Requirements for Survey of Materials and Equipment for the Classification of Inland Waters-operated Vessels/Units

November 2021

Rule Note
NR 544 DT R04 E

Marine & Offshore
Le Triangle de l'Arche - 8 Cours du Triangle - CS 50101
92937 Paris La Defense Cedex - France
Tel: + 33 (0)1 55 24 70 00
https://marine-offshore.bureauveritas.com/bv-rules

BUREAU VERITAS MARINE & OFFSHORE

GENERAL CONDITIONS

1. INDEPENDENCE OF THE SOCIETY AND APPLICABLE TERMS

1.1 The Society shall remain at all times an independent contractor and neither the Society nor any of its officers, employees, servants, agents or subcontractors shall be or act as an employee, servant or agent of any other party hereto in the performance of the Services.

1.2 The operations of the Society in providing its Services are exclusively conducted by way of random inspections and do not, in any circumstances, involve monitoring or exhaustive verification.

1.3 The Society acts as a services provider. This cannot be construed as an obligation bearing on the Society to obtain a result or as a warranty. The Society is not and may not be considered as an underwriter, broker in Unit's sale or chartering, expert in Unit's valuation, consulting engineer, controller, naval architect, designer, manufacturer, shipbuilder, repair or conversion yard, charterer or shipowner; none of the above listed being relieved from any of their expressed or implied obligations as a result of the interventions of the Society.

1.4 Only the Society is qualified to apply and interpret its Rules.

1.5 The Client acknowledges the latest versions of the Conditions and of the applicable Rules applying to the Services' performance.

1.6 Unless an express written agreement is made between the Parties on the applicable Rules, the applicable Rules shall be the Rules applicable at the time of entering into the relevant contract for the performance of the Services.

1.7 The Services' performance is solely based on the Conditions. No other terms shall apply whether express or implied.

2. DEFINITIONS

2.1 **"Certificate(s)"** means classification or statutory certificates, attestations and reports following the Society's intervention.

2.2 **"Certification"** means the activity of certification in application of national and international regulations or standards ("Applicable Referential"), in particular by delegation from different governments that can result in the issuance of a Certificate.

2.3 **"Classification"** means the classification of a Unit that can result or not in the issuance of a classification Certificate with reference to the Rules. Classification (or Certification as defined in clause 2.2) is an appraisement given by the Society to the Client, at a certain date, following surveys by its surveyors on the level of compliance of the Unit to the Society's Rules and/or to Applicable Referential for the Services provided. They cannot be construed as an implied or express warranty of safety, fitness for the purpose, seaworthiness of the Unit or of its value for sale, insurance or chartering.

2.4 **"Client"** means the Party and/or its representative requesting the Services.

2.5 **"Conditions"** means the terms and conditions set out in the present document.

2.6 **"Industry Practice"** means international maritime and/or offshore industry practices.

2.7 **"Intellectual Property"** means all patents, rights to inventions, utility models, copyright and related rights, trade marks, logos, service marks, trade dress, business and domain names, rights in trade dress or get-up, rights in goodwill or to sue for passing off, unfair competition rights, rights in designs, rights in computer software, database rights, topography rights, moral rights, rights in confidential information (including know-how and trade secrets), methods and protocols for Services, and any other intellectual property rights, in each case whether capable of registration, registered or unregistered and including all applications for and renewals, reversions or extensions of such rights, and all similar or equivalent rights or forms of protection in any part of the world.

2.8 **"Parties"** means the Society and Client together.

2.9 **"Party"** means the Society or the Client.

2.10 **"Register"** means the public electronic register of ships updated regularly by the Society.

2.11 **"Rules"** means the Society's classification rules (available online on veristar.com), guidance notes and other documents. The Society's Rules take into account at the date of their preparation the state of currently available and proven technical minimum requirements but are not a standard or a code of construction neither a guide for maintenance, a safety handbook or a guide of professional practices, all of which are assumed to be known in detail and carefully followed at all times by the Client.

2.12 **"Services"** means the services set out in clauses 2.2 and 2.3 but also other services related to Classification and Certification such as, but not limited to: ship and company safety management certification, ship and port security certification, maritime labour certification, training activities, all activities and duties incidental thereto such as documentation on any supporting means, software, instrumentation, measurements, tests and trials on board. The Services are carried out by the Society according to the Rules and/or the Applicable Referential and to the Bureau Veritas' Code of Ethics. The Society shall perform the Services according to the applicable national and international standards and Industry Practice and always on the assumption that the Client is aware of such standards and Industry Practice.

2.13 **"Society"** means the classification society **'Bureau Veritas Marine & Offshore SAS'**, a company organized and existing under the laws of France, registered in Nanterre under number 821 131 844, or any other legal entity of Bureau Veritas Group as may be specified in the relevant contract, and whose main activities are Classification and Certification of ships or offshore units.

2.14 **"Unit"** means any ship or vessel or offshore unit or structure of any type or part of it or system whether linked to shore, river bed or sea bed or not, whether operated or located at sea or in inland waters or partly on land, including submarines, hovercrafts, drilling rigs, offshore installations of any type and of any purpose, their related and ancillary equipment, subsea or not, such as well head and pipelines, mooring legs and mooring points or otherwise as decided by the Society.

3. SCOPE AND PERFORMANCE

3.1 Subject to the Services requested and always by reference to the Rules, and/or to the Applicable Referential, the Society shall:

- review the construction arrangements of the Unit as shown on the documents provided by the Client;
- conduct the Unit surveys at the place of the Unit construction;
- class the Unit and enter the Unit's class in the Society's Register;
- survey the Unit periodically in service to note whether the requirements for the maintenance of class are met.

The Client shall inform the Society without delay of any circumstances which may cause any changes on the conducted surveys or Services.

3.2 The Society will not:

- declare the acceptance or commissioning of a Unit, nor its construction in conformity with its design, such activities remaining under the exclusive responsibility of the Unit's owner or builder;
- engage in any work relating to the design, construction, production or repair checks, neither in the operation of the Unit or the Unit's trade, neither in any advisory services, and cannot be held liable on those accounts.

4. RESERVATION CLAUSE

4.1 The Client shall always: (i) maintain the Unit in good condition after surveys; (ii) present the Unit for surveys; and (iii) inform the Society in due time of any circumstances that may affect the given appraisement of the Unit or cause to modify the scope of the Services.

4.2 Certificates are only valid if issued by the Society.

4.3 The Society has entire control over the Certificates issued and may at any time withdraw a Certificate at its entire discretion including, but not limited to, in the following situations: where the Client fails to comply in due time with instructions of the Society or where the Client fails to pay in accordance with clause 6.2 hereunder.

4.4 The Society may at times and at its sole discretion give an opinion on a design or any technical element that would 'in principle' be acceptable to the Society. This opinion shall not presume on the final issuance of any Certificate nor on its content in the event of the actual issuance of a Certificate. This opinion shall only be an appraisement made by the Society which shall not be held liable for it.

5. ACCESS AND SAFETY

5.1 The Client shall give to the Society all access and information necessary for the efficient performance of the requested Services. The Client shall be the sole responsible for the conditions of presentation of the Unit for tests, trials and surveys and the conditions under which tests and trials are carried out. Any information, drawing, etc. required for the performance of the Services must be made available in due time.

5.2 The Client shall notify the Society of any relevant safety issue and shall take all necessary safety-related measures to ensure a safe work environment for the Society or any of its officers, employees, servants, agents or subcontractors and shall comply with all applicable safety regulations.

6. PAYMENT OF INVOICES

6.1 The provision of the Services by the Society, whether complete or not, involves, for the part carried out, the payment of fees thirty (30) days upon issuance of the invoice.

6.2 Without prejudice to any other rights hereunder, in case of Client's payment default, the Society shall be entitled to charge, in addition to the amount not properly paid, interest equal to twelve (12) months LIBOR plus two (2) per-cent as of due date calculated on the number of days such payment is delinquent. The Society shall also have the right to withhold Certificates and other documents and/or to suspend or revoke the validity of Certificates.

6.3 In case of dispute on the invoice amount, the undisputed portion of the invoice shall be paid and an explanation on the dispute shall accompany payment so that action can be taken to resolve the dispute.

7. LIABILITY

7.1 The Society bears no liability for consequential loss. For the purpose of this clause consequential loss shall include, without limitation:

- Indirect or consequential loss;
- Any loss and/or deferral of production, loss of product, loss of use, loss of bargain, loss of revenue, loss of profit or anticipated profit, loss of business and business interruption, in each case whether direct or indirect.

The Client shall defend, release, save, indemnify, defend and hold harmless the Society from the Client's own consequential loss regardless of cause.

7.2 Except in case of wilful misconduct of the Society, death or bodily injury caused by the Society's negligence and any other liability that could not be, by law, limited, the Society's maximum liability towards the Client is limited to one hundred and fifty per-cent (150%) of the price paid by the Client to the Society for the Services having caused the damage. This limit applies to any liability of whatsoever nature and howsoever arising, including fault by the Society, breach of contract, breach of warranty, tort, strict liability, breach of statute.

7.3 All claims shall be presented to the Society in writing within three (3) months of the completion of Services' performance or (if later) the date when the events which are relied on were first discovered by the Client. Any claim not so presented as defined above shall be deemed waived and absolutely time barred.

8. INDEMNITY CLAUSE

8.1 The Client shall defend, release, save, indemnify and hold harmless the Society from and against any and all claims, demands, lawsuits or actions for damages, including legal fees, for harm or loss to persons and/or property tangible, intangible or otherwise which may be brought against the Society, incidental to, arising out of or in connection with the performance of the Services (including for damages arising out of or in connection with opinions delivered according to clause 4.4 above) except for those claims caused solely and completely by the gross negligence of the Society, its officers, employees, servants, agents or subcontractors.

9. TERMINATION

9.1 The Parties shall have the right to terminate the Services (and the relevant contract) for convenience after giving the other Party thirty (30) days' written notice, and without prejudice to clause 6 above.

9.2 The Services shall be automatically and immediately terminated in the event the Client can no longer establish any form of interest in the Unit (e.g. sale, scrapping).

9.3 The Classification granted to the concerned Unit and the previously issued Certificates shall remain valid until the date of effect of the termination notice issued, or immediately in the event of termination under clause 9.2, subject to compliance with clause 4.1 and 6 above.

9.4 In the event where, in the reasonable opinion of the Society, the Client is in breach, or is suspected to be in breach of clause 16 of the Conditions, the Society shall have the right to terminate the Services (and the relevant contracts associated) with immediate effect.

10. FORCE MAJEURE

10.1 Neither Party shall be responsible or liable for any failure to fulfil any term or provision of the Conditions if and to the extent that fulfilment has been delayed or temporarily prevented by a force majeure occurrence without the fault or negligence of the Party affected and which, by the exercise of reasonable diligence, the said Party is unable to provide against.

10.2 For the purpose of this clause, force majeure shall mean any circumstance not being within a Party's reasonable control including, but not limited to: acts of God, natural disasters, epidemics or pandemics, wars, terrorist attacks, riots, sabotages, impositions of sanctions, embargoes, nuclear, chemical or biological contaminations, laws or action taken by a government or public authority, quotas or prohibition, expropriations, destructions of the worksite, explosions, fires, accidents, any labour or trade disputes, strikes or lockouts.

11. CONFIDENTIALITY

11.1 The documents and data provided to or prepared by the Society in performing the Services, and the information made available to the Society, will be treated as confidential except where the information:

- is properly and lawfully in the possession of the Society;
- is already in possession of the public or has entered the public domain, other than through a breach of this obligation;
- is acquired or received independently from a third party that has the right to disseminate such information;
- is required to be disclosed under applicable law or by a governmental order, decree, regulation or rule or by a stock exchange authority (provided that the receiving Party shall make all reasonable efforts to give prompt written notice to the disclosing Party prior to such disclosure).

11.2 The Parties shall use the confidential information exclusively within the framework of their activity underlying these Conditions.

11.3 Confidential information shall only be provided to third parties with the prior written consent of the other Party. However, such prior consent shall not be required when the Society provides the confidential information to a subsidiary.

11.4 Without prejudice to sub-clause 11.1, the Society shall have the right to disclose the confidential information if required to do so under regulations of the International Association of Classifications Societies (IACS) or any statutory obligations.

12. INTELLECTUAL PROPERTY

12.1 Each Party exclusively owns all rights to its Intellectual Property created before or after the commencement date of the Conditions and whether or not associated with any contract between the Parties.

12.2 The Intellectual Property developed by the Society for the performance of the Services including, but not limited to drawings, calculations, and reports shall remain the exclusive property of the Society.

13. ASSIGNMENT

13.1 The contract resulting from to these Conditions cannot be assigned or transferred by any means by a Party to any third party without the prior written consent of the other Party.

13.2 The Society shall however have the right to assign or transfer by any means the said contract to a subsidiary of the Bureau Veritas Group.

14. SEVERABILITY

14.1 Invalidity of one or more provisions does not affect the remaining provisions.

14.2 Definitions herein take precedence over other definitions which may appear in other documents issued by the Society.

14.3 In case of doubt as to the interpretation of the Conditions, the English text shall prevail.

15. GOVERNING LAW AND DISPUTE RESOLUTION

15.1 These Conditions shall be construed in accordance with and governed by the laws of England and Wales.

15.2 Any dispute shall be finally settled under the Rules of Arbitration of the Maritime Arbitration Chamber of Paris ("CAMP"), which rules are deemed to be incorporated by reference into this clause. The number of arbitrators shall be three (3). The place of arbitration shall be Paris (France). The Parties agree to keep the arbitration proceedings confidential.

15.3 Notwithstanding clause 15.2, disputes relating to the payment of the Society's invoices may be submitted by the Society to the *Tribunal de Commerce de Nanterre*, France, or to any other competent local Court, at the Society's entire discretion.

16. PROFESSIONAL ETHICS

16.1 Each Party shall conduct all activities in compliance with all laws, statutes, rules, economic and trade sanctions (including but not limited to US sanctions and EU sanctions) and regulations applicable to such Party including but not limited to: child labour, forced labour, collective bargaining, discrimination, abuse, working hours and minimum wages, anti-bribery, anti-corruption, copyright and trademark protection, personal data protection (https://personaldataprotection.bureauveritas.com/privacypolicy).

Each of the Parties warrants that neither it, nor its affiliates, has made or will make, with respect to the matters provided for hereunder, any offer, payment, gift or authorization of the payment of any money directly or indirectly, to or for the use or benefit of any official or employee of the government, political party, official, or candidate.

16.2 In addition, the Client shall act consistently with the Bureau Veritas' Code of Ethics and, when applicable, Business Partner Code of Conduct both available at https://group.bureauveritas.com/group/corporate-social-responsibility/operational-excellence.

RULE NOTE NR 544

NR 544
Requirements for Survey of Materials and Equipment for the Classification of Inland Waters-operated Vessels/Units

November 2021

Section 1 General

Section 2 Vessels / Units assigned with Construction Mark ✠ (excepted those intended for Carriage / Storage of Dangerous Goods)

Section 3 Vessels / Units assigned with Construction Mark • (excepted those intended for Carriage / Storage of Dangerous Goods)

Section 4 Vessels / Units intended for Carriage / Storage of Dangerous Goods and assigned with Construction Mark ✠

Section 5 Vessels / Units intended for the Carriage / Storage of Dangerous Goods and assigned with Construction Mark •

Appendix 1 General Index

SECTION 1 GENERAL

1 Scope of application

1.1 Purpose

1.1.1 This Rule Note NR544 summarizes the certification requirements for materials and equipment (generally referred to as «products») which are covered by the class and used or fitted on board the following inland waters-operated vessels/units:

- Inland navigation vessels in accordance with the Rules for the classification of inland navigation vessels (NR217).
- Floating establishments in accordance with the Rules for the classification of floating establishments (NR580).
- Harbour equipment in accordance with the Rules for the classification of harbour equipment (NR612).

2 Application

2.1 General

2.1.1 The requirements of the Rules for the classification of inland waters-operated vessels/units according to [1.1.1] prevail over the provisions of this Rule Note NR544.

As a rule, certification of materials and equipment by the Society in compliance with NR467 Rules for the classification of Steel Ships is considered acceptable within the scope of the Rules for the classification of inland waters-operated vessels/units according to [1.1.1].

In case of discrepancy, the Rules for the Classification of inland waters-operated vessels/units according to [1.1.1] prevail over the provisions of Rules for the classification of Steel Ships (NR467).

2.1.2 The requirements for survey of materials and equipment at works applicable to inland waters-operated vessels/units with respect to:

- the Construction Mark assigned to the vessel/unit
- the intended use of the vessel/unit, as applicable, for the carriage/storage of dangerous goods

are summarized in specific tables included in the relevant sections of this Rule Note NR544, as listed in Table 1.

2.1.3 The certification scheme of materials and equipment covered by the Class is given in NR320, Certification Scheme of Materials and Equipment for the Classification of marine units.

Table 1 : Applicable requirements for survey of materials and equipment at works

	Vessels assigned with Construction Mark	
	✠	•
All vessels / units excepted those intended for the carriage / storage of dangerous goods	see provisions of Section 2	see provisions of Section 3
Vessels / units intended for the carriage / storage of dangerous goods	see provisions of Section 4	see provisions of Section 5

2.2 Explanatory notes, symbols and abbreviations

2.2.1 The following gives explanatory notes concerning the tables implemented in Section 2 to Section 5.

The symbols used in the tables regarding item certification have the following meaning:

- "C" indicates that a BV product certificate is required with invitation of the Surveyor to attend the tests unless otherwise agreed, in addition to the manufacturer's document stating the results of the tests performed and/or compliance with the approved type as applicable.
- "W" indicates that a manufacturer's document is required, stating the results of the tests performed and/or stating compliance with the approved type (as applicable).

"X" indicates that examinations and tests are required.

Where fitted, each additional index (h, ndt, ht, hose, bt) indicates a specific type of test:

h : Pressure test

ht : Tightness test

hose : Hose testing

ndt : Non-destructive test as per Rules

bt : Test bed trials.

2.2.2 Column 1 (item code)

Column 1 contains an alpha-numeric code for ease of reference to equipment or component.

2.2.3 Column 2 (item name)

Column 2 contains the name of the equipment or component with, eventually, its sub-systems.

2.2.4 Column 3 (design assessment index)

Column 3 contains the design index. The meaning of letters TA and DA is the following:

TA : Type Approval is required

TA (HBV): Type Approval is required with work's recognition (HBV scheme as per NR320)

DA : Design Assessment of the product is required; this may be carried out, at choice:

- either for a specific unit, or
- using the Type Approval procedure.

Note 1: Where nothing is mentioned in column 3, a design assessment/approval of the specific unit is not required (or the unit is a sub-system whose DA is already addressed within the scope of the main system approval). However, further inspection may be necessary according to the Surveyor's satisfaction.

2.2.5 Column 4 (raw material certification)

Column 4 indicates the nature of the document that is to be submitted by the manufacturer or supplier of the concerned material.

2.2.6 Columns 5 (examinations and testing)

Column 5 indicates that examination and/or testing are required, and are to be carried out by the manufacturer. For the type of examination and/or testing required, reference is to be made to the relevant provisions of the Rules for the Classification of Inland Navigation Vessels (NR217).

Note 1: As a general rule, even if a cross "X" is not fitted in a cell under column 5, examination and tests during fabrication may be required with invitation/attendance of the Society's Surveyor.

2.2.7 Column 6 (product certification)

Column 6 indicates the nature of the document that is to be submitted by the manufacturer or supplier of the concerned product.

2.2.8 Column 7 (remarks)

Column 7 indicates the remarks (if any) associated to the concerned equipment or component.

2.3 Notice regarding columns 3 to 7 (product certification)

2.3.1 Column 3, column 4, column 5 column 6 and column 7 summarize the product certification process or steps to be completed by the manufacturer within the scope of Survey of Materials and Equipment at Works by the Society.

2.4 Notice regarding item K (Electrical equipment)

2.4.1 Due to the great variety of electrical equipment (item K), it has not been possible to give herewith the details of the surveys to which this electrical equipment is to be submitted. For certain given types of equipment, special test leading to their approval are required; the programmes for such type tests are set up for each category of equipment, together with the requirements for their carrying out, and the conditions of validity of the Type approval certificate are given in the relevant Sections of the Rules for the Classification of Inland Navigation Vessels (NR217).

As defined in NR217, Pt A, Ch 1, Sec 1, [1.3], the auxiliaries considered as essential are typically as follows:

a) Equipment for **primary 'essential services'** (services which need to be maintained in continuous operation):
   - steering gear
   - actuating systems for controllable pitch propellers
   - scavenging air blowers, fuel oil supply pumps, lubricating oil pumps and cooling water pumps for main and auxiliary engines and turbines necessary for the propulsion.
   - azimuth thrusters which are the sole means for propulsion/steering with lubricating oil pumps, cooling water pumps
   - electrical equipment for electric propulsion plant with lubricating oil pumps and cooling water pumps
   - hydraulic pumps supplying the above equipment
   - control, monitoring and safety devices/systems for the equipment for primary essential services.
   - speed regulators dependent on electrical energy for main or auxiliary engines necessary for propulsion

b) Equipment for **secondary 'essential services'** (services which need not necessarily be in continuous operation):
   - thrusters
   - starting air and control air compressors
   - bilge pumps
   - fire pumps and other fire-extinguishing medium pumps
   - ventilation fans for engine rooms
   - services considered necessary to maintain dangerous cargo in safe condition
   - navigation lights, aids and signals
   - internal safety communication equipment
   - fire detection and alarm system
   - electrical equipment for watertight closing system
   - electrical generators and associated power supplying the above equipment
   - hydraulic pumps supplying the above equipment
   - control, monitoring and safety for cargo containment systems
   - control, monitoring and safety devices/systems for equipment for secondary essential services.
   - windlasses.

The Society reserves the right to add other auxiliaries to this list, whenever deemed necessary and more especially for installations of peculiar types.

SECTION 2 VESSELS / UNITS ASSIGNED WITH CONSTRUCTION MARK ✠ (EXCEPTED THOSE INTENDED FOR CARRIAGE / STORAGE OF DANGEROUS GOODS)

1 Equipment and materials certification requirements

1.1 Summary (tables)

1.1.1 Provisions related to survey at works for vessels/units assigned with Construction Mark ✠, excepted those intended for the carriage/storage of dangerous goods, are summarized in the Table below.

