EOSINT P

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Plastic laser-sintering for direct manufacture of styling models, functional prototypes, patterns for plaster, investment and vacuum casting, end products and spare parts

Laser-sintering is well known as the technology of choice for ensuring the quickest route from product idea to market launch. Innovative companies from a broad range of industries are using this technology today in every stage of the product life cycle for batch-size optimized production.

Rapid Product Development with laser-sintering technology from EOS accelerates Simultaneous Engineering. Development quality increases and errors can be avoided or detected early on before they cause high costs or endanger the products' timely launch. Small series of niche and trend products can be manufactured economically and flexibly, as can spare parts on demand. Manufacturers are thus able to react to market fluctuations at short notice and without the risk of high start-up investments. Users of laser-sintering technology thereby increase the quality of their products, their innovative power and profitability.

With various different building materials, laser-sintering technology offers a broad range of applications: fully functional prototypes, series components, moulds or tool inserts for plastic and metal parts.

EOSINT P systems build plastic parts from polyamide or polystyrene directly from CAD data, without support structures and in a short period of time. The systems allow for the efficient production of fully functional parts up to a size of 700 mm x 380 mm x 580 mm. Through intelligent exposure strategies and process control, they offer a very high building speed and excellent part quality. Further parts to be built can be loaded during the building process as well. High process integration and automation guarantee minimum turn-around times. EOSINT P systems thus combine the flexibility of a Rapid Technology with the automation and efficiency of mass production.

Companies which develop, manufacture and supply products are today confronted with many different demands and market trends. Innovative companies ensure their competitive advantage and success by rapidly adapting to new situations in every phase of the product life cycle:

DEVELOPMENT

- **Shorter time to market**
- **More product variants**
- **Increasing design complexity**

→ Rapid Prototyping

PRODUCTION

- **Mass customization**
- **Niche markets**
- **Fluctuations in demand**

→ Rapid Manufacturing

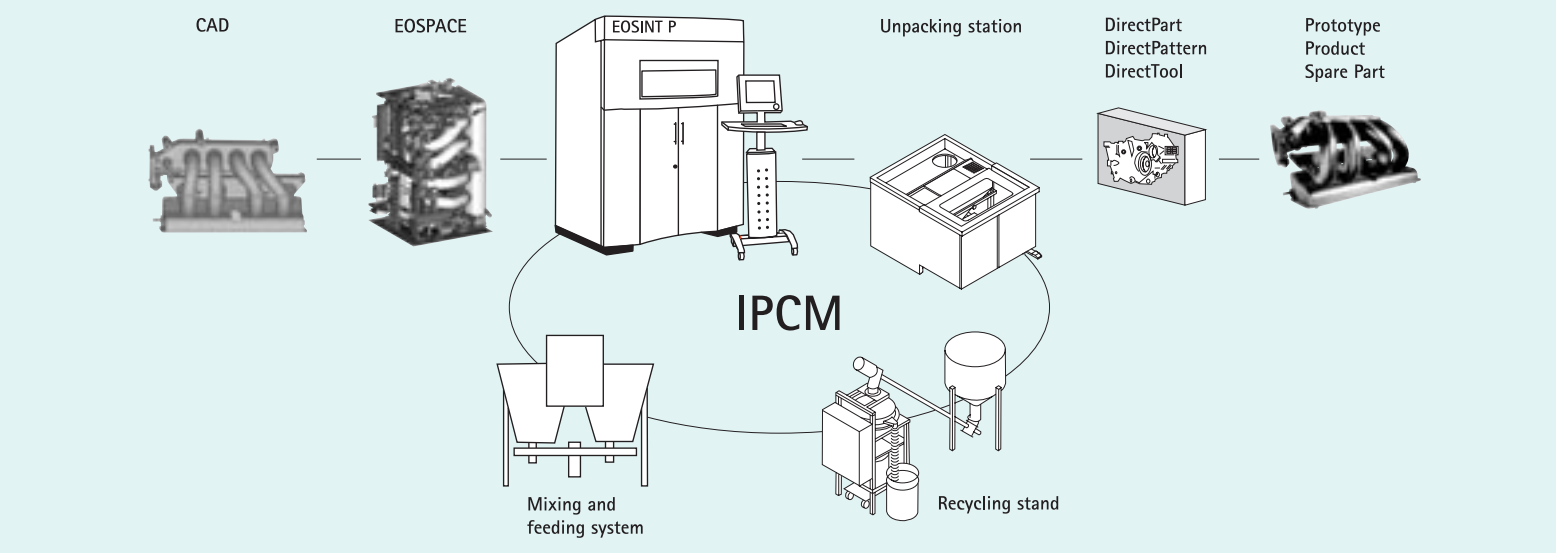
SPARE PARTS PRODUCTION

- **Fast availability**
- **Minimized inventories**
- **Reduced warehousing costs**

