

3D Milling, Fine-Cutting and Boring with a Laser

LASERTEC Series

**DMG**



**3D Milling with the LASERTEC 40:**  
6-axis technology allows automatic  
machining of vertical walls with a  
slanted laser.

## LASERTEC Series: Flexible, Fast and Reliable.

New and unique laser technology is opening up extra possibilities for the machining of filigree workpieces.

The LASERTEC 40 is setting new standards of laser milling for engraving and filigree technical components in tool and mould making, with 6-axis technology (3 optical and 3 to 4 mechanical axes), combined with powerful software options.

The LASERTEC 80 FineCutting combines highly dynamic precision engineering with the most advanced laser technology. The modular machine design offers maximum flexibility in the area of laser fine-cutting, and delivers high machining speeds and the best quality for laser fine-cutting of thin plates, tubes and 3D workpieces.

The LASERTEC 80 PowerDrill offers unique possibilities for precision boring of turbine components in the aerospace and power generation sectors. The combination of excellent precision, intelligent software and an innovative periphery ensures the best quality and increased efficiency.



04 | 05  
LASERTEC 40  
Machine and Technology



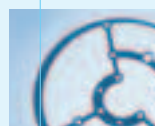
06 | 07  
LASERTEC 40  
Applications and Parts



08 | 09  
LASERTEC 40  
Control Technology



10 | 11  
LASERTEC 80 FineCutting  
Machine and Technology



12 | 13  
LASERTEC 80 FineCutting  
Applications and Parts



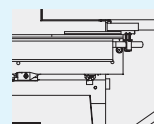
14 | 17  
LASERTEC 80 PowerDrill  
Machine and Technology



18 | 19  
LASERTEC 80 PowerDrill  
Applications and Parts



20 | 21  
LASERTEC 80  
Control Technology



22 | 23  
LASERTEC Series  
Options  
Floor plans



24 | 25  
LASERTEC Series  
Technical Data

## LASERTEC 40 / 3D-machining: The efficient method for the machining of filigree cavities.



- 1|** Redirect mirror moves the laser to the workpiece, to remove material, at angles of as little as 5 – 15°  
**2|** Option S: the machining of vertical walls with a wall angle of up to 0° is possible through slanting the laser and continuously repositioning of the workpiece  
**3|** Option SI: the integrated in-process control allows contact-free surface adjustment during machining

### LASERTEC 40:

With travels in X / Y / Z:  
400 / 300 / 500 mm |  
15.7 / 11.8 / 19.7 in.

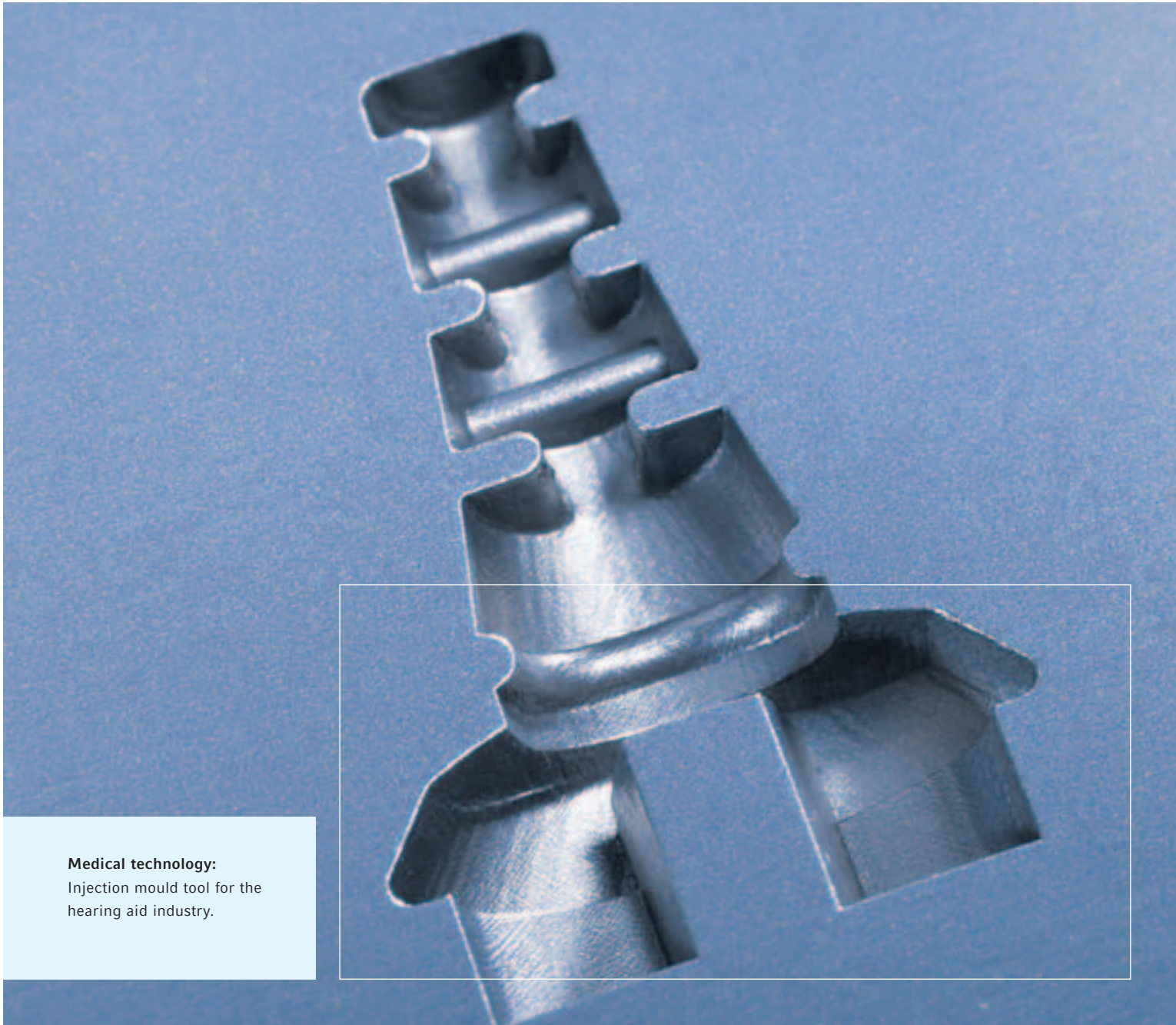




**14** Well laid-out design of the interior: a wide-opening swivel-door for easy access **15** Compound table with digital servo-motors and direct measuring system **16** Beam-guidance by precision scanner; calliper; positioning camera; option: integrated rotary axis (4th axis) **17** Option: new laser source, diode-pumped laser **18** Standard version: Q-switch Nd:YAG-laser with 100 W average power

