



Pressure and injector blast cabinets*1)

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German



Symbol	Consequences	Probability
 Danger	Death or serious injury, irreversible	Will result
 Warning	Death or serious injury, irreversible	Could result
 Caution	Minor or moderate injury, reversible	May result
Caution	Property damage	May result

*1) This document applies only to standard cabinets with regard to explosion protection

0.1 General advice

This owner's manual:

- is part of the product
- must be retained near to the product throughout the product's service life
- must be handed over to any subsequent owners

Design and owner manual were developed based on a risk analysis. That means that:

- the machine or blast cabinet must not be changed
- the operator/user must be trained

All wearing parts are without guarantee.

0.2 CE conformity and explosion protection

This is based on a complete blast cabinet consisting of cabinet, cyclone (optional), hoses, filter with ventilator and the pneumatic and electrical control. In case of component purchase, this CE declaration of conformity only covers these components.

Conformity is based on the 2006/42/EC Machinery Directive as well as 2014/34/EU. The zones – either outside or in enclosed areas – that are to be designated as potentially explosive as defined by the relevant directives or regulations must be determined by the operator or, if there is any doubt with regard to the determination of potentially explosive areas, by the responsible regulating authorities. The definition of such zones is based on the European Directive 99/92/EU and/or the equivalent national legislation.

0.3 Explosion-protection organizational measures

For the operation of a blasting system, the following requirements in particular must be met by the operator:

- Operation in an explosive atmosphere is not permitted! (Special explosion-proof cabinets are optional.)
- The instructions in the owner's manual must be followed.
- In the event of maintenance or cleaning, the system must be depressurized and disconnected from the power supply.
- Any accumulation of dust near the blasting system or filter must be removed immediately.
- Maintenance and operating personnel must also be trained in dealing with fire and explosion hazards.
- Areas subject to fire hazards must be designated and signposted accordingly.

In areas subject to fire hazards:

- the storage of flammable materials is prohibited.
- tasks involving the use of open flames are prohibited
- smoking is strictly forbidden

NOTE: An "area subject to fire hazard" is defined as an area within a 1–3 m radius of the blasting system (including the filter). A case-by-case assessment according to local conditions and the blasting system must always be carried out.

NOTE: Any tasks or processes carried out during repairs that involve the use of sparks, such as welding, sawing, grinding, and cutting work, will require separate approval and the implementation of fire prevention and protection measures (BGI 563). Make sure that no sparks are produced when handling the workpiece during blasting that could ignite flammable material.

NOTE: In practice, visible footprints and/or the surface colors of the ground no longer being visible can be signs that there are dust deposits in those affected areas that need to be cleared.

- For filter systems, dust-collection containers must be emptied at regular intervals according to the volume of dust found or at least once a day. The volume of dust in the filter must be kept as low as possible.
- Raw gas piping between the blasting system and the filter must be inspected for the presence of potential accumulation at regular intervals (or at least once a year) and cleaned if necessary.

0.4 Waste disposal

Type	Disposal
Media disposal	Dependent on the blasted material
Filter cartridges	Dependent on the blasted material
Scrapping at the end of life	Disassembly of electrical parts → Separate disposal

0.5 Applications and restrictions

The dust arising from the blasting process consists of the blasting media, the blasted-off material of the workpieces in question, and the materials adhering to the surface of the workpiece (e.g., paint residues, graphite and carbon residues, metal residues). Depending on the combination of blasting media, workpiece material, and blasting process parameters, the combustion and explosion properties of the resulting dust may vary.

