Internal pipe blast tools

Review 1

Original language: German

Symbols used	Consequences	Probability
	death / serious injury irreversible	immediate risk
	death / serious injury irreversible	potential risk
	slight injury reversible	potential risk
	material damage	potential risk

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0. General notes

0.1 Scope

The operating manual has been written based on a hazard analysis that means:

+ the device may not be altered,
+ the blaster must be trained.

0.2 CE conformity

Refers to a complete inner blast equipment that is:

- internal pipe blast tool, e.g. Spin-Blast, Hollo-Blast, etc.
- approved complete blast pot with hoses and couplings
- approved dust removal technology
- approved blaster protective equipment

The relevant operating manuals **must additionally be followed**!

If **components are purchased** only**, the CE conformity is valid for these as well**. **Achieving CE conformity requires that:**

- the device must be completed with parts that are approved by our company
- or an own risk analysis must be performed.

0.3 Permissible area of application/operating parameters

The user must ensure that the following parameters are not exceeded that is e.g.

+ at higher pressures of compressed air supply, a pressure reducer and a safety valve must be installed in the supply line.
+ that the cycles-to-failure are registered to avoid an exceedance.

Table 1: Permissible area of application

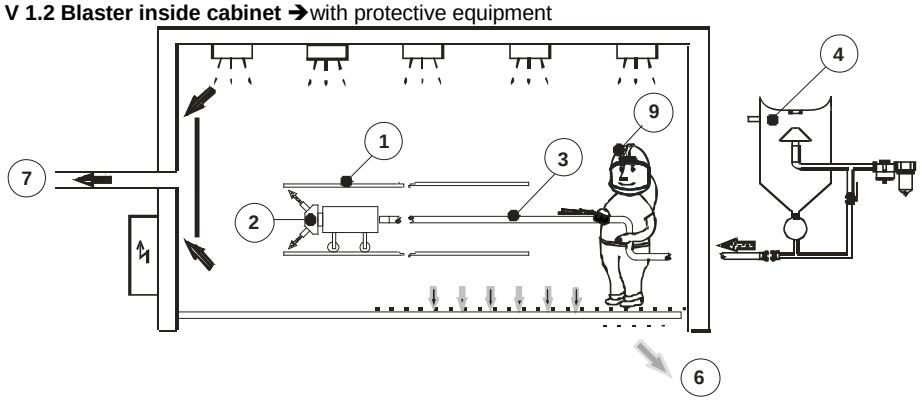
Parameter	**Value**
Operating pressure	0.5… 12 bar 0.5… 10 bar 0.5… 8 bar **Depends on the component with the lowest resilience: see machine data plates or separate operating manual**
Transport temperature	-20 °C to +80 °C
Operating temperature	0… 50 °C
Medium	- Compressed dry air, - Inert steel blast media which poses no additional risk.
Place of application	**Open air and in blast-rooms or cabinets** (For requirements see 0.4)
	Potentially explosive rooms and areas require **additional special safety measures** not mentioned here

0.4 Permissible arrangements (basis of risk analysis)

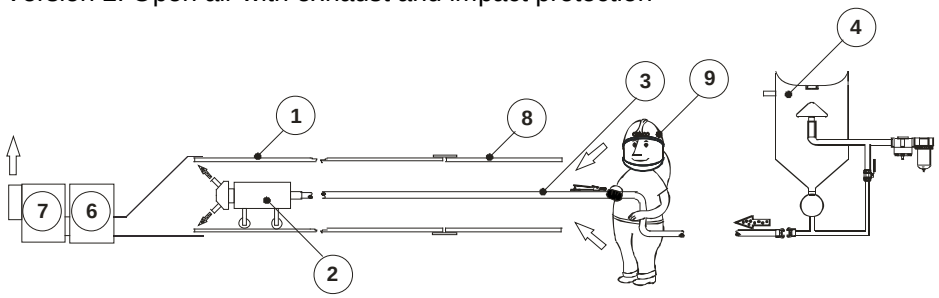
Figure: 1. Recommended system design to achieve CE conformity

