Hitzeschutz // Arbeitsschutz // Isoliertechnik // Laserschutz
Heat Protection // Work Protection // Insulation Technology // Laser Protection
MADE IN GERMANY.

JUTEC

SAFETY. WITH PINPOINT ACCURACY.

- *Active laser protection systems*
- *Passive laser protection*
- *Laser protection clothing*

www.jutec.com

Your partner for safety!

As an owner-operated family business, JUTEC® GmbH has stood for safety and quality for more than 30 years. Our customers the world over benefit from this experience. We flexibly and quickly react to new challenges. Approx. 100 employees stand for competence and know-how. At our new company headquarters on the outskirts of Oldenburg, Germany, we find the most modern working conditions and production processes. The sectors of heat protection, work protection, insulation technology and laser protection are produced here in a production hall with an area of 5,000 m².

We ensure these processes with the quality management system according to DIN EN ISO 9001:2015 as well as those of production in accordance with Module D of the PPE Regulation (EU) 2016/425 (formerly Article 11B of the Directive 89/686/EEC) and Module D of the Directive 2014/90/EU for Marine Equipment.

Visit the new JUTEC® GmbH, we look forward to meeting you.

ZERTIFIKAT

JUTEC Hitzeschutz und Isoliertechnik GmbH
Am Autobahnkreuz 6-8
26180 Rastede

DGUV Test

ZERTIFIKAT

Qualitätssicherungssystem

JUTEC® Hitzeschutz und Isoliertechnik GmbH
Am Autobahnkreuz 6-8
26180 Rastede
Germany

Artikel 11B der Richtlinie 89/686/EWG
(Persönliche Schutzausrüstungen)

DGUV Test

Qualitätssicherungssystem-Zertifikat
Quality Assurance System Certificate

MADE IN GERMANY.

Active and passive laser protection systems.

The standard DIN EN 60825-4 provides information on the service lives of laser protection devices to be ensure with reasonably fore-seeable incorrect use of the laser system. The service lives are staggered in accordance with the operating mode of the laser system in the test classes T1 (automatic machines), T2 (cyclical short-term operation) and T3 (continuous monitoring). Here the service life may decrease the higher the number of the test class.

***Active** laser protection is understood to be a two-dimensional laser protection device that is looped into the safety circuit of the laser. In case of destruction by a striking laser beam, the safety circuit opens before the transmission of laser radiation occurs. In contrast to this, **passive** laser protection devices are not connected to the laser safety circuit, which results in the laser protection generally being considerably reduced.*

*The active laser protection system from JUTEC® is based on a multi-layer textile structure and switch-off electronics. As soon as the laser beam strikes the textile, the switch-off electronics detects this condition and generates the switch-off signal for the laser. **For the first time this technology has been successfully realized in a mechanically flexible design so that the laser protection effect can be housed in a thick, masonry wall in an approx. 10 mm thick textile structure; this worldwide innovation is only available at JUTEC®.***

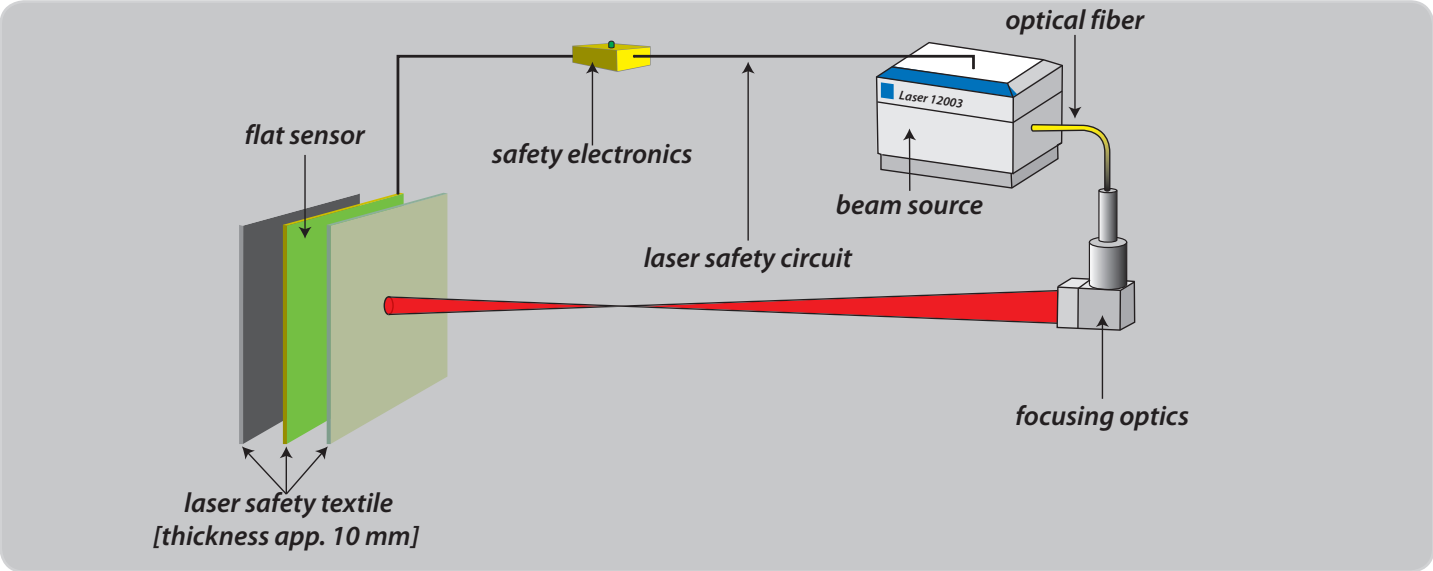
Safety has top priority ad JUTEC.

Active laser protection

- *Worldwide innovation - the result of a research project lasting several years*
- *Tested by the German Technical inspectorate TÜV-Süd*
- *Tested by the BG ETEM*
- *Certified by an independent expert*

Passive laser protection

- *Tested and certified by the DIN-Certco*
- *Light, flexible textile structure*



FAQ: Active or passive laser protection?

A generally applicable answer to this question can hardly be depicted. Therefore, brief information is to be provided on the basic conditions under which active laser protection is indispensable from a safety-related standpoint and under which the use of active laser protection enables business advantages.

Laser protection walls for limiting the laser area for hand-guided laser systems are usually sufficiently dimensioned if they withstand direct laser bombardment for a period of 10 s; this corresponds to test class T3. Passive systems are sufficient for this purpose in many cases.

