



Chemicals

Industrial Application

Foundry Business

Carolin Wallenhorst



Core Shooting

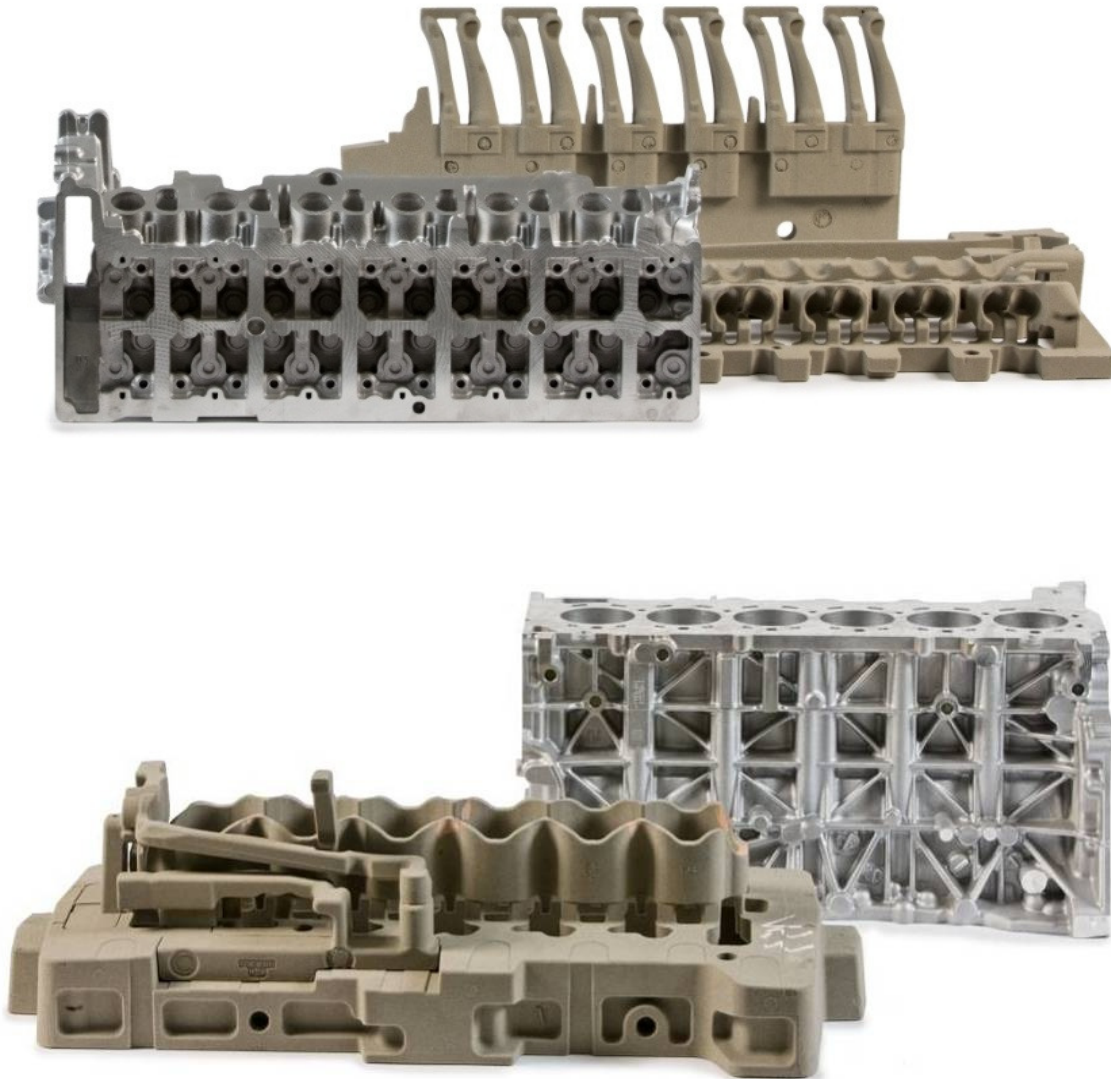


Casting



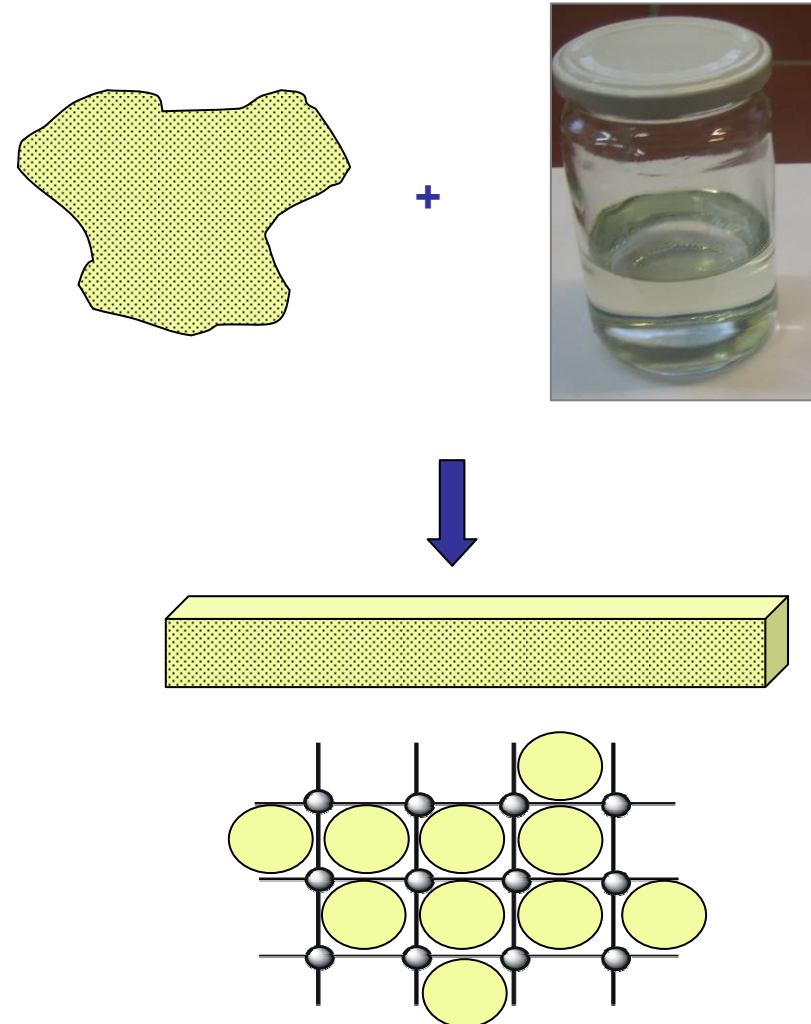
