

## CO<sub>2</sub>-Laser Cutting Centers



High-Speed Laser  
Cutting Centers  
for Machining Thick  
and Thin Sheet Metal

**TRUMATIC L 3050**  
**TRUMATIC L 4050**  
**TRUMATIC L 6050**

**TRUMPF**



# Technology for the Future

In 1987 TRUMPF presented the first flatbed laser cutting centers with TRUMPF TLF lasers. Since that time, everyday production in sheet metal fabrication has undergone massive changes. Quality and productivity requirements will continue to increase in the future – and TRUMPF has already taken a step toward that future by developing the TRUMATIC L 3050 - L 4050 - L 6050 machine series.



The machines from the TRUMATIC L 3050 - L 4050 - L 6050 series are highly dynamic, high-powered flatbed laser cutting centers. They operate according to the „flying optics“ principle, whereby the sheet metal workpiece is held stationary while the laser is moved across the working area. This enables high machining speeds to be achieved.

## Innovative Mechanical Engineering

The primary goal, while keeping the cost factor in mind, was to develop machines that would feature pacesetting technology yet ensure optimal user benefit. That's why the highly successful laser flatbed machine concept from TRUMPF has been equipped with numerous technological innovations.

- The highly-dynamic drive concept benefits decisively from the weight saving machine design.
- Highest stability combined with the consistent application of lightweight construction principles.
- TRUMPF laser of the latest generation: TLF 5000 and TLF 6000
- Intelligent design solutions, such as the integration of multiple functions in one component.

## Modern Drive Concept

The combination of linear direct drives in the Y and Z directions and a gantry drive in the X direction guarantees optimal technical and economical user benefit. The dynamics of these machines enable you to meet all challenges.

## Laser Performance Package

The machines from the TRUMATIC L 3050 - L 4050 - L 6050 series are equipped with lasers of the latest generation. Its high performance coupled with a lightning-fast laser power control mean that the machines are not only mastering high-speed cutting of thin sheet metal but can also cut thicker materials, e.g. mild steel up to 25 mm.



### Optimized Operating Sequences

Short paths mean optimal operation sequences. This philosophy is today revolutionizing the production and assembly process of modern firms. At TRUMPF it is revealed in small details: on the laser cutting systems in the TRUMATIC L 3050 - L 4050 - L 6050 series for example, the area below the laser is used as storage space for items regularly needed every day, such as cutting heads, cutting nozzles, documentation, etc.



# The Part Spectrum

## At Top Speed Through Thick and Thin



### Cutting speed and cutting quality are decisive:

Technologies that have been specially developed for TRUMPF machines ensure that you get the best results during laser cutting:

- SprintLas: increases processing speed by optimizing machining sequences in thin sheets.
- High-speed cutting (option): fast cutting with nitrogen and selective use of metallic vapour plasma to increase processing speed.
- PMS (Plasma Monitoring System): monitors process safety during cutting of thick-gauge stainless steel.
- PCS (Process Control System): Regulates and monitors the piercing process. Yields enormous time savings and less wear on material and machine by shortening the piercing time.
- HI-LAS: oxide-free and burr-free cut edges on stainless steels and aluminium alloys via high-pressure cutting.
- HI-LAS *Plus*: fast high-pressure cutting with nitrogen in thick aluminium and stainless steel.
- ContourLas: thick sheet processing to perfection means using special approach technologies for process-safe cutting of small holes in thick workpieces.
- Corner machining: loopings, curves or cooling in corner areas. Choose your method depending on your material and requirements.
- Twin-Line: common slitting cuts. In combination with ToPs 100, the machines have a module that automatically defines and processes these cuts, which saves on time and material.
- Microweld: Quickly and easily attaches workpieces – also in thick materials – to the sheet with the aid of one or more spot welds.
- Compressed air cutting (option): Using compressed air as the process gas in laser cutting enables rapid cutting at low gas costs.

## HI-LAS





# Laser Machining

## By Far the Best

### APC – Advanced Process Control:

Regulates the distance of the cutting nozzle from the sheet capacitively. Best cutting results – also in uneven sheets – are a matter of course. APC determines the sheet position and transmits the data to the control. This eliminates the need to subsequently reposition the sheet manually, avoiding scratches. In addition to this, APC guarantees process reliability during piercing and cutting.

### Laser Power Control

Laser power during machining is regulated in such a way that corners and small contours can also be machined with optimal cut quality.

### Automatic Focus Adjustment

The laser beam is routed to the cutting head through a completely enclosed guideway. The control mechanism *AutoLasPlus* guarantees automatic adjustment of focus to different types and thicknesses of material.



