

Ready Reckoner for Marine Components

1. Introduction

This Ready Reckoner provides a comprehensive reference for Type Approval, Drawing Approval, and Certification requirements for marine components used in vessels operating under:

- IRS Rules and Regulations for Construction and Classification of steel ships as amended
- IRS Rules and Regulations for Construction and Classification of Inland Waterways Ships
- Classification notes for application of IRS Rules to Indian River Sea Vessels.

The RSV type 1 and type 2 vessels are to comply with IW Rules whereas RSV type 3 and type 4 are to comply with IRS Main Rules.

2. Component Requirements Matrix

The following table provides detailed requirements for each marine component including applicable rule references:

Item / Component	Type Approval/testing	Design Appraisal	Applicable Rules / Standards
Valves (Underwater, Shiplside, Safety valves of boilers and steam generators) -Valves/fittings for use in pressure vessels, boilers & main feed water system -Valves/fittings for use in refrigeration systems	For safety valves of boilers and steam generators, the proposed arrangements are to be submitted for approval and type testing required to be witnessed.	Recognised National/International standard be followed in design. -IRS approval may be required by Rules for specific applications. -Plans of valves / fittings which do not require approval and if submitted may be stamped as "NOTED" by the local survey station after verifying the co-relation with purchase order requirements	IRS IW Rules: Part 3, Ch.11, Sec.7 (Scuppers and Sanitary Discharges) IRS Main Rules: Part 4, Ch.2 (Piping Systems) IRS Main Rules: Part 2, Ch.4, 5, 8 (Materials) Recognised National/International Standards
Anchors		Anchors are to be of an approved design and are to be manufactured as per approved drawings or as per internationally recognized standards.	IRS IW Rules: Part 3, Ch.13 (Anchoring and Mooring Equipment) IRS IW Rules: Part 3, Ch.13, Sec.4 (Anchors) IRS Main Rules: Pt.2, Ch.10, Sec.1 (Equipment) Recognised National/International Standards
Chain Cable		Plan approval not required. Items to comply with recognized standards	IRS IW Rules: Part 3, Ch.13, Sec.5 (Anchor Chain Cables) IRS IW Rules: Part 1, Ch.2, Sec.2.2.1.12 (Survey requirements) BIS IS 4484:2013

Pump - Bilge pumps - Ballast pumps - Sea water cooling pumps - Fresh water-cooling pumps - Fire pumps - Emergency fire pumps - Condensate pumps - Boiler feed water pumps - Boiler water circulating pumps - Lubricating oil pumps - Fuel oil booster pumps - Brine pumps - Refrigerant circulating pumps - Cargo pumps and - Thermal oil heater – oil circulating pumps	Type testing only for pumps handling liquid gases or dangerous chemicals as applicable	Sectional drawings with materials and operating conditions for special pumps	IRS IW Rules: Part 1, Ch.2, Sec.3.2.9 (Pumping and piping system surveys) IRS Main Rules: Part 4, Ch.5 (Machinery - Pumps) Standards: IS 5120, DIN 1944, ISO 2548, BS 599, API 610, Hydraulic Institute Standards, etc.
Electrical Cable at Manufacturer's Works	Type tests consist of Electrical and Non-Electrical type and they are required to be witnessed by Surveyor if the manufacturer is manufacturing and supplying cables first time under Class Survey and in addition whenever any new product is being supplied under Survey.	Details of cables are to be submitted	IRS IW Rules: Part 1, Ch.2, Sec.3.2.11 (Electrical equipment survey) IRS Main Rules: Part 4, Ch.8 (Electrical Installations) IEC 60092-350 (Marine Cables)
Watertight Doors	Type approval is not a requirement. Some designs are type approved and this may be considered whilst reviewing the QAP.	The design of the doors is to be approved by IRS. They are to be of a strength equivalent to that of the subdivision bulkheads in which they are fitted.	IRS IW Rules: Part 3, Ch.9, Sec.2.3 (Openings in watertight bulkheads) IRS Main Rules: Part 3, Ch.10, Sec.2.5 and 2.6 Testing as per QAP in compliance with TDC
Windlass		-Plans are to be approved by IRS. - Approved drawings / Plans will contain information like dimensions, materials, manufacturing / dimensional tolerances, and any requirements specific to the windlass.	IRS IW Rules: Part 3, Ch.13, Sec.7 (Windlass) IRS IW Rules: Part 1, Ch.2, Sec.3.2.4.1 (Auxiliary machinery survey) IRS Main Rules: Part 3, Ch.15, Sec.7