Decoring

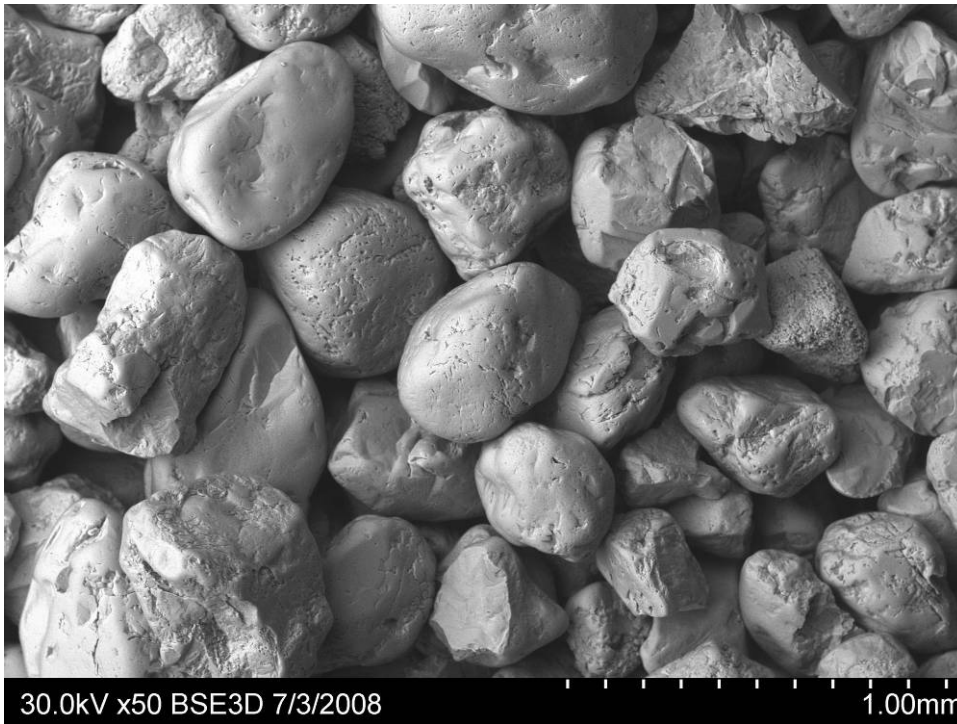
Cores and Castings



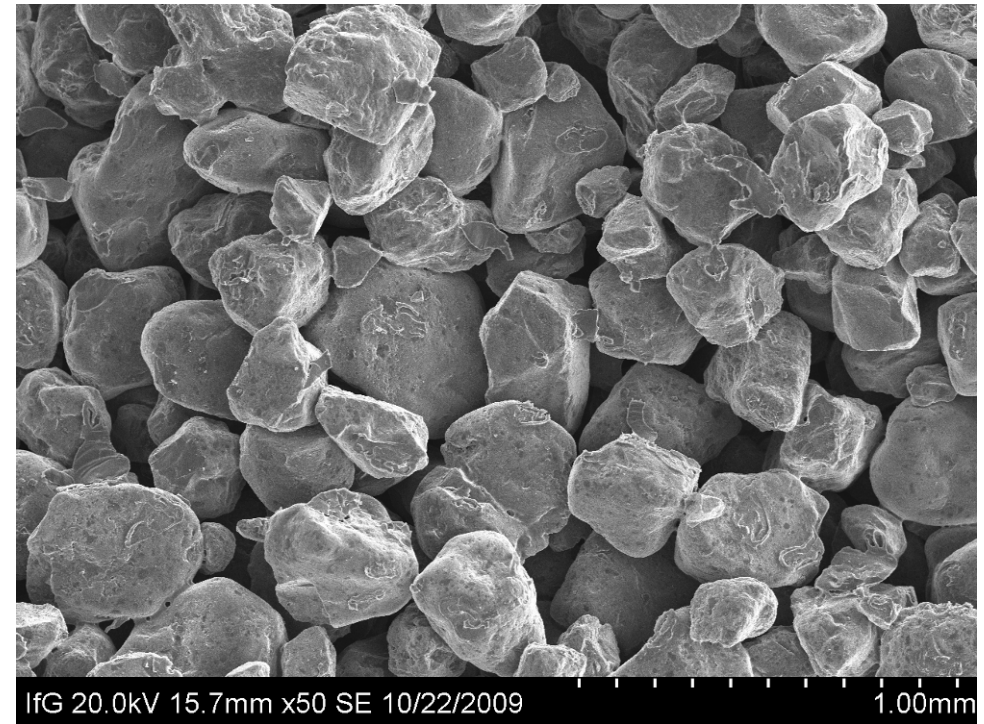
BMW Inorganic Core Production

Network Formation around Sand