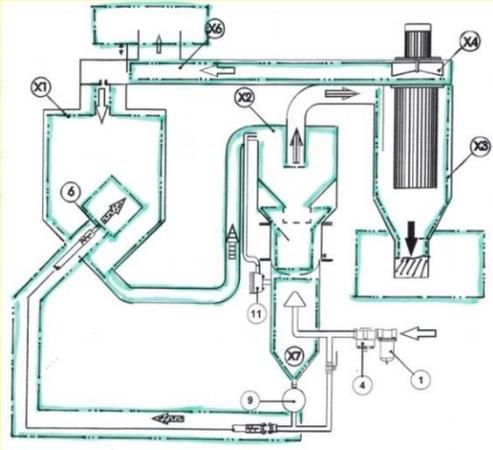
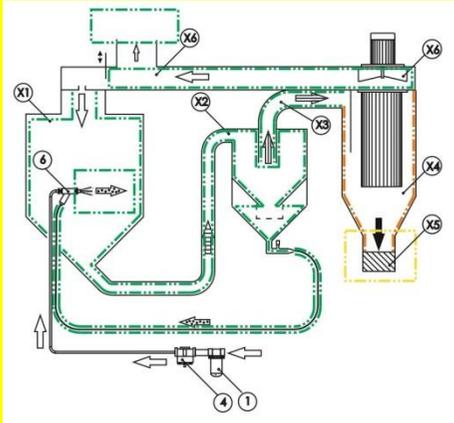
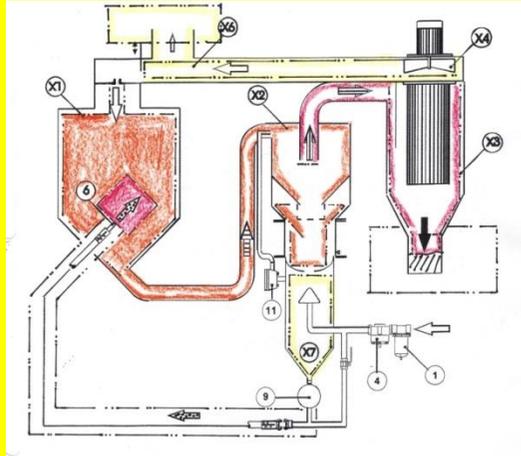
Table 1: Permissible applications

Parameter	Value/requirement
Transport temperature	-20°C to +70°C
Operating area	- Only in closed rooms - Not in aggressive or areas/atmospheres at risk of explosion.
Steadiness	- Even, solid ground - Superstructural parts (e.g., silos) require additional arrangements for sufficient steadiness
Grounding	Cabinet must be grounded, otherwise there is a danger of explosion or electrostatic shocks
Working conditions	Closed working room, temperature: 15–30°C, relative humidity: < 85%
Working pressure	2–7 bar. A pressure reducer and a safety valve have to be installed in the service pipe if there is a higher pressure in the air supply.
Materials	- Dry air - Dry and inert media/abrasives which do not cause chemical reactions
Abrasive	- usable/ in suction process - as per Explosion view, see clause 0.6

Table 2: usable abrasive :

Abrasive		Grit (µm)	Remark
Metallic	Round form	30 ... 400 (40 mesh)	Suction hose „Cabine–Cyclon“ 25mm smaler as Standard-hose
	Edged form	30 ... 600	
Mineral	Sand and Scum	70 ... 800	Not recommended due to short service life
	Corundum		Additional wear protection utilize
	Marble		Highly dry air necessary
Organic	Plastic	100 ... 1600	

0.6 Defined zones inside Clemco's standard blasting cabinets according to dust concentrations and the blasting media / object blasted combinations

	Blasting media type	Blasting process	Grain size	Remarks	Permissible blasting objects	Blasting process	Remarks
a	Light metals	Inj. + pressure	All	Only permitted after in-house risk assessment by customer	Light metals	Inj. + pressure	Only permissible with mineral blasting media!
b	Organic	Inj. + pressure	All		Organic	Inj. + pressure	Only permitted after in-house risk assessment by customer
c	Mineral	Injector	≥ 20 to 800 μm		Mineral	Injector	Only permissible with mineral blasting media!
		Pressure	≥ 20 μm			Pressure	
d	Ferritic, round	Injector	≥ 200 to 400 μm		Ferritic, round and angular (also stainless steel)	Injector	Max. Ø11 mm blasting nozzle, at 500 m³/h throughput
		Pressure	> 200 to 1250 μm			Pressure	Max. Ø6.5 mm blasting nozzle, at 500 m³/h throughput
e	Ferritic, angular	Injector	≥ 200 to 600 μm				
		Pressure	> 200 to 1250 μm				
Case 1 as per Explosion view Permissible, tested combinations Total construction inside - no zone			Case 2 as per Explosion view Permissible, tested combinations Blasting Chamber and Cyclone inside - no zone			Case 3 as per Explosion view Restricted combinations. Only permissible once demonstrated in an individual assessment that the explosion hazard can be sufficiently reduced by taking special measures or a carry-over of the zone can be prevented → Downgrading in case of 2 → Subject no ATEX	
Blasting media type		Blasted object		Blasting media type		Blasted object	
Mineral		Ferritic		Mineral		Paint-layer inertization not secured	
Mineral		Mineral		Mineral		Aluminum	
		Ferritic > 200 μm		Ferritic > 200 μm		Ferritic	
		Ferritic > 200 μm		Ferritic > 200 μm		Paint layers	
		Ferritic > 200 μm		Ferritic > 200 μm		Mineral	
							