In particular automatic machines, e.g. soldering applications in the automotive sector or powder-application welding systems are realized in fully automated CNC systems, which are not necessarily subject to continuous monitoring by an operator. The laser protection walls of these types of systems should match the test class T1 and achieve a service life of 30,000 s (approx. 8.3 h) with laser bombardment.

The most important aspects: The service life.

The service life of a laser protection wall is influenced, among other things, by:

- *The power density of the occurring laser beam. This results from the laser output and the beam divergence,*
- *The distance between the machining optics and the laser protection wall.*

If the distance between the laser protection wall and the optics is so great that the power density on the laser protection wall reaches correspondingly low values and drops below the protection limit radiation, passive laser protection walls can offer sufficient safety. This is even the case for high-performance lasers with optics with a large beam divergence. Especially fiber and disk lasers in the common wavelength range of 1,030 - 1,070 nm provide extremely high beam qualities (and therefore a low beam expansion). This would then result in the distance between the laser protection wall and the optics being disproportionately large in order to also always be able to make due with a passive protection system in the test class T1 for automatic machines. Active systems should therefore be given preference.

This means the active laser protection systems always offer two advantages:

1.: Increased safety.

2.: Reduced spare requirement.

The active laser protection system from JUTEC can easily be integrated in the existing passive laser protection device. This enables the further use of the existing laser protection infrastructure (e.g. laser protection booth) even when more demanding requirements are placed on the stability of the laser protection wall due to a laser upgrade.

By the way: Active laser protection can not only make an important contribution to increasing the safety and reducing the space requirement in (walk-in) laser booths, but also in smaller automated cells for laser (micro-)machining equipped with medium to high laser output.

Laser protection - quo vadis?

Danger: *As soon as the propagation of the laser beam is not automatically vertically directed toward the machine bed (this applies not only to the machining room, but also to the beam path between the beam source and the beam forming optics), transmission of laser radiation can result when a breakdown of the system occurs with a passive design of the laser protection enclosure.*

Remedy: *One way to reduce this danger is also the local, active design of critical system areas. As even minimal laser outputs of, for example, 1 kW can already cause considerable damage to passive laser protection walls in case of a breakdown over a period of 8.3 h (test class T1), even in this power range active laser protection may not only be advantageous, but also necessary.*

Please contact us should you have any questions on this topic.

In this catalog you will find:

- *Active laser protection systems ..... from Page 06*
- *Passive laser protection..... from Page 10*
- *Laser protection clothing..... from Page 18*

Active laser protection systems.

Our active laser protection system is used wherever more safety is required and high flexibility is desired. Although the active textile-based laser protection system has a thickness of just approx. 10 mm, it enables maximum safety. With electrical integration in the safety circuit of your laser system. the active laser protection system switches the laser off when bombarded so that no laser radiation is transmitted. The active laser protection system is delivered ready to connect.

Technical data	Values
Wavelength range of laser radiation	980 to 1,080 nm
Intensity on the surface of the active laser protection textile	≤ 5.0 kW/cm²
Maximum laser output	12 kW
Laser beam diameter according to ISO 13694 (86 % method) on the surface of the active laser protection textile	≥ 5 mm
Operating modes	suitable for all
Emergency-off time of overall laser system	≤ 120 ms
Switch-off electronics tested by German Technical Inspectorate (TÜV) according to EN ISO 13849-1:2015	Performance Level "e"

Thanks to the multi-layer textile structure, the active laser protection system also offers (limited) safety when it is not integrated in the safety circuit.

The protection levels according to DIN EN 12254:2010-07 are as follows:

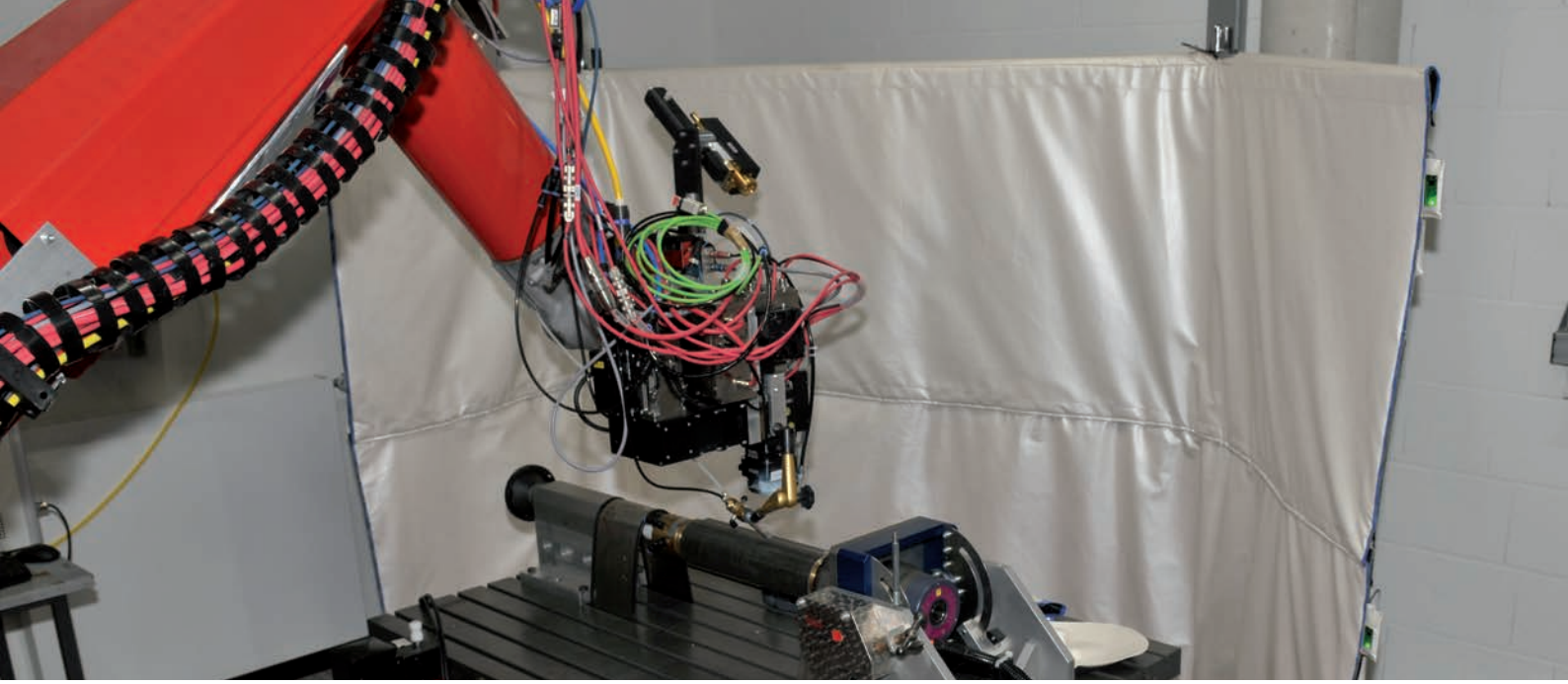
Laser wavelengths	Protection levels
200-315	D AB8 + IR AB3 + M AB6Y
316-1050	D AB6
1051-1400	D AB5
316-1400	I AB8 + R AB6Y + M AB7Y
1401-11000	D AB2 + I AB3

The active laser protection system is designed so that several active curtains can be strung together. The corresponding patch cable can be obtained directly from JUTEC®.