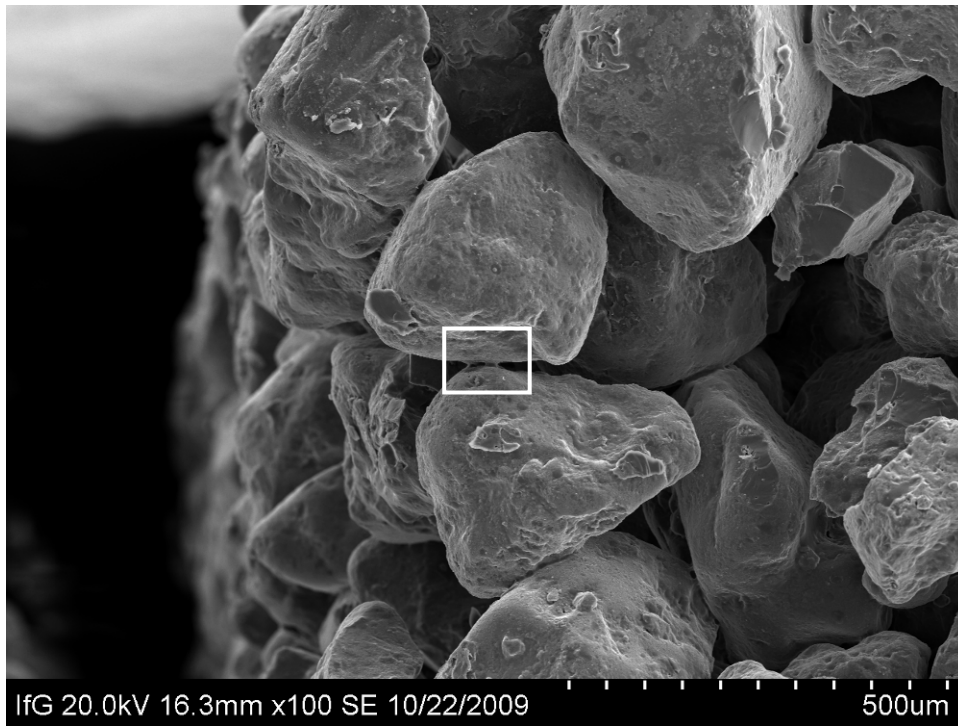




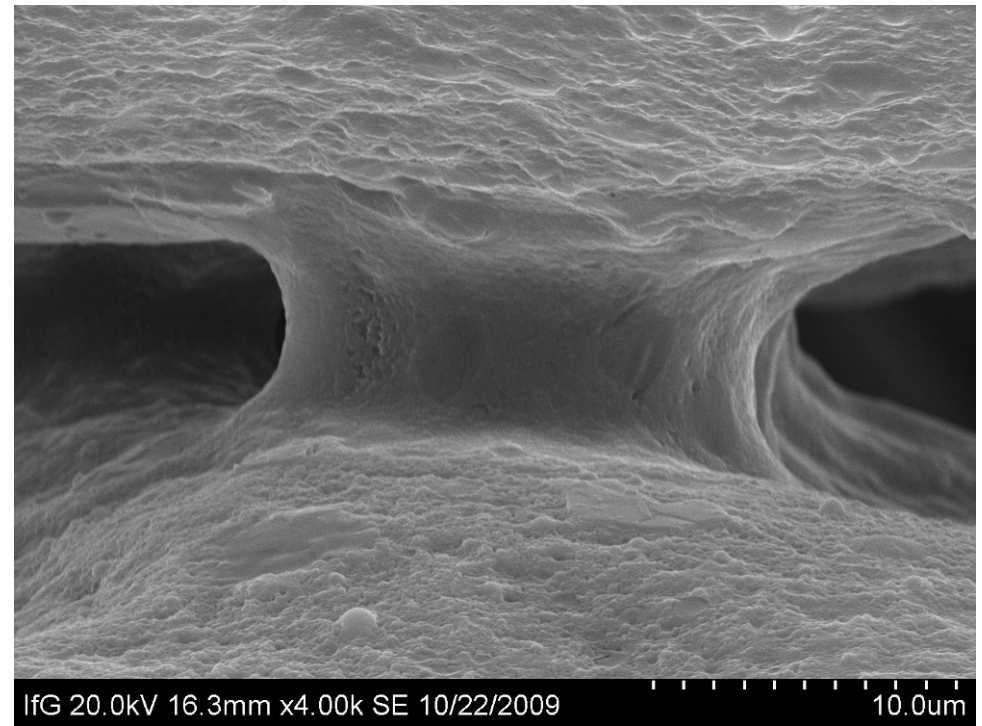
Sand



Sand with binder



Sandcore

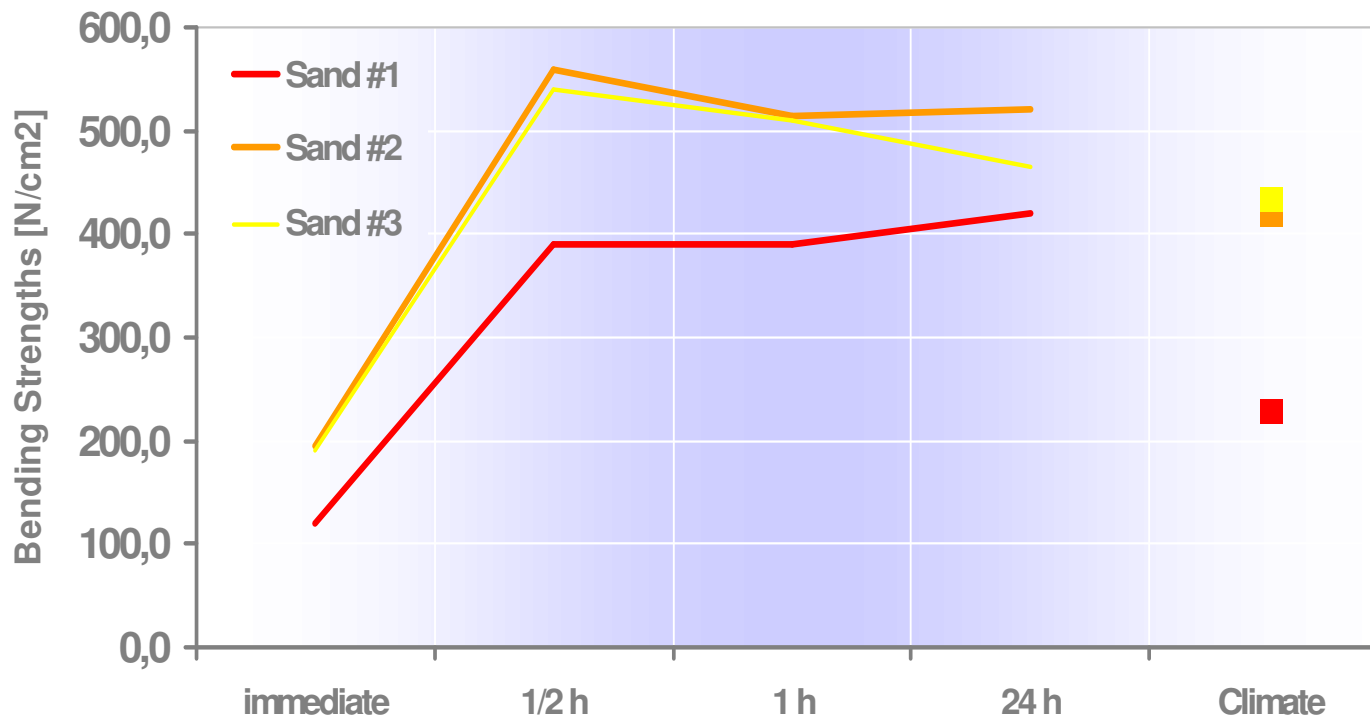


Sandcore (binder bridge)

