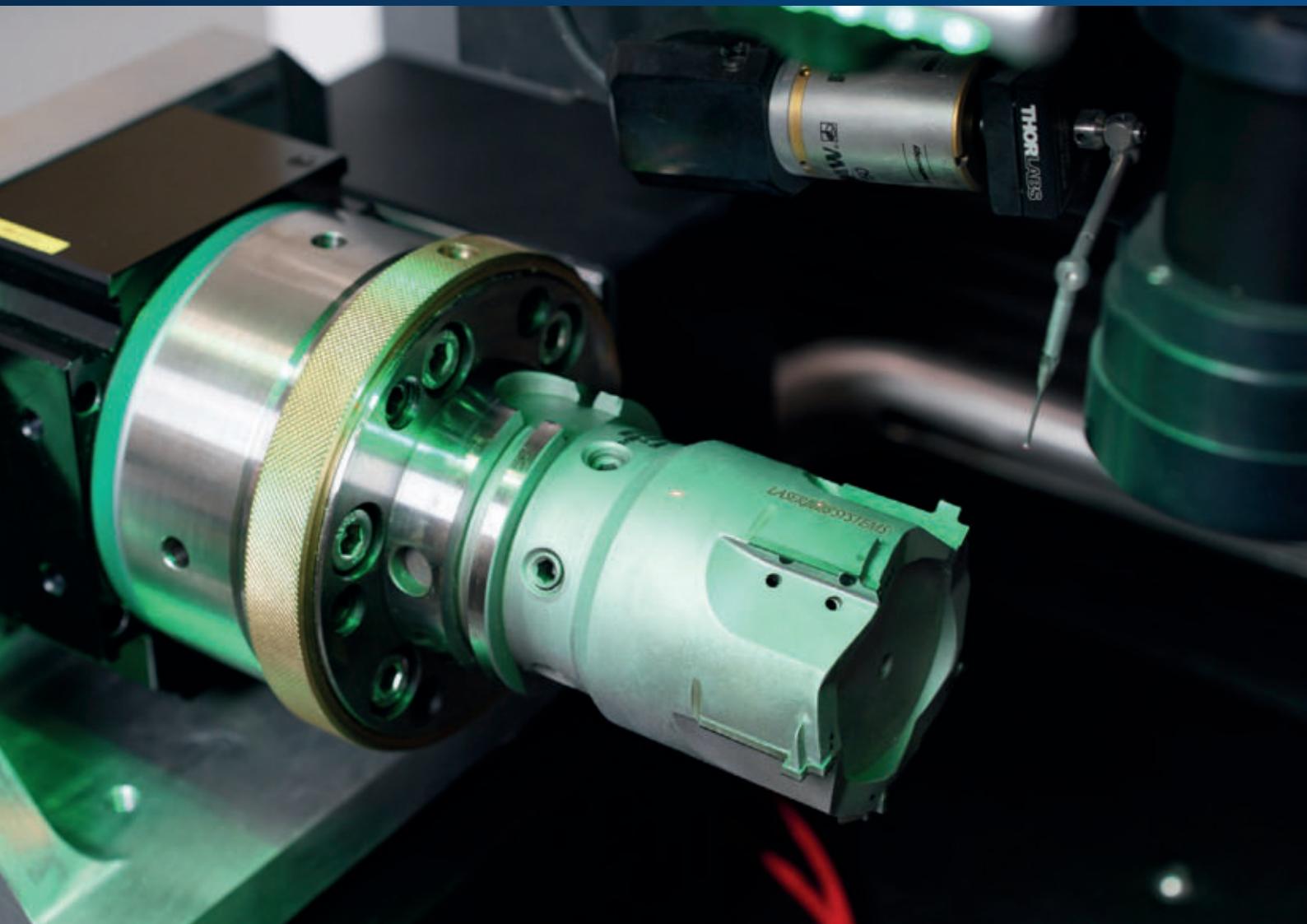


LASER *plus* SYSTEMS



LASER PRECISION PROCESSING

Marking | Cutting | Ablation

# Technology for innovative laser processing

In many fields, laser technology enables innovative and economical developments. Production processes can be set up more flexibly and efficiently. LASERplusSYSTEMS develops laser processing systems for multiple applications with the highest precision requirements.

The product portfolio of LASERplusSYSTEMS includes standard solutions for a wide variety of industries as well as customized special systems which are used in many applications:

- Microprocessing
- Marking
- Deep engraving
- Welding
- Precision cutting of hard materials
- 3D ablation

## Process solutions and services proven in practice – worldwide

LASERplusSYSTEMS develops practical solutions for the most demanding requirements. That is why LASERplusSYSTEMS machines are characterised by outstanding quality and precision.

Highly flexible component and data logistics as well as smooth integration into the customer's production processes are of particular importance for LASERplusSYSTEMS. Consulting, training, support and maintenance are an integral part of our service portfolio.

## LASERplusSYSTEMS – the customising specialist

In addition to standard systems, LASERplusSYSTEMS offers the development of new customer-specific solutions with adapted automation options that can be optimally integrated into the production chain.

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# About laser processing



Plastic marking with color alteration

## Plastic marking

On plastics, the short high-energy laser pulses cause carbonization or foaming of the pigments of the plastic. The result is a color alteration with high contrast sharpness in almost all plastics. The markings are embedded in the plastic and thus resistant to abrasion and environmental influences like the base material itself. Depending on the addition of additives, the laser marking can be displayed brighter, darker or even colored.



Precision engraving with matted, structured surface

## Laser engraving

On metals, the laser pulse leads to evaporation of the material. Due to the effectiveness of the diode-pumped laser (shorter pulse lengths), the influence of the heat conduction in the metal decreases and the removal rates are significantly increased. Due to the high-precision synchronization between the galvo unit and the laser pulse, engraving with steep edges and maximum sharpness can be achieved.



Annealing marking with grid structure for achieving visual color effects

## Annealing marking and surface texturing

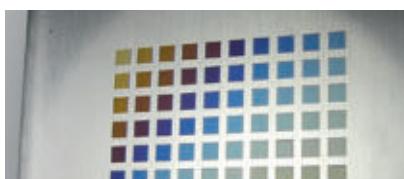
On materials such as stainless steel, steel, iron and other ferrous metals, an annealing color can be achieved by introducing laser heat. Heating causes a structural change in the surface layer, which produces different annealing colors depending on duration and intensity. Annealing colors of yellows over reds and bluish discolorations up to a deep black marking can be produced. Annealing marking is often used when the material surfaces remain smooth or even (such as turned or milled parts) and high contrast must be ensured at the same time. For medical technology, the annealing marking is particularly well suited, since the surface structure is not changed and a sterilization of the parts is still possible. Surface texturings are achieved by precision removal and produce various visual effects that can also be used as security features. In the watch and jewelry industry, annealing marking and various surface texturing are increasingly used to achieve visual effects.