Version 1: Closed blast-room/cabinet

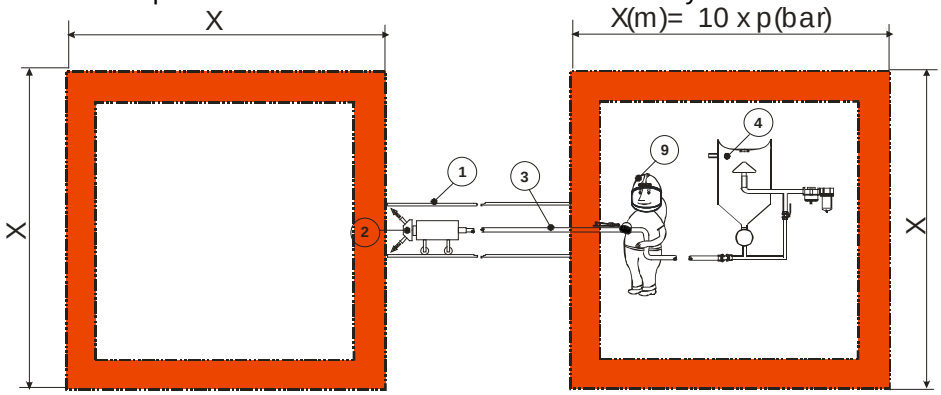
V 1.1 Blaster outside cabinet ➔ without protective equipment
V 1.2 Blaster inside cabinet ➔with protective equipment



Version 2: Open air with exhaust and impact protection



Version 3: Open air without exhaust with authorization only



1: Pipe to be blasted

2: Internal pipe blast tool

3: Blast-hose

4: Blast pot

5: Adaptor pipe-exhaust

6: Blast media cleaner, if necessary

7: Filter with exhauster

8: Impact protection

9: Complete protective equipment

X= Safety zone (see Table 2)

Blast media-air mixture

Clean air

0.5 Assessment of residual risks – residual hazards

Even if the instructions contained in the operating manual are followed, there are residual hazards/risks:

Table 2

	Version 1.1	Version 1.2	Version 2	Version 3
- Risk of injury as the produced **jet** is regarded **as open tool** (see Table 3)	0	X	X	X
- Noise pollution: - > 80dB(A) ➔ hearing protection devices are necessary - depending on nozzle type, size and pressure, higher noise levels can be expected	0	X	X	X
- Dust pollution of unprotected people	0	0	0	X
- Bursts of parts of the blast equipment through wear and danger (see Table 4). The reduction of the hazard is possible only by following the required maintenance measures (see Tables 4, 5 + 6)	0	X	X	X
- If exhausts or shieldings are not used, we recommend a minimum safety zone L, to other people, of 10 x blast pressure (bar) = distance (m)	0	0	0	X

Table 3: Measures to reduce the risks of 'open tool'

Parameter	Greater hazard in the case of	Recommended measures:
Blast pressure	higher pressure	Use of: - the shortest possible blast-hoses - pneumatic metering valves to avoid post-expansion from the pot into the blast-hose - quick circuits, e.g. electro-pneumatic circuits - Quick Stop Systems for quicker venting of blast-hose
Hose length	higher hose length	
Pot size	higher volume	
Location	separate locations of blaster and blast pot	Use of special circuits so that the blast process can be interrupted even in the event of defective control

Table 4: Factors leading to high wear

Factors	Wear behavior	Comments
Blast media structure	round ➔ lower wear edgy ➔ higher wear	
Blast media material	soft ➔ lower wear hard ➔ higher wear	Extreme wear can be expected for corundum
Conveying speed of blast media	low ➔ low wear high ➔ high wear	optimum speed if **blast-hose diameter= 3... 4x nozzle diameter**
Blast-hose diameter-to-nozzle diameter ratio	< 3 ➔ high wear 3… 4 ➔ low wear > 4 ➔ conveying problems	

0.6 Storage + storage times

Parts/components made of organic substance (e.g. rubber products) are subject to natural aging that depends on the following conditions (see Table 6)

Table 5

Influences	Comments for long-term storages
Temperature	ideal between -10° and +15°C, in any event the material should not be exposed to any heat source.
Ambient atmosphere	- no ozone => no operation of e-motors, welding devices etc. in the storage space as these produce ozone - no aggressive chemicals, e.g. solvents
Humidity	- humidity over 65% can lead to alterations in the material.
Radiation effects (e.g. UV light)	- direct sunlight as well as other UV sources are to be avoided.

Table 6: Components with limited storage times / service life

	Requirement	Total service life *1) Storage + use *2)	Service life in blast device *2)
Blast-hoses	DIN 20066	max. 6 years	max. 6 years
Remote control hoses	DIN 20066	max. 6 years	max. 6 years
Closing plugs	Manufacturer	max. 10 years	max. 5 years
O-rings	Manufacturer	max. 10 years	max. 5 years
Seals	Clemco experience	max. 10 years	max. 5 years

*1) Service life can greatly be reduced at temperatures above 25 °C, under solar exposure or other negative effects.
*2) Mechanical wear is not considered.