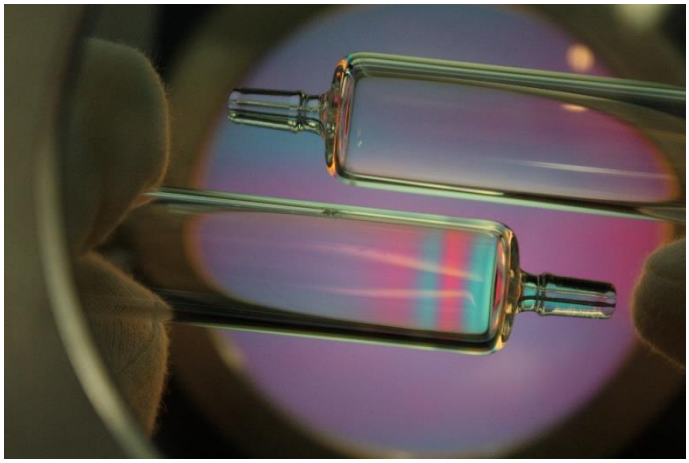
MAX infrared oven allows fast and homogenous glass tempering

Excelitas was able to heat glass five times faster and reduce energy consumption by 90% with the help of the newly developed MAX infrared oven. The tempering process time can be reduced, energy efficiency increased, and operating costs lowered.
Glass is formed under heat, which means there are residual thermal stresses. Before they are put into use, these stresses must be removed, otherwise there is a danger that the glass will crack. Stress relief is achieved by tempering, which involves a controlled heating followed by a slow cool-down.
The new MAX infrared oven from Excelitas is superior to both convection and batch ovens, because it transfers the energy required in a very short time due to its design.
Both the process chamber and the feeder system of the new MAX oven are made of pure quartz material, so that the infrared radiation is diffused to provide a particularly homogenous heating effect. In order to temper the glass products, they are passed into the MAX oven, heated to 600°C and held for a short time at this temperature. Tests in the Excelitas Applications Centre have established that when glass is heated at a rate of 50°C temperature rise per second, the tempering process, including cool-down, can be completed in around five minutes. The test oven had a power of 15kW, so that the temperature was held constant for the glass tempering. All MAX infrared ovens share the same compact construction with specially developed IR mirrors in the process chamber. Energy is then utilized more efficiently because the infrared radiation is reflected in an optimal fashion within the oven. In addition, the natural convection has an extra heating effect. MAX ovens can be located in a modular fashion in series and individually controlled, to allow for rapid product change-over. The compact ovens are also easily connected with feeder systems, and if necessary, these can be of quartz glass. The 15kW power of the oven offers another advantage according to Jürgen Weber, development manager at Noblelight: “Our calculations showed that with this oven it is potentially possible to temper around 1000 glass products, at just 15 kW, within one hour!”



Features

- five times faster compared with conventional electric heating
- Cuts energy consumption by 90%
- Eliminates the need for long heat-up and cool-down periods
- Controlled heating to around 600°C
- Reduction of operating costs

Technical Data

- Process chamber and feeder are made of pure quartz material
- Glass is heated at a rate of 50°C rise/second
- Process time: 5 minutes
- Oven power: 15kW

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