

# LAS



## Extraction and Filtration Technology for Laser Fume

Extraction. Filtration. Persistence.





*Laser processing equipment may only be operated with fume extraction technology of high performance and quality*

# Laser technology is great. When it stopped smoking.

Lasers are welding metal or plastic components, they are cutting sophisticated contours and they are marking and structuring surfaces. Also printing and medical technologies benefit from laser technologies. But all of them share one problem: laser fume.

## Laser fume

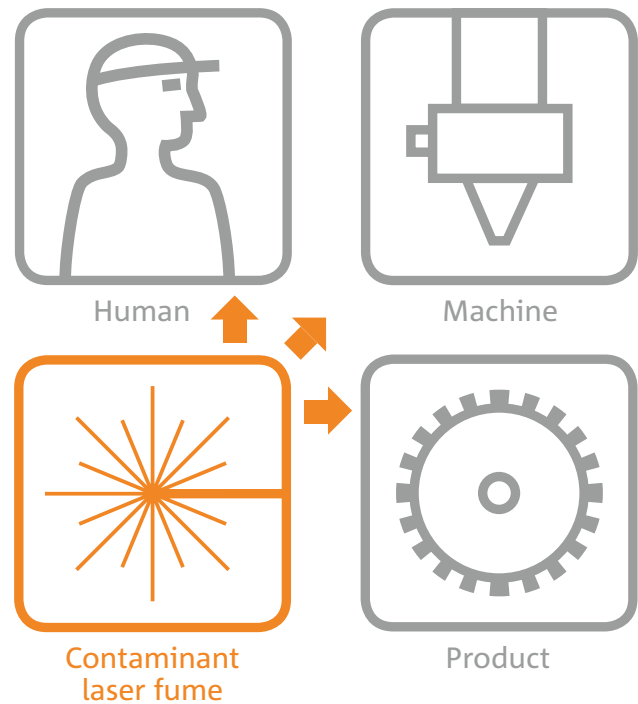
No matter, whether processed materials are harmless — laser fume is not. The energy input during processing triggers pyrolytic and oxidation processes. They release a caustic, toxic mix of aerosols, gases and nano particles. The latter are extremely hazardous, as during inhalation they overcome the lung-blood barrier and enter the nervous system.

Therefore, legal provisions for removing laser fume from the air at work places, e.g. EC directives concerning fine dust pollution, pose strict requirements. It is about human health, but not only: machinery and products are damaged by laser fume that builds up firmly adhering layers of contamination.

## Fume extraction technology

As a result, extraction and filtration technology for laser fume faces high requirements. It is about capturing each and every particle, hence extraction solutions are in demand, which should be positioned as close as possible to the point of origin. The filtration systems must be absolutely safe. Even during exchange. As many laser processes are operated in highly automated volume production environments, a high degree of availability is of concern. ULT's extraction and filtration technology LAS for laser fume removal meets all these requirements.

## The threefold damaging effect of laser fume



## Typical fields of application

- » Laser cutting
- » Laser sintering
- » Laser welding
- » Laser marking
- » Laser structuring
- » Laser ablation
- » Medical laser treatment
- » Laser printing

# Laser fume does not equal laser fume. Two filtration systems.

With operating processes, extraction precedes filtration. When selecting fume extraction technology, however, the reverse order applies. The first question calls for an adequate filtration system. LAS systems offer users the choice between two alternatives.

