renewal

Follows according to item 5.8 of PE-004 Certification of management systems.

6 Suspension, revocation or reduction of the scope of certification

The process of suspension, revocation or reduction of the scope of certification is performed according to item 10 of the PG-02 - Conformity Assessment.



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7 Appeal and claim

The appeal and claim process, as part of the PG-02, is available on the website through the link: <http://www.abnt.org.br/certificacao/downloads>.

8 Certified products marking

8.1 Identification of the ABNT Compliance Mark

The ABNT compliance mark identification for certified products according to this procedure is represented and displayed below:





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Annex

Mandatory
Recommended
Suggested

14574–Fiberglass Reinforced Plastic Recreational Vessels–General Requirements																		
Requirement	Item	Checked	Comments															
1 - The basic raw materials for the construction on fiberglass reinforced plastic (FRP) must be purchased with a certificate of analysis from the manufacturer regarding to the quality, handling and tolerance of the material. Compliant?	4.1.1	[Yes/No/NA]																
2 – The raw material storage locations must be equipped and arranged in such a way as to have a file/binder with the vendor's technical information on safe handling, storage and proper use, in addition to being readily and easily accessible. Compliant?	4.1.2 a	[Yes/No/NA]																
3 – Fiberglass material storage location must be cleaned and cleared so that the material cannot be contaminated, and packaged fiberglass materials must be protected against moisture. Compliant?	4.1.2 b	[Yes/No/NA]																
4 – Gelcoat, resins, catalysts, hardeners, promoters and accelerators must be stored in a ventilated location at a temperature within the limits recommended by the manufacturers. The resin and gelcoat containers must be arranged in a way to facilitate agitation of the material at the frequency and time recommended by the manufacturer. In addition, the storage time must respect the shelf-life of the product. Compliant? Both environmental and safety / fire-fighting laws requires that the total amount of chemical material reserved in the working environment to be for a maximum of one day of production, all other items must be stored in an appropriate location (chemical warehouse).	4.1.2 c	[Yes/No/NA]																
5 – Fillers, adhesives, and additives should be kept in sealed packages, free from dust and moisture attack, and products susceptible to chemical reactions must be stored at safe distances from each other.	4.1.2 d	[Yes/No/NA]																
6 – Sandwich core material should be stored in dry area and protected from mechanical damage and should be kept inside its packaging protection until the use. Compliant?	4.1.2 e	[Yes/No/NA]																
7 – The structural laminate must have a glass content of at least 30%. Compliant?	4.2	[Yes/No/NA]																
8 – The organization shall verify the properties of the resin materials by means of mechanical tests. Additives or fillers must be considered if its use is intended in production. Compliant?	4.2.1	[Yes/No/NA]																
9 – Additives used in the composition of the vessel shall be in accordance with the manufacturer's recommendations. Compliant?	4.2.1	[Yes/No/NA]																
10 – The properties of the thermosetting resins used for the manufacture must comply with the values in the table below:	4.2.1	[Yes/No/NA]																
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Property</th> <th style="width: 40%;">Test methods</th> <th style="width: 30%;">Tolerance %</th> </tr> </thead> <tbody> <tr> <td>Viscosity (Brookfield)</td> <td>ISO 255 or ISO 2884-1</td> <td>±20</td> </tr> <tr> <td>Monomer content</td> <td>ISO 4901</td> <td>±5</td> </tr> <tr> <td>Geltime</td> <td>ISO 2535</td> <td>±20</td> </tr> <tr> <td>Density</td> <td>ISO 1675 or ISO 2811-1</td> <td>±5</td> </tr> </tbody> </table>				Property	Test methods	Tolerance %	Viscosity (Brookfield)	ISO 255 or ISO 2884-1	±20	Monomer content	ISO 4901	±5	Geltime	ISO 2535	±20	Density	ISO 1675 or ISO 2811-1	±5
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Density	ISO 1675 or ISO 2811-1	±5																
Compliant?																		



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14574–Fiberglass Reinforced Plastic Recreational Vessels – General Requirements																														
Requirement	Item	Checked	Comments																											
<p>11 – The properties and tolerances of cured thermosetting resins used for manufacture and tested according to the specified test method shall comply with the values in the table below:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Property</th> <th>Test method</th> <th>Requirement</th> </tr> </thead> <tbody> <tr> <td>Tensile strength</td> <td>ISO 527-1, ISO 527-4</td> <td>45 MPa min</td> </tr> <tr> <td>Elongation</td> <td>ISO 527-1, ISO 527-4</td> <td>1,5% min</td> </tr> <tr> <td>Flexural strength</td> <td>ISO 178</td> <td>80 MPa min</td> </tr> <tr> <td>Young's modulus</td> <td>ISO 178</td> <td>2700 MPa min</td> </tr> <tr> <td>Thermal distortion temperature</td> <td>ISO 75-1, ISO 75-2 A</td> <td>600 °C (1112 °F) min</td> </tr> <tr> <td>Water absorption</td> <td>ISO 62</td> <td>80 mg max</td> </tr> <tr> <td>Volume contraction</td> <td>ISO 527-1, ISO 527-4</td> <td>Initial value + 5% max</td> </tr> <tr> <td>Barcol hardness</td> <td>EN 59</td> <td>35 min</td> </tr> </tbody> </table> <p>Compliant?</p>	Property	Test method	Requirement	Tensile strength	ISO 527-1, ISO 527-4	45 MPa min	Elongation	ISO 527-1, ISO 527-4	1,5% min	Flexural strength	ISO 178	80 MPa min	Young's modulus	ISO 178	2700 MPa min	Thermal distortion temperature	ISO 75-1, ISO 75-2 A	600 °C (1112 °F) min	Water absorption	ISO 62	80 mg max	Volume contraction	ISO 527-1, ISO 527-4	Initial value + 5% max	Barcol hardness	EN 59	35 min	4.2.1	[Yes/No/NA]	
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<p>12 – Fillers must not be used in the resin. Compliant?</p>	4.2.2	[Yes/No/NA]																												
<p>13 – The fiberglass used in the manufacture of the boat must comply with the tolerance standards presented in accordance with the table below:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Property</th> <th>Test method</th> <th>Requirement</th> </tr> </thead> <tbody> <tr> <td>Max moisture content (percentual)</td> <td rowspan="3" style="text-align: center;">ISO 3344</td> <td style="text-align: center;">0,20%</td> </tr> <tr> <td>Roving continuous</td> <td style="text-align: center;">0,50%</td> </tr> <tr> <td>Fiberglass fabrics</td> <td style="text-align: center;">0,20%</td> </tr> <tr> <td>Fiberglass mat</td> <td rowspan="2" style="text-align: center;">ISO 1889</td> <td rowspan="2" style="text-align: center;">- 5% a + 10%</td> </tr> <tr> <td>Reinforcement tolerance (percentual)</td> </tr> <tr> <td>Roving continuous (Length)</td> <td style="text-align: center;">ISO 3374</td> <td style="text-align: center;">- 5% a + 10%</td> </tr> <tr> <td>Fiberglass mat (Area)</td> <td style="text-align: center;">ISO 3374</td> <td style="text-align: center;">- 5% a + 10%</td> </tr> </tbody> </table> <p>Compliant?</p>	Property	Test method	Requirement	Max moisture content (percentual)	ISO 3344	0,20%	Roving continuous	0,50%	Fiberglass fabrics	0,20%	Fiberglass mat	ISO 1889	- 5% a + 10%	Reinforcement tolerance (percentual)	Roving continuous (Length)	ISO 3374	- 5% a + 10%	Fiberglass mat (Area)	ISO 3374	- 5% a + 10%	4.2.2	[Yes/No/NA]								
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<p>14 – Where unidirectional laminates are used, a balance of the mechanical properties shall be considered to prevent secondary laminate fractures. Compliant?</p>	4.3.1	[Yes/No/NA]																												
<p>15 – Laminates with biaxial or triaxial structures may have their thickness reduced proportionally to the variation of the flexural strength obtained in relation to the structure, but the reduction must not exceed 30%. Compliant?</p>	4.3.2	[Yes/No/NA]																												
<p>16 – All the wood used in nautical construction must be free of defects and must be treated and impregnated with resin. Plywoods must use adhesives for bonding or wood impregnation of water. Compliant?</p>	4.4	[Yes/No/NA]																												



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Fiberglass Reinforced Plastic Recreational Vessels – General Requirements	ABNT NBR 14574	CHECKED	COMMENTS
1 – Does the manufacturer has all the construction precedures on file, properly marked and available when needed? (i.e lamination schedule, construction records, work instructions or equivalent document).	5	[Yes/No/NA]	
2 – Lamination area:			
2.1 – The lamination area is designed and have the capability to meet the requirements from the raw material manufacturer. Also, the lamination area must ensure that the raw material manufacturer standards for handling, safety, lamination techniques and curing of the material can be met. Compliant?	5.1	[Yes/No/NA]	
2.2 - Temperature and humidity controls are performed with appropriate measuring instruments in the lamination area.	5.1	[Yes/No/NA]	
2.3 – Or, humidity and temperature are recorded at least 3 times (before, during and after lamination, daily)?	5.1	[Yes/No/NA]	
2.4 - Are these records of measurements archived for at least 2 years?	5.1	[Yes/No/NA]	
2.5 – Does the boat manufacturer has a sanding/holecut booth with integrated filter to an exhaust system?	Ref. ACOBAR	[Yes/No/NA]	
2.6 - Does the boat manufacturer take care so no direct incidence of sunlight on the laminates occurs?	5.1	[Yes/No/NA]	
2.7 – Is the lamination location free of dust, debris or other type of contamination, whenever is possible?	5.1	[Yes/No/NA]	
3 – Fabrication process:			
3.1 - Are precautions being taken so that operators do not step directly on the laminates or on the surfaces where they are laminating?	5.1	[Yes/No/NA]	
3.2 – The plastic reinforced fiberglass laminates are produced following one, or a combination of these methods: Hand lay-up, spray-up or vaccum infusion?	5.2	[Yes/No/NA]	
3.3 - The gel time of the resin and the curing profile are within the limits recommended by the resin manufacturer or others established in this checklist. Compliant?	5.2	[Yes/No/NA]	
3.4 – Is the reinforcement material applied following the lamination schedule and following the proper orientation, meeting the the desing and prints instructions?	5.2.1	[Yes/No/NA]	
3.5 – Is the first reinforcement, after the gelcoat, a fiberglass mat or equivalent material, which reduces the possibility of hull/deck surface lamination issues?	5.2.1	[Yes/No/NA]	
3.6 Is the time between the execution of each lamination layer within the limits recommended by the raw material manufacturer?	5.2.1a	[Yes/No/NA]	
3.7 - Is sufficient time given to avoid excessive heat generation in thicker laminates?	5.2.1a	[Yes/No/NA]	
3.8 - Are the curing systems selected according to the recommendations of the resin manufacturer?	5.2.1b	[Yes/No/NA]	
3.9 – Is the curing time before demolding the parts being determined by the cure rate of the laminate?	5.2.1b	[Yes/No/NA]	
3.10 - The transitions in the thickness of the laminate are gradual along the length or the transitions are made on a lenght not less than eight times the thickness of the thicker laminate?	5.2.1c	[Yes/No/NA]	
3.11 – The fiberglass materials (mats and fabrics) are layed-up with a minimum overlap of 50 mm, and the minimum distance between overlaps is 100 mm. Compliant?	5.2.1d	[Yes/No/NA]	



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3.12 - In the spray-up process, is special attention given to the production arrangement, the production equipment, the quality control and the thickness of the laminate?	5.2.2	[Yes/No/NA]	
3.13 - Does the catalyst dosing system ensure homogeneous feed for the resin used?	5.2.2a	[Yes/No/NA]	
3.14 - The chopped fiberglass must have a length of at least 20 mm. Compliant?	5.2.2a	[Yes/No/NA]	
3.15 – Are the laminate layers “roller” right after the spray up application?	5.2.2b	[Yes/No/NA]	
3.16 – Only qualified lamination operators use the spray-up gun and they follow a process established by the manufacturer?	5.2.2b	[Yes/No/NA]	
3.17 – In the vaccum lamination process, the fiberglass material is filled-up with resin only after being compacted by a vaccum bag or flexible mold. Compliant?	5.2.3b	[Yes/No/NA]	
4 – Secondary lamination			
4.1 – In the secondary lamination, is the first step fiberglass mat?	5.3	[Yes/No/NA]	
4.2 - As superfícies são tratadas de modo que fiquem isentas de poeira ou qualquer outro tipo de contaminação?	5.3	[Yes/No/NA]	
4.3 - Are the surfaces treated so that they are free of dust or other contamination?	5.3	[Yes/No/NA]	
5 – Sandwich core materials			
5.2 – Every joint between the laminate and the core material to be filled up with resin, no voids. Compliant?	5.4b	[Yes/No/NA]	
5.3 - Open cell sandwich core materials having mechanical properties compatible with the requirements of table 6, item 6 are being impregnated with resin prior to use?	5.4c	[Yes/No/NA]	
5.4 - The core material to be free of dust and contamination prior to its application to the laminate.	5.4d	[Yes/No/NA]	
5.5 - Is the resin compatible with the core material?	5.4d	[Yes/No/NA]	
5.6 - The maximum temperature that the sandwich core material can be processed is compatible as specified by the material manufacturer.	5.4e	[Yes/No/NA]	
5.7 - The adhesives used to glue the core material have low exotherm properties and have elongation greater than the elongation of the faces of the laminate and less than the elongation of the core material?	5.4f	[Yes/No/NA]	
6 - Inspections			
6.1 - Are the inspections on the structural laminate being done according to the construction procedures of the boat?	5.5	[Yes/No/NA]	
6.2 - In the lamination process, visual inspections are to be performed frequently. Compliant?	5.5	[Yes/No/NA]	
6.3 - During the inspection the following aspects are verified:	5.5		
6.3.1 - The surface of the mold, prior to the application of the release agent and gelcoat.	5.5a	[Yes/No/NA]	



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Fiberglass Reinforced Plastic Recreational Vessels–General Requirements	ABNT NBR 14574	CHECKED	COMMENTS
6.3.2 – The thickness, quality and catalysis of the gecoat before laminating the first layer.	5.5b	[Yes/No/NA]	
6.3.3 – The thickness of the gelcoat is verified with proper thickness gauge.	5.5b	[Yes/No/NA]	
6.3.4 – The formulation, mixing, amount and type of resin, catalyst and additive accelerator is verified,	5.5c	[Yes/No/NA]	
6.3.5 – Gelcoat other than the ones used in enclosed spaces is for nautical / naval use proven by its manufacturer. Compliant?		[Yes/No/NA]	
6.3.6 – Lamination is in accordance with the lamination schedule and with the overlaps.	5.5d	[Yes/No/NA]	
6.3.7 – Fiberglass-Resin ratio?	5.5e	[Yes/No/NA]	
6.3.9 - Is the Barcol hardness being measured and recorded?	5.5g	[Yes/No/NA]	
6.4 - Is visual inspection performed after the lamination is completed, so that apparent defects can be corrected before demolding?	5.5h	[Yes/No/NA]	
7 – Quality control			
7.1 – Has the manufacturer established a quality control system?	5.6	[Yes/No/NA]	
7.2 - This quality control system aims to measure and verify compliance with construction plans and processes, including: inspection of raw materials, gel time control; quantity of catalyst, record of the resin and fiberglass ratio, measurement of the thickness on the cured laminate, record of the mechanical properties of the laminate and quality control report.	5.6	[Yes/No/NA]	
8 – Test methods:	5.7		
8.1 – All the resins in the process are tested to verify water absorption characteristics?	5.7.1	[Yes/No/NA]	
8.2 - Is the Barcol hardness being measured before demolding?	5.7.2	[Yes/No/NA]	
8.3 – Tests to determine the fiberglass/resin ratio from samples taken from the hull. To be performed.	5.7.3	[Yes/No/NA]	
8.4 - Tests are performed to determine the mechanical properties of the laminates manufactured in the same condition of the hull, every 12 months, as follows: a) Test Methods for Flexural Properties (ASTM D790); b) Test Method for Tensile Properties (ASTM D638); c) Test Method for Compressive Properties (ASTM D695); d) Test Method for In-Plane Shear Strength (ASTM D3846); e) Test Method for Shear Properties of Sandwich Core Materials (ASTM C 273).	5.7.4	[Yes/No/NA]	
9 - If the company does not have a Quality Management System implemented, items 5.4.1 and 5.4.2 shall be verified.			