## Highlights

- \_ Filigree machining of **2D and 3D mould components** with 3 optical and 3 to 4 mechanical axes
- \_ Machining of the most diverse materials (steel, aluminium, brass, carbide, ceramics, graphite, PCD, CBN, etc.)
- \_ Beam-guidance with **precision scanner** with highly dynamic mirrors, **callipers** for positioning the Z-axis and for depth control, **high-resolution CCD camera** for exact workpiece positioning
- \_ **Scanning-field in a 60 x 60 mm | 2.4 x 2.4 in.** area; automatic repositioning with seamless transition for larger workpieces
- \_ **Vertical walls** (up to 5 mm | 0.20 in. depth, combined with optional CO<sub>2</sub> cleaning) can be machined through 6-axis technology and defined draft angles are possible through the slanted laser
- \_ **Excellent surface precision** in all depth ranges with continuous in-process monitoring
- \_ **Unattended machining** is possible for single or multiple workpieces
- \_ Intelligent and user-friendly **LaserSoft 3D-control** on **Windows™ operating system**
- \_ **New software features:** 3D volume generator, 3D contour lasering, 3D engraving with defined wall angle, 3D grey scale machining
- \_ **Diode-pumped laser** for surface qualities up to  $Ra = 0.8 \mu m$  | 0.00003 in., better dimensional and contour accuracy, long-term stability (diode-exchange only after 10,000 h of operation)



**Medical technology:**  
Injection mould tool for the  
hearing aid industry.

## Application

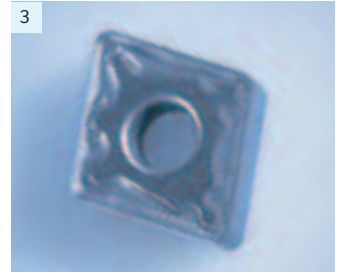
- \_ **Mould / Tool Making:** mould making and rapid-tooling: micro switches, electronics and semiconductor moulds, medical technology, injection moulds, mould inserts, gaskets, erosion electrodes made of graphite up to 10 mm | 0.39 in.
- \_ **Engravings and die manufacturing:** 3D surfaces, logos, coins, embossing tools and mould dies
- \_ **Tools:** cutting inserts made from carbide, milling and cutting of PCD and CBN materials
- \_ **Miniature models:** model cars / trains, toys
- \_ **Job-order production:** flexible manufacturing, starting with simple engravings all the way to filigree precision moulds – on a single machine

## LASERTEC 40: Filigree machining of 2D and 3D mould components with 6-axis technology.

The LASERTEC 40 Series machines the finest contours and cavities, 3D laser engravings and components with vertical walls, using maximum process safety and premium quality, without tool cost or EDM machining.

The most diverse materials, such as hardened steel, graphite, ceramics, carbide, or even extremely dense materials such as CBN and PCD can easily be machined. The machine program on the LASERTEC 40 is automatically generated from 3D CAD data.

The LaserSoft 3D software supports the simple incorporation of lettering and logos into the 3D-surface, such as embossing dies, artistic reliefs, jewellery, or tools for medals and coins.

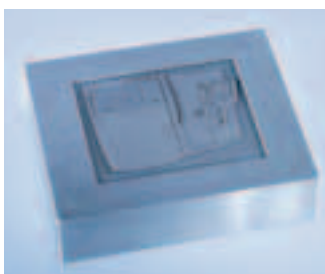


- [1] Electronics industry: insert made from tool steel for a die-casting tool  
 [2] Automotive industry: tool for plug housing  
 [3] Tool making: cutting insert made from carbide  
 [4] Die casting mould made from hardened tool steel  
 [5] Mould making: die-casting tool for micro-switches, machining with vertical walls  
 [6] Mould making: die-casting tool for mobile phone keyboard, machining with vertical walls  
 [7] Application of lettering through laser engraving

## LASERTEC 40: User-friendly operation with new 3D-software features.

The CNC-controls are optimally integrated into the performance range of the LASERTEC 40 Series, and have high storage capacities, fast processors, 15" TFT screens and supportive programming software.

The LaserSoft 3D-software generates the entire machine program automatically on the basis of 3D CAD data. New software features, such as 3D volume generator, 3D contour lasering, 3D engraving, and 3D greyscale machining, increase operator comfort and expand the application range of the LASERTEC 40 Series.



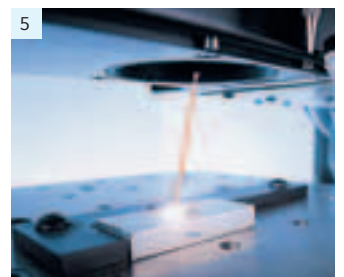
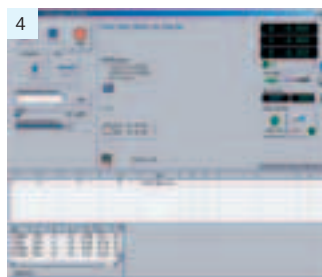
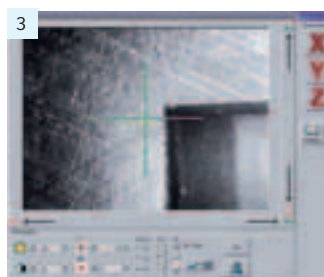
### LaserSoft 3D Software features:

**3D Volume Generator:** With this software, laser/milling can be combined with HSC-milling. The laser removal volume for pre-milled workpieces is automatically computed on the basis of the utilized milling tool. Consequently, the exact volume of material that can be removed by lasering is computed, and no longer needs to be removed by milling.

**3D Contour Lasering:** Contour lasering means contour-parallel burnishing with the laser. This results in a uniform surface, which is especially useful for flat component contours. The software leads to a significant increase of workpiece quality, especially when machining coins, logos, forming dies, etc.

