



MAX – Infrared Heating Plus

Homogenous and Efficient Infrared Heating Technology

The MAX oven concept is a solution for heating processes which combines infrared radiation with convection and optimized reflection. Quartz glass materials including QRC nanoreflectors are used exclusively in the inside of the oven, providing:

- High purity for sensitive products
- Resistance to thermal shock during fast heating processes
- Best possible optical properties
- Excellent mechanical stability, even at very high temperatures
- Can be easily worked and shaped to allow flexible oven dimensions
- Very good homogeneity of the temperature field because of the diffuse reflection

As a result, rapid heating processes at high power can be carried out in a compact unit.

From the Simulation to the Finished Solution

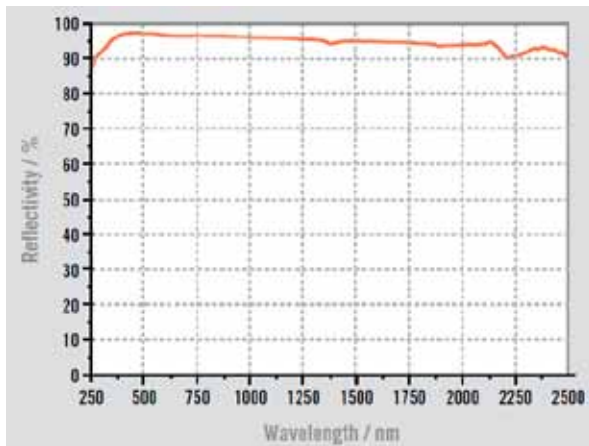
The size of the oven can be matched to product and process. A computerized simulation at the design phase ensures that the heating process is especially efficient. A MAX oven will achieve a maximum product temperature of 900°C in less than 10 minutes and can be cooled down in less than 10 minutes. This permits rapid change over of products to be heated. The MAX oven can be used for both in-line continuous and batch operation.

MAX – custom-built for optimum customer benefit

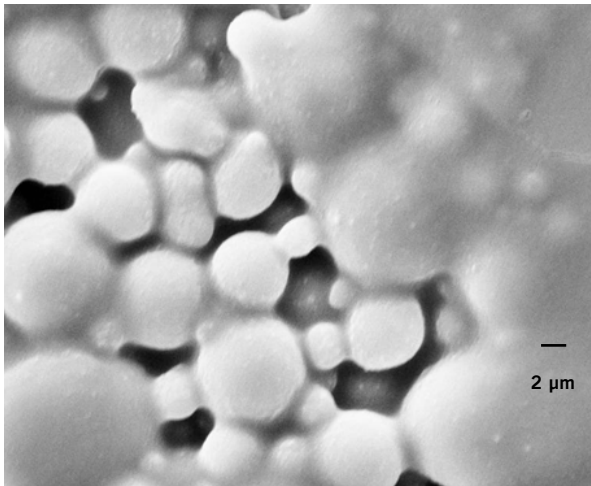
MAX ovens make heating processes more stable, providing for increased capacity and improved quality. This provides savings in time, space and energy.



A MAX oven for in-line continuous operation



Reflection properties of the QRC nanoreflector



QRC material of micro- and nano-structure under a scanning electron microscope

The MAX Oven – Applications

- Burning in of decorative paints onto glass or ceramics
- Shaping and forming of sheet metal or metal bodies
- Shaping and forming of plastic tubes
- Coating of wires
- Heating of highly reflective metals
- Recrystallisation of metal wires
- Enamelling

The MAX Oven – Especially Energy-Efficient

Tests show that the maximum emitter temperature for an oven with a heated length of 700mm and a chamber cross section of 150x150mm is achieved in less than one minute. Because of the exceptional energy efficiency, a holding power of around 3kW is all that is required to maintain a 900°C holding temperature during in-line continuous operation.

Energy-Efficiency Through Precise Matching

In the MAX chamber, the energy from infrared emitters is applied significantly more efficiently as the radiation is optimally reflected and the natural convection is also used. Consequently, a MAX oven offers particularly excellent homogeneity. With glass as a thermal insulator, it is possible to achieve a temperature difference within the product being heated of only +/- 2 °C.

Infrared heating can always be used whenever heating processes face particular challenges in terms of space, time and quality.

The QRC Nanoreflector Sets New Standards.

The QRC (quartz reflective coating) reflector, developed by Heraeus features opaque, white quartz glass. A nano structure imparts a diffuse reflection capability. Consequently, high temperature processes can be carried in a more stable fashion, as process parameters such as temperature and heating time can be better maintained. This reduces costs and improves energy efficiency.

Quartz glass is extremely heat-resistant and widely resistant to the attack of acids and other aggressive substances.

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