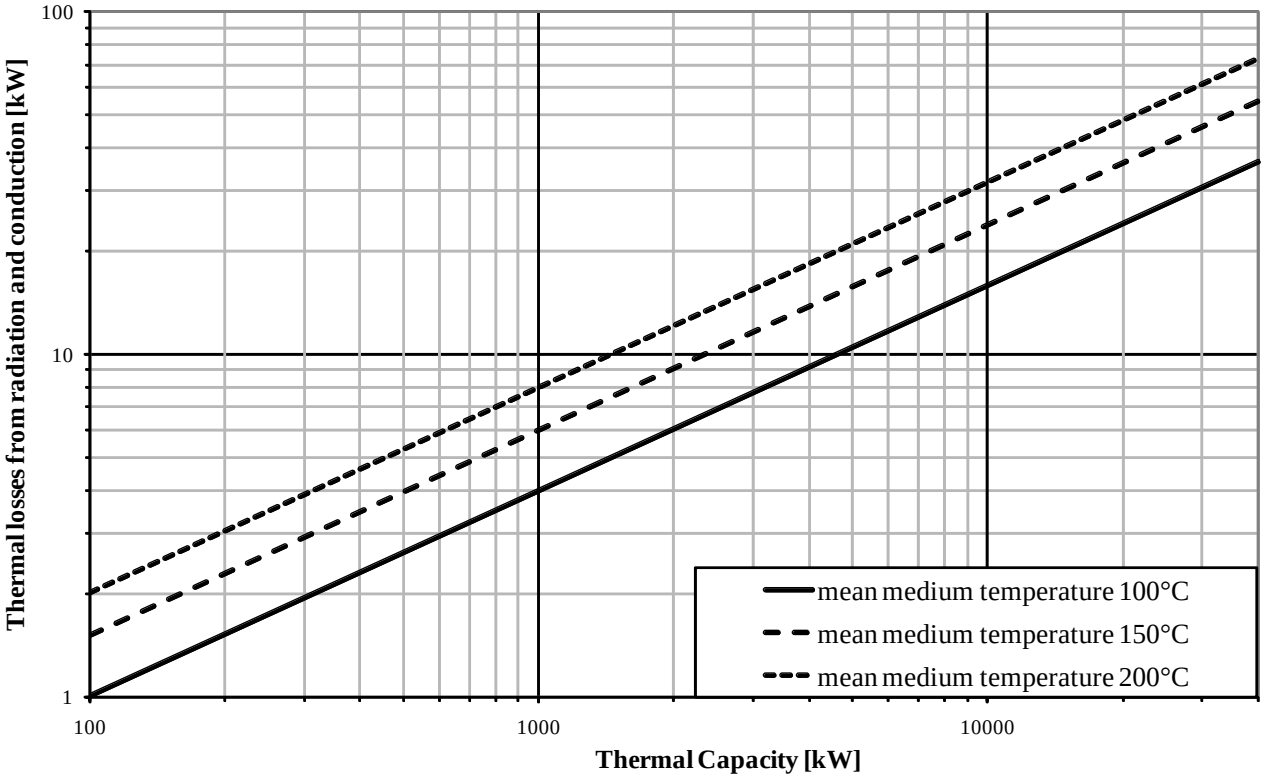
Technical information

Thermal losses from radiation and conduction

TI005

Large-capacity steam and hot water boilers

Version 1 (07/12)



Thermal losses from radiation and conduction subject to the boiler's thermal capacity and the mean medium temperature in the boiler

- Because thermal losses from radiation and conduction (referred to in short as radiation and conduction losses) can not be measured in general, the empirical values to EN 12953 Part 11 are applied.
- To determine the efficiency to EN12953 Part 11, the thermal losses from radiation and conduction determined from the graph above are applied, thus replacing $I_{(N)RC}$ from equation (8.6-3) in EN 12953 Part 11.
  Index N refers to the net calorific value (NCV).
- The formula for the calculation of the thermal losses from radiation and conduction to EN 12953 Part 11 is used as a reference for the thermal losses at a mean medium temperature in the boiler of 180°C.
- The thermal losses from radiation and conduction are subject to the mean medium temperature in the boiler:

  Mean medium temperature for hot water boilers (supply flow temperature + return flow temperature) / 2

  Mean medium temperature for steam boilers: water saturation temperature corresponding to the mean working gauge pressure

  If the medium temperature varies as shown, the thermal losses from radiation and conduction can be determined by linear interpolation or linear extrapolation.
- The thermal losses from radiation and conduction should each be determined at the boiler's maximum thermal capacity.
  For steam boilers, the following can be used to approximate the maximum thermal capacity:
  Maximum thermal capacity [kW] □ 0.65 * boiler type designation
- For steam boilers with superheaters, the thermal losses from radiation and conduction are higher by a factor of 1.25.