All vessels/units assigned with Construction Mark ✠ excepted whose intended for carriage/storage of dangerous goods		
Item	Title	Reference
Item A	Raw materials for hull	Tab 1
Item B	Hull outfitting	Tab 2
Item C	Fire protection, detection and extinguishing	Tab 3
Item E	Main diesel engines & their auxiliaries	Tab 4
Item G	Auxiliary machinery	Tab 5
Item K	Electrical installations	Tab 6
Item S	Pollution prevention installation covered by additional class notation **Cleanvessel / Clean-Unit**	Tab 7

Table 1: Raw materials for hull - item A - ✠

All vessels/units (carriage/storage of dangerous goods excepted)

RAW MATERIALS FOR HULL - ITEM A - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
A1	Steel plates and profiles					(1) As per NR216, Ch 2, Sec 1 (2) As per NR216, Ch 2 Sec 2 (3) See raw material certification
	1 - Plates, sections and bars	(1)	C (1)		(3)	
	2 - Tubes	(2)	C (2)		(3)	
A2	Steel forgings (1)	(2)	C (2)		(3)	(1) Manufacturers of steel forgings are to be recognised by the Society in accordance with NR320. The manufacturing process is to be approved in accordance with NR480 depending on the type, size and weight of steel forgings (e.g over 1000 kg or 200mm diameter for steel forgings as per NR216, Ch 2, Sec 3, [2] and [3]; over 1000 kg for steel forgings as per NR216, Ch 2, Sec 3, [4] to [9]. (2) Approval as per NR216, Ch 2, Sec 3, as applicable (3) See raw material certification
A3	Steel castings (1)	(2)	C (2)		(3)	(1) Manufacturers of steel castings are to be recognised by the Society in accordance with NR320. The manufacturing process is to be approved in accordance with NR480 depending on the type, size and weight of steel casting items (e.g over 1000 kg for steel castings as per NR216, Ch 2, Sec 4, [2] and [3] or NR216, Ch 2, Sec 4, [5], [6] and [7]; any casting for crankshafts as per NR216, Ch 2, Sec 4, [4]; any stainless steel castings for propellers as per NR216, Ch 2, Sec 4, [8]). (2) Approval as per NR216, Ch 2, Sec 4, as applicable (3) See raw material certification
A4	Iron castings (1)	(2)	C (2)		(3)	(1) Manufacturers of iron castings are to be recognised by the Society in accordance with NR320. (2) Approval as per NR216, Ch 2, Sec 5, as applicable (3) See raw material certification
A5	Aluminium alloy plates, profiles, bars and tubes	(1)	C (1)		(2)	(1) Approval as per NR216, as applicable (2) See raw material certification

RAW MATERIALS FOR HULL - ITEM A - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
A6	Transition joints steel / aluminium alloy	TA (1)	C (1)		C	(1) As per NR216, Ch 3, Sec 2
A7	Filler products for welding (welding consumables)	TA (1)			W	(1) As per NR216, Ch 5, Sec 2
A8	Composite materials	DA (1)		X (2)	C / W (3)	(1) DA for structural assembly; as per NR217. Also see provisions of NR546 - Hull in composite Materials and Plywood, Material Approval, Design Principles, Construction and Survey (2) A representative sample of the structural assembly is to be tested and qualified as per agreed program; relevant tests to be carried out by a testing laboratory accepted by the Society (3) Document type according to the agreed survey scheme - as per conditions set in the DA (4) Type approval or case-by-case approval by the Society; see provisions of NR546, Section 11
	• Adhesives intended for marine structural applications	TA (HBV) (4)			W	
	• Reinforcement fibres	TA (HBV) (4)			W	
	• Resin systems	TA (HBV) (4)			W	
	• Core materials for sandwiches	TA (HBV) (4)			W	
A9	Cast steel shaft brackets (1)	DA	C	X ndt (2)	C	(1) As per NR216 (2) Vibration analysis is recommended for single arm propeller shaft

Table 2: Hull outfitting - item B - ✠

All vessels/units (carriage/storage of dangerous goods excepted)

HULL OUTFITTING - ITEM B - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
B1	Rudders / nozzles (1)					(1) As per NR217, Pt B, Ch 7, Sec 1 (2) Leak test is to be carried out for double plate rudder as per NR217, Pt B, Ch 8, Sec 4
	1 - Rudder stock, shaft, pintles, coupling	DA	C	X	C	
	2 - Rudder blade / nozzle shell	DA	C	X h (2)	C	
B2	Anchors (1)	TA	C	X ndt	C	(1) As per NR217, Pt B, Ch 7, Sec 4
B3	Anchor chain cables (1)	TA	C	X ndt (2)	C	(1) As per NR217, Pt B, Ch 7, Sec 4 (2) Additional approval for manufacturing process is required for rolled bars of grade K2 and K3 (or Q2 and Q3)
B4	Anchor chain cable accessories (1) (shackles, swivels and other attachment pieces)	TA	C	X ndt (2)	C	(1) As per NR217, Pt B, Ch 7, Sec 4 (2) Tests as per NR216, Ch 4, Sec 1
B5	Ropes (Steel wire ropes and fibre ropes) (1)		C	X (2)	C	(1) As per NR217, Pt B, Ch 7, Sec 4 (2) Tests as per NR216, Ch 4, Sec 1
B6	Sidescuttles and windows (1)	DA	C	X (2)	C	(1) As per NR217, Pt B, Ch 6, Sec 7 (2) Tests as per NR216, Ch 4, Sec 3
B7	Shell doors	DA	C	X hose (1)	C	(1) Hose test as per NR217, Pt B, Ch 8, Sec 4
B8	Hatchcovers (1)	DA	C	X hose	C	(1) As per NR217, Pt B, Ch 6, Sec 5
B9	Watertight doors	DA	C	X h (1)	C	(1) Structural test is to be carried out for watertight doors below freeboard or bulkhead deck either before or after the door is fitted on board
B10	External ramp (1)	DA	C	X ndt	C	(1) As per NR217, Pt B, Ch 6, Sec 6
B11	Movable deck and inner ramp (1)	DA	C	X	C	(1) As per NR217, Pt B, Ch 6, Sec 6
B12	Independent tanks	DA	C	X ndt (1)	C	(1) Structural test is to be carried out for independent tanks not used as cargo tanks
B13	Elastic bedding		W	X	W	
B14	Bollards and bitts (1)(2)	(2)	W (1)(2)	(2)	W (1)(2)	(1) As per recognised standards - see provisions of NR217, Pt B, Ch 7, Sec 4. (2 Other cases: assessment on a case-by-case basis

Table 3: Fire protection, detection and extinguishing - item C - ✠

All vessels/units (carriage/storage of dangerous goods excepted)

FIRE PROTECTION, DETECTION AND EXTINGUISHING - ITEM C - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
C1	Fire bulkheading, fire doors (1)	TA	W	X	C	(1) As per NR217, Pt C, Ch 4, Sec 1, [2]
C2	Fire dampers (1)	TA	W	X	C	(1) As per NR217, Pt C, Ch 4, Sec 1, [1.5]
C3	Water supply system (1)					(1) As per NR217, Pt C, Ch 4, Sec 4, [1]
	1 - Fire pumps			X h	C	
	2 - Pump prime movers			X	C	
	3 - Hoses	TA (HBV)	W		W	
	4 - Water spray nozzles	TA (HBV)	W		W	
C4	Automatic pressure water spraying system (1)					(1) As per NR217, Pt C, Ch 4, Sec 4, [3]
	1 - Pressure pumps			X h	C	
	2 - Pump prime movers			X	C	
	3 - Water spray piping system		W		W	
	4 - Pressure water tank	DA	W	X h	W	
	5 - Water spray nozzles	TA (HBV)	W		W	
C5	Fixed gas fire extinguishing system (1)					(1) As per NR217, Pt C, Ch 4, Sec 4, [4]
	1 - Piping system		W	X h	W	
	2 - Pressure tank	DA	W	X h	W	
	3 - Discharge nozzles	TA (HBV)	W		W	
	4 - Extinguishing agents	TA (HBV)			W	
C6	Portable fire extinguishers (1)	TA (HBV)		X	W	(1) As per NR217, Pt C, Ch 4, Sec 4, [2]
C7	Detection and alarm system (1)	TA		X	C	(1) As per NR217, Pt C, Ch 4, Sec 3

Table 4: Main diesel engines & their auxiliaries - item E - ✠

All vessels/units (carriage/storage of dangerous goods excepted)

MAIN DIESEL ENGINES & THEIR AUXILIARIES - ITEM E - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
E1	Main diesel engines with diameter of cylinder bore, D > 300 mm (1)	TA		X bt (2)	C	(1) As per NR217, Pt C, Ch 1, Sec 2 (2) Type tests to be in accordance with NR217, Pt C, Ch 1, Sec 2, [4] (3) NDT of magnetic particle and ultrasonic (4) Material test is required if bore > 400 mm (5) Material tests are also required for parts made of material other than steel (6) NDT of magnetic particle or liquid penetrant (if bore > 400 mm) and ultrasonic (all) (7) NDT of magnetic particle or liquid penetrant and ultrasonic are required if bore > 400 mm (8) NDT of magnetic particle or liquid penetrant (all) and ultrasonic (if bore > 400 mm) (9) Material test is required if bore > 300 mm (10) Material tests are required even these parts are not welded and for any material except grey cast iron (11) NDT of magnetic particle or liquid penetrant if bore > 400 mm (12) Material certification and test as per NR217, Pt C, Ch 1, Sec 14, [2.1] (13) For forged steel, test methods other than hydrostatic testing may be accepted e.g. suitable NDT and documented dimensional test (14) Where the cooling space is sealed by the piston rod, or by the piston ron and the shell, the pressure test is to be carried out after the assembly (15) See item Turbochargers (16)Turbocharger air cooler are tested on the water side only
	1 - Crankshaft	DA	C	X ndt (3)	C	
	2 - Crankshaft coupling flange (non-integral) for main power transmissions		C (4)		W	
	3 - Coupling bolts for crankshaft		C (4)		W	
	4 - Steel piston crowns		C (4) (5)	X ndt (6)	W	
	5 - Pistons rods		C (4)	X h ndt (7)	W	
	6 - Connecting rods, together with connecting rod bearing caps		C	X h ndt (8)	W	
	7 - Crossheads		C (4)	X	W	
	8 - Cylinder liners		C (9)	X h	W	
	9 - Steel cylinder covers		C (5) (9)	X h ndt (6)	W	
	10 - Bedplates of welded construction; plates and transverse bearing girders made of forged or cast steel		C (5) (10)	X ndt	W	
	11 - Frames and crankcases of welded construction		C	X	W	
	12 - Entablatures of welded construction		C	X	W	
	13 - Tie rods		C	X h ndt (11)	W	
	14 - Shaft and rotors, including blades for turbochargers		C (12)	X	W	
	15 - Bolts and studs for cylinder covers, crossheads, main bearings and connecting rod bearings; nuts for tie rods		C (9)	X ndt (11)	W	
	16 - Steer gear wheels for camshaft drives		C (4)	X ndt (11)	W	
	17 - Cylinder liner, over the whole length of cooling space			X h	C	
	18 - Cylinder cover, cooling space			X h (13)	C	
	19 - Cylinder jacket, cooling space			X h	C	
	20 - Exhaust valve, cooling space			X h	C	

MAIN DIESEL ENGINES & THEIR AUXILIARIES - ITEM E - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
E1	21 - Piston crown, cooling space			X h (13) (14)	C	
	22 - Turbocharger, cooling space		(15)	X h	C	
	23 - Exhaust pipe, cooling space			X h	C	
	24 - Coolers, each side			X h (16)	C	
	25 - Fuel injection system (injection pump body pressure side, injection valve, injection pipes)			X h	C	
	26 - Hydraulic system (piping pumps, actuators, etc for hydraulic drive of valves)			X h	C	
	27 - Scavenge pump cylinder			X h	C	
	28 - Engine driven air compressor if any (cylinders, covers, intercoolers and aftercoolers); air side, water side			X h	C	
	29 - Engine driven pumps (oil, water, fuel, bilge)			X h	C	
E2	Heat exchangers (1)	TA	C	X h ndt	C	(1) As per NR217, Pt C, Ch 1, Sec 3
E3	Turning gears of main diesel engines (1)			X (2)	W	(1) As per NR217, Pt C, Ch 1, Sec 2 (2) Test to be done on board
E4	Scavenging and supercharging compressors or blowers (1)	TA (HBV)	C (2)	X h bt (3)	W	(1) As per NR217, Pt C, Ch 1, Sec 2 (2) Shaft and rotor where D > 300 mm (3) Test to be carried out during bench trials of the engine of which these equipment are mounted
E5	Control and safety devices (1)	DA		X (2)	C	(1) As per NR217, Pt C, Ch 1, Sec 2 (2) During load test
E6	Mass produced diesel engines with diameter of cylinder bore, D < 300 mm (1)	TA	C (1)	X ndt (1)	C (1)	(1) This item **E6** is kept for information and records only; the terminologies “Mass-produced diesel engines” or “Mass production” are no longer used in NR217 (such consideration has been withdrawn since July 2016). For diesel engines, refer to item **E1** and provisions of NR217, Pt C, Ch 1, Sec 2

MAIN DIESEL ENGINES & THEIR AUXILIARIES - ITEM E - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
E7	Turbochargers (1) (2) having served power by cylinder groups of less or equal to 1000 kW and fitted on diesel engines as: • main propulsion engines • engines driving electric generators, including emergency generators • engines driving other auxiliaries essential for safety and navigation and cargo pumps in tankers	DA or TA (HBV)	W (3)	X h ndt	W	(1) As per NR217, Pt C, Ch 1, Sec 14 (2) Other turbochargers: assessment on a case-by-case basis (3) Material test are required for shafts and rotors, including blades
E8	Starting air receiver (1)	DA or TA	C	X h	C	(1) As per NR217, Pt C, Ch 1, Sec 2

Table 5: Auxiliary machinery - item G - ✠

All vessels/units (carriage/storage of dangerous goods excepted)

AUXILIARY MACHINERY - ITEM G - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G1	Auxiliary diesel engines (1)	TA		X bt	C	(1) As per NR217, Pt C, Ch 1, Sec 2
G2	Gears and couplings (1)	TA	(2)	X ndt (3) (4)		(1) As per NR217, Pt C, Ch 1, Sec 6 (2) Material tests as per NR216, Ch 2, Sec 3 for the following items: • pinions and wheel bodies • rims • plates and other elements intended for propulsion gear casings of welded construction (3) Mechanical test and NDT are to be carried out for pinions and wheel forgings in accordance with NR216, Ch 2, Sec 3 (4) Survey of shafts and their connections (flange couplings, hubs, bolt pins) as per item **G3** Main propulsion shafting (5) Static balancing test of rotating components in particular gear wheel and pinion shaft assemblies with the coupling part attached. Where $n^2 \cdot d \geq 1,5 \cdot 10^9$, gear wheel and pinion shaft assemblies are also to undergo a dynamic balancing test (6) Verification of cutting accuracy, meshing test and hydrostatic tests as per NR217
	1 - Reduction and/or reverse gears intended for propulsion:					
	• with transmitted power P ≥ 220 kW		C	X h ndt (5) (6)	C	
	• with transmitted power P < 220 kW		W	X	W	
	2 - Other reduction and step-up gears:					
	• with transmitted power P ≥ 110 kW		C	X h ndt (5) (6)	C	
	• with transmitted power P < 110 kW		W	X	W	
G3	Main propulsion shafting (1)	DA	(2)	X h (3)	C	(1) As per NR217, Pt C, Ch 1, Sec 7 (2) Material tests are required for all shaft components (3) Parts of hydraulic couplings, clutches of hydraulic reverse gears and control units, hubs and hydraulic cylinders of controllable pitch propellers, including piping systems and associated fittings, are to be hydrostatically tested to 1,5 times the maximum working pressure (4) Sterntubes, when machine-finished, and propeller shaft liners, when machine-finished on the inside and with an overthickness not exceeding 3 mm on the outside, are to be hydrostatically tested to 0,2 N/mm²
	1 - Coupling	DA	C	X	C	
	2 - Propeller shafts	DA	C	X h	C	
	3 - Intermediate shafts	DA	C	X	C	
	4 - Thrust shafts	DA	C	X	C	
	5 - Cardan shafts	DA	C	X h	C	

AUXILIARY MACHINERY - ITEM G - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G3	6 - Sterntubes	DA	W	X h (4)	W	
	7 - Sterntubes bushes and other shaft bearings	DA	W	X h	W	
	8 - Propeller shaft liners	DA	W	X h (4)	W	
	9 - Coupling bolt or studs	DA	W	X	W	
	10 - Flexible couplings	DA	C	X h	C	
	11 - Thrust sliding-blocks	DA	W	X	W	
G4	Propellers (1)	DA or TA (3)	(2)	X ndt (4)	C	(1) As per NR217, Pt C, Ch 1, Sec 8 (2) Material tests to be in accordance with NR216 in the presence of the Surveyor (3) Mass produced propellers may be accepted within the framework of the type approval program of the Society (4) Static balancing is required for all finished propellers in accordance with the specified ISO 484 tolerance class. Dynamic balance is required for propellers running above 500 rpm (5) Required static balancing of complete built-up and CPP propellers may be replaced by an individual check of blade weight and gravity centre position (6) Complete hydraulic system for the control of CPP mechanism is to be hydrotested at a pressure equal to 1,5 times the design pressure. The proper operation of the safety valve is to be tested in the presence of the Surveyor
	1 - Solid propeller	DA	C	X h	C	
	2 - Built-up and controllable pitch propeller (CPP)	DA	C	X h ht (5) (6)	C	
G5	Steering gears (1)	DA	(2)	X ndt (3)		(1) As per NR217, Pt C, Ch 1, Sec 11 (2) Material tests, including examinations for internal defects, to be performed to components subject to pressure or transmitting mechanical forces as per NR216. Works' certificate may be accepted for low stressed parts, provided all characteristics for which verification is required are guaranteed (3) NDT are to be carried out for mechanical components subjected to pressure or transmitting mechanical forces (4) Tests for pipes, valves and fittings are to comply with NR217, Pt C, Ch 1, Sec 10, [20]
	• power ≥ 50 kW	DA		X bt	C	
	• power < 50 kW	DA		X bt	W	
	1 - Power unit			X h	W	
	2 - Pressure components		C	X h ht ndt	W	
	3 - Load transmitting components		C	X ndt	W	
	4 - Pipes, valves and fittings (4)		C	X h ht	W	

AUXILIARY MACHINERY - ITEM G - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G6	Motorized windlasses	DA (1)		X (4)	C	(1) Or assessment by the mean of type tests according to special conditions. Ref. NR626 - Rule Note for Anchor windlass (2) See item **G8** (Piping) and **G12** (Hydraulic systems) (3) For electric systems (motors, switchboards, starter cabinets, alarm panels, etc.), refer to the relevant provisions of item **K**; for the other systems, refer to the relevant provisions of this NR544, of NR626, and of NR217 (4) Refer to relevant provisions of NR626, Section 1, as amended Note: Alternative test methods subject to Society's acceptance / Anchoring tests / load tests on board, as per agreed program - Refer to NR626
	1- Main shaft	DA	W	X ndt	W	
	2- Casing or body, drum / gipsy-wheel, and main load-bearing structures	DA	W	X ndt	W	
	3- Hydraulic systems, Electric systems (2) (3)	DA		X h	W	
	4- Guide roller, Chain stopper (wire stopper), Guide pins	DA	W	X ndt	W	
G7	Thrusters and their prime movers (1) (2) (3)	DA or TA (4)		X	C	(1) As per NR217, Pt C, Ch 1, Sec 12 (2) Thrusters developing power less than 110 kW are to be built in accordance with sound marine practice and tested as required to the satisfaction of the Surveyor (3) Prime movers are to be tested in accordance with the requirements applicable to the type of mover used (4) Mass produced thrusters may be accepted with the frame work of type approval program of the Society (5) Material testing for parts of athwartship thrusters does not need to be witnessed by a Surveyor, provided full test reports are made available to him
	1 - Transverse thrusters intended for manoeuvring		W (5)	X h ht	C	
	2 - Thrusters intended for propulsion and steering		C	X h ht	C	

AUXILIARY MACHINERY - ITEM G - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G8	Pressure equipment (1) (2)		(3) (4)	(5)	(4)	(1) As per NR217, Pt C, Ch 1, Sec 3 (2) Definitions: p : Design pressure, in MPa V : Volume, in liters T : Design temperature, in °C t_A : Actual thickness of the vessel, in mm (3) In addition to the general requirement, material test for the construction of pressure parts of boilers, other steam generators, oil fired thermal oil heaters and exhaust gas thermal oil heaters to be witnessed by the Surveyor (4) Material test to be witnessed by the Surveyor for class 1 pressure vessels and heat exchangers. This may be waived for mass produced small pressure vessels e.g. accumulators for valve controls, gas bottles, etc. (5) Hydrostatic test of all class 1, class 2 and class 3 pressure vessels are to be witnessed by the Surveyor with the exception of mass produced pressure vessels which are built under the conditions stated in (6) (6) Product certificate W may be accepted for mass produced small pressure vessels of class 1, class 2 and class 3 which are type approved by the Society (7) As per NR217, Pt C, Ch 1, Sec 10, [20] (8) The proof of the quality of materials for pipe Class II is to be in the form of an inspection certificate according to EN 10.204. 3.1 or equivalent (9) As per NR217, Pt C, Ch 1, Sec 4
	1 - Steam generators or boilers					
	Class 1: (p > 3,2 and V > 2) or (p·V > 20 and V > 2)	DA	C	X h ndt	C	
	Class 2: if not class 1 or class 3	DA	W (6)	X h ndt	C	
	Class 3: p·V ≤ 5 or V ≤ 2		W (6)	X h ndt	C	
	2 - Pressure vessels for toxic substances					
	Class 1: all in class 1	DA	C	X h ndt	C	
	3 - Pressure vessels for corrosive substances					
	Class 1: p > 20 or p·V > 20 or T > 350	DA	C	X h ndt	C	
	Class 2: if not in class 1	DA	W	X h ndt	C	
	4 - Pressure vessels for gaseous substances					
	Class 1: p > 100 or p·V > 300	DA	C	X h ndt	C	
	Class 2: V > 1 and p·V > 100 and not in class 1	DA	W	X h ndt	C	
	Class 3: all pressure vessels which are not class 1 or class 2		W	X h ndt	C	
	5 - Pressure vessels for liquid substances					
	Class 1: V > 10 and p·V > 1000 and p > 50	DA	C	X h ndt	C	
	Class 2: (V ≤ 10 and p > 100) or (1 < p ≤ 50 and p·V>1000)	DA	W	X h ndt	C	
	Class 3: all pressure vessels and heat exchangers which are not class 1 or class 2		W	X h ndt	C	
	6 - Pressure vessels for thermal oil					
	Class 1: p > 1,6 or T > 300	DA	C	X h ndt	C	
	Class 2: if not class 1 or class 3	DA	W (4)	X h ndt	C	
	Class 3: p ≤ 0,7 and T ≤ 150		W (4)	X h ndt	C	