Side Scuttles/Windows		<p>-Approval of plans by IRS is required only when non-standard sizes are required.</p> <p>-A recognised National/International standard is to be followed in design.</p> <p>-Plans should be approved by the in all cases; alternatively model no. or similar identification from the manufacturer's catalogue should be indicated in the purchase order.</p>	<p>IRS IW Rules: Part 3, Ch.11, Sec.4.4 (Windows and side scuttles)</p> <p>IRS Main Rules: Part 3, Ch.12</p> <p>Recognised National/International Standards</p>
Steering Gear	If desired by the manufacturer, IRS would consider granting type approval to the plans.	<p>-Approval of plans by IRS is required</p> <p>-Detailed plans of steering gear, its layout and operating procedures should be forwarded to HO for approval.</p>	<p>IRS IW Rules: Part 3, Ch.12 (Rudders)</p> <p>IRS IW Rules: Part 1, Ch.2, Sec.2.3.7 (Intermediate Survey - Steering)</p> <p>IRS Main Rules: Part 4, Ch.6</p>
Main Switchboards and large Distribution switch Boards		<p>-Plans are to be approved by IRS</p> <p>-Plans are to include details of construction, materials, sectional views, electrical components, and internal wiring</p>	<p>IRS IW Rules: Part 1, Ch.2, Sec.3.2.11.2 (Switchboard survey)</p> <p>IRS Main Rules: Part 4, Ch.1 and Ch.8</p>
Unfired Class 1 & 2 Pressure Vessels & Heat Exchangers		Plans to be approved by IRS	<p>IRS IW Rules: Part 1, Ch.2, Sec.3.2.8 (Air receivers surveys)</p> <p>IRS Main Rules: Part 2, Ch.3, Sec.6</p> <p>IRS Main Rules: Part 4, Ch.10</p>
Class 3 Pressure Vessels & Heat Exchangers		<p>Design documentation required</p> <p>Plans to be approved by IRS</p>	IRS Main Rules: Part 4, Ch.5, Ch.10
Unfired Pressure Vessels & Heat Exchangers not requiring to be constructed under survey Scope of Inspection at Manufacturer's Works		Plans should be approved by IRS	Recognised National/International Standards
Normal Strength Steels for Ship Structures		<p>Per recognized standards</p> <p>Plans are to be accepted / approved by IRS.</p>	<p>IRS IW Rules: Part 2 (Same as Main Rules Part 2)</p> <p>IRS IW Rules: Part 3, Ch.2 (Materials of Construction)</p> <p>IRS Main Rules: Part 2, Ch.3</p> <p>QAP to be agreed prior to inspection</p>

Flexible Hoses		-Flexible hoses are to be designed and constructed in accordance with recognized national or international standards. - Based on the intended application plans of equipment using flexible hoses are submitted by the manufacturer to IRS (HO) for review / approval	IRS IW Rules: Part 3, Ch.11 (Piping arrangements) Recognized National/International Standards
Aluminium Alloy Castings		- Castings manufactured to recognized National / proprietary specifications may be accepted provided that reasonable equivalence to the requirements of Pt.2, Ch.9. are ensured.	IRS IW Rules: Part 2 (Materials - same as Main Rules) IRS IW Rules: Part 3, Ch.2, Sec.1.4 (Aluminium) IRS Main Rules: Pt.2, Ch.9 National/Proprietary Specifications
Propeller Castings (CU alloy)		Plans to be approved by IRS	IRS Main Rules: Pt.4, Ch.4, Sec.7 IRS IW Rules: Pt.4, Ch.4, Sec.3 IRS Main Rules: Pt.2, Ch.4
Steel Wire Ropes		The details regarding form of construction and minimum breaking strength are to be in accordance with as per recognized standards	IRS IW Rules: Part 3, Ch.13, Sec.6 (Towlines and Mooring Lines) IRS Main Rules: Pt.2, Ch.10, Sec.4 IS: 2266-1989
Hull and Machinery Steel Castings		Plans accepted/approved by IRS as Per recognized standards	IRS IW Rules: Part 2, Ch.4 (Steel Castings) IRS Main Rules: Pt.2, Ch.4 Recognized National/Proprietary Specifications
Hull and Machinery Steel Forgings		Plans accepted/approved by IRS	IRS Main Rules: Pt.2, Ch.5 (Steel Forgings) Recognized National/Proprietary Specifications
Steel Pipes and Tubes		Pipes and tubes are as accepted / approved by IRS or approved by IRS.	IRS IW Rules: Part 2, Ch.6 (Steel Pipes and Tubes) IRS Main Rules: Pt.2, Ch.6
Towing Winch		Plans/drawings to be approved by IRS	IRS IW Rules: Part 3, Ch.13 (for towing operations) IRS Main Rules: Pt.5, Ch.7, Sec.3.2.1 (Tug class notation)
Propeller Shaft		Plans to be approved by IRS	IRS IW Rules: Part 1, Ch.2, Sec.3.2.14 (Propeller shaft surveys - 5 year interval) IRS IW Rules: Part 1, Ch.2, Sec.3.2.3 (Shafting surveys) IRS Main Rules: Pt.4, Ch.4, Sec.6
Rudder Stock and Pintles		Plans to be approved by IRS	IRS IW Rules: Part 3, Ch.12, Sec.5 (Rudder Stock and Pintles) IRS IW Rules: Part 3, Ch.12, Sec.2 (Arrangement and Details) IRS Main Rules: Pt.3, Ch.14, Sec.5