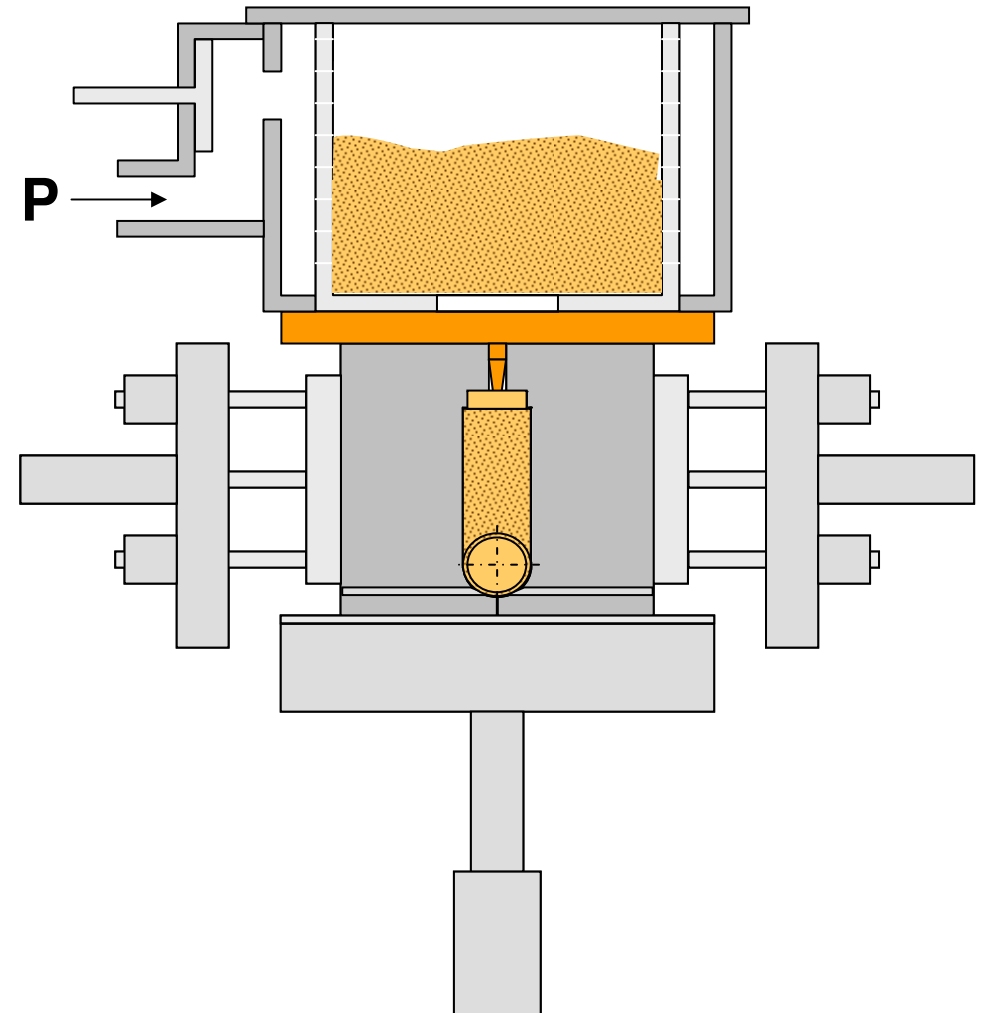
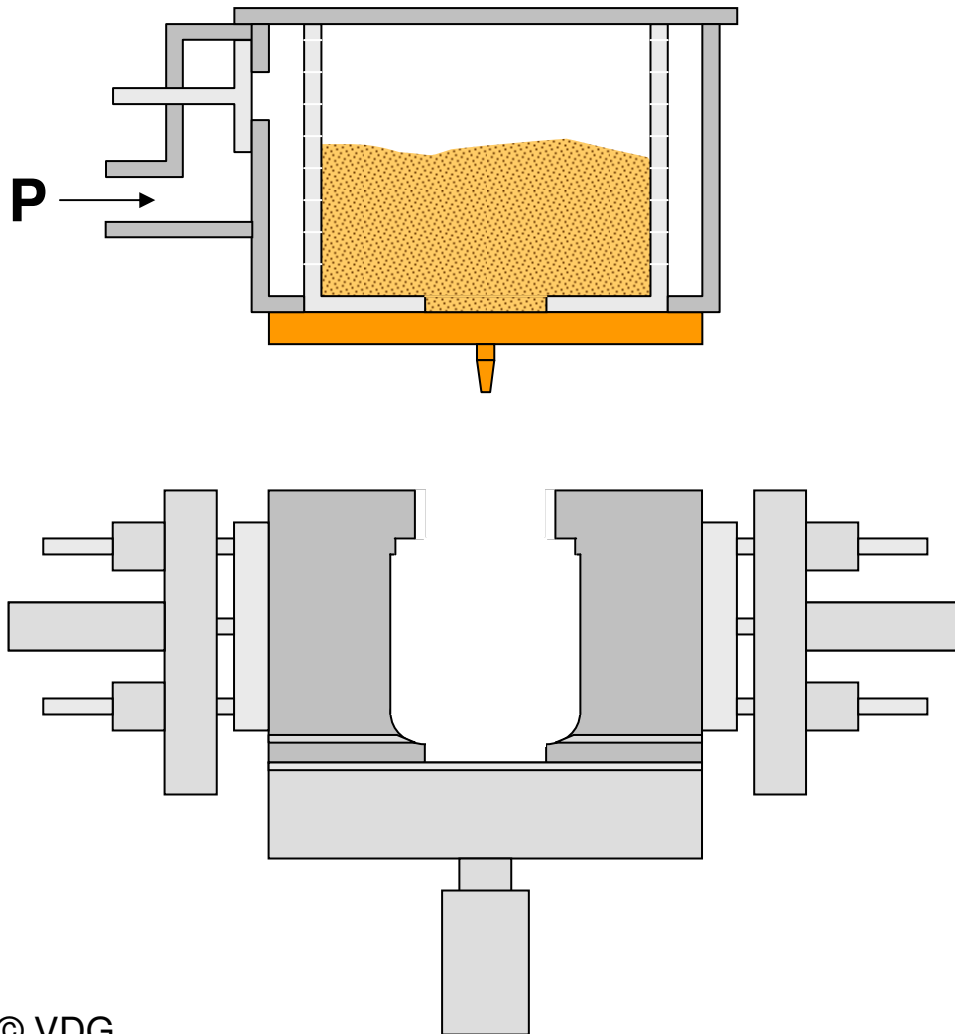
Bench Mark – Sand Test with Binder Systems