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NBR 14574 – STRUCTURAL DESIGN IN FRP																											
In this section the requirements for structures in solid and sandwich core laminates are described.																											
Requirement	Item	Checked	Comments																								
1 – Fiberglass reinforcements must represent, at least, 30% of the total laminate mass.	6.1.1	[Yes/No/NA]																									
2 - The difference between the mechanical properties in the two main directions parallel to the edges of the laminate, known as orthotropy, can not be greater than than 20%.	6.1.2	[Yes/No/NA]																									
3 - The maximum normal stress acting on the solid laminate and the maximum relative deflection of the elements on the structure cannot exceed the values indicated in the table below. Table 5 – Maximum permissible normal stress and relative deflection on solid laminate structures <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 25%;">Location</th> <th style="width: 25%;">Normal stress a</th> <th style="width: 25%;">Relative deflection (w/b)</th> </tr> </thead> <tbody> <tr> <td>Keel/bottom</td> <td style="text-align: center;">0,25 Tu</td> <td style="text-align: center;">1 %</td> </tr> <tr> <td>Sides</td> <td style="text-align: center;">0,25 Tu</td> <td style="text-align: center;">0,9 %</td> </tr> <tr> <td>Deck</td> <td style="text-align: center;">0,25 Tu</td> <td style="text-align: center;">0,9 %</td> </tr> <tr> <td>Hartop/ceiling</td> <td style="text-align: center;">0,25 Tu</td> <td style="text-align: center;">0,9 %</td> </tr> <tr> <td>Bulkheads</td> <td style="text-align: center;">0,25 Tu</td> <td style="text-align: center;">0,9 %</td> </tr> </tbody> </table> Tu is the breaking stress of the solid laminate structure, w is the deflection [mm], and b is short dimension on the solid laminate [mm].	Location	Normal stress a	Relative deflection (w/b)	Keel/bottom	0,25 Tu	1 %	Sides	0,25 Tu	0,9 %	Deck	0,25 Tu	0,9 %	Hartop/ceiling	0,25 Tu	0,9 %	Bulkheads	0,25 Tu	0,9 %	6.1.3	[Yes/No/NA]							
Location	Normal stress a	Relative deflection (w/b)																									
Keel/bottom	0,25 Tu	1 %																									
Sides	0,25 Tu	0,9 %																									
Deck	0,25 Tu	0,9 %																									
Hartop/ceiling	0,25 Tu	0,9 %																									
Bulkheads	0,25 Tu	0,9 %																									
NBR 14574 – STRUCTURAL DESIGN IN FRP																											
In this section the requirements for structures in solid and sandwich core laminates are described.																											
Requirement	Item	Checked	Comments																								
1 - For external applications such as hull, decks, superstructures, sandwich core materials must have a temperature resistance of at least 80 °C (176 °F) and for other parts, must have a resistance of at least 60 °C (140 °F).	6.2	[Yes/No/NA]																									
2 - Fiberglass reinforcements on sandwich core laminates must represent, at least, 40% of the total laminate mass.	6.2.1	[Yes/No/NA]																									
3 - The maximum stress acting on the faces of the sandwich laminate, the maximum shear stress acting on the core material and the maximum relative deflection of the elements on the structure cannot exceed the values indicated in the table below. Tabela 7 – Maximum permissible normal stress and relative deflection on sandwich core laminate structures. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 20%;">Location</th> <th style="width: 20%;">Normal stress a</th> <th style="width: 20%;">Shear stress b</th> <th style="width: 20%;">Relative deflection (w/b)</th> </tr> </thead> <tbody> <tr> <td>Keel/bottom</td> <td style="text-align: center;">0,30 Tu</td> <td style="text-align: center;">0,35 Vc</td> <td style="text-align: center;">1 %</td> </tr> <tr> <td>Sides</td> <td style="text-align: center;">0,30 Tu</td> <td style="text-align: center;">0,40 Vc</td> <td style="text-align: center;">1 %</td> </tr> <tr> <td>Deck</td> <td style="text-align: center;">0,30 Tu</td> <td style="text-align: center;">0,40 Vc</td> <td style="text-align: center;">1 %</td> </tr> <tr> <td>Hartop/ceiling</td> <td style="text-align: center;">0,30 Tu</td> <td style="text-align: center;">0,40 Vc</td> <td style="text-align: center;">1 %</td> </tr> <tr> <td>Bulkheads</td> <td style="text-align: center;">0,30 Tu</td> <td style="text-align: center;">0,40 Vc</td> <td style="text-align: center;">1 %</td> </tr> </tbody> </table> Tu is the breaking stress of the sandwich core laminate structure Vc is the shear stress of the core material. w is the deflection [mm], and b is short dimension on the sandwich core laminate [mm].	Location	Normal stress a	Shear stress b	Relative deflection (w/b)	Keel/bottom	0,30 Tu	0,35 Vc	1 %	Sides	0,30 Tu	0,40 Vc	1 %	Deck	0,30 Tu	0,40 Vc	1 %	Hartop/ceiling	0,30 Tu	0,40 Vc	1 %	Bulkheads	0,30 Tu	0,40 Vc	1 %	6.2.3	[Yes/No/NA]	
Location	Normal stress a	Shear stress b	Relative deflection (w/b)																								
Keel/bottom	0,30 Tu	0,35 Vc	1 %																								
Sides	0,30 Tu	0,40 Vc	1 %																								
Deck	0,30 Tu	0,40 Vc	1 %																								
Hartop/ceiling	0,30 Tu	0,40 Vc	1 %																								
Bulkheads	0,30 Tu	0,40 Vc	1 %																								



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<p>4 - The hull bottom constructed of solid or sandwich laminates shall be longitudinally or transversely reinforced, or by the combination of these two. The longitudinal reinforcements must be continuous, crossing the transverse reinforcements, and their ends should be laminated to other structural elements of the hull. Longitudinal reinforcements shall be supported by bulkheads. No structural element (longitudinal or transverse) can abruptly end on the hull or side laminate. There should always be another structural element that distributes the load over the laminate of the hull or side. There must always be another structural element that distributes the stresses relative to the other elements of the structure. The laminates shall always not end abruptly to enable a smooth transition between thicknesses and structural elements.</p>	6.3.1	[Yes/No/NA]															
<p>5 – Stringers, bulkheads and whale-bones must be continuous, and its ends should be laminated to other structural elements of the hull.</p>	6.3.2	[Yes/No/NA]															
<p>6 - The hull side constructed of solid or sandwich laminates shall be longitudinally or transversely reinforced, or by the combination of these two. The continuity of the reinforcements shall be maintained through the reinforcements of the bottom and the main deck. There cannot be structural discontinuity between reinforcements.</p>	6.3.3	[Yes/No/NA]															
<p>7 – The transom for outboards or sterndrives must be designed and constructed in sandwich core materials, high resistance to compression and shear as well as resistance to the water shall be taken into account when selecting the transom core material. The manufacturer must ensure the flatness of the entire mounting area for the propulsion system.</p> <p>The inner and outer layers must overlap on the side and bottom lamination along the perimeter of the transom.</p> <p>For outboard engines, the thickness of the transom shall not be less than that indicated in the table below and, alternatively, when using sterndrive engines, the parallelism between the inner and outer surfaces of the transom shall be observed and the transom thickness must be at least 51 mm.</p> <p>Tabela 8 – Minimum transom thickness for outboard installation.</p> <table border="1" data-bbox="204 1370 970 1621"> <thead> <tr> <th>Engine Power [HP]</th> <th>Minimum transom thickness [mm]</th> </tr> </thead> <tbody> <tr> <td>3 < P ≤ 25</td> <td>25</td> </tr> <tr> <td>25 < P ≤ 40</td> <td>30</td> </tr> <tr> <td>40 < P ≤ 80</td> <td>35</td> </tr> <tr> <td>80 < P ≤ 130</td> <td>40</td> </tr> <tr> <td>130 < P ≤ 250</td> <td>45</td> </tr> <tr> <td>P > 250</td> <td>50</td> </tr> </tbody> </table>	Engine Power [HP]	Minimum transom thickness [mm]	3 < P ≤ 25	25	25 < P ≤ 40	30	40 < P ≤ 80	35	80 < P ≤ 130	40	130 < P ≤ 250	45	P > 250	50	6.3.4	[Yes/No/NA]	
Engine Power [HP]	Minimum transom thickness [mm]																
3 < P ≤ 25	25																
25 < P ≤ 40	30																
40 < P ≤ 80	35																
80 < P ≤ 130	40																
130 < P ≤ 250	45																
P > 250	50																
<p>8 – The main deck shall have a thickness capable of providing flexural stiffness with the necessary bending or having transverse or longitudinal reinforcements. The longitudinal reinforcements must be preferable continuous, crossing the transverse reinforcements. their ends should be laminated to other structural elements of the hull.</p>	6.3.5	[Yes/No/NA]															
<p>9 – Archs, ceilings and hatches shall be reinforced horizontally. Vertical parts in solid laminates must have vertical reinforcements that coincide with lower deck reinforcements or bulkheads. Door, window, skylight and hatches shall be reinforced all around.</p>	6.3.6	[Yes/No/NA]															
<p>10 - The bulkheads shall be continuous transverse structures secured through laminates to the bottom, side and deck to provide transverse and torsional resistance to the vessel. Watertight bulkheads shall prevent the passage of water to the height of the water line in the maximum load condition.</p>	6.3.7	[Yes/No/NA]															



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NBR 14574 – STRUCTURAL DESIGN IN FRP			
In this section the requirements for structures in solid and sandwich core laminates are described.			
Requirement	Item	Checked	Comments
11 - Structural continuity must be maintained even where there is changes in thickness or shape. Any thickness change must be made gradually. At the transition from sandwich core laminates to solid laminates, the core material must be bevelled. The ends of all structural elements must provide effective bonding and transmit loads to the other support elements.	6.4.1	[Yes/No/NA]	
12 – Holecut edges and opening in sandwich core material laminate must be sealed with resin and fiberglass. Large openings should have rounded corners to avoid stress concentration.	6.4.2	[Yes/No/NA]	
13 – Sharp angle bends may serve as local reinforcements (i.e., chine), but the local stresses cannot exceed the maximum permissible stress and relative deflection indicated in Tables 5 and 7.	6.4.3	[Yes/No/NA]	
14 – Propulsion engine(s) mounts must be supported by longitudinal beams, with local reinforcements for the engine and the drive mounts. If the engine is mounted directly over the bilge stringers, these must be interconnected in the transverse direction and have their thickness increased. The engine mounting surface must be sized in such way that the engine loads can be properly transferred to the hull bottom.	6.4.5	[Yes/No/NA]	
15 - Where masts are installed, transverse reinforcements or bulkheads shall be provided to transmit lateral forces to the hull. Deck area around the masts must be reinforced and sandwich core material laminates to be used. Core material must have high compressive resistance or solid laminates.	6.4.6	[Yes/No/NA]	
16 – Keels and ballasts must be fixed to the hull structure using stainless steel or equivalent bolts with proven corrosion resistance. The number of screws and their diameters must be determined by the geometry and mass of the keel as well as the mechanical properties of the material of the screws. Internally to the hull, stainless steel washers and locking nuts must be installed. The bottom area along which the keel is attached must have its thickness increased and have transverse and longitudinal reinforcements that guarantee local strength.	6.4.7	[Yes/No/NA]	
17 - Hull and deck areas where the installation of a hardware is required, the laminate must have its thickness increased for a better load distribution, must be reinforced with extra layers, naval plywood, high density foam or metal backing plate. All hardware to be secured with through bolts and sealing material to be applied to prevent water from entering these locations.	6.4.8	[Yes/No/NA]	
18 - Metal fastening must be obtained by means of screws, rivets or other type of connection with galvanic compatibility and high resistance to corrosion.	6.4.9	[Yes/No/NA]	



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ISO 10088 – Fuel Systems			
Requirement	Item	Checked	Comments
1 - Individual components of the fuel system, and the fuel system, shall be designed to withstand the combined conditions of pressure, vibration, shocks, corrosion and movement encountered under normal operating conditions and storage.	4.1.1	[Yes/No/NA]	
2 – Each component of the fuel system, and the fuel system as a whole, shall be capable of operation within an ambient temperature range of – 10 °C to + 80 °C, without failure or leakage, and be capable of being stored without operation within an ambient temperature range of – 30 °C to + 80 °C, without failure or leakage.	4.1.2	[Yes/No/NA]	
3 – All materials used in the fuel system shall be resistant to deterioration by its designated fuel and to other liquids or compounds with which it may come into contact under normal operating conditions, e.g. grease, lubricating oil, bilge solvents and sea water.	4.1.3	[Yes/No/NA]	
4 – Any metal or metallic plated component of a petrol tank and its filling system that is in contact with petrol shall be grounded so that its resistance to the craft's ground is less than 1 Ω.	4.1.6	[Yes/No/NA]	
– Fuel filling systems shall be designed to avoid blowback of fuel through the fill fitting. Fuel systems shall be tested in accordance with the following: There shall be no blow back of fuel through the fill fitting when filling at a rate of (considering 25 % to 75 % of the capacity): - 30 L/min for fuel tanks of capacity > 100 L. - 20 L/min for fuel tanks of 100 L capacity or less.	4.1.7 / 4.2.3	[Yes/No/NA]	
5 – Provision shall be made to prevent fuel overflow from the vent opening from entering the craft or the environment.	4.1.8	[Yes/No/NA]	
6 - All fuel system components in engine compartments (e.g. filters, pumps, water separators, and hoses) – excluding permanently installed fuel tanks, shall individually, or as installed in the craft, be capable of withstanding a 2,5-min fire test as specified in ISO 7840:2013, Annex A.	4.1.9 / 5.2.10	[Yes/No/NA]	
7 - After installation, the fuel system as a whole shall pass the pressure test specified below: When testing a separate component of a fuel system, the test pressure shall be equal to the greater of the following two values: 20 kPa or 1,5 times the highest hydrostatic pressure to which the component can be subjected in service. (0,2 bar). The time during which the system is exposed to the pressure shall be equal to the greater of the following two values: 1,5 s per litre of tank capacity or 5 min, up to a maximum of 30 min. Tanks with a capacity of less than 200 l shall be tested for at least 5 min.	4.2.1	[Yes/No/NA]	
8 – The fuel system shall be permanently installed. All component parts, except small connectors and fittings and short sections of flexible hoses, shall be independently supported.	4.3.1	[Yes/No/NA]	
9 – All valves and other components intended to be operated or observed during normal operation of the craft, or for emergency purposes, shall be readily accessible. All fittings and connections of the fuel system shall be readily accessible, or accessible through an access panel, port or hatch. Tanks need not be accessible for removal.	4.3.2	[Yes/No/NA]	
10 - The clearance between a petrol fuel tank and a combustion engine shall not be less than 100 mm.	4.3.3	[Yes/No/NA]	
11 - The clearance between a petrol tank and exhaust components having a temperature exceeding 90 °C shall not be less than 250 mm, unless an equivalent thermal barrier is provided.	4.3.4	[Yes/No/NA]	
12 - Fuel tanks and components of petrol fuel systems shall not be installed directly above batteries unless the batteries are protected against the effects of fuel leakage.	4.3.6	[Yes/No/NA]	
13 - Fuel filling hoses located in engine compartments shall be fire resistant, of type A1 or A2 in accordance with ISO 7840:2013. Fuel fill hoses outside engine compartments shall be of either type A1 or A2 in accordance with ISO 7840:2013, or of type B1 or B2 in accordance with ISO 8469:2013.	5.1.2	[Yes/No/NA]	