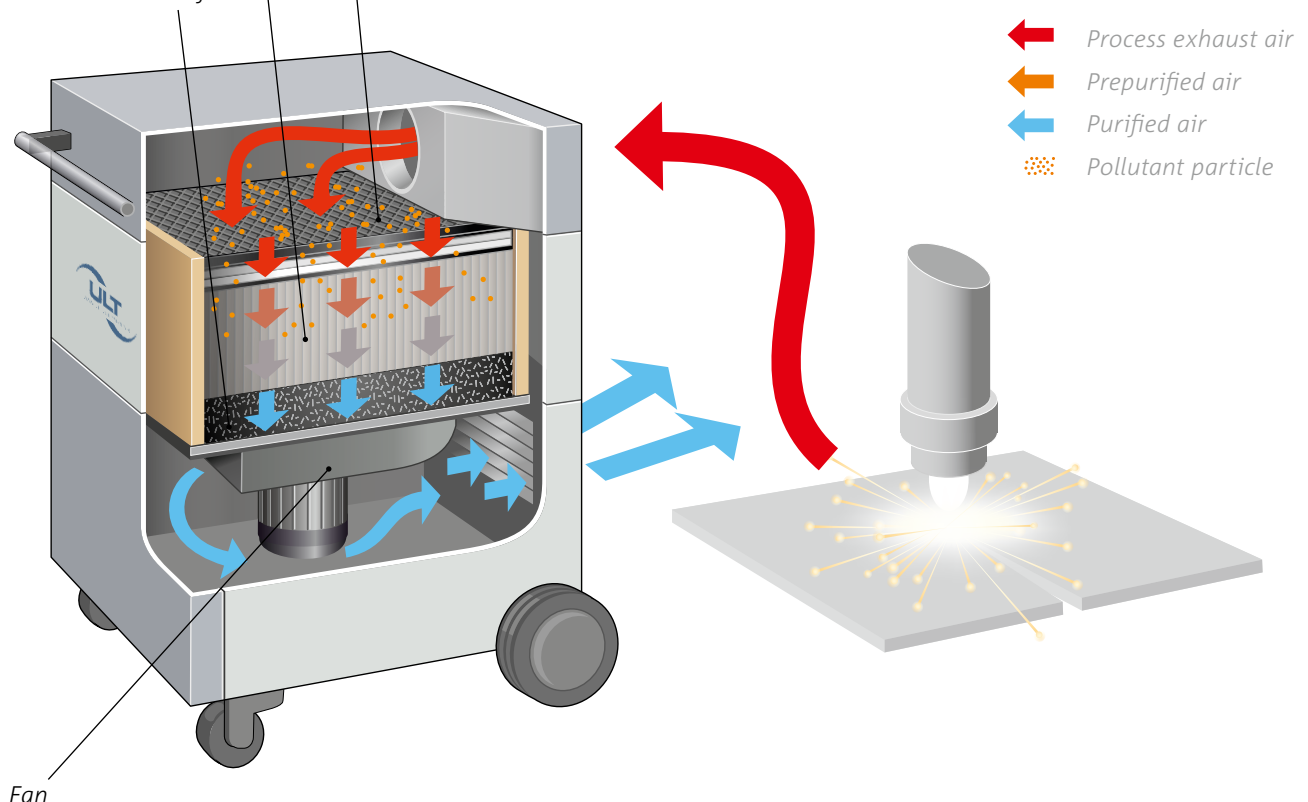
## Saturation filter units

Saturation filter units are mainly used, where the amount of laser fume is comparably small, for removal of sticky laser fumes and for odorous emissions. Dusts and gaseous pollutants are retained by the filtration systems; the purified air is fed back into the work area. At the end of their service lives, saturation filters shall be replaced — a simple matter with LAS units.

Resublimation filter / Spark protection

Submicron particulate filter

Activated carbon filter



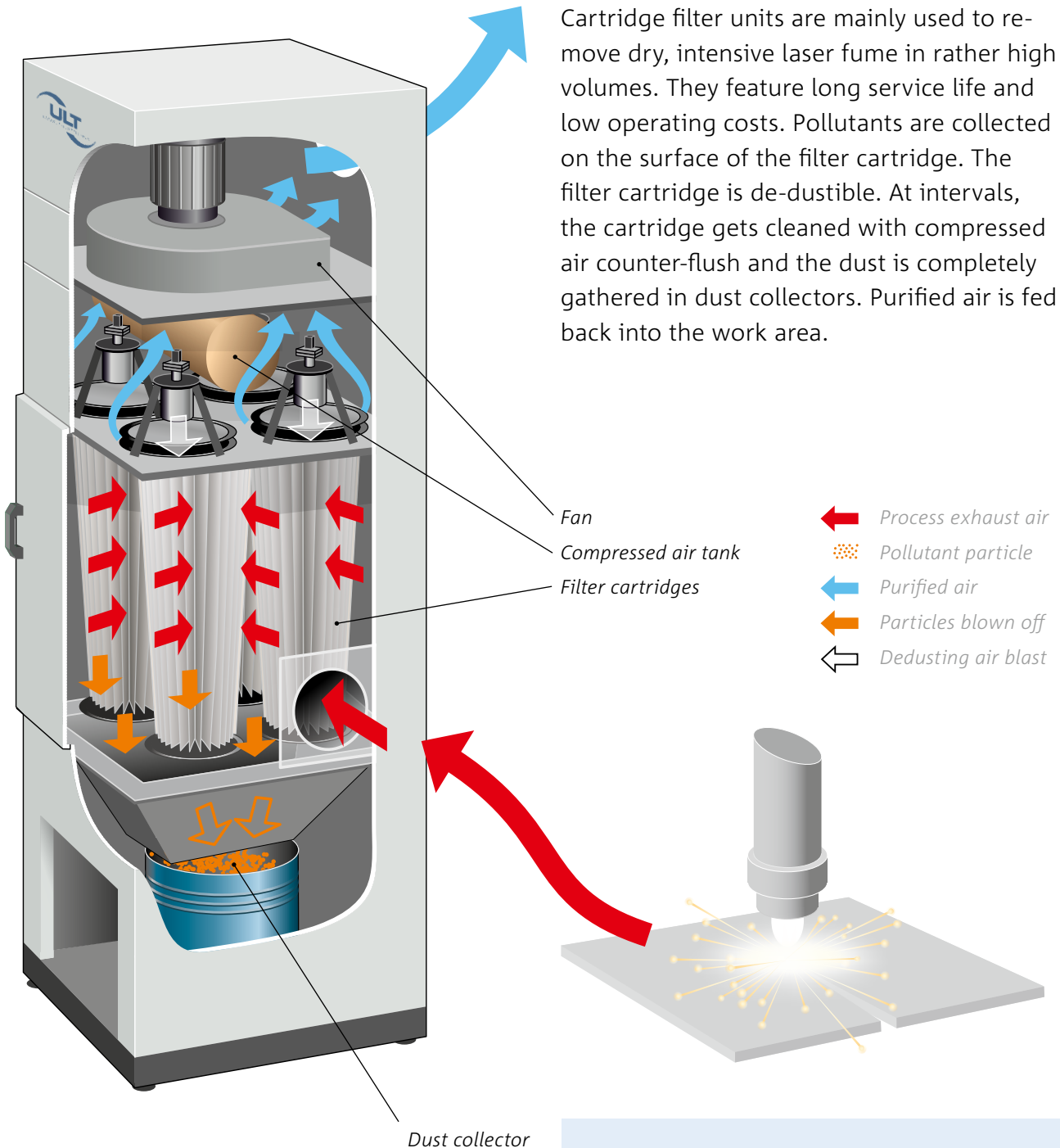
Functional principle of  
saturation filter units