Rudder		Plans to be approved by IRS	IRS IW Rules: Part 3, Ch.12 (Rudders - complete chapter) IRS IW Rules: Part 3, Ch.12, Sec.4 (Rudder Blades) IRS IW Rules: Part 3, Ch.12, Sec.3 (Design Loads) IRS Main Rules: Pt.3, Ch.13, Sec.2
Transformers at Manufacturer's Works (100 KVA and above for essential services)		Drawings in compliance of IEC Publication or an acceptable and relevant national standard.	IRS IW Rules: Part 1, Ch.2, Sec.3.2.11.5 (Transformer survey) IRS Main Rules: Part 4, Ch.8 IEC Publication 60076
Electrical Rotating Machines (Motors 100 kW and above)		Plans to be forwarded to H.O. for approval	IRS IW Rules: Part 1, Ch.2, Sec.3.2.11.6 and 3.2.11.7 (Motor surveys) IRS Main Rules: Part 4, Ch.8, Sec.5 IEC 60092-301:1980/AMD2:1995
A.C. Generators (100 kW and above)		Plans to be forwarded to H.O. for approval	IRS IW Rules: Part 1, Ch.2, Sec.3.2.11.3 (Generator survey) IRS Main Rules: Part 4, Ch.8, Sec.5 IEC 60092-301:1980/AMD2:1995
Copper/Copper Alloy Tubes, Pipes and Fittings		Approved/Accepted by IRS.	IRS IW Rules: Part 2, Ch.8 (Copper Alloys) National or propriety specifications may be accepted provided these specifications give reasonable equivalence to the requirements of Pt.2, Ch.8 of Main Rules
Oil Engines	Type Approval Certification required	To be manufactured as per approved drawings by IRS	IRS IW Rules: Part 1, Ch.2, Sec.3.2.1 (Main engine surveys) IRS Main Rules: Part 4, Ch.4, Sec.4
Natural Gas Fuel Engines	Type Approval Certification required	Approved drawings by IRS	IRS Main Rules: Part 4, Ch.4, Sec.4 IRS Guidelines for Gas-Fuelled Vessels
Controllable Pitch Propulsion (CPP) System		Approved drawings by IRS	IRS IW Rules: Part 1, Ch.2, Sec.3.2.3 (Shafting surveys) IRS Main Rules: Part 2 (Materials) IRS Rules for Construction and Classification of Ships
Reduction Gearing	Type Approval Certification required	Manufactured as per approved drawings	IRS IW Rules: Part 1, Ch.2, Sec.3.2.2 (Reduction gear surveys) IRS Main Rules: Part 4, Ch.4, Sec.5

Diesel Generating Sets (Engine + Alternator)	<p>-Diesel engines of generating sets of capacity 100 kW & above are to be of an approved type and individual unit is to be manufactured under IRS Survey.</p> <p>-Diesel engines of capacity less than 100 kW can be accepted based on manufacturer's certificate provided the diesel engines are of approved type.</p>	<p>-Approval of plans is normally not required for diesel generating sets. For common skid mounted diesel generating set, the arrangement plan is to be submitted for information and record</p> <p>- Alternators & control panels intended for DG sets of capacity 100 kW & above has to undergo design approval from IRS and individual units are to be manufactured & tested under IRS Survey. Alternator & control panels of capacity less than 100 kW can be accepted based on manufacturer's certificate provided the specification meets the requirements of IRS Rules & purchase order requirements</p>	<p>IRS IW Rules: Part 1, Ch.2, Sec.3.2.11.3 (Generator survey)</p> <p>IRS IW Rules: Part 1, Ch.2, Sec.3.2.11.8 (Emergency power)</p> <p>IRS Main Rules: Part 4 (Machinery and Electrical)</p>
Selective Catalytic Reduction (SCR) System	Type Approval Certification required	SCR Systems are to be manufactured as per approved drawings	<p>IRS Main Rules: Part 4, Ch.8 (for emissions)</p> <p>MARPOL Annex VI Requirements</p>

3. INDICATIVE TESTING REQUIREMENTS FOR MARINE COMPONENTS

IRS Rules for Steel Ships (Main Rules) & IRS Rules for Inland Waterways Vessels (July 2025)