AUXILIARY MACHINERY - ITEM G - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
	7 - Pressure vessels for fuel oil, lubricating oil or flammable hydraulic oil					
	Class 1: p > 1,6 or T > 150	DA	C	X h ndt	C	
	Class 2: if not class 1 or class 3	DA	W	X h ndt	C	
	Class 3: p ≤ 0,7 and T ≤ 60		W	X h ndt	C	
	8 - Whatever type of equipment					
G8	**Class 1**: t_A > 40	DA	C	X h ndt	C	
	Class 2: 15 ≤ t_A ≤ 40	DA	W	X h ndt	C	
	9 - Oil firing equipment (7) (9)					
	Class II piping system		W (8)	X h	W	
	Class III piping system if design pressure exceeds 3,5 bar		W	X h	W	
	Domestic gas installations (1)	DA		X (6)	W	
	1 - Medium-pressure pipes			X h ht (2) (3)		
	2 - Other pipes			X ht (4) (5)		
G9	3 - Receptacle fittings subjected to pressure			X ht (7)		
	4 - Gas-consuming appliances			X (8)		

(1) As per NR217, Pt C, Ch 1, Sec 13

(2) Pressure test is carried out with air, an inert gas or liquid at a pressure of 20 bar above atmospheric pressure

(3) Gastightness test is carried out with air or an inert gas at a pressure of 3,5 bar above atmospheric pressure

(4) Tightness test, for concerning pipes, is to be carried out with air or an inert gas at a pressure of 1 bar above atmospheric pressure

(5) Leak test, for concerning pipes, is to be carried out at a pressure of 0,15 bar above atmospheric pressure

(6) Gastightness, tightness and leak tests for the pipes are deemed gastight if, after sufficient time to allow for normal balancing, no fall in the test pressure is observed during the following 10 minutes

(7) Tightness test is carried out with a foaming substance at the operating pressure

(8) All gas-consuming appliances shall be brought into service and tested at the nominal pressure to ensure that combustion is satisfactory with the regulating knobs in the different positions. Flame failure devices shall be checked to ensure that they operate satisfactorily

AUXILIARY MACHINERY - ITEM G - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G10	Pumps and compressors (1)		(7)		(7)	(1) As per NR217, Pt C, Ch 1, Sec 10, [20] (2) The proof of the quality of materials for pipe Class II is to be in the form of an inspection certificate according to EN 10.204. 3.1 or equivalent (3) Cylinders, covers and casings of pumps and compressors are to be subjected to an hydrostatic test. Tightness tests are to be performed on components to which this is appropriate (4) Pumps within this category: • boiler feed water or forced circulating • fuel oil or other flammable oil • compressed air (5) If of welded construction, welding steel pipes are to comply with the applicable requirements of NR467, Pt C, Ch 1, Sec 10. Welded joints in pipelines of Class II are to be tested in accordance with NR216 (6) For main parts before assembling (7) For product certificate C, alternative type of certificate may be accepted depending on the Survey Scheme.
	1 - Class II piping system		W (2)	X h (3)	C	
	2 - Class III piping system if design pressure exceeds 3,5 bar (4)		W	X h	C	
	3 - Class III piping system other than above			X h	W	
	4 - Bilge and fire pumps		W	X h	C	
	5 - Feed pumps for main boilers	DA	C	X h (5) (6)	C	
	6 - Forced circulation pumps for main boilers	DA	C	X h	C	
G11	Starting air receiver (1)	DA or TA	C	X h	C	(1) As per NR217, Pt C, Ch 1, Sec 2
G12	Hydraulic system (1)	DA	W		C	(1) As per NR217, Pt C, Ch 1, Sec 10, [20]
	1 - Pressure casings and oil lines			X h		
	2 - Power unit			X h		
	3 - Systems			X ht		

AUXILIARY MACHINERY - ITEM G - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G13	Pipes, Piping (1)					(1) As per NR217, Pt C, Ch 1, Sec 10, [20] (2) The proof of the quality of materials is to be in the form of an inspection certificate according to EN 10.204. 3.1 or equivalent (3) If of welded construction, welding steel pipes are to comply with the applicable requirements of NR467, Pt C, Ch 1, Sec 10. Welded joints in pipelines of Class II are to be tested in accordance with NR216 (4) All pipe systems are to be tested for leakage under operational conditions. If necessary, special techniques other than hydraulic pressure tests are to be applied: • heating coils in tanks and fuel lines must be tested to not less than 1,5 PB but in no case less than 4 bar • liquefied gas process piping systems are to be leak tested (by air, halides, etc.) to a pressure depending on the leak detection method applied (5) All Class II pipes (and other concerning items) having a design pressure PR greater than 3,5 bar shall be subjected to an hydraulic pressure test in the presence of the Surveyor (6) Relevant tests are to be carried out on each type and each size as per NR467, Pt C, Ch 1, Sec 10, [2.1.3] (7) Hydrostatic tests under supervision of the Society
	1 - Class II		C	X h (3) (4) (5)	C	
	2 - Class III		W (2)	X h (3) (4)	W	
	3 - Hose assemblies and compensators	TA (6)	C	X h (7)	C	
	4 - Plastic piping		C	X h	C	
G14	Pipe fittings (1)					(1) As per NR217, Pt C, Ch 1, Sec 10, [20] (2) If of welded construction, welding steel pipes are to comply with the applicable requirements of NR467, Pt C, Ch 1, Sec 10. Welded joints in pipelines of Class II are to be tested in accordance with NR216 (3) The following valves are to be subjected in the manufacture's work to an hydraulic pressure test in the presence of the Surveyor and are also subjected to undergo a tightness test at 1,0 times the nominal pressure: • valves of pipe Class II to 1,5 PR • valves mounted on the vessel's side not less than 5 bar
	1 - Valves for pipe Class II	DA	C	X h (2) (3)	C	
	2 - Valves for pipe Class III			X (2)		
	• diameter ≤ 100 mm		W	X h (3)	W	
	• diameter > 100 mm	DA	C	X h (3)	C	
	3 - For plastic pipes	DA	C	X	C	
	4 - Remote controlled valves			X	C	

Table 6: Electrical installations - item K - ✠

All vessels/units (carriage/storage of dangerous goods excepted)

ELECTRICAL INSTALLATIONS - ITEM K - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
K1	Generators (1)					(1) As per NR217, Pt C, Ch 2, Sec 4 (2) Tests to be performed: • temperature rise test • overload test • short-circuit test • high voltage test • overspeed test • measurement of insulation resistance (3) All electrical machines are to be tested at manufacturer's work. When the test is not specified, the requirements of IEC 60034 apply
	• power ≥ 50 kW/kVA	TA	C	X (2) (3)	C	
	• power < 50 kW/kVA		W	X (2) (3)	W	
K2	Electrical machines (1)					(1) As per NR217, Pt C, Ch 2, Sec 4 (2) Tests to be performed: • temperature rise test • overload test • short-circuit test • high voltage test • overspeed test • measurement of insulation resistance (3) All electrical machines are to be tested at manufacturer's work. When the test is not specified, the requirements of IEC 60034 apply
	• power ≥ 50 kW/kVA	TA	C	X (2) (3)	C	
	• power < 50 kW/kVA		W	X (2) (3)	W	
K3	Transformers (1)					(1) As per NR217, Pt C, Ch 2, Sec 5 (2) Power transformers are to be tested according to IEC 60076
	• power ≥ 50 kW/kVA	TA		X (2)	C	
	• power < 50 kW/kVA			X (2)	W	

ELECTRICAL INSTALLATIONS - ITEM K - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
K4	Storage batteries (1)	TA (HBV)		X (2)	W	(1) As per NR217, Pt C, Ch 2, Sec 7 (2) The following shall be tested: • installation of storage batteries • ventilation of battery rooms, cupboards/containers; and cross-section of ventilation ducts • storage battery charging equipment • required caution labels and information plates
K5	Storage battery chargers (1)					(1) As per NR217, Pt C, Ch 2, Sec 7
	• power ≥ 2 kW/kVA	TA		X	C	
	• power < 2 kW/kVA			X	W	
K6	Switchboards (1)					(1) As per NR217, Pt C, Ch 2, Sec 8 (2) Including switchboards for emergency generator sets (3) Tests to be performed: • operational test • high voltage test • insulation resistance measurement
	• power ≥ 100 kW/kVA (2)	DA or TA		X (3)	C	
	• power < 100 kW/kVA	DA or TA (HBV)		X	W	
K7	Switchgear (1)	TA (2) (HBV)		X	W	(1) As per NR217, Pt C, Ch 2, Sec 8. (2) As a general principle, switchgear shall be type approved, designed and constructed in accordance with standard IEC, EN or other standards recognized by the Society
K8	Cables and insulated wires (1)	TA (2) (HBV)		X	W	(1) As per NR217, Pt C, Ch 2, Sec 9 (2) As a general principle, the use of the types of cables and wired according to IEC 60092 is permitted
K9	Control, monitoring, alarm and safety systems (1)	TA		X (2)	C	(1) As per NR217, Pt C, Ch 3, Sec 2 (2) Operational test to be performed
K10	Power electronics (1)					(1) As per NR217, Pt C, Ch 3, Sec 4 (2) Routine tests to be performed: • voltage test • insulation resistance test (3) Operational test to be performed on the subsequent machines
	• power ≥ 50 kW/kVA	TA		X (2) (3)	C	
	• power < 50 kW/kVA			X (2) (3)	W	

ELECTRICAL INSTALLATIONS - ITEM K - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
K11	Electrical propulsion plants (1)					(1) As per NR217, Pt C, Ch 2, Sec 13 (2) Material certificate for shafts. Shafts are to be made of material complying with NR216, Ch 2, Sec 3 or, where rolled products are allowed in place of forgings, with NR216, Ch 2, Sec 1 (3) Shaft material for electric propulsion motors and for main engine driven generators where the shaft is part of the propulsion shafting is to be certified by the Society (4) If appropriate, where welded parts are foreseen on shafts and rotors, the provisions of NR216, Chapter 5 apply (5) Type test are to be carried out on a prototype machine or on the first of a batch of machines, and routine tests carried out on the subsequent machines (6) Functioning of the propulsion plant shall be proved by dock trial before river trials (7) Testing during trial voyages as per NR217, Pt C, Ch 2, Sec 14
	• power ≥ 50 kW/kVA	DA or TA	C (2) (3)	X (4) (5) (6) (7)	C	
	• power < 50 kW/kVA	DA or TA (HBV)	W (2) (3)	X (4) (5) (6) (7)	W	
K12	Computer systems (1)					(1) As per NR217, Pt C, Ch 3, Sec 3 (2) Following test shall be carried out in the manufacturer's works: • function test • operating conditions simulation • fault simulation • simulation of the application environment
	1 - Class 1 and class 2			X (2)	W	
	2 - Class 3, class 4 and class 5	TA		X (2)	C	

Table 7: Pollution prevention installation covered by additional class notation Cleanvessel / Clean-Unit - item S - ✠

All vessels/units (carriage/storage of dangerous goods excepted)

POLLUTION PREVENTION INSTALLATION COVERED BY ADDITIONAL CLASS NOTATION CLEANVESSEL / CLEAN-UNIT - ITEM S - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
S	Pollution prevention installation covered by additional class notation **Cleanvessel / Clean-Unit**					
S1	Sewage treatment plant (1)	TA		X h	C	(1) In accordance with IMO Resolution MEPC. 159 (55)
S2	Incinerator (1)	TA		X	C	(1) In accordance with IMO Resolution MEPC. 76 (40) as amended by Resolution MAPC.93 (45) and Annex VI of MARPOL 73/78, Appendix IV
S3	Anti-fouling system (1)	TA (2)		X	C	(1) In accordance with International Convention on the Control of Harmful and Anti-fouling Systems, 2001, Annex 4, Appendices 1 and 2 (2) Anti-fouling paint are to be a type approved by the Society, on the basis of the following criteria: • TBT-free • small quantities of organotin compounds acting as a chemical catalyst are allowed provided their concentration does not exceed 2500 mg total tin per kg of dry paint
S4	Advanced water treatment plants (1)	TA		X	C	(1) In accordance with IMO Resolution MEPC. 159 (55)
S5	Grey water treatment plants (1)	TA		X	C	(1) In accordance with IMO Resolution MEPC. 159 (55)
S6	Onboard NOx monitoring systems (1)	TA		X	C	(1) Where NOx reduction methods (such as water injection, fuel oil emulsification, charge air humidification, exhaust gas after-treatment) are used, they are to be approved by the Society and taken into account in type approval certification of the engine
S7	Oily water separator (OWS) systems (1)	TA		X h	C	(1) In accordance with IMO Resolution MEPC. 107 (49)
S8	Exhaust gas cleaning (EGC) systems (1)	TA		X	C	(1) In accordance with IMO Resolution MEPC.184 (59): 2009 Guidelines for exhaust gas cleaning systems
S9	Oil content meter	TA		X	C	
S10	Oil sealing glands	TA		X	C	
S11	Leak detector for refrigeration systems	TA		X	C	

SECTION 3 VESSELS / UNITS ASSIGNED WITH CONSTRUCTION MARK • (EXCEPTED THOSE INTENDED FOR CARRIAGE / STORAGE OF DANGEROUS GOODS)

1 Equipment and materials certification requirements

1.1 Summary (tables)

1.1.1 Provisions related to survey at works for vessels/units assigned with Construction Mark •, excepted those intended for the carriage/storage of dangerous goods, are summarized in the Table below.

All vessels/units (carriage/storage of dangerous goods excepted) with assignment of Construction Mark •		
Item	Title	Reference
Item A	Raw materials for hull	Tab 8
Item B	Hull outfitting	Tab 9
Item C	Fire protection, detection and extinguishing	Tab 10
Item E	Main diesel engines & their auxiliaries	Tab 11
Item G	Auxiliary machinery	Tab 12
Item K	Electrical installations	Tab 13
Item S	Pollution prevention installation covered by additional class notation **Cleanvessel / Clean-Unit**	Tab 14

Table 8: Raw materials for hull - item A - •

All vessels/units (carriage/storage of dangerous goods excepted)

RAW MATERIALS FOR HULL - ITEM A - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
A1	Steel plates and profiles					(1) As per NR216, Ch 2, Sec 1 (2) As per NR216, Ch 2 Sec 2 (3) See raw material certification
	1 - Plates, sections and bars	(1)	W (1)		(3)	
	2 - Tubes	(2)	W (2)		(3)	
A2	Steel forgings (1)	(2)	W (2)		(3)	(1) Manufacturers of steel forgings are to be recognised by the Society in accordance with NR320. The manufacturing process is to be approved in accordance with NR480 depending on the type, size and weight of steel forgings (e.g over 1000 kg or 200mm diameter for steel forgings as per NR216, Ch 2, Sec 3, [2] and [3]; over 1000 kg for steel forgings as per NR216, Ch 2, Sec 3, [4] to [9]. (2) Approval as per NR216, Ch 2, Sec 3, as applicable (3) See raw material certification
A3	Steel castings (1)	(2)	W (2)		(3)	(1) Manufacturers of steel castings are to be recognised by the Society in accordance with NR320. The manufacturing process is to be approved in accordance with NR480 depending on the type, size and weight of steel casting items (e.g over 1000 kg for steel castings as per NR216, Ch 2, Sec 4, [2] and [3] or NR216, Ch 2, Sec 4, [5], [6] and [7]; any casting for crankshafts as per NR216, Ch 2, Sec 4, [4]; any stainless steel castings for propellers as per NR216, Ch 2, Sec 4, [8]). (2) Approval as per NR216, Ch 2, Sec 4, as applicable (3) See raw material certification
A4	Iron castings (1)	(2)	W (2)		(3)	(1) Manufacturers of iron castings are to be recognised by the Society in accordance with NR320. (2) Approval as per NR216, Ch 2, Sec 5, as applicable (3) See raw material certification
A5	Aluminium alloy plates, profiles, bars and tubes	(1)	W (1)		(2)	(1) Approval as per NR216, as applicable (2) See raw material certification

RAW MATERIALS FOR HULL - ITEM A - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
A6	Transition joints steel / aluminium alloy	TA (1)	W (1)		W	(1) As per NR216, Ch 3, Sec 2
A7	Filler products for welding (welding consumables)	TA (1)			W	(1) As per NR216, Ch 5, Sec 2
A8	Composite materials	DA (1)		X (2)	C / W (3)	(1) DA for structural assembly; as per NR217. Also see provisions of NR546 - Hull in composite Materials and Plywood, Material Approval, Design Principles, Construction and Survey (2) A representative sample of the structural assembly is to be tested and qualified as per agreed program; relevant tests to be carried out by a testing laboratory accepted by the Society (3) Document type according to the agreed survey scheme - as per conditions set in the DA (4) Type approval or case-by-case approval by the Society; see provisions of NR546, Section 11
	• Adhesives intended for marine structural applications	TA (HBV) (4)			W	
	• Reinforcement fibres	TA (HBV) (4)			W	
	• Resin systems	TA (HBV) (4)			W	
	• Core materials for sandwiches	TA (HBV) (4)			W	
A9	Cast steel shaft brackets (1)	DA	W	X ndt (2)	W	(1) As per NR217, Pt B, Ch 7, Sec 3 (2) Vibration analysis is recommended for single arm propeller shaft

Table 9: Hull outfitting - item B - •

All vessels/units (carriage/storage of dangerous goods excepted)

HULL OUTFITTING - ITEM B - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
B1	Rudders / nozzles (1)					(1) As per NR217, Pt B, Ch 7, Sec 1 (2) Leak test is to be carried out for double plate rudder as per NR217, Pt B, Ch 8, Sec 4
	1 - Rudder stock, shaft, pintles, coupling	DA	W	X	W	
	2 - Rudder blade / nozzle shell	DA	W	X h (2)	W	
B2	Anchors (1)	TA (HBV)	W	X ndt	W	(1) As per NR217, Pt B, Ch 7, Sec 4
B3	Anchor chain cables (1)	TA (HBV)	W	X ndt (2)	W	(1) As per NR217, Pt B, Ch 7, Sec 4 (2) Additional approval for manufacturing process is required for rolled bars of grade K2 and K3 (or Q2 and Q3)
B4	Anchor chain cable accessories (1) (shackles, swivels and other attachment pieces)	TA (HBV)	W	X ndt (2)	W	(1) As per NR217, Pt B, Ch 7, Sec 4 (2) Tests as per NR216, Ch 4, Sec 1
B5	Ropes (Steel wire ropes and fibre ropes) (1)		W	X (2)	W	(1) As per NR217, Pt B, Ch 7, Sec 4 (2) Tests as per NR216, Ch 4, Sec 1
B6	Sidescuttles and windows (1)	DA	W	X (2)	W	(1) As per NR217, Pt B, Ch 7, Sec 4 (2) Tests as per NR216, Ch 4, Sec 3
B7	Shell doors	DA	W	X hose (1)	W	(1) Hose test as per NR217, Pt B, Ch 8, Sec 4
B8	Hatchcovers (1)	DA	W	X hose	W	(1) As per NR217, Pt B, Ch 6, Sec 5
B9	Watertight doors	DA	W	X h (1)	W	(1) Structural test is to be carried out for watertight doors below freeboard or bulkhead deck either before or after the door is fitted on board
B10	External ramp (1)	DA	W	X ndt	W	(1) As per NR217, Pt B, Ch 6, Sec 6
B11	Movable deck and inner ramp (1)	DA	W	X	W	(1) As per NR217, Pt B, Ch 6, Sec 6
B12	Independent tanks	DA	W	X ndt (1)	W	(1) Structural test is to be carried out for independent tanks not used as cargo tanks
B13	Elastic bedding		W	X	W	
B14	Bollards and bitts (1)(2)	(2)	W (1)(2)	(2)	W (1)(2)	(1) As per recognised standards - see provisions of NR217, Pt B, Ch 7, Sec 4. (2 Other cases: assessment on a case-by-case basis

Table 10: Fire protection, detection and extinguishing - item C - •

All vessels/units (carriage/storage of dangerous goods excepted)

FIRE PROTECTION, DETECTION AND EXTINGUISHING - ITEM C - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
C1	Fire bulkheading, fire doors (1)	TA (HBV)	W	X	W	(1) As per NR217, Pt C, Ch 4, Sec 1, [1]
C2	Fire dampers (1)	TA (HBV)	W	X h	W	(1) As per NR217, Pt C, Ch 4, Sec 1, [1.5]
C3	Water supply system (1)					(1) As per NR217, Pt C, Ch 4, Sec 4, [1]
	1 - Fire pumps			X h	W	
	2 - Pump prime movers			X	W	
	3 - Hoses	TA (HBV)	W		W	
	4 - Water spray nozzles	TA (HBV)	W		W	
C4	Automatic pressure water spraying system (1)					(1) As per NR217, Pt C, Ch 4, Sec 4, [3]
	1 - Pressure pumps			X h	W	
	2 - Pump prime movers			X	W	
	3 - Water spray piping system		W		W	
	4 - Pressure water tank	DA	W	X h	W	
	5 - Water spray nozzles	TA (HBV)	W		W	
C5	Fixed gas fire extinguishing system (1)					(1) As per NR217, Pt C, Ch 4, Sec 4, [4]
	1 - Piping system		W	X h	W	
	2 - Pressure tank	DA	W	X h	W	
	3 - Discharge nozzles	TA (HBV)	W		W	
	4 - Extinguishing agents	TA (HBV)			W	
C6	Portable fire extinguishers (1)	TA (HBV)		X h	W	(1) As per NR217, Pt C, Ch 4, Sec 4, [2]
C7	Detection and alarm system (1)	TA (HBV)		X ndt	W	(1) As per NR217, Pt C, Ch 4, Sec 3

Table 11: Main diesel engines & their auxiliaries - item E - •

All vessels/units (carriage/storage of dangerous goods excepted)