## Saturation filter units

- » For low laser fume concentration
- » For sticky laser fume
- » For additional odor pollution

## Cartridge filter units

Cartridge filter units are mainly used to remove dry, intensive laser fume in rather high volumes. They feature long service life and low operating costs. Pollutants are collected on the surface of the filter cartridge. The filter cartridge is de-dustible. At intervals, the cartridge gets cleaned with compressed air counter-flush and the dust is completely gathered in dust collectors. Purified air is fed back into the work area.



*Functional principle of cartridge filter units*

## Cartridge filter units

- » For high laser fume concentration
- » For dry laser fume
- » For high demands on service life

# Also essential: extraction capacity.

Type and volume of the laser fume are not the sole criterion when selecting the adequate filter system. The required extraction capacity is also of key importance. Work place and suction environment are essential here.

LAS saturation filter units are primarily designed for low to medium laser fume intensity. They are suitable for numerous single-user workstations in labs, manufacturing or industry.

The normally small footprint of saturation filter units brings some advantages into play: compact and mobile solutions.

## *LAS saturation filter units*

<b>LAS Series</b>	<b>Volume flow max. [m³/h]</b>	<b>Vacuum max. [Pa]</b>	<b>Nominal capacity [m³/h at Pa]</b>
<b>JUMBO Filtertrolley</b>	190	3,200	80/1,900
<b>160 MD.11</b>	190	3,200	80/1,900
<b>200 MD.14</b>	635	3,200	250/2,000
<b>200 HD.12</b>	220	22,000	120/12,000
<b>260 HD.16</b>	200	22,000	160/6,500
<b>260 HD.19</b>	340	8,300	200/5,000
<b>300 MD.16</b>	900	3,650	250/3,000
<b>300 HD.13</b>	400	12,000	200/7,500
<b>300.81</b>	400	20,200	270/5,000
<b>400 MD.17</b>	1,000	2,600	400/2,300
<b>1200 MD.18</b>	1,500	3,250	1,000/1,700

*Examples of saturation filter units:  
LAS 1200, LAS 260  
and LAS 160*



*LAS cartridge filter units*

<b>LAS Series</b>	<b>Volume flow max [m<sup>3</sup>/h]</b>	<b>Vacuum max. [Pa]</b>	<b>Nominal capacity [m<sup>3</sup>/h at Pa]</b>
300 MD.16	900	3,650	250/3,500
300 HD.13	400	12,000	200/7,500
500 MD.47	2,100	2,880	750/2,750
500 HD.14	400	20,200	270/5,000
1500 MD.60	2,160	3,200	800/2,500
1500 MD.61	3,240	3,450	1,200/2,500
2500 MD.63	3,250	5,000	2,000/3,000
3000-9FP	4,300	4,000	3,600/3,300

For high laser fume intensity, LAS cartridge filter units are the devices of choice. Due to integrated dust collectors they require slightly more space than saturation filter units. The highest-performing units are stationary devices. They are perfectly suited for extraction at large or central systems. They effectively remove high volumes of laser fume.