**3D Engraving with defined wall-angle:** The program for the laser machine is automatically generated on the basis of 2D CAD data in DXF format, taking the desired depth and the drafting angle into consideration. This simplifies handling for the machining of engravings, logos, symbols, and simple tools, etc.

**3D Greyscale Machining:** Different grey levels can be assigned to corresponding depths on the basis of greyscale images in a bitmap format. This permits machining of 3D surfaces, surface structures and logos, etc. The software can even generate a program starting with a scanned paper blueprint.



[1] The volume to be removed in STL format is directly transferred to the control [2] Position and reference point are determined, and the automatic computation of the machine program begins [3] The CCD camera facilitates exact positioning in  $\mu\text{m}$ - 1 inch-range [4] After the selection of material specific parameters, machining is initiated [5] The adjustment of the machining depth occurs via calliper or optical sensor (option SI). After program initiation, the workpiece is completed in unattended operation.

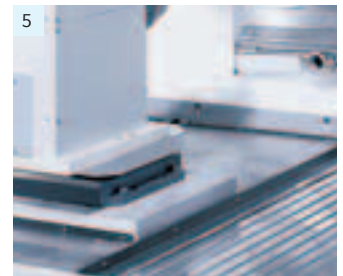
## LASERTEC 80 FineCutting: 1.2 g acceleration and cutting gap of up to 20 $\mu\text{m}$ | 0.0008 in.

The LASERTEC 80 FineCutting features very high machine precision, exact positioning accuracy, with excellent dynamics in X and Y and linear rotary axes.

The entire machine has been designed for precision: X / Y compound table with linear drive technology, a massive machine bed with 3-point support, and direct measuring systems on all axes, highly dynamic torque motors, automatic distance adjustment and user-friendly controls, thus ensuring that exceptional cutting quality is guaranteed. The laser moves along the Z-axis, resulting in a direct beam with a short and continuous optical path.



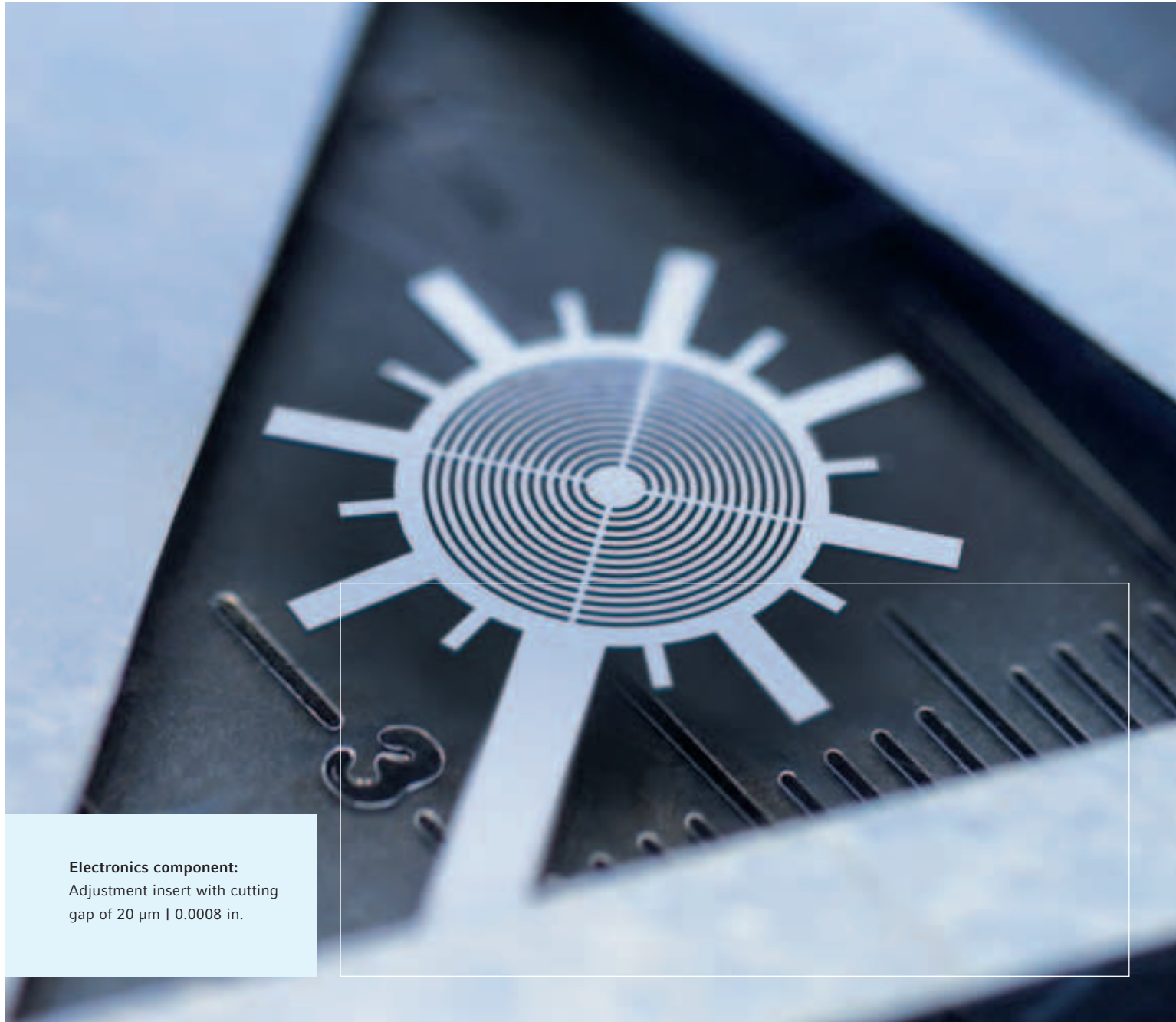
**LASERTEC 80 FineCutting:**  
with travels in X / Y / Z: 800 / 500 / 700 mm |  
31.5 / 19.7 / 27.6 in. and Siemens 840D powerline  
with integrated laser control.



