

United 3D-Cores (U3DC): A New Partner For Investment Casting

A new partnership is born in 3D printing ceramics for investment casting between Avignon Ceramic and 3DCeram Sinto.

Avignon Ceramic was created in 1870 in Bruère-Allichamps under the name "Porcelaines Avignon", specializing in porcelains and technical ceramics. It has kept on innovating over the years to be in line with the times. Avignon Ceramic started CIM in 1990, manufacturing ceramic cores for investment casting, and has more than 30 years supplying the largest aviation engine manufacturers, as well as the world's leading precision foundries. In 2017, Avignon Ceramic launched an ambitious R&D project for 3D printed ceramic cores.

3DCeram was created in 2001 in Limoges, France. In 2017, Sintokogio Ltd of Nagoya, Japan, became the major shareholder of 3DCERAM. 3DCeram Sinto is a turnkey provider of solutions for the additive manufacturing of ceramics, with over 15 years' experience in 3D printing and machine sales using stereolithography.

Considering their respective backgrounds, the two companies recently decided to join forces to create United 3D-Cores (U3DC), with the aim to provide the investment casting industry with proven solutions in both the production of 3D printed ceramic cores and to offer a complete 3D printing solution (machine, materials and process).

Ceramic core is an essential component in investment casting. Airline companies requiring always smaller, more efficient and cost-effective engines, ceramic cores shapes are more and more complex: 3D printing can meet this challenge.

This technology offers:

- Shorter Leadtime: no need for tooling
- Very complex cores can be made in one part, instead of several parts to



- be assembled in traditional process
- Higher flexibility: modification / adjustment can be done easily, whereas tooling modification would be needed in traditional process

Ceramic material selection remains of utmost importance: ceramic core complexity, alloy to be casted (to ensure no reaction core/metal), leachability, thermal expansion, mechanic resistance and casting process have to be considered. They are suitable for EQX, DS and SX casting parts.

Naturally, the usual constraints continue to be met with 3D printing: dimensional accuracy, structural strength, surface roughness, material porosity, thermal characteristics, ...

Ceramic cores manufacturing is moving fast and we are confident that 3D printing will meet customers' expectations.

Therefore, the creation of U3DC is the response to the expectations of

the investment casting industry (both foundries and core manufacturers). U3DC will be responsible for qualifying and labellizing the material and the process, by carrying out good ceramic demonstrating cores to validate the 3D printing solution for the casting parts. Avignon Ceramic will be able to supply mass production 3D printed cores based on this new process, and 3DCeram the 3D printers, slurries as well as the associated global production process.

3DCeram-Sinto and Avignon Ceramic, with their respective experience and expertise, will support customers needing ceramic cores and wishing to integrate 3D into the various stages of the process, as well as carry out tests to integrate this new printing technology.

For more information on 3DCeram Sinto please visit their website at www.3DCeram.com

For more information on Avignon Ceramic please visit our website at www.avignonceramic.com.