

1. Purpose

This specification establishes the standards for the surface treatment of components with surfaces, needing a pre-defined finish for use in vacuum.

2. Definition of Terms used in this specification**2.1 Products to be treated by blasting**

Object of blasting is a part or component, whose surface has to be treated by blasting.

2.2 Blasting abrasive

Blasting abrasives are the means by which blasting is carried out. The abrasives are granular particles, either metallic or mineral (glass, sand).

2.3 Blasting techniques**2.3.1 Blast-cleaning**

Blast-cleaning is used to remove homogeneous or heterogeneous layers as well as impurities or contaminations from the surface of parts. It is mainly used for descaling or rust removing purposes.

2.3.2 Blast-hardening

Blasting with the use of globular particles (shot) is used to produce residual stress in layers close to the surface of parts. This technique improves certain properties of the product. At Bühler Alzenau it is used mainly to improve the surface desorption property of components.

2.3.3 Blast-roughing

Blast-roughing is used to change the surface appearance of the part for various reasons: for example, to ensure a good bonding property for surface coating of the part, or to change its surface roughness or to obtain a desired optical effect on its surface. At Bühler Alzenau, blast-roughing is used to improve the bonding properties of surfaces for coating. The blasting-abrasives that are used have particles with angular, granular structure (grit).

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3. Surface roughness

The surface roughness achieved by blasting, depends on various factors: the material, the surface condition and hardness as well as the type of blasting-abrasive and the blasting technique used.

The following table shows the nominal values (R_z) of surface roughness that can be reached depending on the parameters given above. An initial-value of $R_z = 3$ to $30\mu\text{m}$ shall be considered as a base-value.

Nominal surface roughness R_z in μm					
Blasting technique		Blast-cleaning*	Blast-hardening	Blast-roughing	
Recommended Blasting abrasive acc. to DIN EN ISO 11124		Chilled iron grit GH-K 0.3-0.6	Glass beads MGL 0.071-0.16	Electric corundum MKE 1-2	
Part				<u>stable shape</u>	<u>unstable shape</u>
	Al and alloys	-	≤ 40	60÷120	40÷60
	Cu and alloys	-	≤ 40	60÷120	40÷60
	CrNi-Steel	-	≤ 35	50÷80	30÷50
	Steel, Ferrous	30-100	-	-	-

* = In exceptional cases, even non-ferrous materials can be treated.

4. Blasting Characteristics

It is assumed that the operator of the blasting facility has specific knowledge about the characteristics of the process. Therefore, detailed information regarding parameter like blasting-pressure, blasting-angle, etc. will not be discussed in detail in this specification.

General supplementary data:

- The compressed air used for blasting must be filtered and free of oil and water.
- The abrasives used for the hardening- and roughing shall not contain any Fe-constituents; these shall not be used to treat ferro-magnetic materials.

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5. Information in Drawings

5.1 Type of Information

The following information shall be given in the drawings:

- type of blasting technique
- LHH-Specification number
- surface roughness (R_z)
- markings with dash-and-dot lines to indicate "partial-treatments" (wherever required).

5.2 Presentation of the information

The above information shall be indicated in the form of a graphical symbol, which is defined in DIN EN ISO 1302. This symbol shall appear near the header of the drawing in the case of a "complete-treatment", and on the dash-and-dot line in the case of a "partial-treatment".

Example:

To indicate a roughing blasting treatment for a stable component made of CrNi-steel using electric-corundum for achieving a surface roughness of $R_z=50\div80\mu\text{m}$, the following symbol shall be used:



6. Treatment before and after blasting

This information refers only to blast-hardening and -roughing.

Before blasting the part must be cleaned and degreased. For more detailed information, refer to the specification LHH-N 120.002.

The sealing areas and threads shall not be blasted - they shall be covered with an adhesive tape (e.g. *Tesaflex* 4160 black).

The boreholes with tolerated dimension and threaded-holes shall be closed.

The residue after blasting shall be removed by use of a vacuum-cleaner or shall be blown off with clean, oil-free compressed air.

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After completion, the components shall be handled using gloves only.

The adhesive foils and all adhesive residues shall be removed using grease-free solvents.

For their storage and transport, the blasted components shall be wrapped in protective and sealed foils.

7. Referenced Standards and Specifications

DIN EN ISO 11124

DIN EN ISO 1302

LHH-N 120.002

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