Revision: 7

Pressure and injector blast cabinets

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

0.1 General advise

This owner's manual is: -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 Training of operating personnel

The operating personnel used to operate the machine or system must be well trained and well informed about the hazards associated with the process.

0.3 CE- conformity

Refers to a complete blast cabinet, that means. cabinet, cyclone (option), hoses, filter with fan and the pneumatic and electric controls. If only components are purchased, the CE conformity only applies to these.
Conformity is based on a risk assessment according to the Machinery Directive 2006/42/EG and the associated regulations.

0.4 Explosion protection - organizational measures

The system does not fall under the scope of Directive 2014/34/EU (ATEX 95) and is therefore not approved for operation in an explosive atmosphere.
Explosive dust mixtures (zones) **can form inside the system that must not be carried outside**. For this purpose, the following requirements in particular must be met by the operator:
- For maintenance, cleaning and repair work
- -the system must be depressurized and de-energized.
  -no sparking work (grinding, welding, cutting work, etc.) may be carried out in the presence of dust within a radius of 3m
  -the regulations (operating manual) must be observed when emptying the dust container and changing cartridges.
- Dust deposits in the vicinity of the blasting system and filter system must be removed immediately. Criteria for dust deposits to be removed are recognizable footsteps and/or surface colors of the substrate that are no longer recognizable.
- The maintenance and operating personnel must be trained in relation to fire and explosion hazards.

0.5 Applications and restrictions

The blasting cabin is designed to be operated by one person only.

Table 1: Permissible applications

Parameter	**Value / requirements**
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 danger of explosion or electrostatic shocks Each cabinet has a central grounding point that is well marked for the user.
Working conditions	Closed working room, temperature: 15–30°C, relative humidity: < 85%
Compressed air supply:	
Medium	Filtered, oil-free and dried compressed air according to ISO 8573-1, Class 6-4-4, free from aggressive components
Operating 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.
Requiredon site	Shut-off valve for compressed air
Abrasives	-Processable / conveyable abrasives in the suction process: see Table 2, -From the point of view of explosion hazard: see section 0.6 - Concentrations of hazardous substances in blasting media which must not be exceeded - see Table 3

Table 2: Processable abrasives

Abrasives		**Grit (µm)**	**Remarks**
Metallic	Round forms	30 … 400 µm (40 mesh)	Reliable operation only with optional equipment / subject to consultation
	Edged forms	30 … 600	
Mineral	Sand and Scum	70 … 800	To maximise the service life of the equipment, additional wear protection is recommended
	Corrundum		
	Glass beads		A dry compressed air supply is particularly recommended to ensure consistent blasting results
Organic	Plastic	100 … 1600	For use only with the optional ATEX package

Table 3: Maximum concentration of hazardous substances in blasting media

The following concentrations of hazardous substances in blasting media must not be exceeded (see DGUV Rule 100-500):

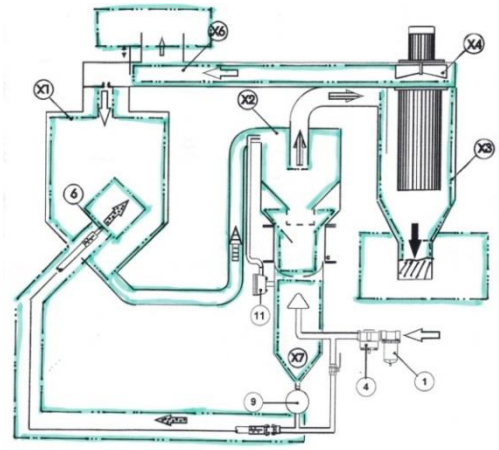
Identification of the hazardous substance	**Information**
Antimony, Lead, Cadmium, Tin, Arsenic, Berylium, Chromate, Cobalt Nickel	Total : 2% by weight
Arsenic, Berylium, Chromates, Cobalt and Nickel	Total: 0.2% by weight
Berylium, Chromates, Cobalt, Cadmium	Each 0.1 percent by weight
Metallic Compounds	Are to be calculated as CrO3 like metals and chromates
Free crystalline silica (SiO2)	2 percent by weight

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

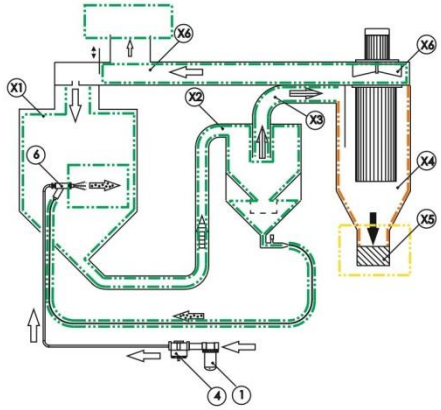
Blasting media type	Blasted object
Mineral	Ferritic
Mineral	Mineral