Holographic effects by surface texturing

## Precision ablation

On hard-brittle materials such as PCD, PCBN, ceramics, solid carbide, high-precision 3D geometries are generated by evaporating the material layer by layer in the single-digit  $\mu\text{m}$  range. By varying the laser parameters, the surface quality can be changed or a specific structuring can be achieved. Due to the high-precision components such as axes, 3D scanner and optics, the ablation accuracy is up to  $\pm 5\mu\text{m}$ .



Color scale with annealing marking

## Cutting

By means of ablation of material layers and introduction of process gas, materials ranging from hard-brittle materials such as PCD, CVD or monocrystalline diamond to metals and non-ferrous metals such as stainless steel, brass or precious metals such as gold or silver can be cut with highest precision.

## Suitable materials

Many materials are suitable for laser processing, such as aluminum, sheet metal, stainless steel, steel, carbide, HSS, PCD, CBN, gold, silver, brass, titanium, ceramics, plastic, foils.

## Wide range of applications

New perspectives, higher productivity,  
quality and profitability through laser technology

### Tool industry



Marked tool with plain text  
(pallet handling possible)

### Automotive



Data matrix code marking on die-cast aluminium  
gear components

### Mould and prototype making



Micro-engraving in injection moulding dies

### Plastic industry



Marking of plastics using colour change,  
day and night marking

### Watch and jewellery industry



Engraved ring with "fingerprint" and handwriting,  
innovative ring handling with special software

### Medical engineering



Micro-welding of two plastic materials — maximum  
machining precision

### Semiconductor industry



Marking of wafers and finished modules, marking of  
metals, plastics and ceramics

### Minting and stamping industry



3D engraving in die

### Electronics industry



Ablation, marking, cutting, welding — production of  
large quantities in fully-automated processes

### Advantages of laser processing:

- + Non-contact machining and permanent marking
- + High precision and flexibility
- + Marking of a large diversity of materials
- + High cost-effectiveness thanks to low operating costs and high productivity
- + Easy integration into existing production processes

# Product portfolio

## Innovative, individualized and intelligent

Laser equipment from LASERplusSYSTEMS is characterized by outstanding machine concepts, high quality and longevity as well as a special user comfort. We develop laser systems with vision, so that your investment is future-proof and value-preserving.

### Quality first

Your laser system is an investment in your production to increase product quality, productivity and profitability. In order to obtain the best possible results over a long period of time, we only use high-quality materials, parts and components.

### Sophisticated machine concepts

Our development focuses on precision and customer benefit. That is why we rely on innovative, intelligent and individual solutions. Our laser systems are characterized by a modular concept and perfection in detail. An intelligent data and workpiece handling ensures maximum flexibility. With the graphical user interface our intuitive software contributes to this high level of comfort.



#### Integration capability as a standard

Integration into your production processes increases productivity enormously. Therefore, all LASERplusSYSTEMS equipment is integratable, designed to be PLC-compatible and has an open interface architecture with various connection options [such as PROFIBUS, PROFINET, OPC UA, Ethernet with TCP/IP protocol].

Our software also supports the connection to ERP systems, e.g. for the transfer of marking contents and the feedback of process information.

#### High standard of equipment

Useful features such as pilot laser, focus finder and variable pulse widths are already included as standard equipment in LASERplusSYSTEMS equipment at no extra cost.

#### Your benefit from LASERplusSYSTEMS:

- + High expertise in laser technology
- + High competence in mechanical engineering
- + Broad industry experience
- + Highly qualified engineers and professionals
- + More than 20 years' experience in laser development

# RayIntegral

Wherever a laser marking unit needs to be added to a production line easily and quickly, RayIntegral is the right solution. The RayIntegral can be integrated particularly quickly and easily into an existing production line. The control cabinet and laser head can be placed separately from each other at a distance of up to three meters and can thus be connected to an existing automation system in a space-saving manner.

The camera system optionally installed on the scan head, which is guided coaxially to the processing laser via mirrors, allows very high magnification depending on the camera resolution while simultaneously viewing the entire marking field.

This means that even the smallest contours can be measured and workpieces can be recognized, processed and tested in a single operation. Additional cameras or systems are no longer required for this reason.

Thus, the RayIntegral enables easy recognition and variable laser marking even in existing production lines to increase process reliability and ensure the highest product quality.



Depending on the application, two different RayIntegral design versions allow flexible integration.



RayIntegral control box with integrated touch panel



Scanning head with area lighting for illumination for camera evaluation

## RayIntegral

Machine dimensions W × D × H	Laser unit: 246 × 699 × 236 mm Supply unit: 900 × 337 × 998 mm
Space requirements	900 × 350 mm integrated
Machine weight	< 30 kg
Laser power	20 W to 100 W
Energy consumption	< 500 W
Autofocus (integrated optical Z axis)	up to 25 mm
Processing range scanner X × Y, component height H	Variable optics e.g. F420 up to max. 350 × 350 mm
Max. workpiece dimension W × D × H	System-specific
Laser class	LC 4
Workpiece weight	System-specific
Spot diameter	Depending on configuration 19 – 50 µm

## Applications



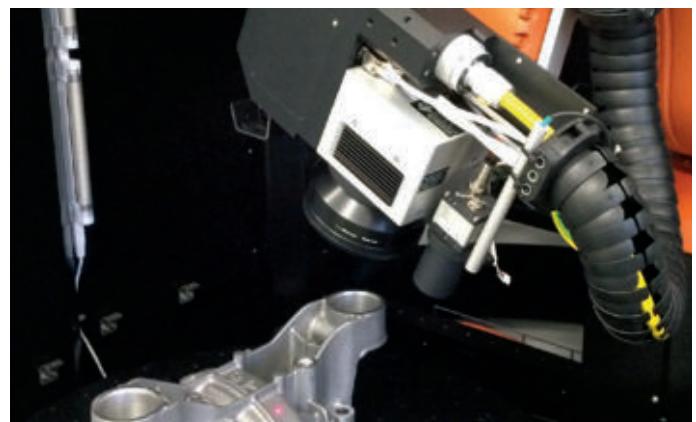
Application of a data matrix code and plain text to increase process reliability



