

# DEVELOPMENT AND PRODUCTION OF RED GLASS

## Motivation

Red glasses are widely used for optical applications (e. g. photometer, laser, traffic lights, etc.) or as decorative element. As the production of transparent, intense red glass is complex and expensive, its use for decorative purposes or for everyday items is rare.

## Background

The color of glass is influenced by the composition of the glass melt, the furnace atmosphere, the processing temperatures, the glassy or crystalline solidification, and by the type and amount of the coloring substance.

Since transparent glasses with intense red colors, such as ruby or bordeaux red, cannot be produced by conventional ion coloring, Fraunhofer ISC offers the development and production of special glasses with colloid coloring. With its many years of expertise ISC supports customers with the complex and costly development of the dyeing colloid process, which enables transparent glasses with beautiful, warm red tones.

In addition to the colloid method ISC uses pigments and ions for coloration and adapts the process to the base glass system and the production facilities of the customer.

## Our range of services

Fraunhofer ISC offers development and production of glasses and glass ceramics (e. g. enamel and glazing) with coloration in the spectral range of 600 to 680 nm wave length.

Other properties can be defined and regulated to some extent via the material composition:

- Refractive index
- Transmission: translucency and X-ray opacity
- Density
- Viscosity characteristics
- Thermal expansion coefficient
- Mechanical characteristics: bending strength, Young's modulus
- Chemical stability

## Our equipment

- 5 liter nozzle crucible with stirrer and the possibility to inject gas; crucible material either platinum-rhodium or silica glass for temperatures up to 1500 °C
- 2 liter casting crucible, crucible material either platinum-rhodium, platinum-iridium, silica glass or aluminium oxide for temperatures up to 1650 °C
- 0.1 liter platinum-rhodium pot, chamber furnace for temperatures up to 1700 °C
- Moulding: powder ( $d_{50} > 4 \mu\text{m}$ ), frits, bars (up to 1 meter length), blocks
- Muffle furnaces for temperatures up to 1200 °C

