DDM SYSTEMS

LAMP™ LARGE AREA MASKLESS PHOTOPOLYMERIZATION
LAMP™ SYSTEM CPT6060

The LAMP™ System CPT6060, developed and manufactured by DDM Systems, is an additive manufacturing system designed for the production of ceramic green bodies incorporating microscale features in macroscale structures.

This system is the exclusive platform embodying the patented Large Area Maskless Photopolymerization (LAMP™) technology. For the first time, large ceramic bodies can be produced with fine details limited only by the size of the ceramic particles used.

The process uses a high resolution optical imaging system and precision motion control to build parts by UV-curing a ceramic-loaded photocurable slurry layer-by-layer. Images projected from a digital micromirror device (DMD) are scrolled onto the surface of slurry swept over a build platform to cure selected regions of each slurry layer, corresponding to slice images of CAD models of complex three-dimensional parts. Parts built on the CPT6060 can then be fired in a furnace to yield highly precise final parts made of technical ceramics.

SPECIFICATIONS

The following specifications reflect current system performance.

- Light Source: LED @ 405 nm
- Configurable Build Area
  - Minimum: 100 mm X 100 mm
  - Maximum: 600 mm X 600 mm
- Maximum Build Height: 500 mm
- Print resolution in the Build Plane: 10.8 µm
- Layer Thickness
  - Minimum: 75 µm
  - Maximum: 150 µm
- Positioning accuracy: +/- 2 µm in all three axes.
- Currently available material systems
  - Silica with minor addition of other ceramic constituents.
- Build Rate:
  - 25-30 mm/day for the maximum build area of 600mm x 600mm
  - Rate depends on material selection and design characteristics.
- System Dimensions:
  - Footprint: 2.1 m x 2.0 m
  - Height: 2.4 m
  - Weight: approximately 6,800 kg

SOFTWARE AND ANCILLARY EQUIPMENT

- Custom off-line software tools are provided for slice image preparation and data manipulation including:
  - Image slicing of 3D CAD model.
  - Part layout and image templating.
  - Design rules checking.
- Material blending and firing consistent with existing customer practice, so no new processes required.
- Part breakout and cleaning
  - Station provided by DDM Systems.
  - Provides for singulation of parts from templated structure.
  - Provides for basic rinsing and cleaning.
  - No other postprocessing required before firing.

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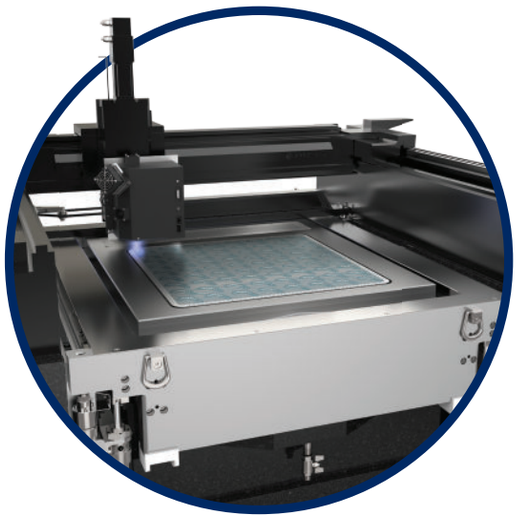
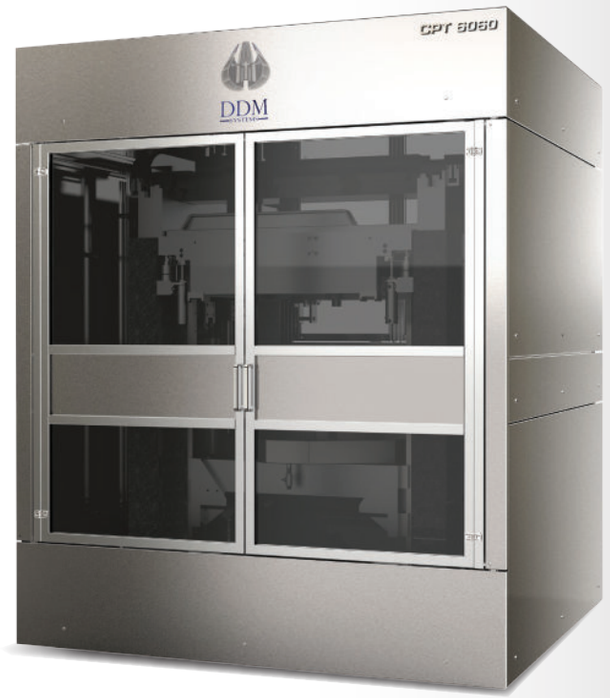
The LAMP™ System CPT6060 additive manufacturing solution from DDM Systems disrupts the "lost wax" investment casting process by 3D printing ceramic cores and shells directly from digital data. Using a stack of slice images each comprising 2.5 billion pixels, it continuously projects over 2 million tiny UV light beams onto thin layers of a ceramic resin, selectively forming precise structures layer-by-layer over a 600mm by 600mm area. This approach eliminates up to 7 of 12 process steps and associated tooling, reduces manufacturing cost by 60%, and compresses lead time for precision castings by over 90%.





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