

# Additive Manufacturing

HA binder systems for 3D printing





## Layer by layer to success

**The HA Group maintains close technological exchange with most international manufacturers of moulding material printers. Within these partnerships, we have set common goals that we consistently pursue in our research and development. The aim is to support foundries in the establishment of 3D printing technology as a complement to conventional core and mould manufacturing processes.**

In addition to reducing the finishing effort and increasing the strengths, we are also focused on improving thermal stability and optimising the disintegration properties. Furthermore, we are working on concepts for the regeneration of 3D moulding materials.

The furan resin binder systems have been tested on our own 3D printers and approved by the 3D printer manufacturers before their market release.

Through selected raw materials and tight tolerance windows in production, we achieve very high levels of purity in the binder systems. Long-term studies show that with HA furan resin binder systems, print head lifetimes of > 2.5 years can be achieved without any loss of quality.

Our international team of foundry experts and chemists is ready to support new projects and overcome challenges.

# HA binder systems for 3D printing

## Inorganic system

- three-component system for optimal performance
- 100% BTEX emission-free
- tested on various printing systems
- for casting materials up to 900 °C casting temperature

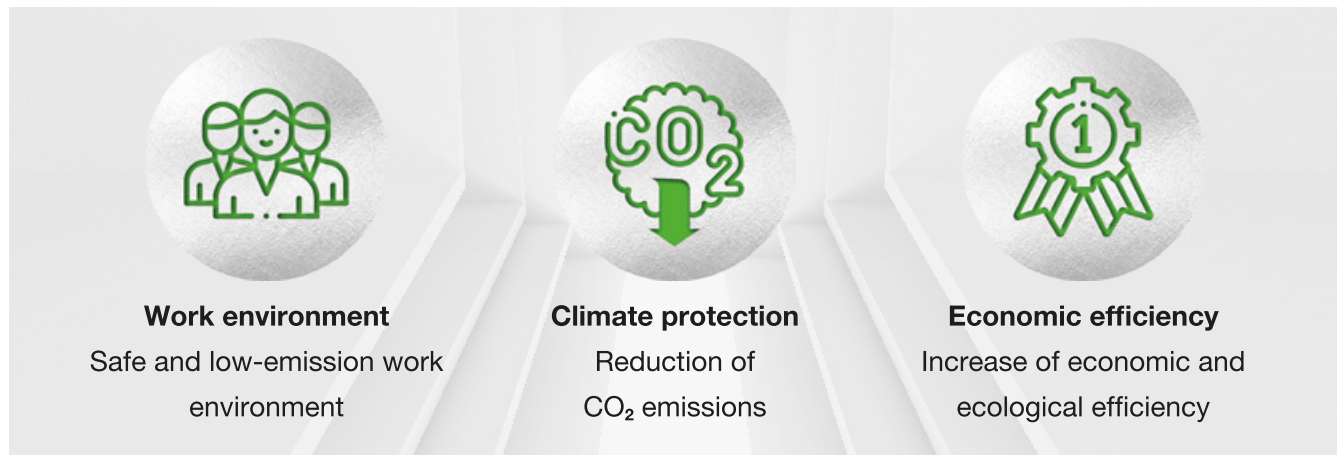
## Furan resin

- two-component system
- reduced workplace exposure
- easy to use
- approved for use on all common printing systems
- suitable for all materials and casting temperatures

## Phenolic resin

- one-component system
- backing sand 100% reusable
- curing through temperature
- suitable for all materials and casting temperatures

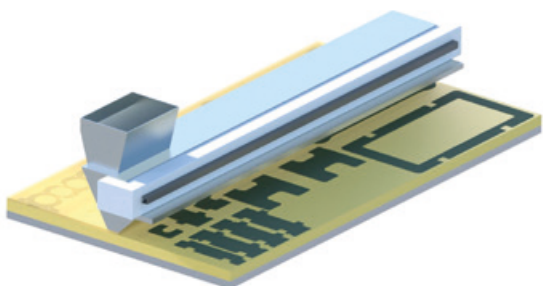
## Advantages of all 3D printing binder systems from HA:



## HA AM Moulding materials HA AM Additive

### Without qualified moulding materials, there is no good casting:

We offer AM moulding materials that have established themselves as problem solvers for critical components in 3D printing, thanks to their outstanding flow properties and optimal high-temperature strength. These materials have been optimized in terms of activator requirements and surface quality for the printing of cores and moulds.



### AM additive as a problem solver:

Conventional additives are not suitable for 3D printing due to their fine particles. The same applies to additives with a wide particle size distribution, which cannot be reliably applied using the recoater. Our AM additives are characterised by an optimal particle size distribution, which even at addition levels of up to 8%, does not result in a significant loss of strength for cores and moulds.



## HA AM Coating

### To enhance casting quality:

Due to the nature of the process, 3D-printed cores and moulds have a more open-porous and rough surface structure. This is caused by the absence of fine particles and a lower compaction of the moulding material, as well as the „staircase effect“.

Depending on the casting material, our specially optimized surface coatings for specific applications

are used in these cases:

- optimal smoothing properties while maintaining high mouldability
- water or alcohol as carrier liquids
- very good rheological properties
- prevention of casting defects specific to the printing process

## HA AM Qualification

Following the principle of „just as much as necessary“, we optimize the optimal dosage amounts for each application in coordination with foundries and printer manufacturers. Since binder system dosages in 3D printing are not solely determined by the percentage of components but also by the drop repetition rate, determining the correct parameters is not

trivial. We assist in the identification and adjustment of these parameters and provide support and guidance through our application technicians, including on-site assistance if needed. Additionally, we offer various training sessions at our HA Center of Competence.

## HÜTTENES-ALBERTUS

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