

2. REFERENCE DESIGN CONDITIONS (operating environment)

The Vessel (podded fixed pitch propellers ocean going passenger cruise vessel engaged on long international voyages and certified LSA for a total of about 1,000 persons on board) shall be designed for worldwide cruises operation and without any limitation according to the Class Notation specified

CLASS REQUIREMENTS FOR AMBIENT CONDITIONS

The reference **General Class requirements** regarding **AMBIENT CONDITIONS** for all the **Equipment/Systems** covered by **DNV Rules**

Such requirements are found in the following Chapters of the same PART depending on the type of Equipment/System involved:

- Chapter 1 *Machinery systems, general* - Section 3 - Paragraph 2.2 *Environmental conditions* (Sub. 2.2.1 – Table 2) for **MACHINERY, EQUIPMENT AND APPLIANCES** covered by DNV Rules
- Chapter 8 *Electrical Installations* – Section 3 – Paragraph 2 *Environmental requirements* (Sub. 2.3.1 and 2.3.3) for **ELECTRICAL EQUIPMENT** covered by DNV Rules
- Chapter 9 *Control and Monitoring systems*, Section 5, Paragraph 2 *Environmental conditions, instrumentations* (Sub. 2.1, 2.4 and 2.5) for **ELECTRONIC APPLIANCES AND INSTRUMENTATION EQUIPMENT** covered by DNV Rules

The **general AMBIENT CONDITIONS** required by Class are reported in the following **Sec. [2.1]**. All **equipment/machineries and systems** included in the Scope of Supply and covered by **PART 4** of **DNV Rules** shall be designed to operate properly under the **AMBIENT CONDITIONS** described in the

same **Sec. [2.1]** unless otherwise specified in each **specific Chapter/Section** of the same **PART 4** of **DNV Rules** or in the **Technical Specification for the supply** and clearly managed as deviation respect the current general requirement.

For **AMBIENT CONDITIONS** of Equipment/Systems other than those ones described in **PART 4 Systems and components** of **DNV Rules** reference to be made to relevant **PART/Chapter/Section** of **DNV Rules** and/or specific **Technical Code** or **International/National recognised standards** they refer to.

REFERENCE DESIGN CONDITIONS

- Overall **GENERAL AMBIENT CONDITIONS** for Equipment/Systems included in the Scope of Supply taking care of **a.m. Class Requirements** and **Ship Specification Requirements** are specified in the following **Sec. [2.1]**
- **MACHINERY AND PIPING SITE CONDITIONS** for Equipment/Systems included in the Scope of Supply are specified in the following **Sec. [2.2.]**
- **POWER SUPPLY AND ELECTRICAL SITE CONDITIONS** for Equipment/Systems included in the Scope of Supply are specified in the following **Sec. [2.3]**

2.1 AMBIENT CONDITIONS

REQUIREMENTS COMING FROM SHIP SPECIFICATION

Equipment/Machinery arranged in exposed locations (OPEN areas):

They shall be capable of being operated within the following temperature range:

- $T = -10^{\circ}\text{C} \div + 35^{\circ}\text{C}$

Equipment/Machinery arranged in enclosed spaces (VENTILATED or AIR CONDITIONED):

They shall be capable of being operated within the following temperature range:

- $T_{\text{max}} = 45^{\circ}\text{C}$
- $T_{\text{max}} = 50^{\circ}\text{C}$ (for AC Compressors and Bow Thruster HV electric motors only)

REQUIREMENTS COMING FROM DNV RULES

Equipment/Machinery arranged in exposed locations (OPEN areas):

They shall be capable of being operated within the following **temperature range**:

Ambient **air temperature** required by DNV Rules (Pt 4, Ch1, Sec 3, Par 2.2 and Pt 4, Ch8, Sec 3, Par 2)

- **Machinery equipment and Electrical equipment/components:**

$$T = - 25^{\circ}\text{C} \div + 45^{\circ}\text{C}$$

Ambient **air temperature** required by DNV Rules (Pt 4, Ch 9, Sec 5, Par 2)

- **Electronic appliances and Instrumentation equipment:**

$$T = - 25^{\circ}\text{C} \div + 55^{\circ}\text{C} \quad (\text{test temperatures: } - 25^{\circ}\text{C} \div + 70^{\circ}\text{C})$$

They shall be constructed to work properly and safely within the following **umidity range** (**Electrical** and **Electronic** equipments only)

Ambient **relative umidity** required by DNV Rules (Pt 4, Ch 8, Sec 3, Par 2)

- **Electrical equipment/components:**

up to 95% relative umidity

Ambient **relative umidity** required by DNV Rules (Pt 4, Ch 9, Sec 5, Par 2)

- **Electronic appliances and Instrumentation equipment:**

up to 100% relative umidity

Equipment/Machinery arranged in enclosed spaces (VENTILATED or AIR CONDITIONED):

They shall be capable of being operated within the following **temperature range**:

Ambient **air temperature** required by DNV Rules (Pt 4, Ch1, Sec 3, Par 2.2 and Pt 4, Ch8, Sec 3, Par 2)