→ Spare Parts on Demand

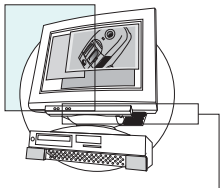
Automation and intelligent functionality – EOSPACE and IPCM

The software EOSPACE positions parts automatically in such a way that the build envelope is used optimally or that the required building height is reduced to a minimum. The ergonomic peripheral devices with a high degree of automation guarantee highest productivity, the basis for integration into an industrial environment. Integrated Process Chain Management (IPCM) components include automatic powder feeding with a mixing and feeding system, an unpacking station with exchangeable frame docking system and powder recycling in a recycling stand. The concept of IPCM increases productivity and user friendliness.

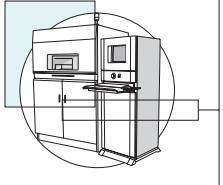


EOSINT P *Process chain and IPCM. The ideal solution for the integration into an industrial environment.*

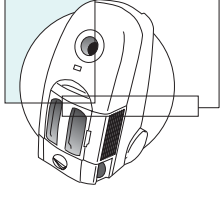
1. CAD-*Data*



2. EOSINT *P*



3. Prototyp
or End Product



DirectPart®:
Direct manufacture of fully functional parts
Computer-aided design of the product – laser-sintering of the three-dimensional CAD data – ready. Fully functional parts cannot be produced faster.

EOSINT P with Polyamide

EOSINT P systems process polyamide powders to create strong functional prototypes with durable, flexible features quickly and cost-effectively. Even living hinges can be built. For example, in one project for a domestic appliances manufacturer 40 washing machine dispensers with snap connectors were built within 10 hours on an EOSINT P machine. Not only did the components have smooth surfaces, they were also highly accurate and could be used directly by the manufacturer for functional tests.

If necessary, the polyamide models can be easily finished in order to meet the high styling requirements of industrial product development. Using laser-sintering, the prototype for an automobile wheel rim was manufactured within just 6 hours. After the laser-sintering process, the prototype was high-temperature painted and used by the manufacturer for styling and wind tunnel testing.

The decision of whether to use laser-sintered parts as end- or series products is purely a question of costs, comparing the costs for tooling with those for laser-sintering the required number of parts. Frequently, several tools can be saved by functional integration of the parts while product design is optimized at the same time.

EOSINT P systems build parts suitable for series production within a short time and with excellent long-term stability. The parts are resistant against most chemicals and neither harmful to health nor the environment. The polyamide material PA 2200 is certified as biocompatible.

EOSINT P *with polystyrene produces models that are ideal as patterns for secondary processes such as plaster, investment and vacuum casting.*

EOSINT P with Polystyrene

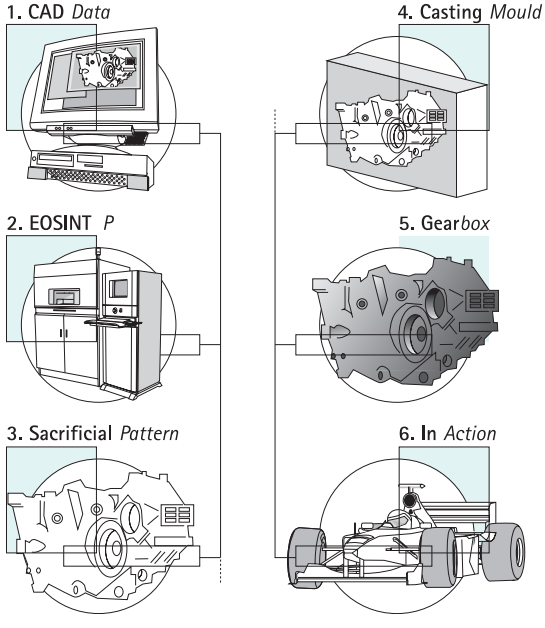
The quickest way to produce metallic castings is to use EOSINT P systems with polystyrene. The laser-sintered patterns are ideally suited for plaster casting, plaster investment casting and ceramic shell casting. Minimal residual ash and thermal expansion ensure maximum process reliability.