HSK 63 tool holder with company logo and ID number



Automatic reading and evaluation of marking information such as 2D codes directly through the laser optics



Compact design optimized for connection to robotics systems

## Features and Benefits



- Easy to integrate into your existing production line
- Open data interfaces for integration into your IT environment, control or data exchange through Ethernet or PROFIBUS available
- PLC connection
- Control box per IP65 with integrated IPC and control unit
- Reading data matrix codes
- Easily adaptable laser unit, laser class 4
- Diode-pumped fiber laser, optional output of 20 W to 100 W
- Beam deflection with galvanometer mirror unit
- Precise synchronization between the mirror position and the laser pulse

# RayMarker® 700

The machine for industrial marking and precision engraving. The successor to the proven RayDesk® XL offers a larger working space and is even more economical in production.

With its many extension options, RayMarker® 700 can be ideally adapted to your requirements.

The additional X-axis is software-controlled and can be operated via the user interface. This allows the marking field to be enlarged and the processing sections to be determined. With the optional rotary table the machine achieves a very high efficiency. The RayMarker® 700 system is available with the EasyVision camera system which allows you to perform component detection with the utmost precision and, for example, read out 2D codes.



## RayMarker® 700

Machine dimensions W × D × H	775 × 1190 × 1010 mm [without base cabinet and operating arm]
Space requirements	1620 x 2460 mm [with operating arm]
Machine weight	< 220 kg [without base cabinet]
Laser power	20 W to 100 W
Travel range of linear axes	Z = 300 mm, X = 200 mm
Rotary axes	Ø 80, 160 mm – HSK, SK
Processing range scanner X × Y, component height H	Optics F160: 120 × 120 mm, H = 300 mm
Max. workpiece dimension W × D × H	700 × 400 × 300 mm
Laser class	LC 1
Workpiece weight	≤ 50 kg

## Applications



Day/night design by removing the black paint surface



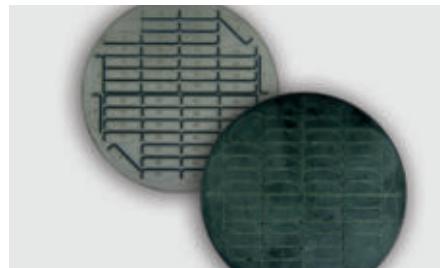
Scale created by removing the anodized layer



Annealing marking on steel body of a milling tool



Deep engraving with highest surface quality and precise edge sharpness in stainless steel



Blank production: ablation of the PCD layer after pressing/sintering to create a defined density and surface precision; chamfering



Inscribed tool with plain text [pallet processing]

## Features and Benefits

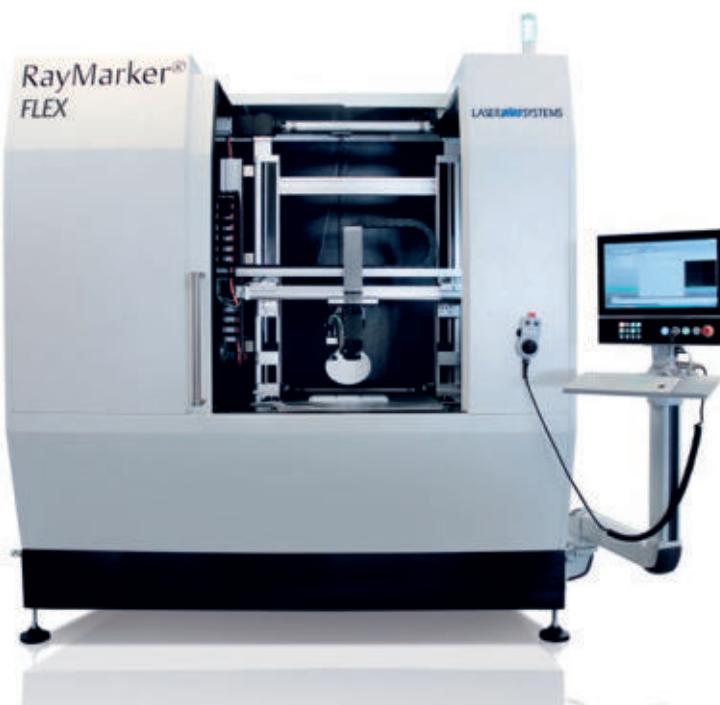


- Basic machine can be extended as desired
- High productivity with CNC rotary table, including media feedthrough and processing precision of  $\leq 50 \mu\text{m}$
- Available with an EasyVision camera system for component detection  $< 10 \mu\text{m}$  and processing precision of  $\leq 50 \mu\text{m}$
- Integration into your IT infrastructure through the RayBank database interface
- Compact machine design for tight space requirements

# RayMarker® Flex

The machine for marking and engraving of large workpieces. The machine design is the ideal choice for loading large components, such as transmission housings. The machine can be configured with various axis systems, so that the loading area can be adapted to individual customer needs. The system can be equipped with many optional add-ons, such as rotary axes with a swivel table or a motor-driven X-axis.

The intuitive software can use data formats such as plain text, graphics or barcodes from ordinary graphics and CAD programs. The system has a PLC control for monitoring the system as well as safety functions and optional extensions for automation functions.



## RayMarker® Flex

Machine dimensions W × D × H	2350 × 1900 × 2600 mm (without operating arm)
Space requirements	5000 x 4000 mm
Machine weight	1850 kg
Laser power	20 W to 100 W
Travel range of linear axes	X = 500 mm, Y = 500 mm, Z = 500 mm, optional X = 1000 mm
Rotary axes	Ø 100 – 200 mm – HSK, SK
Processing range scanner X × Y, component height H	Optics F160: 120 × 120 mm
Max. workpiece dimension W × D × H	670 × 800 × 500 mm
Laser class	LC 1

## Applications



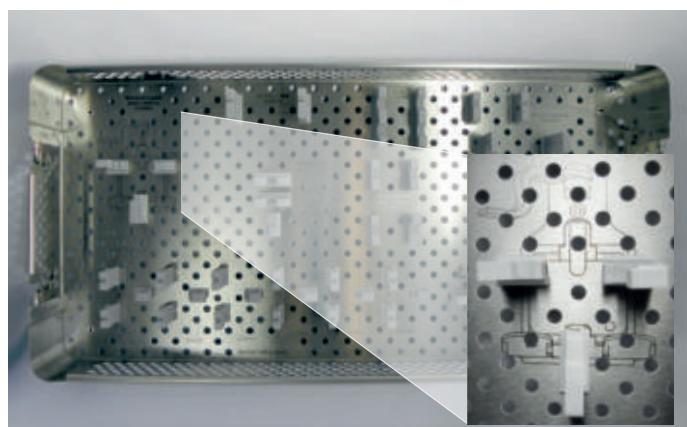
Annealing marking of logo in color on round tool



Data matrix code on mirror-smooth surface on round tool



Rotary axis with 200 mm circle chuck for holding and inscribing large cylindrical components.