Item/Component	Tests Required	Main Rules Reference	IW Rules Reference (July 2025)
Anchors & Accessories	Chemical Analysis, Tensile Test, Impact Test, MT/PT, Proof Load Test	Part 2, Ch.4, Sec.4; Ch.10	Part 2, Ch.4; Part 3, Ch.13, Sec.4
Propeller Boss	Chemical Analysis, Tensile Test, Impact Test, MT/PT, UT 100%, Hardness	Part 2, Ch.4, Sec.7	Part 2, Ch.4
Forgings - Shafts (Propeller/Intermediate)	Chemical Analysis, Tensile (L & T), Impact Test, Hardness Survey, MT/UT 100%, Dimensional	Part 2, Ch.5, Sec.5	Part 2, Ch.5; Part 1, Ch.2, Sec.3.2.14
Forgings - Rudder Stock	Chemical Analysis, Tensile Test (L & T), Impact Test, MT/UT 100%, Dimensional, Taper Check	Part 2, Ch.5, Sec.5	Part 2, Ch.5; Part 3, Ch.12, Sec.5
Seamless Steel Pipes	Chemical Analysis, Tensile Test, Flattening Test, Hydrostatic Test, Eddy Current/UT	Part 2, Ch.6, Sec.2	Part 2, Ch.6
Welded Steel Pipes (ERW/SAW)	Chemical Analysis, Tensile Test, Flattening/Reverse Flattening, Hydrostatic, RT/UT of weld	Part 2, Ch.6, Sec.3	Part 2, Ch.6
Stainless Steel Pipes	Chemical Analysis, Tensile Test, Flattening Test, Intergranular Corrosion Test, Hydrostatic	Part 2, Ch.6, Sec.4	Part 2, Ch.6
Boiler & Heat Exchanger Tubes	Chemical Analysis, Tensile Test, Flattening/Expansion/Flaring Test, Hydrostatic, Eddy Current	Part 2, Ch.6, Sec.5	Part 2, Ch.6
Copper Alloy Castings (Bronze)	Chemical Analysis, Tensile Test, Hardness Test, Visual/PT surface defects	Part 2, Ch.8, Sec.2-3	Part 2, Ch.8
Copper Alloy Propeller Castings	Chemical Analysis, Tensile Test, Hardness Test, PT 100%, UT (blades >25mm), Dimensional	Part 2, Ch.8, Sec.4	Part 2, Ch.8
Copper Alloy Tubes/Pipes	Chemical Analysis, Tensile Test, Expansion Test, Flattening Test, Hydrostatic, Eddy Current	Part 2, Ch.8, Sec.5	Part 2, Ch.8
Copper Alloy Bars/Sections	Chemical Analysis, Tensile Test, Hardness Test	Part 2, Ch.8, Sec.6	Part 2, Ch.8
Aluminium Alloy Castings	Chemical Analysis, Tensile Test, Hardness Test, Visual/PT	Part 2, Ch.9, Sec.5	Part 2, Ch.9
Anchors (Stockless - Cast/Forged)	Material Test (casting/forging), Drop Test (sample), Proof Load Test, Breaking Test (1 per 50)	Part 2, Ch.10, Sec.2-3	Part 2, Ch.10; Part 3, Ch.13, Sec.4
Anchors (High Holding Power)	Material Test, Proof Load Test, Breaking Test, Holding Power Certification	Part 2, Ch.10, Sec.4	Part 2, Ch.10; Part 3, Ch.13, Sec.4
Anchor Chain Cable (Stud Link)	Chemical Analysis, Tensile/Impact (material), Proof Load (each length), Breaking Test (samples)	Part 2, Ch.10, Sec.5-6	Part 2, Ch.10; Part 3, Ch.13, Sec.5; BIS IS 4484
Chain Cable Accessories	Proof Load Test, Breaking Test (samples), Visual/Dimensional	Part 2, Ch.10, Sec.7	Part 2, Ch.10; Part 3, Ch.13, Sec.5
Steel Wire Ropes	Breaking Test (sample), Construction Check, Lay Verification, Dimensional	Part 2, Ch.10, Sec.8	Part 3, Ch.13, Sec.6; IS 2266
Watertight Doors (Sliding)	Hydrostatic Test (operational head), Local/Remote Operation Test, Alarm Test, Indicator Test	Part 3, Ch.10, Sec.5	Part 3, Ch.9, Sec.2.3; Ch.15
Watertight Doors (Hinged)	Hydrostatic Test, Operational Test, Dog Engagement Test	Part 3, Ch.10, Sec.5	Part 3, Ch.9, Sec.2.3
Weather-tight Doors	Hose Test, Operational Test, Gasket/Dog Inspection	Part 3, Ch.10, Sec.6	Part 3, Ch.11, Sec.4.2
Semi-watertight Doors	Operational Test, Gasket Check	Part 3, Ch.10, Sec.6	Part 3, Ch.11