## The Laser

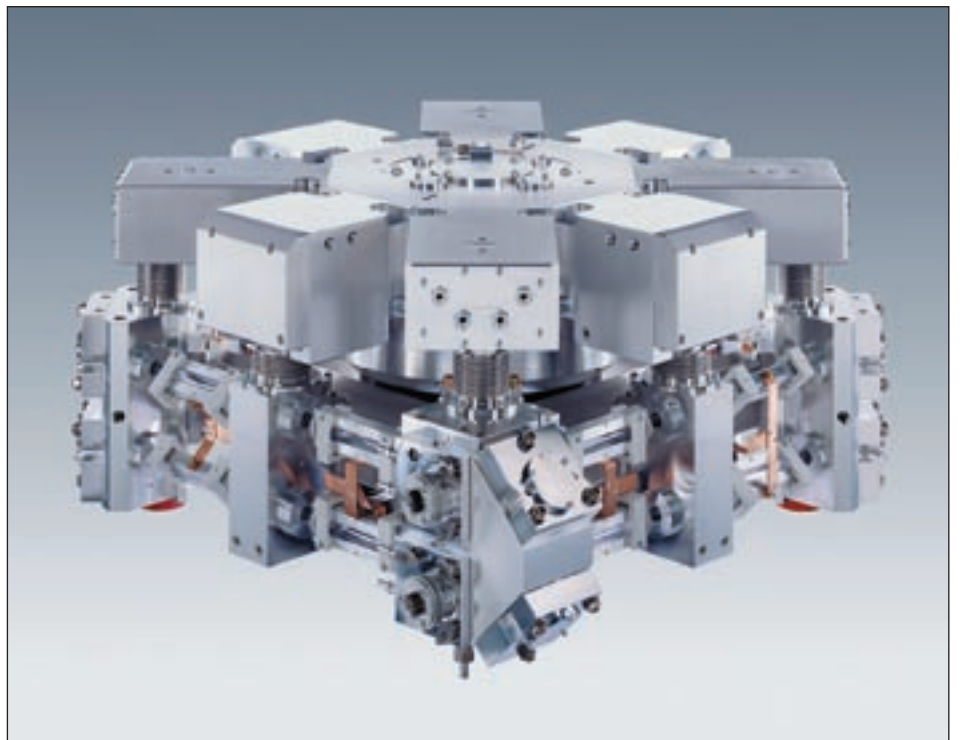
### Powerful, Reliable and Economical

The TRUMPF TLF 6000 laser is the most powerful member of the new TRUMPF laser-generation. The resonator of this RF-excited gas laser is folded into a square, enabling a very compact design and guaranteeing high long-term stability.

TRUMPF lasers have proven themselves thousands of times over in tough everyday use. Their chief characteristics are excellent beam quality and stepless adjustable output combined with low gas consumption thanks to RF technology.

### Turboblower on Magnetic Bearings

For circulation of the laser gas, the TRUMPF TLF lasers are equipped with a maintenance-free radial turboblower on magnetic bearings.