Combined with plaster investment casting, even complex metal castings based on polystyrene patterns can be created in one to two weeks.

Starting from a sacrificial polystyrene pattern built on EOSINT P, a pattern-making company produced a magnesium gearbox for a Formula 1 racing car under extremely tight deadlines and delivered it to the customer on time. The conventional manufacturing process would have taken twice as long and would have caused substantially higher costs.

EOSINT P for Vacuum Casting

The EOSINT P technology can also be used very well for the vacuum casting process, if flexible or transparent prototypes are required: The polystyrene material PrimeCast 100 is ideally suited for building master patterns.



DirectPattern®:
Cast metal parts with EOSINT P
Sacrificial patterns of any complex geometry can be created directly using polystyrene. Being an ideal starting point for secondary processes, they shorten the entire production time and reduce the effort significantly.

EOSINT P

FOR RAPID SUCCESS

EOS has been developing technologies and processes for Rapid Prototyping since 1989. It all started with a vision – the dream of manufacturing three-dimensional parts direct from CAD data using laser technology. Today the company is the leading European manufacturer of Rapid Prototyping, Rapid Tooling and Rapid Manufacturing systems. All over the world, manufacturing enterprises from many different sectors are using EOS technologies to improve their competitiveness and market position.

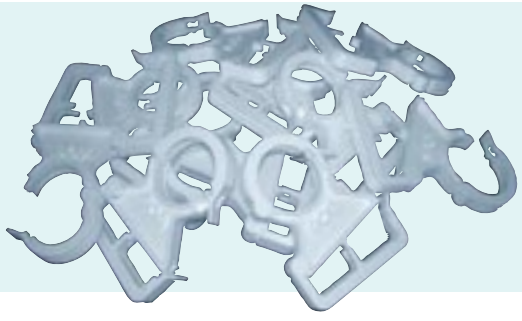
EOSINT P in product development

Voluminous parts can be built rapidly and cost-effectively with EOSINT P. The master patterns for vacuum casting of the housing of this table grill as well as the sacrificial patterns for the cast grill plate were created with PrimeCast 100 using EOSINT P. Five samples of the grill have been produced with laser-sintering, thereby saving 29% of the costs for the patterns. The parts excel in a multitude of characteristics: they are dimensionally stable, resistant against moisture, they possess an excellent dimensional accuracy, a very high surface quality and exceptional finishing properties.

EOSINT P in production

Individual design, highest functionality, simple and quick assembly / disassembly characterize this laser-sintered cable fixture. Conventional cable fixture modules have a complicated screw-design and typically consist of approx. 20 components. This fixture was built in one piece. A rubber inlay was added in order to achieve optimum clamping.

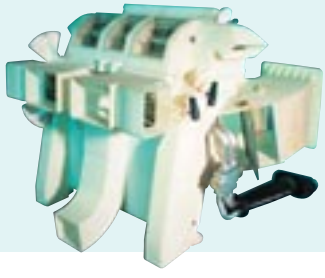
As an integral solution, the part has two directly integrated hinged joints and snap connectors. Several variants can be produced without causing additional costs. An efficient alternative without initial investment for tools and without the risk of having to sell a pre-determined number of articles.

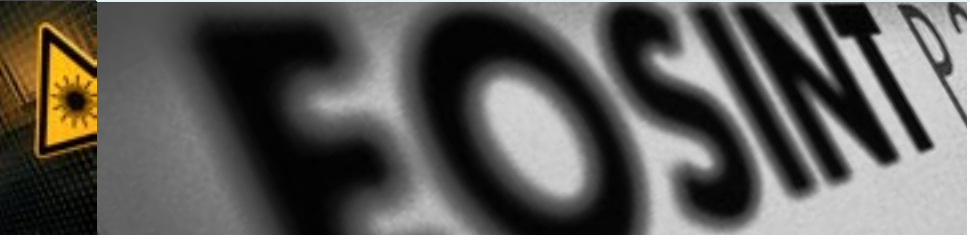


EOSINT P in spare parts production

All five parts of this air conditioning system were built in one job and in just 19 hours. The surface quality, dimensional accuracy and mechanical properties of the laser-sintered air conditioning system are similar to those of the series part and thus make the use as spare part possible.