[1] 3D laser machining of a grid casing, optional 4th and 5th axis for greater flexibility [2] Automatic distance adjustment compensates for unevenness in the material [3] Compound table with linear drives [4] Automation-option through conveyor belt feed [5] Quick clamping system allows switching between 2D and 3D-operation in only minutes [6] Option: cutting box for easy incorporation of sheet metals [7] The massive machine bed made from polymer concrete forms the foundation for precision machining

## Highlights

- \_ **Super finishing** of thin plates (< 5 mm | 0.20 in. width), tubes and 3D-workpieces
- \_ **Laser cutting gap** of as low as 20 µm | 0.0008 in.
- \_ **2D / 3D laser machining** with highest precision and dynamics
- \_ Laser precision machine ( $P_{\max.} < 10 \mu\text{m}$  | 0.0004 in.) in a 3, 4 or 5-axis version
- \_ Highest dynamics due to **linear drives** on X and Y (acceleration > 1 g), as well as **torque motors** on all rotary axes
- \_ **Selection** of the best laser for each application
- \_ **Diverse laser beam sources:** pulsed Nd:YAG-laser from 15 to 500 Watts | 0.067 hp., CO<sub>2</sub> laser with 500 W to 3 kW | 4.0 hp. power
- \_ **Easy access** to work area and laser
- \_ **Wide application range** (sheet metal, tubes and 3D-moulds)
- \_ **Wide range of materials:** carbide, graphite, ceramics, PCD, CBN
- \_ **Automation option with robot loading** and **automatic conveyor belt feed**



**Electronics component:**  
Adjustment insert with cutting  
gap of 20  $\mu\text{m}$  | 0.0008 in.

## Applications

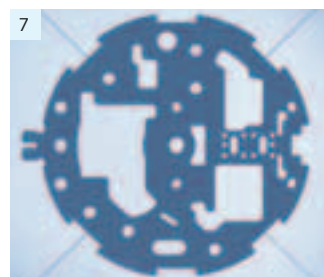
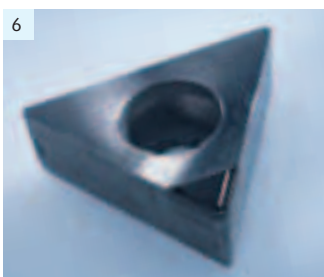
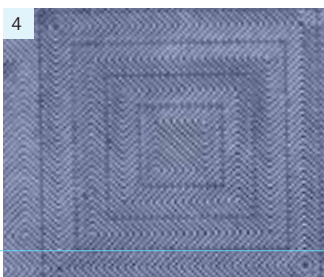
- \_ **Electronics:** stencils and punchings
- \_ **Medical technology:** implants, endoscopy and surgical tools
- \_ **Vehicle and tool manufacturing:** hydraulics components and jets
- \_ **Precision punchings:** prototypes and small series
- \_ **Job shop production:** mould / etching workpieces
- \_ **Tool making:** PCD, CBN and carbide cutting inserts
- \_ **Materials of the future**

## LASERTEC 80 FineCutting: Laser fine cutting of sheet metals, tubes and 3D workpieces.

The LASERTEC 80 FineCutting is a universal precision machine for dynamic laser fine cutting at the highest quality, with a cutting gap of up to 20 µm | 0.0008 in.

The machines of the LASERTEC 80 FineCutting Series are utilized in the most diverse industries, such as electronics, medical technology, machine construction and job order production. Availability of the best laser source and user-friendly programming allow unparalleled flexibility.

Today, prototypes and small series of punchings, medical implants and instruments, precise watch components and hydraulic components are manufactured on the LASERTEC 80 FineCutting.



**[1]** Electronics: individual display elements for the electronics industry with web widths up to 0.04 mm | 0.002 in. **[2]** Precision engineering: component for the watch industry with a bore hole diameter of 0.05 mm | 0.002 in. **[3]** Electronics: 3D laser machining of a grid bushing **[4]** Micro-web with a cutting gap of 20 µm | 0.0008 in. **[5]** Machine construction: precision insert for apparatus engineering, material thickness 0.01 mm | 0.0004 in. **[6]** Tool making: cutting of a PCD insert on a carbide disk **[7]** Watch component

## LASERTEC 80 PowerDrill: The innovation for precision boring of turbine components with a laser.

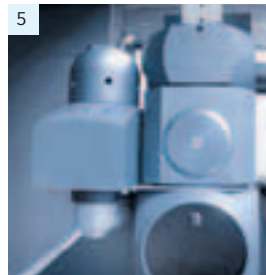
The LASERTEC 80 PowerDrill is in a class by itself, with the highest precision ( $P_{\max} = 10 \mu\text{m}$  | 0.0004 in.), best dynamics ( $X, Y > 1 \text{ g}$ ), an innovative periphery, and user-friendly operating software.

The entire machine is especially designed for the laser precision boring of turbine blades and other components in the gas turbine sector. The laser drilling programming system (LDPS) was developed particularly for this machine and offers user-friendly programming and operation. The integration of simulation features into the software eliminates collisions, during programming. The automatic infrared calliper brings the workpiece into the correct position, making extensive clamping devices unnecessary.

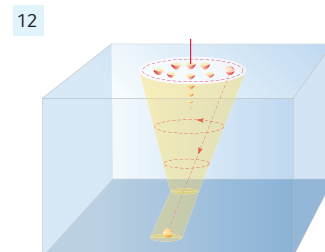
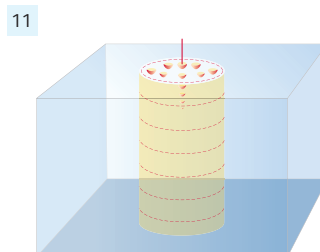
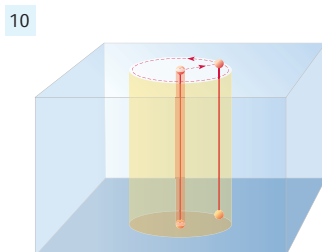
**LASERTEC 80 PowerDrill:**

With travels in X / Y / Z:

800 / 500 / 700 mm | 31.5 / 19.7 / 27.6 in.



