trotec

10 questions

to ask yourself before buying a laser

SETTING NEW STANDARDS

Are you planning to buy a laser machine? Before you invest in a laser machine, you should ask yourself a few questions. If you have clear answers for these, they will serve as a good basis for deciding which laser machine is the right one for you.

1 / What do I want to do with my laser?

Are you thinking of buying a laser machine to pursue a hobby, such as model making? Or are you looking for a laser machine for your company? If you are looking for a laser machine for your company, productivity should be right at the top of your checklist.

What materials can a laser process?

With the Speedy series of laser machines, you can engrave, cut and mark the widest possible range of materials. The palette ranges from glass, plastic and wood, rubber, leather and metals to textiles, cardboard or MDF. You'll find an overview in the following table.

The list gives you a general overview of which materials can be processed with the laser. We would be pleased to check special requirements for your laser application in a material and application test.

Material	Engraving			Cutting			Marking		
Wood	CO_2		Flexx	CO_2		Flexx	CO_2	Fiber	Flexx
Glass	CO_2		Flexx			Flexx			
Paper white	CO_2		Flexx	CO_2		Flexx	CO_2		Flexx
Paper coloured	CO_2		Flexx	CO_2		Flexx	CO_2	Fiber	Flexx
Cardboard	CO_2		Flexx	CO_2		Flexx	CO_2		Flexx
Leather	CO_2		Flexx	CO_2		Flexx	CO_2	Fiber	Flexx
Textiles	CO_2		Flexx	CO_2		Flexx	CO_2	Fiber	Flexx
Mirror	CO_2	Fiber	Flexx			Flexx			
Stone	CO_2		Flexx			Flexx			
Ceramics	CO_2	Fiber	Flexx			Flexx	CO_2	Fiber	Flexx
Cork	CO_2		Flexx	CO_2		Flexx	CO_2		Flexx
Food	CO_2	Fiber	Flexx	CO_2	Fiber	Flexx	CO_2	Fiber	Flexx
Metals									
Aluminium*		Fiber	Flexx					Fiber	Flexx
Aluminium anodised*		Fiber	Flexx				CO_2	Fiber	Flexx
Precious metals		Fiber	Flexx					Fiber	Flexx
Metal foils up to 0.5 mm (aluminium, brass, copper, precious metals)		Fiber	Flexx		Fiber	Flexx		Fiber	Flexx
Stainless steel*		Fiber	Flexx					Fiber	Flexx
Coated metal (varnished)	CO_2	Fiber	Flexx						
Brass		Fiber	Flexx					Fiber	Flexx
Copper		Fiber	Flexx					Fiber	Flexx
Titanium		Fiber	Flexx					Fiber	Flexx
Plastics									
Acrylonitrile butadiene styrene copolymer (ABS)	CO_2		Flexx	CO_2		Flexx		Fiber	Flexx
Acrylic (PMMA)	CO_2		Flexx	CO_2		Flexx			
Rubber (laser rubber)	CO_2		Flexx	CO_2		Flexx			
Polyamide (PA)	CO_2		Flexx	CO_2		Flexx		Fiber	Flexx
Polybutylene terephthalate (PBT)	CO_2		Flexx	CO_2		Flexx		Fiber	Flexx
Polycarbonate (PC) up to 0.5 mm	CO_2		Flexx	CO_2		Flexx		Fiber	Flexx
Polyethylene (PE)	CO_2		Flexx	CO_2		Flexx		Fiber	Flexx
Polyester (PES)	CO_2		Flexx	CO_2		Flexx		Fiber	Flexx
Polyethylene terephthalate (PET)	CO_2		Flexx	CO_2		Flexx		Fiber	Flexx
Polyimide (PI)	CO_2		Flexx	CO_2		Flexx		Fiber	Flexx
Polyoxymethylene (POM) e.g. Delrin®	CO_2		Flexx	CO_2		Flexx		Fiber	Flexx
Polypropylene (PP)	CO_2		Flexx	CO_2		Flexx		Fiber	Flexx
Polyphenylene sulfide (PPS)	CO_2		Flexx	CO_2		Flexx		Fiber	Flexx
Polystyrene (PS)	CO_2		Flexx	CO_2		Flexx		Fiber	Flexx
Polyurethane (PUR) foam	CO_2		Flexx	CO_2		Flexx		Fiber	Flexx
Foam (PVC free)	CO_2		Flexx	CO_2		Flexx			

Frequently Asked Questions:

Can I cut metal with the laser? Cutting metal requires a very high laser power; flatbed lasers typically don't have this. Furthermore, pure oxygen under high pressure must be used for metal cutting. Systems that are optimised for this are again not suitable for plastic cutting due to the high risk of explosion. Nowadays, almost no CO_2 lasers are used for metal cutting. These have been completely replaced by fiber laser systems. On the Trotec laser machines with a fiber laser source, you can engrave and cut thin metal foils made of aluminium, brass, copper or precious metals up to 0.5 mm.

