Powder Nozzle for Laser Cladding

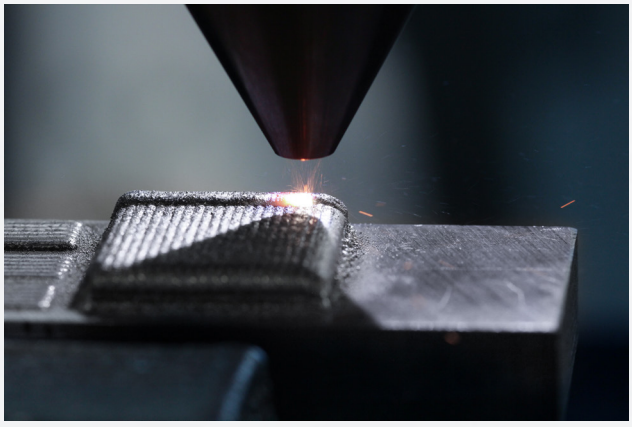
AL-FLOW POWDER - ANNULAR GAP NOZZLE

Laser metal deposition with powder is a generative manufacturing process. Metal powder is fed through a nozzle with a carrier gas into the laser focus and melted onto a workpiece. Surfaces, lines, or any geometry can be applied when the nozzle is moved relative to the workpiece. For processes without a defined direction, an annular gap nozzle is used to ensure uniform melting. Almost any layer thickness and even 3D volumes can be achieved by coating suitable materials in several layers. The produced layers are free of pores and cracks with low dilution.

AL-FLOW Powder

The process is ideal for the coating of components with high-quality wear protection layers. Laser cladding allows the joining of different materials, which means that the best possible material properties can be combined (metallurgicalbond). This significantly increases the service life of the components. Examples of possible uses are hard coating (HRC60) and corrosion or abrasion protection (nickel alloy with embedded tungsten carbide particles).

This method is also suitable for repairs in which pre-programmed geometries are filled in or built up. Large-scale material application is possible quickly and efficiently.



In addition, powder deposit welding can be used for gap bridging during joining.

The nozzle for powder deposit welding is available for the AL*Flak* 900/1200 F and AL-TW 900/1200 F laser systems.

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Technical Data

		AL-FLOW POWDER
Overall Dimension	*(B × T × H)*	*100 × 143 × 170 mm*
	Weight	*2,3 kg*
Powder Nozzle	*Laser spot diameter*	*max. Ø 3 mm*
	Focal distance	*f 150 mm*
	Aperture	*Ø 35 mm*
	Distance to workpiece	*approx. 7 mm*
	Laser power	*Appropriate to 2 kW mean power*
	X-Y-adjustment	*integrated, to tune nozzle <--> laser*
	Cooling	*continuous water cooling with quick-change connection*
	Protection glass	*quick-change system*
	Integrated illumination	*LED cold, 270 lm, Ra 70, (possible to dismantle)*
	Shielding gas	*Connector Ø 6 mm tube*
Powder	*Powder carrier gas*	*Connector Ø 4 mm tube, integrated powder dispersion*
	Powder nozzle	*annular gap nozzle, independent of travel path*
	Powder grain size	*50-150 µm*
	Powder class	*Metallic powder*
Compatibility List	AL*Flak*	*900/1200 F recommended, 450F possible (smaller gauge)*
	AL-*TW*	*900/1200 F recommended, 450F possible (smaller gauge)*
	AL-*F*	*900/1200 F recommended, 450F possible (smaller gauge)*
Powder Feeder	*AL-PF*	*Start-stop remote controlled, ALFlak/AL-TW*
		Powder feed rate with fine tuning 0,1-200 g/min
		mass flow controller 0-20 l/min
Provision	*2 × Argon gas supply, powder conveyor, powder, AL type see compatibility, exhaust unit, respirator*	
Options	*exhaust unit**	*W3 certified suction recommended *needed*
	Holder for exhaust tube	*Ø 50mm tube, articulated arm mountable to linear rail on resonator, capture element*
	Respirator	*at least FFP2 Filter*
	Vacuum cleaner	*safety vacuum cleaner, dust class H*

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