The maximum width of an active laser protection curtain is 1,400 mm,
the maximum height 4,000 mm;
Your system will be manufactured in accordance with your dimension specifications.

CERTIFIED
BY INDEPENDENT APPRAISER
AND PROFESSIONAL ASSOCIATION TESTED.

Fastening is carried out either with loops, piping, eyelets or screws.
On the following pages you will find the application possibilities of the active laser protection system.



Mobile swiveling arm frame with active laser protection curtain.

The mobile swiveling arm frame with active laser protection is used where mobility and maximum safety are required. With the active laser protection, you also protect mobile and stationary laser systems with outputs up to 12 kW. Should you use a low-powered laser, then passive laser protection may also be sufficient, enabling integration in the safety circuit to be eliminated (not recommended).

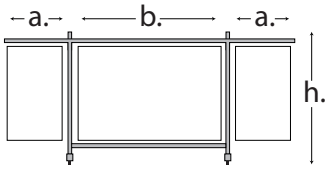
- *Simple integration in the safety circuit*
- *Green status LED signals operability*
- *Series connection of several active systems possible with patch cables*
- *Temporary limitation of laser areas*
- *Several swiveling arm frames create an all-around closed area*
- *Protection against direct bombardment and scattered radiation*
- *Especially well-suited for mobile laser systems and high-performance lasers up to 12 kW.*

DIN EN 60825-4:2011-12

See P. 6 for the technical specifications with regard to the laser parameters.

Dimensions

- *Height 2,070 mm*
- *Total width 4,000 mm*
- *Length of swiveling arms: 1,050 mm each*



Status LED signals the correct integration in the safety circuit.

Switch-off electronics positioned on side facing away from laser.

Art. No.	Total width [mm]	h = Height [mm]	a [mm]	b [mm]
LSV4020ML-20-GST3	4,000	2,070	1050	1,900

MADE IN GERMANY.

Active laser protection for fully automated 2D or 3D laser machining systems.

Fully automated systems must have a switch-off device to prevent laser radiation from causing an explosion even when the system breaks down. A breakdown occurs, for example, when

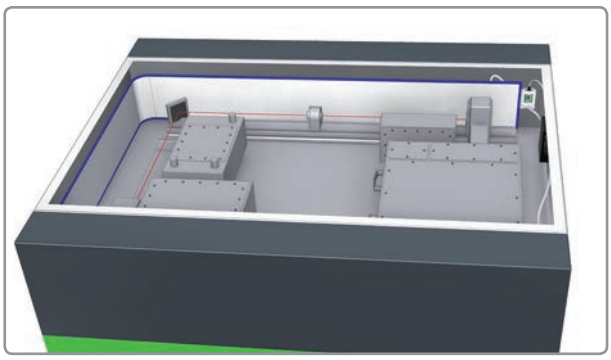
- *the machining process is unintentionally interrupted while the laser cannot be switched off, or*
- *a mirror in the beam guidance system fails, causing the laser beam to leave the planned beam path.*

The active laser protection system offers the necessary protection in this case locally by positioning it at points which the laser beam can potentially strike. In the case of mirror breakage (e.g. due to soiling), the laser beam strikes the active laser protection textile and the laser is switched off.

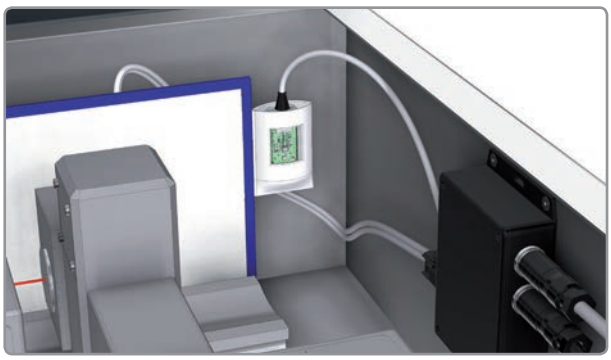
Active laser protection for fully automated 3D robot systems.

Active laser protection textiles can also be used in enclosures of laser machining systems. This is especially advisable when a fully automated 3D machining system is concerned and the laser beam can strike the walls of the enclosure in case of a breakdown.

- *Prefabricated to meet space requirement of your system*
- *Local equipment of especially endangered wall surfaces sufficient*
- *Competitive advantages for you and your customers*
- *Switch-off of laser source by opening safety circuit*
- *Simple equipment and retrofitting with approx. 10 mm thick active laser protection textile (e.g. when adjusting the optics, increasing the laser output, etc.)*
- *Simplified acceptance of the machining system when the active laser protection textile was taken into account during its design.*



View into the beam path. The active laser protection textile (white) protects the housing locally against escaping of the laser beam.



Detailed image of the active laser protection textile and the switch-off electronics.

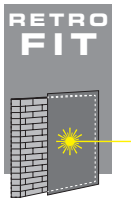
RetroFit with active laser protection curtain.

If you want to convert your machining process from a CO2 laser to a modern fiber or disk laser, or if you simply want to use a more powerful laser, then the requirements for laser protection increase considerably.

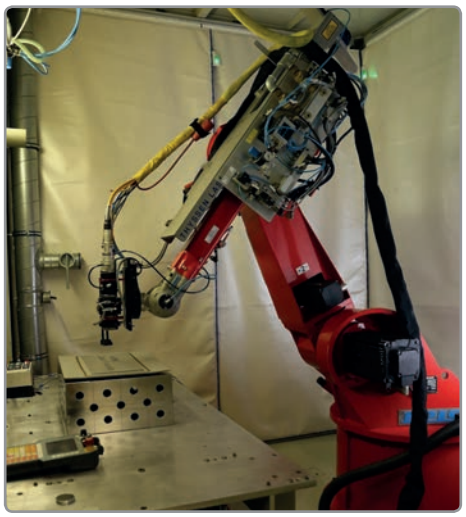
Retrofitting your laser booth with the active laser protection textile eliminates the need for new construction or costly conversion of the booth, as especially endangered areas can easily be retrofitted with the active laser protection textile.

