



# EOSINT P 800

e-Manufacturing with high-performance polymers

## EOSINT P 800

*The first laser-sintering system world-wide operating at up to 385°C processing high performance polymers*

### Benefits

High performance polymer parts show extremely high stiffness and tensile strength, resistance against most chemicals. This makes for excellent application-specific properties, such as flame retardancy, biocompatibility and sterilisability.

Tool-less production with laser-sintering makes it possible to manufacture different products, one next to the other, in one single process. Since laser-sintering does not require lengthy lead times, you can respond to individual customer demand very quickly and cost-effectively.

EOS PEEK HP3, a material from the polyaryl ether ketone family, is the first high-performance polymer selected for use in the new system and readied for market by EOS. The material is produced in accordance with ISO 9001 and is of highest quality.

### Process

The High Performance Polymer laser-sintering process is operated at up to 385°C. These elevated process temperatures enable the creation of parts with extremely good performance. The process characteristics known from traditional laser-sintering are comparable, but the material used, the temperatures required and the resulting product characteristics are completely different.

The process control of this newest layer building

process differs significantly from the traditional process. For example heating-up and cooling-down is performed in a parameterised manner due to the higher level of temperature to be bridged. The system contains an optional Online-Laser-Power-Control (OLPC) which measures in real-time the actual laser output-power and optionally does also a closed loop control of the laser power.

### System

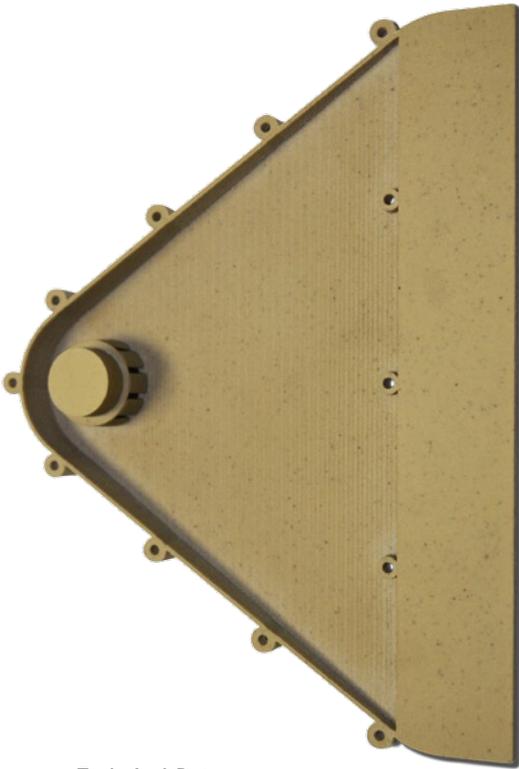
The system is based on the sophisticated, tried and proven EOSINT P 730 and is built to fulfil the demands of high temperature processing with newly designed modules such as processing chamber and exchangeable frame. The system is designed for e-Manufacturing – the fast, flexible and cost efficient production directly from electronic data. The modular setup of the new components prepares the system for future improvement innovations to be added through upgrades.

Highly efficient insulation means that the energy consumption of the EOSINT P 800 is only slightly increased compared to the EOSINT P 730, although the process operates at a much higher temperature level than conventional polymer laser-sintering processes.

### Material

EOS PEEK HP3, a high performance polymer, is a material with outstanding mechanical and chemi-





cal properties. The base product is transformed into powder form in fully quality controlled steps and modified to be processed on the EOSINT P 800. The laser-sintered parts reach tensile strength up to 95 MPa and a Young's modulus up to 4400 MPa. These values are up to 100% above those attained by the PA 12 and PA 11 materials currently available. The long term usage temperature varies depending on the application mode from 260°C (electrical), 240°C (mechanic static) to 180°C (mechanic dynamic).

These facts lead to outstanding application properties. For example the burning behaviour conforms to UL 94-V0. The material is biocompatible and can be sterilized. As a result of their outstanding material properties, high-performance polymers are well suited for numerous applications such as medical, aerospace or motor sports.

#### Technical Data

<i>Layer thickness (material-dependent)</i>	<i>typically 0.12 mm (0.005 in)</i>
<i>Support structure</i>	<i>not necessary</i>
<i>Laser type</i>	<i>CO<sub>2</sub>, 2 x 50 W</i>
<i>Precision optics</i>	<i>F-theta lenses</i>
<i>Scan speed during build process</i>	<i>up to 2 x 6 m/s (19.7 ft/sec)</i>
<i>Power supply</i>	<i>32 A</i>
<i>Power consumption (nominal)</i>	<i>4.5 kW</i>
<i>Nitrogen generator</i>	<i>integrated</i>
<i>Compressed air supply</i>	<i>minimum 6,000 hPa; 20 m<sup>3</sup>/h (87 psi; 26.2 yd<sup>3</sup>/h)</i>
<b>Dimensions (B x D x H)</b>	
<i>System incl. switchgear cabinet</i>	<i>2,250 mm x 1,550 mm x 2,100 mm (88.6 x 61 x 82.7 in)</i>
<i>Control terminal</i>	<i>1,045 mm x 850 mm x 1,620 mm (41.1 x 33.5 x 63.8 in)</i>
<i>Powder conveying system</i>	<i>1,890 mm x 1,350 mm x 1,550 mm (74.4x 53.2 x 61 in)</i>
<i>Break-out station</i>	<i>1,600 mm x 800 mm x 1,370 mm (63 x 32 x 53.9 in)</i>
<i>Recommended installation space</i>	<i>4.8 m x 4.8 m x 3.0 m (189 x 189 x 118 in)</i>
<i>Weight</i>	<i>approx. 2,300 kg (5,071 lb)</i>
<b>Data preparation</b>	
<i>PC</i>	<i>current Windows operating system</i>
<i>Software</i>	<i>EOS RP Tools; Magics RP (Materialise)</i>
<i>CAD interface</i>	<i>STL. Optional: converter to all common formats</i>
<i>Network</i>	<i>Ethernet</i>
<b>Certification</b>	<i>CE, NFPA</i>

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*EOS has been developing technologies and processes for Rapid Prototyping since 1989. Today the company is the world-wide leading manufacturer of laser-sintering systems for Rapid Prototyping, Rapid Tooling and Rapid Manufacturing. Laser-sintering is the key technology for e-Manufacturing.*

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