

# LET OP!!!

# ATTENTION!!!

Voor het inbedrijfstellen dient de waterkwaliteit aan deze norm te voldoen

The waterquality should meet the standards before operating

Table 5-1 Feedwater for steam boilers (except attemperator spray water ) and hot water boilers

Parameter	Unit	Feedwater for steam boilers		Make-up water for hot water boilers
		> 0,5 - 20	> 20	total range
Operating pressure	bar (= 0,1 MPa)	> 0,5 - 20	> 20	total range
Appearance	—	clear, free from suspended solids		
Direct conductivity at 25 °C	µS/cm	not specified, only guide values relevant for boiler water see table 5-2		
pH value at 25 °C a	—	> 9,2 b	> 9,2 b	> 7,0
Total hardness (Ca + Mg)	mmol/l	< 0,01 c	< 0,01	< 0,05
Iron (Fe) concentration	mg/l	< 0,3	< 0,1	< 0,2
Copper (Cu) concentration	mg/l	< 0,05	< 0,03	< 0,1
Silica (SiO <sub>2</sub> ) concentration	mg/l	not specified, only guide values for boiler water relevant, see table 5-2		—
Oxygen (O <sub>2</sub> ) concentration	mg/l	< 0,05 d	< 0,02	—
Oil/grease concentration (see EN 12953-6)	mg/l	< 1	< 1	< 1
Organic substances (as TOC) concentration	—	see footnote e		

a With copper alloys in the system the pH value shall be maintained in the range 8,7 to 9,2.

b With softened water pH value > 7,0 the pH value of boiler water according to table 5-2 should be considered.

c At operating pressure < 1 bar total hardness max. 0,05 mmol/l shall be acceptable.

d Instead of observing this value at intermittent operation or operation without deaerator if film forming agents and/or excess of oxygen scavenger shall be used.

e Organic substances are generally a mixture of several different compounds. The composition of such mixtures and the behaviour of their individual components under the conditions of boiler operation are difficult to predict. Organic substances may be decomposed to form carbonic acid or other acidic decomposition products which increase the acid conductivity and cause corrosion or deposits. They also may lead to foaming and/or priming which shall be kept as low as possible.

Table 5-2 boiler water for steam boilers and hot water boilers

Parameter	Unit	Boiler water for steam boilers using Feedwater direct conductivity			Boiler water for hot water boilers
		> 30 µS/cm	< 30 µS/cm	> 0,5	
Operating pressure	bar (= 0,1MPa)	> 0,5 - 20	> 20	> 0,5	total range
Appearance	—	clear, no stable foam			
Direct conductivity at 25 °C	µS/cm	< 6.000 <sup>a</sup>	see Figure 5-1 a	< 1.500	< 1.500
pH value at 25 °C	—	10,5 - 12	10,5 - 11,8	10-nov	9 - 11,5 d
Composite alkalinity	mmol/l	1 - 15 <sup>a</sup>	1 - 10 <sup>a</sup>	0,1 - 1,0 <sup>c</sup>	< 5
Silica (SiO <sub>2</sub> ) concentration	mg/l	pressure dependent, according to figure 5-2			—
Phosphate (PO <sub>4</sub> ) e	mg/l	10 - 30	10 - 30	6 - 15	—
Organic substances	—	see footnote - f			—

a With superheater consider 50 % of the indicated upper value as maximum value.

b Basic pH adjustment by injecting Na<sub>3</sub>PO<sub>4</sub>, additional NaOH injection only if the pH value is < 10.

c If the acid conductivity of the boiler feedwater is < 0,2 µS/cm Na + K concentration is < 0,010 mg/l, phosphate injection is not necessary. Under the conditions AVT (all volatile treatment, feedwater pH 9,2 and boiler water pH 8,0) can be applied, in this case the acid conductivity of the boiler water is < 5 µS/cm.

d If non-ferrous materials are present in the system, e. g. aluminium, they may require lower pH value and direct conductivity, however, the protection of the boiler has priority.

e If coordinated phosphate treatment is used; considering all other values higher PO<sub>4</sub>-concentrations are acceptable.

f See e in table 5-1.