MAIN DIESEL ENGINES & THEIR AUXILIARIES - ITEM E - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
E1	Main diesel engines with diameter of cylinder bore, D > 300 mm (1)	TA (HBV)		X (2)	W	(1) As per NR217, Pt C, Ch 1, Sec 2 (2) Type tests to be in accordance with NR217, Pt C, Ch 1, Sec 2, [4] (3) NDT of magnetic particle and ultrasonic (4) Material test is required if bore > 400 mm (5) Material tests are also required for parts made of material other than steel (6) NDT of magnetic particle or liquid penetrant (if bore > 400 mm) and ultrasonic (all) (7) NDT of magnetic particle or liquid penetrant and ultrasonic are required if bore > 400 mm (8) NDT of magnetic particle or liquid penetrant (all) and ultrasonic (if bore > 400 mm) (9) Material test is required if bore > 300 mm (10) Material tests are required even these parts are not welded and for any material except grey cast iron (11) NDT of magnetic particle or liquid penetrant if bore > 400 mm (12) Material certification and test as per NR217, Pt C, Ch 1, Sec 14, [2.1] (13) For forged steel, test methods other than hydrostatic testing may be accepted e.g. suitable NDT and documented dimensional test (14) Where the cooling space is sealed by the piston rod, or by the piston ron and the shell, the pressure test is to be carried out after the assembly (15) See item Turbochargers (16) Turbocharger air cooler are tested on the water side only
	1 - Crankshaft	DA	W	X ndt (3)	W	
	2 - Crankshaft coupling flange (non-integral) for main power transmissions		W (4)		W	
	3 - Coupling bolts for crankshaft		W (4)		W	
	4 - Steel piston crowns		W (4) (5)	X ndt (6)	W	
	5 - Pistons rods		W (4)	X h ndt (7)	W	
	6 - Connecting rods, together with connecting rod bearing caps		W	X h ndt (8)	W	
	7 - Crossheads		W (4)	X	W	
	8 - Cylinder liners		W (9)	X h	W	
	9 - Steel cylinder covers		W (5) (9)	X h ndt (6)	W	
	10 - Bedplates of welded construction; plates and transverse bearing girders made of forged or cast steel		W (5) (10)	X ndt	W	
	11 - Frames and crankcases of welded construction		W	X	W	
	12 - Entablatures of welded construction		W	X	W	
	13 - Tie rods		W	X h ndt (11)	W	
	14 - Shaft and rotors, including blades for turbochargers		W (12)	X	W	
	15 - Bolts and studs for cylinder covers, crossheads, main bearings and connecting rod bearings; nuts for tie rods		W (9)	X ndt (11)	W	
	16 - Steer gear wheels for camshaft drives		W (4)	X ndt (11)	W	
	17 - Cylinder liner, over the whole length of cooling space			X h	W	
	18 - Cylinder cover, cooling space			X h (13)	W	
	19 - Cylinder jacket, cooling space			X h	W	
	20 - Exhaust valve, cooling space			X h	W	

MAIN DIESEL ENGINES & THEIR AUXILIARIES - ITEM E - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
E1	21 - Piston crown, cooling space			X h (13) (14)	W	
	22 - Turbocharger, cooling space		(15)	X h	W	
	23 - Exhaust pipe, cooling space			X h	W	
	24 - Coolers, each side			X h (16)	W	
	25 - Fuel injection system (injection pump body pressure side, injection valve, injection pipes)			X h	W	
	26 - Hydraulic system (piping pumps, actuators, etc for hydraulic drive of valves)			X h	W	
	27 - Scavenge pump cylinder			X h	W	
	28 - Engine driven air compressor if any (cylinders, covers, intercoolers and aftercoolers); air side, water side			X h	W	
	29 - Engine driven pumps (oil, water, fuel, bilge)			X h	W	
E2	Heat exchangers (1)	TA (HBV)	W	X h ndt	W	(1) As per NR217, Pt C, Ch 1, Sec 3
E3	Turning gears of main diesel engines (1)			X		(1) As per NR217, Pt C, Ch 1, Sec 2
E4	Scavenging and supercharging compressors or blowers (1)	TA (HBV)	W (2)	X h bt (3)	W	(1) As per NR217, Pt C, Ch 1, Sec 2 (2) Shaft and rotor where D > 300 mm (3) Test to be carried out during bench trials of the engine of which these equipment are mounted
E5	Control and safety devices (1)	DA		X (2)	W	(1) As per NR217, Pt C, Ch 1, Sec 2 (2) During load test
E6	Mass produced diesel engines with diameter of cylinder bore, D < 300 mm (1)	TA	C (1)	X ndt (1)	C (1)	(1) This item **E6** is kept for information and records only; the terminologies “Mass-produced diesel engines” or “Mass production” are no longer used in NR217 (such consideration has been withdrawn since July 2016). For diesel engines, refer to item **E1** and provisions of NR217, Pt C, Ch 1, Sec 2

MAIN DIESEL ENGINES & THEIR AUXILIARIES - ITEM E - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
E7	Turbochargers (1) (2) having served power by cylinder groups of less or equal to 1000 kW and fitted on diesel engines as: • main propulsion engines • engines driving electric generators, including emergency generators • engines driving other auxiliaries essential for safety and navigation and cargo pumps in tankers	DA or TA (HBV)	W (3)	X h ndt	W	(1) As per NR217, Pt C, Ch 1, Sec 14 (2) Other turbochargers: assessment on a case-by-case basis (3) Material test are required for shafts and rotors, including blades
E8	Starting air receiver (1)	DA or TA (HBV)	W	X h	W	(1) As per NR217, Pt C, Ch 1, Sec 2

Table 12: Auxiliary machinery - item G - •

All vessels/units (carriage/storage of dangerous goods excepted)

AUXILIARY MACHINERY - ITEM G - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G1	Auxiliary diesel engines (1)	TA (HBV)		X bt	W	(1) As per NR217, Pt C, Ch 1, Sec 2
G2	Gears and couplings (1)	DA	(2)	X ndt (3) (4)		(1) As per NR217, Pt C, Ch 1, Sec 6 (2) Material tests as per NR216, Ch 2, Sec 3 for the following items: • pinions and wheel bodies • rims • plates and other elements intended for propulsion gear casings of welded construction (3) Mechanical test and NDT are to be carried out for pinions and wheel forgings in accordance with NR216, Ch 2, Sec 3 (4) Survey of shafts and their connections (flange couplings, hubs, bolt pins) as per item **G3** Main propulsion shafting (5) Static balancing test of rotating components in particular gear wheel and pinion shaft assemblies with the coupling part attached. Where $n^2 \cdot d \geq 1{,}5 \cdot 10^9$, gear wheel and pinion shaft assemblies are also to undergo a dynamic balancing test (6) Verification of cutting accuracy, meshing test and hydrostatic tests as per NR217
	1 - Reduction and/or reverse gears intended for propulsion:					
	• with transmitted power P ≥ 220 kW		W	X h ndt (5) (6)	W	
	• with transmitted power P < 220 kW		W	X	W	
	2 - Other reduction and step-up gears:					
	• with transmitted power P ≥ 110 kW		W	X h ndt (5) (6)	W	
	• with transmitted power P < 110 kW		W	X	W	
G3	Main propulsion shafting (1)	DA	(2)	X h (3)	W	(1) As per NR217, Pt C, Ch 1, Sec 7 (2) Material tests are required for all shaft components (3) Parts of hydraulic couplings, clutches of hydraulic reverse gears and control units, hubs and hydraulic cylinders of controllable pitch propellers, including piping systems and associated fittings, are to be hydrostatically tested to 1,5 times the maximum working pressure (4) Sterntubes, when machine-finished, and propeller shaft liners, when machine-finished on the inside and with an overthickness not exceeding 3 mm on the outside, are to be hydrostatically tested to 0,2 N/mm²
	1 - Coupling	DA	W	X	W	
	2 - Propeller shafts	DA	W	X h	W	
	3 - Intermediate shafts	DA	W	X	W	
	4 - Thrust shafts	DA	W	X	W	
	5 - Cardan shafts	DA	W	X h	W	

AUXILIARY MACHINERY - ITEM G - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G3	6 - Sterntubes	DA	W	X h (4)	W	
	7 - Sterntubes bushes and other shaft bearings	DA	W	X h	W	
	8 - Propeller shaft liners	DA	W	X h (4)	W	
	9 - Coupling bolt or studs	DA	W	X	W	
	10 - Flexible couplings	DA	W	X h	W	
	11 - Thrust sliding-blocks	DA	W	X	W	
G4	Propellers (1)	DA or TA (HBV) (3)	(2)	X ndt (4)	W	(1) As per NR217, Pt C, Ch 1, Sec 8 (2) Material tests to be in accordance with NR216 (3) Mass produced propellers may be accepted within the framework of the type approval program of the Society (4) Static balancing is required for all finished propellers in accordance with the specified ISO 484 tolerance class. Dynamic balance is required for propellers running above 500 rpm (5) Required static balancing of complete built-up and CPP propellers may be replaced by an individual check of blade weight and gravity centre position (6) Complete hydraulic system for the control of CPP mechanism is to be hydrotested at a pressure equal to 1,5 times the design pressure. The proper operation of the safety valve is to be tested in the presence of the Surveyor
	1 - Solid propeller	DA	W	X h	W	
	2 - Built-up and controllable pitch propeller (CPP)	DA	W	X h ht (5) (6)	W	
G5	Steering gears (1)	DA	(2)	X ndt (3)	W	(1) As per NR217, Pt C, Ch 1, Sec 11 (2) Material tests, including examinations for internal defects, to be performed to components subject to pressure or transmitting mechanical forces as per NR216 (3) NDT are to be carried out for mechanical components subjected to pressure or transmitting mechanical forces (4) Tests for pipes, valves and fittings are to comply with NR217, Pt C, Ch 1, Sec 10, [20]
	• power ≥ 50 kW	DA		X bt	W	
	• power < 50 kW	DA		X bt	W	
	1 - Power unit			X h	W	
	2 - Pressure components		W	X h ht ndt	W	
	3 - Load transmitting components		W	X ndt	W	
	4 - Pipes, valves and fittings (4)		W	X h ht	W	

AUXILIARY MACHINERY - ITEM G - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G6	Motorized windlasses	DA (1)		X (4)	W	(1) Or assessment by the mean of type tests according to special conditions. Ref. NR626 - Rule Note for Anchor windlass (2) See item **G8** (Piping) and **G12** (Hydraulic systems) (3) For electric systems (motors, switchboards, starter cabinets, alarm panels, etc.), refer to the relevant provisions of item **K**; for the other systems, refer to the relevant provisions of this NR544, of NR626, and of NR217 (4) Refer to relevant provisions of NR626, Section 1, as amended Note: Alternative test methods subject to Society's acceptance / Anchoring tests / load tests on board, as per agreed program - Refer to NR626
	1- Main shaft	DA	W	X ndt	W	
	2- Casing or body, drum / gipsy-wheel, and main load-bearing structures	DA	W	X ndt	W	
	3- Hydraulic systems, Electric systems (2) (3)	DA		X h	W	
	4- Guide roller, Chain stopper (wire stopper), Guide pins	DA	W	X ndt	W	
G7	Thrusters and their prime movers (1) (2) (3)	DA or TA (HBV) (4)		X	W	(1) As per NR217, Pt C, Ch 1, Sec 12 (2) Thrusters developing power less than 110 kW are to be built in accordance with sound marine practice and tested as required to the satisfaction of the Surveyor (3) Prime movers are to be tested in accordance with the requirements applicable to the type of mover used (4) Mass produced thrusters may be accepted with the frame work of type approval program of the Society (5) Material testing for parts of athwartship thrusters does not need to be witnessed by a Surveyor, provided full test reports are made available to him
	1 - Transverse thrusters intended for manoeuvring		W (5)	X h ht	W	
	2 - Thrusters intended for propulsion and steering		W	X h ht	W	

AUXILIARY MACHINERY - ITEM G - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G8	Pressure equipment (1) (2)		(3) (4)	(5)	(4)	(1) As per NR217, Pt C, Ch 1, Sec 4
	1 - Steam generators or boilers					(2) Definitions: p : Design pressure, in MPa V : Volume, in litres T : Design temperature, in °C t_A : Actual thickness of the vessel, in mm
	Class 1: (p > 3,2 and V > 2) or (p·V > 20 and V > 2)	DA	W	X h ndt	W	
	Class 2: if not class 1 or class 3	DA	W (6)	X h ndt	W	
	Class 3: p·V ≤ 5 or V ≤ 2		W (6)	X h ndt	W	(3) In addition to the general requirement, material test for the construction of pressure parts of boilers, other steam generators, oil fired thermal oil heaters and exhaust gas thermal oil heaters to be witnessed by the Surveyor
	2 - Pressure vessels for toxic substances		C			
	Class 1: all in class 1	DA	W	X h ndt	W	
	3 - Pressure vessels for corrosive substances					(4) Material test to be witnessed by the Surveyor for class 1 pressure vessels and heat exchangers. This may be waived for mass produced small pressure vessels e.g. accumulators for valve controls, gas bottles, etc.
	Class 1: p > 20 or p·V > 20 or T > 350	DA	W	X h ndt	W	
	Class 2: if not in class 1	DA	W	X h ndt	W	(5) Hydrostatic test of all class 1, class 2 and class 3 pressure vessels are to be witnessed by the Surveyor with the exception of mass produced pressure vessels which are built under the conditions stated in (6)
	4 - Pressure vessels for gaseous substances					
	Class 1: p > 100 or p·V > 300	DA	W	X h ndt	W	
	Class 2: V > 1 and p·V > 100 and not in class 1	DA	W	X h ndt	W	(6) Product certificate W may be accepted for mass produced small pressure vessels of class 1, class 2 and class 3 which are type approved by the Society
	Class 3: all pressure vessels which are not class 1 or class 2		W	X h ndt	W	
	5 - Pressure vessels for liquid substances					(7) As per NR217, Pt C, Ch 1, Sec 10, [20]
	Class 1: V > 10 and p·V > 1000 and p > 50	DA	W	X h ndt	W	(8) The proof of the quality of materials for pipe Class II is to be in the form of an inspection certificate according to EN 10.204. 3.1 or equivalent
	Class 2: (V ≤ 10 and p > 100) or (1 < p ≤ 50 and p·V>1000)	DA	W	X h ndt	W	(9) As per NR217, Pt C, Ch 1, Sec 4
	Class 3: all pressure vessels and heat exchangers which are not class 1 or class 2		W	X h ndt	W	
	6 - Pressure vessels for thermal oil					
	Class 1: p > 1,6 or T > 300	DA	W	X h ndt	W	
	Class 2: if not class 1 or class 3	DA	W (4)	X h ndt	W	
	Class 3: p ≤ 0,7 and T ≤ 150		W (4)	X h ndt	W	

AUXILIARY MACHINERY - ITEM G - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
	7 - Pressure vessels for fuel oil, lubricating oil or flammable hydraulic oil					
	Class 1: p > 1,6 or T > 150	DA	W	X h ndt	W	
	Class 2: if not class 1 or class 3	DA	W	X h ndt	W	
	Class 3: p ≤ 0,7 and T ≤ 60		W	X h ndt	W	
	8 - Whatever type of equipment					
G8	**Class 1**: t_A > 40	DA	W	X h ndt	W	
	Class 2: 15 ≤ t_A ≤ 40	DA	W	X h ndt	W	
	9 - Oil firing equipment (7) (9)					
	Class II piping system		W (8)	X h	W	
	Class III piping system if design pressure exceeds 3,5 bar		W	X h	W	
	Domestic gas installations (1)	DA		X (6)	W	
	1 - Medium-pressure pipes			X h ht (2) (3)		
	2 - Other pipes			X ht (4) (5)		
G9	3 - Receptacle fittings subjected to pressure			X ht (7)		
	4 - Gas-consuming appliances			X (8)		

(1) As per NR217, Pt C, Ch 1, Sec 13

(2) Pressure test is carried out with air, an inert gas or liquid at a pressure of 20 bar above atmospheric pressure

(3) Gastightness test is carried out with air or an inert gas at a pressure of 3,5 bar above atmospheric pressure

(4) Tightness test, for concerning pipes, is to be carried out with air or an inert gas at a pressure of 1 bar above atmospheric pressure

(5) Leak test, for concerning pipes, is to be carried out at a pressure of 0,15 bar above atmospheric pressure

(6) Gastightness, tightness and leak tests for the pipes are deemed gastight if, after sufficient time to allow for normal balancing, no fall in the test pressure is observed during the following 10 minutes

(7) Tightness test is carried out with a foaming substance at the operating pressure

(8) All gas-consuming appliances shall be brought into service and tested at the nominal pressure to ensure that combustion is satisfactory with the regulating knobs in the different positions. Flame failure devices shall be checked to ensure that they operate satisfactorily

AUXILIARY MACHINERY - ITEM G - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G10	Pumps and compressors (1)		(7)		(7)	(1) As per NR217, Pt C, Ch 1, Sec 10, [20] (2) The proof of the quality of materials for pipe Class II is to be in the form of an inspection certificate according to EN 10.204. 3.1 or equivalent (3) Cylinders, covers and casings of pumps and compressors are to be subjected to an hydrostatic test. Tightness tests are to be performed on components to which this is appropriate (4) Pumps within this category: • boiler feed water or forced circulating • fuel oil or other flammable oil • compressed air (5) If of welded construction, welding steel pipes are to comply with the applicable requirements of NR467, Pt C, Ch 1, Sec 10. Welded joints in pipelines of Class II are to be tested in accordance with NR216 (6) For main parts before assembling (7) For product certificate C, alternative type of certificate may be accepted depending on the Survey Scheme.
	1 - Class II piping system		W (2)	X h (3)	W	
	2 - Class III piping system if design pressure exceeds 3,5 bar (4)		W	X h	W	
	3 - Class III piping system other than above			X h	W	
	4 - Bilge and fire pumps		W	X h	W	
	5 - Feed pumps for main boilers	DA	W	X h (5) (6)	W	
	6 - Forced circulation pumps for main boilers	DA	W	X h	W	
G11	Starting air receiver (1)	DA or TA (HBV)	W	X h	W	(1) As per NR217, Pt C, Ch 1, Sec 2
G12	Hydraulic system (1)	DA	W		W	(1) As per NR217, Pt C, Ch 1, Sec 10, [20]
	1 - Pressure casings and oil lines			X h		
	2 - Power unit			X h		
	3 - Systems			X ht		

AUXILIARY MACHINERY - ITEM G - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G13	Pipes, Piping (1)					(1) As per NR217, Pt C, Ch 1, Sec 10, [20] (2) The proof of the quality of materials is to be in the form of an inspection certificate according to EN 10.204. 3.1 or equivalent (3) If of welded construction, welding steel pipes are to comply with the applicable requirements of NR467, Pt C, Ch 1, Sec 10. Welded joints in pipelines of Class II are to be tested in accordance with NR216 (4) All pipe systems are to be tested for leakage under operational conditions. If necessary, special techniques other than hydraulic pressure tests are to be applied: • heating coils in tanks and fuel lines must be tested to not less than 1,5 PB but in no case less than 4 bar • liquefied gas process piping systems are to be leak tested (by air, halides, etc.) to a pressure depending on the leak detection method applied (5) All Class II pipes (and other concerning items) having a design pressure PR greater than 3,5 bar shall be subjected to an hydraulic pressure test in the presence of the Surveyor (6) Relevant tests are to be carried out on each type and each size as per NR467, Pt C, Ch 1, Sec 10, [2.1.3] (7) Hydrostatic tests under supervision of the Society
	1 - Class II		W (2)	X h (3) (4) (5)	W	
	2 - Class III		W (2)	X h (3) (4)	W	
	3 - Hose assemblies and compensators	TA (6) (HBV)	W	X h (7)	W	
	4 - Plastic piping		W	X h	W	
G14	Pipe fittings (1)					(1) As per NR217, Pt C, Ch 1, Sec 10, [20] (2) If of welded construction, welding steel pipes are to comply with the applicable requirements of NR467, Pt C, Ch 1, Sec 10. Welded joints in pipelines of Class II are to be tested in accordance with NR216 (3) The following valves are to be subjected in the manufacture's work to an hydraulic pressure test in the presence of the Surveyor and are also subjected to undergo a tightness test at 1,0 times the nominal pressure: • valves of pipe Class II to 1,5 PR • valves mounted on the vessel's side not less than 5 bar
	1 - Valves for pipe Class II	DA	W	X h (2) (3)	W	
	2 - Valves for pipe Class III			X (2)		
	• diameter ≤ 100 mm		W	X h (3)	W	
	• diameter > 100 mm	DA	W	X h (3)	W	
	3 - For plastic pipes	DA	W	X	W	
	4 - Remote controlled valves			X	W	

Table 13: Electrical installations - item K - •

All vessels/units (carriage/storage of dangerous goods excepted)

ELECTRICAL INSTALLATIONS - ITEM K - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
K1	Generators (1)					(1) As per NR217, Pt C, Ch 2, Sec 4 (2) Tests to be performed: • temperature rise test • overload test • short-circuit test • high voltage test • overspeed test • measurement of insulation resistance (3) All electrical machines are to be tested at manufacturer's work. When the test is not specified, the requirements of IEC 60034 apply (4) Test on board of the generator sets shall be conducted under normal operating conditions
	• power ≥ 50 kW/kVA	TA (HBV)	W	X (2) (3) (4)	W	
	• power < 50 kW/kVA		W	X (2) (3) (4)	W	
K2	Electrical machines (1)					(1) As per NR217, Pt C, Ch 2, Sec 4 (2) Tests to be performed: • temperature rise test • overload test • short-circuit test • high voltage test • overspeed test • measurement of insulation resistance (3) All electrical machines are to be tested at manufacturer's work. When the test is not specified, the requirements of IEC 60034 apply (4) Test on board subjected to the most severe operating conditions
	• power ≥ 50 kW/kVA	TA (HBV)	W	X (2) (3) (4)	W	
	• power < 50 kW/kVA		W	X (2) (3) (4)	W	
K3	Transformers (1)					(1) As per NR217, Pt C, Ch 2, Sec 5 (2) Power transformers are to be tested according to IEC 60076
	• power ≥ 50 kW/kVA	TA (HBV)		X (2)	W	
	• power < 50 kW/kVA			X (2)	W	