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14 – Fuel filling lines shall be self-draining to the tank(s) when the craft is in its static floating position.	5.1.3	[Yes/No/NA]	
15 – The fuel filling system shall be designed so that accidental fuel spillage does not enter the craft when it is in its static floating position.	5.1.4	[Yes/No/NA]	
16 – The distance between compartment ventilation openings and fuel fill openings shall be at least 380 mm, except where the craft's coaming, superstructure or hull creates a barrier to prevent fuel vapour entering the craft through the ventilation opening.	5.1.5	[Yes/No/NA]	
17 - The fuel filling point shall be marked "petrol" or "diesel" and/or with a symbol specified in ISO 11192 to identify the type of fuel to be used.	5.1.6	[Yes/No/NA]	
18 - Each fuel tank shall have a separate vent line.	5.2.1	[Yes/No/NA]	
19 - Vent hoses located in engine compartments shall be fire resistant, of type A1 or A2 in accordance with ISO 7840:2013. Vent hoses outside engine compartments shall be of either type A1 or A2 in accordance with ISO 7840:2013, or type B1 or B2 in accordance with ISO 8469:2013. Compliant?	5.2.2	[Yes/No/NA]	
20 - Vent hoses located in engine compartments shall be fire resistant, of type A1 or A2 in accordance with ISO 7840:2013. Vent hoses outside engine compartments shall be of either type A1 or A2 in accordance with ISO 7840:2013, or type B1 or B2 in accordance with ISO 8469:2013.	5.2.3	[Yes/No/NA]	
21 - Vent lines shall not have valves other than those that permit free flow of air and prevent flow of liquid (fluid) both in and out of the tank(s).	5.2.4	[Yes/No/NA]	
22 - Vent lines shall be self-draining when the craft is in its static floating position.	5.2.5	[Yes/No/NA]	
23 - The distance between compartment ventilation openings and fuel vent openings shall be at least 400 mm, except where the craft's coaming, superstructure or hull creates a barrier to prevent fuel vapour entering the craft through the ventilation opening.	5.2.6	[Yes/No/NA]	
24 – The vent line shall be arranged to minimize intake of water without restricting the release of vapour or intake of air and shall not allow fuel or vapour overflow to enter the craft.	5.2.7	[Yes/No/NA]	
25 - The vent-line termination or a gooseneck in the vent-line routing shall be arranged at sufficient height to prevent spillage of fuel through the vent line during filling and entry of water under normal operating conditions of the craft.	5.2.8	[Yes/No/NA]	
26 – The vent lines on all petrol installations shall incorporate a flame arrester device that fulfils the requirements in 4.1.7 and 5.2.3.	5.2.9	[Yes/No/NA]	
27 – Para componentes da linha de ventilação em compartimentos do motor, com a capacidade de capturar combustível, os Requirements de teste de fogo em 4.1.9 se aplicam.	5.2.10	[Yes/No/NA]	
28 - The vent lines on all petrol installations shall incorporate a flame arrester device that fulfils the requirements in 4.1.7 and 5.2.3.	5.3.1	[Yes/No/NA]	
29 – Rigid fuel lines shall be connected to the engine by a flexible hose section. Support shall be provided within 100 mm of the connection to the metal supply line on the rigid side of the connection.	5.3.2	[Yes/No/NA]	
30 – Connections in rigid fuel lines shall be made with efficient screwed, compression, cone, brazed or flanged joints.	5.3.3	[Yes/No/NA]	
31 - Flexible fuel hoses shall be accessible for inspection and maintenance.	5.3.5	[Yes/No/NA]	
32 - Petrol hoses shall be fire-resistant, type A1 hoses in accordance with ISO 7840:2013, except hoses entirely within the splash well at the stern of the craft connected directly to an outboard engine, which shall be type B1 or B2 hoses in accordance with ISO 8469:2013 or A1 or A2 hoses in accordance with ISO 7840:2013.	5.3.6	[Yes/No/NA]	
33 - Diesel hoses shall be fire-resistant, type A1 or A2 hoses in accordance with ISO 7840:2013.	5.3.7	[Yes/No/NA]	
34 - Fuel lines shall be properly supported and secured to the craft structure above bilge water level, unless specifically designed for immersion or protected from the effects of immersion.	5.3.8	[Yes/No/NA]	



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35 – There shall be no joints in fuel pipes or hoses other than those required to connect required fuelline components, e.g. filters and bulkhead connections.	5.3.9	[Sim/Não/NA]	
36 - Petrol line systems shall be designed or installed to prevent fuel siphoning out of the tank(s) following a failure in the system.	5.3.10	[Sim/Não/NA]	
37 - Diesel line systems shall be designed or installed to prevent fuel siphoning out of the tank(s) following a failure in the system or be fitted with a manual shut-off valve as close as practical to the tank.	5.3.11	[Sim/Não/NA]	
38 – Diverting valves in diesel return lines shall ensure that the return line flow is not restricted	5.3.12	[Sim/Não/NA]	
39 – Fuel hoses shall be secured to the pipe, spud or fitting by metal hose clamps or be equipped with permanently attached end fittings	5.4.1	[Sim/Não/NA]	
40 – Pipes, spuds or other fittings for hose connection with hose clamps shall have a bead, flare, series of annular grooves or serrations. The fuel-tank spud constitutes an exception to this requirement.	5.4.2	[Sim/Não/NA]	
41 - Spuds or other fittings for hose connection with hose clamps shall have a nominal outer diameter which is the same as the nominal inner diameter of the hose.	5.4.3	[Sim/Não/NA]	
42 - Hose connections designed for a clamp connection shall have a spud at least 25 mm long	5.4.4	[Sim/Não/NA]	
43 - Hose connections having a nominal diameter of more than 25 mm shall have two hose clamps. The spud shall be at least 35 mm long, to provide space for the clamps.	5.4.5	[Sim/Não/NA]	
44 - Spuds intended for hose connection shall be free from sharp edges that could cut or abrade the hose.	5.4.6	[Sim/Não/NA]	
45 - Hose clamps shall be made of stainless steel, or equivalent, and be reusable. Clamps depending solely on spring tension shall not be used. The nominal clamp band width shall be at least 8 mm for nominal outside hose diameters up to and including 25 mm and at least 10 mm for bigger hoses.	5.4.7	[Sim/Não/NA]	
46 – Clamps shall be installed to fit directly on the hose and shall not overlap each other. Clamps shall be installed behind the bead, if any, or fully on the serrations on spuds at least one clamp width from the end of the hose.	5.4.8	[Sim/Não/NA]	
47 - Manually operated valves shall be designed with positive stops in the open and closed positions or shall clearly indicate their open and closed positions.	5.5.1	[Sim/Não/NA]	
48 – The integrity and tightness of a valve shall not depend solely on spring tension.	5.5.2	[Sim/Não/NA]	
49 - Threaded valve housing covers that can be exposed to an opening torque when the valve is operated shall be secured against unintentional opening by a device that can be reused.	5.5.3	[Sim/Não/NA]	
50 - Petrol fuel systems shall be equipped with a fuel filter.	5.6.1	[Sim/Não/NA]	
51 - Diesel fuel systems shall be equipped with at least one fuel filter and one water separator. The two functions may be combined in one unit.	5.6.2	[Sim/Não/NA]	
52 – Each filter shall be independently supported on the engine or craft structure.	5.6.3	[Sim/Não/NA]	
53 - All components fulfil these requirements of shall be labelled or marked with the following:- manufacturer's name or trademark; ISO 10088, fire resistant; type of fuel or fuels for which the component is suitable.	5.7	[Sim/Não/NA]	



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ISO 21487 – FUEL TANKS																														
Requirement	Item	Checked	Comments																											
General																														
1 – Fuel type:	3.1/3.2	[Petrol / Diesel]																												
2 - All seals such as gaskets, o-rings and joint-rings shall be of non-wicking, i.e. non-fuel absorbent, material.	4.1.1	[Yes/No/NA]																												
3 – All materials used shall be resistant to deterioration by the fuel for which the system is designed and to other liquids or compounds with which the material can come in contact as installed under normal operating conditions, e.g. grease, lubricating oil, bilge solvents and sea water.	4.1.2	[Yes/No/NA]																												
3 - Copper-based alloys for fittings are acceptable for direct coupling with all tank materials specified in the below table, except aluminium.	4.2	[Yes/No/NA]																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3">Table 1 — Metallic tank materials</th> </tr> <tr> <th style="width: 50%;">Material</th> <th style="width: 25%;">Minimum nominal sheet thickness for corrosion resistance mm</th> <th style="width: 25%;">Fuel</th> </tr> </thead> <tbody> <tr> <td>Copper, internally tin-coated</td> <td>1,5</td> <td>Petrol only</td> </tr> <tr> <td>Aluminium alloys containing no more than 0,1 % copper</td> <td>2,0</td> <td>Diesel and petrol</td> </tr> <tr> <td>Stainless steel, with all welding deposits removed</td> <td>1,0</td> <td>Diesel and petrol</td> </tr> <tr> <td>Mild steel</td> <td>2,0</td> <td>Diesel only</td> </tr> <tr> <td>Mild steel externally hot-dip zinc-coated after fabrication</td> <td>1,5</td> <td>Diesel only</td> </tr> <tr> <td>Mild steel externally and internally hot-dip zinc-coated after fabrication</td> <td>1,5</td> <td>Petrol only</td> </tr> <tr> <td>Aluminized steel</td> <td>1,5</td> <td>Diesel and petrol</td> </tr> </tbody> </table>				Table 1 — Metallic tank materials			Material	Minimum nominal sheet thickness for corrosion resistance mm	Fuel	Copper, internally tin-coated	1,5	Petrol only	Aluminium alloys containing no more than 0,1 % copper	2,0	Diesel and petrol	Stainless steel, with all welding deposits removed	1,0	Diesel and petrol	Mild steel	2,0	Diesel only	Mild steel externally hot-dip zinc-coated after fabrication	1,5	Diesel only	Mild steel externally and internally hot-dip zinc-coated after fabrication	1,5	Petrol only	Aluminized steel	1,5	Diesel and petrol
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4 - Copper-based alloy fittings are allowed for aluminium tanks only if a galvanic barrier is arranged between fitting and tank.	4.2	[Yes/No/NA]																												
5 - There shall be provisions to determine the fuel level or quantity in the tank.	4.3.1	[Yes/No/NA]																												
6 - Metal tanks shall be designed or installed so that no exterior surface will trap water.	4.3.2	[Yes/No/NA]																												
7 - All rigid tubes and pipes which extend near the tank bottom shall have sufficient clearance to prevent contact with the bottom during normal operation of the craft.	4.3.3	[Yes/No/NA]																												
8 - On metallic tanks, all metallic non-integral tank supports, chocks or hangers shall either be separated from the surface of the tank by a non-abrasive material or welded to the tank.	4.3.4	[Yes/No/NA]																												
9 - If baffles are provided, the total open area provided in the baffles shall be not greater than 30 % of the tank cross section in the plane of the baffle.	4.3.5	[Yes/No/NA]																												
10 – Baffle openings shall be designed so that they do not prevent the fuel flow across the bottom or trap vapour across the top of the tank.	4.3.6	[Yes/No/NA]																												
11 - Diesel tanks shall be equipped with inspection hatch(es) having a suitable diameter of at least 120 mm at suitable position(s) for cleaning and inspection of the lowest part(s) of the tank. The hatch must remain accessible when the tank has been installed in the craft. The hatch(es) may be located on the top or side of the tank.	4.3.10	[Yes/No/NA]																												



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12 - Suitable metallic tank materials and minimum recommended material thicknesses required is shown in the following table	4.3.9	[Yes/No/NA]																																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="5">Tabela 2 – Minimum thickness of fuel tanks</th> </tr> <tr> <th rowspan="2">Tank capacity L</th> <th colspan="4">Material</th> </tr> <tr> <th>Stainless steel mm</th> <th>Aluminium mm</th> <th>FRP mm</th> <th>Polyethylene mm</th> </tr> </thead> <tbody> <tr> <td>L ≤ 50</td> <td>1,00</td> <td>2,00</td> <td>4,00</td> <td>5,00</td> </tr> <tr> <td>50 < L ≤ 100</td> <td>1,00</td> <td>3,00</td> <td>4,00</td> <td>6,00</td> </tr> <tr> <td>100 < L ≤ 200</td> <td>2,00</td> <td>4,00</td> <td>4,00</td> <td>8,00</td> </tr> <tr> <td>200 < L ≤ 1000</td> <td>3,00</td> <td>5,00</td> <td>5,00</td> <td>-</td> </tr> <tr> <td>L > 1000</td> <td>3,50</td> <td>6,00</td> <td>6,00</td> <td>-</td> </tr> </tbody> </table>				Tabela 2 – Minimum thickness of fuel tanks					Tank capacity L	Material				Stainless steel mm	Aluminium mm	FRP mm	Polyethylene mm	L ≤ 50	1,00	2,00	4,00	5,00	50 < L ≤ 100	1,00	3,00	4,00	6,00	100 < L ≤ 200	2,00	4,00	4,00	8,00	200 < L ≤ 1000	3,00	5,00	5,00	-	L > 1000	3,50	6,00	6,00	-
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200 < L ≤ 1000	3,00	5,00	5,00	-																																						
L > 1000	3,50	6,00	6,00	-																																						
13 – Non-integral tanks shall be installed so that the loads due to the mass of the full tank are safely introduced into the structure, with due consideration given to upward and downward acceleration due to the craft's movements at maximum speed in the sea. In this respect, continuous flexible supports spreading loads are preferable to rigid ones.	4.4.1	[Yes/No/NA]																																								
Petrol Tanks																																										
13.1 – Petrol fuel tanks shall not be integral with the hull.	5.1.1	[Yes/No/NA]																																								
14 - Petrol fuel tanks shall have all fittings and openings on top, except metallic fill and ventilation pipes, which may be connected to the sides or ends of metal petrol fuel tanks, provided that they are welded to the tank and reach above the top of the tank.	5.1.2	[Yes/No/NA]																																								
16 – Petrol fuel tanks shall be leakage tested in accordance with the following (Shall be greater than): -20 kPa; or -1,5 times the highest hydrostatic pressure to which the tank may be subjected in service (maximum fill-up height above tank top). The test pressure shall be applied for 5 min without pressure drop or rise. After the test, the fuel tank shall not show any leakage when using a leak detection method other than the pressure-drop method.	5.2.1 / 7.2.1	[Yes/No/NA]																																								
17 – Petrol fuel tanks shall be pressure-impulse tested in accordance with 7.3.	5.2.2	[Yes/No/NA]																																								
17.1 Non-metallic petrol fuel tanks shall meet the fire test in accordance with 7.4 or 7.5.	5.2.3	[Yes/No/NA]																																								
Diesel Tanks																																										
18. Fittings in the bottom, sides or ends are allowed provided that each connection has a shut-off valve directly coupled to the tank. The valve shall be protected or located to prevent physical damage or be of at least 25 mm nominal diameter.	6.1.3	[Yes/No/NA]																																								
19 - Diesel fuel tank drains, where fitted, shall have a shut-off valve with a plug on the outlet that can only be removed by the use of tools, or the handle of the drain shut-off valve shall be removable with the valve in its closed position.	6.1.4	[Yes/No/NA]																																								
20 - Sight gauges, if used, shall be fitted with a self-closing valve at the bottom and that can only be manually operated to open while attended. The top valve is not required to be self-closing.	6.1.5	[Yes/No/NA]																																								
21 - Diesel tanks shall be leakage tested in accordance with 7.2.1.	6.2.1	[Yes/No/NA]																																								
22 – Diesel tanks shall be pressure tested in accordance with 7.2.2.	6.2.2	[Yes/No/NA]																																								
22.1 All fuel tanks shall display the following information in contrasting or embossed letters and numerals at least 3 mm high. The entire marking and its type of labelling shall be visible during inspections after the tank is installed. A supplementary label may be required for this purpose. manufacturer's name or trademark, city or equivalent, and country; year of manufacture (last two digits);	8	[Yes/No/NA]																																								



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design capacity, expressed in litres; maximum temperature to which the tank may be exposed (for non-metallic tanks only) fuel or fuels for which the tank is suitable, in symbols (as specified in ISO 11192) or in words; maximum fill-up height above tank top, expressed in metres, and allowable test pressure, expressed in kilopascals; "ISO 21487" marking or label if the tank is a non-metallic petrol fuel tank fire tested in accordance with this International Standard.			
23 – Tank certification number			

ISO 11105 – Ventilation System			
Requirement	Item	Checked	Comments
1 - Compartments containing petrol engines and/or petrol tanks shall be sealed from enclosed accommodation spaces.	4.4	[Yes/No/NA]	
2 - No ventilation is required in petrol engine or petrol tank compartments which are open to the atmosphere as defined as follow: Compartment or space having at least 0,34 m2 of permanent open area directly exposed to the atmosphere for each cubic metre of net compartment volume.	4.5	[Yes/No/NA]	
3 - Neither supply nor exhaust ducts shall open into an accommodation space.	4.6	[Yes/No/NA]	
4 - Unless open to the atmosphere, each compartment in a craft shall have a natural ventilation system if — it contains a permanently installed petrol engine; or — it contains a permanently installed petrol tank and an electrical component other than the petrol level gauge sending unit; or — it is designated to contain a portable petrol tank.	5.1	[Yes/No/NA]	
5 – Natural ventilation shall be achieved by an airflow in a compartment by the following: — a supply opening or duct from the atmosphere; and — an exhaust opening or duct to the atmosphere.	5.2	[Yes/No/NA]	
6 - Each exhaust opening or exhaust duct shall originate in the lower one-third of the compartment	5.2	[Yes/No/NA]	
7 – Compartment air intake and exhaust duct openings shall be separated by at least 600 mm, compartment dimensions permitting.	5.2	[Yes/No/NA]	
8 – the combined area of supply openings or supply ducts, and the combined area of exhaust openings or exhaust ducts shall have a minimum internal cross-sectional area calculated as follows: $A = 3\,300 \ln(V/0,14)$ where A is the minimum combined internal cross-sectional area of the openings or ducts, in square millimetres; V is the net compartment volume equal to the total compartment volume minus the volume of permanently installed components in it, in cubic metres.	5.3	[Yes/No/NA]	
9 – The minimum internal cross-sectional area of each supply opening or duct, and exhaust opening or duct shall exceed 3 000 mm ² .	5.4	[Yes/No/NA]	
10 – The minimum internal cross-sectional area of terminal fittings for flexible ventilation ducts installed to meet the requirements of 5.3 shall not be less than 80 % of the required internal cross-sectional area of the flexible ventilation duct.	5.5	[Yes/No/NA]	
11 – The exhaust of the natural ventilation system may be part of the powered ventilation system	5.6	[Yes/No/NA]	
12 – Unless open to the atmosphere, each compartment containing a permanently installed petrol engine shall be ventilated by removing air from the compartment to the atmosphere outside the craft by an exhaust blower system.	6.1	[Yes/No/NA]	
13 – Each exhaust blower or combination of blowers shall be rated at an airflow capacity q_r not less than that given in the below table	6.2	[Yes/No/NA]	
V (m ³)			q_r (m ³ /min)
< 1			1,5
$1 \leq V \leq 3$			$1,5 \times V$
> 3	$0,5 \times V + 3$		
14 - Each intake duct for an exhaust blower shall be in the lower one-third of the compartment and above the normal level of accumulated bilge water.	6.3	[Yes/No/NA]	



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<p>15 - Each craft that is required to have an exhaust blower shall have a label that</p> <ul style="list-style-type: none"> — is located as close as practicable to each ignition switch; — is in plain view of the operator; — has the symbols in accordance with ISO 11192, depicted in figure below, or at least the following information in a language acceptable in the country of sale: <p style="text-align: center;">WARNING — — Operate blower for 4 min before starting engine.</p> <div style="text-align: center;"> </div> <p>NOTE — "4 min" shall be at least 5 mm high.</p> <p style="text-align: center;">Figure 3 — Symbols</p>	6.5	[Yes/No/NA]	
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NBR 14574 – VESSEL PRINCIPAL DIMENSIONS

This section establishes uniformity of the principal dimensions and other specifications related to the masses and loading of a vessel. All measures relating to areas shall be expressed in square meters (m²), measures of lengths and distances shall be expressed in meters (m), masses in kilograms (kg) or tonnes (t), and volumes in cubic meters (m³).