No zone			No zone			No zone	
Zone 22			Zone 22			Zone 22	
Zone 21			Zone 21			Zone 21	
Zone 20			Zone 20			Zone 20	

0.7 Stocking/limits

Components and parts made from organic material do age depending on the following circumstances (see Table 3 + 4):

Table 3: Stocking requirements

<u>Factors</u>	<u>Comments regarding long-term stocking</u>
Temperature	Ideal between -10° und +15°C, no exposure to direct heat source.
Atmosphere	- No ozone => No operation of E-motors, welding units, etc. in stock area, as they produce ozone - No aggressive chemicals such as solvents
Humidity	- Humidity above 65% can lead to changes in the materials
Radiation	- Avoid direct solar radiation and other ultraviolet sources

Table 4: Components with restricted stocking/operation times

	Specified by	Total time of usage *1) stocking + operation *2)	Usage in blasting unit *2)
Blast hoses	DIN 20066	Max. 6 years	Max. 6 years
Remote control hoses	DIN 20066	Max. 6 years	Max. 6 years
Pop-Up Valve	Manufacturer	Max. 10 years	Max. 5 years
O-Rings	Manufacturer	Max. 10 years	Max. 5 years
Gaskets	Clemco's experience	Max. 10 years	Max. 5 years

*1) The time for usage can very much reduce in case of temperatures above 25°C, exposure to sunlight, or other negative influence.

*2) Mechanical wear due to operation is not taken into account.

0.8 Noise level

The noise level is a function of the blast pressure, number of nozzles, nozzle diameter, geometry of the parts, the kind of media etc. Generally the noise level is between 80 and 120 dB(A) without additional noise protection.

0.9 Dust exposure

- Attention to dust exposure: < 1 mg/m³ (valid only with correct maintenance)
- The following should be observed in particular:
 - o Periodic inspection and changing of the door gaskets
 - o The dust container must be emptied, as mandatory, at regular intervals
 - o Clean or change the cartridges periodically
 - o The blasted parts must be deducted with an air nozzle, after which the doors must be kept closed for 15 seconds

0.10 Protection against accidental blasting

- Blast process is interrupted by releasing the foot pedal and opening the door
- If the foot pedal is jammed (blast process fails to stop when the foot pedal is released), the air supply to the cabinet must be interrupted and the door may only be opened once the system is fully depressurized.
- Create a risk of explosion by dragging zones: Compliance with the requirements according to section

0.11 Leakage of blast accelerated media from worn equipment

Blasting produces high wear, which can be dangerous. The requirements in the "Maintenance" section must be therefore followed closely.

0.12 Assessment of residual risk

- **Noise:** > 80 dB(A) → **Wear ear protection**
- **Burst blast equipment parts due to wear.** (Can be prevented or minimized only by observing the necessary maintenance requirements)

0.13 Air consumption of the blast nozzle

The air rate of the compressor should be at least 50% higher because the consumption will increase according to the wear of the nozzle.

Table 5: Injection blasting

Diameter [mm]		Nozzle N°.	Air consumption [m ³ /min.] at a pressure [bar] of		
Orifice	Blast nozzle		<u>3</u>	<u>5.5</u>	<u>7</u>
3.2	6.0	4	0.4	0.6	0.75
4.0	8.0	5	0.6	0.9	1.25
4.8	9.5	6	0.9	1.3	1.75
5.6	11.0	7	1.1	1.75	2.4

Table 6: Pressure blasting

Diameter [mm]		Nozzle N°.	Air consumption [m ³ /min.] at a pressure [bar] of		
Blast nozzle			<u>2.6</u>	<u>4.9</u>	<u>7</u>
3		2	0.3	0.4	0.6
4.5		3	0.6	0.9	1.3
6.0		4	1.2	1.7	2.3
8.0		5	1.8	2.8	3.7