How thick can you cut acrylic? The rule of thumb for a crystal-clear acrylic cut is: For every 10 watts of laser power, 1mm acrylic can be cut perfectly. So a laser with 120 watts of laser power can cut 12 mm perfectly. A thicker separation cut is also possible. Note the difference between a separation cut and a quality cut.

Which materials can I not engrave or cut with the laser? Even though the list of processable materials is almost endless, there are a few points to consider. There are materials that you should not process with the laser. During processing, substances are released in the form of gases or dust, which endanger the user and the functioning of the machine. This includes PVC, among other things. When heated, hydrocyanic acid is formed.

Caution with these materials

- Inferior leather (Chrome VI)
- Carbon fibers (carbon)
- Polyvinyl chlorides (PVC) including PVC-based synthetic leather
- Polyvinyl butyral (PVB)
- Polytetrafluorethylenes (PTFE /Teflon®)
- Beryllias
- Materials containing halogens (e.g. fluorine, chlorine, bromine, iodine and astatine), epoxy or phenolic resins.

Can a laser cut Dibond? Unfortunately, aluminium composite boards such as Dibond cannot be laser cut. In principle, materials made of aluminium or plastic can be processed with the laser engraving machine. However, the combination of aluminium-plastic-aluminium makes the makes material unsuitable for laser cutting. For interior applications, plastic laminate or acrylic sheets serve as a good alternative to Dibond. These are very easy to engrave and cut with the laser.

If you want to buy a laser for your company, you should consider the aspect of productivity in your purchase decision. The key factors are:

- Speed: Time is money.
- With more laser power, you can cut and engrave faster or process thicker materials.
- Reliability: The more reliable the laser machine and the longer-lasting your laser source, the less downtime you will have.
- Flexibility: Think about the day after tomorrow. You can process the widest range of materials on a laser machine with a CO_2 and a fiber laser source.

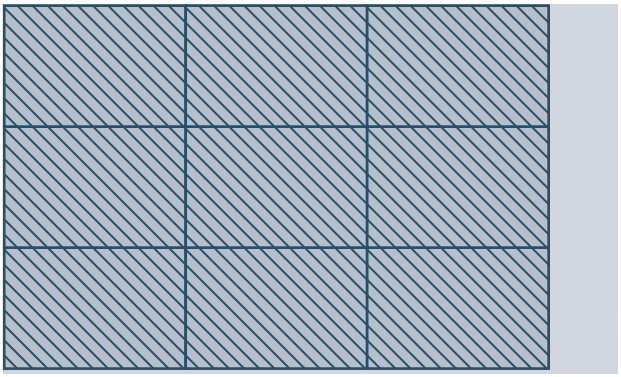
Productivity as the basis for profitability

2 / How big should the work area be?

One of the most important parameters when choosing a suitable laser machine is the size of the work area. This is determined by the individual size of the workpieces that you want to process with your laser machine. The more individual pieces you can place on the work area, the less time you need for loading and unloading. This results in idle time for the laser. More work area means more productivity.
Standard plate formats should also be considered. This minimises material waste and optimises utilisation of your laser.

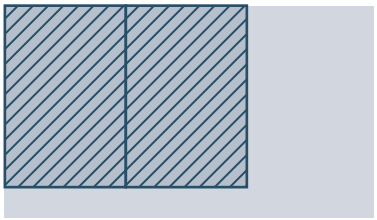
The same applies here: Think about the future. A larger work area means more application options and therefore greater flexibility. Align your choice of work area with the “best case scenario”. The difference between the higher leasing costs, which arise from a laser machine with a larger work area, is less than profits lost from orders that are not accepted due to lack of availability or that have to be outsourced.

Speedy 400



9 signs (200x300 mm)

Speedy 100



2 signs (200x300 mm)

In addition to waste, set-up time (i.e. the time required to load and unload the work area) also plays an important role. The 9 signs are engraved in one pass on the Speedy 400, while on the Speedy 100 only 2 plates are processed in one pass and the corresponding set-up time increases.

3 / What laser power do I need?