With laser bombardment, e.g. due to a system breakdown, the active laser protection curtain switches off your radiation source - the danger situation is ended.

We coordinate the dimensions of the active laser protection textiles with your needs.



See P. 6 for the technical specifications with regard to the laser parameters.



Fully automated robot system; active laser protection system fastened with piping and profile rails.

Status LED green - safety circuit closed.

Robot cell, designed for low laser output. Thanks to the active laser protection system from JUTEC, it can now also be used for extremely high laser outputs and automated operation.

For example:

Art. No.	Designation	Total width [mm]	h = Height [mm]
LSV1020ML-20	Active laser protection curtain including switch-off electronics and patch cable	1,000	2,000
LSV1430ML-20	Active laser protection curtain including switch-off electronics and patch cable	1,400	3,000

Other dimensions on request!

LASER QUBE

DIN EN 12254:2012-04

The all-around protection for mobile laser systems.

Mobile (hand-guided) laser devices can meanwhile be employed so flexibly that they can be used in almost any production environment. The size of the laser device enables the laser to come to the workpiece and not the other way around. As a result, it is also time to provide laser protection that can be used just as mobily and flexibly as the laser source.

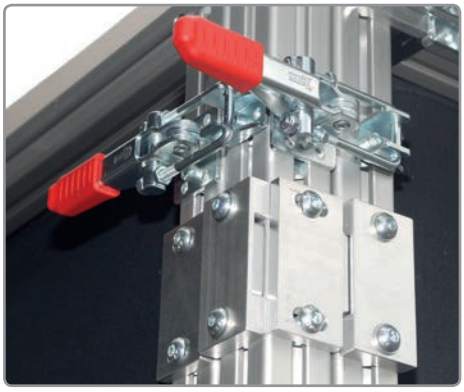
The mobile laser booth supports you in limiting the laser area so safely that surrounding employees are not restricted in their activities by working with the laser. In accordance with the modular design of the booth, optional roof modules are also available so that the laser area is protected from all sides. This is especially important in high, spacious halls when not all access points (e.g. on galleries) can be closed.

Laser protection - quo vadis?

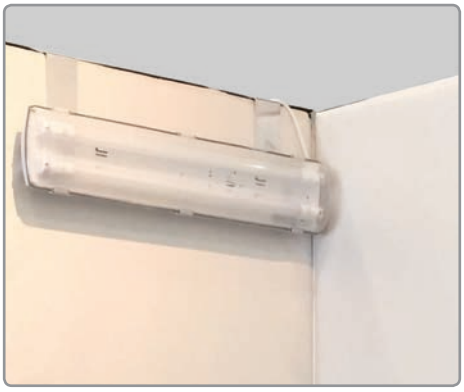
In the course of the flexibilization of modern production environments, the question arises as to what degree the familiar concept of rigid (thick) passive laser protection walls is future-oriented, as they can represent obstacles to a redesign of the production environment. It may be more practical in this context to use flexible, active laser protection textiles. Their mobility opens up completely new leeway for production planners.

The booth can be equipped with the ***ML-20 active laser protection system*** *or the* ***ML-9 passive laser protection textile****.*

Warning lamp for signaling the operating mode.



Simple installation and removal with quick-release locks.



Optionally available lighting unit.

- *Setup without tools withing <10 min (3,300 x 3,300 mm² booth)*
- *Easy handling, rollable, 1 operator is sufficient*
- *Simple maintenance thanks to modular concept*
- *Tested safety concept from the BG ETEM*
- *Pluggable lighting system (optional)*
- *Size adjustable due to modular design*
- *Laser safety wherever you are*
- *Safety thanks to integrated door contact switch*
- *Door module equipped with laser protection window*
- *High laser protection levels, tested by DIN Certco*

Dimensions

- *Height 2,250 mm, module width 1,100 mm (other dimensions on request)*
- *The proven size is 3 x 3 modules. Interior approx. 3,300 x 3,300 mm² or 3 x 4 modules*

Test results for ML-9:

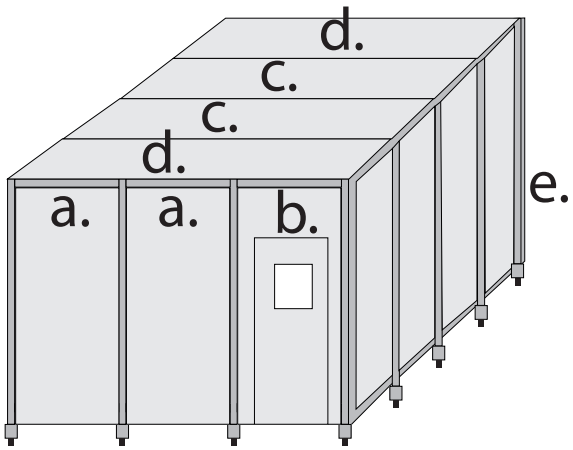
D AB8 + IR AB3 + M AB6Y JUTEC 200-315 DIN-tested

D AB7 JUTEC 316-1050 DIN-tested

D AB5 JUTEC 1051-1400 DIN-tested

I AB8 + R AB6Y + M AB7Y JUTEC 316-1400 DIN-tested

D AB3 + I AB4 + R AB3Y JUTEC 1401-11000 DIN-tested



	Art. No.	Remarks	Necessary number
a.	LSK1123ML-9-SW	Sidewall module	13
b.	LSK1123ML-9-TU	Door module with window	2
c.	LSK1133ML-1-DA-M	Roof module (center) with ventilation scoop	2
d.	LSK1133ML-1-DA-E	Roof module (edge) with ventilation scoop	2
e.	LSK0101-EV	90° corner connector	4
	LSK0602-IR	Optional: Interior lamp	4

Passive single-layer laser protection curtains.

*Due to its thickness of less than 1 mm, the **ML-1 single-layer laser protection curtain** is especially suitable for applications in which high mechanical flexibility is important. The laser protection levels are considerably lower than for the multi-layer **ML-6 passive laser protection curtain**.*

Fastening options:

Piping, loop, eyelets/rings, hook and loop closure, ceiling rail

*The **ML-1** is very popular for equipping laser protection roller blinds, for which loading with laser radiation tends to be minimal.*

Passive laser protection roller blind with ML-1

- *Delivery directly ready to install or including installation by our partner*
- *Suitable for all wavelengths from 200 to 1,400 nm. Additional wavelengths on request*
- *Drive electric or mechanical with crank*
- *Integration in your system, e.g. with radio control, gesture control, smart phone, voice control, motion detector, etc.*
- *Closing speed 11 to 81 rotations per minute*
- *Housing available in over 8,000 colors with powder coating or anodizing, in two colors as well*
- *Excellent brightness thanks to pearly, diffusely reflecting surface of laser protection textile; back side black*
- *Laser protection textile certified by DIN Certco according to DIN EN 12254:2012-04*
- *Height and width of roller blind always according to your requirements*
- *Medium laser protection levels, tested by DIN Certco*
- *Completely silicone-free*

Motorized laser protection roller blind with ML-1 laser textile.

