

PLATE HEAT EXCHANGER – LIMIT VALUES FOR DRINKING WATER QUALITY

Corrosion resistance of soldered plate heat exchangers to water-borne substances – the soldered plate heat exchanger consists of stamped stainless steel plates 1.4401/1.4404 or SA240 316/SA240 316L

The plate heat exchangers in Taconova fresh hot water stations are produced as standard as copper soldered stainless steel plate heat exchangers. Before these heat exchangers can be used, building services engineers and installation companies have to check in the framework of system planning whether the issues of corrosion protection and scale formation have been sufficiently taken into account in accordance with

DIN 1988-200 and DIN EN 806-5 as well as current drinking water analyses. This includes the following points:

- Selection of materials
- Consideration of corrosion-related changes to the drinking water quality
- Performance of installation
- Consideration of anticipated operating conditions

Signs of corrosion may occur in copper materials with high electrical

conductivity of the drinking water of more than 500 $\mu\text{S}/\text{cm}$, which could cause damage to the copper solder in the heat exchanger. For electrical conductivities of $> 500 \mu\text{S} / \text{cm}$, we therefore recommend the use of our nickel- or stainless-steel-soldered plate heat exchangers. The following values for water-borne substances and characteristic values should be observed [1.4401/1.4404 / SA240 316/SA240 316L]:

Water-borne substances and characteristic values	Unit	Plate heat exchanger		
		Copper-soldered	Nickel-soldered	Stainless-steel-soldered
pH value		7 – 9 <small>(considering the SI index)</small>	6 – 10	6 – 10
Saturation index SI (delta pH value)		-0,2 < 0 < +0,2	Not specified	
Total hardness	°dH	6 – 15	6 – 15	6 – 15
Conductivity	$\mu\text{S}/\text{cm}$	10 ... 500	10-1000	Not specified
Substances that can be filtered out	mg/l	< 30	< 30	< 30
Chloride*	mg/l	No chloride permitted above 100°C		
Free chlorine free	mg/l	< 0,5	< 0,5	< 0,5
Hydrogen sulfide (H ₂ S)	mg/l	< 0,05	Not specified	
Ammonia (NH ₃ /NH ₄ ⁺)	mg/l	< 2	< 2	Not specified
Sulfate	mg/l	< 100	< 300	< 400
Hydrogen carbonate	mg/l	< 300	Not specified	
Hydrogen carbonate / sulfate	mg/l	> 1,0	Not specified	
Sulfide	mg/l	< 1	< 5	< 7
Nitrate	mg/l	< 100	Not specified	
Nitrite	mg/l	< 0,1	Not specified	
Iron (dissolved)	mg/l	< 0,2	Not specified	
Manganese	mg/l	< 0,1	Not specified	
Free (aggressive) carbonic acid	mg/l	< 20	Not specified	

* At 20 °C max. 600 mg/l | At 25 °C max. 500 mg/l | At 50 °C max. 200 mg/l | At 75 °C max. 75 mg/l | ≥ 100 °C max. 0 mg/l
The specified values are guide values, which may deviate under certain operating conditions