Requirement	Item	Dimensões	Comments
Longitudinal Measures			
Length Overall LMAX	13.1.1.1		
Length of the Hull LH	13.1.1.2		
Length Waterline LWL	13.1.1.3		
Transversal Measures			
Maximum Beam BMAX	13.1.2.1		
Moulded Beam of the Hull BH	13.1.2.2		
Beam Waterline BWL	13.1.2.3		
Vertical Measures			
Maximum Depth DMAX	13.1.3.1		
Freeboard F	13.1.3.2		
Aft Freeboard FA	13.1.3.2.1		
Freeboard at Midship FM	13.1.3.2.2		



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Fwd Freeboard FF	13.1.3.2.3		
Draft of the Hull T	13.1.3.3		
Maximum Draft TMAX	13.1.3.4		
Height of the Cabin	13.1.3.5		
Other data			
Deadrise B	13.1.4		
Deadrise at the Transom	13.1.5		

ISO 15084 – ANCHORING, MOORING AND STRONG POINTS

Requirement	Item	Checked	Comments
1 - The assessment of the breaking strength of the strong points may be made by direct calculation, taking into account the design category, the configuration of the craft with special regard to the windage area, the hull form, and the wave spectrum in the intended area of operation. Compliant?	6.3	[Yes/No/NA]	
2 - supplies lines, chains or cables are in accordance with the manufacturer breaking strength requirements. And in accordance with the below table?	6.4	[Yes/No/NA]	

ISO 15084 – ANCHORING, MOORING AND STRONG POINTS

Requirement	Item	Checked	Comments																																																																																						
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ISO 11812 - Watertight cockpits and quick-draining cockpits			
Requirement	Item	Checked	Comments
1 – The measurement or calculations shall be made with the boat upright and at rest in smooth water. Compliant?	5.1	[Yes/No/NA]	
2 - On sailing monohulls, drainage shall be provided for at least 90 % of V C at the lesser heel angle of 30° heel, or when the deck at side begins to touch the water.	7.1.3.1	[Yes/No/NA]	
3 - On non-sailing boats and multihulls, drainage shall be provided for at least 90 % of V C at 10° heel. Compliant?	7.1.3.2	[Yes/No/NA]	



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ISO 13297 Electrical System – A.C.			
Requirement	ITEM	Checked	Comments
1 - The protective conductor insulation shall be green or green with a yellow stripe. Compliant?	4.1	[Yes/No/NA]	
2 - The a.c. protective conductor(s) shall be provided with a final (single) connection to the hull. Compliant?	4.4	[Yes/No/NA]	
3 - The a.c. protective conductor(s) shall be provided with a final (single) connection to the hull of a metallic hull craft, or if the craft has a non-metallic hull, to the main grounding/earthing point of the craft. Compliant?		[Yes/No/NA]	
4 - Metallic housings or enclosures of permanently installed a.c. electrical appliances shall be connected to the protective conductor system in the craft. Compliant?	4.6	[Yes/No/NA]	
5 - Individual circuits shall not be capable of being energized by more than one source of electrical power at a time. Compliant?	4.7	[Yes/No/NA]	
6 - Metallic housings or enclosures of permanently installed a.c. electrical appliances shall be connected to the current carrying system. Compliant?		[Yes/No/NA]	
7 - Each shore power inlet, generator or inverter is a separate source of electrical power. Compliant?	4.7	[Yes/No/NA]	
8 - Energized parts of electrical equipment shall be guarded against accidental contact by the use of enclosures or other protective means. Compliant?	4.8	[Yes/No/NA]	
9 - Access to energized parts of the electrical system shall require the use of hand tools. Compliant?	4.8	[Yes/No/NA]	
10 - A transferência e cut-off de uma fonte para outra fulfills alimentando 4.6(????)		[Yes/No/NA]	
11 - The neutral conductor shall be grounded (earthed) only at the source of power, i.e. at the onboard generator. Compliant?	4.9	[Yes/No/NA]	
12 - Energized parts of electrical equipment shall be guarded against accidental contact by the use of enclosures of at least IEC 60529-IP 2X or other protective means which shall not be used for non-electrical equipment. Access to energized parts of the electrical system shall require the use of hand tools. Compliant?		[Yes/No/NA]	
13 - Access to energized parts of the electrical system shall require the use of hand tools or be at least IP 2X. Compliant		[Yes/No/NA]	
14 - A suitable warning sign shall be displayed (see 5.2). Compliant?		[Yes/No/NA]	
15 - When an optional galvanic isolator is fitted in the protective conductor to resist imported stray galvanic current flow while permitting the passage of a.c. current. Compliant?	4.10	[Yes/No/NA]	
16 - Craft equipped with both d.c and a.c. electrical systems shall have their distribution from either separate panel boards or from a common one with a partition or other positive means provided to separate clearly the a.c. and d.c. sections from each other. Compliant?	4.12	[Yes/No/NA]	
17 - A permanently mounted waterproof warning sign shall be located at the panel board on the craft. The sign shall include the information shown below. Compliant?	5.2	[Yes/No/NA]	



General warning sign
ISO 7010 — W001

Warning: Electricity
ISO 7010 — W012

Warning: Flammable material
ISO 7010 — W021

Refer to instruction manual/booklet
ISO 7010 — M002



**Certification procedure for recreational vessels
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WARNING -- To minimize shock and fire hazards:																																													
1	Turn off craft's shore power connection switch before connecting or disconnecting shore power cable.																																												
2	Connect shore power cable to craft's inlet before connecting to shore power source.																																												
3	If incorrect polarity is indicated, immediately disconnect cable.																																												
4	Disconnect shore power cable at shore power source first.																																												
5	Close shore power inlet cover tightly.																																												
DO NOT ALTER SHORE POWER CABLE CONNECTORS																																													
18 - Switches and controls shall be marked to indicate their function, unless the purpose of the switch is obvious and if operation of the switch could not, under normal operating conditions, cause a hazardous condition. Compliant?	5.3	[Yes/No/NA]																																											
19 - Electrical equipment shall be marked or identified to indicate: manufacturer's identification; model number or designation; electrical rating in volts and amperes, or volts and watts; phase and frequency, if applicable; ignition protected. Compliant?	5.4	[Yes/No/NA]																																											
20 - In unpolarized systems double-pole circuit breakers opening both active (phase) and neutral conductors are required. Compliant?	7.1.1	[Yes/No/NA]																																											
21 - Shore power inlets shall be marked with the electricity warning symbol. Compliant?		[Yes/No/NA]																																											
22 - Fuses shall not be installed in unpolarized systems. Compliant?	7.1.2	[Yes/No/NA]																																											
23 - If used in polarized systems, fuses shall be located to interrupt the active (phase) conductor. Compliant?	7.1.2	[Yes/No/NA]																																											
24 - Overcurrent protection devices for motor loads shall have a predetermined value of amperage consistent with electrical demand of the protected circuit. Compliant?	7.1.3	[Yes/No/NA]																																											
25 - All a.c. motor installations and each motor of a motor-operated device shall be individually protected in accordance with 7.1.3 or by an integral overcurrent or thermal protection. Compliant?	7.1.4	[Yes/No/NA]																																											
26 Electrical components installed in compartments which in normal operation can contain LPG gases or petrol vapor, e.g. petrol tank, engine compartment and LPG lockers, shall be designed to be compliant with ISO 8846 or designed according to IEC 60079-0. Compliant?		[Yes/No/NA]																																											
27 - The rating of the overcurrent protection device shall not exceed the maximum current-carrying capacity of the conductor being protected. See table below.	7.1.5	[Yes/No/NA]																																											
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Conductor size</th> <th>Tensile force</th> <th>Conductor size</th> <th>Tensile force</th> <th>Conductor size</th> <th>Tensile force</th> </tr> <tr> <th style="text-align: center;">mm²</th> <th style="text-align: center;">N</th> <th style="text-align: center;">mm²</th> <th style="text-align: center;">N</th> <th style="text-align: center;">mm²</th> <th style="text-align: center;">N</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0,75</td> <td style="text-align: center;">40</td> <td style="text-align: center;">6</td> <td style="text-align: center;">200</td> <td style="text-align: center;">50</td> <td style="text-align: center;">400</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">60</td> <td style="text-align: center;">10</td> <td style="text-align: center;">220</td> <td style="text-align: center;">70</td> <td style="text-align: center;">440</td> </tr> <tr> <td style="text-align: center;">1,5</td> <td style="text-align: center;">130</td> <td style="text-align: center;">16</td> <td style="text-align: center;">260</td> <td style="text-align: center;">95</td> <td style="text-align: center;">550</td> </tr> <tr> <td style="text-align: center;">2,5</td> <td style="text-align: center;">150</td> <td style="text-align: center;">25</td> <td style="text-align: center;">310</td> <td style="text-align: center;">120</td> <td style="text-align: center;">660</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">170</td> <td style="text-align: center;">35</td> <td style="text-align: center;">350</td> <td style="text-align: center;">150</td> <td style="text-align: center;">770</td> </tr> </tbody> </table>				Conductor size	Tensile force	Conductor size	Tensile force	Conductor size	Tensile force	mm ²	N	mm ²	N	mm ²	N	0,75	40	6	200	50	400	1	60	10	220	70	440	1,5	130	16	260	95	550	2,5	150	25	310	120	660	4	170	35	350	150	770
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28 - Double-pole circuit breakers shall be installed in conductors to all supply circuits. Compliant?	7.2.1	[Yes/No/NA]																																											
29 - A manually reset trip-free circuit breaker shall be installed within 0,5 m of the source of power or, if impractical, the conductor from the source of power to the panel-board circuit breaker shall be contained within a protective covering of some sort. Compliant?	7.2.2	[Yes/No/NA]																																											
30 Overcurrent protection devices for motor loads shall have a predetermined value of amperage consistent with electrical demand of the protected circuit. Compliant?		[Yes/No/NA]																																											
31 - Each transformer shall be protected by an individual overcurrent device on the primary side. Compliant?	7.2.3	[Yes/No/NA]																																											
32 - All a.c. motor installations and each motor of a motor-operated device shall be individually protected in accordance with 7.1.3 or by an integral overcurrent or thermal protection device unless the motors will not overheat under continuous locked rotor conditions. Compliant?		[Yes/No/NA]																																											
33 - The active (phase) conductor of each branch circuit in a polarized system shall be provided with overcurrent protection, i.e. fuse or circuit breaker, at the point of connection to the main panel board bus. Compliant?	7.3.1	[Yes/No/NA]																																											
34 - Both current-carrying conductors of each branch circuit in unpolarized systems shall be provided with overcurrent protection by double-pole circuit breakers and double-pole switches, at the point of connection to the main panel board bus. Compliant?	7.3.2	[Yes/No/NA]																																											
35 - Shorepower connection must be protected by a double circuit breaker. Compliant?		[Yes/No/NA]																																											



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36 - The craft shall be provided with earth-leakage protection in all a.c. sources by one or more double- pole RCDs. Compliant?	8.2	[Yes/No/NA]																																																																																																																																																									
37 - The RCD device shall have an internal circuit for manually testing the trip function. Compliant?	8.3	[Yes/No/NA]																																																																																																																																																									
38 - If the location of the main shore power inlet circuit breaker exceeds 3 m from the shore power inlet connection or the electrical attachment point of a permanently installed shore power cord, additional circuit breakers shall be provided within 3 m of the inlet or attachment point to the electrical system in the craft, measured along the conductor. Compliant?		[Yes/No/NA]																																																																																																																																																									
39 - Appliances and fixed a.c. electrical equipment installed on a craft shall have exposed conductive parts connected to the craft protective conductor, unless the appliance is of double-insulated construction. Compliant?	9.1	[Yes/No/NA]																																																																																																																																																									
40 - Overcurrent protection shall be provided for isolation and polarization transformers, including a bank of transformers operating as a unit. Compliant?		[Yes/No/NA]																																																																																																																																																									
41 - Integral or external overcurrent protection shall be provided. Compliant?	9.2	[Yes/No/NA]																																																																																																																																																									
42 - Conductors, including flexible cords, shall have a minimum rating of 300/500 V. Compliant?	10.1	[Yes/No/NA]																																																																																																																																																									
43 - Conductors and flexible cords shall be multi-strand copper, with cross-sectional areas no smaller than those determined using table below:																																																																																																																																																											
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44 – RCD (Recreational Craft Directive) devem ser do tipo ?		[Yes/No/NA]																																																																																																																																																									
45 - The insulation temperature rating of conductors and flexible cords outside engine spaces shall be at least 60 °C. Compliant?	10.3	[Yes/No/NA]																																																																																																																																																									
46 - Conductors shall be at least 1 mm ² in area. An exception may be made for conductors of minimum 0,75 mm ² area which can be used as internal wiring in panel boards.	10.4	[Yes/No/NA]																																																																																																																																																									
47 - The craft shall be provided with earth-leakage protection in all a.c. sources by one or more double- pole RCDs having a maximum nominal trip sensitivity of 30 mA and 100 ms maximum trip time. Compliant?		[Yes/No/NA]																																																																																																																																																									
48 - Conductor insulation temperature ratings in engine spaces shall be 70 °C minimum, and the conductor insulation shall be oil-resistant, or shall be protected by insulating conduit or sleeving.	10.5	[Yes/No/NA]																																																																																																																																																									
49 - The protective conductor shall have a cross-sectional area equal to that of the live conductors.	10.6	[Yes/No/NA]																																																																																																																																																									
50 - active (phase) conductors shall be black or brown. Compliant?	10.7	[Yes/No/NA]																																																																																																																																																									
51 - neutral conductors shall be white or light blue. Compliant?	10.7	[Yes/No/NA]																																																																																																																																																									
52 - Conductor connections shall be in locations protected from the weather. Compliant?	11.1	[Yes/No/NA]																																																																																																																																																									
53 - Connections above deck exposed to intermittent immersion shall be in IEC 60529-IP 67 enclosures as a minimum. Compliant?	11.1	[Yes/No/NA]																																																																																																																																																									
54 - Conductors and cables shall be supported throughout their length in conduits, cable trunking or trays, or by individual supports at maximum intervals of 450 mm. Compliant?	11.2	[Yes/No/NA]																																																																																																																																																									
55 - Sistemas A.C. e D.C não devem estar contidos no mesmo sistema de fiação, a menos que:	11.3	[Yes/No/NA]																																																																																																																																																									