- **Machinery equipment and Electrical equipment/components:**

$$T = 0^{\circ}\text{C} \div + 45^{\circ}\text{C}$$

Ambient air temperature required by DNV Rules (Pt 4, Ch 9, Sec 5, Par 2)

- **Electronic appliances and Instrumentation equipment:** according to the following table depending on classification/location of the item in subject:

Class	Location	Ambient temperatures	Test temperatures
A	Machinery spaces, control rooms, accommodation, bridge	Tmin = 0°C - Tmax = + 45°C	+ 5°C and + 55°C
B	Inside cabinets, desks, etc. with temperature rise of 5°C or more installed in location A	Tmin = 0°C - Tmax = + 55°C	+ 5°C and + 70°C
C	Pump rooms, holds, rooms with no heating	Tmin = -25°C - Tmax = + 45°C	- 25°C and + 55°C
D	Open deck, masts and inside cabinets, desks etc. with a temperature rise of 5°C or more installed in location C	Tmin = -25°C - Tmax = + 55°C	- 25°C and + 70°C

They shall be constructed to work properly and safely within the following **umidity range** (**Electrical and Electronic equipments only**):

Ambient **relative umidity** required by DNV Rules (Pt 4, Ch 8, Sec 3, Par 2)

- **Electrical equipment/components:**

up to 95% relative umidity

Ambient **relative umidity** required by DNV Rules (Pt 4, Ch 9, Sec 5, Par 2)

- **Electronic appliances and Instrumentation equipment:** according to the following table depending on classification/location of the item in subject:

Class	Location	Ambient relative umidity
A	Location where special precautions are taken to avoid condensation	Up to 96% at all relevant temperatures with no condensation
B	All locations except as specified for location	Up to 100% at all relevant temperatures

OVERALL REQUIREMENTS (SHIP SPECIFICATION AND DNV RULES)

Equipment/Machinery arranged in exposed locations (OPEN areas):

By considering both the **Ship Specification** and the **DNV Rules** requirements, the **operating temperature range** shall be the following:

- **Machinery equipment and Electrical equipment/components:**

$$T_{\min} = - 25^{\circ}\text{C} \quad T_{\max} = + 45^{\circ}\text{C}$$

- **Electronic appliances and Instrumentation equipment:**

Tmin = - 25°C Tmax = + 55°C (test temperatures: - 25°C ÷ + 70°C)

By considering both the **Ship Specification** and the **DNV Rules** requirements, the operating umidity range shall be the following:

- **Electrical equipment/components:**
up to 95% relative umidity
- **Electronic appliances and Instrumentation equipment:**
up to 100% relative umidity

Equipment/Machinery arranged in enclosed spaces (VENTILATED or AIR CONDITIONING):

By considering both the **Ship Specification** and the **DNV Rules** requirements, the **operating temperature range** shall be the following:

- **Machinery equipment and Electrical equipment/components:**
T = 0°C ÷ + 45°C
T = 0°C ÷ + 50°C (for AC Compressors and Bow Thruster HV electric motors only)
- **Electronic appliances and Instrumentation equipment:** according to the following table depending on classification/location of the item in subject:

Class	Location	Ambient temperatures	Test temperatures
A	Machinery spaces, control rooms, accommodation, bridge	Tmin = 0°C - Tmax = + 45°C	+ 5°C and + 55°C
B	Inside cabinets, desks, etc. with temperature rise of 5°C or more installed in location A	Tmin = 0°C - Tmax = + 55°C	+ 5°C and + 70°C
C	Pump rooms, holds, rooms with no heating	Tmin = -25°C - Tmax = + 45°C	- 25°C and + 55°C
D	Open deck, masts and inside cabinets, desks etc. with a temperature rise of 5°C or more installed in location C	Tmin = -25°C - Tmax = + 55°C	- 25°C and + 70°C

By considering both the **Ship Specification** and the **DNV Rules** requirements, the operating umidity range shall be the following:

- **Electrical equipment/components:**
up to 95% relative umidity
- **Electronic appliances and Instrumentation equipment:** according to the following table depending on classification/location of the item in subject:

Class	Location	Ambient relative umidity
A	Location where special precautions are taken to avoid condensation	Up to 96% at all relevant temperatures with no condensation
B	All locations except as specified for location	Up to 100% at all relevant temperatures

3. SUPPLY WEIGHT REQUIREMENTS

Weight breakdown of the whole supply shall be clearly detailed at each stage of the process with the **tolerance** hereafter specified:

- at **Binding Offer**: weights are to be stated with a tolerance of **± 3%**
- at **Technical Specification agreement** before Purchasing Order: the weights to be within those ones specified in the offer but with a tolerance of **± 2%**
- **Final Drawings**: the weights to be within those ones stated in the Technical Specification but with a tolerance of **± 1%**

Final weight assessment will be done at the delivery of the equipment to the Shipyard and for this purposes the transportation documents shall be clearly detailing the equipment/component delivered with relevant weight indications.

4. LANGUAGE

All correspondence, as well as text on Drawings, Plans, sub-Supplier Specifications, Operating Manuals, Instruction Manuals, Data Books, Labels, Nameplates, Signage and Marking on board shall be in **English language**.