Sterilization containers for instruments with partial annealing marking over the entire surface, component size 500 × 250 mm

## Features and Benefits



- Machine housing for loading large components (e.g. transmission housings)
- Loading space configurable to customer requirements with up to 5 different axis systems (X-, Y-, Z-, A- and B-axis)
- Optional pivotable scanning head 0 – 90°
- Optional rotary axis
- Height-adjustable, swiveling operating panel with industrial PC, keyboard and mouse
- Intuitive graphical user interface
- Integrated PLC for monitoring system functions
- Expandable and automation capable

# RayMarker® Flex XXL Customized

Laser markings offer several advantages compared to mechanical engraving, including high precision and flexibility. Whether it's annealing marking (without any damage to the surface), several engraving variations or a color change, the RayMarker® offers everything.

The tailor-made RayMarker® Flex XXL for inscribing milling tools in batches of 1 to 5 components stands out for its simple programming, and its quick conversion and loading.

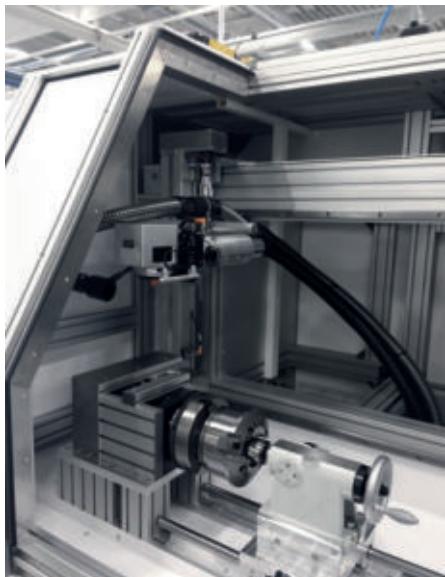
An 8 to 10-digit code consisting of month, year and number of pieces as well as consecutive number and logo is inscribed. The data are retrieved via barcode or optionally from the database (SAP connection). The marking type is deep engraving of 0.05 to 0.3 mm in aluminum, steel, titanium, heavy metal or hard metal. The manual scanning head is continuously adjustable to 90° and allows marking on bevels on workpieces mounted in the rotary axis.



## Laser protection booth equipment

The laser class 1 system is equipped with a diode-pumped 70-watt fiber laser. Due to the manual hood system opening to the right it is possible to load by crane. The booth consists of aluminum profile with panel elements made of anodized, partially painted aluminum sheet. The system has a height-adjustable, shiftable control panel.

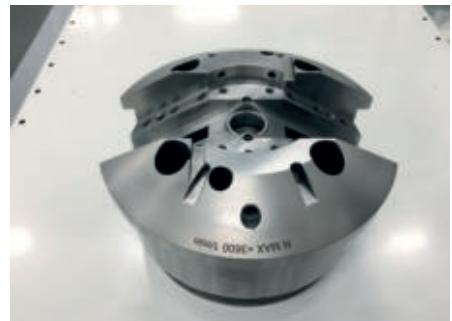
## In detail



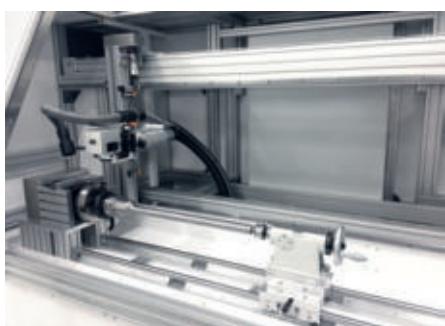
Scanning head in defined reference position



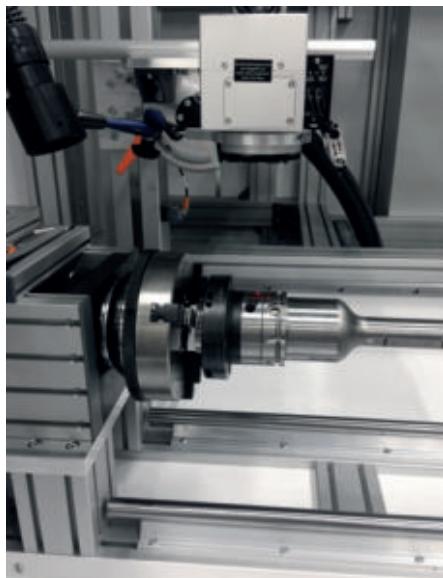
Variably adjustable scanning head for marking on inclined surfaces



Workpiece with marking on inclined, curved surface, workpiece weight 40 kg



Movable tail stock on linear rail system for supporting shafts of up to 2500 mm length



Automatic alignment of the marking to the component geometry, reading and evaluation of marking information such as 2D codes directly through the laser optics



## Performance features

- Crane loading possible
- Component length up to max. 2500 mm
- Swiveling scanning head
- Rotary axis for components up to 400 mm in diameter
- Cubic components up to 400 × 400 × 400 mm
- Workpiece weight up to max. 200 kg
- Motor-controlled X- and Z-axes
- Travel ranges: X-axis 2500 mm, Z-axis 500 mm
- Tail stock guided on linear rails to support long components

# CutMaster

The CutMaster is the optimal device when different laser processes are to be realized highly economically with only one system. With the CutMaster, components can be marked with the highest precision, round blanks can be separated, chip grooves can be produced and different materials can be cut.