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56 - the cables are installed on a tray or ladder where physical separation is provided by a partition. Compliant?	11.3	[Yes/No/NA]																																											
57 - a separate conduit, sheath or trunking system is used. Compliant?	11.3	[Yes/No/NA]																																											
58 - the a.c. and d.c. conductors are fixed directly to a surface and separated by at least 100 mm.	11.3	[Yes/No/NA]																																											
59 - Current-carrying conductors of the a.c. system shall either be routed above foreseeable levels of bilge water and in other areas where water can accumulate, or at least 25 mm above the water level at which the automatic bilge pump switch activates. Compliant?	11.4	[Yes/No/NA]																																											
60 - Metals used for terminal studs, nuts and washers shall be corrosion-resistant and galvanically compatible with the conductor and terminal. Compliant?	11.5	[Yes/No/NA]																																											
61 - All conductors shall have suitable terminals installed, i.e. no bare wires to stud or screw connections. Compliant?	11.7	[Yes/No/NA]																																											
62 - Twist-on connectors (wire nuts) shall not be used. Compliant?	11.10	[Yes/No/NA]																																											
63 - Exposed shanks of terminals shall be protected against accidental shorting by insulating barriers or sleeves, except those in the protective conductor system. Compliant?	11.11	[Yes/No/NA]																																											
64 - Conductors shall be routed away from exhaust pipes and other heat sources which can damage the insulation. The minimum clearance is 50 mm from water-cooled exhaust components. Compliant?	11.12	[Yes/No/NA]																																											
65 - Socket outlets mated with the appropriate plug shall also remain sealed in accordance with IEC 60529, IP55. Compliant?		[Yes/No/NA]																																											
66 - 250 mm from dry exhaust components, unless an equivalent thermal barrier is provided. Compliant?	11.12	[Yes/No/NA]																																											
67 - Connections and components on panel boards shall be in locations protected from the weather in conformity with IEC 60529 IP 67 as a minimum, if exposed to short-term immersion. Compliant?		[Yes/No/NA]																																											
68 - Conductors which can be exposed to physical damage shall be protected by sheaths, conduits or other equivalent means. Compliant?	11.13	[Yes/No/NA]																																											
69 - Each conductor-to-connector and conductor-to-terminal connection shall be capable of withstanding a tensile force equal to at least the value shown in below table, compliant?	11.14	[Yes/No/NA]																																											
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70 - No more than four conductor connectors shall be secured to one terminal stud.	11.15	[Sim/ NA]																																											
71 - An a.c. system panel board with a means of indicating system on/off status shall be installed. Compliant?	12.1	[Yes/No/NA]																																											
72 - A system voltmeter shall be installed on the panel board if the system is designed to supply motor circuits or if an onboard generator is installed. Compliant?	12.2	[Yes/No/NA]																																											
73 - Panel boards shall be permanently marked with the system voltage and frequency. EXAMPLE: 230 V, 50 Hz; 115 V, 60 Hz. Compliant?	12.3	[Yes/No/NA]																																											
74 - The front and rear sides of panel boards, shall be accessible. Compliant?	12.4	[Yes/No/NA]																																											
75 - Solderless crimp-on terminals and connectors shall be used on conductors and connectors, and shall be attached with the type of crimping tool designed for the termination used and for produNICg a connection meeting the requirements of 11.14. Compliant?		[Yes/No/NA]																																											
76 - A visible means, i.e. voltmeter or lamp, indicating that the inverter is active on line and/or in standby mode, shall be provided at the a.c. panel board. Compliant?	12.6	[Yes/No/NA]																																											
77 - All conductors shall have suitable terminals installed, i.e. no bare wires to stud or screw connections. Compliant?		[Yes/No/NA]																																											
78 - A warning label shall be placed at the panel board to indicate that the electrical system includes an inverter. Example below:	12.7	[Yes/No/NA]																																											

WARNING – ELECTRICAL SHOCK HAZARD
 Craft is equipped with a d.c. to a.c. power inverter.
 To avoid serious injury or death from electrical shock:
 disconnect a.c. shore power and d.c. battery power to inverter before opening panel or servicing electrical systems.



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79 - Terminais de grampos? Aparafusados ou terminais de blocos sem parafuso devem estar em conformidade com a IEC 60947-7-			
80 - Socket outlets and matching plugs used on a.c. systems shall not be interchangeable with those used in the d.c. system on the craft.	13.2	[Yes/No/NA]	
81 - Outros terminais são de anel ou do tipo pá cativo. Terminais pá cativa? Devem ser do tipo auto bloqueio		[Yes/No/NA]	
82 - Socket outlets installed in locations subject to rain, spray or splash shall be in enclosures	13.3	[Yes/No/NA]	
83 - Socket outlets shall be of the earthing type with a terminal provided for the protective conductor.	13.5	[Yes/No/NA]	
84 - Socket outlets provided for the galley area shall be located so that appliance cords can be plugged in without crossing above a galley stove or sink or across a traffic area.	13.6	[Yes/No/NA]	
85 - Socket outlets shall have a voltage rating in accordance with the voltage supplied by the power sources.	13.7	[Yes/No/NA]	
86 - The shore power cable(s) alone or with onboard generator(s) capacity in addition shall be at least as large as the required system load(s).	14.2	[Yes/No/NA]	
87 - Except for the system indicated in the note below, the power feeder conductor from the a.c. generator shall be protected at the generator with overcurrent protection devices with a rating such that 120 % of the generator nominal output is not exceeded. NOTE: Self-limiting (self-adjusting) generators whose maximum overload current does not exceed 120 % of its rated current output do not require additional external overcurrent protection.	14.4	[Yes/No/NA]	
88 - Connections and components on panel boards shall be in locations protected from the weather in conformity with IEC 60529: IP 67 as a minimum, if exposed to short-term immersion; IP 56 as a minimum, if exposed to splashing water; IP 20 as a minimum, if located in protected locations inside the craft.		[Yes/No/NA]	
89 - Power for the a.c. system shall be supplied by one of the following means: single shore power cable, power inlet, wiring and components with a capacity to supply the required design system load; separate shore power cables, power inlets, wiring and components with a capacity to supply the required design system loads; inverter supplying a.c. power from the craft's d.c. system; onboard a.c. generator(s) supplying the required system load; combination of shore power cable(s), onboard generator(s), inverters or inverter/chargers used simultaneously if the craft's circuitry is arranged such that the load connected to each source is isolated from the other sources or supplies are combined in accordance with item 8		[Yes/No/NA]	
90 - Where a.c. generators are installed, they shall be connected to the electrical distribution system as required in 5 and/or protected in accordance with 8.		[Yes/No/NA]	

ISO 10133 – Electrical System – D.C.			
Requirement	Item	Checked	Comments
1 - The system type shall be either a fully insulated two-wire d.c. system or a two-wire d.c. system with negative ground. Compliant?	4.1	[Yes/No/NA]	
2 - The hull shall not be used as a current-carrying conductor	4.1	[Yes/No/NA]	
3 - Engine-mounted wiring systems can use the engine block as the grounded conductor. Systems with multiple battery banks shall have a common negative connection.	4.1	[Yes/No/NA]	
4 - An equipotential bonding conductor, if fitted, shall be connected to the craft's main grounding/earthing point.	4.2	[Yes/No/NA]	
5 - Protective devices such as trip-free circuit breakers or fuses shall be provided at the source of power, e.g. the panel board (switchboard), to interrupt any overload current in the circuit.	4.4	[Yes/No/NA]	
6 - The selection, arrangement and performance characteristics shall be such that: a) there is a maximum continuity of service to healthy circuits where fault conditions exist in other circuits through selective operation of the various protective devices.	4.5	[Yes/No/NA]	
7 - All d.c. equipment shall be capable of function within a voltage range of 75 % to 133 % of nominal voltage at the battery terminals, e.g.: — for a 12 V system: 9 V to 16 V; — for a 24 V system: 18 V to 32 V; — for a 48 V system: 36 V to 64 V.	4.6	[Yes/No/NA]	
8 - The length and cross-sectional area of conductors in each circuit shall be such that the calculated voltage drop does not exceed 10 % of the nominal voltage.	4.7	[Yes/No/NA]	
9 - Batteries shall be permanently installed in a dry, ventilated location above anticipated bilge water level. Compliant?	5.1	[Yes/No/NA]	



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10 - Batteries shall be installed in a manner to restrict their movement horizontally and vertically considering the intended use of the craft, including trailering if applicable. A battery, as installed, shall not move more than 10 mm in any direction when exposed to a force corresponding to twice the battery weight.	5.2	[Yes/No/NA]	
11 - Batteries as installed in the craft shall be capable of inclinations of up to 30° without leakage of electrolyte. Means shall be provided in monohull sailing craft for containment of any spilled electrolyte up to inclinations of 45°.	5.3	[Yes/No/NA]	
12 - Batteries shall be installed, designed or protected so that metallic objects cannot come into unintentional contact with any battery terminal.	5.4	[Yes/No/NA]	
13 - Batteries, as installed, shall be protected against mechanical damage at their location or within their enclosure.	5.5	[Yes/No/NA]	
14 - Batteries shall not be installed directly above or below a fuel tank or fuel filter without an intervening deck or structure to isolate fuel components.	5.6	[Yes/No/NA]	
15 - Any metallic component of the fuel system within 300 mm and above the battery top, as installed, shall be electrically insulated.	5.7	[Yes/No/NA]	
16 - A battery-disconnect switch shall be installed so the switch can be reached quickly and safely.	6.1	[Yes/No/NA]	
17 - Electrical distribution shall use insulated stranded copper conductors.	7.1	[Yes/No/NA]	
18 - Conductor insulation shall be of fire-retardant material	7.1	[Yes/No/NA]	
18.1 - The minimum continuous rating of the battery switch shall be at least equal to the maximum current for which the main circuit breaker is rated. For engine-starting circuits, the battery switch shall be rated appropriately for the engine starter that it serves.	6.2	[Yes/No/NA]	
19 - Remote controlled battery disconnect switches, if used, shall also permit safe manual operation.	6.3	[Yes/No/NA]	
19.1 - Conductor insulation temperature rating in engine spaces shall be 70°C minimum, and rated oil-resistant, or shall be protected by insulating conduit or sleeving.	7.2	[Yes/No/NA]	
19.1 - Conductors and cables shall be supported throughout their length in conduits, cable trunking or trays, or by individual supports at maximum intervals of 450 mm.	7.3	[Yes/No/NA]	
20 - Sheathed conductors and battery conductors to the battery disconnect switch shall be supported at maximum intervals of 300 mm. EXCEPTION Sheathed outboard starter motor conductors	7.4	[Yes/No/NA]	
21 - Each conductor longer than 200 mm installed separately shall have an area of at least 1 mm ²	7.7	[Yes/No/NA]	
21.1 - Condutores no compartimento de motor devem suportar a temperatura de 70° e ser resistente ao contato com óleo ou estarem em eletrodutos ou "sleeving isolados"		[Yes/No/NA]	
22 - The voltage rating of each fuse or circuit breaker shall not be less than the nominal circuit voltage; the current rating shall not exceed the value for the smallest size conductor in the circuit.		[Yes/No/NA]	
23 - Output circuits of self-limiting generators and battery chargers do not require fuses or circuit breakers (Although it is recommended the user of circuit breakers)		[Yes/No/NA]	
24 - Screw-clamp terminals or screwless terminal blocks shall clamp conductors to ensure reliable mechanical linkage and electrical contact is properly maintained without bearing directly on conductor strands.		[Yes/No/NA]	
25 - Other terminals shall be of the ring or captive spade type not dependent on screw or nut tightness alone for retention on the screw or stud.		[Yes/No/NA]	
26 - Conductor-to-connector and conductor-to-terminal connections shall be capable of withstanding a tensile force equal to at least the value shown in Table 1 for the smaller conductor in the connection, without separating.		[Yes/No/NA]	
27 - For conductors in engine rooms (60 °C ambient), the maximum current rating in Table A.2 shall be derated by the factors below:		[Yes/No/NA]	

Temperature rating of conductor insulation, °C	Multiply maximum current from Table A.2 by:
70	0,75
85 to 90	0,82
105	0,86
125	0,89
200	1



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ABNT NBR 14547 – Fiberglass Reinforced Plastic Recreational Vessels			
Requirement	Item	Checked	Comments
1 – The manufacturer must provide an electrical/wiring schematics that represents the model in question. Compliant?	9.1	[Yes/No/NA]	
2 –The sizing of conductors must ensure the power needed for each device with necessary attention to its operation and the ability to the conduction of the electric current, in a compatible manner withh the circuit. Compliant?	9.2.1	[Yes/No/NA]	
3 - The conductor connections must be made in such a way that the firmly attached. Compliant?	9.2.4	[Yes/No/NA]	
4 - Conductor connections should not allow poor contact or spark and must be electrically insulated. Compliant?	9.2.4	[Yes/No/NA]	
5 - The metal components of the vessel must be connected to a submerged metallic driver, with sufficient area for the total electric discharge in the water. Compliant?	9.7	[Yes/No/NA]	

ISO 10240 Small Craft – Owner's Manual / ABNT NBR 14547 – Fiberglass Reinforced Plastic Recreational Vessels				
Owner's manual requirements	ABNT NBR 14547	ISO 10240	Checked	Comments
1) Is the owner's manual delivered together with the boat? In Portuguese?			[Yes/No/NA]	
2) Engine and other equipment manual are referenced in the owner's manual?	14.4		[Yes/No/NA]	
3) The owner's manual:			[Yes/No/NA]	
3.1) Is on a hardcopy version and in portuguese?	14.3		[Yes/No/NA]	
3.2) Is generic, having the capability to represent information for more than one model?	14.3.1		[Yes/No/NA]	
3.3) Has a summary if has more than 4 pages?	14.3.2	4.2	[Yes/No/NA]	
3.4) Contain informations that can be represented by images or signs?	14.3.3		[Yes/No/NA]	
3.5) Contain diagrams of all on-board systems?			[Yes/No/NA]	
3.6) Contain a check-list of actions to be undertaken before use?		4.1	[Yes/No/NA]	
For the owner's manual:			[Yes/No/NA]	
4 SI units shall be used in the owner's manual in accordance with NBR ISO 80000-1; other units may be added between brackets. Compliant?	14.3.4		[Yes/No/NA]	
5) Warning sign denotes that a hazard exists which can result in injury or death if proper precautions are not taken.	14.1.1		[Yes/No/NA]	
6) Caution sign denotes a reminder of safety practices or directs attention to unsafe practices which could result in personal injury or damage to the craft or components or to the environment.	14.1.2		[Yes/No/NA]	



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Owner's manual requirements	ABNT NBR 14547	ISO 10240	Checked Estaleiro	Comments
7) Daner sign denotes that an extreme intrinsic hazard exists which would result in high probability of death or irreparable injury if proper precautions are not taken.				
8) Contain a check-list of actions to be undertaken before use?	14.2		[Yes/No/NA]	
9) Contain drawing, diagrams or pictures?	14.3.5		[Yes/No/NA]	
10) Each manual shall have an introductory paragraph informing the owner of his responsibility concerning the intended use of the craft as well as a recommendation to read it to the last page	14.4.1		[Yes/No/NA]	
11) The information on the owner's manual are in accordance with the item 14.4.2 of ABNT NBR 14574, as follow:	14.4.2		[Yes/No/NA]	
11.1 – Boat manufacturer's name			[Yes/No/NA]	
11.2 – Name of craft manufacturer, company or person responsible for putting the craft on the market;			[Yes/No/NA]	
11.3 – Model name			[Yes/No/NA]	
11.4 – Hull identification number (NIC)			[Yes/No/NA]	
11.5 – Length overall			[Yes/No/NA]	
11.6 – Hull length			[Yes/No/NA]	
11.7 – Maximum beam			[Yes/No/NA]	
11.8 – Maximum draft			[Yes/No/NA]	
11.9 – Maximum displacement			[Yes/No/NA]	
11.10 – Light displacement			[Yes/No/NA]	
11.11 – Fuel tank capacity			[Yes/No/NA]	
11.12 – Water tank capacity			[Yes/No/NA]	
11.13 – Maximum recommended power			[Yes/No/NA]	
12) Is stated the maximum people capacity?	14.4.3		[Yes/No/NA]	
13) Are there information regarding the warranty of the product?	14.4.4		[Yes/No/NA]	
14) Are there information regarding what type of construction standar the boat was built??	14.4.5		[Yes/No/NA]	
15) Does the maximum recommended load include the total mass of persons on board, all provisions and personal effects?	14.4.6		[Yes/No/NA]	
16) Informs the mass of the vessel in the light condition, in kg (mass of light vessels according to ISO 8666)?		5.3 d)		