# Operation

## Laser Technology Made Easy

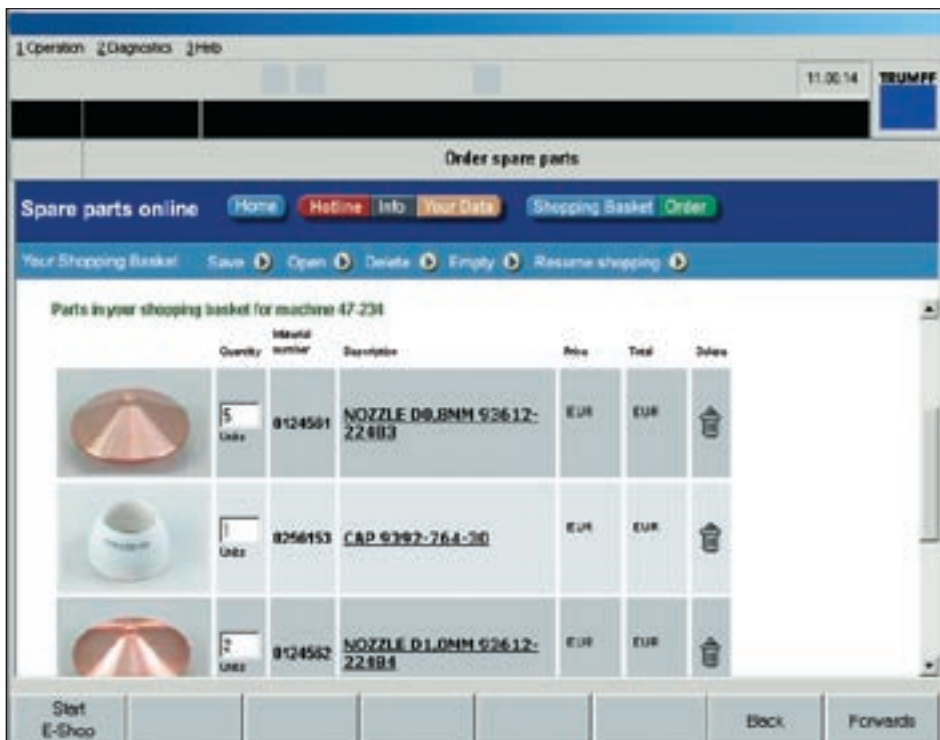


Modern controls guarantee simple operation. The comfortable user interface is a TRUMPF development and places the operator's activities in the foreground.

- An integrated online help function answers questions as they arise.
- Naturally the machine also features a sophisticated diagnosis concept including Teleservice via phone-modem.
- The heart of the system is based on technology tables. This enables swift and flexible adaptation to all kinds of materials and sheet thicknesses. For frequently used materials all laser parameters are preset, and activated automatically via table call-up.
- Simple parts can be programmed directly at the machine itself: for this, the control is equipped with the module ToPs 100 lite – the workshop edition of ToPs 100.

# E-Shop

## Ordering Spare Parts Online



Do you need new nozzles? Not a problem! Using the integrated modem, Internet and the TRUMPF e-shop you can order your spare parts directly through the machine control. E-Shop offers completely new possibilities:

- Pulls items together, directly into a shopping cart
- Sends and files orders

A perfect spare parts management system – eliminating paper work and fax machine.

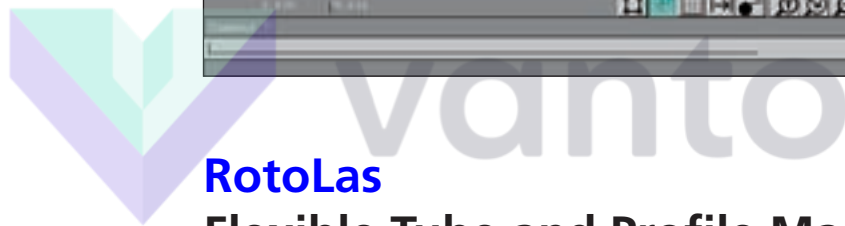
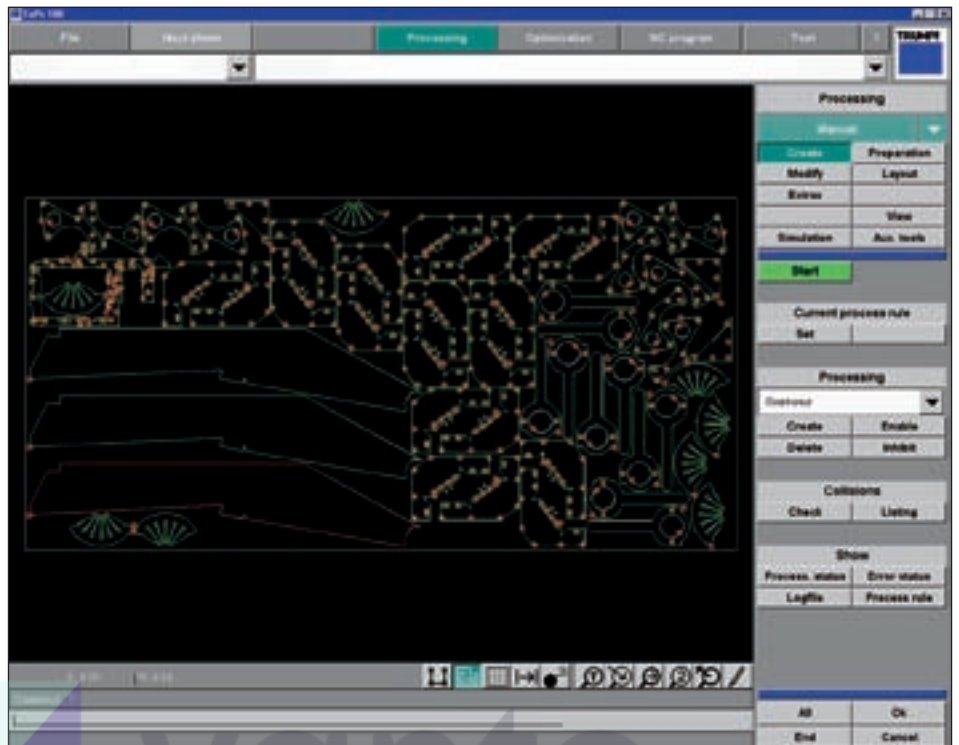
*Ordering spare parts quickly*

## The Programming System Tailored Precisely to the Machine

Mature machine technology also means uncomplicated programming. ToPs 100 is a CAD/CAM development from TRUMPF which ensures that machine and operator work together in perfect harmony.