*Example of cartridge filter units: LAS 300, LAS 500 and LAS 1500*



# An eye on the real laser process.

## Flexible performance

Quite often, an individual work place is used to process different materials with changing laser tools, or occasionally it may be foreseeable from the outset that the laser system will be expanded and the fume extraction technology must then grow accordingly.

Simple module replacement helps to increase suction capacity within the range of a given filter system, or even change the filter system by substituting the main filter module. Special pre-filter and post-filter modules can be added as well as interchangeable capturing elements.

### Variable unit configurations to suit the application conditions:

- |  |   |
|--|---|
| <b>Areas of application</b>            | <ul style="list-style-type: none"><li>» Metal</li><li>» Wood</li><li>» Rubber</li><li>» Plastics</li></ul>  |
| <b>Available type of drive</b>         | <ul style="list-style-type: none"><li>» Fan with EC drive: maintenance-free, low energy consumption</li><li>» Turbine with EC drive: maintenance-free, medium collection volumes, compensation of high pressure losses in intake path</li></ul> |
| <b>Available main filter modules</b>   | <ul style="list-style-type: none"><li>» Cartridge filter for high-intensity laser fume</li><li>» Dust filter combination for medium-intensity laser fume</li><li>» Combination filter for special applications</li></ul>                        |
| <b>Available add-on filter modules</b> | <ul style="list-style-type: none"><li>» Pre-filters for high amounts of sticky laser fume particles</li><li>» Spark protection units</li><li>» Automatic dosing systems for filter aids to bind and inert particles</li></ul>                   |

