



■ Deutsche Technoplast GmbH, Germany

Precise Production Processes

Plastic-metal combinations for LED housings are manufactured with high precision using Sinumerik 840D-controlled milling machines.

Pictures: Deutsche Technoplast GmbH

Light Emitting Diodes (LEDs) have a promising future ahead of them. They are energy efficient, have a long service life and a low heat dissipation. These factors are promoting their use in an ever-increasing number of industrial applications, from mobile phone displays to traffic light systems and even vehicle lighting. Production of complex plastic-metal combinations that are used in LED housings requires an extremely high level of tool accuracy.

Deutsche Technoplast GmbH recognized this trend years ago and started manufacturing LED housings

for various sectors. The company, which is family-owned for two generations, employs more than 100 people in the company headquarters in the German town of Wörth an der Donau and an additional 50 people at its Malaysian office in Melaka.

Maximum precision and process reliability

Thanks to its expertise in manufacturing high precision molds for plastic injection molding and in high temperature thermoplastic processing, the company

is now a key partner for international companies in the automotive and electronics industry. As Technoplast Chief Executive Hans Jürgen Bauer explains, LED housings are made from a complex plastic-metal combination, which presents a particular challenge for production and requires maximum precision and process reliability.

The company's precision mold production facilities use various machining centers, ranging from a Spinner MT350-500 turning machine to a Jung J630D flat grinding machine and DMU 70 and DMG HSC 20 milling center. "The machines are equipped with Sinumerik CNCs and can, therefore, realize their full individual potential," explains Karl Baumann, head of Metal Machining at Technoplast. "The Sinumerik 840D controls all machining stages with the same level of efficiency and via the same user interface. We could not do without it, particularly for a product that is not a traditionally milled part, but one that we still manufacture on the DMU 70. This would not be possible with any other control system."

Logical and intuitive

High reliability and flexibility are named by Baumann as key attributes of the motion control system, which is equipped with ShopMill, the operating and programming interface for milling and drilling. Using the software reduces the expense for programming and operation as well as setting up of tools and workpieces, allowing the manufacturer to respond flexibly to customer requirements. Even with low-volume production series, the way from drawing to finished workpiece is considerably faster and more reliable.

The user interface simplifies programming work on machinery as it features graphical animations and is structured in an intuitive manner. Although more than 90 percent of the programs at Technoplast are created for DMU 70 systems at external workstations, subsequent adaptation is carried out at the machine. According to production employees, ShopMill is structured so logically and intuitively that it is possible to work with the software without errors and productively within just a few days.

Fast and convenient data transfer

Once a component has been programmed, the employee can follow the production process in setup mode with the machine door open thanks to the Safety Integrated solution on the Sinumerik 840D.

If any operating errors occur, dangerous movements are brought to an immediate standstill and the power to the motor is quickly cut. The safety mode allows speeds of up to 2 meters per minute. If irregularities occur, Safety Integrated ensures that all drive systems stop within a maximum of 1 to 2 mm.

As Deutsche Technoplast GmbH primarily programs its machines externally, rapid data transfer is



Technoplast achieves maximum precision to less than 5 micrometers and a perfect surface finish thanks to the HSC 20 milling machine and Sinumerik 840D

important. For the Sinumerik CNC, data transfer occurs via the USB interface or the network. Head of Metal Machining Karl Baumann also sees advantages in terms of rapid and user-oriented block search: "The program immediately makes the right tool available with corresponding feed speed and spindle speed at the previously selected re-entry point." This is particularly effective.

Linear motors ensure high dynamics

The DMG HSC 20 milling center, also introduced at the company in January 2008, is particularly impressive when it comes to high precision. "We must maintain an overall tolerance of less than 5 micrometers in the production of some electrodes. We consciously chose the three-axis version of the HSC 20 to ensure



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Karl Baumann,
Head of Metallbearbeitung,
Deutsche Technoplast GmbH

the stability and accuracy of the machine required to achieve this," explains Baumann. The work spindle has an output of 7 Kilowatts and reaches a maximum speed of 40,000 rpm at a torque of 6 Newton meters. The Siemens 1FN3 linear motors also ensure an extremely high level of dynamics and a maximum feed rate of 40,000 millimeters per minute. ■

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