- Part drawings can be generated in ToPs, or imported from CAD/CAM systems or ToPs 600.
- Nesting is job-related.
- Nested sheets are automatically fabricated at the touch of a button.
- Know-how included.

ToPs incorporates all our technological know-how: all machining parameters and data are stored in the technology tables and rules. ToPs »knows« which cutting parameters are suited to your material, and how to achieve the very best cutting results.

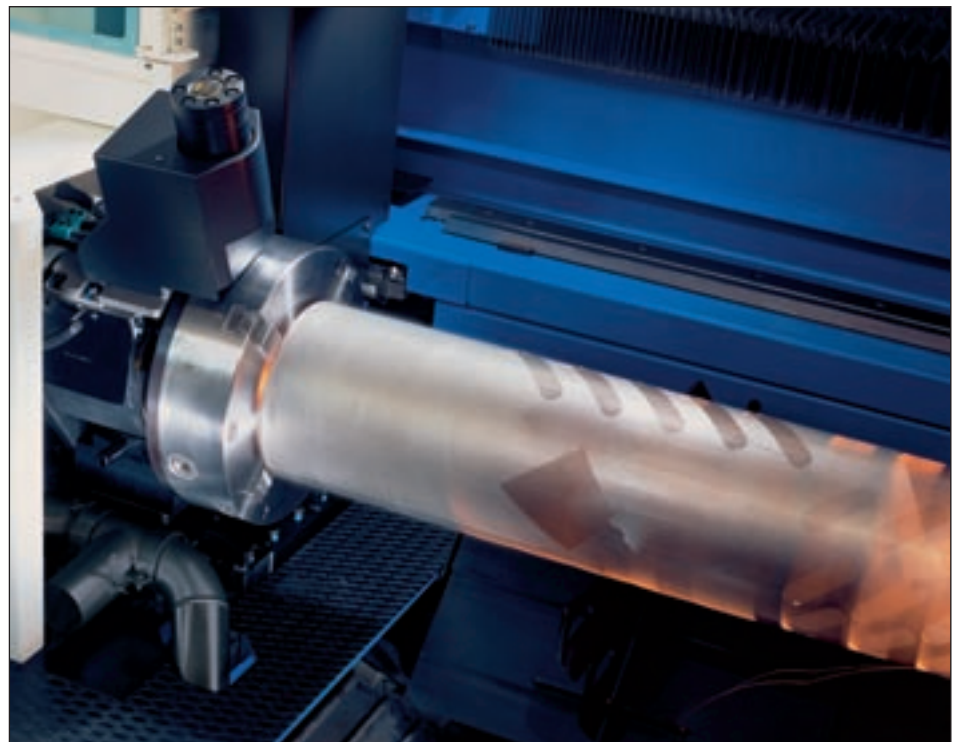


## Flexible Tube and Profile Machining

RotoLas is an accessory device for the machining of tubes and profiles.

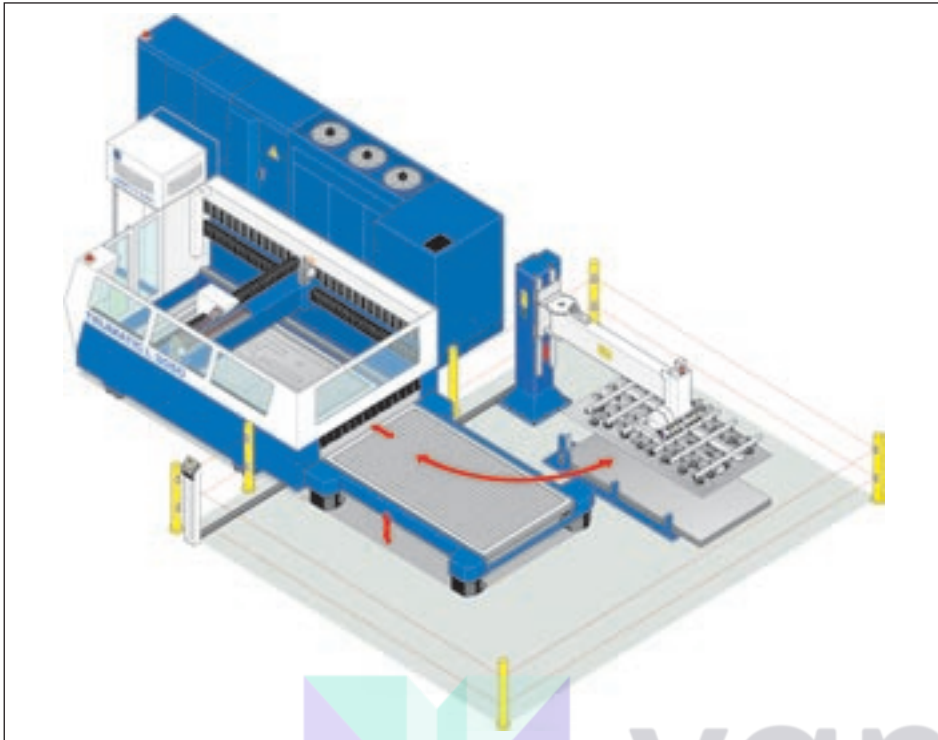
The changeover from flat sheet machining to tube machining takes very little time. The NC rotational axis is firmly connected with the machine frame, and a flexible support system ensures that all kinds of different tube types can be fed safely and securely into the machine.