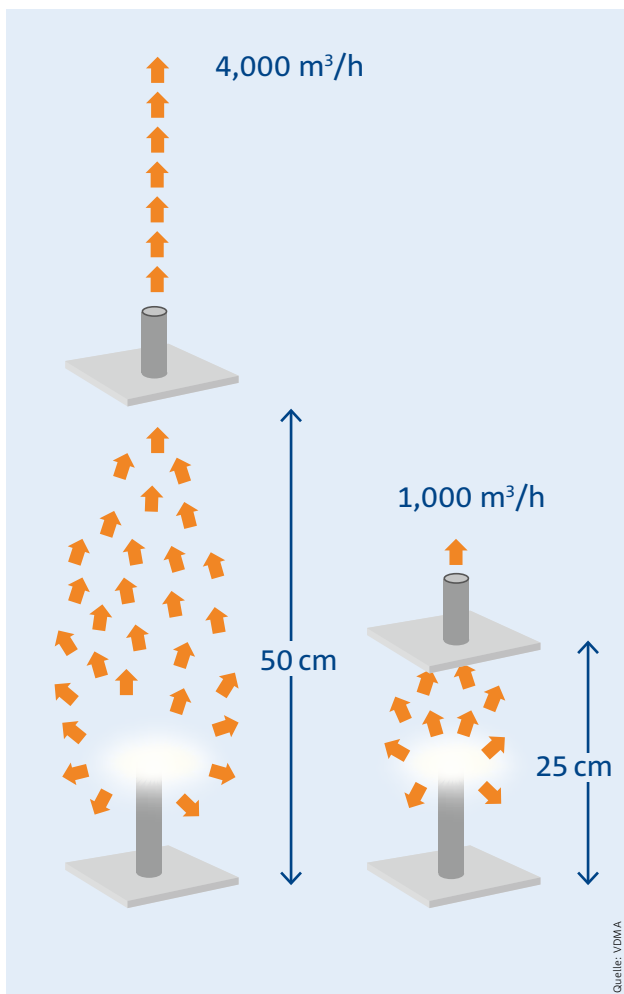


## Individual capturing

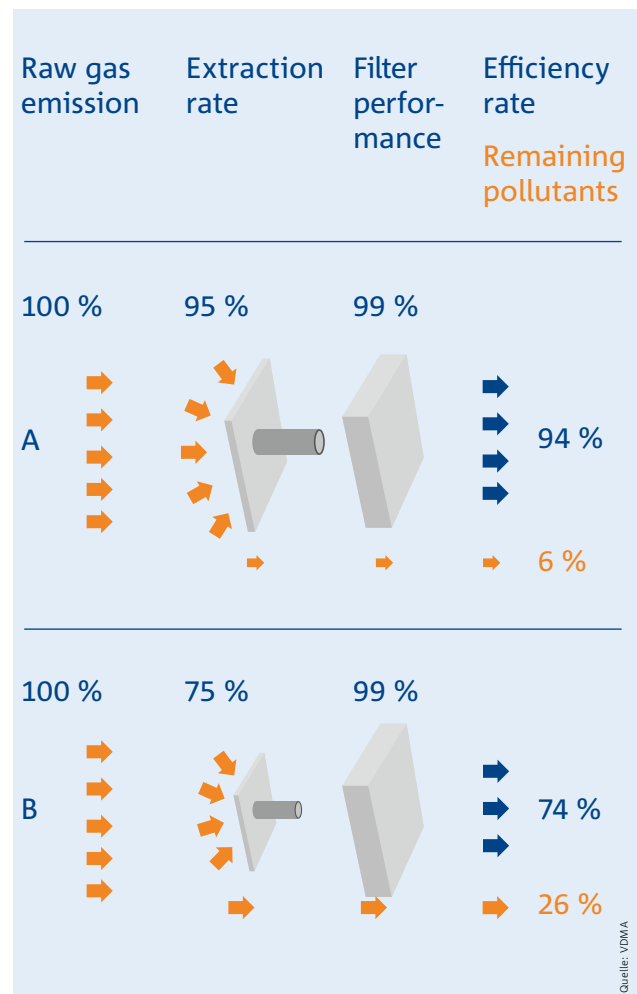
Quality of pollutant collection is the linchpin of fume extraction technology. In particular, closest proximity to the source of pollution is of critical importance: e.g. doubling the distance means a fourfold increase in required suction capacity and an exponential increase in energy consumption, to collect the corresponding amount of particles. In general, the one type of collection element must be used that best suits the selective extraction situation at the respective work

place. ULT selects it from the portfolios of leading suppliers of collection elements. Often, the design will be adapted, to come to grips with the discharge impulse of pollution particles created by the laser process or even benefit from it for energy savings.

Adaptations cover a variety of solutions, ranging from extraction tips and hoods via extraction arms to complete housing of the source of pollution.



Impact of the distance of the collecting element on the required air capacity



Impact of the extraction rate on efficiency

# LAS: perfect serial products. Built on sophisticated engineering.

LAS stands for a sophisticated series of modularly designed units according to user requirements. Smart engineering concepts enable a perfect adaptation to individual local demands making the units an integral part of the production equipment.

## Small and large solutions

ULT's solutions range from mobile units for individual work places to complete solutions for entire production halls. Also for situations with lack of space.

## Particularly user friendly

Low noise level and low energy consumption. Simple operation and maintenance. Recirculation operation possible. Easy and contamination low filter exchange.

## Individual extraction solutions

The design of the extraction point gets adapted to the individual work place condition.

## Safety for automated production lines

The filter systems' long service life significantly reduces down time and maintenance costs.



*Laser welding system with integrated fume extraction system*

## Open to special requirements

Systems can be configured suitable for ESD or with explosion protection. They are also available with stainless steel housing, for corrosive gases, with special supply voltage and frequency, digital control for pressure stabilisation, timer function, filter analysis and interfaces for external control.

## Exceptional service

On-site installation and commissioning by ULT. Functional warranty included.

## ULT AG

ULT AG provides fume extraction technology that really works: in-house developed, excellent serial units, adapted to individual requirements by sophisticated engineering.

From single work places to hall solutions. Permanent research ensures that even the latest production processes are safely served.



LASER FUMES



DUST AND SMOKE



SOLDERING FUMES



ODORS, GASES, AND VAPORS



ADDITIVE MANUFACTURING



PROCESS AIR DRYING



WELDING FUMES



OIL AND EMULSION MISTS



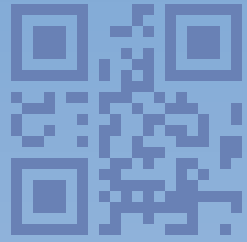
COMPLETE SOLUTIONS



*Based on sophisticated series devices, ULT AG provides adapted fume extraction solutions*

## ULT AG

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ULT is certified according to ISO 9001:2015. The plants are designed meeting international standards. If required, they will be certified according to ATEX and W3 and tested to meet H requirements.

In addition, the plants always comply with current EC directives on energy efficiency (ErP directive: Total energy efficiency of ready-to-use ventilation systems or minimum energy efficiency of electric motors).

Detailed technical information can be found on device specific data sheets or on our website. All technical data is general and not binding and does not guarantee the suitability of a product for a specific application.

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