

Can you improve production reliability in your gas heated furnaces?

CASE STORY · HEAT TREATMENT IN GAS FIRED FURNACES · KANTHAL APM™

Gearbox del Prat, situated in Barcelona, Spain is the central manufacturing unit of gearboxes to Seat, with a daily production of some 3000 gearboxes.

THE CHALLENGE

The heat treatment is carried out in four continuous gas fired pusher furnaces and in a two sealed quench furnaces.

Production reliability is of course critical, and the furnaces must operate at tight production schedules where production stop-pages would cause severe problems.

THE SANDVIK SOLUTION

Kanthal APM inner and outer tubes in the recuperative systems were installed on trial in May 1995, and they have outperformed the different previous systems by far. The lifetime is superior and the rating is higher.

Kanthal APM tubes since may 1995

The four continuous furnaces are running at 880–930°C (1620–1710°F) with endogas atmosphere, heated by natural gas. Originally, they were equipped with silicon impregnated silicon carbide inner tubes and nickel-chromium outer tubes.

The encouraging experiences with Kanthal APM metallic tubes in other similar furnaces made Gearbox install them on trial in one furnace in May 1995. Compared to the original system's tubes Kanthal APM had a longer lifetime and no tubes had to be ex-changed during the production periods. Step by step the tubes are now changed to Kanthal APM.

Ipsen T4 with Kanthal APM tubes for rapid cooling

Gearbox is also operating two Ipsen T4 gas heated furnaces for smaller batches and as a complement to the large continuous furnaces. They are running at maximum 950°C (1740°F) and have eight tubes each. The total power is 144 kW.



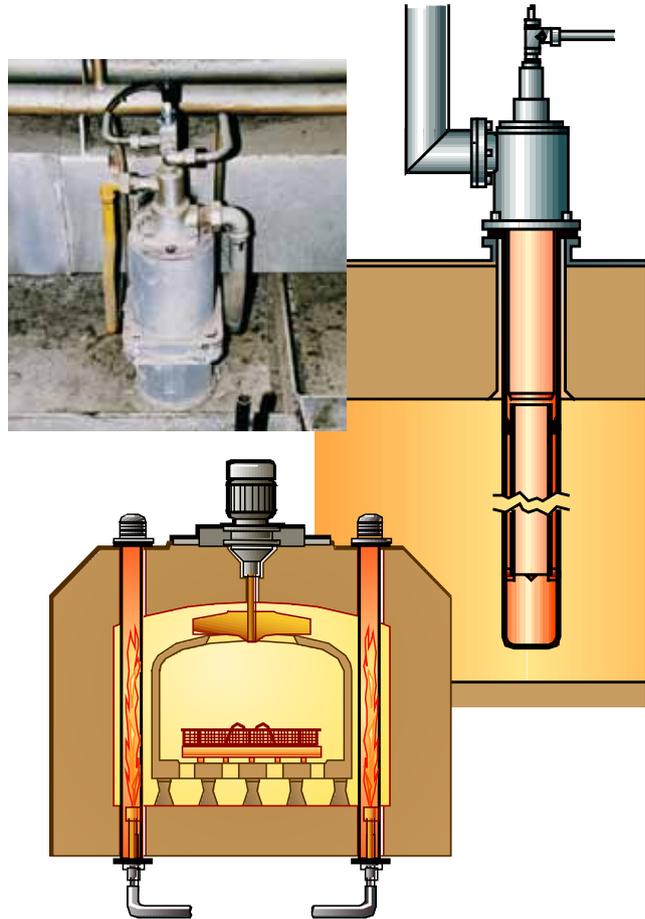
One of the four gas heated continuous furnaces at Gearbox. Kanthal APM tubes are installed as inner and outer tubes.



The gas heated Ipsen T4 with eight Kanthal APM metallic tubes.

THE RESULT

Kanthal APM™ tubes were installed in 1994 and the lifetime is superior to the previous ceramic tubes. The tubes are also equipped with flame busters made from Kanthal APM, twisted strips that improves the efficiency by creating turbulence around the gas flame.



The recuperative system with Kanthal APM tubes. The inner tube is (outer diam.x wall thickness x L) 87 x 5 x 875 mm (3.4 x 0.2 x 34.4 in) and is loaded at 6.3 W/cm² (1.0 W/in²). The outer tube is 128 x 5.5 x 1650 mm (5 x 0.2 x 65 in) and is loaded at 4.2 W/cm² (0.7 W/in²). The system is rated at 20.5 kW and there are 30 units in each furnace.

Sandvik Group

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CHALLENGE YOUR EXPECTATIONS

Sandvik Materials Technology
Sandvik Heating Technology AB · Box 502 · 734 27 Hallstahammar, Sweden
Phone +46 220 210 00 · Fax +46 220 211 66
www.kanthal.com · www.smt.sandvik.com