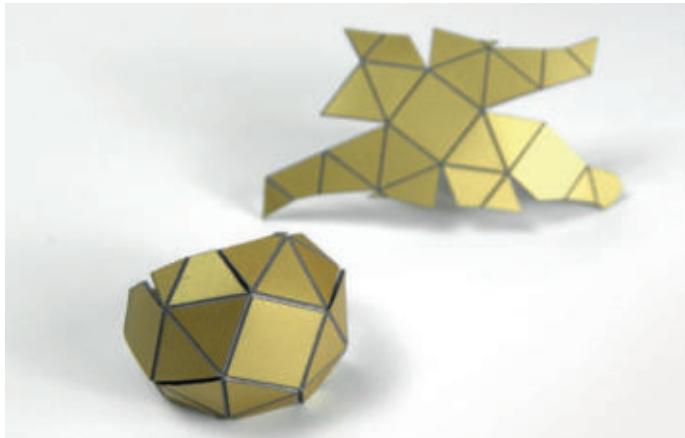
The pre-cutting technology allows efficient, economical entry into the market for processing hard and ultra-hard materials. Circular PCD, PcbN and CVD plates are cut using multiple ablation of layers of material. This 3D processing is precise, preserves material, and allows cutting depths to 2 mm, along with a cutting gap with defined angle. The operation of the system is intuitive and user-friendly, so that the training period for technical personnel is short and efficient.



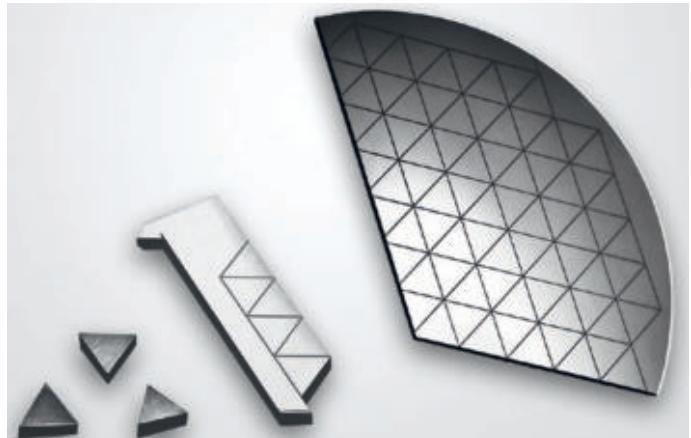
**CutMaster**

Machine dimensions W × D × H	980 × 1880 × 2150 / 2750 mm (without operating arm, hood closed / hood open)
Space requirements W × D × H	3120 x 2800 x 3300 mm
Machine weight	< 1500 kg
Laser power	50 W / 100 W
Energy consumption	< 800 W
Travel range of linear axes [X, Y, Z]	400 × 400 × 400 mm
Rotary axis	250 × 275 mm L, Ø
Loading space W × D × H	800 × 700 × 375 mm
Net working area (X/Y axes, Z)	305 × 305 mm, 275 mm
Axis positioning accuracy	≤ 10 µm
Laser class	LC 1
Workpiece weight	max. 50 kg

## Applications



Blank made of brass sheet



Separation and chamfering of PCD/HM round blanks



Examples of chip grooves in tools



Marking and chip geometries even on rotating tools

## Features and Benefits



- Cutting, 3D processing and marking on a single machine
- Processable materials: PCD, PCBN, CVD, metals, ceramics and many others
- Small cutting gap and low material loss
- Precision cutting of metals up to 2 mm thickness with outstanding cut quality
- Trimming of hard materials and metals
- High-precision cutting of chip geometries
- Measuring camera and probe for measuring component position and correcting processing location
- High precision 3D scan and optical system
- Zero-point clamping system for fast application change
- Options: Rotary axis, chuck for round blanks

# Automation and custom solutions

## Productivity increase thanks to individual automation solutions

The integration of laser systems into highly accurate production processes is a specialty of LASERplusSYSTEMS. Together with you, we develop a custom solution to meet your needs. Solutions from LASERplusSYSTEMS have proven themselves in a wide range of automated series production.

### Sample applications

#### Automated conveyor system for the tool industry



- Standard pallet system with changeable prism-shaped inserts for varying workpiece diameters
- Driven workpiece pallets for multi-line marking over the circumference
- Flexible RFID coding for all pallets, allowing mixed operation even for small batches
- Input terminal with connection to ERP system (SAP, ProAlpha, etc.) for production control



## Laser engraving of fittings



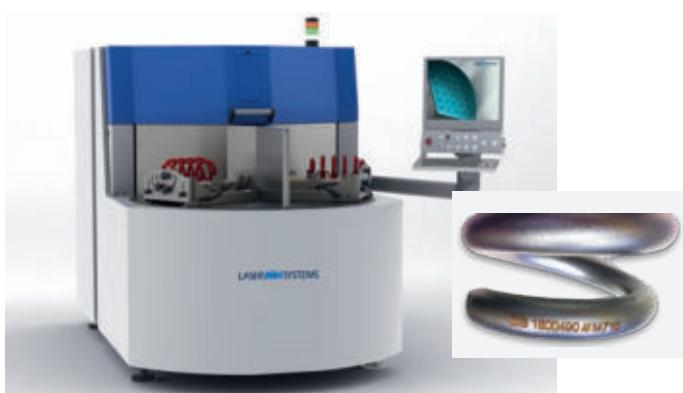
- Automated laser engraving of fittings (supporting member and support arm)
- Universal workpiece carrier for both versions mounted on a CNC-controlled flat chain conveyor
- Engraving of seven parts in one cycle
- Automated approach to different positions through programmable X- and Z-axes
- Safety light curtain in loading area allowing manual loading after removal from the cleaning system
- Designed for a throughput of 80 parts per hour

## Robot integration in an automotive application



- Utmost flexibility for marking on different component positions
- Either component handling with individual gripper systems or scanner freely positionable in processing area
- Image processing systems for recognition of component, position and data matrix code
- Easy robot control and programming through the RayBank software
- CAD-supported positioning of the scanner for processing position

## With rotary table for laser engraving of chassis springs



- Laser engraving of a chassis spring and other coil springs
- Rotary index table with three positions, allowing manual or robotic loading and unloading during marking
- Versions from 70 – 200 mm and lengths of 100 – 400 mm can be covered by universally adjustable prism supports
- Cycle time < 8 sec., marking time < 5 sec. – depth up to 100 µm
- Camera system for automatic position and height determination as well as for spring contour determination

### Watch industry automation



RayDesk® XL with robot handling and cleaning section CAD design  
(project phase)

