Innovative Heat Treatment of Ceramics Using „Low O2“ Technology
Debinding processes

Discontinuously operated kiln plant with „Low O₂“ technology

Continuously operated kiln plant with „Low O₂“ technology

Result

State of the Technology

Innovation
In the traditional firing the debindinging time requires up to 50% of the entire firing time.

Uncontrollable reaction in the product without "Low O₂"
Almost the entire weight loss takes place between 150 °C and 400 °C.
Debinding Processes

The strongest reactions run between 150 °C and 400 °C

Exothermal and Endothermal Reaction Subject to \( \text{O}_2 \)-Content

The strongest reactions run between 150 °C and 400 °C.
Discontinuously operated kiln plant with „Low O₂“ Technology

The „Low O₂“ technology principle for discontinuous firing
Discontinuously operated kiln plant with „Low O₂“ Technology

Shuttle kiln with „Low O₂“ technology
Continuously operated kiln plant with „Low O₂“ Technology

The „Low O₂“ technology principle for continuous firing
**Continuously operated kiln plant with „Low O₂“ Technology**

- **Debinder kiln**
- **Gas-tight sintering kiln**
Continuously operated kiln plant with „Low O₂“ Technology

Debinding zone of the tunnel kiln with following components:

- Air-water heat exchanger
- Thermal post-combustion
Continuously operated kiln plant with „Low O₂“ Technology

Tunnel kiln with „Low O₂“ Technology
With „Low O₂“ technology firing time can be radically shortened.

**Result**

**without „Low O₂“**

**with „Low O₂“**

**Temperature**

**Time**
State of the Technology

Thermal treatment with „Low O₂“

Indirectly heated rotary kiln

Gas-tight top hat kiln
Heat treatment of ceramics with a regulated kiln atmosphere is the stand of the art (e.g. hard porcelain).

Regulation of the oxygen content in a gas-heated kiln in a low temperature area is a real innovation with following advantages:

- "Low $O_2$" „$O_2$ control“ regulation of the kiln atmosphere in a wide area
- low investment cost
- low required space
- low energy consumption
  - short duration of the process
  - recirculation of waste gas
- Applicable for continuously and discontinuously operated firing processes
- Debinding and sintering in one firing cycle