No zone
Zone 22
Zone 21
Zone 20

Case 2 as per Explosion view
Permissible, tested combinations
Blasting Chamber and Cyclone inside - no zone

Blasting media type	Blasted object
Mineral	Paint-layer inertization not secured
Mineral	Aluminum
Ferritic > 200 µm	Ferritic
Ferritic > 200 µm	Paint layers
Ferritic > 200 µm	Mineral

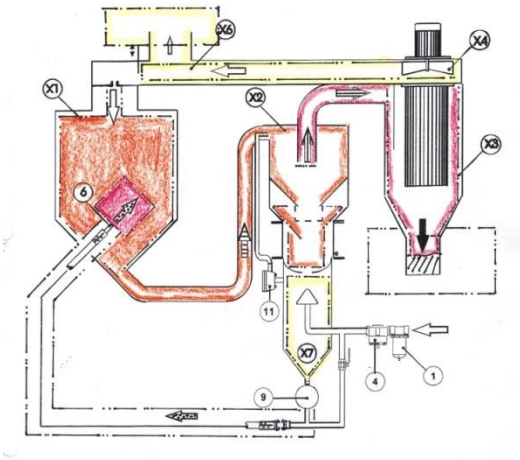


No zone
Zone 22
Zone 21
Zone 20

Case 3 as per Explosion view

Restricted combinations.
Only permissible if it can be proven in the course of an individual investigation that the risk of explosion is sufficiently restricted or that the zones can be prevented from being carried over ➔
Downgrading to case 2 ➔ No subject to ATEX

Blasting media type	Blasted object
Organic	Aluminum, ferritic
Light metals	Light metals, ferritic



No zone
Zone 22
Zone 21
Zone 20

0.7 Stocking / limits

Parts/assemblies made of organic material are subject to natural aging, which depends on, among other things: (see table 4 +5).

Table 4: Storage requirements

Influences	**Comments regarding long-term stocking**
Temperature	Ideally between -10°C and +15°C, in any case the material should not be exposed to any heat source.
Ambient atmosphere	-No ozone ➔ no operation of electric motors, welding equipment, etc. in the storage room because they generate ozone. -No aggressive chemicals, e.g. solvents
Humidity	- Humidity above 65% can lead to changes in the material.
Radiation influences	-Avoid direct sunlight and other UV sources.

Table 5: Components with limited storage periods/service life

	Specified by	***Total time of usage *1) Stocking + operation *2)***	***Usage in blasting unit *2)***
Jet and air hoses	DIN 20066	max. 6 years	max. 6 years
Remote control hoses	DIN 20066	max. 6 years	max. 6 years
Pop-up valve (blast machine)	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 service life can be greatly reduced at temperatures < 25°C, in the event of direct sunlight or other negative influences.
*2) Mechanical wear due to operation is not taken into account.

0.8 Noise level

Depends on the blasting pressure, number of nozzles, nozzle diameter, geometry of the blasting material, type of blasting agent, etc. It is normally between 80 and 120dB(A) without additional noise protection measures.
Noise impairments: > 80dB(A) ➔ Ear protection must be worn.

0.9 Dust exposure: < 1mg / m3 ➔Can only be guaranteed with proper maintenance.

Pay attention to:
- Check the door seal and replace it if necessary.
- Empty the dust container at the prescribed intervals.
- Clean the cartridges or replace them.
- Dust off the blasted parts with an air nozzle, then leave the doors closed for at least 15 seconds.

0.10 Vibration level

The vibration value (emission value) to which the hand / arm system is exposed is less than 2.5 m/s^2.

0.11 Safety notice

-The blasting process stops when the foot pedal is released and a door is opened.

Caution! After the compressed air has been switched off, the blasting media escapes from the nozzle for a short time until the pressure in the blast pot has been reduced
-Bursting of blasting machine parts due to wear - compliance with the prescribed maintenance measures and monitoring intervals.
-Generation of an explosion hazard due to the escape of dust ➔Compliance with the requirements of section 0.4.

0.12 Air consumption of the blast nozzle

Select the compressor output at least 50% higher, because consumption increases with wear of the blast nozzle.

Table 6: Injection blasting

Diameter[mm]		***Nozzle number:***	***Air consuption [m³/min.] at a pressure of:***		
Air bozzle	**Blast nozzle**		**3 [bar]**	**5,5 [bar]**	**7 [bar]**
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 7: Pressure blasting

Diameter blast nozzle [mm]	**Nozzle number.:**	***Air consuption [m³/min.] at a pressure of:***		
		2,6 [bar]	**4,9 [bar]**	**7 [bar]**
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

0.13 Waste disposal

Type	**Disposal**
Media disposal	Dependent on the blasted material
Filter cartridge	Dependent on the blasted material
Scrapping at the end of life	Disassembly of electrical parts ➔ separate disposal