Choosing the appropriate laser power depends on the main application. If you mainly use the machine for engraving, you will achieve good results with a power range between 25 and 80 watts. If you want to laser cut materials or you need a very high working speed for your application, we recommend a laser power of more than 80 watts.

Rule of thumb: The higher the laser power, the more flexible you are in the application. Laser power has a direct impact on your productivity – and therefore your sales and earnings too.

With twice as much laser power, the machine cuts and engraves twice as fast. This means that, for example, if you get the desired result with 50% speed and 100% laser power on a 60 watt laser machine, you can engrave with 100% speed on a 120 watt laser system. This linear relationship applies to cutting too. Twice as much power means cutting twice as fast or at the same speed but on material that is twice as thick.

One aspect that should not be overlooked is beam quality. More laser power doesn't necessarily result in higher productivity if the beam quality is compromised. Precise engineering of the beam guidance ensures that the laser power reaches the work area and is therefore more than just a data sheet value. Laser systems built to lower quality standards may state a laser source power on their data sheet, but this is not necessarily what will be delivered during laser processing.

In certain applications, for example when engraving paper, a relatively low laser power is recommended.

On troteclaser.com (https://www.troteclaser.com/en/faqs/optimal-laser-power/) you will find detailed recommendations for choosing the right laser power.

Cutting: acrylic letters, cut with 80 watts or 120 watts

Laser power: 80 watts
Process: 65 % completed
Time per piece: 29 seconds

Laser power: 120 watts
Process: 100 % completed
Time per piece: 29 seconds

Engraving: anodised aluminium dataplate, engraved with 30 watts or 80 watts

Laser power: 30 watts
Process: 48 % completed
Time per piece: 55 seconds

Laser power: 80 watts
Process: 100 % completed
Time per piece: 55 seconds

4 / What does a laser machine cost?

Many interested parties ask us about the price of our laser machines. This is closely related to the purpose of a laser machine. If you are using your laser machine for a hobby, for example, a very inexpensive laser plotter that fulfills the basic purpose such as laser cutting and laser engraving may be the right choice for you. Our experts like to compare the question of the price of a laser machine with the question of the price of a vehicle: The price points of a small car, sports car and truck are fundamentally different. Every machine at Trotec is configured individually according to customer requirements.

Don't just consider the initial investment, but focus on the total cost of ownership. Which customers do you supply? What requirements do your customers have in terms of reliability in delivery and quality? And what would it mean for your business if you lost these customers due to downtime of your laser machine?

Entry-class laser:

Acquisition	Finishing	Replacement of a laser tube	Acquisition

High-quality laser machine:

Acquisition	Finishing	Replacement of a laser tube

Include costs for maintenance, servicing, replacement of a laser tube or parts and warranty in your initial calculation. What are the respective manufacturer's warranty terms? Compare these. Put a supposedly very inexpensive machine to the test theoretically.

If the laser is to contribute to your economic success and your productivity, we recommend the quality of engraving and cutting results and the total cost of ownership as important points of reference. What initially looks like high costs becomes clear and easy to finance through leasing offers – and thus part of your long-term business success.

The period under consideration for this calculation refers to 10 years. For the Trotec laser we assume a service life of 10 years. With the entry-level laser, on the other hand, we assume a life span of 5 years and therefore include a 2nd purchase.

Read more about this: https://www.troteclaser.com/en/faqs/comparison-chinese-laser-western-laser/

In addition to the question of the price of a laser system, we are also frequently asked about second-hand machines. In principle, second-hand laser machines are also available from us, but in limited quantities.