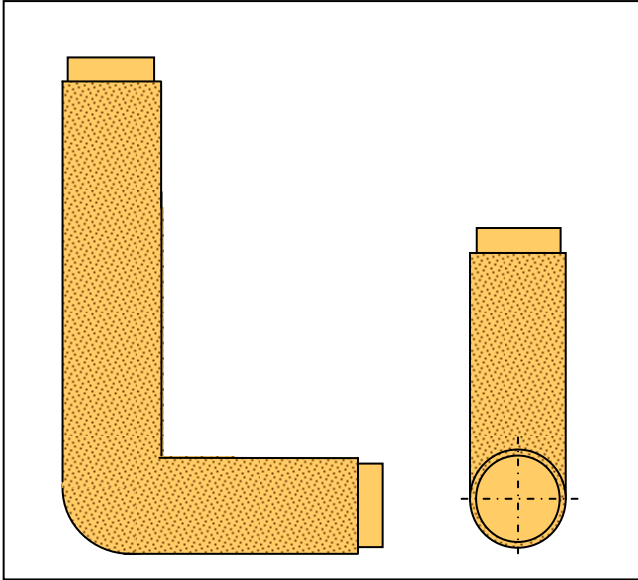
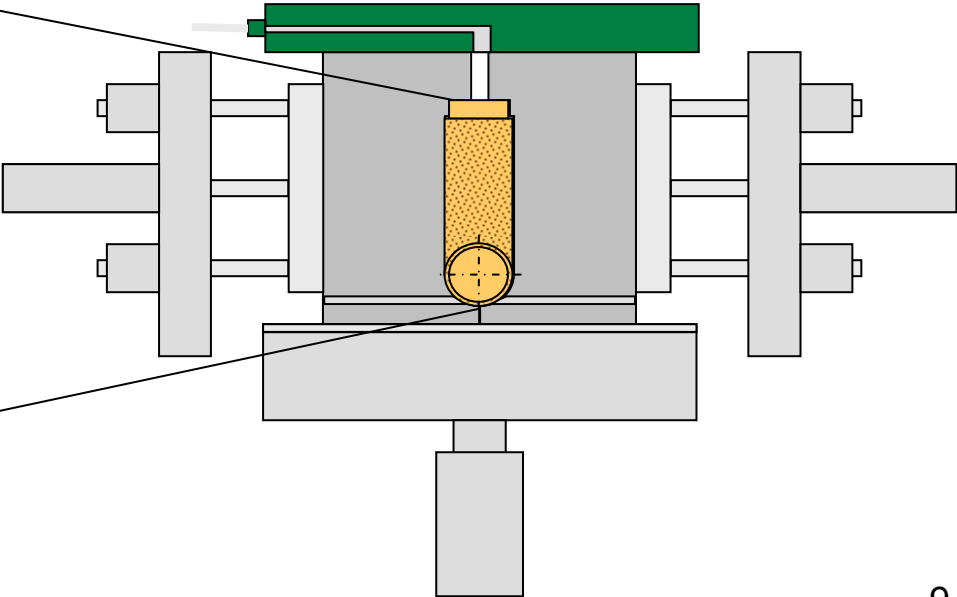
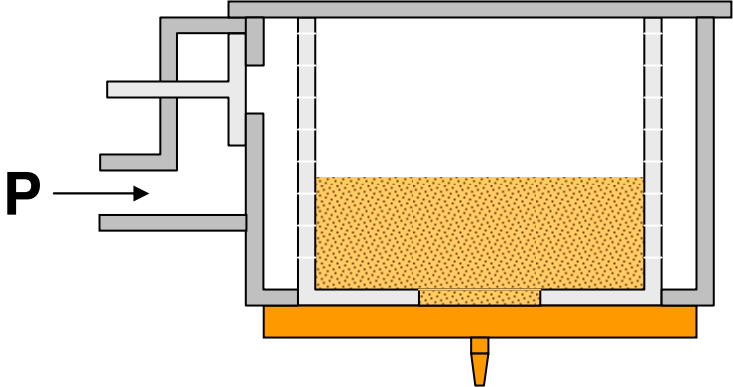