Dimensions

- Widths up to 5,500 mm (special design up to 7,000 mm)
- Heights up to 9,000 mm
- Over-corner systems possible

Test results for ML-1:

D AB7 + IR AB2 + M AB5Y JUTEC 200-315 DIN-tested

D AB5 JUTEC 315-720 DIN-tested

D AB3 JUTEC 720-1050 DIN-tested

D AB3 JUTEC 1050-1400 DIN-tested

I AB7 + R AB5Y + M AB6Y JUTEC 315-655 DIN-tested

I AB5 + R AB5Y + M AB5 JUTEC 655-720 DIN-tested

IRM AB3 JUTEC 720-1400 DIN-tested

DIN EN 12254:2012-04

For example:

Art. No.	Designation	Total width [mm]	h = Height [mm]
LSV0609ML-1	Passive laser protection curtain	600	900
LSV1020ML-1	Passive laser protection curtain	1,000	2,000

Other dimensions on request!

Passive multi-layer laser protection curtains.

Our **ML-6 multi-layer passive laser protection curtain** is suitable for securing laser areas in laboratories and medical facilities in which Class 3B, 3R, 4 or 1 (new) lasers are used. If requirements for laser protection walls change, e.g. if laser systems of various sizes must be briefly encased or laser systems must be encased for maintenance, the use of laser curtains in mobile frames is advisable.

The ML-6 multi-layer laser protection curtain consists of diffusely reflecting, non-flammable fabric.

The suitability of the laser protection curtains for the respective application is subject to the individual assessment of the laser specifications and

is the responsibility of local laser protection representative. We'll be happy to support you in the process.

As a light-proof material, the curtain is suitable for the laser wavelengths from 200 to 11,000 nm in the medium power range and is certified according to the standard DIN EN 12254:2012-04 for shielding at laser workplaces.

DIN EN 12254:2012-04

- Height and width of curtain according to your requirements
- High mechanical flexibility
- Easy to clean thanks to closed surface of curtain side facing toward laser
- Excellent brightness with pearly, diffusely reflecting surface
- High laser protection levels, tested by DIN Certco
- Completely silicone-free
- Low surface weight of approx. 1,200 g/m²

Rugged, high-quality slide rail of anodized aluminum.

Hanging slider, double ball-bearing mounted with horizontal and vertical guide.

Fastening options:

- Piping, loop, eyelets/rings, hook and loop closure, ceiling rail

  You can fasten the passive laser protection curtains very well with high-quality aluminum ceiling rails and ball-bearing mounted sliders that you can purchase through JUTEC. If desired, our partner will install the entire system, including fastening materials, on-site at your plant.

Test results for ML-6:

D AB8 + IR AB3 + M AB6Y JUTEC 200-315 DIN-tested

D AB6 JUTEC 316-1050 DIN-tested

D AB5 JUTEC 1051-1400 DIN-tested

I AB8 + R AB6Y + M AB7Y JUTEC 316-1400 DIN-tested

D AB2 + I AB3 JUTEC 1401-11000 DIN-tested

Laser protection curtain with slide rail.

For example:

Art. No.	Designation	Total width [mm]	h = Height [mm]
LSV1820ML-6	Passive multi-layer laser protection curtain	1,800	2,000
LSV1425ML-6	Passive multi-layer laser protection curtain	1,400	2,500

Other dimensions on request!

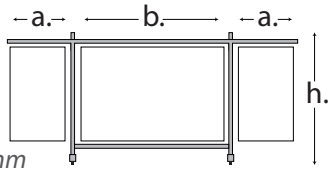
Mobile swiveling arm frame with passive laser protection curtain.

The combination of the ML-6 passive laser protection curtain and the mobile swiveling arm frame on castors is ideally suited for the temporary laser protection of mobile laser application.

To address your application in the best possible way, various heights and widths are available as standard.

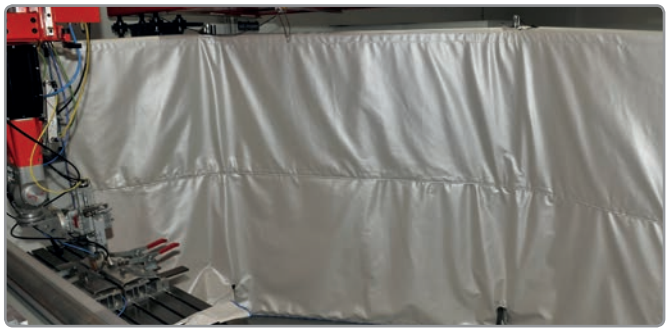
DIN EN 12254:2012-04

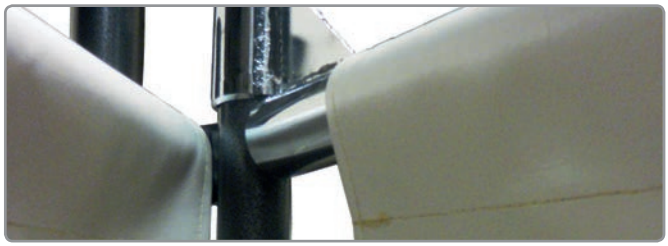
- *Mobile frame for high flexibility*
- *Swiveling booms*
- *Excellent brightness with pearly, diffusely reflecting surface*
- *High laser protection levels, tested by DIN Certco*
- *Various dimensions available as standard*



Dimensions

- *Heights: 2,070 // 2,570 mm*
- *Total widths: 4,000 // 4,550 // 5,000 mm*
- *Length of swiveling arms: 1,050 mm each*





Test results for ML-6:

D AB8 + IR AB3 + M AB6Y JUTEC 200-315 DIN-tested

D AB6 JUTEC 316-1050 DIN-tested

D AB5 JUTEC 1051-1400 DIN-tested

I AB8 + R AB6Y + M AB7Y JUTEC 316-1400 DIN-tested

D AB2 + I AB3 JUTEC 1401-11000 DIN-tested

Art. No.	Total width [mm]	h = Height [mm]	a [mm]	b [mm]
LSV4020ML-6-GST3	4,000	2,070	1,050	1,900
LSV4025ML-6-GST3	4,000	2,570	1,050	1,900
LSV4620ML-6-GST3	4,550	2,070	1,050	2,450
LSV4625ML-6-GST3	4,550	2,570	1,050	2,450
LSV5020ML-6-GST3	5,000	2,070	1,050	2,900
LSV5025ML-6-GST3	5,000	2,570	1,050	2,900

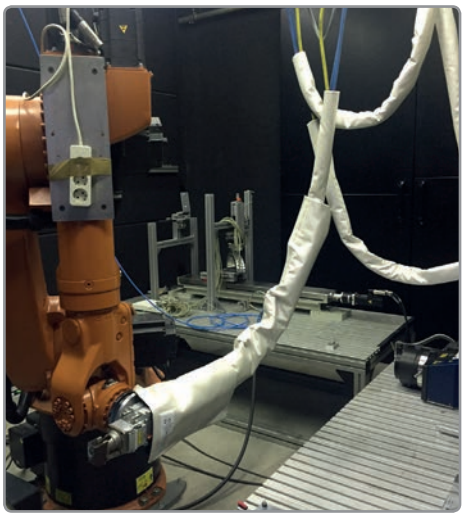
Laser protection of peripherals and devices.

Due to the increasing power of beam sources, the power of the scattered radiation is also growing for laser material machining processes. Scattered radiation is understood to be the radiation which is made available by the laser, however is not coupled into the material, but is instead reflected directed or undirected. For machining processes with high laser outputs and a low beam intensity, an especially large amount of scattered radiation occurs. This can lead to cables, hydraulic or pneumatic lines or other hoses near the process melting.

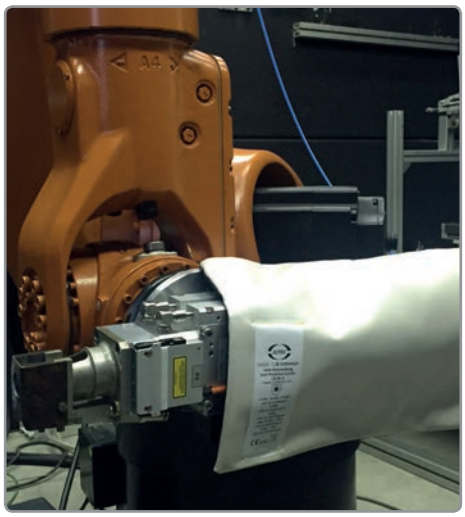
For this purpose, JUTEC offers corresponding hose protection, whereby either the multi-layer material ML-6 or the single-layer ML-1 is used, depending on the laser power.

Dimensions are according to your specifications!

Guard against scattered radiation mounted on the scanning head.



Protective hose for protecting the fiber-optic cable from scattered radiation.

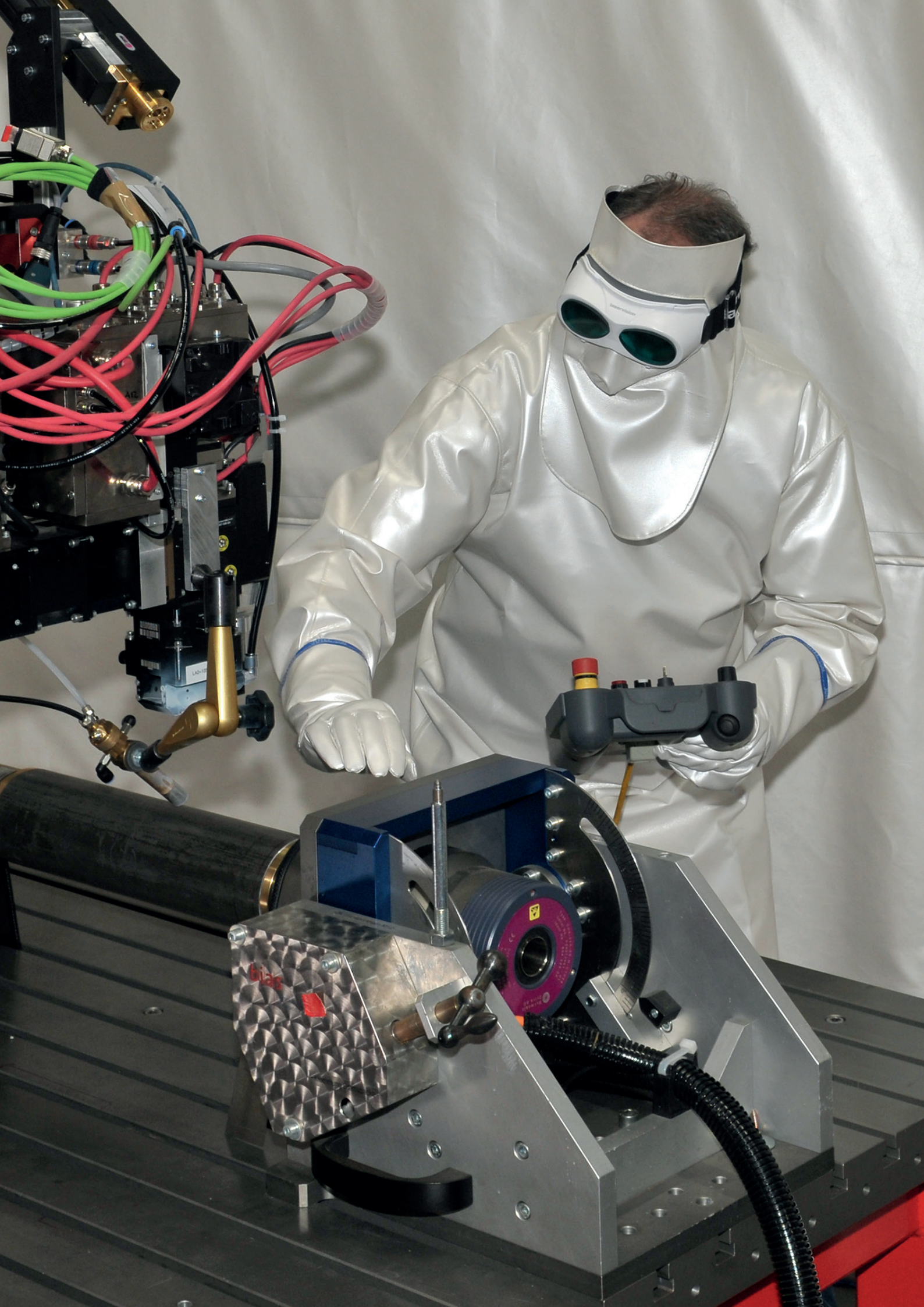


Protection of optics.