**LASERTEC 80 PowerDrill:** |1| Easy access to the work area |2| CCD-camera for fast positioning |3| Welding of cover plates |4| Calliper for the automatic adjustment at the workpiece |5| Piercing control |6| Camera image of a turbine component



|10| Percussion method: fast and deep boring with up to 50 kW | 67.1 hp. laser power |11| Drilling: allows fast and precise boring not only of round but also of the most diverse geometries |12| Shaped hole drilling: bevelled and cylindrical bores can be performed in a single setup with time-saving 5-axis simultaneous machining



**LASERTEC 80 Shape:** |7| Insertion of the bevelled exit holes with mill-lasering |8| Shape machine version with 2 laser sources (1 boring and 1 milling laser) |9| Technology combination: laser boring of the cylindrical duct (step 1), incorporation of the bevelled exit holes with the milling laser (step 2)

## Highlights

- \_ **5-axis laser boring** in aerospace and generator technology
- \_ Highly dynamic **linear drives** in the X and Y-axis, with up to 1.2 g
- \_ **Special Lasertec turbine software** with simple programming and operation
- \_ **Touch probe positioning** and **piercing control**
- \_ **Rotary and turning axes** with torque motor (B, C-axis)
- \_ 5 axis laser boring of film cooling holes in turbine components
- \_ Highly precise **Nd:YAG laser** for boring, cutting and welding
- \_ Up to **50 kW | 67.1 hp. laser power** during milling
- \_ Removal of the thinnest surfaces and the smallest particles
- \_ Short and unvarying laser beam length
- \_ **Innovations for shaped holes:** combination of laser milling and laser boring on a single machine, for the manufacturing of shaped holes
- \_ **Shape:** laser boring of the cylindrical bores, subsequently incorporation of the bevelled exit holes via milling laser
- \_ **Shape:** special software tools are available for programme creation
- \_ **Shape:** cooling air bores with bevelled exit holes for a better distribution of the cooling air-flow on the surface

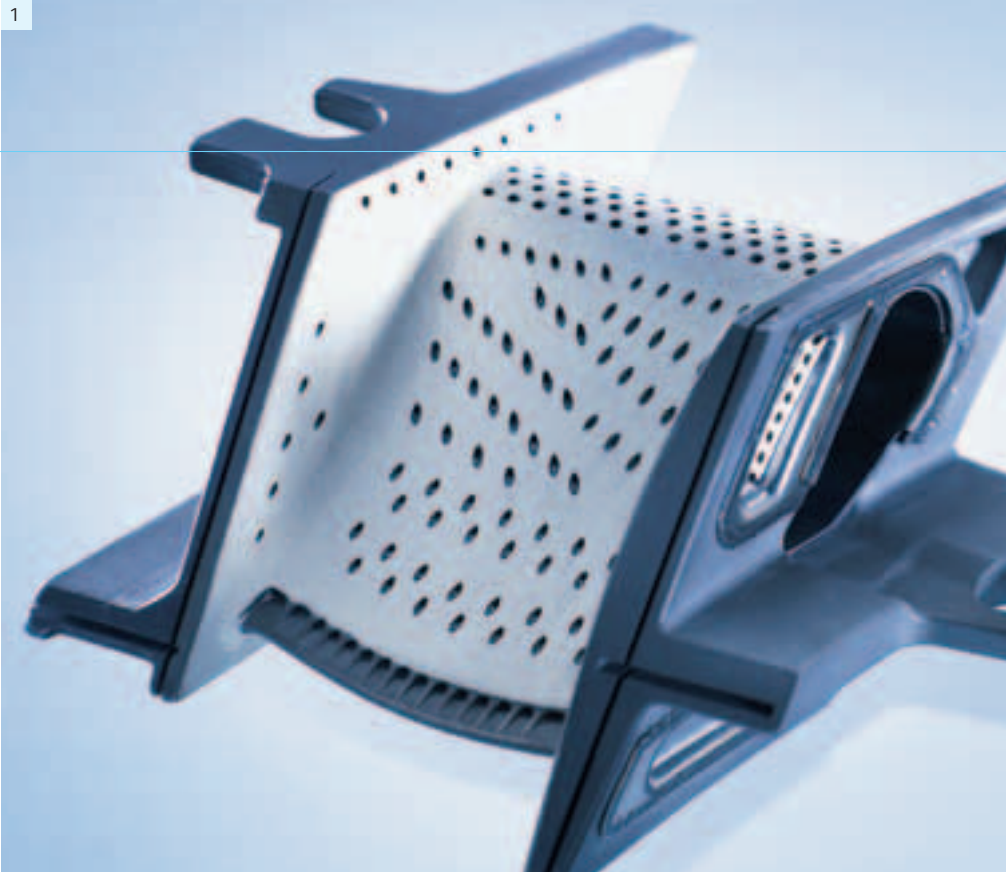
**5-axis Machining:**

Insertion of air-cooling bores into a turbine blade.



## LASERTEC 80 PowerDrill: Highly dynamic precision boring.

The LASERTEC 80 PowerDrill allows 5-axis precision boring for quality work. The machines of the LASERTEC 80 PowerDrill Series are mainly used by manufacturers of aircraft and stationary gas turbines. Apart from laser boring, the integrated laser also makes laser welding applications possible. The range of machining applications includes turbine stator vanes, turbine moving blades, shrouds, thrust chambers and other turbine components.