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ISO 10240 Small Craft – Owner's Manual / ABNT NBR 14547 – Fiberglass Reinforced Plastic Recreational Vessels				
Owner's manual requirements	ABNT NBR 14547	ISO 10240	Checked	Comments
17) Include the following warning note: "WARNING — Do not exceed the maximum recommended number of persons. Regardless of the number of persons on board, the total weight of persons and equipment must never exceed the maximum recommended load. Always use the seats/seating spaces provided."		5.4		
18) Include the following warning note: "WARNING — When loading the craft, never exceed the maximum recommended load. Always load the craft carefully and distribute loads appropriately to maintain design trim (approximately level). Avoid placing heavy weights high up."		5.5		
19) Does it have a place to fill out the engine serial number?	14.4.7 (a)		[Yes/No/NA]	
20) Give the following information? Maximum recommended engine power (kW); maximum recommended engine mass (if relevant).	14.4.7 (b; c e d)	5.3 e)	[Yes/No/NA]	
21) Contain information for location of seacocks and through-hull fittings	14.5.1		[Yes/No/NA]	
22) Advice on keeping seacocks, cockpit drains, bungs and other opening/closing devices in the hull closed or open, as appropriate, to minimize the risk of flooding. If necessary, operating instructions for any such devices?	14.5.1		[Yes/No/NA]	
23) Advice on keeping portlights, windows, washboards, doors, hatches or ventilation openings closed when appropriate, e.g. in rough weather or at planing speeds. If necessary, provide operating instructions?	14.5.1		[Yes/No/NA]	
24) Location of each bilge pump, and its capacity, as rated by the pump manufacturer. Compliant?	14.5.2		[Yes/No/NA]	
25) Operating instructions for bilge pumps are included?	14.5.2		[Yes/No/NA]	
26) Routine survey and maintenance instructions are included when needed?	14.5.2		[Yes/No/NA]	
27) The craft manufacturer gives detail information about the stability of the boat. Compliant?	14.5.3		[Yes/No/NA]	
28) Any change in the disposition of the masses aboard (for example the addition of a fishing tower, a radar, a stowing mast, change of engine, etc.) may significantly affect the stability, trim and performance of the craft. Compliant?	14.5.3		[Yes/No/NA]	
29) Give capsizing recovery information specific to the type of craft, when applicable. Compliant?	14.5.4		[Yes/No/NA]	
30) Give instructions for safe operation of the engine, including, requirement to ensure proper ventilation. Compliant?	14.6		[Yes/No/NA]	
31) Give instructions for safe operation of the engine, including, requirement to ensure flow of cooling water. Compliant?	14.6.1		[Yes/No/NA]	
32) Give instructions for safe operation of the engine, including, precautions when refuelling, e.g., non-smoking and treatment of fuel spillage in craft. Compliant?	14.6.1		[Yes/No/NA]	
33) Give instructions for safe operation of the engine, including, prevention of damage to fuel lines. Compliant?	14.6.2		[Yes/No/NA]	



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ISO 10240 Small Craft – Owner's Manual / ABNT NBR 14547 – Fiberglass Reinforced Plastic Recreational Vessels				
Owner's manual requirements	ABNT NBR 14547	ISO 10240	Checked	Comments
34) Give instructions for safe operation of the engine, including, avoidance of contact of flammable materials with hot engine parts, advice not to store equipment containing petrol (outboard engines, tanks, petrol generators, etc.) in compartments not designed for this purpose. Compliant?	14.6.2		[Yes/No/NA]	
35) Give instructions for safe operation and inspection of gas systems with Requirements as appropriate, including precautions to the LPG systems?	14.6.3		[Yes/No/NA]	
36) Give instructions for safe operation and inspection of gas systems with Requirements as appropriate, including information required by ISO 10239, including the following, where relevant: operating instructions for appliances; instructions for inspection of the system; requirement that gas cylinders shall be stored only in specified lockers or housings; location of gas lockers or housings; procedure for changing gas cylinders; precautions to avoid contact of materials with naked flames and other hot areas; advice to shut off the gas valve in the event of an LPG leak or fire from an LPG tank; advice to ensure proper ventilation in order to prevent asphyxiation. Compliant?		5.8.2	[Yes/No/NA]	
37) Show the requirement that gas cylinders shall be stored only in specified lockers or housings. Compliant?	14.6.3		[Yes/No/NA]	
38) Give advice to ensure proper ventilation in order to prevent asphyxiation per GLP. Compliant?	14.6.3		[Yes/No/NA]	
39) Give instructions for safe operation and inspection of systems with Requirements as appropriate, including the following, where relevant: operating instructions for appliances; precautions when refuelling appliances; instructions for safe storage of fuel containers; precautions to avoid contact of materials with naked flames and other hot areas; advice to ensure proper ventilation in order to prevent asphyxiation		5.8.3	[Yes/No/NA]	
40) The manufacturer provides proper instructions for safe operation of: cabin appliances, safe storage for fuel containers, and how to prevent the exposure of flammable materials to flames and sparks. Compliant?	14.6.4		[Yes/No/NA]	
41) Reproduce the relevant information required by ISO 9094 in the owner's manual or Normam. Compliant?	14.6.5	5.8.4	[Yes/No/NA]	
41.1) Provides information on the necessity of a portable fire extinguisher in the cabin vicinity. Compliant?				
42) Identify the position of hatches, doors, and other openings intended to be a means of escape from the interior in case of fire, where required by ISO 9094, and explain their operation procedures or Normam. Compliant?	14.6.6	5.8.3	[Yes/No/NA]	
43) Give information on the fire or explosion hazards that may result from improper use of electric DC and AC systems, and the electric-shock hazards that may result from improper use of electric AC systems. Compliant?		5.9	[Yes/No/NA]	
SAME AS ABOVE	14.6.7		[Yes/No/NA]	



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ISO 10240 Small Craft – Owner's Manual / ABNT NBR 14547 – Fiberglass Reinforced Plastic Recreational Vessels				
Owner's manual requirements	ABNT NBR 14547	ISO 10240	Checked	Comments
45) Give instructions for safe operation of electrical systems with Requirements as appropriate, including, operation and position of battery selector switches. Compliant?	14.6.7		[Yes/No/NA]	
46) Give instructions on the Requirement of switch panel(s); procedure for changing fuses and diagram indicating fuse position, type and capacity. Compliant?	14.6.7		[Yes/No/NA]	
47) Give instructions on precautions when recharging and disconnecting/reconnecting battery and precautions when connecting/disconnecting shore supply. Compliant?	14.6.7		[Yes/No/NA]	
48) Give information on safe handling of the craft under power. Compliant?	14.8		[Yes/No/NA]	
49) Give instructions for safe operation when starting an engine. Compliant?	14.8.1		[Yes/No/NA]	
50) Indicate the location and operation of emergency steering device, where applicable. Compliant?	14.8.2		[Yes/No/NA]	
51) Give information about man-overboard prevention and recovery. Compliant?	14.8.3		[Yes/No/NA]	
52) On craft where a liferaft stowage area needs to be identified, give information on its location. Compliant?	14.8.4		[Yes/No/NA]	
53) Give recommendations to secure loose equipment safely when underway. Compliant?	14.8.5		[Yes/No/NA]	
54) Give the following information or instructions: Local environments law, and international regulations against marine pollution. Compliant?	14.8.6		[Yes/No/NA]	
55) Give instructions not to discharge toilets or holding tanks close to shore or in any prohibited zone, and to use harbour or marina pump-out facilities to empty the holding tank before leaving the harbour. Compliant?	14.8.6		[Yes/No/NA]	
56) If a holding tank is fitted, give information required by ISO 8099, including: operation and maintenance; capacity of holding tanks, chemicals acceptable for use: cleaning materials, deodorants, anti-freeze solution. Compliant?	14.8.7		[Yes/No/NA]	
57) Give identification of "strong points" required for mooring, towing and being towed. Compliant?	14.8.8		[Yes/No/NA]	
58) Give identification of anchoring? Anchoring means and capacities. Compliant?	14.8.8		[Yes/No/NA]	
59) Does it alert you to risks if you want to install motors or accessories different from the initial design of the audited model / family?			[Yes/No/NA]	



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ISO 10240 Small Craft – Owner's Manual / ABNT NBR 14547 – Fiberglass Reinforced Plastic Recreational Vessels				
Requirements	ABNT NBR 14547	ISO 10240	Checked	Comments
60) Any other information that is relevant for the safe operation of the craft shall be included in the owner's manual?	14.9		[Yes/No/NA]	
61) Give information connected with the risk of flooding and stability?		5.7	[Yes/No/NA]	
Give the stability information specific to the type of craft including the following statements: any change in the disposition of the masses aboard (for example the addition of a fishing tower, a radar, a stowing mast, change of engine, etc.) may significantly affect the stability, trim and performance of the craft; 62) bilge water should be kept to a minimum; 63) stability is reduced by any weight added high up; 64) in rough weather, hatches, lockers and doorways should be closed to minimize the risk of flooding; 65) stability may be reduced when towing or lifting heavy weights using a davit or boom; 66) air tanks shall not be punctured; 67) breaking waves are a serious stability hazard.		5.7.3	[Yes/No/NA]	
63) Give information on safe handling of the craft under power, including Do not operate the craft with an engine of rated power greater than the maximum recommended power. Avoid sudden manoeuvres at speed. For comfort and safety, reduce speed in waves. Do not sit in the bow cockpit when the boat is moving fast. Always use the dead-man switch if provided.		5.10	[Yes/No/NA]	
64) Indicate the location and operation of emergency steering device, where applicable.		5.10.3	[Yes/No/NA]	
65) Give information connected with the man-overboard prevention and recovery?		5.11.1	[Yes/No/NA]	
66) Give the following information, if relevant: instructions to avoid moving parts of engine, propeller shafts, etc.; if relevant, details concerning guards fitted and instructions for use.		5.11.3	[Yes/No/NA]	
67) On craft where a liferaft stowage area needs to be identified, give information on its location.		5.11.2	[Yes/No/NA]	
68) Give recommendations to secure loose equipment safely when underway. Compliant?		5.11.5	[Yes/No/NA]	
68.1) Give the following information: WARNING — Fuel-burning open-flame appliances consume cabin oxygen and release products of combustion into the craft. Ventilation is required when appliances are in use. Open designated vent openings while appliances are in use. Never obstruct ventilation openings and ensure that flued appliances are operating correctly.		5.11.4	[Yes/No/NA]	
69) Give identification of "strong points" required for mooring, towing and being towed.		5.11.8	[Yes/No/NA]	



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ISO 9094 – Fire Protection			
Requirement	Item	Checked	Comments
1 – Free passages are located within the accommodation spaces. Compliant?	4.1.4	[Yes/No/NA]	
1.1 - Compartments or spaces containing fixed petrol engines and/or fixed petrol tanks shall be separated from habitable spaces. Compliant?	4.1.2	[Yes/No/NA]	
1.2 - Where a non-metallic component or flexible hose is part of a water-cooled exhaust system a means to indicate a loss of cooling water shall be provided to prevent failure of the component or flexible hose. The means shall be obvious from the steering position. Compliant?	4.1.3	[Yes/No/NA]	
2 – For boats of 15 m and under in length, the distance to the nearest fire exit shall not exceed 5m. Compliant?	4.2.1	[Yes/No/NA]	
3 - For boats of 15 m and under in length, if the escape route pass beside an engine, the distance to the nearest fire exit shall not exceed 5m. Compliant?	4.2.1	[Yes/No/NA]	
4.a - For boats of 15 m and under in length, if there is only one escape route, the escape route shall not pass directly over a stove. Compliant?	4.2.1	[Yes/No/NA]	
4.b – For boats over 15 m in length, where there are two escape routes required only one can pass through, over or beside an engine compartment. Compliant?	4.2.1	[Yes/No/NA]	
4.c - Additionally, the fire escape route for enclosed habitable spaces for sleeping shall have its middle line passing not less than 750 mm from the centre of the closest burner, or an open flame appliance, or the distance measured along the middle line, from the cabin threshold to the bottom of the stairs leading to the open air is less than 2 m. Compliant?	4.2.1	[Yes/No/NA]	
5 - A second fire escape route shall be provided if the habitable space is separate by a solid door to closest escape route and if any open flame appliance or engine compartment is within this escape route. Compliant?	4.2.1	[Yes/No/NA]	
6 - Any fire exit from a habitable space shall have clear openings. Compliant?	4.2.1	[Yes/No/NA]	
7 - Fire exits shall be capable of being opened from the inside and the outside when closed and unlocked. Compliant?	4.2.3	[Yes/No/NA]	
8 - Where deck hatches are designated as fire exits the following shall be provided: footholds, ladders, steps or other access means	4.2.4	[Yes/No/NA]	
9 - If yes to the above question, this access means are intended to be permanently installed, shall only be removable with tools. Compliant?	4.2.4	[Yes/No/NA]	
10 – If yes to the above question, means shall be provided to reach the upper foothold whose vertical distance to the fire exit shall not exceed 1,2 m. Compliant?	4.2.4	[Yes/No/NA]	
11 – Main exits (cabin door/ladder) are identified by the proper sign. Compliant?	4.2.5	[Yes/No/NA]	
11.1 - Any fire exit from a habitable space shall have the following minimum clear openings. Compliant?	4.3	[Yes/No/NA]	
<p style="text-align: center;">Figure 2 — Measurement of minimum clear opening, in millimetres</p>			
12 - Material used for the insulation of engine compartments shall present a non-fuel absorbent surface towards the engine.	4.3.1.1	[Yes/No/NA]	
13 - Bilges and other spaces that can contain spillage of petrol and diesel shall be accessible for cleaning and shall have a non-fuel absorbent floor surface. Compliant?	4.3.1.3	[Yes/No/NA]	
14 – If exhausts are installed they shall be insulated or shielded where necessary to avoid overheating or damage to adjacent material or to the structure of the craft. Compliant?	4.3.2.1	[Yes/No/NA]	
15 – Are there any liquid fuel appliance? If yes, they shall be permanently fixed. Compliant?	4.3.2.2	[Yes/No/NA]	



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16 - Permanently installed cooking and heating appliance with open-flame device must be equipped with a readily accessible plate. Compliant?	4.3.2.2	[Yes/No/NA]	
17 - If open flame water heater devices are installed, a proper ventilation and combustion area must be provided. Compliant?	4.3.2.2	[Yes/No/NA]	
18 - Unidades de aquecimento que utilizam combustível líquido devem estar em ambientes separados de onde a luz piloto do aquecedor está instalada. Em conformidade?	4.3.2.2	[Yes/No/NA]	
19 - Permanently installed (non-integral) tanks, a readily accessible shut-off valve shall be installed in the supply line at the tank connection. Compliant?	4.3.2.2	[Yes/No/NA]	
20 - If this is outside the space containing the appliance a second valve shall be fitted in the fuel line in the space containing the appliance, outside Zone II, but not behind the appliance. This requirement does not apply where the tank is located lower than the cooking appliance/heater and there is no possibility of back siphoning or where a fire or fusible valve that prevents fuel from continuing to flow to an appliance in the event of a fire is installed in the appliance or near to the final fuel supply joint to it. Compliant?	4.3.2.2	[Yes/No/NA]	
21 - Deck fuel fill plates shall be marked with "GAS" or "DIESEL". Compliant?	4.3.2.2	[Yes/No/NA]	
22 - Material used for the insulation of engine compartments shall present a non-fuel absorbent surface towards the engine. Compliant?	4.4.1	[Yes/No/NA]	
23 - Compartments or spaces containing fixed petrol engines and fixed petrol tanks shall be well ventilated to avoid explosive gases accumulation. Compliant?	4.4.1	[Yes/No/NA]	
23.1 - Se as unidades de cozimento/aquecimento usam combustível líquido, aparelhos que utilizam gasolina para o priming ou como combustível não deverão estar instalados. Em conformidade?	4.4.2.2	[Yes/No/NA]	
23.2 - Material used for the insulation of engine compartments shall have an oxygen index (OI) of at least 21 according to ISO 4589-3 at an ambient temperature of 60°C, or be tested as meeting an equivalent standard. Compliant?	4.5.2	[Yes/No/NA]	
23.3 - Compartments containing fixed petrol engines/tanks or LPG appliances shall be only fitted with ignition protected electrical items in accordance with ISO 8846, or another non-electrical item. Compliant?	4.9	Sim/Não/NA]	
24 - Sprinkler system being used? If yes, are they located in compliance?	5.3.2	[Yes/No/NA]	
24.4 - Do not use water sprinklers in the kitchen. Compliant?	5.3.3	Sim/Não/NA]	
25 - Where inboard engines are protected by portable fire extinguisher(s) intended for use in a fire port, such fire port shall be positioned so that the extinguishing medium can be properly discharged in the engine compartment without opening the primary access. Compliant?	5.3.4.2	[Yes/No/NA]	
25.1 - The extinguishing media is of proper use and properly sized to cover the entire engine space. Compliant?	5.3.4.2	[Yes/No/NA]	
25.2 - The extinguishing media is of proper use and properly sized to cover the entire engine space. Compliant?	5.3.4.2	[Yes/No/NA]	
26 - For automatic systems a remote discharge indicator shall be installed and shall be clearly perceptible from the main helm position. Compliant?	5.3.4.3	[Yes/No/NA]	
27 - For automatic systems a remote discharge indicator shall be installed and shall be clearly perceptible from the main helm position. Compliant?	5.3.4.3	[Yes/No/NA]	
28 - A proteção do convés aberto deve ser formatada por um sistema de tubos de água ou por baldes com colhedores anexados. Em conformidade?	5.3.4.3	[Yes/No/NA]	
28.1 - A abertura de descarga é dimensionada para aceitar o bico de descarga? Em conformidade?	5.3.4.3	[Yes/No/NA]	
28.2 - A abertura de descarga está aberta ou que pode ser aberta para fornecer acesso pronto para a descarga do meio para o espaço do motor? Em conformidade?	5.3.4.3	[Yes/No/NA]	
28.3 - Uma abertura de descarga está localizada de modo que o tamanho necessário de extintor pode ser operado em condições que vai permitir a descarga completa do meio extintor. Em conformidade?	5.3.4.3	[Yes/No/NA]	
28.4 - Outros espaços fechados são tratados como espaços de alojamentos, exceto se forem designados para o armazenamento de combustível ou outros produtos inflamáveis quando eles devem ser tratados como especificado. Em conformidade?	5.3.4.3	[Yes/No/NA]	
29 - A embarcação deve possuir alarme contra incêndio? Em conformidade?	5	[Yes/No/NA]	
30 - A means to alert craft occupants to the outbreak of fire is required for craft with more than one habitable space. Shower and toilet compartments are not to be included as an additional habitable space. Shall provide an audible alarm; and be independently powered.	5	[Yes/No/NA]	
31 - The distance to the nearest fire exit shall not exceed the greater of 6 m or LH/2.5, (LH = Length of Hull). Compliant?	6.1.1	[Yes/No/NA]	



