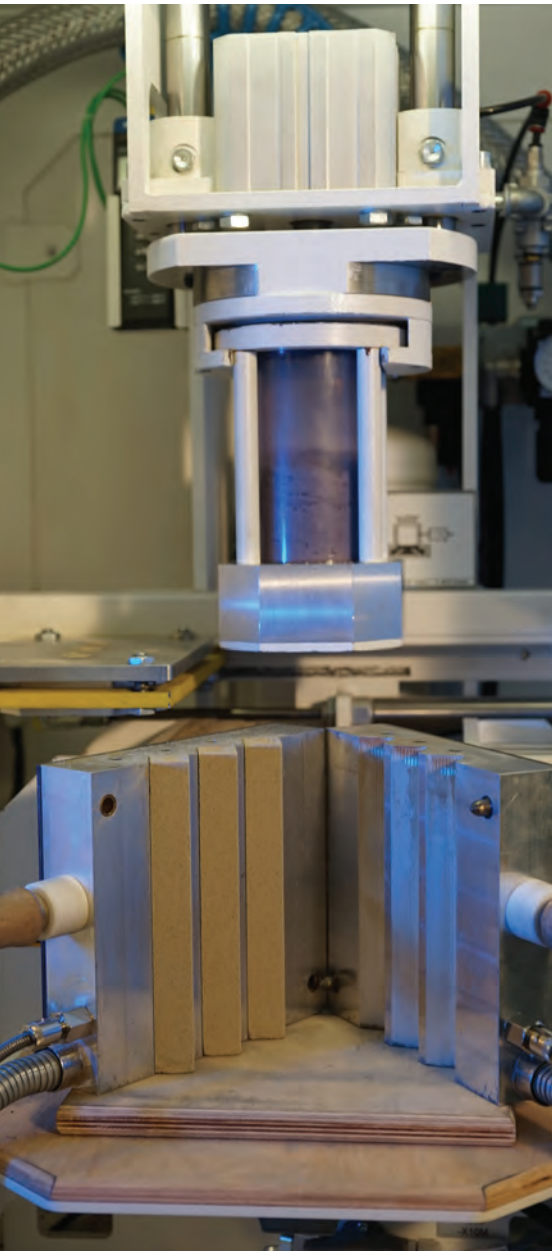


## SOLOSIL\* TX - Inorganic warm set binders

NON-FERROUS FOUNDRIES - MASS PRODUCTION

- + Eco-friendly, inorganic binder system
- + Suitable for the large-scale production of cores for non-ferrous castings
- + High binder reactivity allows short core-making cycle times
- + Cores reach the strength level of PUCB and can be stored easily
- + No pollution and odour emissions during core production, storage and during casting



# SOLOSIL TX – Inorganic binder for cores

For environment-friendly core production without hazardous emissions

SOLOSIL TX is a binder that can be used to produce complex cores for the automotive industry.

Cores made with SOLOSIL TX are completely inorganic and therefore emit only water vapour during core storage and the casting process.

The core-making process as well as cores produced from SOLOSIL TX are completely odourless.

Thanks to intensive research, Foseco succeeded to develop a binder with which it is possible to achieve core strengths reached by conventional cold box binders.

Curing of SOLOSIL TX bonded sand takes place by moisture extraction by means of warm core box tools which are temperature-controlled at 150° C in combination with a warm air purge.

## Cores made with SOLOSIL TX show many benefits:

- + High core strengths, equal to Coldbox
- + Good sand flowability
- + Sharply contoured and high dimensional accuracy
- + Easy dosing of the binder
- + Free of harmful substances
- + Trouble free processing
- + Fast operational availability
- + High storage stability over several months under controlled conditions
- + Completely odourless during core-making, storage and casting
- + No formation of fume during casting
- + Free of Phenol, Formaldehyde, Isocyanate and Amines

## The inorganic binder SOLOSIL TX is characterized by:

- + Free of any organic compound
- + Low addition rate to the sand
- + Long binder shelf life
- + Easy dosing of the binder
- + Free of harmful substances
- + Trouble free processing



Section from water jacket core 03HD

# SOLOSIL TX – Inorganic binders for cores

In practical use

## Processing of SOLOSIL TX

SOLOSIL TX can be mixed with any sand using batch or continuous mixers. The sand mixtures produced with SOLOSIL TX provide a bench life of several hours and are characterized by excellent sand flow, therefore even small segments within core boxes can be filled completely and tightly during the core-blowing process.