For example:

Art. No.	Designation	Diameter [mm]	Length [mm]
LSV0520ML-6KL2	Passive hose protection with Velcro fastener	150	2,000
LSV0250ML-6KL2	Passive hose protection with Velcro fastener	80	5,000

Other dimensions on request!


bilas

PPE for laser systems.

According to the Occupational Safety Regulations on Artificial Optical Radiation (OStrV) and the Technical Regulations for the Occupational Safety Regulations on Artificial Optical Radiation (TROS laser radiation), it must be worn when operating Class 1 (new), 3B, 3R and 4 laser systems.

JUTEC developed a testing principle together with reputable partners to test laser safety equipment for laser protection textiles and to offer it especially for this application. The development of textiles as laser protection clothing and gloves is carried out based on this research.

The task of the laser protection textiles is to absorb the irradiated energy in case of an accidental exposure to the laser beam in such a way that the user has sufficient time to move out of the danger area before permanent injuries result.

EN 388 / DIN SPEC 91250:2014-11 / EN 407	DIN EN ISO 11612 + LASERPRÜFUNG	DIN EN 12254:2012-04	DIN EN 60825-4:2011-12
Standards for protective gloves against laser radiation	*Standard for protective clothing against laser radiation*	*Standard for passive shielding against laser radiation*	*Standard for active and passive shielding against laser radiation*

PPE Regulation.

The new European regulation (EU) 2016/425 on personal protective equipment (PPE) was published on 31 March 2016 in the Official Journal of the European Union and, after a lead time of two years, must be bindingly applied as of 21 April 2018. At this point in time, the new PPE Regulation replaces the existing Directive 89/686/EEC.

The next years is a transitional phase. PPE products which correspond to the "old" regulation may still be placed on the market until 21 April 2019. EC type-examination certificates according to the regulation still apply until 21 April 2023, provided they do not expire beforehand.

Applications.

The number of applications of hand-held laser devices (HLD) for materials and surface machining is continually growing. The fields of application of the HLDs include car manufacturing, shipbuilding, aircraft construction, mechanical engineering and toolmaking. Based on devices for precision welding, HLDs are used today among other things for:

- *Welding, cutting*
- *Cleaning tool molds*
- *Melting*
- *Setting up lasers*
- *Soldering*
- *Cutting applications*
- *Laboratory work*
- *Servicing lasers*
- *Surface machining*
- *Hardening*
- *System modification*
- *etc.*

Risks and protective measures.

Due to the effects of intensive laser radiation on the health of employees with regard to the eyes and skin, the use of personal protective equipment (PPE) is required in the OstrV (Occupational Safety Regulations on Artificial Optical Radiation) or the TROS Laser (Technical Regulations for the Occupational Safety Regulations on Artificial Optical Radiation) if protection cannot be ensured with technical or organizational measures alone.

Laser protection gloves.

*Protection against exposure of the skin to laser radiation is part of the **Occupational Safety Regulations on Artificial Optical Radiation (OStrV)** and the **Technical Regulations for the Occupational Safety Regulations on Artificial Optical Radiation (TROS laser radiation)**. JUTEC laser protection gloves have been developed and certified according to the current state of research based on the standard DIN-SPEC 91250:2014-11 for protective gloves against laser radiation.*

- *Certified laser protection glove*
- *Good thermal insulation*
- *Pleasant wearing properties*
- *Innovative carbon coating*
- *Good flexibility*

EN 407 EN 388 CE KAT. II

DIN SPEC 91250:2014-11

Model line: H915LS
***Sizes:** 9 - 12 | **Glove length:** 38 cm*

P7 Tested laser resistance!

without lining
(H915LS238-ML1)

P5 Tested laser resistance!

(H915LS238-ML7)

P8 Tested laser resistance!

with lining
(H915LS238-ML8)

FAQ: Which gloves for which application?

***ML1:** The standard laser protection glove with a high level of all-around laser protection.*

***ML7:** The laser protection glove with increased flexibility. However, lower laser protection effect due to improved tactility. Suitable for laser applications with which it is highly probable that the palm is subjected to no or very minor scattered radiation.*

***ML8:** Very high laser protection, however as a result limited tactility. Highly recommended for high-power applications with a high hazard potential. Not suitable for precision adjustment work.*

Art. No.	Description	Length	CE KAT	EN 388	EN 407	Laser protection level
H915LS238-ML1	5-finger glove of JT450ML-1	38 cm	II	1 X 1 X	4 X X X X X	P7
H915LS238-ML7	5-finger glove of JT450ML-1 and JT260CBL in the palm	38 cm	II	1 X 1 X	4 X X X X X	P5
H915LS238-ML8	5-finger glove of JT450ML-1 with lining of JT125COB	38 cm	II	1 X 1 X	4 X X X X X	P8

Laser protection clothing.

Laser protection clothing makes up an increasingly important part of PPE. New occupational protection regulations are based on studies which will legally define this application in the future. If the user has worn normal work clothing in the past, the employers' liability insurance association now requires that new laser protection clothing be worn.

- *When danger occurs due to laser radiation (direct/reflection)*
- *Flexible*
- *Excellent wearing comfort*

* CE
DIN EN ISO 11612
+ LASER TEST

Model line: PPE laser protection
Sizes: *44 - 70* | ***Clothing lengths:*** *80 - 160 cm*

(LSJ080ML-7)

(LSH100ML-7)

FAQ: Which clothing for which application?

ML1: *Completely coated, overall protection level P7.*

ML7: *Dark areas offer lower laser protection, however in exchange better flexibility and breathability.*

ML8: *High laser protection, protection level P8*

Art. No.	Description	Material	CE KAT	DIN EN 11612	Laser protection level
LSJ080ML-1	Laser protection jacket	ML-1 (beige)	II	1 1 1 X X X	P7
LSJ080ML-7	Laser protection jacket	ML-7 (front beige, back dark blue)	II	1 1 1 X X X	P5
LSJ080ML-8	Laser protection jacket	ML-8 (outside beige, inside blue)	II	1 1 1 X X X	P8
LSH100ML-1	Laser protection trousers	ML-1 (beige)	II	1 1 1 X X X	P7
LSH100ML-7	Laser protection trousers	ML-7 (front beige, back dark blue)	II	1 1 1 X X X	P5
LSH100ML-8	Laser protection trousers	ML-8 (outside beige, inside blue)	II	1 1 1 X X X	P8

* *According to internal company testing principle for laser protection clothing of STFI.*

MADE IN GERMANY.