Item/Component	Tests Required	Main Rules Reference	IW Rules Reference (July 2025)
Side Scuttles (Non-opening)	Pressure Test, Visual Inspection	Part 3, Ch.10, Sec.7	Part 3, Ch.11, Sec.4.4
Side Scuttles (Opening)	Pressure Test, Operational Test (port & deadlight)	Part 3, Ch.10, Sec.7	Part 3, Ch.11, Sec.4.4
Rectangular Windows (Bridge)	Pressure Test (Type Test), Heating Element Test (where fitted)	Part 3, Ch.10, Sec.7; ISO 3903	Part 3, Ch.11, Sec.4.4
Skylights	Hose Test, Operational Test (if opening), Securing Test	Part 3, Ch.10, Sec.8	Part 3, Ch.11
Ventilator Heads (Weathertight)	Closing Device Test, Visual Inspection	Part 3, Ch.10, Sec.9	Part 3, Ch.11, Sec.5
Scupper Valves & Non-return Valves	Operational Test, Seat Tightness Test	Part 3, Ch.10, Sec.11	Part 3, Ch.11, Sec.7
Sea Inlet Valves (Main)	Hydrostatic Shell Test (1.5x design), Seat Leakage Test, Operational Test	Part 4, Ch.2, Sec.2	Part 3, Ch.11, Sec.7; Main Rules Part 4, Ch.2
Sea Outlet/Overboard Valves	Hydrostatic Shell Test, Seat Test, Operational Test	Part 4, Ch.2, Sec.2	Part 3, Ch.11, Sec.7
Emergency Bilge Suction Valve	Hydrostatic Test, Remote Operation Test, Local Operation Test	Part 4, Ch.2, Sec.3	Part 1, Ch.2, Sec.3.2.9
Gate Valves	Hydrostatic Shell Test (1.5x PN), Seat Leakage Test, Stem Seal Test	Part 4, Ch.2, Sec.4	Main Rules Part 4, Ch.2
Globe Valves	Hydrostatic Shell Test, Seat Leakage Test, Operational Test	Part 4, Ch.2, Sec.4	Main Rules Part 4, Ch.2
Check Valves (Non-return)	Hydrostatic Test, Back-flow Test	Part 4, Ch.2, Sec.4	Main Rules Part 4, Ch.2
Butterfly Valves	Hydrostatic Shell Test, Seat Leakage Test, Torque Test	Part 4, Ch.2, Sec.4	Main Rules Part 4, Ch.2
Ball Valves	Hydrostatic Shell Test, Seat Leakage Test, Operational Test	Part 4, Ch.2, Sec.4	Main Rules Part 4, Ch.2
Safety/Relief Valves	Set Pressure Test, Seat Tightness Test, Capacity Test (type test)	Part 4, Ch.2, Sec.5; Ch.3	Main Rules Part 4, Ch.2-3
Quick-Closing Valves (Fuel)	Hydrostatic Test, Remote Trip Test, Local Reset Test, Seat Test	Part 4, Ch.2, Sec.6	Main Rules Part 4, Ch.2
Pressure Reducing Valves	Set Pressure Test, Capacity Test, Safety Cut-off Test	Part 4, Ch.2, Sec.7	Main Rules Part 4, Ch.2
Cargo Valves (Tankers)	Hydrostatic Test, Seat Test, Fire Test (where req.), Material Compatibility	Part 5, Ch.2	Part 5, Ch.2
Flexible Hoses - Cargo/Bunker	Hydrostatic Burst Test, Electrical Continuity Test, Vacuum Test, Flame Test (Type)	Part 4, Ch.2, Sec.8	Part 3, Ch.11
Flexible Metallic Hoses	Hydrostatic Test, Cycle Test (Type), Visual Inspection	Part 4, Ch.2, Sec.8	Main Rules Part 4, Ch.2
Cargo Tank Venting (PV Valves)	Set Pressure Test, Seat Test, Flame Screen Check	Part 5, Ch.2	Part 5, Ch.2
Main Bilge Pumps	Type Test (Head & Capacity per rules), Hydrostatic Test, Performance Test on board	Part 4, Ch.2, Sec.9	Part 1, Ch.2, Sec.3.2.9; RSV 150% capacity
Emergency Bilge Pump	Type Test, Independent Power Test, Suction Test	Part 4, Ch.2, Sec.9	Part 1, Ch.2, Sec.3.2.9
Ballast Pumps	Type Test, Hydrostatic Test, Performance Test	Part 4, Ch.2, Sec.10	Part 1, Ch.2, Sec.3.2.9
Main Fire Pump	Type Test (IS 5120/ISO 2548), Hydrostatic Test, Head & Capacity Test, Relief Valve Test	Part 4, Ch.2, Sec.11; SOLAS II-2	Part 1, Ch.2, Sec.3.2.9; RSV Annex 7
Emergency Fire Pump	Type Test, Independent Power Source Test, Priming Test (if not self-priming)	Part 4, Ch.2, Sec.11; SOLAS II-2	RSV Annex 7
Fuel Oil Service/Booster Pumps	Type Test, Hydrostatic Test, Capacity Test, Relief Valve Test	Part 4, Ch.2, Sec.12	Part 1, Ch.2, Sec.3.2.9
Fuel Oil Transfer Pumps	Type Test, Hydrostatic Test, Performance Test	Part 4, Ch.2, Sec.12	Part 1, Ch.2, Sec.3.2.9
Lubricating Oil Pumps (Main Engine)	Type Test, Pressure/Flow Test, Relief Valve Test	Part 4, Ch.4	Part 1, Ch.2, Sec.3.2.9
LO Purifier/Transfer Pumps	Type Test, Performance Test	Part 4, Ch.2	Part 1, Ch.2, Sec.3.2.9