ELECTRICAL INSTALLATIONS - ITEM K - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
K4	Storage batteries (1)	TA (HBV)		X (2)	W	(1) As per NR217, Pt C, Ch 2, Sec 7 (2) The following shall be tested: • installation of storage batteries • ventilation of battery rooms, cupboards/containers; and cross-section of ventilation ducts • storage battery charging equipment • required caution labels and information plates
K5	Storage battery chargers (1)					(1) As per NR217, Pt C, Ch 2, Sec 7
	• power ≥ 2 kW/kVA	TA (HBV)		X	W	
	• power < 2 kW/kVA			X	W	
K6	Switchboards (1)					(1) As per NR217, Pt C, Ch 2, Sec 8 (2) Including switchboards for emergency generator sets (3) Tests to be performed: • operational test • high voltage test • insulation resistance measurement
	• power ≥ 100 kW/kVA (2)	DA or TA (HBV)		X (3)	W	
	• power < 100 kW/kVA	DA or TA (HBV)		X	W	
K7	Switchgears (1)	TA (2) (HBV)		X (3)	W	(1) As per NR217, Pt C, Ch 2, Sec 8 (2) As a general principle, switchgear shall be type approved, designed and constructed in accordance with standard IEC, EN or other standards recognized by the Society (3) Test on board
K8	Cables and insulated wires (1)	TA (2) (HBV)		X	W	(1) As per NR217, Pt C, Ch 2, Sec 9 (2) As a general principle, the use of the types of cables and wired according to IEC 60092 is permitted
K9	Control, monitoring, alarm and safety systems (1)	TA (HBV)		X (2)	W	(1) As per NR217, Pt C, Ch 3, Sec 2 (2) Operational test to be performed
K10	Power electronics (1)					(1) As per NR217, Pt C, Ch 3, Sec 4 (2) Routine tests to be performed: • voltage test • insulation resistance test (3) Operational test to be performed on the subsequent machines
	• power ≥ 50 kW/kVA	TA (HBV)		X (2) (3)	W	
	• power < 50 kW/kVA			X (2) (3)	W	

ELECTRICAL INSTALLATIONS - ITEM K - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
K11	Electrical propulsion plants (1)					(1) As per NR217, Pt C, Ch 2, Sec 13 (2) Material certificate for shafts. Shafts are to be made of material complying with NR216, Ch 2, Sec 3 or, where rolled products are allowed in place of forgings, with NR216, Ch 2, Sec 1 (3) Shaft material for electric propulsion motors and for main engine driven generators where the shaft is part of the propulsion shafting is to be certified by the Society (4) If appropriate, where welded parts are foreseen on shafts and rotors, the provisions of NR216, Chapter 5 apply (5) Type test are to be carried out on a prototype machine or on the first of a batch of machines, and routine tests are to be carried out on the subsequent machines (6) Functioning of the propulsion plant shall be proved by dock trial before river trials (7) Testing during trial voyages as per NR217, Pt C, Ch 2, Sec 14
	• power ≥ 50 kW/kVA	DA or TA	C (2) (3)	X (4) (5) (6) (7)	C	
	• power < 50 kW/kVA	DA or TA (HBV)	W (2) (3)	X (4) (5) (6) (7)	W	
K12	Computer systems (1)					(1) As per NR217, Pt C, Ch 3, Sec 3 (2) Following test shall be carried out in the manufacturer's works: • function test • operating conditions simulation • fault simulation • simulation of the application environment
	1 - Class 1 and class 2			X (2)	W	
	2 - Class 3, class 4 and class 5	TA (HBV)		X (2)	W	

Table 14: Pollution prevention installation covered by additional class notation Cleanvessel / Clean-Unit - item S - •

All vessels/units (carriage/storage of dangerous goods excepted)

POLLUTION PREVENTION INSTALLATION COVERED BY ADDITIONAL CLASS NOTATION CLEANVESSEL / CLEAN-UNIT - ITEM S - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
S	Pollution prevention installation covered by additional class notation **Cleanvessel / Clean-Unit**					
S1	Sewage treatment plant (1)	TA (HBV)		X h	W	(1) In accordance with IMO Resolution MEPC. 159 (55)
S2	Incinerator (1)	TA (HBV)		X	W	(1) In accordance with IMO Resolution MEPC. 76 (40) as amended by Resolution MAPC.93 (45) and Annex VI of MARPOL 73/78, Appendix IV
S3	Anti-fouling system (1)	TA (2) (HBV)		X	W	(1) In accordance with International Convention on the control of Harmful and Anti-fouling systems, 2001, Annex 4, Appendices 1 and 2 (2) Anti-fouling paint are to be a type approved by the Society, on the basis of the following criteria: • TBT-free • small quantities of organotin compounds acting as a chemical catalyst are allowed provided their concentration does not exceed 2500 mg total tin per kg of dry paint
S4	Advanced water treatment plants (1)	TA (HBV)		X	W	(1) In accordance with IMO Resolution MEPC. 159 (55)
S5	Grey water treatment plants (1)	TA (HBV)		X	W	(1) In accordance with IMO Resolution MEPC. 159 (55)
S6	Onboard NOx monitoring systems (1)	TA (HBV)		X	W	(1) Where NOx reduction methods (such as water injection, fuel oil emulsification, charge air humidification, exhaust gas after-treatment) are used, they are to be approved by the Society and taken into account in type approval certification of the engine.
S7	Oily water separator (OWS) systems (1)	TA (HBV)		X h	W	(1) In accordance with IMO Resolution MEPC. 107 (49)
S8	Exhaust gas cleaning (EGC) systems (1)	TA (HBV)		X	W	(1) In accordance with IMO Resolution MEPC.184 (59): 2009 Guidelines for exhaust gas cleaning systems.
S9	Oil content meter	TA (HBV)		X	W	
S10	Oil sealing glands	TA (HBV)		X	W	
S11	Leak detector for refrigeration systems	TA (HBV)		X	W	

SECTION 4 VESSELS / UNITS INTENDED FOR CARRIAGE / STORAGE OF DANGEROUS GOODS AND ASSIGNED WITH CONSTRUCTION MARK ✠

1 Equipment and materials certification requirements

1.1 Summary (tables)

1.1.1 Provisions related to survey at works for vessels/units assigned with Construction Mark ✠, and intended for the carriage/storage of dangerous goods, are summarized in the Table below.

Vessels/units intended for the carriage/storage of dangerous goods with assignment of Construction Mark ✠		
Item	Title	Reference
Item A	Raw materials for hull	Tab 15
Item B	Hull outfitting	Tab 16
Item C	Fire protection, detection and extinguishing	Tab 17
Item E	Main diesel engines & their auxiliaries	Tab 18
Item G	Auxiliary machinery	Tab 19
Item H	Cargo handling and containment systems for liquefied gases	Tab 20
Item I	Cargo handling and containment systems for liquids	Tab 21
Item K	Electrical installations	Tab 22
Item S	Pollution prevention installation covered by additional class notation **Cleanvessel / Clean-Unit**	Tab 23

Table 15: Raw materials for hull - item A - ✠

Vessels/units intended for the carriage/storage of dangerous goods

RAW MATERIALS FOR HULL - ITEM A - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
A1	Steel plates and profiles					(1) As per NR216, Ch 2, Sec 1 (2) As per NR216, Ch 2 Sec 2 (3) See raw material certification
	1 - Plates, sections and bars	(1)	C (1)		(3)	
	2 - Tubes	(2)	C (2)		(3)	
A2	Steel forgings (1)	(2)	C (2)		(3)	(1) Manufacturers of steel forgings are to be recognised by the Society in accordance with NR320. The manufacturing process is to be approved in accordance with NR480 depending on the type, size and weight of steel forgings (e.g over 1000 kg or 200mm diameter for steel forgings as per NR216, Ch 2, Sec 3, [2] and [3]; over 1000 kg for steel forgings as per NR216, Ch 2, Sec 3, [4] to [9]. (2) Approval as per NR216, Ch 2, Sec 3, as applicable (3) See raw material certification
A3	Steel castings (1)	(2)	C (2)		(3)	(1) Manufacturers of steel castings are to be recognised by the Society in accordance with NR320. The manufacturing process is to be approved in accordance with NR480 depending on the type, size and weight of steel casting items (e.g over 1000 kg for steel castings as per NR216, Ch 2, Sec 4, [2] and [3] or NR216, Ch 2, Sec 4, [5], [6] and [7]; any casting for crankshafts as per NR216, Ch 2, Sec 4, [4]; any stainless steel castings for propellers as per NR216, Ch 2, Sec 4, [8]). (2) Approval as per NR216, Ch 2, Sec 4, as applicable (3) See raw material certification
A4	Iron castings (1)	(2)	C (2)		(3)	(1) Manufacturers of iron castings are to be recognised by the Society in accordance with NR320. (2) Approval as per NR216, Ch 2, Sec 5, as applicable (3) See raw material certification
A5	Aluminium alloy plates, profiles, bars and tubes	(1)	C (1)		(2)	(1) Approval as per NR216, as applicable (2) See raw material certification

RAW MATERIALS FOR HULL - ITEM A - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
A6	Transition joints steel / aluminium alloy	TA (1)	C (1)		C	(1) As per NR216, Ch 3, Sec 2
A7	Filler products for welding (welding consumables)	TA (1)			W	(1) As per NR216, Ch 5, Sec 2
A8	Composite materials	DA (1)		X (2)	C / W (3)	(1) DA for structural assembly; as per NR217. Also see provisions of NR546 - Hull in composite Materials and Plywood, Material Approval, Design Principles, Construction and Survey (2) A representative sample of the structural assembly is to be tested and qualified as per agreed program; relevant tests to be carried out by a testing laboratory accepted by the Society (3) Document type according to the agreed survey scheme - as per conditions set in the DA (4) Type approval or case-by-case approval by the Society; see provisions of NR546, Section 11
	• Adhesives intended for marine structural applications	TA (HBV) (4)			W	
	• Reinforcement fibres	TA (HBV) (4)			W	
	• Resin systems	TA (HBV) (4)			W	
	• Core materials for sandwiches	TA (HBV) (4)			W	
A9	Cast steel shaft brackets (1)	DA	C	X ndt (2)	C	(1) As per NR217, Pt B, Ch 7, Sec 3 (2) Vibration analysis is recommended for single arm propeller shaft

Table 16: Hull outfitting - item B - ✠

Vessels/units intended for the carriage/storage of dangerous goods

HULL OUTFITTING - ITEM B - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
B1	Rudders / nozzles (1)					(1) As per NR217, Pt B, Ch 7, Sec 1 (2) Leak test is to be carried out for double plate rudder as per NR217, Pt B, Ch 8, Sec 4
	1 - Rudder stock, shaft, pintles, coupling	DA	C	X	C	
	2 - Rudder blade / nozzle shell	DA	C	X h (2)	C	
B2	Anchors (1)	TA	C	X ndt	C	(1) As per NR217, Pt B, Ch 7, Sec 4
B3	Anchor chain cables (1)	TA	C	X ndt (2)	C	(1) As per NR217, Pt B, Ch 7, Sec 4 (2) Additional approval for manufacturing process is required for rolled bars of grade K1 and K2 (or Q2 and Q3)
B4	Anchor chain cable accessories (1) (shackles, swivels and other attachment pieces)	TA	C	X ndt (2)	C	(1) As per NR217, Pt B, Ch 7, Sec 4 (2) Tests as per NR216, Ch 4, Sec 1
B5	Ropes (steel wire ropes and fibre ropes) (1)		C	X (2)	C	(1) As per NR217, Pt B, Ch 7, Sec 4 (2) Tests as per NR216, Ch 4, Sec 1
B6	Sidescuttles and windows (1)	DA	C	X (2)	C	(1) As per NR217, Pt B, Ch 7, Sec 4 (2) Tests as per NR216, Ch 4, Sec 3
B7	Shell doors	DA	C	X hose (1)	C	(1) Hose test as per NR217, Pt B, Ch 8, Sec 4
B8	Hatchcovers (1)	DA	C	X hose	C	(1) As per NR217, Pt B, Ch 6, Sec 5
B9	Watertight doors	DA	C	X h (1)	C	(1) Structural test is to be carried out for watertight doors below freeboard or bulkhead deck either before or after the door is fitted on board
B10	External ramp (1)	DA	C	X ndt	C	(1) As per NR217, Pt B, Ch 6, Sec 6
B11	Movable deck and inner ramp (1)	DA	C	X	C	(1) As per NR217, Pt B, Ch 6, Sec 6
B12	Independent tanks	DA	C	X ndt (1)	C	(1) Structural test is to be carried out for independent tanks not used as cargo tanks
B13	Elastic bedding		W	X	W	
B14	Bollards and bitts (1)(2)	(2)	W (1)(2)	(2)	W (1)(2)	(1) As per recognised standards - see provisions of NR217, Pt B, Ch 7, Sec 4. (2 Other cases: assessment on a case-by-case basis

Table 17: Fire protection, detection and extinguishing - item C - ✠

Vessels/units intended for the carriage/storage of dangerous goods

FIRE PROTECTION, DETECTION AND EXTINGUISHING - ITEM C - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
C1	Fire bulkheading, fire doors (1)	TA	W	X h	C	(1) As per NR217, Pt C, Ch 4, Sec 1, [1]
C2	Fire dampers (1)	TA	W	X h	C	(1) As per NR217, Pt C, Ch 4, Sec 1, [1.5]
C3	Water supply system (1)					(1) As per NR217, Pt C, Ch 4, Sec 4, [1]
	1 - Fire pumps			X h	C	
	2 - Pump prime movers			X	C	
	3 - Hoses	TA (HBV)	W	X	W	
	4 - Water spray nozzles	TA (HBV)	W	X	W	
C4	Automatic pressure water spraying system (1)					(1) As per NR217, Pt C, Ch 4, Sec 4, [3]
	1 - Pressure pumps			X h	C	
	2 - Pump prime movers			X	C	
	3 - Water spray piping system		W	X	W	
	4 - Pressure water tank	DA	W	X h	W	
	5 - Water spray nozzles	TA (HBV)	W	X	W	
C5	Fixed gas fire extinguishing system (1)					(1) As per NR217, Pt C, Ch 4, Sec 4, [4]
	1 - Piping system		W	X h	W	
	2 - Pressure tank	DA	W	X h	W	
	3 - Discharge nozzles	TA (HBV)	W	X	W	
	4 - Extinguishing agents	TA (HBV)		X	W	
C6	Portable fire extinguishers (1)	TA (HBV)		X h	W	(1) As per NR217, Pt C, Ch 4, Sec 4, [2]
C7	Detection and alarm system (1)	TA		X ndt	C	(1) As per NR217, Pt C, Ch 4, Sec 3

Table 18: Main diesel engines & their auxiliaries - item E - ✠

Vessels/units intended for the carriage/storage of dangerous goods

MAIN DIESEL ENGINES & THEIR AUXILIARIES - ITEM E - ✠						
No.	Item	Product certification				Item
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
E1	Main diesel engines with diameter of cylinder bore, D > 300 mm (1)	TA		X (2)	C	(1) As per NR217, Pt C, Ch 1, Sec 2 (2) Type tests to be in accordance with NR217, Pt C, Ch 1, Sec 2, [4] (3) NDT of magnetic particle and ultrasonic (4) Material test is required if bore > 400 mm (5) Material tests are also required for parts made of material other than steel (6) NDT of magnetic particle or liquid penetrant (if bore > 400 mm) and ultrasonic (all) (7) NDT of magnetic particle or liquid penetrant and ultrasonic are required if bore > 400 mm (8) NDT of magnetic particle or liquid penetrant (all) and ultrasonic (if bore > 400 mm) (9) Material test is required if bore > 300 mm (10) Material tests are required even these parts are not welded and for any material except grey cast iron (11) NDT of magnetic particle or liquid penetrant if bore > 400 mm (12) Material certification and test as per NR217, Pt C, Ch 1, Sec 14, [2.1] (13) For forged steel, test methods other than hydrostatic testing may be accepted e.g. suitable NDT and documented dimensional test (14) Where the cooling space is sealed by the piston rod or by the piston rod and the shell, the pressure test is to be carried out after the assembly (15) See item Turbochargers (16) Turbocharger air cooler are tested on the water side only
	1 - Crankshaft	DA	C	X ndt (3)	C	
	2 - Crankshaft coupling flange (non-integral) for main power transmissions		C (4)		W	
	3 - Coupling bolts for crankshaft		C (4)		W	
	4 - Steel piston crowns		C (4) (5)	X ndt (6)	W	
	5 - Pistons rods		C (4)	X h ndt (7)	W	
	6 - Connecting rods, together with connecting rod bearing caps		C	X h ndt (8)	W	
	7 - Crossheads		C (4)	X	W	
	8 - Cylinder liners		C (9)	X h	W	
	9 - Steel cylinder covers		C (5) (9)	X h ndt (6)	W	
	10 - Bedplates of welded construction; plates and transverse bearing girders made of forged or cast steel		C (5) (10)	X ndt	W	
	11 - Frames and crankcases of welded construction		C	X	W	
	12 - Entablatures of welded construction		C	X	W	
	13 - Tie rods		C	X h ndt (11)	W	
	14 - Shaft and rotors, including blades for turbochargers		C (12)	X	W	
	15 - Bolts and studs for cylinder covers, crossheads, main bearings and connecting rod bearings; nuts for tie rods		C (9)	X ndt (11)	W	
	16 - Steer gear wheels for camshaft drives		C (4)	X ndt (11)	W	
	17 - Cylinder liner, over the whole length of cooling space			X h	C	
	18 - Cylinder cover, cooling space			X h (13)	C	
	19 - Cylinder jacket, cooling space			X h	C	
	20 - Exhaust valve, cooling space			X h	C	

MAIN DIESEL ENGINES & THEIR AUXILIARIES - ITEM E - ✠						
No.	Item	Product certification				Item
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
E1	21 - Piston crown, cooling space			X h (13) (14)	C	
	22 - Turbocharger, cooling space		(15)	X h	C	
	23 - Exhaust pipe, cooling space			X h	C	
	24 - Coolers, each side			X h (16)	C	
	25 - Fuel injection system (injection pump body pressure side, injection valve, injection pipes)			X h	C	
	26 - Hydraulic system (piping pumps, actuators, etc for hydraulic drive of valves)			X h	C	
	27 - Scavenge pump cylinder			X h	C	
	28 - Engine driven air compressor if any (cylinders, covers, intercoolers and aftercoolers); air side, water side			X h	C	
	29 - Engine driven pumps (oil, water, fuel, bilge)			X h	C	
E2	Heat exchangers (1)	TA	C	X h ndt	C	(1) As per NR217, Pt C, Ch 1, Sec 3
E3	Turning gears of main diesel engines (1)			X	W	(1) As per NR217, Pt C, Ch 1, Sec 2
E4	Scavenging and supercharging compressors or blowers (1)	TA (HBV)	C (2)	X h bt (3)	W	(1) As per NR217, Pt C, Ch 1, Sec 2 (2) Shaft and rotor where D > 300 mm (3) Test to be carried out during bench trials of the engine of which these equipment are mounted
E5	Control and safety devices (1)	DA		X (2)	C	(1) As per NR217, Pt C, Ch 1, Sec 2 (2) During load test
E6	Mass produced diesel engines with diameter of cylinder bore, D < 300 mm (1)	TA	C (1)	X ndt (1)	C (1)	(1) This item **E6** is kept for information and records only; the terminologies “Mass-produced diesel engines” or “Mass production” are no longer used in NR217 (such consideration has been withdrawn since July 2016). For diesel engines, refer to item **E1** and provisions of NR217, Pt C, Ch 1, Sec 2

MAIN DIESEL ENGINES & THEIR AUXILIARIES - ITEM E - ✠						
No.	Item	Product certification				Item
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
E7	Turbochargers (1) (2) having served power by cylinder groups of less or equal to 1000 kW and fitted on diesel engines as: • main propulsion engines • engines driving electric generators, including emergency generators • engines driving other auxiliaries essential for safety and navigation and cargo pumps in tankers	DA or TA (HBV)	W (3)	X h ndt	W	(1) As per NR217, Pt C, Ch 1, Sec 14 (2) Other turbochargers: assessment on a case-by-case basis (3) Material test are required for shafts and rotors, including blades
E8	Starting air receiver (1)	DA or TA	C	X h	C	(1) As per NR217, Pt C, Ch 1, Sec 2

Table 19: Auxiliary machinery - item G - ✠

Vessels/units intended for the carriage/storage of dangerous goods

AUXILIARY MACHINERY - ITEM G - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G1	Auxiliary diesel engines (1)	TA		X bt	C	(1) As per NR217, Pt C, Ch 1, Sec 2
G2	Gears and couplings (1)	DA	(2)	X ndt (3) (4)		(1) As per NR217, Pt C, Ch 1, Sec 6 (2) Material tests as per NR216, Ch 2, Sec 3 for the following items: • pinions and wheel bodies • rims • plates and other elements intended for propulsion gear casings of welded construction (3) Mechanical test and NDT are to be carried out for pinions and wheel forgings in accordance with NR216, Ch 2, Sec 3 (4) Survey of shafts and their connections (flange couplings, hubs, bolt pins) as per item **G3** Main propulsion shafting (5) Static balancing test of rotating components in particular gear wheel and pinion shaft assemblies with the coupling part attached. Where $n^2 \cdot d \geq 1{,}5 \cdot 10^9$, gear wheel and pinion shaft assemblies are also to undergo a dynamic balancing test (6) Verification of cutting accuracy, meshing test and hydrostatic tests as per NR217 (7) Tests on board as per NR217, Pt C, Ch 1, Sec 15
	1 - Reduction and/or reverse gears intended for propulsion:					
	• with transmitted power P ≥ 220 kW		C	X h ndt (5) (6) (7)	C	
	• with transmitted power P < 220 kW		W	X (7)	W	
	2 - Other reduction and step-up gears:					
	• with transmitted power P ≥ 110 kW		C	X h ndt (5) (6) (7)	C	
	• with transmitted power P < 110 kW		W	X (7)	W	
G3	Main propulsion shafting (1)	DA	(2)	X h (3)	C	(1) As per NR217, Pt C, Ch 1, Sec 7 (2) Material tests are required for all shaft components (3) Parts of hydraulic couplings, clutches of hydraulic reverse gears and control units, hubs and hydraulic cylinders of controllable pitch propellers, including piping systems and associated fittings, are to be hydrostatically tested to 1,5 times the maximum working pressure. (4) Sterntubes, when machine-finished, and propeller shaft liners, when machine-finished on the inside and with an overthickness not exceeding 3 mm on the outside, are to be hydrostatically tested to 0,2 N/mm²
	1 - Coupling	DA	C	X	C	
	2 - Propeller shafts	DA	C	X h	C	
	3 - Intermediate shafts	DA	C	X	C	
	4 - Thrust shafts	DA	C	X	C	
	5 - Cardan shafts	DA	C	X h	C	
	6 - Sterntubes	DA	W	X h (4)	W	