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32 - A fire escape route shall: have a passage way with minimum width of 500 mm and a minimum height of 500 mm. Compliant?	6.1.1	[Yes/No/NA]	
33 - Habitable spaces shall be fitted with at least one fire escape route leading to the open air or the next habitable space, or the bottom step of a staircase leading to the next habitable space or open air. Compliant?	6.1.1	[Yes/No/NA]	
34 - All portable fire extinguishers, or their designated locations, shall be readily accessible.	6.2.1	[Yes/No/NA]	
35 - Fire extinguishers shall be easily identified.	6.2.1	[Yes/No/NA]	
36 To minimize corrosion cylinders shall be mounted clear of the anticipated bilge water level and above surfaces on which water can accumulate. Compliant?	6.2.2	[Yes/No/NA]	
36.1 - Portable extinguishers may be stored in a locker or other protected or enclosed space. The locker or the enclosed space door shall carry the appropriate symbol. Compliant?			
37 - Portable carbon dioxide (CO ₂) extinguishers may only be located in habitable spaces where energized electrical equipment is located.	6.2.4	[Yes/No/NA]	
37.1 - The requirements of ISO 5923 apply for CO ₂ as an extinguishing medium.			
38 - The extinguishers allow clear visualization of expiration dates and refill dates. Compliant?	6.3	[Yes/No/NA]	
38.1 - The number, type, capacity, and technical characteristics of portable fire extinguishers and the extinguishing media must meet or exceed the requirements. Compliant?	6.4	[Yes/No/NA]	
38.2 - There shall be a portable fire extinguisher located within 2 m unobstructed distance from the main helm position. Compliant?	6.4	[Yes/No/NA]	
38.3 - There shall be a portable fire extinguisher located within 2 m from any permanently installed cooking and heating appliance or open-flame device, but so located that it is accessible in the event of a fire at any such appliance or open-flame device. Compliant?	6.4	[Yes/No/NA]	
38.4 - There shall be a portable fire extinguisher located within 2 m unobstructed distance from the fire port if the engine compartment is protected by a portable fire extinguisher. Compliant?	6.4	[Yes/No/NA]	
38.5 - There shall be a portable fire extinguisher located within within (Lh/3) m unobstructed distance from the centre of a bunk measured in the horizontal plane. Compliant?	Sem ref.	[Yes/No/NA]	
38.6 - At least one extinguisher of 5A/34B capacity shall be located within each 20 m ² of the habitable space. Compliant?	6.4	[Yes/No/NA]	
39 - There shall be at least 1 portable fire extinguisher on accommodations spaces with bunks. Compliant?	7.2	[Yes/No/NA]	
39.1 - For automatic systems a remote discharge indicator shall be installed and shall be clearly perceptible from the main helm position.	7.2.2	[Yes/No/NA]	
39.2 - Where installed, a manual release device shall be readily accessible for fixed extinguishing systems. Compliant?	7.2.3	[Yes/No/NA]	
39.3 - The installation of a fixed system using an asphyxiate gas extinguishing medium (e.g. CO ₂) shall be limited to spaces in a craft that are not intended for habitable purposes and are separated from the habitable space. Compliant?	7.3	[Yes/No/NA]	
39.4 - The components for a fixed system shall be securely fastened to the craft's structure to withstand motions, shock and vibrations from normal craft operating conditions. Compliant?	7.4.1	[Yes/No/NA]	
39.5 - Cylinders containing the extinguishing medium, distribution lines and controls shall be located so that they will not be subject to temperatures outside the system's designed operating range, while the craft is in service.	7.4.1	[Yes/No/NA]	
40 - There shall be a portable fire extinguisher located near permanently installed cooking and heating appliance or open-flame device. Compliant?	7.3	[Yes/No/NA]	
41 - Portable extinguishers located where they might be exposed to splashed or sprayed water shall have extinguisher operating nozzle and triggering devices shielded unless the extinguishers are certified or listed for marine service. Compliant?	7.4.2	[Yes/No/NA]	
41.1 - Cylinders shall be accessible for removal. Controls and dials shall be readily accessible and visible. Compliant?	7.4.2	[Yes/No/NA]	
41.2 - To minimize corrosion cylinders shall be mounted clear of the anticipated bilge water level and above surfaces on which water can accumulate. Compliant?	7.4.2	[Yes/No/NA]	



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42 - Cylinders shall be accessible for removal. Controls and dials shall be readily accessible and visible. Compliant?	7.4.2.2	[Yes/No/NA]	
42.1 - Where installed, a manual release device shall be readily accessible with the protected space(s) identified. Compliant?	7.4.3	[Yes/No/NA]	
42.2 - Se o sistema de extinção de incêndios fixo (sistema manual, dispositivo de liberação) é instalado, o dispositivo de liberação é facilmente acessível e operável. Em conformidade?	7.4.3	[Yes/No/NA]	
42.3 - Non-metallic components of the distribution line(s) including their fixtures that are not intended to melt as part of the fire fighting system as installed shall be fire resistant or be otherwise protected from fire. Compliant?	7.4.4	[Yes/No/NA]	
42.4 - Solder or brazing material used for metallic lines or fittings shall have a melting temperature of not less than 600 °C. Compliant?	7.4.4	[Yes/No/NA]	
42.5 - Se o sistema de extinção de incêndios está instalado fixa, número e localização do bocal (s) de descarga assegura extinção eficaz de incêndios dentro do espaço. Em conformidade?	7.4.4	[Yes/No/NA]	
42.6 - For automatic systems a remote discharge indicator shall be installed and shall be clearly perceptible from the main helm position. Compliant?	7.5.1	[Yes/No/NA]	
42.7 - For automatic systems, the system is installed to allow complete discharge of the extinguishing medium in the required location. Compliant?	7.5.2	[Yes/No/NA]	
43 - Portable carbon dioxide (CO2) extinguishers may only be located in habitable spaces where energised electrical equipment is located (e.g. electric motor space, battery space, switchboard) or flammable liquids are present (e.g. galley). Any individual CO2 extinguisher shall have a maximum capacity of 2 kg. There may be no more than one CO2 extinguisher in each habitable space.	7.5.2	[Yes/No/NA]	
43.1 - Where the fixed system uses an asphyxiant gas at or above a concentration harmful to health: it shall be fitted with a shut-off valve, that clearly indicates open and closed, as close as possible to the gas bottle, and distinct from the activation system protected spaces large enough to be occupied by one person, even occasionally, shall be equipped with a visual and sound alarm activated prior to discharge.	7.5.3	[Yes/No/NA]	
43.2 - If more than one fixed system is installed in a space, each system shall be capable of individually protecting the space, unless their discharge is simultaneous. Compliant?	7.5.4	[Yes/No/NA]	
43.3 - Fixed systems shall be capable of operating in an ambient temperature higher than 0°C. Compliant?	7.6.1	[Yes/No/NA]	
43.4 - Where a space is protected by a fixed fire extinguishing system with manual activation capability, the following information shall be displayed near the manual release device. Compliant?	7.6.2	[Yes/No/NA]	



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43.5 - The information and instructions of a fixed extinguishing system to be provided with each system. Compliant?	7.6.3	[Yes/No/NA]	
43.6 - If the fixed fire-extinguishing system is installed and the extinguishing agent is asphyxiant, instructions include instructions on how to ventilate the space before to enter for damage assessment and subsequent engine starting damage. Compliant?	7.6.3	[Yes/No/NA]	
43.7 - If a fixed fire extinguishing system is installed, the extinguishing system is sized on the net volume of the compartment. Compliant?	7.7	[Yes/No/NA]	
43.8 – All requirements are being followed?	8	[Yes/No/NA]	
44 – The fire blanket shall be readily accessible and ready for immediate use. Compliant?	8	[Yes/No/NA]	
45 – Motorboats less than 8 meters in length shall have 1 portable fire extinguisher type B-1* in the engine vicinity**. Compliant? (* If the vessel has a portable fuel tank with capacity no more than 27 L, it is exempt. (**) Alternatively, may use fire extinguisher types 5-B:C or 1-A:5-B:C.	Cap. 4 - Seção IV M 3	[Yes/No/NA]	
46 – Vessels 8 meters and over in length but less than 12 m shall have 2 portable fire extinguishers type B-1*/** in the engine vicinity and 1 portable fire extinguisher type B-1* near the helm. Compliant? (* If the vessel has a portable fuel tank with capacity no more than 27 L, need only 1 B-1 near the engine. (**) Alternatively, may use fire extinguisher types 10-B:C or 1-A:10B:C.	Cap. 4 - Seção IV M 3	[Yes/No/NA]	
47 – Vessels 12 meters and over in length but less than 24 m shall have 2 portable fire extinguishers type B-1(*) near the engine room, 01 portable fire extinguisher B-1(***) near the helm, 01 portable fire extinguisher B-1(***) at the galley area and 01 portable fire extinguisher B-1(**)(***) or C-1 (**)(***) on each deck, in the main aisle, the distance between each bottle shall not be more than 20 m. Compliant? (* Sailboats may alternatively replace 2 B-1 for 1 B-2 (**) Sailboats are exempt. (***) Alternatively, may use fire extinguisher types 10-B:C or 1-A:10B:C.	Cap. 4 - Seção IV M 3	[Yes/No/NA]	
48 – LPG containers shall be installed out of the cabin or in a compartment not intended to be used during normal operation of the vessel, shall also be isolated from accommodation spaces. This compartment shall be well ventilated and safe. with the main valve protected from the direct action of the sun and sources that may cause ignition. Compliant?	Cap. 4 - Seção IV M 3	[Yes/No/NA]	
49 – LPG lines shall have proper protection against the heat and, when plastic is used, they shall be approved by INMETRO. Compliant?	Cap. 4 - Seção IV M 3	[Yes/No/NA]	
50 – Vessels less than 12 meters in length shall have, at least, a manual or electric bilge pump. Compliant?	Cap. 4 - Seção IV M 3	[Yes/No/NA]	
51 - Vessels 12 meters and over in length shall have, at least, 1 manual bilge pump and 2 electric bilge pumps. Electric bilge pumps shall be rated for, at least, 1.53 m ³ /h [404 GPH]. Compliant?	Cap. 4 - Seção IV M 3	[Yes/No/NA]	



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ISO 15084 – Anchoring, mooring and towing - Strong points			
Requirement	Item	Checked Embarcação	Comments
1 - The assessment of the breaking strength of strong points may be made by direct calculation, considering the design category, the configuration of the craft with special regard to the windage area, the hull form, and the wave spectrum in the intended area of operation.	No ref. (6.3)	[Yes/No/NA]	
2 - Where a boat manufacturer specifies or supplies lines, chains or cables which exceed the requirements above, the breaking strength of the related strong point shall be not less than 125 % of the rope or chain that is specified or supplied.	No ref. (6.4)	[Yes/No/NA]	
3 - Doubling plates or washers of adequate size shall be used where the strong points are secured with nuts and bolts. Compliant?	7.1	[Yes/No/NA]	
4 - Strong points shall be made of materials that are resistant to or protected against corrosion. Compliant?	7.2	[Yes/No/NA]	
5 - Where non-metallic (plastics) strong points are provided, the material shall be UV stabilized. Compliant?	7.2	[Yes/No/NA]	
6 - Where the intended use of a strong point for anchoring and/or being towed is not self evident, the strong point shall be labelled. Compliant?	7.3	[Yes/No/NA]	

Table B.1 — Mechanical properties of 3-strand hawser-laid synthetic ropes

Polyamide ropes		Polyester ropes		Polypropylene ropes	
Nominal diameter	Minimum breaking strength (ISO 1140)	Nominal diameter	Minimum breaking strength (ISO 1141)	Nominal diameter	Minimum breaking strength (ISO 1346)
mm	kN	mm	kN	mm	kN
6	7,35	6	5,8	6	5,9
8	13,2	8	10,5	8	10,4
10	20,4	10	16,8	10	15,3
12	29,4	12	24,0	12	21,7
14	40,2	14	33,7	14	29,9
16	52,0	16	43,4	16	37,0
18	65,7	18	54,8	18	47,2
20	81,4	20	68,2	20	56,9
22	98,0	22	82,0	22	68,2
24	118,0	24	98,5	24	79,7
26	137,0	26	115,5	26	92,2



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ISO 11812 - Small craft - Watertight cockpits and quick-draining cockpits			
Requirement	Item	Checked	Comments
1 – Maximum load capacity must be displayed. Including full tankage, capacity of people and load conditions. Compliant?	5.1	[Yes/No/NA]	
2 – Watertight cockpits shall have sills in accordance with table of the annex 1 below (Table 5). Compliant?	5.2	[Yes/No/NA]	
3 - The minimum cockpit bottom height, $H_{B,min}$, above the the waterline shall be according to annex 2? (Table2). Compliant?	6.1	[Yes/No/NA]	
4 - Draining shall only be by gravity. Compliant?	7.1.1	[Yes/No/NA]	
5 – A watertight cockpit shall have at least two drains, at least one opening enables drainage when the boat is in the horizontal position. Compliant?	7.3	[Yes/No/NA]	
6 - Drains with a circular cross section shall have a diameter of at least 25 mm. Compliant?	7.4.1	[Yes/No/NA]	
7 - Drains with other cross-sectional shapes shall have a cross-sectional area of at least 500 mm ² and a minimum dimension of 20 mm. Compliant?	7.4.1	[Yes/No/NA]	
8 – If the drains are equipped with systems preventing loose objects from falling into the draining system, these past has at least a section of 125 mm ² or diameter of 12 mm. Compliant?	7.4.2	[Yes/No/NA]	
9 - The drain outlet running through the hull shall either be located above the waterline. Compliant?	7.6	[Yes/No/NA]	
10 - Drain piping shall be protected against damage from loose objects stowed in the boat and against being kicked or stepped on. Compliant?	7.7	[Yes/No/NA]	
11 - Drain piping shall not trap water. Compliant?	7.7	[Yes/No/NA]	
12 - Semi-fixed sills and washboards shall have a device maintaining them in place. Compliant?	8.2.4	[Yes/No/NA]	

Anexo 1:

Table 5 — Minimum values $h_{s,min}$ for fixed sills and semi-fixed sills

Dimensions in metres

Design category	Sailing monohulls			Non-sailing boats and sailing multihulls		
	Fixed sill	Semi-fixed sill		Fixed sill	Semi-fixed sill	
	Top of sill $h_{s,min}$	Top of fixed part $h_{s,min}/2$	Top of mobile part $h_{s,min}$	Top of sill $h_{s,min}$	Top of fixed part $h_{s,min}/2$	Top of mobile part $h_{s,min}$
A	0,3	0,15	0,3	0,2	0,1	0,2
B	0,25	0,125	0,25	0,15	0,075	0,15
C	0,15	0,075	0,15	0,1	0,05	0,1
D	0,05	0,025	0,05	0,05	0,025	0,05

NOTE The above requirements may be raised by other International Standards, such as ISO 12217.

Anexo 2:

Table 2 — Minimum height, $H_{B,min}$, of the cockpit bottom

Dimensions in metres

Design category	Height, $H_{B,min}$
A	0,15
B	0,1
C	0,075
D	0,05

NOTE Greater heights than these minimum values may be required to fulfil the maximum acceptable draining time according to 7.2



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Categorias:

A – ocean: boat designed for extended voyages where conditions experienced may exceed wind force 8 (Beaufort Scale) and significant wave heights of 4 m and above, but excluding abnormal conditions (e.g. hurricanes).