Item/Component	Tests Required	Main Rules Reference	IW Rules Reference (July 2025)
Sea Water Cooling Pumps	Type Test, Hydrostatic Test, Head & Capacity Test	Part 4, Ch.2, Sec.14	Part 1, Ch.2, Sec.3.2.9
Fresh Water Cooling Pumps	Type Test, Hydrostatic Test, Performance Test	Part 4, Ch.2, Sec.14	Part 1, Ch.2, Sec.3.2.9
General Service/Sanitary Pumps	Hydrostatic Test, Performance Test	Part 4, Ch.2	Part 1, Ch.2, Sec.3.2.9
Fresh Water Hydrophore Pumps	Type Test, Pressure Switch Test, Tank Test	Part 4, Ch.2	Main Rules Part 4, Ch.2
Cargo Oil Pumps (Tankers)	Type Test (API 610), Hydrostatic Test, NPSH Test, Performance Curve	Part 5, Ch.2	Part 5, Ch.2; API 610
Cargo Stripping Pumps	Type Test, Self-priming Test, Performance Test	Part 5, Ch.2	Part 5, Ch.2
Ballast/Cargo Eductors	Performance Test, Driving Medium Test	Part 4, Ch.2	Main Rules Part 4, Ch.2
Main Diesel Engine (Complete)	Type Test (Power, SFOC, Emissions), Shop Trial (110% MCR), Torsional Vibration Calc., Sea Trial	Part 4, Ch.4, Sec.4	Part 1, Ch.2, Sec.3.2.1
Dual Fuel Engine (DF)	All diesel engine tests + Gas Mode Tests, Gas Detection Test, Changeover Test	Part 4, Ch.4; Part 5, Ch.12 (IGF Code)	Classification Note 16
Gas Fuel Supply System	Leak Test, Safety Valve Test, Ventilation Test, ESD Test	Part 5, Ch.12 (IGF Code)	Classification Note 16
Reduction Gearbox	Type Test, Gear Contact Test (Blue Check), Oil Tightness, No-load & Load Test, Vibration	Part 4, Ch.4, Sec.5	Part 1, Ch.2, Sec.3.2.2
Gear Wheel & Pinion	Forging Tests, Hardness Survey, Gear Tooth Accuracy, MT/UT	Part 2, Ch.5, Sec.7; Part 4, Ch.4	Part 2, Ch.5
Clutch Assembly	Type Test, Engagement/Disengagement Test, Heat Dissipation, Torque Test	Part 4, Ch.4, Sec.5	Part 1, Ch.2, Sec.3.2.2
Flexible Coupling	Type Test, Torsional Stiffness Test, Alignment Tolerance Check	Part 4, Ch.4	Part 1, Ch.2, Sec.3.2.2
Thrust Shaft	Forging Tests (Part 2, Ch.5), UT/MT 100%, Dimensional, Alignment Check	Part 4, Ch.4, Sec.6	Part 1, Ch.2, Sec.3.2.3
Intermediate Shafts	Forging Tests, UT/MT 100%, Dimensional Check, Alignment Check	Part 4, Ch.4, Sec.6	Part 1, Ch.2, Sec.3.2.3
Propeller Shaft (Tailshaft)	Forging Tests, UT/MT 100%, Dimensional, Taper/Keyway Check, Liner Bond Test (if applicable)	Part 4, Ch.4, Sec.6	Part 1, Ch.2, Sec.3.2.14 (5-yr survey)
Propeller (FPP - Cast)	Material Tests (Part 2, Ch.8), PT 100%, UT (blades), Balancing, Pitch Measurement, Dimensional	Part 4, Ch.4, Sec.7; Part 2, Ch.8	Main Rules Part 4, Ch.4; Part 2, Ch.8
Propeller (FPP - Built-up)	Blade Tests, Boss Tests, Assembly Test, Balancing, Pitch Check	Part 4, Ch.4, Sec.7	Main Rules Part 4, Ch.4
CPP System (Complete)	Type Test (Pitch change, Response), Hydraulic Test, Functional Test, Emergency Op Test	Part 4, Ch.4, Sec.7	Part 1, Ch.2, Sec.3.2.3
CPP Hub & Blades	Material Tests, PT/UT, Hydraulic Test, Pitch Mechanism Test	Part 4, Ch.4, Sec.7	Main Rules Part 4, Ch.4
Propeller Shaft Bracket	Material Tests (Casting/Forging), MT/PT, UT, Dimensional	Part 2, Ch.4-5; Part 3, Ch.5	Part 3, Ch.5, Sec.4.4
Steering Gear - Hydraulic (Rotary Vane)	Type Test, Pressure Test (1.5x relief), Full Movement Test, Emergency Op Test, Alarm Test	Part 4, Ch.6	Part 3, Ch.12
Steering Gear - Hydraulic (Ram)	Type Test, Pressure Test, Full Movement Test, Emergency Op Test, Alarm Test	Part 4, Ch.6	Part 3, Ch.12
Steering Gear - Electro-hydraulic	Type Test, Electrical Test, Hydraulic Test, Full Movement Test, Changeover Test	Part 4, Ch.6	Part 3, Ch.12
Steering Gear - Electric	Type Test, Insulation Test, Motor Test, Full Movement Test, Emergency Power Test	Part 4, Ch.6	Part 3, Ch.12
Steering Gear Power Units	Type Test, Pressure Test, Relief Valve Test, Flow Test	Part 4, Ch.6	Main Rules Part 4, Ch.6
Steering Gear Control System	Functional Test (all control positions), Alarm Test, Indicator Test, Follow-up Test	Part 4, Ch.6; Ch.9	Part 3, Ch.12; Part 1, Ch.2, Sec.3.2.10
Rudder Stock	Forging Tests, UT/MT 100%, Dimensional Check, Taper Check, Keyway Check	Part 2, Ch.5; Part 3, Ch.7	Part 2, Ch.5; Part 3, Ch.12, Sec.5