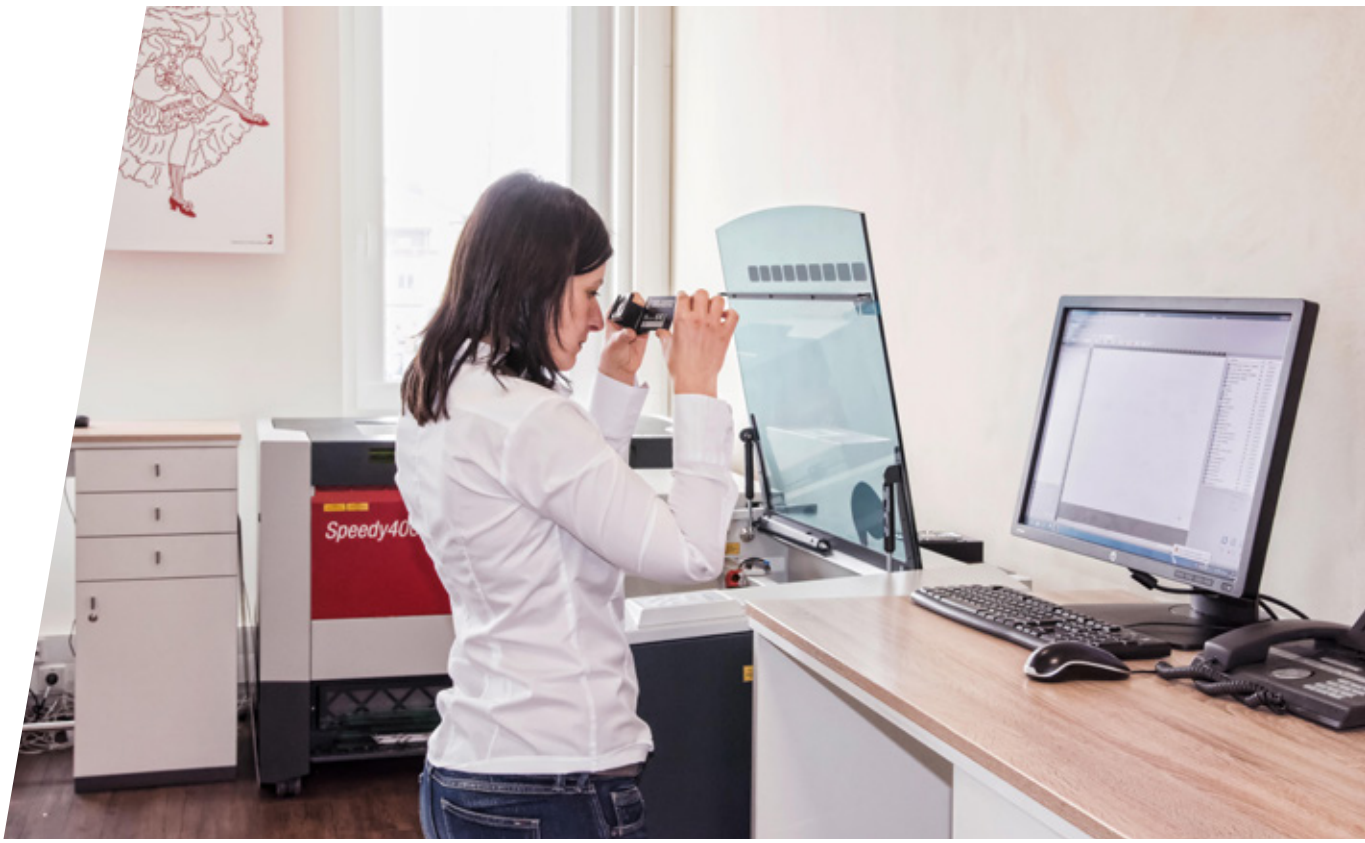
Trotec laser machines are known for their quality and long life. Therefore, they are extremely popular as used laser machines. Our 180 showrooms worldwide are constantly being equipped with new laser machines. In this way, used lasers are returned to our stock. If customers reach their capacity limits and decide on a larger laser machine, we will gladly take back the existing laser machine and make it available to other prospective buyers. These second-hand laser machines are serviced and maintained by us professionally before we offer them for sale.

5 / What services do different laser manufacturers offer before buying?

The investment in a laser machine should be well planned. Find out about possible financing options before you buy. If you choose a leasing model, you only need a small amount of start-up capital, you can use your laser and earn money with it immediately. Your laser machine finances itself so to speak. Furthermore, leasing rates are tax deductible as business expenses and offer planning security thanks to the compiled financing plan.

Get lots of information before making a purchase decision: Which manufacturers offer demos, material tests before the contract is signed and training courses as well as helpful support long after the contract is signed?

The Trotec team supports you with all the services mentioned above. We will advise you in detail on which laser machine is the right one for your application and your business case. Together with you, we think about the future. Be it at online demos, an individual appointment in one of our 180 demo centres, at your location or at trade fairs – we will gladly answer all your questions relating to application, laser power, laser parameters, financing and marketing. We are also happy to test unusual materials in our laboratory and work out appropriate laser settings. For all common materials, settings can be found in the supplied Trotec Laser software. Are you wondering how to optimally integrate your laser into your production environment? We take a close look at your setup and provide tips for seamless, efficient integration. Our many years of experience with several thousands of systems installed worldwide helps us to do this.



6 / What do the servicing and support offers of different manufacturers look like after the purchase?