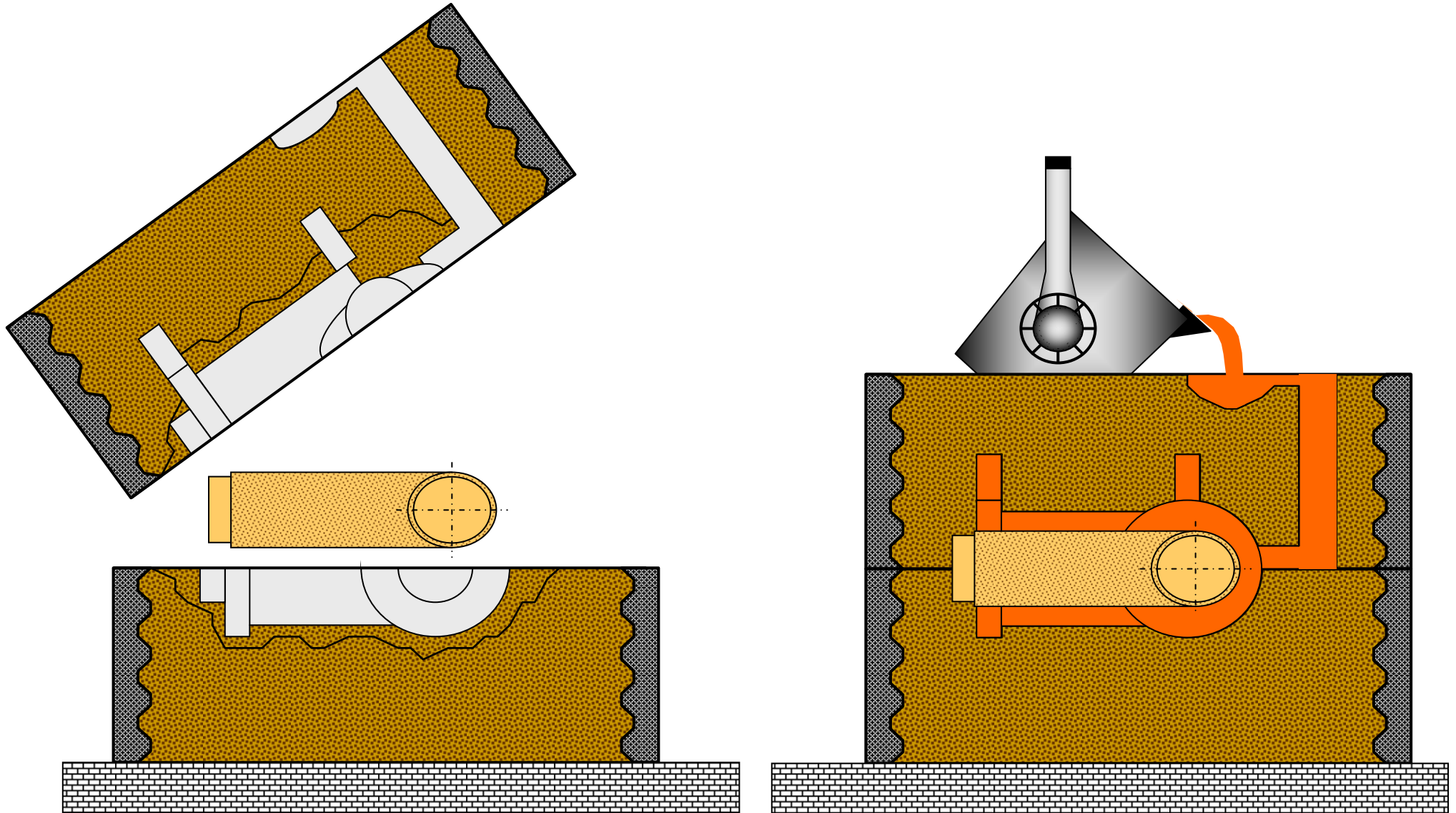
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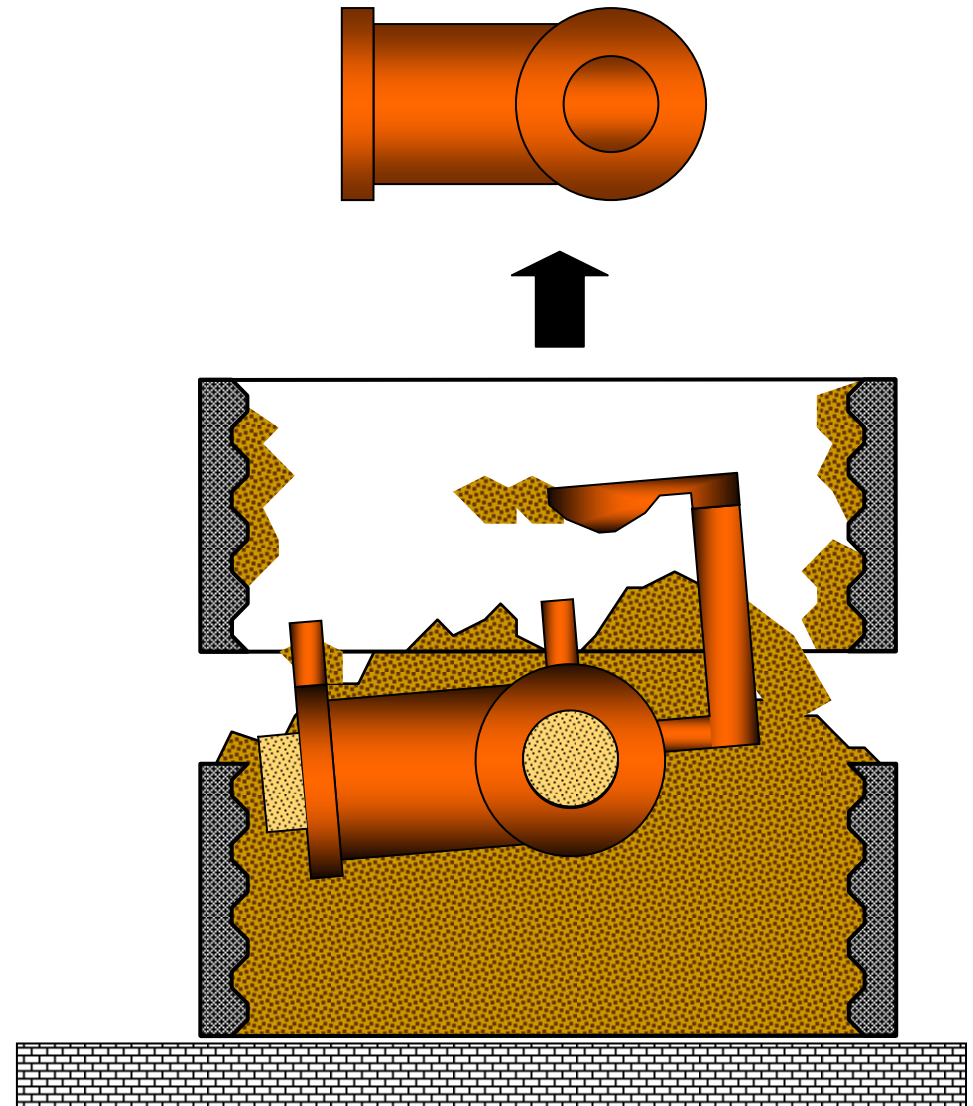
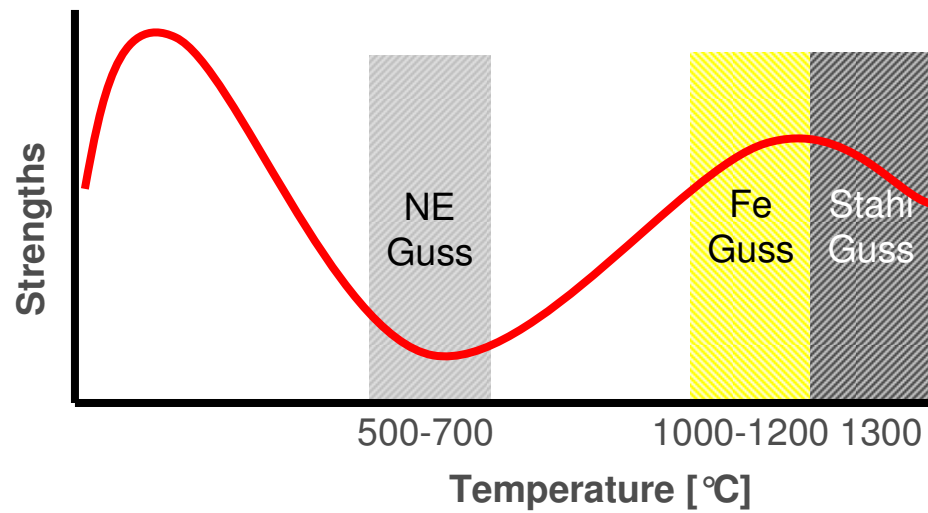
Sand mixture:
2,00% Inotec® Binder
0,95% Inotec® Promotor
Cycle time 35''20''(180/100 °C)