Item/Component	Tests Required	Main Rules Reference	IW Rules Reference (July 2025)
Rudder Blade (Fabricated)	Material Tests, Weld Tests (UT/RT), Hydrostatic Test (if hollow)	Part 3, Ch.7	Part 3, Ch.12, Sec.4
Rudder Blade (Cast)	Casting Tests, PT/MT, UT, Dimensional Check	Part 2, Ch.4; Part 3, Ch.7	Part 2, Ch.4; Part 3, Ch.12
Rudder Carrier Bearing	Material Check, Dimensional Check, Load Test (if applicable)	Part 3, Ch.7	Part 3, Ch.12, Sec.5.2
Rudder Pintles & Gudgeons	Forging Tests, UT/MT, Dimensional Check, Clearance Check	Part 2, Ch.5; Part 3, Ch.7	Part 3, Ch.12, Sec.5.2
Rudder Coupling (Horizontal Flange)	Forging Test (coupling), Bolt Test, Torque Test, Alignment Check	Part 3, Ch.7	Part 3, Ch.12, Sec.6
Rudder Assembly (Complete)	Alignment Check, Jump Test, Clearance Check, Movement Test (Port to Stbd)	Part 3, Ch.7	Part 3, Ch.12
Main Boilers (Water Tube)	Material Tests, Weld Tests (RT 100%), Hydrostatic (1.5x design), Safety Valve, Steam Trial	Part 4, Ch.3, Sec.2-4	Main Rules Part 4, Ch.3
Main Boilers (Fire Tube)	Material Tests, Weld Tests (RT), Hydrostatic Test, Tube Expansion Test, Safety Valve	Part 4, Ch.3, Sec.2-4	Main Rules Part 4, Ch.3
Auxiliary Boilers	Material Tests, Weld Tests, Hydrostatic Test (1.5x), Safety Valve Test, Functional Test	Part 4, Ch.3	Part 1, Ch.2, Sec.3.2.6 (2.5-yr survey)
Composite Boilers	Material Tests, Weld Tests, Hydrostatic Test, Oil/Exhaust Gas Operation Test	Part 4, Ch.3	Part 1, Ch.2, Sec.3.2.6
Exhaust Gas Boilers/Economizers	Material Tests, Weld Inspection, Hydrostatic Test, Soot Fire Protection Check	Part 4, Ch.3	Main Rules Part 4, Ch.3
Boiler Mountings (Safety Valves)	Set Pressure Test, Seat Tightness Test, Accumulation Test (Type)	Part 4, Ch.3, Sec.5	Main Rules Part 4, Ch.3
Boiler Mountings (Gauge Glass)	Pressure Test, Shut-off Valve Test, Illumination Test	Part 4, Ch.3, Sec.5	Main Rules Part 4, Ch.3
Pressure Vessels - Class I (Fired/High Pressure)	Material Tests, Weld RT 100%, Hydrostatic (1.5x), Safety Valve, Thickness Measurement	Part 4, Ch.10, Sec.2	Part 1, Ch.2, Sec.3.2.8
Pressure Vessels - Class II	Material Tests, Weld RT/UT (spot), Hydrostatic Test, Safety Valve	Part 4, Ch.10, Sec.2	Part 1, Ch.2, Sec.3.2.8
Pressure Vessels - Class III	Material Tests, Visual Weld Inspection, Hydrostatic Test	Part 4, Ch.10, Sec.2	Part 1, Ch.2, Sec.3.2.8
Air Receivers (Starting Air)	Material Tests, Weld Tests, Hydrostatic (1.5x), Safety Valve, Drain Test, Internal Exam	Part 4, Ch.10	Part 1, Ch.2, Sec.3.2.8
Air Compressors	Type Test, Relief Valve Test, Capacity Test, Cooling Test, Safety Device Test	Part 4, Ch.4	Main Rules Part 4, Ch.4
Thermal Fluid Heaters	Material Tests, Weld Tests, Hydrostatic Test, Temperature Control Test, Safety Device Test	Part 4, Ch.3	Main Rules Part 4, Ch.3
Heat Exchangers (Shell & Tube)	Material Tests, Hydrostatic Test (both sides), Tube Expansion Test	Part 4, Ch.10	Main Rules Part 4, Ch.10
Plate Type Heat Exchangers	Hydrostatic Test, Leak Test, Performance Test	Part 4, Ch.10	Main Rules Part 4, Ch.10
Main Generators (AC) ≥100kW	Type Test (IEC 60092-301), Routine Test (IR, Dielectric, Performance), Temp Rise, Vibration	Part 4, Ch.1, Sec.2; Ch.8	Part 1, Ch.2, Sec.3.2.11.3; IEC 60092-301
Main Generators (DC)	Type Test, Routine Test, Temperature Rise Test, Commutation Test	Part 4, Ch.1; Ch.8	Part 1, Ch.2, Sec.3.2.11.3
Emergency Generator	Type Test, Routine Test, Auto-start Test (45 sec), Load Acceptance Test, Endurance Test	Part 4, Ch.1, Sec.6	Part 1, Ch.2, Sec.3.2.11.8
Shaft Generator	Type Test, Frequency/Voltage Stability Test, Load Test, Protection Test	Part 4, Ch.1; Ch.8	Main Rules Part 4, Ch.1, 8
Diesel Generator Sets	Type Test (Engine + Generator), Factory Load Test (100% for 1hr), Parallel Op Test	Part 4, Ch.1; Ch.4	Part 1, Ch.2, Sec.3.2.11.3, 3.2.11.8
AC Motors ≥100kW	Type Test (IEC 60092-301), Routine Test, Temperature Rise Test, Vibration Test	Part 4, Ch.1; Ch.8	Part 1, Ch.2, Sec.3.2.11.6-7; IEC 60092-301
DC Motors ≥100kW	Type Test, Routine Test, Temperature Rise Test, Commutation Test	Part 4, Ch.1; Ch.8	Part 1, Ch.2, Sec.3.2.11.6-7