Choose a provider whose support doesn't end with a signature on the purchase contract and delivery of the laser system. Especially in "daily business", you should be able to access a wide range of services. When it comes to servicing, support directly from the manufacturer is worth its weight in gold, because nobody knows the laser machine as well as the manufacturer's service team.

As part of the installation of your laser machine, Trotec also provides you with initial user training on your laser machine. Use this training to ask all your unanswered questions.
You will find a wide range of laser templates and design samples in the DIY area on troteclaser.com. The product ideas contain laser parameters as well as tips and tricks for manufacturing. Trotec offers you a comprehensive training program as part of the Trotec Academy: The training courses on laser processing of the most common materials, graphics or laser software are very popular. The feedback from our customers is consistently positive. However, the focus is not only on the laser machine. Our laser material for engraving and cutting is quick and easy to process and keeps the cleaning effort to a minimum.

When it comes to servicing, you can contact Trotec Support in various ways. Top-trained laser experts are available on the Trotec Support hotline. In addition to the service hotline, we offer error diagnosis via a remote maintenance service. A service technician logs on to your PC via the Internet and checks the status of your laser software. Many problems can be solved in just a few minutes. If this isn't the case, a service technician will come to you and solve the problem on site.

The most important spare parts for our laser machines are kept permanently in stock. In this way, we ensure short delivery times. We procure rare or worn spare parts at short notice so that we can respond quickly if necessary.

Should your business idea not commercialise despite the best planning, or if your business is booming so much that you reach capacity limits and want to expand, there is the option of a laser trade-in at Trotec.

We are a reliable partner for our customers long after the purchase.

7 / How easy is it to operate the laser machine?

Up to 65% of the process costs arise in the layout or preliminary stage of production. Fast set-up, little cleaning effort and immediate and reliable material processing make a decisive contribution to profit.
Laser engraving is as simple as printing. First, create the desired design in your usual graphics program (e.g. CorelDraw, Photoshop, AutoCAD, Illustrator, InkScape, etc.). Then use the printer driver to send the graphic to the laser machine. At the touch of a button, you can then laser engrave or laser cut your material with the stored parameters. Of course, you can still make various adaptations in the laser software if required.

The Trotec development team claims that everyone can operate our laser machines. After initial training, you and your team are ready to start lasering.

The result: Unnecessary downtime is avoided and time and money saved.

Simply intuitive
- good view
- open access to the laser machine
- very quick and easy table change
- dynamic status display: Laser status recognisable at a glance
- Sonar Autofocus for fastest focusing
- Parameter database
- Camera system

How safe is the laser?