Thanks to the high reactivity of the binder system total production cycles can be set corresponding to those of traditional organic binder systems.

Due to the absence of solvents, cores made with SOLOSIL TX can be cast immediately after core-making. However if needed cores can also be stored without any quality loss for several weeks.

## Computer simulation of the core production for SOLOSIL TX

The processing of inorganic, thermosetting core binder materials like SOLOSIL TX takes place in heated metal core boxes. The removal of water from the binder is effected by temperature increase of the moulding material due to heat input from the core box plus additional hot air purging.

For cost-effective core production the shortest possible cycle times should be aimed at. The cycle time is determined by the process stage of drying the core material. The computer simulation of the core production process can be a valuable aid for optimising the flow of the air into the core box, necessary for removal of the moisture.

For this, it is necessary, however, to know numerous product and process quantities to input the program with the parameters required for the calculation.

The execution of calculations of this kind can, in the initial stage of core box development and positioning of heating elements in the core box, save expensive test series which become necessary when the core production tool does not perform as required in foundry practice for achieving the desired core quality or production cycle time.

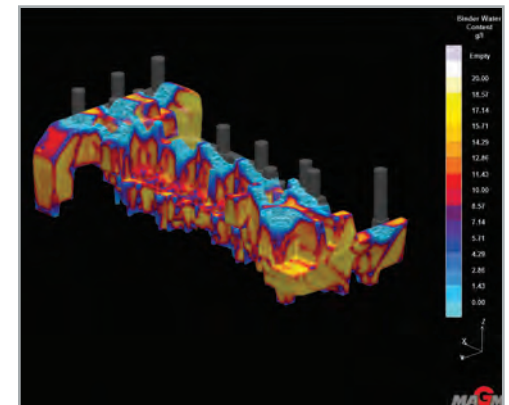
Completely compacted core bridges of a water jacket core produced with SOLOSIL TX for an aluminium cylinder head for a passenger car



By successful development of the SOLOSIL TX additive it was possible to eliminate the metal-sand reaction completely



Water content of an oil gallery core after 5 seconds





# Inorganic binders - Research & Development

Focus on Product development

## Modification of existing binder systems

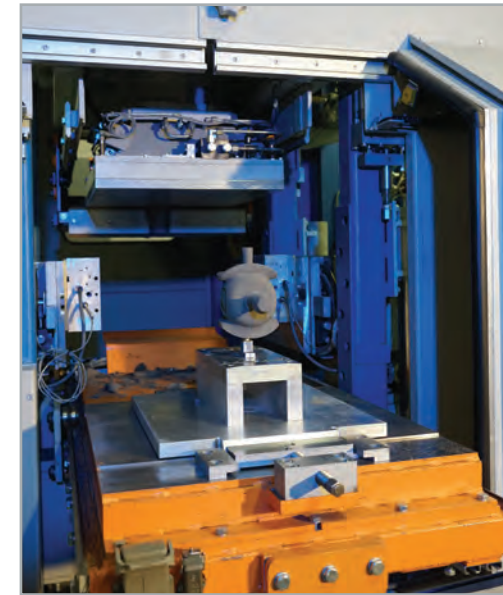
SOLOSIL TX binder systems are under continuous development and will be modified according to the customer needs.

In this context it is of particular importance to test new raw materials in order to improve both the strength characteristics of cores bonded with SOLOSIL TX and the thermal breakdown after casting.

## Development target: SOLOSIL TX inorganic binder systems for ferrous castings

Another focus of the ongoing research activities is the development of inorganic SOLOSIL TX systems for the mass production of ferrous castings.

These new inorganic binders have to provide at least equivalent technical performance to conventional PUCB binder systems and on top superior characteristics in respect to environmental aspects.



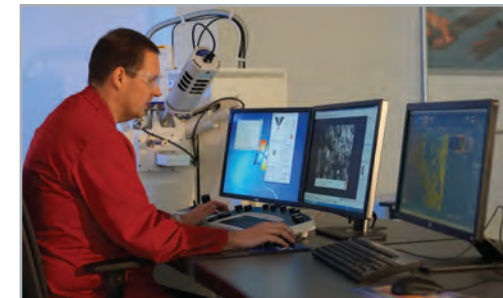
Core blower with inorganic SOLOSIL TX core



Powder Flow Tester for the determination of the sand flowability



Product development team



Analyses of raw materials by SEM



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