AUXILIARY MACHINERY - ITEM G - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
	7 - Sterntubes bushes and other shaft bearings	DA	W	X h	W	
	8 - Propeller shaft liners	DA	W	X h (4)	W	
	9 - Coupling bolt or studs	DA	W	X	W	
G3	10 - Flexible couplings	DA	C	X h	C	
	11 - Thrust sliding-blocks	DA	W	X	W	
	Propellers (1)	DA or TA (3)	(2)	X ndt (4) (5)	C	(1) As per NR217, Pt C, Ch 1, Sec 8 (2) Material tests to be in accordance with NR216 in the presence of the Surveyor (3) Mass produced propellers may be accepted within the framework of the type approval program of the Society (4) Static balancing is required for all finished propellers in accordance with the specified ISO 484 tolerance class. Dynamic balance is required for propellers running above 500 rpm (5) Test on board as per NR217, Pt C, Ch 1, Sec 15 (6) Required static balancing of complete built-up and CPP propellers may be replaced by an individual check of blade weight and gravity centre position (7) Complete hydraulic system for the control of CPP mechanism is to be hydrotested at a pressure equal to 1,5 times the design pressure. The proper operation of the safety valve is to be tested in the presence of the Surveyor
G4	1 - Solid propeller	DA	C	X h	C	
	2 - Built-up and controllable pitch propeller (CPP)	DA	C	X h ht (6) (7)	C	
	Steering gears (1)	DA	(2)	X ndt (3)		(1) As per NR217, Pt C, Ch 1, Sec 11 (2) Material tests, including examinations for internal defects, to be performed to components subject to pressure or transmitting mechanical forces as per NR216. Works' certificate may be accepted for low stressed parts, provided all characteristics for which verification is required are guaranteed (3) NDT are to be carried out for mechanical components subjected to pressure or transmitting mechanical forces (4) Tests for pipes, valves and fittings are to comply with NR217, Pt C, Ch 1, Sec 10, [20]
	• power ≥ 50 kW	DA		X bt	C	
	• power < 50 kW	DA		X bt	W	
G5	1 - Power unit			X h	W	
	2 - Pressure components		C	X h ht ndt	W	
	3 - Load transmitting components		C	X ndt	W	
	4 - Pipes, valves and fittings (4)		C	X h ht	W	

AUXILIARY MACHINERY - ITEM G - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G6	Motorized windlasses	DA (1)		X (4)	C	(1) Or assessment by the mean of type tests according to special conditions. Ref. NR626 - Rule Note for Anchor windlass (2) See item **G8** (Piping) and **G12** (Hydraulic systems) (3) For electric systems (motors, switchboards, starter cabinets, alarm panels, etc.), refer to the relevant provisions of item **K**; for the other systems, refer to the relevant provisions of this NR544, of NR626, and of NR217 (4) Refer to relevant provisions of NR626, Section 1, as amended Note: Alternative test methods subject to Society's acceptance / Anchoring tests / load tests on board, as per agreed program - Refer to NR626
	1- Main shaft	DA	W	X ndt	W	
	2- Casing or body, drum / gipsy-wheel, and main load-bearing structures	DA	W	X ndt	W	
	3- Hydraulic systems, Electric systems (2) (3)	DA		X h	W	
	4- Guide roller, Chain stopper (wire stopper), Guide pins	DA	W	X ndt	W	
G7	Thrusters and their prime movers (1) (2) (3)	DA or TA (4)		X	C	(1) As per NR217, Pt C, Ch 1, Sec 12 (2) Thrusters developing power less than 110 kW are to be built in accordance with sound marine practice and tested as required to the satisfaction of the Surveyor (3) Prime movers are to be tested in accordance with the requirements applicable to the type of mover used (4) Mass produced thrusters may be accepted with the frame work of type approval program of the Society (5) Material testing for parts of athwartship thrusters does not need to be witnessed by a Surveyor, provided full test reports are made available to him
	1 - Transverse thrusters intended for manoeuvring		W (5)	X h ht	C	
	2 - Thrusters intended for propulsion and steering		C	X h ht	C	

AUXILIARY MACHINERY - ITEM G - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G8	Pressure equipment (1) (2)		(3) (4)	(5)	(4)	(1) As per NR217, Pt C, Ch 1, Sec 3 (2) Definitions: p : Design pressure, in MPa V : Volume, in litres T : Design temperature, in °C t_A : Actual thickness of the vessel, in mm (3) In addition to the general requirement, material test for the construction of pressure parts of boilers, other steam generators, oil fired thermal oil heaters and exhaust gas thermal oil heaters to be witnessed by the Surveyor (4) Material test to be witnessed by the Surveyor for class 1 pressure vessels and heat exchangers. This may be waived for mass produced small pressure vessels e.g. accumulators for valve controls, gas bottles, etc. (5) Hydrostatic test of all class 1, class 2 and class 3 pressure vessels are to be witnessed by the Surveyor with the exception of mass produced pressure vessels which are built under the conditions stated in (6) (6) Product certificate W may be accepted for mass produced small pressure vessels of class 1, class 2 and class 3 which are type approved by the Society (7) As per NR217, Pt C, Ch 1, Sec 10, [20] (8) The proof of the quality of materials for pipe Class II is to be in the form of an inspection certificate according to EN 10.204. 3.1 or equivalent (9) As per NR217, Pt C, Ch 1, Sec 4
	1 - Steam generators or boilers					
	Class 1: (p > 3,2 and V > 2) or (p·V > 20 and V > 2)	DA	C	X h ndt	C	
	Class 2: if not class 1 or class 3	DA	W (6)	X h ndt	C	
	Class 3: p·V ≤ 5 or V ≤ 2		W (6)	X h ndt	C	
	2 - Pressure vessels for toxic substances					
	Class 1: all in class 1	DA	C	X h ndt	C	
	3 - Pressure vessels for corrosive substances					
	Class 1: p > 20 or p·V > 20 or T > 350	DA	C	X h ndt	C	
	Class 2: if not in class 1	DA	W	X h ndt	C	
	4 - Pressure vessels for gaseous substances					
	Class 1: p > 100 or p·V > 300	DA	C	X h ndt	C	
	Class 2: V > 1 and p·V > 100 and not in class 1	DA	W	X h ndt	C	
	Class 3: all pressure vessels which are not class 1 or class 2		W	X h ndt	C	
	5 - Pressure vessels for liquid substances					
	Class 1: V > 10 and p·V > 1000 and p > 50	DA	C	X h ndt	C	
	Class 2: (V ≤ 10 and p > 100) or (1 < p ≤ 50 and p·V>1000)	DA	W	X h ndt	C	
	Class 3: all pressure vessels and heat exchangers which are not class 1 or class 2		W	X h ndt	C	
	6 - Pressure vessels for thermal oil					
	Class 1: p > 1,6 or T > 300	DA	C	X h ndt	C	
	Class 2: if not class 1 or class 3	DA	W (4)	X h ndt	C	
	Class 3: p ≤ 0,7 and T ≤ 150		W (4)	X h ndt	C	

AUXILIARY MACHINERY - ITEM G - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
	7 - Pressure vessels for fuel oil, lubricating oil or flammable hydraulic oil					
	Class 1: p > 1,6 or T > 150	DA	C	X h ndt	C	
	Class 2: if not class 1 or class 3	DA	W	X h ndt	C	
	Class 3: p ≤ 0,7 and T ≤ 60		W	X h ndt	C	
G8	8 - Whatever type of equipment					
	Class 1: t_A > 40	DA	C	X h ndt	C	
	Class 2: 15 ≤ t_A ≤ 40	DA	W	X h ndt	C	
	9 - Oil firing equipment (7) (9)					
	Class II piping system		W (8)	X h	W	
	Class III piping system if design pressure exceeds 3,5 bar		W	X h	W	
	Domestic gas installations (1)	DA		X (6)	W	
	1 - Medium-pressure pipes			X h ht (2) (3)	W	
	2 - Other pipes			X ht (4) (5)	W	
G9	3 - Receptacle fittings subjected to pressure			X ht (7)	W	
	4 - Gas-consuming appliances			X (8)	W	

(1) As per NR217, Pt C, Ch 1, Sec 13

(2) Pressure test is carried out with air, an inert gas or liquid at a pressure of 20 bar above atmospheric pressure

(3) Gastightness test is carried out with air or an inert gas at a pressure of 3,5 bar above atmospheric pressure

(4) Tightness test, for concerning pipes, is to be carried out with air or an inert gas at a pressure of 1 bar above atmospheric pressure

(5) Leak test, for concerning pipes, is to be carried out at a pressure of 0,15 bar above atmospheric pressure

(6) Gastightness, tightness and leak tests for the pipes are deemed gastight if, after sufficient time to allow for normal balancing, no fall in the test pressure is observed during the following 10 minutes

(7) Tightness test is carried out with a foaming substance at the operating pressure

(8) All gas-consuming appliances shall be brought into service and tested at the nominal pressure to ensure that combustion is satisfactory with the regulating knobs in the different positions. Flame failure devices shall be checked to ensure that they operate satisfactorily

AUXILIARY MACHINERY - ITEM G - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G10	Pumps and compressors (1)		(7)		(7)	(1) As per NR217, Pt C, Ch 1, Sec 10, [20] (2) The proof of the quality of materials for pipe Class II is to be in the form of an inspection certificate according to EN 10.204. 3.1 or equivalent (3) Cylinders, covers and casings of pumps and compressors are to be subjected to an hydrostatic test. Tightness tests are to be performed on components to which this is appropriate (4) Pumps within this category: • boiler feed water or forced circulating • fuel oil or other flammable oil • compressed air (5) If of welded construction, welding steel pipes are to comply with the applicable requirements of NR467, Pt C, Ch 1, Sec 10. Welded joints in pipelines of Class II are to be tested in accordance with NR216 (6) For main parts before assembling (7) For product certificate C, alternative type of certificate may be accepted depending on the Survey Scheme.
	1 - Class II piping system		W (2)	X h (3)	C	
	2 - Class III piping system if design pressure exceeds 3,5 bar (4)		W	X h	C	
	3 - Class III piping system other than above			X h	W	
	4 - Bilge and fire pumps		W	X h	C	
	5 - Feed pumps for main boilers	DA	C	X h (5) (6)	C	
	6 - Forced circulation pumps for main boilers	DA	C	X h	C	
G11	Starting air receiver (1)	DA or TA	C	X h	C	(1) As per NR217, Pt C, Ch 1, Sec 2
G12	Hydraulic system (1)	DA	W		C	(1) As per NR217, Pt C, Ch 1, Sec 10, [20]
	1 - Pressure casings and oil lines			X h		
	2 - Power unit			X h		
	3 - Systems			X ht		

AUXILIARY MACHINERY - ITEM G - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G13	Pipes, Piping (1)					(1) As per NR217, Pt C, Ch 1, Sec 10, [20] (2) The proof of the quality of materials is to be in the form of an inspection certificate according to EN 10.204. 3.1 or equivalent (3) If of welded construction, welding steel pipes are to comply with the applicable requirements of NR467, Pt C, Ch 1, Sec 10. Welded joints in pipelines of Class II are to be tested in accordance with NR216 (4) All pipe systems are to be tested for leakage under operational conditions. If necessary, special techniques other than hydraulic pressure tests are to be applied: • heating coils in tanks and fuel lines must be tested to not less than 1,5 PB but in no case less than 4 bar • liquefied gas process piping systems are to be leak tested (by air, halides, etc.) to a pressure depending on the leak detection method applied (5) All Class II pipes (and other concerning items) having a design pressure PR greater than 3,5 bar shall be subjected to an hydraulic pressure test in the presence of the Surveyor (6) Relevant type approval tests are to be carried out on each type and each size as per NR467, Pt C, Ch 1, Sec 10 (7) Hydrostatic tests under supervision of the Society
	1 - Class II		C (2)	X h (3) (4) (5)	C	
	2 - Class III		W	X h (3) (4)	W	
	3 - Hose assemblies and compensators	TA (6)	C	X h (7)	C	
	4 - Plastic piping		C	X h	C	
G14	Pipe fittings (1)					(1) As per NR217, Pt C, Ch 1, Sec 10, [20] (2) If of welded construction, welding steel pipes are to comply with the applicable requirements of NR467, Pt C, Ch 1, Sec 10. Welded joints in pipelines of Class II are to be tested in accordance with NR216 (3) The following valves are to be subjected in the manufacture's work to an hydraulic pressure test in the presence of a Surveyor and are also subjected to undergo a tightness test at 1,0 times the nominal pressure: • valves of pipe Class II to 1,5 PR • valves mounted on the vessel's side not less than 5 bar
	1 - Valves for pipe Class II	DA	C	X h (2) (3)	C	
	2 - Valves for pipe Class III			X (2)		
	• diameter ≤ 100 mm		W	X h (3)	W	
	• diameter > 100 mm	DA	C	X h (3)	C	
	3 - For plastic pipes	DA	C	X	C	
	4 - Remote controlled valves			X	C	

Table 20: Cargo handling and containment systems for liquefied gases - item H - ✠

Vessels/units intended for the carriage/storage of dangerous goods

CARGO HANDLING AND CONTAINMENT SYSTEMS FOR LIQUEFIED GASES - ITEM H - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
H1	Independent cargo tanks (1)	DA	C	X h	C	(1) As per NR217, Pt D, Ch 3
H2	Compressors (1)	DA	C / W (2)	X (3)	C	(1) As per NR217, Pt D, Ch 3 (2) Material certificate: • C for cast body • W for welded construction (3) Inspection to be carried out according to a program approved by the Society
H3	Cargo pumps (1)	DA	C / W (2)	X h (3)	C	(1) As per NR217, Pt D, Ch 3 (2) Material certificate: • C for cast body • W for welded construction (3) Inspection to be carried out according to a program approved by the Society
H4	Pipes, valves and fittings (1)		(2)	(3) (4)		(1) As per NR217, Pt D, Ch 3 (2) Tests subjected as per NR217, Pt C, Ch 1, Sec 10, [20] (3) The setting pressure of the pressure/vacuum valves is to be checked with regard to the applicable Society's Rules (4) Cargo piping system is to be checked for leakage under operational conditions after installation on board (5) Welded joints are to be subjected to examinations specified in NR217, Pt C, Ch 1, Sec 10, [20] for Class II pipes
	• ND > 100 mm	TA	C	X h	C	
	• ND ≤ 100 mm	TA	W	X h (5)	C	
H5	Expansion joints and cargo hoses (1)	TA	W (2)	X h (3)	C	(1) As per NR217, Pt D, Ch 3 (2) If metallic (3) Tests may be carried out in the workshops or on board
H6	Gas-tight penetration glands (1)	TA		X h ht	C	(1) As per NR217, Pt D, Ch 3
H7	Cargo tank P/V and high velocity valves (1)	TA	W	X ht (2)	C	(1) As per NR217, Pt D, Ch 3 (2) Tests may be carried out in the workshops or on board

CARGO HANDLING AND CONTAINMENT SYSTEMS FOR LIQUEFIED GASES - ITEM H - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
H8	Gas detection system (1)	TA		X	C	(1) As per NR217, Pt D, Ch 3
H9	Instrumentation (1)	TA		X	C	(1) As per NR217, Pt D, Ch 3
H10	Fans for enclosed spaces (1)	TA (HBV)		X	W	(1) As per NR217, Pt D, Ch 3
H11	Insulation materials of pressure vessels (1)	TA	C	X	C	(1) As per NR217, Pt D, Ch 3
H12	Safety relief valves (1)	TA		X	C	(1) As per NR217, Pt D, Ch 3
H13	Stainless or high alloy steel for membrane cargo containment system	(1)	C (1)	X	C	(1) As per provisions of NR467, Part D, Chapter 9

Table 21: Cargo handling and containment systems for liquids - item I - ✠

Vessels/units intended for the carriage/storage of dangerous goods

CARGO HANDLING AND CONTAINMENT SYSTEMS FOR LIQUIDS - ITEM I - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
I1	Independent cargo tanks (1)	DA	C	X h	C	(1) As per NR217, Pt D, Ch 3
I2	Compressors (1)	DA	C / W (2)	X (3)	C	(1) As per NR217, Pt D, Ch 3 (2) Material certificate: • C for cast body • W for welded construction (3) Inspection to be carried out according to a program approved by the Society
I3	Cargo pumps (1)	DA	C / W (2)	X h (3)	W	(1) As per NR217, Pt D, Ch 3 (2) Material certificate: • C for cast body • W for welded construction (3) Inspection to be carried out according to a program approved by the Society
I4	Pipes, valves and fittings (1)		(2)	(3) (4)		(1) As per NR217, Pt D, Ch 3 (2) Tests subjected as per NR217, Pt C, Ch 1, Sec 10, [20] (3) The setting pressure of the pressure/vacuum valves is to be checked with regard to the applicable Society's Rules (4) Cargo piping system is to be checked for leakage under operational conditions after installation on board (5) Welded joints are to be subjected to examinations specified in NR217, Pt C, Ch 1, Sec 10, [20] for Class I & II pipes
	• ND > 100 mm	TA	C	X h (5)	C	
	• ND ≤ 100 mm	TA	W	X h (5)	C	
I5	Expansion joints and cargo hoses (1)	TA	W (2)	X h (3)	C	(1) As per NR217, Pt D, Ch 3 (2) If metallic (3) Tests may be carried out in the workshops or on board
I6	Gas-tight penetration glands (1)	TA		X h ht	C	(1) As per NR217, Pt D, Ch 3
I7	Cargo tank P/V and high velocity valves (1)	TA	W	X ht (2)	C	(1) As per NR217, Pt D, Ch 3 (2) Tests may be carried out in the workshops or on board

CARGO HANDLING AND CONTAINMENT SYSTEMS FOR LIQUIDS - ITEM I - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
I8	Flame arresters (1)	TA		X	C	(1) As per NR217, Pt D, Ch 3
I9	Gas detection system (1)	TA		X	C	(1) As per NR217, Pt D, Ch 3
I10	Instrumentation (1)	TA		X	C	(1) As per NR217, Pt D, Ch 3
I11	Fans for enclosed spaces (1)	TA (HBV)		X	W	(1) As per NR217, Pt D, Ch 3
I12	Insulation materials (1)	TA		X	C	(1) As per NR217, Pt D, Ch 3
I13	Safety relief valves (1)	TA		X	C	(1) As per NR217, Pt D, Ch 3

Table 22: Electrical installations - item K - ✠

Vessels/units intended for the carriage/storage of dangerous goods

ELECTRICAL INSTALLATIONS - ITEM K - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
K1	Generators (1)					(1) As per NR217, Pt C, Ch 2, Sec 4 (2) Tests to be performed: • temperature rise test • overload test • short-circuit test • high voltage test • overspeed test • measurement of insulation resistance (3) All electrical machines are to be tested at manufacturer's work. When the test is not specified, the requirements of IEC 60034 apply (4) Test on board of the generator sets shall be conducted under normal operating conditions
	• power ≥ 50 kW/kVA	TA	C	X (2) (3) (4)	C	
	• power < 50 kW/kVA		W	X (2) (3) (4)	W	
K2	Electrical machines (1)					(1) As per NR217, Pt C, Ch 2, Sec 4 (2) Tests to be performed: • temperature rise test • overload test • short-circuit test • high voltage test • overspeed test • measurement of insulation resistance (3) All electrical machines are to be tested at manufacturer's work. When the test is not specified, the requirements of IEC 60034 apply
	• power ≥ 50 kW/kVA	TA	C	X (2) (3)	C	
	• power < 50 kW/kVA		W	X (2) (3)	W	
K3	Transformers (1)					(1) As per NR217, Pt C, Ch 2, Sec 5 (2) Power transformers are to be tested according to IEC 60076
	• power ≥ 50 kW/kVA	TA		X (2)	C	
	• power < 50 kW/kVA			X (2)	W	

ELECTRICAL INSTALLATIONS - ITEM K - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
K4	Storage batteries (1)	TA (HBV)		X (2)	W	(1) As per NR217, Pt C, Ch 2, Sec 7 (2) The following shall be tested: • installation of storage batteries • ventilation of battery rooms, cupboards/containers; and cross-section of ventilation ducts • storage battery charging equipment • required caution labels and information plates
K5	Storage battery chargers (1)					(1) As per NR217, Pt C, Ch 2, Sec 7
	• power ≥ 2 kW/kVA	TA		X	C	
	• power < 2 kW/kVA			X	W	
K6	Switchboards (1)					(1) As per NR217, Pt C, Ch 2, Sec 8 (2) Including switchboards for emergency generator sets (3) Tests to be performed: • operational test • high voltage test • insulation resistance measurement
	• power ≥ 100 kW/kVA (2)	DA or TA		X (3)	C	
	• power < 100 kW/kVA	DA or TA (HBV)		X	W	
K7	Switchgear (1)	TA (HBV) (2)		X (3)	W	(1) As per NR217, Pt C, Ch 2, Sec 8 (2) As a general principle, switchgear shall be type approved, designed and constructed in accordance with standard IEC, EN or other standards recognized by the Society (3) Test on board
K8	Cables and insulated wires (1)	TA (HBV) (2)		X	W	(1) As per NR217, Pt C, Ch 2, Sec 9 (2) As a general principle, the use of the types of cables and wired according to IEC 60092 is permitted
K9	Control, monitoring, alarm and safety systems (1)	TA		X (2)	C	(1) As per NR217, Pt C, Ch 3, Sec 2 (2) Operational test to be performed
K10	Power electronics (1)					(1) As per NR217, Pt C, Ch 3, Sec 4 (2) Extent of routine tests to be performed: • voltage test • insulation resistance test (3) Operational test to be performed on the subsequent machines
	• power ≥ 50 kW/kVA	TA		X (2) (3)	C	
	• power < 50 kW/kVA			X (2) (3)	W	