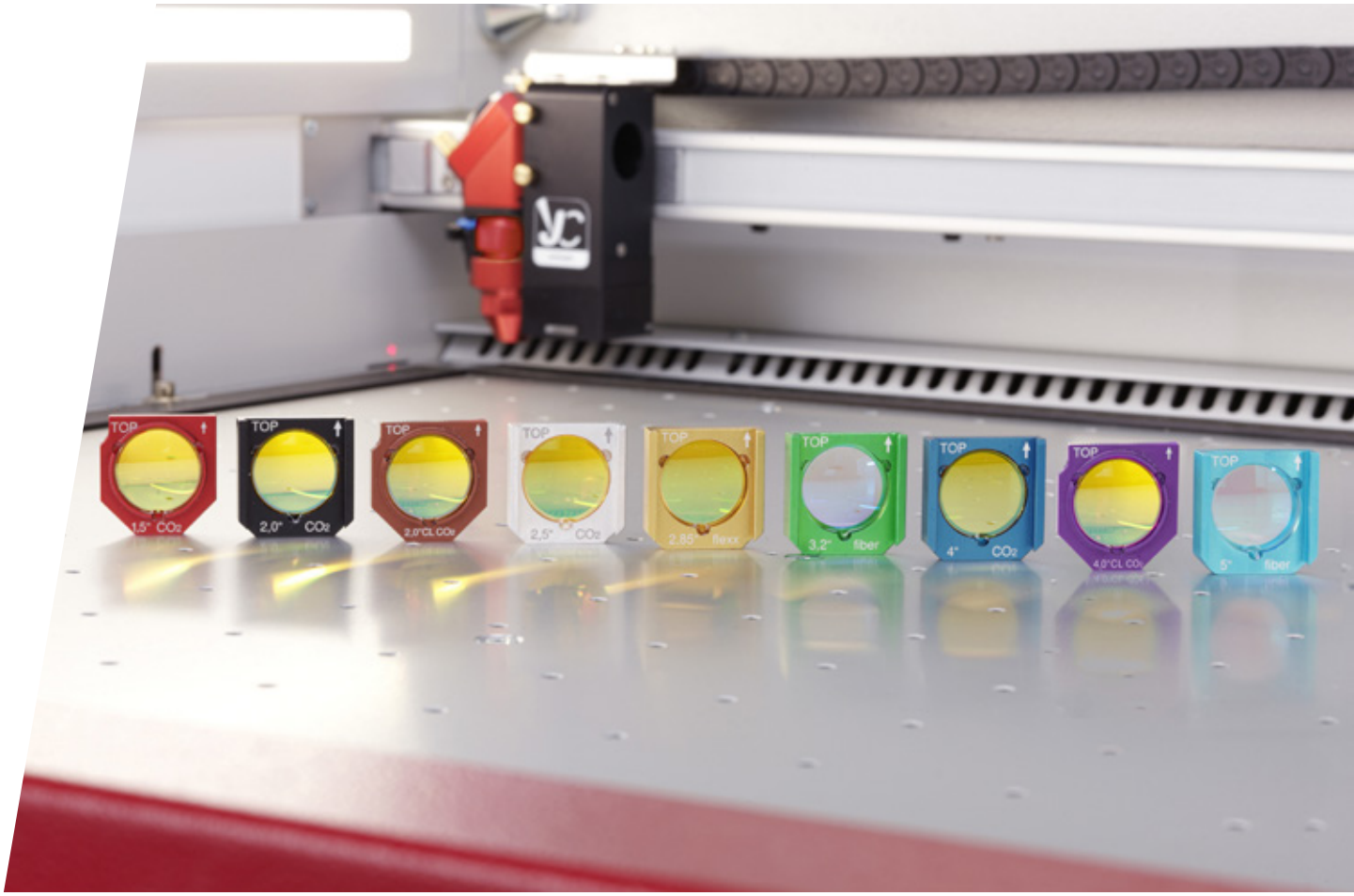
Thanks to the enclosed design of the Trotec laser machines, you and your team are optimally protected. The rapid and efficient extraction of dust and gas in the closed concept also ensures safety. Trotec laser plotters belong to safety class 2. Why only laser class 2? Laser pointers are installed in all Trotec laser machines to show the user where the laser hits the material. According to the internationally recognised standard, laser pointers with less than one milliwatt of power belong to laser safety class 2.
All Trotec laser machines are CE-compliant and thus meet the essential safety and health requirements of the EC Machinery Directive 2006/42/EC. Here you will find an overview of machine-specific safety and protection devices, which make our lasers one of the safest in their class all over the world.

If you have any questions about laser safety, please contact us.

8 / Can the laser machine be expanded?

In the best case, your laser grows with your company. Invest in a laser machine that you can expand as your requirements change. A wide range of accessories is available for Trotec laser machines: The offer ranges from different table designs to a rotary engraving attachment to a camera system for the precise cutting of printed materials.

In addition, you can also increase the laser power of your laser machine or replace your existing laser machine with a larger system if you reach your capacity limits. We would also be happy to advise you on this.



9 / Should I invest in an adapted overall system?

In addition to the laser machine itself, the interaction of laser - software - exhaust system is crucial for optimal engraving and cutting results.

Trotec is the only laser manufacturer to produce exhaust systems that are optimally adapted to the respective laser machine. A suitable exhaust system ensures the safe and clean operation of your laser machine. It reliably removes dust and gases from the processing area and, with its activated carbon filters, it filters out odours that may be generated during laser processing. The Atmos exhaust system helps to deliver the best possible engraving and cutting quality.

Another aspect that avoids errors is the bi-directional communication between laser and software. The user is made aware of possible errors before they occur and valuable material is cut.

Trotec materials for engraving and cutting complete the overall concept. Trotec also draws on years of experience and expertise when developing materials.

10 / What do I need to consider when setting up the laser machine?

When your Trotec laser machine arrives, you can start lasering and earning money within just a few hours.
When choosing the location for your laser machine, you should consider the following things: How does the laser machine get into your premises?

Does the laser device fit through the existing door width? Can direct sunlight be avoided?

Of course, we will go through all the important points with you in advance and will be happy to advise you on the choice of the optimum location.

Open questions & advice

Would you like to go through your questions in detail with a Trotec Laser expert or would you like specific advice for your business? Contact us! We are happy to advise you. Let's laser together.

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