#### Customer requirements:

- Ring-shaped marking of a watch bottom on a strongly rounded edge (90° arc) with micro-engraving
- High quality of engraving: precise, uniform and distinctive
- High level of automation for workpiece handling
- Complete automation from workpiece insertion to the cleaning unit
- Designed for 24-hour unmanned operation



Complete, space-saving system installed at the customer



#### Solution:

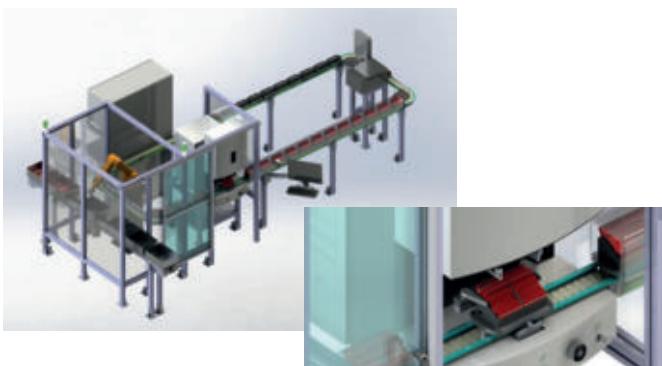
- Fully automated part handling by a 6-axis articulated-arm robot with 4 pallet locations
- RayDesk® XL laser system with 3-axis ring-handling system
- Camera system for location-oriented alignment of marking to the drill pattern of the watch bottom cover
- Ultrasonic cleaning station incl. acid bath and drying unit

## RayMarker® Flex with integrated robot system for marking of solid carbide tools



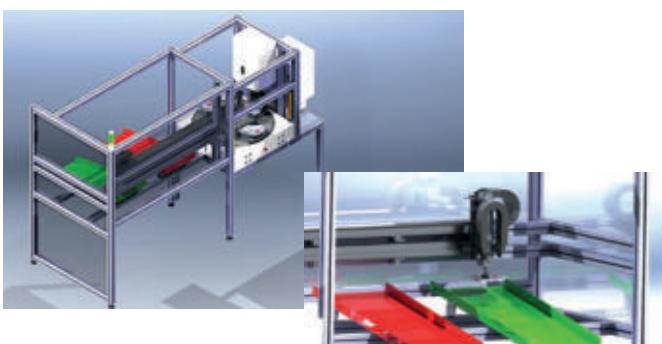
- Robot integrated into laser housing, so that no additional safety enclosure is necessary
- Loading and unloading from standard grinding machine cassettes
- Shaft diameters of 3/4/6/8/10/12 mm
- One cassette place each for raw parts and completed inscribed parts
- Data matrix code marking on the front surface through additional deflection mirrors
- 3-line marking on all shafts
- Damage-free marking on the circumference of the tool shaft through use of short-pulse laser sources

## Conveyor line with robot automation



- Automatic component position detection for aligning the DMC marking
- Circular conveyor system with buffer section for 24 tools
- Type and quantity monitoring in the loading area
- Reading and evaluation of DMC marking by EasyVision camera system
- Loading of small load carriers by robot with vacuum grippers, including buffer for 3 small load carriers

## Laser system with rotary table for DMC marking on transmission cover



- Camera system for DMC evaluation
- Exchangeable workpiece supports with RFID transponders
- Gantry handling system with vacuum gripper for placing parts in OK/NOK box
- Ready for connection to robot automation
- Light grid in loading area

## You benefit from our expertise and a team of first-class specialists:

- + Mechanical engineers
- + Automation experts
- + Software experts
- + Decades of experience in laser development
- + High standard of quality and expertise
- + Broad industry experience and understanding of the clients' processes

# Software

Only with the right software your laser system can reach its full potential. RayMake is a universal software product for all laser applications on the LASERplusSYSTEMS equipment. RayMake has a modular structure and always leads you safely with a simple, practice-oriented user guidance. It includes the RayBank module for database-based job data management with the EasyVision extension for component recognition as well as modules for creating and executing cutting, ablation and marking tasks on flat parts, turned parts/turning tools and rings. Optionally, a connection to ERP systems or higher-level control systems can be implemented, e.g. via Profibus, Webservice or OPC UA. In addition, our in-house software development enables a flexible implementation of customer requirements.

## RayBank module: database-based job management



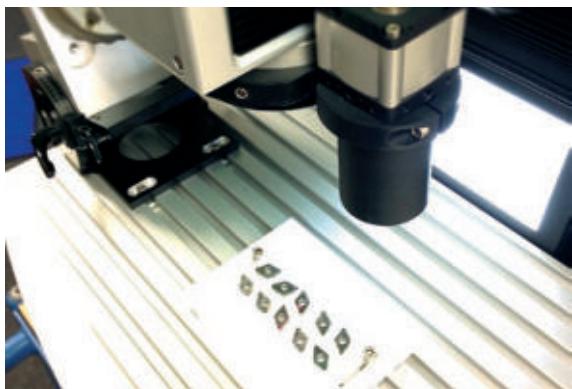
RayBank is a client-server based job management program for mixed production with job import and mask for manual entry. RayBank combines all marking information (palletization, layout, job data), and controls the marking process.

The required marking information can be assigned to job numbers. RayBank creates the connection to upstream process controls through Profibus, Profinet, OPC-UA or potential-free contacts.

### Your advantages:

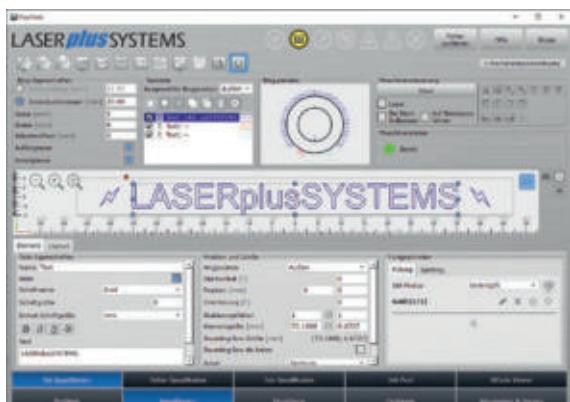
- + Software development at LASERplusSYSTEMS
- + Customer-specific adaptations and special programming
- + Software optimally tailored to customer needs
- + Intuitive user guidance makes the laser systems easy to operate
- + Mutually adapted modules
- + Interfaces to ERP systems

## EasyVision: component recognition for RayBank



EasyVision is a system for component recognition and position determination consisting of a camera and the associated software module. Workpieces are displayed as a live image and are reliably detected in the process. Numerous processing functions such as positioning of the components to the laser or the alignment of marking contents (including text, graphics and data matrix code) on the component are possible using live images. The recognition and alignment can also be carried out using a 2D drawing in DXF format. For quality control purposes, a direct read-back of data matrix codes is possible after marking including processing and transfer of the quality evaluation based on the AIM DPM quality guideline.