One example among many of the steadily expanding range of applications for tube machining is the steel construction industry, where an increasing number of structures featuring fitted sections of tubular steel are being built.





## Tailored Automation Automatic Loading

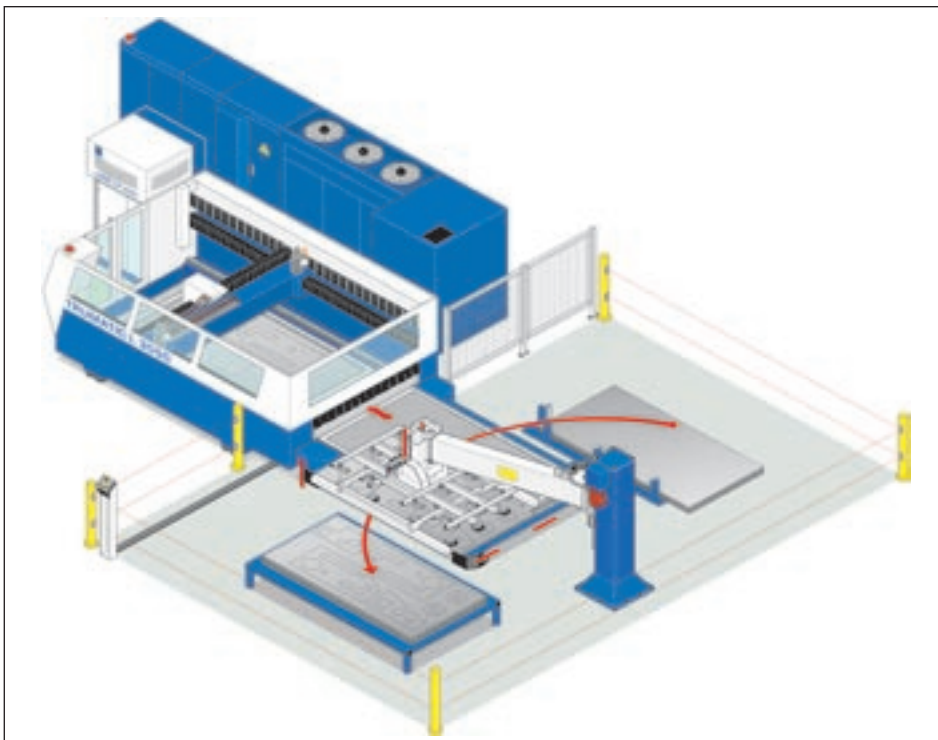


The machines from the TRUMATIC L 3050 - L 4050 - L 6050 series come with an automatic pallet changer as standard, enabling loading and unloading of the machine parallel to production time. The multistage automation concept is very flexible, and the degree of automation can thus be tailored and adapted to suit your requirements precisely.

The loading unit enables quick loading and easy handling, even of heavy, unprocessed blanks.

vanto

## Automatic Loading and Unloading



The starter solution for automation technology is the LiftMaster, which automates all loading and unloading processes. Sheets are conveyed from the raw material stack to the pallet changer by means of special suction cups. An unloading rake transports finished workpieces and sheet skeletons from the machine to the stack of finished parts. The LiftMaster enables unmanned operation over several hours – e.g. during a second shift.