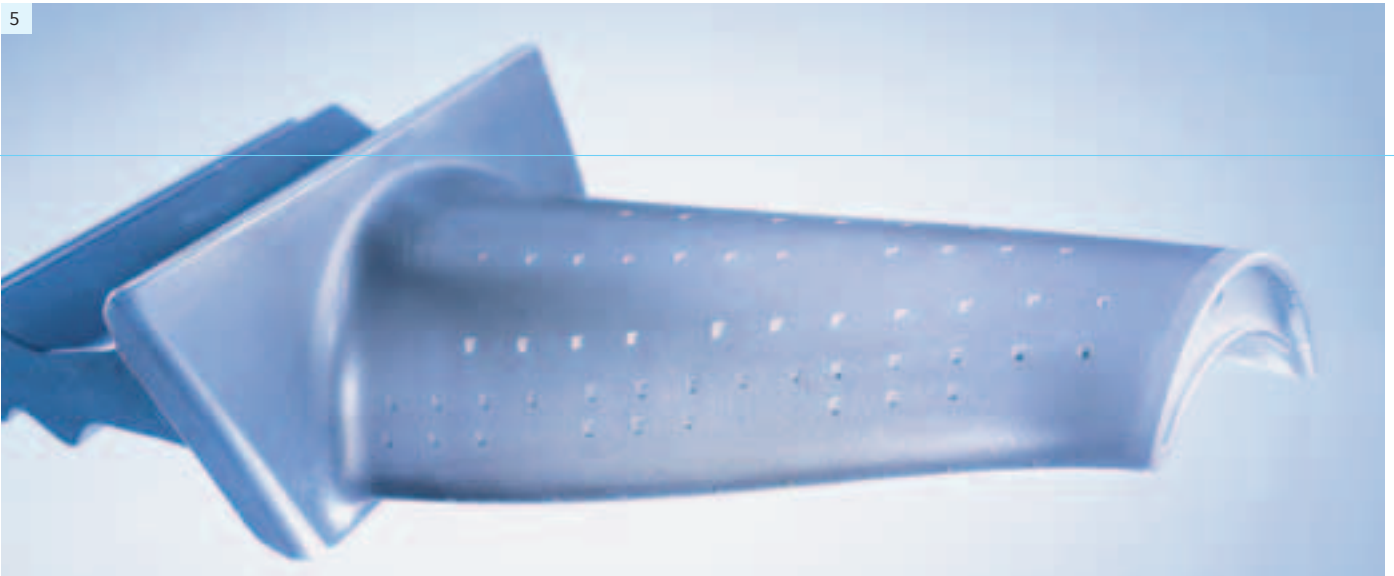


1| Turbine blade: boring of complete shaped hole geometries 2| Compressor ring: highly precise laser cutting with CO<sub>2</sub> laser 3| Insertion of holes with formed geometry 4| Jet housing: percussion boring, drilling and boring of shrouds with 5-axis interpolation

## LASERTEC 80 Shape: Laser milling and boring on a single machine.

The new shape technology combines laser milling and laser boring on a single machine, for the manufacturing of cooling air bores with exit funnels (shaped holes). At first, cylindrical bores are created through laser boring. Subsequently, a second laser (milling laser) inserts the bevelled exit holes. This leads to an efficient distribution of the cooling air-flow on the surface of the turbine component and better cooling ensures more efficient combustion.

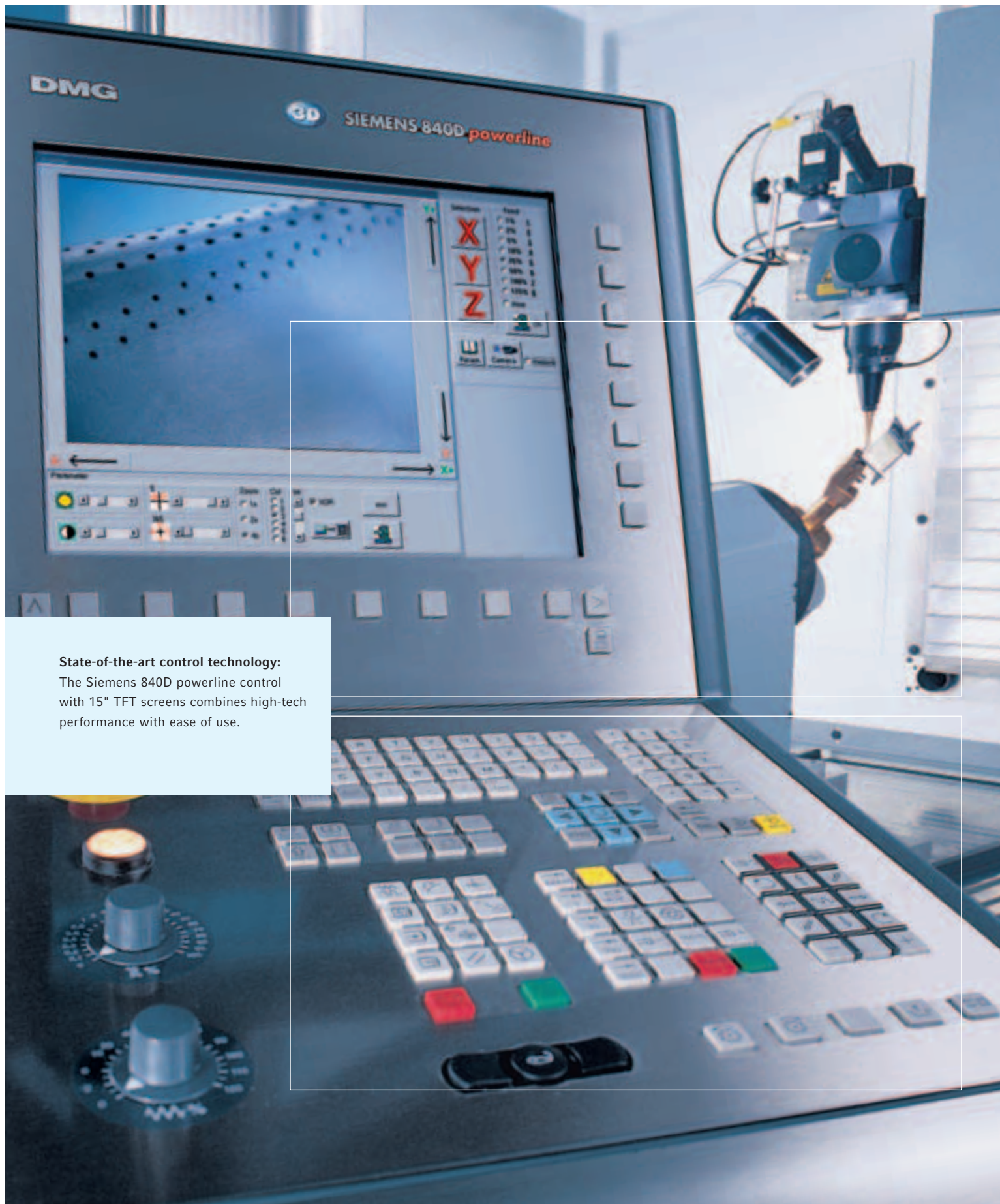
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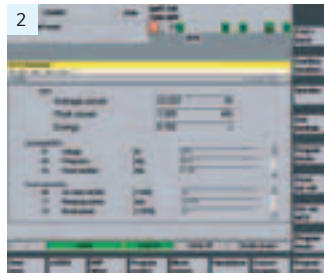
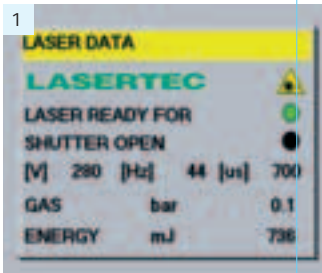
[5] Turbine guide vane: boring of complete shaped-hole geometries with the aid of shape technology [6] Technology combination of laser boring and laser milling for shaped holes: laser boring of the cylindrical ducts and insertion of the shaped exit holes via milling laser

**State-of-the-art control technology:**

The Siemens 840D powerline control with 15" TFT screens combines high-tech performance with ease of use.