B – offshore: boat designed for offshore voyages where conditions up to and including wind force 8 (Beaufort Scale) and significant wave heights up to and including 4 m may be experienced.

C – Inshore: boat designed for voyages in coastal waters, large bays, estuaries, lakes and rivers, where conditions up to and including wind force 6 (Beaufort Scale) and significant wave heights up to and including 2 m may be experienced.

D – sheltered waters: boat designed for voyages in sheltered waters, small bays, estuaries, lakes, rivers and canals, where conditions up to and including wind force 4 (Beaufort Scale) and maximum occasional wave heights up to and including 0,3 m may be experienced.

ISO 15083 – Bilge Pumps						
Requirement		Item	Checked Embarcação	Comments		
1 - Bilge-pumping systems shall be capable of removing water from all main compartments of the craft where water can accumulate. Compliant?		5.1	[Yes/No/NA]			
2 – At least one bilge pump must be directly connected to the battery. Compliant?		ACOBAR Requirement	[Yes/No/NA]			
2.1 – Use the space “Comments” to enter bilge pump type, serial number, certification number e location of the bilge pump(s).		5.1	Not applicable			
3 – The quantity of bilge pump follows the below table. Compliant?		5.2	[Yes/No/NA]			
Vessel type	Characteristic				Bilge pump type	Descriptions
Open and partially decked boats Design categories A, B, C, D						See owners manual
Fully decked boats Design category A, B, C	Exposed steering position				Primary pump	1 manual pump (water head less than 1,5 m) 1 manual mechanical or electric pump (water head 1,5 m or more)
					Secondary pump	1 manual mechanical or electric pump
	Enclosed steering position				Primary pump	1 manual mechanical or electric pump
					Secondary pump	1 manual mechanical or electric pump
Fully decked boats Design category D	LH greater than 6 m	Primary pump	1 manual mechanical or electric pump			
	LH less than or equal to 6 m	Primary pump	1 manual mechanical pump			
4-Bilge pumps shall be mounted in an accessible location. Compliant?		7.1	[Yes/No/NA]			
5-Bilge-pump water inlets (e.g. strainers) shall be designed and installed to minimize ingestion of debris. Compliant?		7.2	[Yes/No/NA]			



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6 - Outlets on the hull shall be above the waterline unless a seacock is installed, and there is a means to prevent backflow into the boat. Compliant?	7.5	[Yes/No/NA]	
7 - The system shall be designed so that the operation of one pump will not feed back through another pump. Compliant?	7.6	[Yes/No/NA]	
8 - Hose connections shall be secured with non-corrosive types of clamps. Compliant?	7.7	[Yes/No/NA]	
9 - Non-submersible bilge pump motors shall be located above the critical bilge-water level. Compliant?	7.8	[Yes/No/NA]	
10 - Bilge pumps with automatic controls shall be provided with a readily accessible manual power-supply switch. Compliant?	7.9	[Yes/No/NA]	
11 - Automatic controls shall be provided with a visual indication showing that power is supplied to the pump. Compliant?	7.10	[Yes/No/NA]	

ISO 9093-2 – Seacocks and through-hull fittings - Part 2: Non-metallic			
Requirement	Item	Checked	Comments
1 - Bedding compounds used in the installation of a fitting shall not impair the mechanical properties of the fitting. Compliant?	10.1.4	[Yes/No/NA]	

ISO 9093-2 Seacocks and through-hull fittings - Part 2: Non-metallic			
Requirement	Item	Checked Embarcação	Comments
1 - When installed, through-hull fittings, seacocks and drain plugs to the hull shall be watertight and secure to prevent loosening under normal operating conditions. Compliant?	10.1.2	[Yes/No/NA]	
2 - Seacocks shall be readily accessible. Compliant?	10.2.1	[Yes/No/NA]	
3 - The seacock assembly shall ensure that no part can come loose under any operating conditions. Compliant?	10.2.2	[Yes/No/NA]	
4 - Seacocks and through-hull fittings shall be located so as to minimize the likelihood of damage to them or inadvertent operation. Compliant?	10.2.3	[Yes/No/NA]	
5 - Metallic hose clamps shall be reuseable and made entirely of stainless steel or other material with equal or higher strength and corrosion resistance. Compliant?	10.4	[Yes/No/NA]	

n 03 /RIPEAM 72 Navigation Lights			
Requirement	n 03 /RIPEAM 72	Checked	Comments
The vessel has navigation lights provided for in RIPEAM, according to NORMAN. Compliant?	0403 – n 03	[Yes/No/NA]	
The vessel complies with the rules to prevent collision as far as navigation lights as established in RIPEAM 72. Compliant?	0405 n 03	[Yes/No/NA]	
The vessel has the following navigation lights approved, and its operation, in accordance with part C and Annex I of the "International Regulations for Preventing Collisions at Sea - 1972"(RIPEAM) and their amendments: 1) mast light (s) (where applicable); 2) side lights; 3) All-around lights; and 4) anchor lights. Compliant?	n 03 Anexo 3-B Items gerais	[Yes/No/NA]	
1. The vessel was equipped with: side lights, tow lights and a all-around lights, White, red, green or yellow. Compliant?	n 03/ Ripeam 72	[Yes/No/NA]	
2. Masthead light shall be placed in a height above the hull no less than the beam of the boat. Compliant?	n 03/ Ripeam 72	[Yes/No/NA]	
3. If there is a rear light, it shall be placed on a height no less than 4.5 m from the masthead light. Compliant?	n 03/ Ripeam 72	[Yes/No/NA]	



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4. The lights are visible according to the minimum distances described below: Masthead light, 5 miles; when the length of the vessel is less than 20 meters it shall be 3 miles; side lights, 2 miles; anchor light, 2 miles; tow light, 2 miles; all-around light, 2 miles.	n 03/ Ripeam 72	[Yes/No/NA]	
n 03 /RIPEAM 72 Navigation Lights			
Requirement	RIPEAM 72	Checked	Observações
For vessels under 12 meters in length: Masthead light, 2 miles; side lights, 1 mile; anchor light, 2 miles; tow light, 2 miles; all-around light, 2 miles. Compliant?	n 03/ Ripeam 72	[Yes/No/NA]	
1 - A separação vertical das luzes de mastro é tal que, em todas as condições de compasso, a luz de ré seja vista sobre e separada da luz de vante a uma distância de 1000 metros da proa, quando vistas do nível do mar?	n 03/ Ripeam 72	[Yes/No/NA]	
2 - Masthead light shall be placed in a height above the hull no less than 2.5 meters from the board of the boat. Compliant?	n 03/ Ripeam 72	[Yes/No/NA]	
3 – Side lights shall be installed above the hull in a height no more than ¾ of the the height that the masthead is installed above the hull. Compliant?	n 03/ Ripeam 72	[Yes/No/NA]	
4 – If the vessel is under 24 meters and combined side lights are used, this installation must be at least 1 meter below the masthead light. Compliant?	n 03/ Ripeam 72	[Yes/No/NA]	
5 - For vessels of 20 meters and over in length, the spacing of vertical lights shall not be less than 2 meters. Except where a towing light is required, the height above the hull of the lower light shall not be less than 4 meters;	n 03/ Ripeam 72	[Yes/No/NA]	
6 - For vessels under 20 meters in length, the spacing of vertical lights shall not be less than 1 meter. Except where a towing light is required, the height above the hull of the lower light shall not be less than 2 meters;	n 03/ Ripeam 72	[Yes/No/NA]	
7 - If the vessel uses three lights, the spacing between them should be the same.	n 03/ Ripeam 72	[Yes/No/NA]	
9 The chromaticity of all navigation lights is in compliance with following standards:	n 03/ Ripeam 72	[Yes/No/NA]	
> White x 0,525 0,525 0,452 0,310 0,310 0,443 y 0,382 0,440 0,440 0,348 0,283 0,382			
> (II) Green x 0,028 0,009 0,300 0,203 y 0,385 0,723 0,511 0,356	n 03/ Ripeam 72	[Yes/No/NA]	
> (III) Red x 0,680 0,660 0,735 0,721 y 0,320 0,320 0,265 0,259	n 03/ Ripeam 72	[Yes/No/NA]	
> (IV) Yellow x 0,612 0,618 0,575 0,575 y 0,382 0,382 0,425 0,406	n 03/ Ripeam 72	[Yes/No/NA]	



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ABNT NBR 14574 - Fiberglass Reinforced Plastic Recreational Vessels			
Requirement	ITEM	Checked	Comments
1. Does the steering system allow continuous and safe vessel maneuvering?	10	[Yes/No/NA]	
2. Have the fixings been made in such a way as to absorb both the movements of the vessel and those generated by the operation of the steering system itself?	10	[Yes/No/NA]	
3. Hull passageways such as the rudder shaft, steering cables and other components of the steering system must be sealed to prevent water penetration. Compliant?	10	[Yes/No/NA]	
4. If the outboard engine installed is over 18,64 kW [25 hp], tiller steering system must not be used. Compliant?	10	[Yes/No/NA]	

MARINE AUTHORITY RULES - NORMAM 03 / DHN			
Requirement	ITEM	Checked	Comments
1. Has the Captain endowed the vessel with navigational equipment compatible with the course he will undertake?	0419	[Yes/No/NA]	
2. Is the vessel equipped with a properly compensated compass?	0419	[Yes/No/NA]	
3. Is the vessel equipped with a global positioning system - GPS? - When in coastal navigation: 1 GPS device - When in ocean navigation: 2 GPS devices	0419	[Yes/No/NA]	
4. If the vessel is 24 meters in length and over, the vessel has installed a radar, depth finder besides the GPS. Compliant?	0419	[Yes/No/NA]	
5. Has the vessel been provided with nautical charts for the regions in which they intend to operate, in an accessible and appropriate place?	0420	[Yes/No/NA]	
6. Vessels must be equipped with the below information in a readily accessible location:	0421	[Yes/No/NA]	
7. For vessel with LOA of 24 meters and over: 1. Steering and navigation rules; 2. Signs and rescue table; 3. Buoyage system; 4. First aid; 5. Artificial respiration; 6. Sound and light signals; 7. Navigation lights and markings; Vessels under 24 meter and exempt of having the following items: 4), 5), 6) and 7);		[Yes/No/NA]	



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ISO 14945 - Small Craft - Builder's Plate/ ABNT NBR 14574 - Fiberglass Reinforced Plastic Recreational Vessels - Hull Identification Number (NIC)				
Requirement	ISO 14945	ABNT NBR 14574	Checked Vessel	Observações
1) Is the builder's plate a rigid plate or flexible label affixed to the craft in such a way that it can only be removed by the use of tools?	4.1		[Yes/No/NA]	
2) Or it is marked on the boat's hull. Compliant?	4.1		[Yes/No/NA]	
3) Characters and other markings on the builder's plate shall be carved, stamped-burned, embossed, moulded, etched, printed, affixed by permanently setting adhesive, or be applied by other suitable means. Alternatively, the information may be printed or etched on the craft itself. Compliant?	4.2		[Yes/No/NA]	
4) The characters shall contrast or be on a different level to the background so that alterations will be obvious. Compliant?	4.2		[Yes/No/NA]	
5) Are the colours applied to the label fade resistant?	4.2		[Yes/No/NA]	
6) The required information characters shall be at least 5 mm in height. Compliant?	4.3		[Yes/No/NA]	
7) Other characters are at least 3 mm in height. Compliant?	4.3		[Yes/No/NA]	



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ISO 14945 - Small Craft - Builder's Plate/ ABNT NBR 14574 - Fiberglass Reinforced Plastic Recreational Vessels - Hull Identification Number (NIC)																														
Requirement (Placa do Construtor/ NIC)	ISO 14945	ABNT NBR 14574	CHECKED	Comments																										
8) Pictograms and symbols shall be at least 8 mm in height. Compliant?	4.4		[Yes/No/NA]																											
9) The builder's plate is readily visible, preferably in the cockpit or near the main steering position?	4.5		[Yes/No/NA]																											
10) Is the builder's plate separate from the hull identification number?	4.5		[Yes/No/NA]																											
11) Is the manufacturer's name displayed on the builder's plate?	5.1		[Yes/No/NA]																											
12) Is the boat design category displayed on the builder's plate?	5.1		[Yes/No/NA]																											
13) Is the manufacturer's recommended maximum load according to ISO 14946, excluding the mass of the contents of fixed fuel and water tanks when full, with the person symbol and the suitcase symbol displayed?	5.1		[Yes/No/NA]																											
14) For craft which are powered by outboard engine(s), is the mass of the engine(s) included, with the outboard engine symbol?	5.1		[Yes/No/NA]																											
15) Is the maximum number of persons that the craft is designed to carry while underway displayed on the builder's plate?	5.1		[Yes/No/NA]																											
16) The manufacturer is free to provide additional information in the label. The inclusion of this additional information shall not impair the legibility of the minimum required information and shall be separated from it (preferably by a line or similar delimiter). Compliant?	5.3		[Yes/No/NA]																											
17) A NIC shall consist of 14 consecutive characters plus a hyphen without intervening spaces, solidi (slashes) or dashes. a) The first two characters, followed by a hyphen, designate the code of the country of the manufacturer; b) The next three characters are the unique identification code from the manufacturer; c) The following five characters indicate the unique serial number (The serial number may consist of numerals and/or letters, except for the letters I, O and Q.); d) The last four characters designate the month and year of manufacture, and the model year. The month of manufacture shall be coded according to Table – Months codes; e) The year of manufacture shall be identified by the last numeral of the production year; f) The model year shall be identified by the last numeral of the production year. Compliant? Table – Months codes			[Yes/No/NA]																											
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Month</th> <th style="width: 50%;">Code</th> </tr> </thead> <tbody> <tr><td>January</td><td>A</td></tr> <tr><td>February</td><td>B</td></tr> <tr><td>March</td><td>C</td></tr> <tr><td>April</td><td>D</td></tr> <tr><td>May</td><td>E</td></tr> <tr><td>June</td><td>F</td></tr> <tr><td>July</td><td>G</td></tr> <tr><td>August</td><td>H</td></tr> <tr><td>September</td><td>I</td></tr> <tr><td>October</td><td>J</td></tr> <tr><td>November</td><td>K</td></tr> <tr><td>December</td><td>L</td></tr> </tbody> </table>	Month	Code	January	A	February	B	March	C	April	D	May	E	June	F	July	G	August	H	September	I	October	J	November	K	December	L		12.1.1 a 12.1.8		
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ISO 14945 - Small Craft - Builder's Plate/ ABNT NBR 14574 - Fiberglass Reinforced Plastic Recreational Vessels - Hull Identification Number (NIC)				
Requirement (Placa do Construtor/ NIC)	ISO 14945	ABNT NBR 14574	Checked	Comments
<p>Hull identification number (NIC)</p> <p>Model year _____</p> <p>Month of manufacture _____</p> <p>Manufacturer's identification _____</p> <p style="text-align: center;">NL-HXAB7A33G506</p> <p>Country code _____</p> <p>Serial number _____</p> <p>Year of manufacture _____</p>		12.1.8	[Yes/No/NA]	
18) NIC is located on the starboard side of the transom within 2" (50mm) of hull/deck joint. Compliant?		12.1.12	[Yes/No/NA]	
19) Characters of the NIC are at least 6.0 mm in height. Compliant?		12.1.10	[Yes/No/NA]	
20) On craft without a transom or with a transom on which it is impractical to locate the NIC, the NIC shall be affixed within 300 mm of the stern. Compliant?		12.1.2.1	[Yes/No/NA]	
For multihulls vessels:				
21) On catamarans with structurally and permanently connected hulls, the NIC is installed at the transom of the starboard hull. Compliant?		12.1.2.2 a)	[Yes/No/NA]	
22) Hulls detachable but regarded as the primary structure, the NIC is installed on both hulls. Compliant?		12.1.2.2 b)	[Yes/No/NA]	
23) On catamarans with removable/replacable hull, the NIC is located on the aft starboard cross-beam. Compliant?		12.1.2.2 c)	[Yes/No/NA]	
24) On trimarans, the NIC is located on the starboard side of the centre hull. Compliant?		12.2.3	[Yes/No/NA]	
25) On inflatable boats the NIC is affixed on the rigid aft cross-beam or motor bracket within 300 mm of the starboard hull attachment? If the place is not suitable to have the NIC affixed, is it affixed on other, easily visible location, such as the console assembly. Compliant?		12.2.4	[Yes/No/NA]	
26) For the installation of a duplicate NIC, this must be installed in hidden location. Compliant?		12.2.6	[Yes/No/NA]	
27) The NIC is affixed to the hull while the boat is in production or, at least, before the boat leaves the facility. Compliant?		12.2.7	[Yes/No/NA]	
28) If additional information is displayed on the craft within 50 mm of the NIC, is it separated from the NIC by means of borders or it shall be on a separate label so that it will not be interpreted as part of the NIC. Compliant?		12.2.8	[Yes/No/NA]	