Laser protection clothing.

With hand-guided laser devices or direct observation of laser processes, radiation loading directed from the workpiece toward the body usually occurs. For these kinds of workplaces in rooms with a laser beam source, we recommend the laser protection frontal protection coat. If several laser beam sources are in operation or the radiation load can come from different directions, laser protection jacket and trousers are usually used. With low laser output, protection level P5 is sufficient, and for higher laser outputs protection level P7. Extremely high laser outputs require extremely high laser protection of the level P8. It is especially suitable and required for systems with laser outputs >> 1 kW.

- ***Low laser protection***
  *Frontal protection with protective effect at front **P7** and back open*
  recommended for one-person workplaces.
- ***Medium laser protection***
  *same protective effect at front and back **P7***
  recommended for multi-person workplaces.
- ***Extreme laser protection***
  *the standard version is increased to **P8** with an additional lining.*

Frontal protection coat.

Model line: PPE laser protection
Sizes: *44 - 70* | ***Clothing lengths:*** *80 - 160 cm*

P7 **Tested laser resistance!**

Frontal protection.
(LSFM120ML-1-ADD-9054)

P8 **Tested laser resistance!**

Jacket and trousers with lining.
(LSJ080ML-8 | LSH100ML-8)

P7 **Tested laser resistance!**

Face protection mask with R14 laser protection glasses.
(LSGS003ML-1)

FAQ: When is the face protection mask required?

With heavily reflecting laser processes, and especially for UV lasers, eye protection with laser protection glasses is not sufficient for the rest of the face.

Art. No.	Description	Material	CE KAT	DIN EN 11612	Laser protection level
LSM120ML-1	Laser protection coat	ML-1 (beige)	II	1 1 1 X X X	P7
LSM120ML-7 ADD-403	Laser protection coat	ML-7 (front beige, back dark blue)	II	1 1 1 X X X	P5
LSM120ML-8	Laser protection coat	ML-8 (outside beige, inside blue)	II	1 1 1 X X X	P8
LSFM120ML-1 ADD-9054	Laser protection frontal protection coat	ML-1 (beige)	II	1 1 1 X X X	P7
LSG036ML-1	Gaiter	ML-1 (beige)	II	1 1 1 X X X	P5
LSGS003ML-1	Face protection mask	ML-1 (beige) with R14 laser protection glasses from LaserVision	II		

DIMENSION SHEET FOR LASER CURTAINS.

Use our dimension sheets for fast ordering.

Simply copy, fill out, fax or send by email to bestellunge@JUTEC.com.

• Width ..... mm Height ..... mm

Type of attachment:

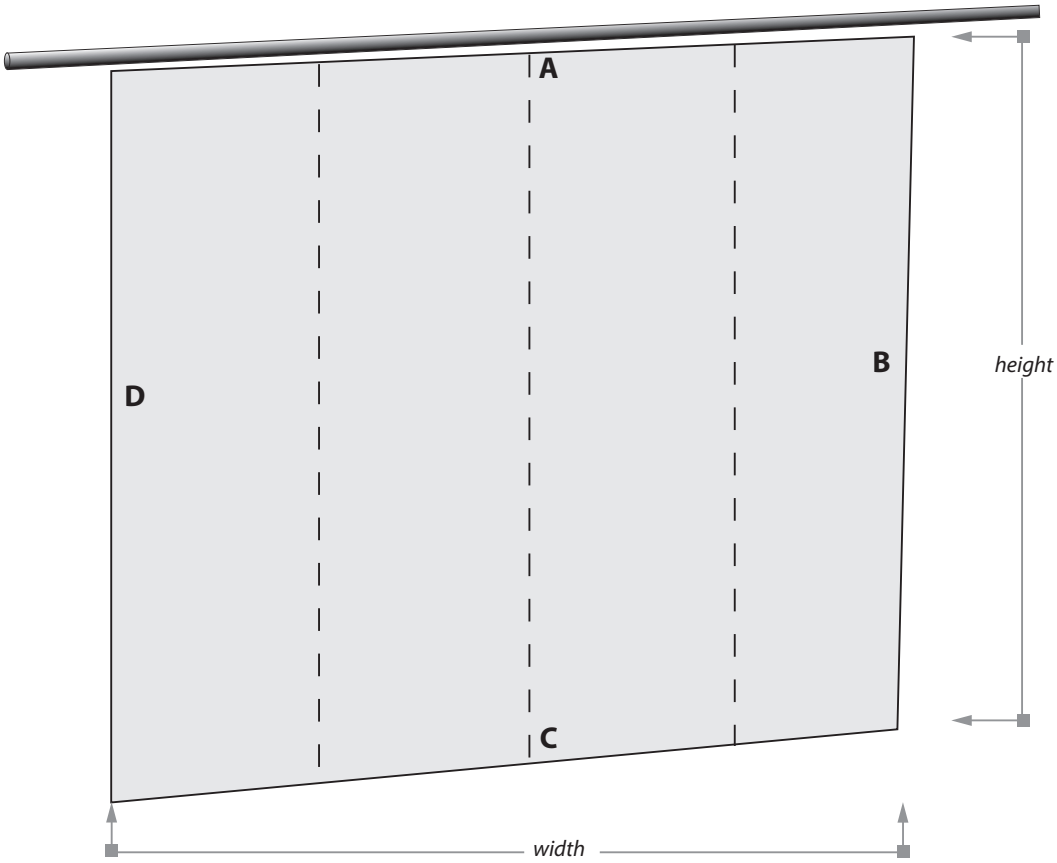
- ☐ Eyelets [Ö]
- ☐ Piping [K]
- ☐ Velcro [KL]
- ☐ loop [S]

[Standard distance is 30 cm for eyelets and loops]

• miscellaneous: [Please draw!]

☐ continuous loop ☐ Velcro ☐ individual tabs

A	B	C	D
.....	.....	.....	.....
☐ Ö	☐ Ö	☐ Ö	☐ Ö
☐ K	☐ K	☐ K	☐ K
☐ KL	☐ KL	☐ KL	☐ KL
☐ S	☐ S	☐ S	☐ S



Our catalogs.

Work Protection

Heat Protection

Insulation Technology

Laser Protection

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JUTEC® Hitzeschutz und Isoliertechnik GmbH
Am Autobahnkreuz 6 - 8 | DE-26180 Rastede
Tel.: +49 (0) 4402 - 86 32 - 0 | Fax: +49 (0) 4402 - 86 32 - 499
info@jutec.com | www.jutec.com