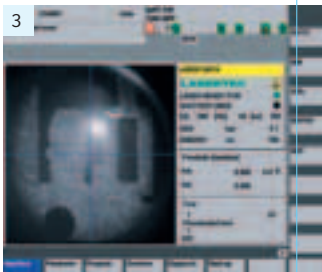
## Maximum process safety due to advanced software features.

The Siemens 840D powerline control is impressive with its pioneering technology for FineCutting and PowerDrill applications. The front-end PC allows the integration of additional applications. All important functions are fully supported on the CNC and PLC levels. The entire Siemens power train, with CNC-control, drive control and motors ensures maximum process safety.



[1] **LASERTEC 80 FineCutting:** important laser safety devices, the status of the laser, actual values of the laser power and gas pressure are all displayed.

[2] Integrated laser control on a front-end PC with adjustment camera for FineCutting: the entire laser control appears in a separate window on the CNC-screen. All laser functions for setup, diagnostics and maintenance are accessible at all times. The ergonomic layout of the operator panel makes the laser control visible even during laser adjustment at the resonator or laser head.



[3] Adjustment camera through the course of the beam, for beam adjustment, process diagnostics and setup operations at the workpiece.

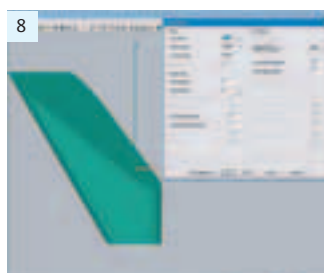
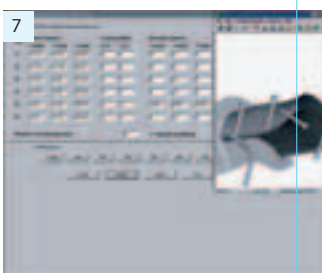
[4] Viewing window for conveyor belt feed an automatic conveyor belt feed is fully integrated into the machine-control on the PLC. The status of all system components can be monitored on the special display at all times.



[5] **LASERTEC 80 PowerDrill:** A separate PC work station with laser drilling programming system (LDPS) can be connected to the machine through an online connection. Here, bore programmes are generated and then transmitted to the Siemens 840D powerline control.

[6] Visual NC-simulation of the work area, of turning swivel axis, jet and the workpiece: possible collisions between workpiece and jet workpiece and machine parts or violations of the axis boundaries are displayed.

[7] Touch Probe – LDPS: The laser drilling programming software (LDPS) is a time-saving method of measuring turbine-components across six defined points and then orienting them accordingly in the machine. Counter boring tables and a visual database even allow individual bores to be selected for counter-boring.



[8] **LASERTEC 80 Shape:** On an external PC, programmes for shaped-hole applications are generated by the LPSW in programming software.

# Options

## LASERTEC 40

|                           |                                                                                                                                                                                           |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Machine type</b>       | Standard machine: laser engraving<br>S-machining of a vertical wall<br>SI-machining of a vertical wall / optical depth control                                                            |
| <b>Mechanics</b>          | Camera X / Y orientation<br>Calliper Heidenhain MT 60 (setup Z / mechanical depth adjustment)<br>Additional laser viewing windows<br>Setup 4th axis (B-axis)<br>4th axis (B-axis)         |
| <b>Laser machining</b>    | Machining of finest contours<br>Diode-pumped solid-state laser                                                                                                                            |
| <b>Software</b>           | LaserSoft 3D (additional software)<br>3D volume generator<br>3D contour lasering*<br>3D engravings with defined wall-angle*<br>3D-greyscale machining<br>Lettering and engraving software |
| <b>Additional options</b> | Machine model 60 Hz<br>Wearing parts package                                                                                                                                              |

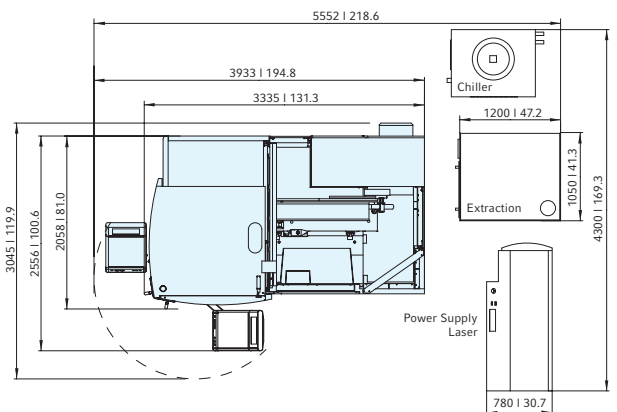
\* only available with options S or SI

## LASERTEC 80 FineCutting

|                               |                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mechanics</b>              | Flat work-plate, cutting box<br>NC-workpiece unit with NC-swivel rotary table<br>Extraction system<br>Cooling device for laser and linear drives<br>Additional laser viewing window                                                                                                                                                                                                                        |
| <b>Laser machining</b>        | Lasag Nd:YAG-laser KLS with 15 W power<br>Additional charge for Lasag Nd:YAG-laser FLS with 300 W power<br>Additional end-mirror, curved (No. 440026)<br>Shutter kit 2.0 to 6.0; in 0.5 mm   0.02 inch increments<br>Camera through beam centre with halogen lamp<br>Collision switch for machining head<br>Viewing glass holder 2 bar   29 psi. (welding)<br>Machining head with automatic gap adjustment |
| <b>Control</b>                | Control Siemens 840D powerline<br>Dynamic guide-way compensation<br>5-axis transformation<br>Electronic hand wheel<br>CompCad compressor function<br>Selection of additional process-gas<br>Programmable process gas pressure                                                                                                                                                                              |
| <b>Quick clamping systems</b> | Quick clamping system, basic fitting for compound table<br>Quick clamping system, fitting for cutting box<br>Quick clamping system, fitting for rotary /swivel table                                                                                                                                                                                                                                       |
| <b>Additional options</b>     | Machine model 60 Hz                                                                                                                                                                                                                                                                                                                                                                                        |