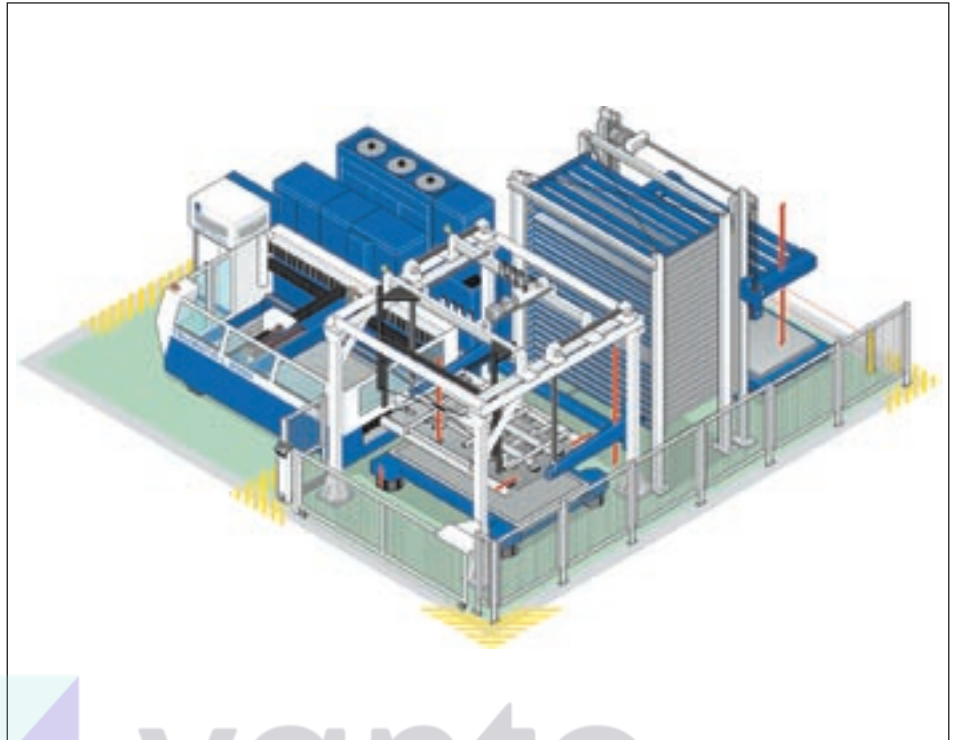
Valid for TRUMATIC L 3050 - L 4050



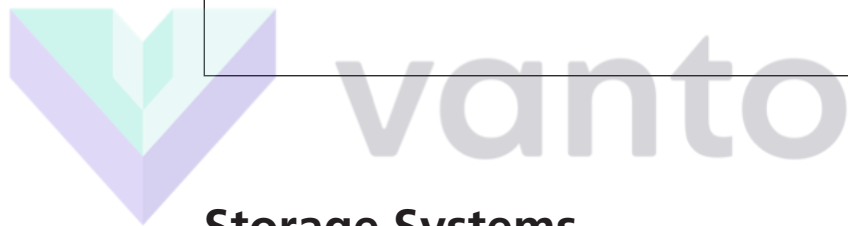
## Tailored Automation Storage Interface: LiftMaster store

The LiftMasterstore, combined with a shelf storage, opens the door to unmanned production. Its portal construction has been realized in a space-saving way above the pallet changer which thus remains optimally accessible at all times. Separating, double-sheet checking, picking up, and loading are done with the suction unit. The rake takes over removal from the pallet changer and depositing on the unloading position. Depending on the design, larger parts can also be separated from the sheet skeleton and deposited on an additional position.

Due to the realization of shorter cycle times, the automation keeps pace with the ever increasing productivity of laser machines.