ELECTRICAL INSTALLATIONS - ITEM K - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
K11	Electrical propulsion plants (1)					(1) As per NR217, Pt C, Ch 2, Sec 13 (2) Material certificate for shafts. Shafts are to be made of material complying with NR216, Ch 2, Sec 3 or, where rolled products are allowed in place of forgings, with NR216, Ch 2, Sec 1 (3) Shaft material for electric propulsion motors and for main engine driven generators where the shaft is part of the propulsion shafting is to be certified by the Society (4) If appropriate, where welded parts are foreseen on shafts and rotors, the provisions of NR216, Chapter 5 apply (5) Type test are to be carried out on a prototype machine or on the first of a batch of machines, and routine tests are to be carried out on the subsequent machines (6) Functioning of the propulsion plant shall be proved by dock trial before river trials (7) Testing during trial voyages as per NR217, Pt C, Ch 2, Sec 14
	• power ≥ 50 kW/kVA	DA or TA	C (2) (3)	X (4) (5) (6) (7)	C	
	• power < 50 kW/kVA	DA or TA (HBV)	W (2) (3)	X (4) (5) (6) (7)	W	
K12	Computer systems (1)					(1) As per NR217, Pt C, Ch 3, Sec 3 (2) The following test shall be carried out in the manufacturer's works: • function test • operating conditions simulation • fault simulation • simulation of the application environment
	1 - Class 1 and class 2			X (2)	W	
	2 - Class 3, class 4 and class 5	TA		X (2)	C	

Table 23: Pollution prevention installation covered by additional class notation Cleanvessel / Clean-Unit - item S - ✠

Vessels/units intended for the carriage/storage of dangerous goods

POLLUTION PREVENTION INSTALLATION COVERED BY ADDITIONAL CLASS NOTATION CLEANVESSEL / CLEAN-UNIT - ITEM S - ✠						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
S	Pollution prevention installation covered by additional class notation **Cleanvessel / Clean-Unit**					
S1	Sewage treatment plant (1)	TA		X h	C/W	(1) In accordance with IMO Resolution MEPC. 159 (55)
S2	Incinerator (1)	TA		X	C/W	(1) In accordance with IMO Resolution MEPC. 76 (40) as amended by Resolution MAPC.93 (45) and Annex VI of MARPOL 73/78, Appendix IV
S3	Anti-fouling system (1)	TA (2)		X	C	(1) In accordance with International Convention on the control of Harmful and Anti-fouling systems, 2001, Annex 4, Appendices 1 and 2 (2) Anti-fouling paint are to be a type approved by the Society, on the basis of the following criteria: • TBT-free • small quantities of organotin compounds acting as a chemical catalyst are allowed provided their concentration does not exceed 2500 mg total tin per kg of dry paint
S4	Advanced water treatment plants (1)	TA		X	C/W	(1) In accordance with IMO Resolution MEPC. 159 (55)
S5	Grey water treatment plants (1)	TA		X	C/W	(1) In accordance with IMO Resolution MEPC. 159 (55)
S6	Onboard NOx monitoring systems (1)	TA		X	C/W	(1) Where NOx reduction methods (such as water injection, fuel oil emulsification, charge air humidification, exhaust gas after-treatment) are used, they are to be approved by the Society and taken into account in type approval certification of the engine
S7	Oily water separator (OWS) systems (1)	TA		X h	C/W	(1) In accordance with IMO Resolution MEPC. 107 (49)
S8	Exhaust gas cleaning (EGC) systems (1)	TA		X	C/W	(1) In accordance with IMO Resolution MEPC.184 (59): 2009 Guidelines for exhaust gas cleaning systems
S9	Oil content meter	TA		X	C/W	
S10	Oil sealing glands	TA		X	C/W	
S11	Leak detector for refrigeration systems	TA		X	C/W	

SECTION 5 VESSELS / UNITS INTENDED FOR THE CARRIAGE / STORAGE OF DANGEROUS GOODS AND ASSIGNED WITH CONSTRUCTION MARK •

1 Equipment and materials certification requirements

1.1 Summary (tables)

1.1.1 Provisions related to survey at works for vessels/units assigned with Construction Mark • and intended for the carriage/storage of dangerous goods, are summarized in the Table below.

Vessels/units intended for the carriage/storage of dangerous goods with assignment of Construction Mark •		
Item	Title	Reference
Item A	Raw materials for hull	**(1)**
Item B	Hull outfitting	**(2)**
Item C	Fire protection, detection and extinguishing	Tab 24
Item E	Main diesel engines & their auxiliaries	Tab 25
Item G	Auxiliary machinery	Tab 26
Item H	Cargo handling and containment systems for liquefied gases	Tab 27
Item I	Cargo handling and containment systems for liquids	Tab 28
Item K	Electrical installations	Tab 29
Item S	Pollution prevention installation covered by additional class notation **Cleanvessel / Clean-Unit**	Tab 30

(1) For raw materials for hull, reference is made to Sec 4, Tab 15

(2) For hull outfitting, reference is made to Sec 4, Tab 16

Table 24: Fire protection, detection and extinguishing - item C - •

Vessels/units intended for the carriage/storage of dangerous goods

FIRE PROTECTION, DETECTION AND EXTINGUISHING - ITEM C - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
C1	Fire bulkheading, fire doors (1)	TA (HBV)	W	X h	W	(1) As per NR217, Pt C, Ch 4, Sec 1, [1]
C2	Fire dampers (1)	TA (HBV)	W	X h	W	(1) As per NR217, Pt C, Ch 4, Sec 1, [1.5]
C3	Water supply system (1)					(1) As per NR217, Pt C, Ch 4, Sec 4, [1]
	1 - Fire pumps			X h	W	
	2 - Pump prime movers			X	W	
	3 - Hoses	TA (HBV)	W	X	W	
	4 - Water spray nozzles	TA (HBV)	W	X	W	
C4	Automatic pressure water spraying system (1)					(1) As per NR217, Pt C, Ch 4, Sec 4, [3]
	1 - Pressure pumps			X h	W	
	2 - Pump prime movers			X	W	
	3 - Water spray piping system		W	X	W	
	4 - Pressure water tank	DA	W	X h	W	
	5 - Water spray nozzles	TA (HBV)	W	X	W	
C5	Fixed gas fire extinguishing system (1)					(1) As per NR217, Pt C, Ch 4, Sec 4, [4]
	1 - Piping system		W	X h	W	
	2 - Pressure tank	DA	W	X h	W	
	3 - Discharge nozzles	TA (HBV)	W	X	W	
	4 - Extinguishing agents	TA (HBV)		X	W	
C6	Portable fire extinguishers (1)	TA (HBV)		X h	W	(1) As per NR217, Pt C, Ch 4, Sec 4, [2]
C7	Detection and alarm system (1)	TA (HBV)		X ndt	W	(1) As per NR217, Pt C, Ch 4, Sec 3

Table 25: Main diesel engines & their auxiliaries - item E - •

Vessels/units intended for the carriage/storage of dangerous goods

MAIN DIESEL ENGINES & THEIR AUXILIARIES - ITEM E - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
E1	Main diesel engines with diameter of cylinder bore, D > 300 mm (1)	TA (HBV)		X (2)	W	(1) As per NR217, Pt C, Ch 1, Sec 2 (2) Type tests to be in accordance with NR217,Pt C, Ch 1, Sec 2, [4] (3) NDT of magnetic particle and ultrasonic (4) Material test is required if bore > 400 mm (5) Material tests are also required for parts made of material other than steel (6) NDT of magnetic particle or liquid penetrant (if bore > 400 mm) and ultrasonic (all) (7) NDT of magnetic particle or liquid penetrant and ultrasonic are required if bore > 400 mm (8) NDT of magnetic particle or liquid penetrant (all) and ultrasonic (if bore > 400 mm) (9) Material test is required if bore > 300 mm (10) Material tests are required even these parts are not welded and for any material except grey cast iron (11) NDT of magnetic particle or liquid penetrant if bore > 400 mm (12) Material certification and test as per NR217, Pt C, Ch 1, Sec 14, [2.1] (13) For forged steel, test methods other than hydrostatic testing may be accepted e.g. suitable NDT and documented dimensional test (14) Where the cooling space is sealed by the piston rod, or by the piston ron and the shell, the pressure test is to be carried out after the assembly (15) See item Turbochargers (16) Turbocharger air cooler are tested on the water side only
	1 - Crankshaft	DA	W	X ndt (3)	W	
	2 - Crankshaft coupling flange (non-integral) for main power transmissions		W (4)		W	
	3 - Coupling bolts for crankshaft		W (4)		W	
	4 - Steel piston crowns		W (4) (5)	X ndt (6)	W	
	5 - Pistons rods		W (4)	X h ndt (7)	W	
	6 - Connecting rods, together with connecting rod bearing caps		W	X h ndt (8)	W	
	7 - Crossheads		W (4)	X	W	
	8 - Cylinder liners		W (9)	X h	W	
	9 - Steel cylinder covers		W (5) (9)	X h ndt (6)	W	
	10 - Bedplates of welded construction; plates and transverse bearing girders made of forged or cast steel		W (5) (10)	X ndt	W	
	11 - Frames and crankcases of welded construction		W	X	W	
	12 - Entablatures of welded construction		W	X	W	
	13 - Tie rods		W	X h ndt (11)	W	
	14 - Shaft and rotors, including blades for turbochargers		W (12)	X	W	
	15 - Bolts and studs for cylinder covers, crossheads, main bearings and connecting rod bearings; nuts for tie rods		W (9)	X ndt (11)	W	
	16 - Steer gear wheels for camshaft drives		W (4)	X ndt (11)	W	
	17 - Cylinder liner, over the whole length of cooling space			X h	W	
	18 - Cylinder cover, cooling space			X h (13)	W	
	19 - Cylinder jacket, cooling space			X h	W	
	20 - Exhaust valve, cooling space			X h	W	

MAIN DIESEL ENGINES & THEIR AUXILIARIES - ITEM E - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
E1	21 - Piston crown, cooling space			X h (13) (14)	W	
	22 - Turbocharger, cooling space		(15)	X h	W	
	23 - Exhaust pipe, cooling space			X h	W	
	24 - Coolers, each side			X h (16)	W	
	25 - Fuel injection system (injection pump body pressure side, injection valve, injection pipes)			X h	W	
	26 - Hydraulic system (piping pumps, actuators, etc for hydraulic drive of valves)			X h	W	
	27 - Scavenge pump cylinder			X h	W	
	28 - Engine driven air compressor if any (cylinders, covers, intercoolers and aftercoolers); air side, water side			X h	W	
	29 - Engine driven pumps (oil, water, fuel, bilge)			X h	W	
E2	Heat exchangers (1)	TA (HBV)	W	X h ndt	W	(1) As per NR217, Pt C, Ch 1, Sec 3
E3	Turning gears of main diesel engines (1)			X	W	(1) As per NR217, Pt C, Ch 1, Sec 2
E4	Scavenging and supercharging compressors or blowers (1)	TA (HBV)	W (2)	X h bt (3)	W	(1) As per NR217, Pt C, Ch 1, Sec 2 (2) Shaft and rotor where D > 300 mm (3) Test to be carried out during bench trials of the engine of which these equipment are mounted
E5	Control and safety devices (1)	DA		X (2)	W	(1) As per NR217, Pt C, Ch 1, Sec 2 (2) During load test
E6	Mass produced diesel engines with diameter of cylinder bore, D < 300 mm (1)	TA	C (1)	X ndt (1)	C (1)	(1) This item **E6** is kept for information and records only; the terminologies “Mass-produced diesel engines” or “Mass production” are no longer used in NR217 (such consideration has been withdrawn since July 2016). For diesel engines, refer to item **E1** and provisions of NR217, Pt C, Ch 1, Sec 2

MAIN DIESEL ENGINES & THEIR AUXILIARIES - ITEM E - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
E7	Turbochargers (1) (2) having served power by cylinder groups of less or equal to 1000 kW and fitted on diesel engines as: • main propulsion engines • engines driving electric generators, including emergency generators • engines driving other auxiliaries essential for safety and navigation and cargo pumps in tankers	DA or TA (HBV)	W (3)	X h ndt	W	(1) As per NR217, Pt C, Ch 1, Sec 14 (2) Other turbochargers: assessment on a case-by-case basis (3) Material test are required for shafts and rotors, including blades
E8	Starting air receiver (1)	DA or TA (HBV)	W	X h	W	(1) As per NR217, Pt C, Ch 1, Sec 2

Table 26: Auxiliary machinery - item G - •

Vessels/units intended for the carriage/storage of dangerous goods

AUXILIARY MACHINERY - ITEM G - •							
No.	Item	Product certification				Remarks	
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate		
G1	Auxiliary diesel engines (1)	TA (HBV)		X bt	W	(1)	As per NR217, Pt C, Ch 1, Sec 2
G2	Gears and couplings (1)	DA	(2)	X ndt (3) (4)		(1)	As per NR217, Pt C, Ch 1, Sec 6
						(2)	Material tests as per NR216, Ch 2, Sec 3 for the following items: • pinions and wheel bodies • rims • plates and other elements intended for propulsion gear casings of welded construction
	1 - Reduction and/or reverse gears intended for propulsion:					(3)	Mechanical test and NDT are to be carried out for pinions and wheel forgings in accordance with NR216, Ch 2, Sec 3
	• with transmitted power P ≥ 220 kW		W	X h ndt (5) (6) (7)	W	(4)	Survey of shafts and their connections (flange couplings, hubs, bolt pins) as per item **G3** Main propulsion shafting
	• with transmitted power P < 220 kW		W	X (7)	W	(5)	Static balancing test of rotating components in particular gear wheel and pinion shaft assemblies with the coupling part attached. Where $n^2 \cdot d \geq 1,5 \cdot 10^9$, gear wheel and pinion shaft assemblies are also to undergo a dynamic balancing test
	2 - Other reduction and step-up gears:					(6)	Verification of cutting accuracy, meshing test and hydrostatic tests as per NR217
	• with transmitted power P ≥ 110 kW		W	X h ndt (5) (6) (7)	W	(7)	Tests on board as per NR217, Pt C, Ch 1, Sec 15
	• with transmitted power P < 110 kW		W	X (7)	W		
G3	Main propulsion shafting (1)	DA	(2)	X h (3)	W	(1)	As per NR217, Pt C, Ch 1, Sec 7
	1 - Coupling	DA	W	X	W	(2)	Material tests are required for all shaft components
	2 - Propeller shafts	DA	W	X h	W	(3)	Parts of hydraulic couplings, clutches of hydraulic reverse gears and control units, hubs and hydraulic cylinders of controllable pitch propellers, including piping systems and associated fittings, are to be hydrostatically tested to 1,5 times the maximum working pressure
	3 - Intermediate shafts	DA	W	X	W	(4)	Sterntubes, when machine-finished, and propeller shaft liners, when machine-finished on the inside and with an overthickness not exceeding 3 mm on the outside, are to be hydrostatically tested to 0,2 N/mm²
	4 - Thrust shafts	DA	W	X	W		
	5 - Cardan shafts	DA	W	X h	W		

AUXILIARY MACHINERY - ITEM G - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G3	6 - Sterntubes	DA	W	X h (4)	W	
	7 - Sterntubes bushes and other shaft bearings	DA	W	X h	W	
	8 - Propeller shaft liners	DA	W	X h (4)	W	
	9 - Coupling bolt or studs	DA	W	X	W	
	10 - Flexible couplings	DA	W	X h	W	
	11 - Thrust sliding-blocks	DA	W	X	W	
G4	Propellers (1)	DA or TA (3) (HBV)	(2)	X ndt (4)	W	(1) As per NR217, Pt C, Ch 1, Sec 8 (2) Material tests to be in accordance with NR216 (3) Mass produced propellers may be accepted within the framework of the type approval program of the Society (4) Static balancing is required for all finished propellers in accordance with the specified ISO 484 tolerance class. Dynamic balance is required for propellers running above 500 rpm (5) Required static balancing of complete built-up and CPP propellers may be replaced by an individual check of blade weight and gravity centre position (6) Complete hydraulic system for the control of CPP mechanism is to be hydrotested at a pressure equal to 1,5 times the design pressure. The proper operation of the safety valve is to be tested in the presence of the Surveyor
	1 - Solid propeller	DA	W	X h	W	
	2 - Built-up and controllable pitch propeller (CPP)	DA	W	X h ht (5) (6)	W	
G5	Steering gears (1)	DA	(2)	X ndt (3)		(1) As per NR217, Pt C, Ch 1, Sec 11 (2) Material tests, including examinations for internal defects, to be performed to components subject to pressure or transmitting mechanical forces as per NR216 (3) NDT are to be carried out for mechanical components subjected to pressure or transmitting mechanical forces (4) Tests for pipes, valves and fittings are to comply with NR217, Pt C, Ch 1, Sec 10, [20] (5) "C" if the additional class notation **ADN** is assigned
	• power ≥ 50 kW	DA		X bt	W / C (5)	
	• power < 50 kW	DA		X bt	W	
	1 - Power unit			X h		
	2 - Pressure components		W / C (5)	X h ht ndt		
	3 - Load transmitting components		W / C (5)	X ndt		
	4 - Pipes, valves and fittings (4)		W / C (5)	X h ht		

AUXILIARY MACHINERY - ITEM G - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G6	Motorized windlasses	DA (1)		X (4)	W	(1) Or assessment by the mean of type tests according to special conditions. Ref. NR626 - Rule Note for Anchor windlass (2) See item **G8** (Piping) and **G12** (Hydraulic systems) (3) For electric systems (motors, switchboards, starter cabinets, alarm panels, etc.), refer to the relevant provisions of item **K**; for the other systems, refer to the relevant provisions of this NR544, of NR626, and of NR217 (4) Refer to relevant provisions of NR626, Section 1, as amended Note: Alternative test methods subject to Society's acceptance / Anchoring tests / load tests on board, as per agreed program - Refer to NR626
	1- Main shaft	DA	W	X ndt	W	
	2- Casing or body, drum / gipsy-wheel, and main load-bearing structures	DA	W	X ndt	W	
	3- Hydraulic systems, Electric systems (2) (3)	DA		X h	W	
	4- Guide roller, Chain stopper (wire stopper), Guide pins	DA	W	X ndt	W	
G7	Thrusters and their prime movers (1) (2) (3)	DA or TA (4) (HBV)		X	W	(1) As per NR217, Pt C, Ch 1, Sec 12 (2) Thrusters developing power less than 110 kW are to be built in accordance with sound marine practice and tested as required to the satisfaction of the Surveyor (3) Prime movers are to be tested in accordance with the requirements applicable to the type of mover used (4) Mass produced thrusters may be accepted with the frame work of type approval program of the Society (5) Material testing for parts of athwartship thrusters does not need to be witnessed by a Surveyor, provided full test reports are made available to him
	1 - Transverse thrusters intended for manoeuvring		W (5)	X h ht	W	
	2 - Thrusters intended for propulsion and steering		W	X h ht	W	

AUXILIARY MACHINERY - ITEM G - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G8	Pressure equipment (1) (2)		(3) (4)	(5)	(4)	(1) As per NR217, Pt C, Ch 1, Sec 3 (2) Definitions: p : Design pressure, in MPa V : Volume, in litres T : Design temperature, in °C t_A : Actual thickness of the vessel, in mm (3) In addition to the general requirement, material test for the construction of pressure parts of boilers, other steam generators, oil fired thermal oil heaters and exhaust gas thermal oil heaters to be witnessed by the Surveyor (4) Material test to be witnessed by the Surveyor for class 1 pressure vessels and heat exchangers. This may be waived for mass produced small pressure vessels e.g. accumulators for valve controls, gas bottles, etc. (5) Hydrostatic test of all class 1, class 2 and class 3 pressure vessels are to be witnessed by the Surveyor with the exception of mass produced pressure vessels which are built under the conditions stated in (6) (6) Product certificate W may be accepted for mass produced small pressure vessels of class 1, class 2 and class 3 which are type approved by the Society (7) As per NR217, Pt C, Ch 1, Sec 10, [20] (8) The proof of the quality of materials for pipe Class II is to be in the form of an inspection certificate according to EN 10.204. 3.1 or equivalent (9) As per NR217, Pt C, Ch 1, Sec 4
	1 - Steam generators or boilers					
	Class 1: (p > 3,2 and V > 2) or (p·V > 20 and V > 2)	DA	W	X h ndt	W	
	Class 2: if not class 1 or class 3	DA	W (6)	X h ndt	W	
	Class 3: p·V ≤ 5 or V ≤ 2		W (6)	X h ndt	W	
	2 - Pressure vessels for toxic substances					
	Class 1: all in class 1	DA	W	X h ndt	W	
	3 - Pressure vessels for corrosive substances					
	Class 1: p > 20 or p·V > 20 or T > 350	DA	W	X h ndt	W	
	Class 2: if not in class 1	DA	W	X h ndt	W	
	4 - Pressure vessels for gaseous substances					
	Class 1: p > 100 or p·V > 300	DA	W	X h ndt	W	
	Class 2: V > 1 and p·V > 100 and not in class 1	DA	W	X h ndt	W	
	Class 3: all pressure vessels which are not class 1 or class 2		W	X h ndt	W	
	5 - Pressure vessels for liquid substances					
	Class 1: V > 10 and p·V > 1000 and p > 50	DA	W	X h ndt	W	
	Class 2: (V ≤ 10 and p > 100) or (1 < p ≤ 50 and p·V>1000)	DA	W	X h ndt	W	
	Class 3: all pressure vessels and heat exchangers which are not class 1 or class 2		W	X h ndt	W	
	6 - Pressure vessels for thermal oil					
	Class 1: p > 1,6 or T > 300	DA	W	X h ndt	W	
	Class 2: if not class 1 or class 3	DA	W (4)	X h ndt	W	
	Class 3: p ≤ 0,7 and T ≤ 150		W (4)	X h ndt	W	

AUXILIARY MACHINERY - ITEM G - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
	7 - Pressure vessels for fuel oil, lubricating oil or flammable hydraulic oil					
	Class 1: p > 1,6 or T > 150	DA	W	X h ndt	W	
	Class 2: if not class 1 or class 3	DA	W	X h ndt	W	
	Class 3: p ≤ 0,7 and T ≤ 60		W	X h ndt	W	
G8	8 - Whatever type of equipment					
	Class 1: t_A > 40	DA	W	X h ndt	W	
	Class 2: 15 ≤ t_A ≤ 40	DA	W	X h ndt	W	
	9 - Oil firing equipment (7) (9)					
	Class II piping system		W (8)	X h	W	
	Class III piping system if design pressure exceeds 3,5 bar		W	X h	W	
	Domestic gas installations (1)	DA		X (6)	W	
	1 - Medium-pressure pipes			X h ht (2) (3)		
G9	2 - Other pipes			X ht (4) (5)		
	3 - Receptacle fittings subjected to pressure			X ht (7)		
	4 - Gas-consuming appliances			X (8)		

