

- World record - Depth to diameter ratio bigger than 1000

A new world record was set in the successful development of EDM fast hole drilling processes by Mr. Markus Munz, chief of the scientific department at the Institute of Materials and Processes (IMP) in Karlsruhe, Germany.

He and his colleagues succeeded in drilling a hole with a depth of 1.036 mm. This is already amazing, but what is astonishing the professional world is the diameter of the tool (electrode). The electrode has an external diameter of only 1 millimeter. This is an extraordinary operation as the depth to diameter ratio is bigger than 1000.

It is no wonder that this result is attracting



Quelle: IMP/ Munz

worldwide attention, especially when it comes to the machining time. It only took 30 minutes to produce the drilled hole. This equates to an averaged feed rate of 0,575 mm/ s.

These types of operations are only possible with EDM fast hole drilling machines which are used in the production of the medical, aerospace and space industry. Other competing applications like laser cutting or chipping are no longer in the position to produce such big depth to diameter ratios.



As the EDM fast hole drilling process is based on electrical discharges between the workpiece and the electrode in an isolating fluid a small gap is remaining during the application. Therefore the material removal takes place without any mechanical contact. A pulsed generator supplies the required energy for the electrical discharges which leads to the evaporation and melting of both material partners. In this case the generator supplies 14.000 impulses per second.

A special feature in the EDM fast hole drilling process is the flushing, which plays a major role in all EDM applications. Through the inside of the hollow electrode the dielectric fluid is pumped with pressures up to 250 bars. In the manner a relatively strong flushing is created at the hot spot which is affecting the EDM process.

The right choice of the dielectric fluid is extremely important. Therefore

Markus Munz is working with the IonoVit S from oelheld GmbH in Germany. IonoVit S enabled him to increase the stock removal rate respectively to increase the feed rates. The electrode wear was greatly reduced which cut the costs for electrodes by more than 50 %.

This world record is a perfect example for a successful cooperation between universities and business companies. Everybody benefits from this symbiosis and therefore oelheld GmbH from Germany is consequently developing its product quality as this is the key to success of its products.



Quelle: IMP/ Munz

Markus Munz says: "Within the research and development activities exists a strong network of national and international partners from the industry and universities. The company oelheld GmbH is since many years a competent partner and supporter of the scientific department at the Institute of Materials and Processes (IMP) in Karlsruhe, Germany. World records like this amaze people and only if Germany extends its technological leadership, our companies can compete on an international level."



Quelle: IMP/ Munz

For additional information please visit:
www.hs-karlsruhe.de
www.oelheld.de



Vita of Markus Munz:

09/2000 – 09/ 2006: academic studies at the university of Karlsruhe/ Germany – engineering and economy (diploma & master)

11/2006 – today: staff member of the scientific department at the Institute of Materials and Processes (IMP) – department of production engineering. Key activities: EDM, injection molding

02/ 2009 – today: chief engineer/ member of the board at the IMP



oelheld GmbH:

When Carl Christian Held started the production of machine oils and greases in 1887, he laid the foundation stone for a medium-sized company that over the past decades has established itself as a specialist in the lubricants sector. oelheld GmbH has been managed by Dr.Manfred Storr since 1973.

