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## **A New Metal 3D Printer**

### **The One Process Milling Center**

#### **Notice about the Development and Release of the Linear Motor Driven OPM250L**

Sodick has succeeded in the development of and will be initiating sales from October 2014 of the new One Process Milling Center, the linear motor driven metal 3D printer OPM250L.

The OPM250L now offers the industry's first one-stop solution for the entire metal 3D printer process by applying the element technology of the Sodick Group to precision parts processing and mold making.

The OPM250L is slated to be exhibited at the 27th Japan International Machine Tool Fair (JIMTOF 2014) (30 Oct. Through 4 Nov. 2014 at the Tokyo Big Sight).

Selling price of the OPM250L is JPY65 million (excluding tax) and Sodick plans on a production system that manufacturers over 60 units of the OPM250L annually. The product will be manufactured at the Kaga Plant (Kaga City, Ishikawa Prefecture, Japan).

#### **● The Aims of Development**

When adapting the mold making process for plastic molding products by metal 3D printer, 3D cooling channels and narrow deep rib formations can be positioned inside of mold, enabling facilitation of complex mold making that could not be machined in conventional machines. Manufacturing that makes use of this technology would achieve high performance through the interlinked development of software and processing machines throughout all processes of molded product manufacturing: e.g. CAD/CAE that simulate the placement of optimal 3D cooling channels, CAM that generate paths for laser lights and cutting tools, metal 3D printers that actually shape molds, and injection molding machines that manufacture plastic molding.

However, in actual manufacturing practice, software and processing machines had been developed separate of one another. Since this necessitated the construction of separate metal 3D printer systems, not only was there no consistency between processes but a high degree of operational skills was

needed as well. Consequently, despite research departments embracing the new technology, those who did the actual manufacturing had found it difficult to integrate the technology.

Sodick has built up know-how in fundamental technology and an impressive track record in linear motor driven high-speed milling machines with high precision and high quality, NC units developed in-house, and injection molding machines that make possible precision molding through Sodick developed mechanisms.

The one-stop process and milling achieved by the newly developed OPM250L is a fully automated processing system that facilitates the manufacturing process by metal 3D printer. OPM250L opens the door to the continuous process of melting and solidification by the scanning of metallic powder by laser and then even finish machining by high speed milling with rotating tools.

By developing within the Sodick Group all processes of manufacturing utilizing metal 3D printers, we are able to provide a lineup of products that are based on a consistent design concept. Additionally, Sodick can provide servicing for all processes, including molding, achieving to expand use of metal 3D printers to work in manufacturing facilities where plastic molding takes place.

## ●Features of the OPM250L

### 1. **A high-precision all-in-one processing machine providing both melting and solidification of metal powder as well as mill finish processing in a single device**

The OPM250L is a fully automated machine that works to melt and solidify metal powder by scanning the surface of the metal with laser light and then submit the metal to a high-accuracy finishing process through high-speed milling using a rotating tool.

### 2. **Enables manufacturing of thicker products through its large stroke**

The OPM250L can be used to produce formed products measuring 250 mm (W) × 250 mm (D) × 250 mm (H) in size.

### 3. **Employs a laser with a maximum output of 500 W**

The OPM250L uses an Yb-doped fiber laser with a maximum output of 500 W as the laser oscillator used for the melting and solidification of metal powder facilitating producing of metal 3D printing at high speed.

### 4. **Utilizes the cutting mechanism used in the Sodick high-speed milling center**

Sodick has fostered a line of high-speed, high-accuracy cutting technology over the years using high-speed milling center developed in-house. The OPM250L provides a stable finishing process for a wide range of applications through use of a time-proven cutting mechanism that has performed successfully in this high-speed milling center.

### 5. **Adopts a Sodick-designed linear motor for the milling axis**

Sodick electrical discharge machines (EDMs) and high-speed milling centers utilize proprietary linear motors designed by Sodick itself to deliver excellent machining performance. The OPM250L uses a Sodick brand linear motor for the main control axes including the spindle drive axis used for high-speed milling achieving compatibility between both high speed and high accuracy.

## 6. Employs the Sodick-developed NC unit LN2RP

The OPM250L is a fully automated machine that faithfully executes NC programs created with CAM software. The NC unit LN2RP is a proprietary NC unit produced by Sodick developed specifically for use with the OPM250L to smoothly execute commands jointly with the CAM software.

### ●Features of OPM Laboratory Co., Ltd. and CAD/CAE/CAM

In developing the OPM250L, the Sodick Group was joined by OPM Laboratory Co., Ltd., an organization that has been exclusively dedicated to the manufacturing business related to metal 3D printers for a decade. The two companies have been forging ahead with the joint development of the product. OPM Laboratory develops and sells CAD software that assists with piping design for the optimal positioning of 3D cooling channels inside of molds, as well as CAE software that simulates resin temperature distribution when plastic molding is implemented with the designed molds.

OPM Laboratory also develops and sells CAM software that generates laser and rotating tool paths for designed mold shapes that can be processed by the OPM250L.

### ●Synergy with Sodick's V-LINE<sup>®</sup> Injection Molding Machines

Sodick injection molding machines adopts two-stage "V-LINE<sup>®</sup>" method for plasticizing and injection. This method achieves precision weighting and high-speed injection of resin. When processing plastic injection molding dies with internal 3D cooling channels manufactured by the OPM250L in the Sodick V-LINE<sup>®</sup> injection molding machines, the benefits of the resultant synergy can be reaped from molded products needing high precision and complex shapes.

\*V-LINE<sup>®</sup> is a registered trademark of Sodick Co., Ltd. in Japan.

### ●Main Specifications of the OPM250L

- **Max. potential print size (Width) × (Depth) × (Height)** : 250 mm × 250 mm × 250 mm
- **Max. workpiece loading weight** : 100 kg
- **Max. laser output** : 500 W
- **Max. spindle rotation speed** : 45,000 min<sup>-1</sup>
- **Tool holder type** : Dual Contact Shrink Fit Holder shrink fit tool holder HSK-E25
- **No. of stored tools (ATC)** : 16 tools
- **Machine dimensions** : 1,870 mm × 2,200 mm × 2,055 mm (Excl. peripheral devices)
- **Machine weight** : 4,500 Kg (Excl. peripheral devices)

- An OPM250L unit



•For inquiries:

Please contact the Sales Promotion Office of the Sodick Co., Ltd. Marketing Center at 045-530-2006.