|                           |                                                                 |
|---------------------------|-----------------------------------------------------------------|
| <b>Mechanics</b>          | Cooling Unit                                                    |
|                           | Extraction system                                               |
|                           | EROWA Clamping system for rotary- / swivel axes                 |
|                           | Programmable process-gas pressure                               |
|                           | Renishaw 3D-calliper (deployed automatically)                   |
|                           | Noise insulation                                                |
| <b>Laser machining</b>    | Aser sources: Nd:YAG-laser or CO <sub>2</sub> -piercing control |
|                           | Camera aligned along the course beam                            |
|                           | Motor-driven expander                                           |
|                           | Viewing glass holder for laser-welding                          |
|                           | Additional hand-terminal                                        |
| <b>Software</b>           | LDPS                                                            |
|                           | Simulation software                                             |
|                           | Electronic hand wheel                                           |
|                           | 5-axis transformation                                           |
|                           | DMG NetSERVICE                                                  |
| <b>Additional options</b> | Machine model 60 Hz                                             |

## LASERTEC 80 FineCutting / PowerDrill



# Technical Data

|                                                   |                     | LASERTEC 40                        | LASERTEC 80<br>FineCutting | LASERTEC 80<br>PowerDrill  |
|---------------------------------------------------|---------------------|------------------------------------|----------------------------|----------------------------|
| <b>Work area</b>                                  |                     |                                    |                            |                            |
| X-axis                                            | mm   in.            | 400   15.7                         | 800   31.5                 | 800   31.5                 |
| Y-axis                                            | mm   in.            | 300   11.8                         | 500   19.7                 | 500   19.7                 |
| Z-axis (focusing axes)                            | mm   in.            | 500   19.7                         | 700   27.6                 | 700   27.6                 |
| Table size                                        | mm   in.            | 400/300   15.7/11.8                | 900/600   35.4/23.6        | Ø 200   7.9                |
| Max. table load (3 axes)                          | kg   lbs.           | 50   110.2                         | 200   440.9                | -                          |
| <b>Traverse speed</b>                             |                     |                                    |                            |                            |
| Rapid traverse X / Y / Z                          | m/min               | 20 / 20 / 20                       | 120 / 120 / 30             | 120 / 120 / 30             |
|                                                   | ipm.                | 787.4 / 787.4 / 787.4              | 4,724.4 / 4724.4 / 1,181.1 | 4,724.4 / 4724.4 / 1,181.1 |
| Acceleration                                      | g                   | 0.3                                | 1.2                        | > 1.2                      |
| <b>Laser</b>                                      |                     |                                    |                            |                            |
| Laser type                                        |                     | Nd:YAG (lamp),<br>Nd:YV04 (diode)  | Nd:YAG, CO <sub>2</sub>    | Nd:YAG, CO <sub>2</sub>    |
| Laser power (average)                             | W                   | 100 (lamp),<br>15 (diode)          | 100                        | 500                        |
| Laser-spot diameter                               | mm                  | approx. 0.03                       | 0.02 - 0.2                 | approx. 0.3 - 0.8          |
|                                                   | in.                 | approx. 0.001                      | 0.0008 - 0.008             | approx. 0.01 - 0.03        |
| <b>Technology milling</b>                         |                     |                                    |                            |                            |
| Range of the laser                                | mm   in.            | 60 x 60   2.4 x 2.4                | -                          | -                          |
| Automatic traverse                                |                     |                                    |                            |                            |
| for large workpieces                              |                     | yes                                | -                          | -                          |
| Minimal wall angle                                | Degrees             | 0*                                 | -                          | -                          |
| Depth measurement                                 |                     | optical across<br>entire surface** | -                          | -                          |
| <b>Connection values and power train elements</b> |                     |                                    |                            |                            |
| Connection power (incl. power train elements)     | kVA                 | max. 27                            | max. 72                    | max. 72                    |
| Operating voltage                                 | V/Hz                | 400 / 50                           | 400 / 50                   | 400 / 50                   |
| Machine / equipment weight                        | kg   lbs. (approx.) | 2,200   4,850.2                    | 7,000   15,432.4           | 7,000   15,432.4           |
| Dimensions extraction system W / D / H            | mm (approx.)        | 340 / 660 / 1,400                  | 1,050 / 1,200 / 2,000      | 1,050 / 1,200 / 2,000      |
|                                                   | in. (approx.)       | 13.4 / 26.0 / 55.1                 | 41.3 / 47.2 / 78.7         | 41.3 / 47.2 / 78.7         |
| Dimensions cooling system W / D / H***            | mm (approx.)        | 580 / 780 / 1,020                  | 1,110 / 800 / 1,450        | 1,110 / 800 / 1,450        |
|                                                   | in. (approx.)       | 22.8 / 30.7 / 40.2                 | 43.7 / 31.5 / 57.1         | 43.7 / 31.5 / 57.1         |
| Space requirements W / D / H                      | mm (approx.)        | 3,000 / 3,500 / 2,720              | 4,500 / 6,000 / 2,300      | 4,500 / 6,000 / 2,300      |
|                                                   | in. (approx.)       | 118.1 / 137.8 / 107.1              | 177.2 / 236.2 / 90.6       | 177.2 / 236.2 / 90.6       |

\* only in combination with option S or SI, \*\* only in combination with Option SI, \*\*\* not applicable for diode as laser source

| Controls | LaserSoft 3D | Siemens 840D<br>powerline | Siemens 840D<br>powerline |
|----------|--------------|---------------------------|---------------------------|
|----------|--------------|---------------------------|---------------------------|

**LASERTEC 80 FineCutting:**

The highly dynamic rotary axis is also suitable for 5-axis machining of shafts with very small diameters (< 1 mm | 0.04 in.).



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