- Cold Box binder decomposes during casting
- Wasserglas changes strengths



Core storage

amine,
highly volatile
components

Oven drying

highly and middle volatile
components



Mixer

highly volatile
components

Cast

medium and low volatile
components
pyrolysis- and recombination
products
(85%)

Core-making

amine,
highly volatile
components

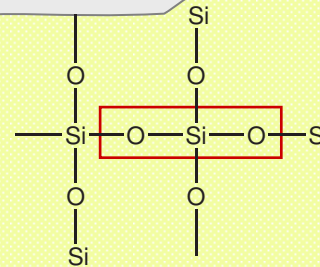
Silica binder



Promotor

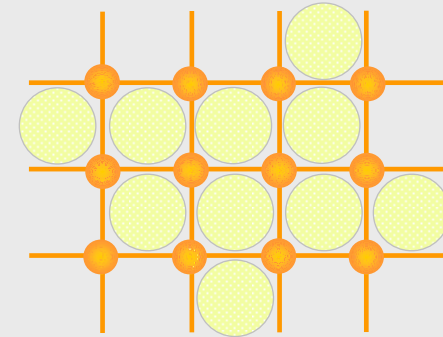


Molding material / quartz sand



- ✘ quartz sand consists of > 99 % SiO₂.
- ✘ SiO₂ has a 3-dimensional network out of SiO₄⁴⁻-tetrahedrons, linked through their edges.

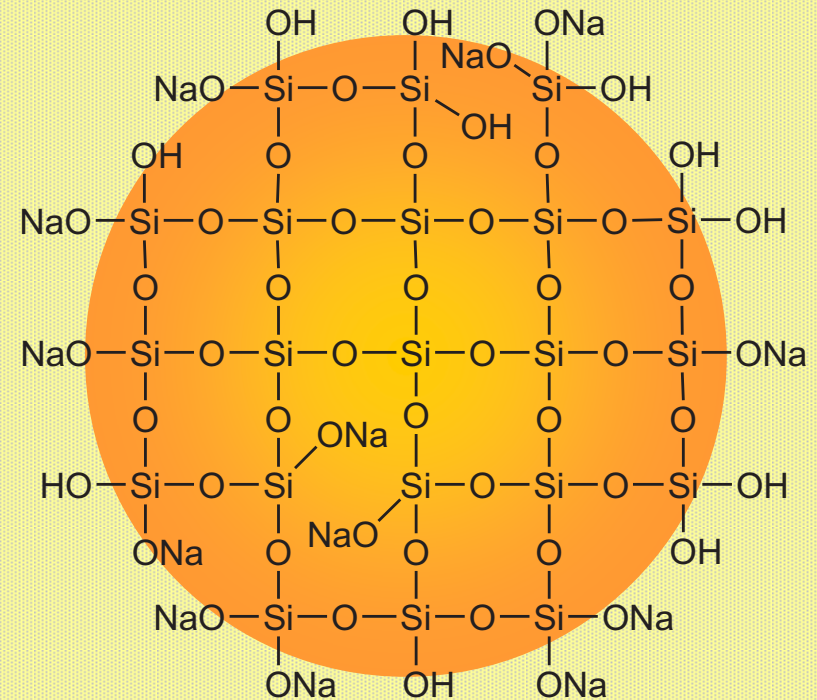
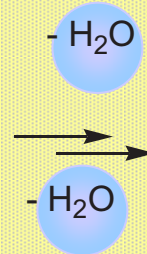
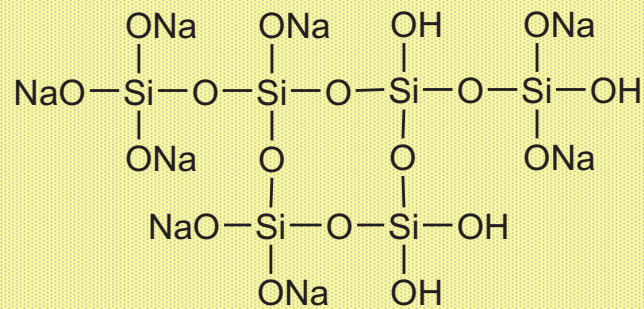
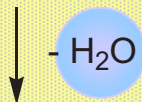
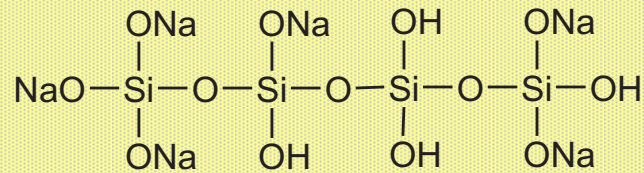
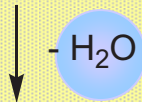
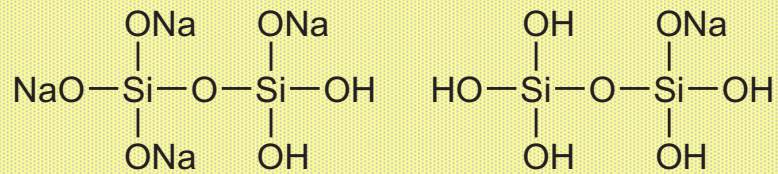
polymeric network