## Ring marking with RayMake



The ring handling system developed for the jewelry and watch industry is operated via the RayMake module for ring marking. It is possible to enter and edit all marking data via a simple, intuitive user interface. Interior, exterior, side and bevel markings can be realized. The software ensures an outstandingly precise implementation of the marking by the laser. Depending on the requirements, the marking is either split fully automatically (splitting) or continuously („marking on-the-fly“). Integration into an automation system is possible.

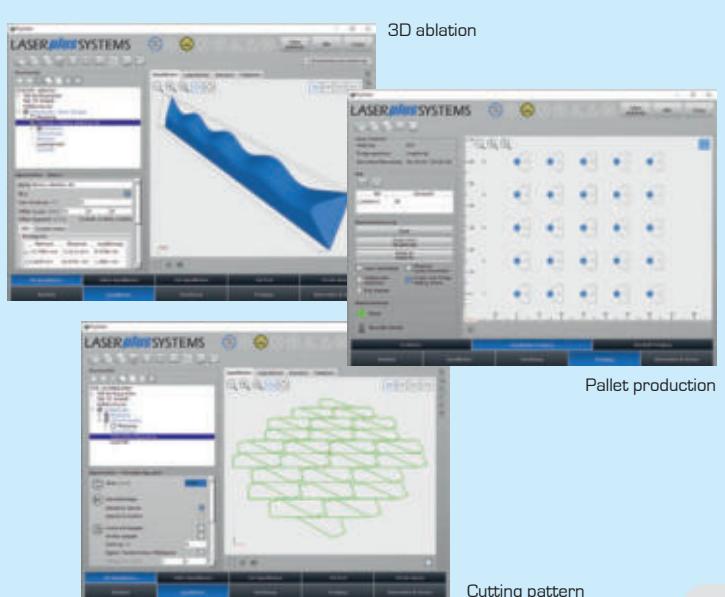
## 3D ablation, cutting, marking with RayMake

RayMake offers comprehensive functions for the specification of parts to be produced, for part measurement, for the creation of holders and pallets, for setting up the machine and

for controlling the production. In one part, 3D ablations, cutting tasks and marking can be combined as desired.

### Functional overview:

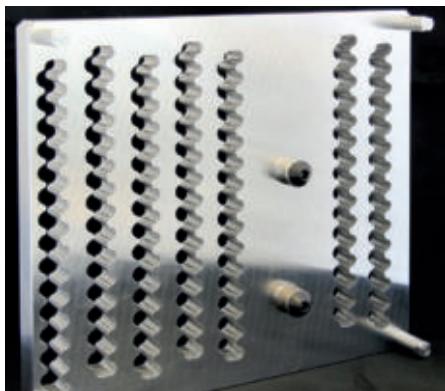
- Machining of flat parts (e.g. milling inserts, circular blanks) with linear axes as well as turned parts/turning tools with optional rotary axis
- Import of 2D and 3D geometries (e.g. DXF, IGES, STL)
- 3D visualization of the component to be produced and the generated laser paths
- Extensive editing and setting options
- Component measurement with camera and probe, selection and graphic display of different measurement variants
- Creation of pallets and turned part adapters
- Single part and pallet production
- Integrated order management for production planning



# Options and extensions

To optimally meet your requirements, we offer a range of accessories and extensions.

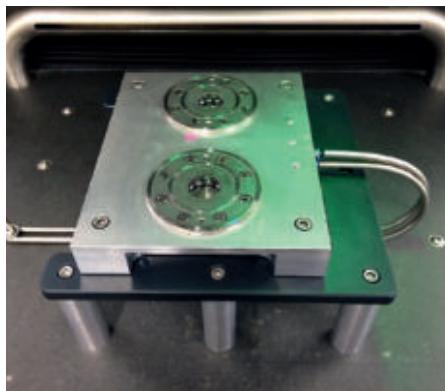
## Palletizing systems



High efficiency through use of palletizing systems:

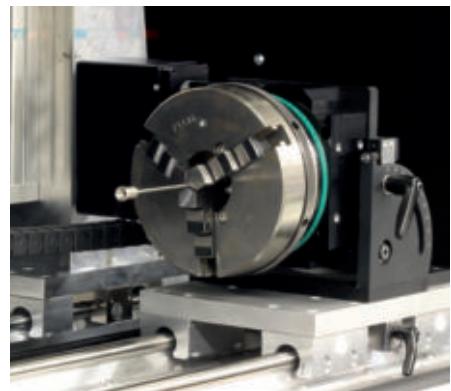
- Custom-made for your components
- Zero-point clamping system for high precision and reproducibility

## Mounting and clamping devices



For different component geometries, you can get individually adapted devices for fast and easy production change.

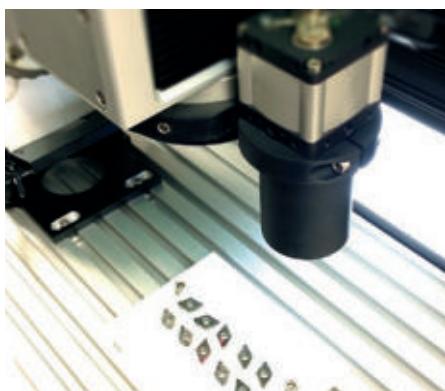
## Rotary axes



For various applications involving circumference markings, we offer various rotary axes:

- 80, 160, 200 mm – variable, such as 3-jaw or 6-jaw clamping chucks
- HSK, SK manual and automatic
- More upon request

## Component recognition



With EasyVision, you get an observation and measuring camera that includes a software module for component measurement and position detection. This allows the marking to be oriented to specified contours even with loose, unsorted parts.

## Barcode scanner



In industrial application, the barcode scanner can be used in the production workflow for reading job data and for checking data matrix codes.

## Extraction



Extraction systems configured to your application, e.g. with three-stage filter system, controllable via the laser system with run-on, mobile on casters, filter monitoring and a separation level of ≥ 99%.

