

## Translation of the original claims arising from a defect

The warranty period agreed in the contract can only be granted if the following points are observed:

### 1. Water quality

Depending on the type of equipment to be cooled, certain requirements are placed on the purity of the cooling water.

**Recommended general values for the quality of circulation water in cold water systems<sup>1</sup>**  
 based on BTGA 3.003 considering the specific manufacturer's requirements

			Limits <sup>2</sup> Circuits up to 60°C	Limits <sup>2</sup> Circuits from 60°C to 90°C	Limits <sup>2</sup> Circuits from 90°C to 160°C <sup>3</sup>
<b>Appearance</b>		—	Clear, no sediment	Clear, no sediment	Clear, no sediment
<b>Colour</b>		—	Colourless	Colourless	Colourless
<b>Odour</b>		—	None	None	None
<b>pH value at 25°C</b>		—	7 – 8.5	7 – 8.5	7 – 8.5
<b>Conductivity</b>	µS/cm	(mS/m)	< 2000 (200)	< 1500 (150)	< 600 (60)
<b>Ammonium</b>	g/m <sup>3</sup>	NH <sub>4</sub>	< 5	< 2	< 1
<b>Chlorides</b>	g/m <sup>3</sup>	Cl	< 80	< 60	< 30
<b>Sulphates</b>	g/m <sup>3</sup>	SO <sub>4</sub>	< 100	< 80	< 30
<b>Total hardness</b>	°d	Ca / Mg	1 - 4	1 - 2	< 0,5
<b>Product content (molybdenum)</b>	g/m <sup>3</sup>	Mo	≥ 150	≥ 150	> 150
<b>Microbial count<sup>4:5</sup></b>	CFU/ml	—	< 10.000	< 10.000	< 10.000

Date: 21 Dec 2020; No liability assumed

In addition, the circulating water must be completely free of glycol and oil.

Depending on the contamination present, suitable methods need to be applied for purification, cleaning and care of the water.

We ask you to contact an authorised specialist company in this regard. If required, our customer service department will be able to supply appropriate contact details.

- 1 - The manufacturer's guidelines must be followed in all cases.
- 2 - Depending on the materials used and on the particular situation on site, stricter limits may apply.
- 3 - In cooling circuits with a water exchange rate, a complete water change must be carried out once a year.
- 4 - If the microbial count (number of colony-forming units CFU) increases, use additional ONI disinfectants.
- 5 - If a biocide is used, the dead biological matter and decomposition products must be removed by way of regular partial water changes.

### Water contamination and impurities

Mechanical contamination during use of cooling tower water, surface water or deep water

Too hard

Moderate content of mechanical impurities and hardeners

Moderate content of chemical impurities

Biological contamination due to slime bacteria and algae

### Possible methods

Filtration of the water via sieve filters, gravel filters, cartridge filters, precoat filters, ONI-Aquaclean

Water softening via ion exchanger

Inoculation of the water with chemical stabilisers and/or dispersing agents

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Inoculation of the water with Biozidan

In the interest of design-compliant operation of a recooling system that is operated with water on at least one side, the quality of the water used should not deviate significantly from the following list of hydrological data:

**A restriction applies with regard to the selected materials (for aluminium max. PH value 8.5) and the direct use of this cooling water for transformers, induction furnaces and other aggregates charged with electrical voltage (the conductivity of the cooling water should then be below 400 µs/cm, which can usually only be achieved by desalination).**

In the event of deviating water quality, appropriate specialist companies must be consulted. If faults or damage occur due to deviating water qualities, these are not subject to our warranty obligation.

The water quality must be checked at regular intervals with the measuring equipment and recorded in a protocol.



## 2. Compressed air quality

The specifications of filtered (<40 µm) and lubricated compressed air are made according to ISO 8573-1:2010 [7:4:4].

## 3. Power supply

ONI is not liable for damage caused by overvoltage or undervoltage in the mains supply.

## 4. Maintenance of the ONI equipment

In cases where the warranty period exceeds 12 months, maintenance of the equipment must be performed by ONI maintenance staff 12 months after commissioning and then at maintenance intervals that are to be agreed.

Maintenance includes the checking of all functions of the system and any necessary readjustments and settings.

Wearing parts that need to be replaced are **billed separately** in addition to the costs for the maintenance.

Unless agreed otherwise, any necessary cleaning work is **billed separately** in addition to the costs for the maintenance.

## 5. Operating staff

Operation and maintenance of our equipment by customer personnel must be carried out in accordance with our operating instructions.

Any damage caused by incorrect operation or maintenance is excluded from the warranty.

