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# Inorganic warm-set binder technology for the production of Non-ferrous and ferrous castings

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# Inorganic – The process

- The core-making process is based on the physical hardening of alkali silicates ("water glass") by water removal and displacement of the binder module.
- Curing takes place in practice by a combination of drying the outer shell (warm core box) and warm air purge (inner region of the core) with air (do not apply CO<sub>2</sub>).
- Cores can be casted immediately after withdrawal.

# Inorganic – The binder

- The inorganic binder consists of two components; a liquid component and a powder additive.
- The liquid component is a modified Sodium Silicate.
- The powder additive consists of several components in order to guarantee certain properties during manufacture of the core and the finished cores.
- All binder components are inorganic. The binder contains no phenol, formaldehyde, isocyanate, amine, etc. and emits only water vapor.

# Inorganic – Typical process parameters (Standard values) (1/2)

- **Silica sand:** Almost any type can be used
- **Binder addition level:** 1.7 to 2,3 w.-% Silicate +  
1 to 3 w.-% additive
- **Mixer:** Any conventional mixer can be used – mixing time: ca. 2 min
- **Bench life:** covered with a lid to protect against atmosphere:  
minimum 90 min (@20° C)
- **Core-blowing:** as Coldbox

## Inorganic – Typical process parameters (Standard values) (2/2)

- **Core boxes:** Metal, heated by oil or with electric cartridges
- **Core box temperature:** 120° to 150° C
- **Warm air purge:** ca. 100° - 130° C; Pressure up to 2 bar,  
Volume flow: depending on the core box design
- **Cycle time:** similar to PUCB
- **Initial strength:** 200 – 250 N/cm<sup>2</sup> transverse strength (minimum)

# Inorganic – Summary of key features

- **Initial strength**

minimum 200 to 250 N /cm<sup>2</sup>; up to 600 N/cm<sup>2</sup> after a few hours

- **Core quality after core storage**

If the relative humidity is not higher than 60-70%; the inorganically bounded cores can be used for approx. one year

- **Productivity**

The entire cycle time comprising of:

(Compaction+Hardening+Taking out the core) is no longer than for the PUCB process subject to a proper core box design

- **Emissions / Odour**

The binder is without any odour. No odour and hazardous emissions during casting and shake-out.

# Further information, please contact:

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