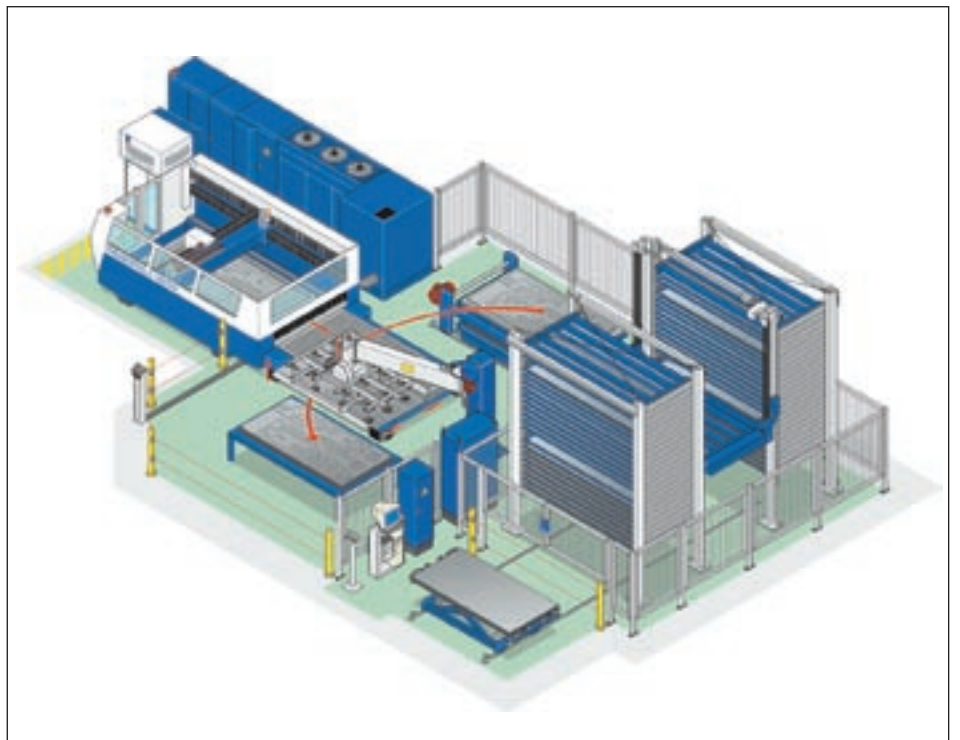


Valid for TRUMATIC L 3050



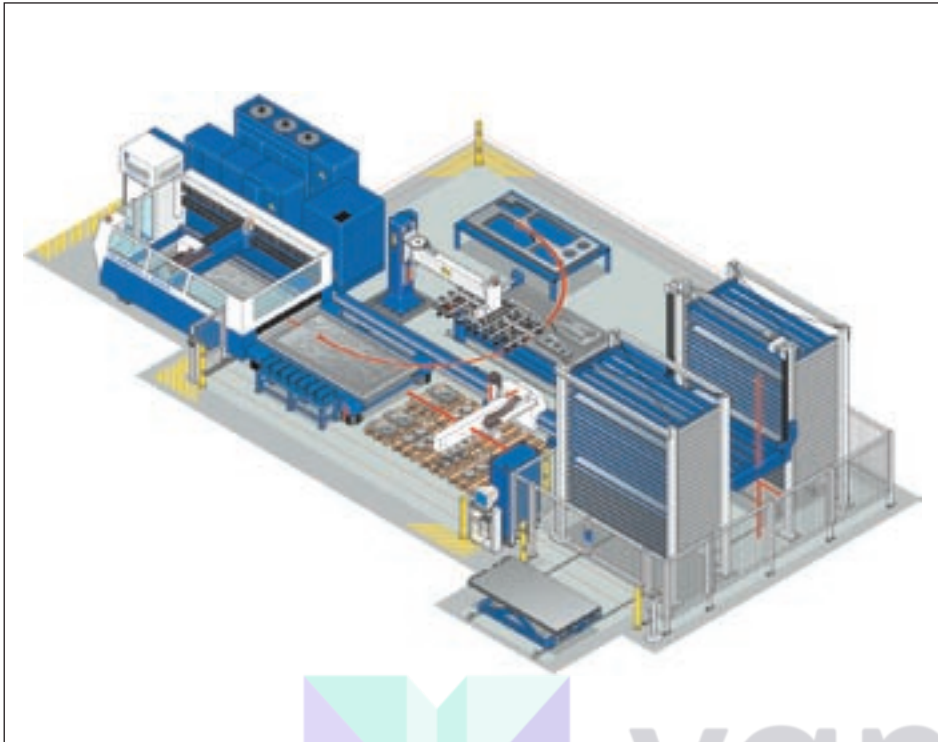
## Storage Systems

The large-scale solution is connection to a store – either a TRUMPF compact store or a system store. This means that fully automated production is guaranteed. Sheet metal blanks are taken from the store and readied on individual pallets or in a stack. Finished workpieces are then returned to the store either on pallets or in stacks.