The higher the complexity and number of tools required, the more profitable is the manufacture of spare parts on EOSINT P. As a result, companies can eliminate the storage and administration of tools and can decrease the costs for spare part production substantially – also for large and complex parts.





Status 12/02. Technical data subject to change without notice.

EOS is certified according to ISO 9001.

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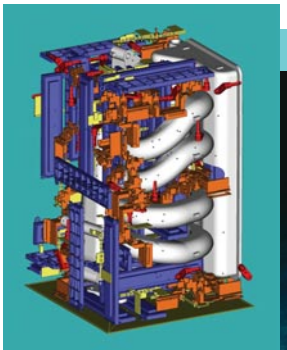
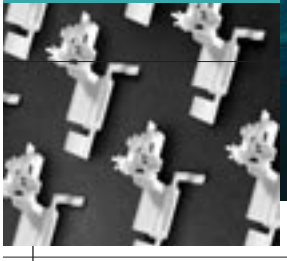
EOSINT P 380





EOSINT P 380

Plastic laser-sintering system for direct manufacture of styling models, functional prototypes, patterns for plaster, investment and vacuum casting, end products and spare parts

Laser-sintering is well known as the technology of choice for ensuring the quickest route from product idea to market launch. Innovative companies from a broad range of industries are using this technology today in every stage of the product life cycle for batch-size optimized production.

Productive Tool

With its broad range of applications, EOSINT P 380 offers economical solutions for all phases of the product life cycle. It is a highly productive system for processing thermoplastics. Plastic parts from polyamide or polystyrene materials are built directly from CAD data within a very short time and are suited for a variety of uses.

EOSINT P 380 builds fully functional parts as well as high-quality patterns for plaster, plaster investment and vacuum casting in a few hours. The excellent surface quality of the parts makes them ideally suited for use as end products. At the same time, parts fulfil the high demands of styling departments.

EOSINT P 380 creates parts without support structures, thereby avoiding time-consuming tasks such as the generation, assembly and removal of supports. Furthermore, it is possible to build several parts in one job and to add new parts during the building process. Once built, the parts can be removed from the process chamber and a new job can be started immediately.

The build volume of the EOSINT P 380 is up to 340 mm x 340 mm x 620 mm. With these dimensions, the height of 595 mm, which is especially important for the household appliances industry, can be realized. The volume also allows the efficient production of a broad range of parts.

Integration into an Industrial Environment

EOSINT P 380 distinguishes itself by ergonomic peripheral devices and a high level of automation. These features guarantee comfortable handling, the optimal utilization of the machine capacity and excellent integration into an industrial environment.

In order to optimize the process flow, EOSINT P 380 offers an Integrated Process Chain Management (IPCM). This concept includes automatic powder feeding, the unpacking station with exchangeable frame docking system as well as integrated powder recycling.

Automatically to Highest Productivity

For the preparation of the three-dimensional CAD data EOS offers the software EOSPACE. The software performs a surface-oriented part placement to guarantee maximum utilization of the build envelope and minimal building height. At the same time the software ensures that parts do not intersect.

The EOSINT P 380 offers the flexibility of a Rapid Technology combined with the automation and efficiency of mass production.

EOSINT P 380

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Technical Data

Effective building volume		340 mm x 340 mm x 620 mm (B x D x H)
Building speed (material-dependent)		10 – 25 mm height/h
Layer thickness (material-dependent)		typically 0.15 mm
Support structure		not necessary
Laser type		CO_2, 50W
Precision optics		F-theta lens
Scan speed		5 m/s
Power supply		32 A
Power consumption (nominal)		4 kW
Nitrogen generator		integrated (optional)
Compressed air supply		minimum 5,000 hPa; 6 m^3/h
Dimensions		
	Process cabinet	1,250 mm x 1,300 mm x 2,150 mm (B x D x H)
	Control terminal	610 mm x 820 mm x 1,785 mm (B x D x H)
	Recommended installation space	4,700 mm x 3,700 mm x 3,000 mm (B x D x H)
	Weight	approx. 800 kg
Data preparation		
	PC	current Windows operating system
	Software	EOS RP Tools; Magics RP (Materialise); Expert Series (DeskArtes)
	CAD interface	STL, CLI
	Network	Ethernet
Certification		CE

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