BERGMANN STEFFEN

INNOVATIVE WELDING SOLUTIONS

Product information llaserwall®

Our patented llaserwall® product is an innovative material for the manufacture of passive laser protection walls or complete laser protection cabins for higher laser outputs up to 6 kW.

The material itself is a composite material consisting of several steel walls and extremely strong cross-linked plastic hard foam.

The material is characterized by low grammage, high inherent stiffness and very high resistance to laser radiation (satisfies a permissible exposure limit (PEL) of 3.7 MW/m2 (d86min> 45 mm) according to the current test standard DIN/EN 60 825-4).

This makes it far superior to all conventional passive protective wall systems currently available on the market.

goebel ingenieurbüro

LASER SAFETY CERTIFICATE

The laser guard described hereunder has been tested according to the stated norms and has been evaluated as described. Measurement techniques and test results are documented in the stated laser safety report.

Laser Safety Report	**1406230633 GUT**
Manufacturer / Distributor	Bergmann und Steffen GmbH
Street	Raiffeisenstrasse 176
Post Code / Town	Germany – 32139 Spenge
Product / System	
Designation	Wall panel with PIR foam filling, 80 mm
Test unit: S/N	LW-80
Intended use	Passive laser guard
Laser source(s)	
Manufacturer	IPG Photonics
Model & processing optics	YLR – 8000 with fiber 200 µm
Lasertype / Wavelength	Fiber laser
Op. mode / Power	cw
Specifications	SPP ≧ 6,9 mm mrad; w_0 ≧ 340 µm; FFD ≧ 41 mrad; z_R ≧ 17 mm
Norms / Regulations	
ISO /IEC EN	60 825-4:2006 + A1:2008 + A2:2011
Classification /PEL	**Exposure limit incl. 30 % additional safety factor**
Maximum laser power	5.800 Watt @ 1.070 nm
Minimum beam dimensions	$d_{86,min}$ ≧ 45 mm
Maximum intensity (PEL)	$I_{PEL,max}$ ≧ 3,7·10⁶ W/m² = 3,7 MW/m²
Maximum protection time	210 s
Test classification	T2 = 100 s
Fire protection class acc. to manufacturer	B – s1, d0 according EN 13 501-1 + A1:2009

Our experts' report confirms that the tested laser guard, given the compliance with the determined protective exposure limit (PEL), provides a protection time which allows the usage in machines with short cycle operation and intermittent inspection (test classification T2 / 100 s, according to EN 60825-4). Since the client is not the manufacturer of the tested material, he always has to ensure within his quality control, that the used material, according to its specifications, complies with the test specimen.

Design and construction of the laser machine guarding are not part of this review and have to be taken into account separately. This shall apply mutatis mutandis to the test classification (EN 60835-4) of the final product when a risk analysis is made, respectively the foreseeable exposure limit (PEL) is assessed.

Darmstadt, November 25, 2015

Prof. Klaus R. Goebel

Publicly appointed and certified expert for laser technology by the Darmstadt Chamber of Industry and Commerce

Prof. Klaus R. Goebel Sachverständiger für Lasertechnik

• Öffentlich bestellte und vereidigte Sachverständige für Lasertechnik
• Beratende Ingenieure der Kammer Hessen / Reg.: B 902
• Akkreditiertes Prüflabor für optischen Strahlenschutz

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We look forward to your inquiries.

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