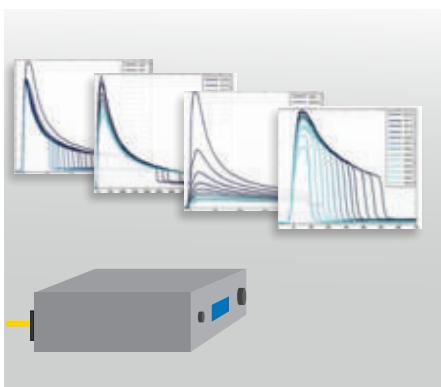
## Ring handling



For marking of ring applications in the jewelry and watch industry:

- Fully automatic axis control with marking on-the-fly (continuous marking without splitting)
- Inside, outside, bevel and side inscriptions possible
- Variable clamping force
- Suitable for automation

## Laser



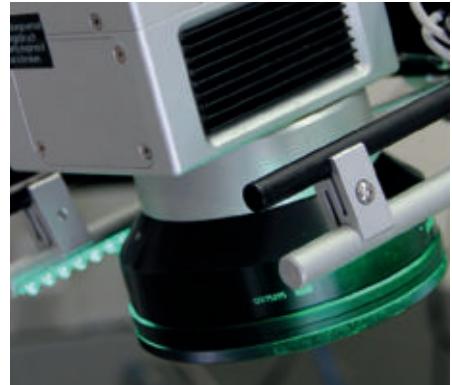
Fiber lasers adapted to the application: power 20 – 100 watts, beam qualities from  $M^2 < 1.3$  to 3.5, single- and multimode, up to 31 variable pulse lengths.

## Rotary table



Rotary table with direct drive and mechanical bearings for fastening magazines for series production.

## Optics



Depending on the application, focal lengths from F100, F160, F254, F330, F420 to F880 are used for bundling the laser beam.

## Software modules and interfaces



The laser system operating software not only comes with premium marking software as a standard, but also with modules for special applications and interfaces for integration into the customer's IT and production structures.

## Customer services



After-sales services:

- Training
- Technical customer service
- Service packages

Advanced services:

- Machine updates and upgrades
- Application consulting
- Customization

# Customer services

LASERplusSERVICE offers services and solutions for securing and expanding productivity and product quality. Preventive repair and maintenance ensure greater process reliability. With the expertise of the employees, both product quality and production speed increase. Your requirements also change over time. With custom services, we help you realize and expand the full potential of your system. Take advantage of our services to optimize every factor.

## After sales services

### Commissioning

Your new system arrives after successfully passing a full quality check. After that, our technical personnel can perform fast, trouble-free commissioning at your site.

### Training

Our specialists hold the first training as part of commissioning. You learn what you need to know to get optimal results and ensure your system's long service life. More in-depth training programs perfect your skills and expand your performance range.

Use our modular training concept to extend your employees' knowledge to ensure efficient work processes and increase productivity. The training is practice-oriented and conveys the best possible handling of the laser systems. Training courses take place directly on the systems and are held by our experts.

The various training levels with modular units always focus on your system and your requirements. Completely individualized training is also possible after a needs analysis.

It can focus on various topics, such as machine operation, maintenance or software.

### Technical service

LASERplusSYSTEMS machines are built to be reliable and meet premium standards. However, if the need arises, LASERplusSERVICE is a strong partner at your side. Our service technicians offer you the best possible support on site or by remote maintenance — flexibly, quickly and all over the world.

### Service hotline

The service hotline is your direct connection to technical customer service. When you need service, we decide whether our remote maintenance can help, or whether to deploy a service technician. Special service packages provide an expanded service hotline.

### Service packages

To be sure that your laser systems are always optimally used, LASERplusSERVICE offers various service packages at fixed prices. Fixed annual rates allow you to plan your maintenance and operating costs. The offerings range from expanded call availability in the event of a malfunction to full-service agreements that cover a necessary inventory of replacement parts, maintenance services, and more.

### Reliable:

Fast on-site service and fixed prices for increased planning security.

#### Your advantages:

- + Online support for immediate help
- + Faster service when needed
- + Predictable maintenance costs
- + Securing the productivity and value of your laser system

#### Service hotline:

+49 6781 98664-71

[info@laserplusservice.de](mailto:info@laserplusservice.de)

## Advanced services

### Solutions that suit you and grow with you

The technological development is advancing steadily. And the needs of your production process grow, too. It is therefore important that your systems keep up with your increasing requirements.

#### Machine updates and upgrades

To ensure that your machine's capabilities match your growing requirements, upgrading is an efficient solution. This can include both hardware and software. The modular construction of LASERplusSYSTEMS equipment allows upgrading to higher laser power, implementation of new applications, or an increase in production capacity, for example. An upgrade or update can also include the development or expansion of an automation solution.

#### Sample upgrade options:

- + Rotary axes, rotary tables
- + EasyVision optical part recognition
- + Automation components
- + Conveyor systems
- + Stronger laser sources
- + Software updates
- + 2D code scanner

#### Application consulting

Use your laser system's functionalities more efficiently by optimizing part quality, productivity or process reliability.

Through on-site consulting and solution finding in our application laboratory, our application engineers develop

and improve important technology parameters for your production together with you. Sample processing is done on your original processing workpieces to find the optimal configuration.

#### Your request includes:

- A sample workpiece
- The task
- Drawings and data

#### Our application laboratory provides:

- Processing of your sample
- Feasibility determination
- Determining the right machine configuration and process parameters

#### The result:

You get a proposal for optimal implementation of your task.

#### Customizing

With our standard systems we already cover many customer requirements. However, the tasks of our customers can go beyond this. We are specialists in developing custom solutions highly adapted to your needs — excellence in customization.

For example, we integrate and adapt:

- + Laser sources
- + Optics matching requirements and component size
- + Additional axes
- + Pallet systems
- + Robot and conveyor systems
- + Controlled indexing devices
- + Optical part recognition
- + Software solutions

#### Production optimization

Use our expert team's knowledge and years of experience to your advantage. Together, we analyze the current situation and develop a suitable solution that optimizes your system's availability and capability, and therefore its efficiency, too.

#### Custom automation

With customized automation, we can redesign your production processes. Leaner, automated production increases productivity. Equipment from LASERplusSYSTEMS has proven itself in a wide range of automated series production scenarios.

# LASER**plus**SYSTEMS

Perfect fit:  
Benefit from our team  
of experts and our  
years of experience.

LASERplusSYSTEMS by SATEG

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