Growth of Binder-Molecules via Condensation Reactions



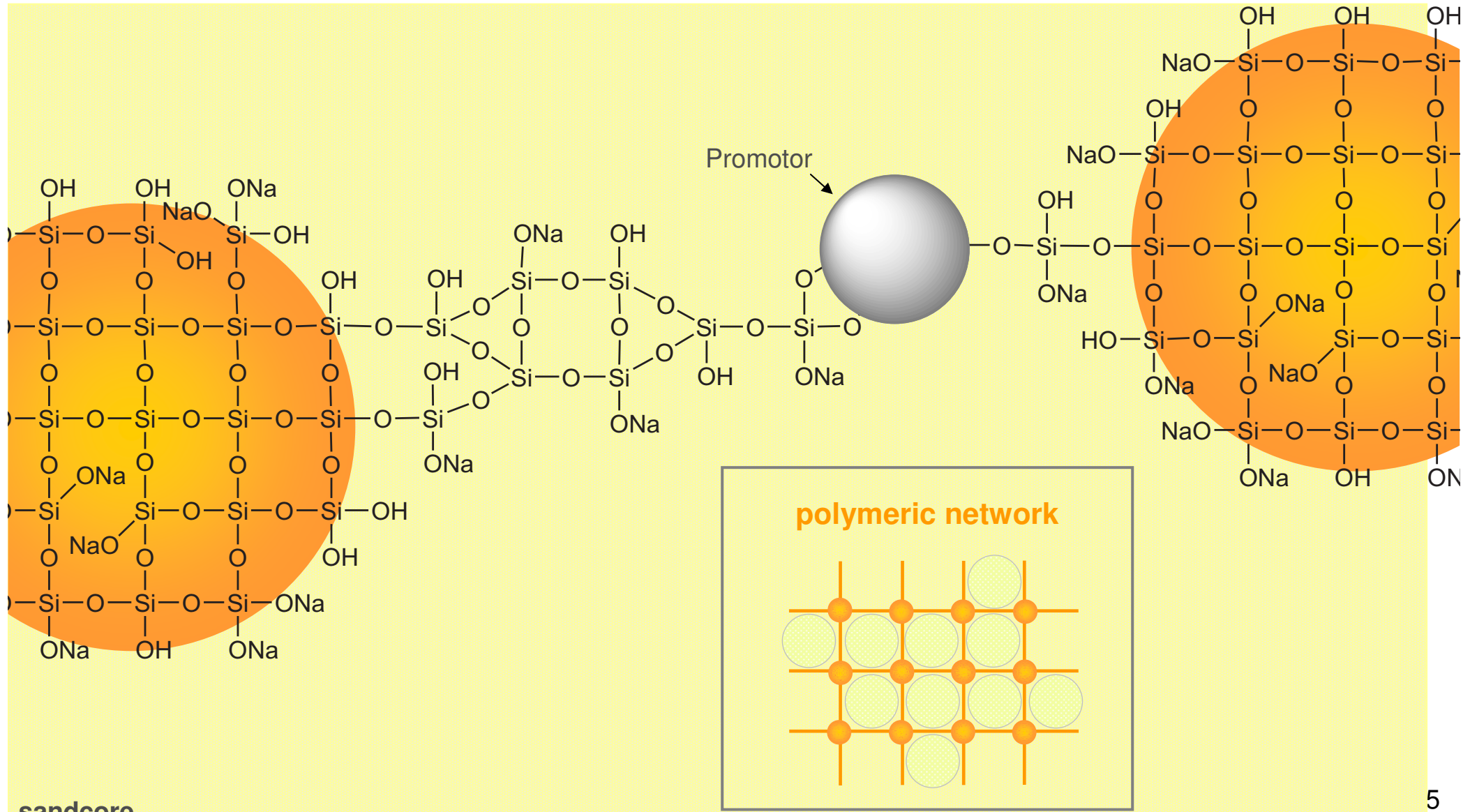
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Operating Principle of Promotors



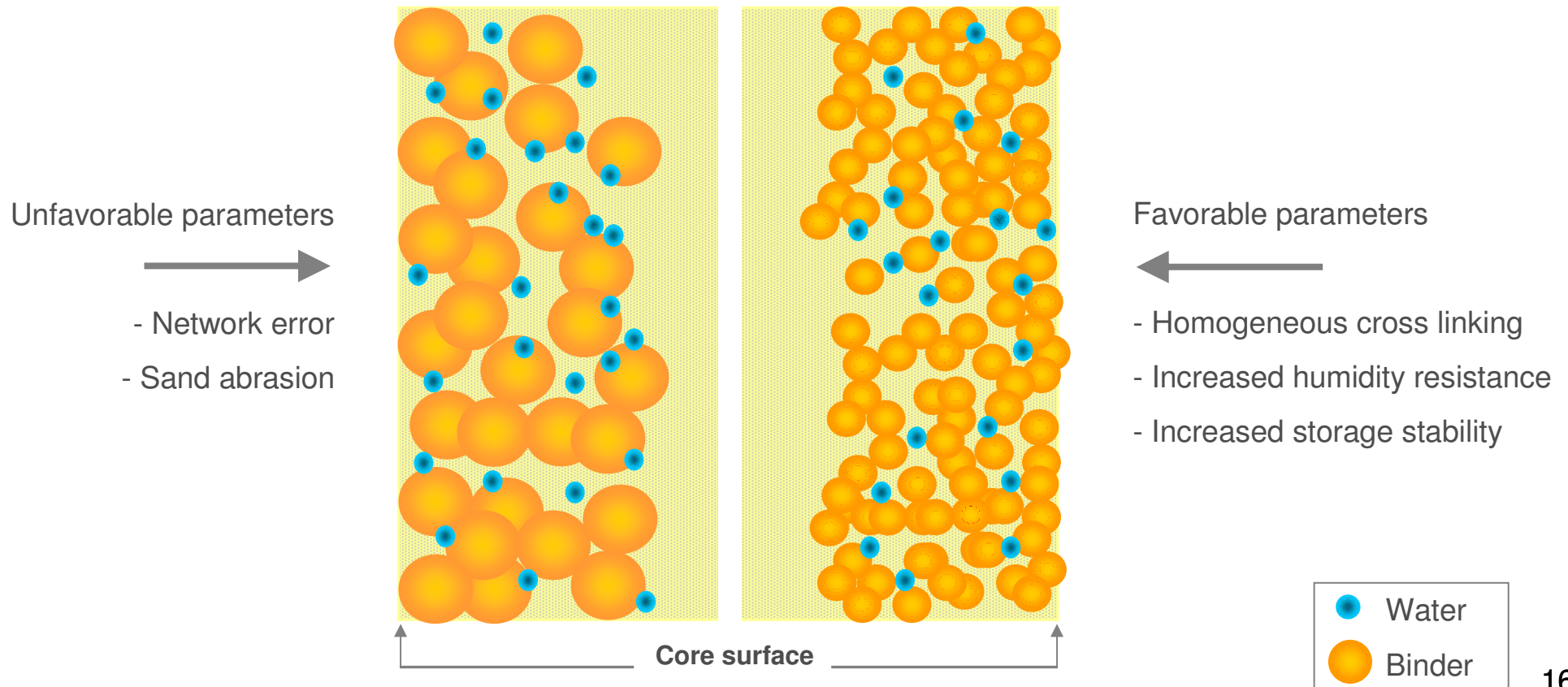
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sandcore

The rate of curing and networks setup is strongly affected by the process parameters.

(e.g.: core geometry, temperature, time, purging air, binder system).





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Thank you for your attention!

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