Item/Component	Tests Required	Main Rules Reference	IW Rules Reference (July 2025)
Steering Gear Motors	Type Test, Routine Test, Overload Test, Air Gap Measurement	Part 4, Ch.1; Ch.6	Part 1, Ch.2, Sec.3.2.11.7
Windlass/Mooring Winch Motors	Type Test, Routine Test, Starting Current Test, Duty Cycle Test	Part 4, Ch.1; Ch.8	Main Rules Part 4, Ch.1
Cargo Pump Motors (Tankers)	Type Test (Ex rated if req.), Routine Test, Temperature Rise Test	Part 4, Ch.1; Part 5, Ch.2	Part 5, Ch.2
Power Transformers ≥100kVA	Type Test (IEC 60076), Routine Test (Ratio, IR, Dielectric), Temp Rise, Oil Test	Part 4, Ch.1; Ch.8	Part 1, Ch.2, Sec.3.2.11.5; IEC 60076
Lighting/Distribution Transformers	Routine Test (Ratio, IR, Dielectric)	Part 4, Ch.1; Ch.8	Main Rules Part 4, Ch.1
Welding Transformers	Type Test, Routine Test, Duty Cycle Test	Part 4, Ch.8	Main Rules Part 4, Ch.8
Main Switchboard	Type Test, Routine Test (IR, Dielectric, Temp Rise), Short-circuit Test, Protection Test	Part 4, Ch.1, Sec.4; Ch.8; IEC 61439	Part 1, Ch.2, Sec.3.2.11.2
Emergency Switchboard	Type Test, Routine Test, Auto-changeover Test, Protection Test	Part 4, Ch.1, Sec.6; Ch.8	Part 1, Ch.2, Sec.3.2.11.2
Section/Distribution Boards	Routine Test (IR, Dielectric), Visual Inspection	Part 4, Ch.8	Main Rules Part 4, Ch.8
Power Cables	Type Test (IEC 60092-350/353), Conductor Test, IR Test, Voltage Test, Flame Test	Part 4, Ch.8, Sec.7	Part 1, Ch.2, Sec.3.2.11; IEC 60092-350
Control & Instrumentation Cables	Type Test, Conductor Test, IR Test, Capacitance Test	Part 4, Ch.8, Sec.7	IEC 60092-376
Fire Resistant Cables	Type Test (IEC 60331), Fire Resistance Test, Flame Propagation Test	Part 4, Ch.8; IEC 60331	Main Rules Part 4, Ch.8
Cable Installation (Complete)	IR Test (all circuits), Continuity Test, Phase Sequence Test, Earth Test	Part 4, Ch.8, Sec.8	Part 1, Ch.2, Sec.3.2.11.4

TEST ABBREVIATIONS

RT = Radiographic Testing | UT = Ultrasonic Testing | MT = Magnetic Particle Testing | PT = Penetrant Testing (Dye/Fluorescent)

NDT = Non-Destructive Testing | CTOD = Crack Tip Opening Displacement | WPQ = Welding Procedure Qualification | NPSH = Net Positive Suction Head

DSC = Digital Selective Calling | FTP Code = Fire Test Procedures Code | FSS Code = Fire Safety Systems Code | LSA Code = Life-Saving Appliances Code

4. Key References

- IRS Rules and Regulations for Construction and Classification of Inland Waterways Ships – as amended
- Classification notes for application of IRS Rules to Indian River Sea Vessels.
- IRS Rules and Regulations for Construction and Classification of Steel Ships (Main Rules)
- M.S. (Load Line) Rules 1979 as amended
- Inland Vessels Act, 2021 and IV Rules 2022 (for latest requirements where applicable)