Where required by Regulations (i.e. Statutory matters) Safety Plans/Booklets shall be additionally in the **language of Vessel's Registry**.

5. MEASUREMENT UNITS

In general **International Metric System only** shall be adopted. More exactly:

- All **linear measures** and **dimensions**, wherever indicated, shall be in **metric units**
- **Weights** shall be always indicated in **metric tons** (1 ton = 1000 kg)
- Equipment and machinery **power** shall be always indicated in **metric kW**
- **Pressure** units (as well as pressure and vacuum gauges scales) shall be **metric units**
- **Temperature** units (as well as thermometer scales) shall be **Celsius degree (°C)**
- **Threading** shall be according to **metric system**

7. LABELS AND NAMEPLATES

Tagging

SY identifies various components installed in the ship by **tag numbers**, according to a defined standard. These tag numbers shall be indicated by the Supplier in all the documentation to identify each component. Moreover, every document is to indicate the tag number which it is referred to.

Each **equipment/machinery** and **outfitting component** for which a tag number is defined, is to be **marked with the tag number** corresponding to the tag number specified on functional plans, diagrams, material lists, etc.

SUPPLIER'S IDENTIFICATION CODE AND SERIAL NUMBER

All the **Equipment/Machinery, outfitting component** and all the **Loose Fittings** (comprising, but not limited to, those for which the tag number is defined) are to be **marked with the Supplier's identification code** of the equipment.

The purpose of the identification code is to identify exactly any component in the ship, particularly in order to distinguish components that have been modified to solve issues from the previous ones. For this reason, when any part of one component is modified, the identification code of such component is to be changed, both into the documentation and on the component itself.

The identification code of every component, together with its **serial number** (if deemed necessary by the Supplier), is to be such to allow its complete tracking, i.e. information about raw material and sub-suppliers used, production batch, quality checks performed, etc.

Serial number (i.e. an unique number identifying the single piece) can be omitted if the identification code alone permits the a.m. tracking.

NAMEPLATES / LABELS / IDENTIFICATION PLATES

Description

Equipment/Machinery and **outfitting components** are to be provided with **Nameplates / Labels / Identification plates** indicating:

- SY tag number (if applicable, see above)
- Supplier's identification code (see above)

- Manufacturer name, Serial Number, year of manufacturing, main technical data and further data in compliance with the Rules.

Loose Fittings are to be provided with **Nameplates / Labels / Identification plates** indicating:

- Supplier's identification code (see above)
- Manufacturer name, Serial Number and further data in compliance with the Rules

Class approved equipment/fittings to have the **Classification Mark** clearly stamped on their body.

All the **pipelines** service to be identified (service and flow direction) by properly coloured tape or paint (reference to be made to **ISO standard 14726** – Pipe identification on the Seagoing ships)

Materials

Nameplates, Labels and Identification plates are to be **metallic** and **corrosion resistant** (i.e. made of **brass**), properly **fixed**, with **engraved inscriptions** and texts in **English language**.

For Loose Fittings of small dimensions, Nameplates, Labels and Identification plates can be not metallic, but in any case they shall be suitable for the installation in the foreseen ambient conditions and designed to last at least two years over the guarantee period. If a non-metallic material is adopted, this is to be approved in advance by SY. In any case, paper labels and adhesive labels are not allowed.

Electrical equipment and components

Electrical equipment and components are to be provided with Label, Nameplates and Identification plates accordingly.

OTHER LABELS

Safety labels to be in English language and in other languages required by Flag Authorities, Classification Societies or any other Authority involved (if any) as mentioned in document *ATN340300 Rules and Regulation requirements*.

Statutory Safety signs, Passenger and Crew hotel signs and Security, ISPS and Operational signs are to be according to IMO, USCG, USPHS, ISPS and ISO regulations (ref to be made to detailed specifications provided by our MC-SIR - Safety arrangements office).

SRTP related components to have its own labelling code.

For any additional information needed to prepare the a.m. documentation, the Supplier shall refer to IMO Resolution MEPC. 379(80) and to **Regulation (EU) No 1257/2013** of the European Parliament and of the Council of 20 November 2013 on ship recycling as amended .

17. TEMPORARY PROTECTIONS

In order to protect the materials, components, exposed surfaces and, in general, all the parts included in the scope of supply (as described in the attached Supply Technical Specification) subject to damage or exposed to weather during shipment, warehouse receipt, storage, installation and staying on board, the Supplier is to provide and install suitable temporary protections according to the following different supply configurations:

1. **Turn-key Supply**
2. **Shipment, Storage and Handling phases**
3. **Embarkation, Installation and Preservation on board**

Selected configuration

For scope of supply different from Turn-key Supply, shall be separately considered and quoted in the offer; in the Purchasing Order the **selected configuration** shall be clearly specified.

Temporary Protection plan

For **Main Items/components** shall be protected, all the protection details will be defined in a specific document, defined as ***Temporary Protection Plan***, enclosed to Supply Technical Specification or Purchase Order.

Such a ***Temporary Protection Plan*** shall be agreed and issued before Purchasing Order.