(1) As per NR217, Pt C, Ch 1, Sec 13

(2) Pressure test is carried out with air, an inert gas or liquid at a pressure of 20 bar above atmospheric pressure

(3) Gastightness test is carried out with air or an inert gas at a pressure of 3,5 bar above atmospheric pressure

(4) Tightness test, for concerning pipes, is to be carried out with air or an inert gas at a pressure of 1 bar above atmospheric pressure

(5) Leak test, for concerning pipes, is to be carried out at a pressure of 0,15 bar above atmospheric pressure

(6) Gastightness, tightness and leak tests for the pipes are deemed gastight if, after sufficient time to allow for normal balancing, no fall in the test pressure is observed during the following 10 minutes

(7) Tightness test is carried out with a foaming substance at the operating pressure

(8) All gas-consuming appliances shall be brought into service and tested at the nominal pressure to ensure that combustion is satisfactory with the regulating knobs in the different positions. Flame failure devices shall be checked to ensure that they operate satisfactorily

AUXILIARY MACHINERY - ITEM G - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G10	Pumps and compressors (1)		(7)		(7)	(1) As per NR217, Pt C, Ch 1, Sec 10, [20] (2) The proof of the quality of materials for pipe Class II is to be in the form of an inspection certificate according to EN 10.204. 3.1 or equivalent (3) Cylinders, covers and casings of pumps and compressors are to be subjected to an hydrostatic test. Tightness tests are to be performed on components to which this is appropriate (4) Pumps within this category: • boiler feed water or forced circulating • fuel oil or other flammable oil • compressed air (5) If of welded construction, welding steel pipes are to comply with the applicable requirements of NR467, Pt C, Ch 1, Sec 10. Welded joints in pipelines of Class II are to be tested in accordance with NR216 (6) For main parts before assembling (7) For product certificate C, alternative type of certificate may be accepted depending on the Survey Scheme.
	1 - Class II piping system		W (2)	X h (3)	W	
	2 - Class III piping system if design pressure exceeds 3,5 bar (4)		W	X h	W	
	3 - Class III piping system other than above			X h	W	
	4 - Bilge and fire pumps		W	X h	W	
	5 - Feed pumps for main boilers	DA	W	X h (5) (6)	W	
	6 - Forced circulation pumps for main boilers	DA	W	X h	W	
G11	Starting air receiver (1)	DA or TA	W	X h	C	(1) As per NR217, Pt C, Ch 1, Sec 2
G12	Hydraulic system (1)	DA	W		W	(1) As per NR217, Pt C, Ch 1, Sec 10, [20]
	1 - Pressure casings and oil lines			X h		
	2 - Power unit			X h		
	3 - Systems			X ht		

AUXILIARY MACHINERY - ITEM G - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
G13	Pipes, Piping (1)					(1) As per NR217, Pt C, Ch 1, Sec 10, [20] (2) The proof of the quality of materials is to be in the form of an inspection certificate according to EN 10.204. 3.1 or equivalent (3) If of welded construction, welding steel pipes are to comply with the applicable requirements of NR467, Pt C, Ch 1, Sec 10. Welded joints in pipelines of Class II are to be tested in accordance with NR216 (4) All pipe systems are to be tested for leakage under operational conditions. If necessary, special techniques other than hydraulic pressure tests are to be applied: • heating coils in tanks and fuel lines must be tested to not less than 1,5 PB but in no case less than 4 bar • liquefied gas process piping systems are to be leak tested (by air, halides, etc.) to a pressure depending on the leak detection method applied (5) All Class II pipes (and other concerning items) having a design pressure PR greater than 3,5 bar shall be subjected to an hydraulic pressure test in the presence of the Surveyor (6) Relevant type approval tests are to be carried out on each type and each size as per NR467, Pt C, Ch 1, Sec 10 (7) Hydrostatic tests under supervision of the Society
	1 - Class II		W (2)	X h (3) (4) (5)	W	
	2 - Class III		W	X h (3) (4)	W	
	3 - Hose assemblies and compensators	TA (6) (HBV)	W	X h (7)	W	
	4 - Plastic piping		W	X h	W	
G14	Pipe fittings (1)					(1) As per NR217, Pt C, Ch 1, Sec 10, [20] (2) If of welded construction, welding steel pipes are to comply with the applicable requirements of NR467, Pt C, Ch 1, Sec 10. Welded joints in pipelines of Class II are to be tested in accordance with NR216 (3) The following valves are to be subjected in the manufacture's work to an hydraulic pressure test in the presence of a Surveyor and are also subjected to undergo a tightness test at 1,0 times the nominal pressure: • valves of pipe Class II to 1,5 PR • valves mounted on the vessel's side not less than 5 bar
	1 - Valves for pipe Class II	DA	W	X h (2) (3)	W	
	2 - Valves for pipe Class III			X (2)		
	• diameter ≤ 100 mm		W	X h (3)	W	
	• diameter > 100 mm	DA	W	X h (3)	W	
	3 - For plastic pipes	DA	W	X	W	
	4 - Remote controlled valves			X	W	

Table 27: Cargo handling and containment systems for liquefied gases - item H - •

Vessels/units intended for the carriage/storage of dangerous goods

CARGO HANDLING AND CONTAINMENT SYSTEMS FOR LIQUEFIED GASES - ITEM H - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
H1	Independent cargo tanks (1)	DA	C	X h	C	(1) As per NR217, Part D, Chapter 3
H2	Compressors (1)	DA	C / W (2)	X (3)	C	(1) As per NR217, Part D, Chapter 3 (2) Material certificate: • C for cast body • W for welded construction (3) Inspection to be carried out according to a program approved by the Society
H3	Cargo pumps (1)	DA	C / W (2)	X h (3)	C	(1) As per NR217, Part D, Chapter 3 (2) Material certificate: • C for cast body • W for welded construction (3) Inspection to be carried out according to a program approved by the Society
H4	Pipes, valves and fittings (1)		(2)	(3) (4)		(1) As per NR217, Part D, Chapter 3 (2) Tests subjected as per NR217, Pt C, Ch 1, Sec 10, [20] (3) The setting pressure of the pressure/vacuum valves is to be checked with regard to the applicable Society's Rules (4) Cargo piping system is to be checked for leakage under operational conditions after installation on board (5) Welded joints are to be subjected to examinations specified in NR217, Pt C, Ch 1, Sec 10, [20] for Class II pipes
	• ND > 100 mm	TA (HBV)	C	X h	W	
	• ND ≤ 100 mm	TA (HBV)	W	X h (5)	W	
H5	Expansion joints and cargo hoses (1)	TA	W (2)	X h (3)	C	(1) As per NR217, Part D, Chapter 3 (2) If metallic (3) Tests may be carried out in the workshops or on board
H6	Gas-tight penetration glands (1)	TA		X h ht	C	(1) As per NR217, Part D, Chapter 3
H7	Cargo tank P/V and high velocity valves (1)	TA	W	X ht (2)	C	(1) As per NR217, Part D, Chapter 3 (2) Tests may be carried out in the workshops or on board

CARGO HANDLING AND CONTAINMENT SYSTEMS FOR LIQUEFIED GASES - ITEM H - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
H8	Gas detection system (1)	TA (HBV)		X	W	(1) As per NR217, Part D, Chapter 3
H9	Instrumentation (1)	TA (HBV)		X	W	(1) As per NR217, Part D, Chapter 3
H10	Fans for enclosed spaces (1)	TA (HBV)		X	W	(1) As per NR217, Part D, Chapter 3
H11	Insulation materials of pressure vessels (1)	TA	C	X	C	(1) As per NR217, Part D, Chapter 3
H12	Safety relief valves (1)	TA		X	C	(1) As per NR217, Part D, Chapter 3
H13	Stainless or high alloy steel for membrane cargo containment system	(1)	C (1)	X	C	(1) As per provisions of NR467, Part D, Chapter 9

Table 28: Cargo handling and containment systems for liquids - item I - •

Vessels/units intended for the carriage/storage of dangerous goods

CARGO HANDLING AND CONTAINMENT SYSTEMS FOR LIQUIDS - ITEM I - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
I1	Independent cargo tanks (1)	DA	C	X h	C	(1) As per NR217, Part D, Chapter 3
I2	Compressors (1)	DA	C / W (2)	X (3)	C	(1) As per NR217, Part D, Chapter 3 (2) Material certificate: • C for cast body • W for welded construction (3) Inspection to be carried out according to a program approved by the Society
I3	Cargo pumps (1)	DA	C / W (2)	X h (3)	W	(1) As per NR217, Part D, Chapter 3 (2) Material certificate: • C for cast body • W for welded construction (3) Inspection to be carried out according to a program approved by the Society
I4	Pipes, valves and fittings (1)		(2)	(3) (4)		(1) As per NR217, Part D, Chapter 3 (2) Tests subjected as per NR217, Pt C, Ch 1, Sec 10, [20] (3) The setting pressure of the pressure/vacuum valves is to be checked with regard to the applicable Society's Rules (4) Cargo piping system is to be checked for leakage under operational conditions after installation on board (5) Welded joints are to be subjected to examinations specified in NR217, Pt C, Ch 1, Sec 10, [20] for Class I & II pipes
	• ND > 100 mm	TA (HBV)	C	X h (5)	W	
	• ND ≤ 100 mm	TA (HBV)	W	X h (5)	W	
I5	Expansion joints and cargo hoses (1)	TA	W (2)	X h (3)	C	(1) As per NR217, Part D, Chapter 3 (2) If metallic (3) Tests may be carried out in the workshops or on board
I6	Gas-tight penetration glands (1)	TA		X h ht	C	(1) As per NR217, Part D, Chapter 3
I7	Cargo tank P/V and high velocity valves (1)	TA	W	X ht (2)	C	(1) As per NR217, Part D, Chapter 3 (2) Tests may be carried out in the workshops or on board

CARGO HANDLING AND CONTAINMENT SYSTEMS FOR LIQUIDS - ITEM I - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
I8	Flame arresters (1)	TA (HBV)		X	W	(1) As per NR217, Part D, Chapter 3
I9	Gas detection system (1)	TA (HBV)		X	W	(1) As per NR217, Part D, Chapter 3
I10	Instrumentation (1)	TA (HBV)		X	W	(1) As per NR217, Part D, Chapter 3
I11	Fans for enclosed spaces (1)	TA (HBV)		X	W	(1) As per NR217, Part D, Chapter 3
I12	Insulation materials (1)	TA		X	C	(1) As per NR217, Part D, Chapter 3
I13	Safety relief valves (1)	TA		X	C	(1) As per NR217, Part D, Chapter 3

Table 29: Electrical installations - item K - •

Vessels/units intended for the carriage/storage of dangerous goods

ELECTRICAL INSTALLATIONS - ITEM K - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
K1	Generators (1)					(1) As per NR217, Pt C, Ch 2, Sec 4 (2) Tests to be performed: • temperature rise test • overload test • short-circuit test • high voltage test • overspeed test • measurement of insulation resistance (3) All electrical machines are to be tested at manufacturer's work. When the test is not specified, the requirements of IEC 60034 apply
	• power ≥ 50 kW/kVA	TA (HBV)	W	X (2) (3)	W	
	• power < 50 kW/kVA		W	X (2) (3)	W	
K2	Electrical machines (1)					(1) As per NR217, Pt C, Ch 2, Sec 4 (2) Tests to be performed: • temperature rise test • overload test • short-circuit test • high voltage test • overspeed test • measurement of insulation resistance (3) All electrical machines are to be tested at manufacturer's work. When the test is not specified, the requirements of IEC 60034 apply
	• power ≥ 50 kW/kVA	TA (HBV)	W	X (2) (3)	W	
	• power < 50 kW/kVA		W	X (2) (3)	W	
K3	Transformers (1)					(1) As per NR217, Pt C, Ch 2, Sec 5 (2) Power transformers are to be tested according to IEC 60076
	• power ≥ 50 kW/kVA	TA (HBV)		X (2)	W	
	• power < 50 kW/kVA			X (2)	W	

ELECTRICAL INSTALLATIONS - ITEM K - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
K4	Storage batteries (1)	TA (HBV)		X (2)	W	(1) As per NR217, Pt C, Ch 2, Sec 7 (2) The following shall be tested: • installation of storage batteries • ventilation of battery rooms, cupboards/containers; and cross-section of ventilation ducts • storage battery charging equipment • required caution labels and information plates
K5	Storage battery chargers (1)					(1) As per NR217, Pt C, Ch 2, Sec 7
	• power ≥ 2 kW/kVA	TA (HBV)		X	W	
	• power < 2 kW/kVA			X	W	
K6	Switchboards (1)					(1) As per NR217, Pt C, Ch 2, Sec 8 (2) Including switchboards for emergency generator sets (3) Tests to be performed: • operational test • high voltage test • insulation resistance measurement
	• power ≥ 100 kW/kVA (2)	DA or TA (HBV)		X (3)	W	
	• power < 100 kW/kVA	DA or TA (HBV)		X	W	
K7	Switchgear (1)	TA (2) (HBV)		X (3)	W	(1) As per NR217, Pt C, Ch 2, Sec 8 (2) As a general principle, switchgear shall be type approved, designed and constructed in accordance with standard IEC, EN or other standards recognized by the Society (3) Test on board
K8	Cables and insulated wires (1)	TA (2) (HBV)		X	W	(1) As per NR217, Pt C, Ch 2, Sec 9 (2) As a general principle, the use of the types of cables and wired according to IEC 60092 is permitted
K9	Control, monitoring, alarm and safety systems (1)	TA (HBV)		X (2)	W	(1) As per NR217, Pt C, Ch 3, Sec 2 (2) Operational test to be performed
K10	Power electronics (1)					(1) As per NR217, Pt C, Ch 2, Sec 4 (2) Routine tests to be performed: • voltage test • insulation resistance test (3) Operational test to be performed on the subsequent machines
	• power ≥ 50 kW/kVA	TA (HBV)		X (2) (3)	W	
	• power < 50 kW/kVA			X (2) (3)	W	

ELECTRICAL INSTALLATIONS - ITEM K - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
K11	Electrical propulsion plants (1)					(1) As per NR217, Pt C, Ch 2, Sec 13 (2) Material certificate for shafts. Shafts are to be made of material complying with NR216, Ch 2, Sec 3 or, where rolled products are allowed in place of forgings, with NR216, Ch 2, Sec 1 (3) Shaft material for electric propulsion motors and for main engine driven generators where the shaft is part of the propulsion shafting is to be certified by the Society (4) If appropriate, where welded parts are foreseen on shafts and rotors, the provisions of NR216, Chapter 5 apply (5) Type test are to be carried out on a prototype machine or on the first of a batch of machines, and routine tests carried out on the subsequent machines (6) Functioning of the propulsion plant shall be proved by dock trial before river trials (7) Testing during trial voyages as per NR217, Pt C, Ch 2, Sec 14
	• power ≥ 50 kW/kVA	DA or TA	C (2) (3)	X (4) (5) (6) (7)	C	
	• power < 50 kW/kVA	DA or TA (HBV)	W (2) (3)	X (4) (5) (6) (7)	W	
K12	Computer systems (1)					(1) As per NR217, Pt C, Ch 3, Sec 3 (2) The following test shall be carried out in the manufacturer's works: • function test • operating conditions simulation • fault simulation • simulation of the application environment
	1 - Class 1 and class 2			X (2)	W	
	2 - Class 3, class 4 and class 5	TA (HBV)		X (2)	W	

Table 30: Pollution prevention installation covered by additional class notation Cleanvessel / Clean-Unit - item S - •

Vessels/units intended for the carriage/storage of dangerous goods

POLLUTION PREVENTION INSTALLATION COVERED BY ADDITIONAL CLASS NOTATION CLEANVESSEL / CLEAN-UNIT - ITEM S - •						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product Certificate	
S	Pollution prevention installation covered by additional class notation **Cleanvessel / Clean-Unit**					
S1	Sewage treatment plant (1)	TA (HBV)		X h	W	(1) In accordance with IMO Resolution MEPC. 159 (55)
S2	Incinerator (1)	TA (HBV)		X	W	(1) In accordance with IMO Resolution MEPC. 76 (40) as amended by Resolution MAPC.93 (45) and Annex VI of MARPOL 73/78, Appendix IV
S3	Anti-fouling system (1)	TA (2) (HBV)		X	W	(1) In accordance with International Convention on the control of Harmful and Anti-fouling systems, 2001, Annex 4, Appendices 1 and 2 (2) Anti-fouling paint are to be a type approved by the Society, on the basis of the following criteria: • TBT-free • small quantities of organotin compounds acting as a chemical catalyst are allowed provided their concentration does not exceed 2500 mg total tin per kg of dry paint
S4	Advanced water treatment plants (1)	TA (HBV)		X	W	(1) In accordance with IMO Resolution MEPC. 159 (55)
S5	Grey water treatment plants (1)	TA (HBV)		X	W	(1) In accordance with IMO Resolution MEPC. 159 (55)
S6	Onboard NOx monitoring systems (1)	TA (HBV)		X	W	(1) Where NOx reduction methods (such as water injection, fuel oil emulsification, charge air humidification, exhaust gas after-treatment) are used, they are to be approved by the Society and taken into account in type approval certification of the engine
S7	Oily water separator (OWS) systems (1)	TA (HBV)		X h	W	(1) In accordance with IMO Resolution MEPC. 107 (49)
S8	Exhaust gas cleaning (EGC) systems (1)	TA (HBV)		X	W	(1) In accordance with IMO Resolution MEPC.184 (59): 2009 Guidelines for exhaust gas cleaning systems
S9	Oil content meter	TA (HBV)		X	W	
S10	Oil sealing glands	TA (HBV)		X	W	
S11	Leak detector for refrigeration systems	TA (HBV)		X	W	

APPENDIX 1 GENERAL INDEX

1 Key-words and labels (from A to Z)

1.1 Index

1.1.1

Table 1 : General index

	Key-words and labels (from A to Z)	Item reference No.
A	Advance water treatment plants	S4
	Aluminium alloy plates, profiles, bars and tubes	A5
	Anchor chain cable accessories	B4
	Anchor chain cables	B3
	Anchors	B2
	Anti-fouling system	S3
	Automatic pressure water spraying system	C4
	Auxiliary diesel engines	G1
	Bedding (elastic bedding - hull outfitting)	B13
B	Bitts	B14
	Bollards	B14
C	Cables and insulated wires	K8
	Cargo pumps (for liquefied gases)	H3
	Cargo pumps (for liquids)	I3
	Cargo tank P/V and high velocity valves (for liquefied gases)	H7
	Cargo tank P/V and high velocity valves (for liquids)	I7
	Cast steel shaft brackets	A9
	Composite materials	A8
	Compressors (for liquefied gases)	H2
	Compressors (for liquids)	I2
	Computer systems	K12
	Consumables (welding), Filler products for welding	A7
	Control and safety devices	E5
	Control, monitoring, alarm and safety system	K9
D	Detection and alarm system	C7
	Domestic gas installations	G9
E	Electrical machines	K2
	Electrical propulsion plants	K11
	Exhaust gas cleaning (EGC) systems	S8
	Expansion joints and cargo hoses (for liquids)	I5
	Expansion joints and cargo hoses (for liquefied gases)	H5
	External ramp	B10

	Key-words and labels (from A to Z)	Item reference No.
F	Fans for enclosed spaces (for liquefied gases)	H10
	Fans for enclosed spaces (for liquids)	I11
	Filler products for welding (welding consumables)	A7
	Fire bulkheading, fire doors	C1
	Fire dampers	C2
	Fixed gas fire extinguishing system	C5
	Flame arresters (for liquids)	I8
G	Gas detection system (for liquefied gases)	H8
	Gas detection system (for liquids)	I9
	Gas-tight penetration glands (for liquefied gases)	H6
	Gas-tight penetration glands (for liquids)	I6
	Gears and couplings	G2
	Generators	K1
	Grey water treatment plants	S5
H	Hatch covers	B8
	Heat exchangers	E2
	Hydraulic system	G12
I	Incinerator	S2
	Independent cargo tanks (for liquefied gases)	H1
	Independent cargo tanks (for liquids)	I1
	Independent tanks	B12
	Instrumentation (for liquefied gases)	H9
	Instrumentation (for liquids)	I10
	Insulation materials (for liquefied gases)	H11
	Insulation materials (for liquids)	I12
	Iron castings	A4
L	Leak detector for refrigeration systems	S11
M	Main diesel engines with diameter of cylinder bore > 300 mm	E1
	Main propulsion shafting	G3
	Mass produced diesel engines diameter of cylinder bore D ≤ 300 mm	E6
	Membrane cargo containment system	H13
	Motorised windlasses	G6
	Movable deck and inner ramp	B11
O	Oil content meter	S9
	Oil sealing glands	S10
	Oily separator (OWS) systems	S7
	Onboard NOx monitoring systems	S6

	Key-words and labels (from A to Z)	Item reference No.
P	Pipe fittings	G14
	Pipes, piping	G13
	Pipes, valves and fittings (for liquefied gases)	H4
	Pipes, valves and fittings (for liquids)	I4
	Portable fire extinguishers	C6
	Power electronics	K10
	Pressure vessels	G8
	Pump and compressors	G10
	Propellers	G4
R	Ropes (Steel wire ropes and fibre ropes)	B5
	Rudders / nozzles	B1
S	Safety relief valves (for liquefied gases)	H12
	Safety relief valves (for liquids)	I13
	Scavenging and supercharging compressors or blowers	E4
	Sewage treatment plant	S1
	Shell doors	B7
	Sidescuttles and windows	B6
	Starting air receiver (for main diesel engines)	E8
	Starting air receiver (for auxiliary machinery)	G11
	Steel castings	A3
	Steel forgings	A2
	Steel plates and profiles	A1
	Steering gears	G5
	Storage batteries	K4
	Storage battery chargers	K5
	Switchboards	K6
	Switchgears	K7
T	Thrusters and their prime movers	G7
	Transformers	K3
	Transition joints steel / Aluminium alloy	A6
	Turbochargers	E7
	Turning gears of main diesel engines	E3
W	Water supply system	C3
	Watertight doors	B9
	Welding consumables	A7
	Windlasses (Motorised windlasses)	G6

BUREAU
VERITAS

Shaping a World of Trust

Marine & Offshore
Le Triangle de l'Arche - 8 Cours du Triangle - CS 50101
92937 Paris La Defense Cedex - France
Tel: + 33 (0)1 55 24 70 00
https://marine-offshore.bureauveritas.com/bv-rules