

Appendix 2: Requirements for water in heating boilers

Warning: Bad water quality can cause damage to the boiler and heating system by corrosion.

Dissolved oxygen and hardness

The quality of water supplied to heating systems is partly determined by the contents of dissolved oxygen and hardness of the water in the heating system. This is the reason why the whole system is to be checked for leakage regularly and leaking is to be dealt with immediately.

Oxygen

The excess of oxygen in the water is to be prevented. If an open expansion system is applied, then measures have to be taken that solution of oxygen in the water is prevented. Another cause of oxygen dissolving into the water is via gaskets and other permeable materials like some kinds of rubber, plastics, etc. This type of dissolving is not to prevent, therefore actions taken to prevent corrosion still can be necessary.

Starting a circulating pump with insufficient system pressure also entrains air through the pump seal or through automatic deaerators.

Hardness

Scaling can occur when water is heated in a boiler. To predict the possibility of scaling the following formula is to be used:

$$St = tH \times (5 \times Sj + I) / Qk$$

in with:

St: figure-indicating risk of scaling

tH: temporary hardness in ° dH.

This figure is given by the water supplier or easy to measure yourself.

Sj: Quantity of water added to the system per year.

I: Volume of the whole heating system in m³.

QK: Boiler capacity in kW.

If $St < 0.25$ the risk of scaling is negligible.

If $St > 0.25$ measures should be taken to prevent scaling like using a softener.

Installation water

Inspection of the water quality, at least once a year is recommended. If this is done by an expert, he will also give an evaluation of the water quality and advise how to proceed

If chemicals have to be added, this only can be done by experts and following guidelines have to be respected:

Solids (sluds)	:	none
pH	:	9-10 (with presence of aluminium 8-9)
Hardness	:	# 1 °D
p-number	:	0,5 - 2 mval/l
m-number	:	< 2 p-getal
O ₂	:	< 0.1 mg/l
Conductivity	:	without additives < 1000 µSi/cm
Cl-	:	< 100 mg/l
Hydrazine	:	none because of carcinogenity
Sulfite	:	of additives only 5-20 mg/l
P ₂ O ₅	:	of additives only 5-40 mg/l

Other products on advice and for the responsibility of supplier of this products.