Valid for TRUMATIC L 3050 - L 4050

# Automatic Sorting of Single Parts

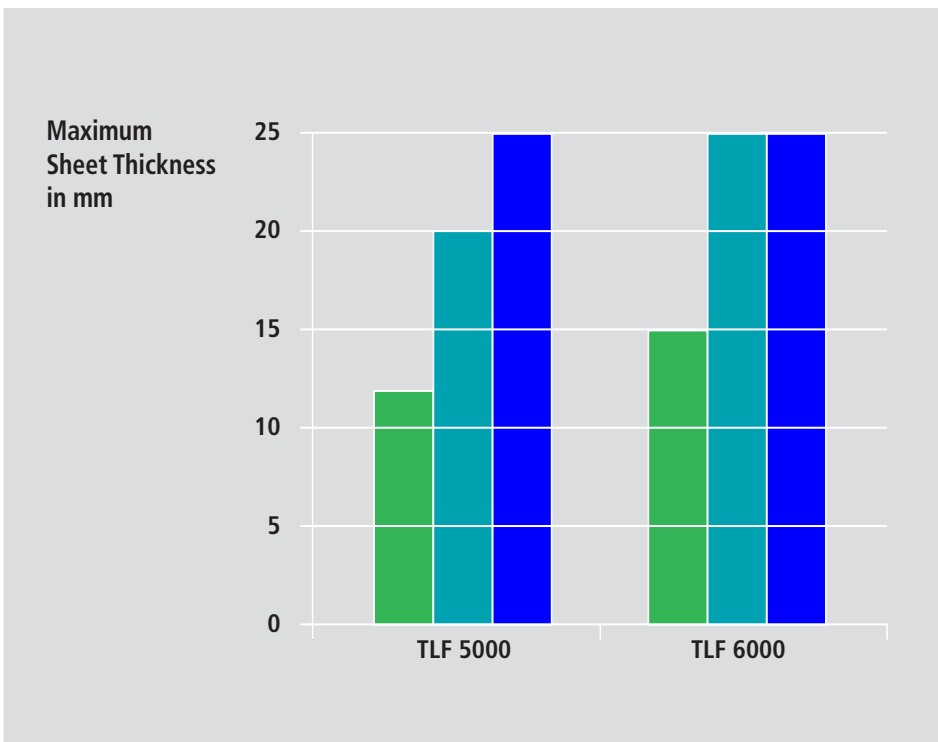


With the LiftMaster Sort and the SortMaster, TRUMPF offers an automation system of modular design. It enables unattended production, all the way from picking up the raw sheet from the stack, sorted depositing of small and large finished parts all the way to deposition the scrap skeletons.

The time-consuming sorting of finished parts from the scrap skeleton is drastically reduced. No finish-cut part is "neglected". Process-safety is ensured throughout the entire work sequence.



Valid for TRUMATIC L 3050 - L 4050



# Technical Data

Machine	TRUMATIC L 3050	TRUMATIC L 4050	TRUMATIC L 6050
<b>Working area</b>			
x axis	3000 mm	4000 mm	6000 mm
y axis	1500 mm	2000 mm	2000 mm
z axis (APC)	115 mm	115 mm	115 mm
<b>Max. workpiece weight</b>	900 kg	1800 kg	2800 kg
<b>Max. sheet thickness</b>			
Mild steel	25 mm	25 mm	25 mm
Stainless steel	25 mm	25 mm	25 mm
Aluminium	15 mm	15 mm	15 mm
<b>Max. axial speeds</b>			
Axis parallel	200 m/min	200 m/min	200 m/min
Simultaneous, approx.	300 m/mi	300 m/min	300 m/min
<b>Accuracy <sup>1</sup></b>			
Smallest programmable increment	0.001 mm	0.001 mm	0.001 mm
Positioning accuracy	± 0.1 mm	± 0.1 mm	± 0.1 mm
Repeatability ± 0.03 mm	± 0.03 mm	± 0.03 mm	± 0.03 mm
<b>Control</b>			
TRUMPF CNC control	Basis Sinumerik 840D	Basis Sinumerik 840D	Basis Sinumerik 840D
<b>Space requirements and weight <sup>2</sup></b>			
Length	11250 mm	13000 mm	16950 mm
Width	4600 mm	5400 mm	5550 mm
Height	2400 mm	2400 mm	2550 mm
Weight	12000 kg	14000 kg	16000 kg
<b>TRUMPF TLF CO<sub>2</sub>-Laser</b>	<b>TLF 5000</b>	<b>TLF 6000</b>	
<b>Guaranteed max. output</b> (programmable in 1% increments)	5000 W	6000 W	
<b>Wavelength</b>	10.6 µm	10.6 µm	
<b>Beam mode</b>	TEM <sub>01*</sub>	TEM <sub>01*</sub>	
<b>Consumption values</b>			
<b>Laser gas</b>			
CO <sub>2</sub>	1 l/h	1 l/h	
N <sub>2</sub>	6 l/h	6 l/h	
He	13 l/h	13 l/h	
<b>Cutt. gas consumption <sup>3</sup></b>	500-2000 l/h	500-2000 l/h	
<b>Laser cooling</b>	Enclosed cooling system	Enclosed cooling system	
<b>Electrical consumption of complete machine, approx.</b>	33 – 72 kW	37 – 76 kW	

<sup>1</sup> The achievable accuracy in the workpiece depends – among other things – on the kind of workpiece, its pretreatment, sheet size and position in the work area. According to VDI/DGQ 3441. Measuring length 1 m.

<sup>2</sup> Approx. value. The exact data can be found on the installation plan.

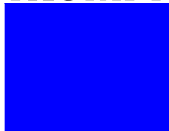
<sup>3</sup> Depending on application.



TRUMPF is certified according to DIN EN ISO 9001 and VDA 6.4



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