

## ***Press Release***

### **Unique conformal cooling techniques achieved by LaserCUSING®**

Concept Laser GmbH was formed in 2000 as a subsidiary company of the Hofmann Innovation Group AG, founded by Siegfried Hofmann in 1958, and which has grown become one of the most renowned service providers for the plastics processing industry. The specific vision of Concept Laser was the development of their unique selective laser melting process or LaserCUSING® a phrase coined by Concept Laser from the combination of the words Concept and Fusing. This unique technology and the process advantages which it offers is now exclusively available within the United Kingdom from ES Technology Limited.

### **Making the impossible – practical!**

LaserCUSING® is a process which involves the fusion of a metallic powder by a scanning laser to produce complex and intricate 3 dimensional components. The layer by layer construction of the part makes it possible to design and manufacture components which would otherwise be impossible or impractical to produce by traditional machining methods. This process was pioneered by Concept Laser for the mould tool manufacturing industry and initially the parent company Hoffmann Innovation Group AG, were quick to seize the competitive advantages which could be realised by using LaserCUSING® technology.

Plastic injection moulding is today a highly competitive business and mould tool design influences not only quality and cycle times but ultimately production output and profit. For over 6 years now forward-thinking mould tool manufacturers have used the unique characteristics of LaserCUSING® to enable them to win tooling orders and provide their customers with the competitive advantages which they need to continue to win production orders for components.

Continued/

Continued /

## Some like it cool

A major influence in the ongoing success for users of the LaserCUSING® process has been the ability to design and manufacture mould tools and inserts which use conformal cooling principals (Fig.1). The opportunity to cool critical regions of the mould tool frees the users of LaserCUSING® technology from the traditional constraints of tool design.



(Fig.1 – Conformal Cooling In Mould Insert)

The ability to produce high resolution features such as conformal cooling channels and thin wall sections, which also retain excellent mechanical properties, means that mould tool performance is improved and moulding cycle times reduced. The resultant improvements in mould tool performance and the reduction in cycle time can mean for example, that the same productivity can be obtained from a highly efficient 12 cavity tool as would normally be achieved from a less efficient 16 cavity tool. The smaller conformally cooled mould tool may allow for the use of a lower tonnage injection moulding machine and therefore lower hourly running costs and lower costs per component.

A further example of the competitive advantages made possible with conformally cooled mould tools manufactured using LaserCUSING® is the capability to produce the required volume from fewer tools. In one instance 2 tools incorporating conformal cooling principles were proven to have the capacity to produce the required yearly volume in only a 9 month period. By contrast 3 tools using conventional cooling principles would be required to run for the full 12 month period to achieve the same volume of parts. In this example the conformally cooled tools were capable of achieving double the output per tool.



(Fig.2 – Conformal Surface Cooling)

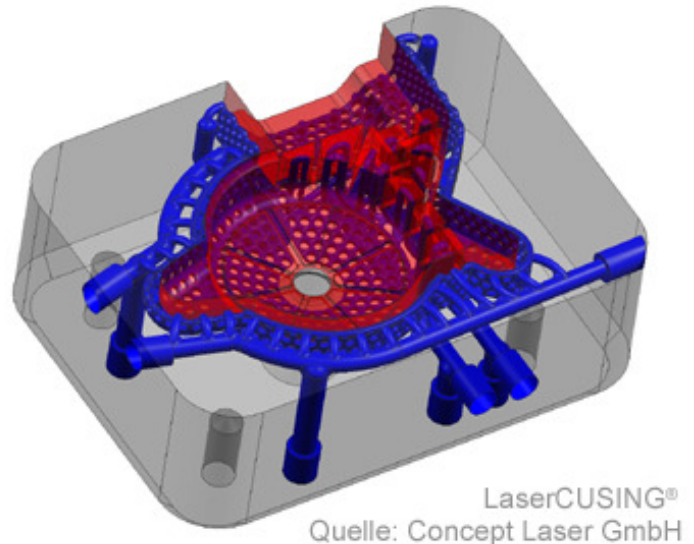
The principals of the LaserCUSING® process enables tool designers to place cooling channels and features exactly where they will provide the maximum benefit to the process, and even highly complex components 3 dimensional components (Fig.3) can incorporate conformal cooling principals.

Continued /

Continued /

## Concept to reality

Concept Laser's *M3 Linear* system (Fig.4) defines state-of-the-art tool making. The *M3 Linear* does not operate only using galvo scanning optics, instead beam deflection is controlled via a combination of galvo mirrors and linear direct drives. This guarantees accuracy in the manufacturing process at the same time as offering a very large build envelope.



( Fig. 3 - Complex 3 D Components Can Incorporate Conformal Cooling Principles)

Further, the exposure strategy ensures that heat is applied in a random pattern over larger exposure areas in a 'chequer-board' style. This patented laser processing concept makes it possible to produce solid and large volume components with minimal internal stresses.



Concept Laser offer the choice of a 100W diode-pumped solid state laser (cw + pulsed), or 100W/200W fibre lasers (cw) within the *M3 Linear* system. A maximum scanning speed of 7 metres per second can be achieved and the system has a focal diameter of 70-200 $\mu$ . For LaserCUSING® operations the system has a build envelope of 300 X 350 X 300mm and can produce layers of between 20 $\mu$  and 80 $\mu$ . Positioning resolution of the linear motors used in this system is 15 $\mu$ .

( Fig. 4 - *M3 Linear* - Modular System by Concept Laser GmbH)

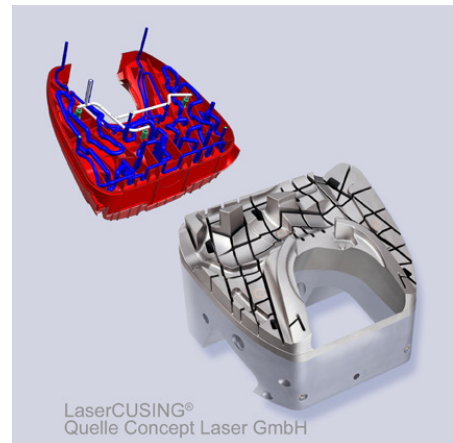
Features such as "wheel out" build chambers for easy access and filtered semi-automatic powder re-cycling make the *M3 Linear* simple to use. The *M3 Linear* system can also be used for laser marking and laser erosion, using optional process modules enabling the system to perform 3 separate processes using only one laser.

Continued /

Continued /

This new partnership with Concept Laser not only brings LaserCUSING® technology to the UK but also enhances what was already a comprehensive range of products and services offered by ES Technology Limited, including:-

- Sub-contract laser marking services
- Laser and optical components
- After sales service
- Design and manufacture of laser marking systems



For Further Information Please Contact:-

Mr Colin Cater  
ES Technology Limited  
Telephone - 01327 701 107  
E-mail - [c.cater@estechology.co.uk](mailto:c.cater@estechology.co.uk)  
Web Site - [www.estechology.co.uk](http://www.estechology.co.uk)