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Degree of purity (iron/steel)

The degree of purity describes the purity of steel surfaces from mill scale, scale and rust. Different standards define the degree of purity and are usually required by the paint manufacturer or customer for a project. A steel surface to be painted normally requires a purity of SA 2½ or even SA 3. The surface must be cleaned of all ferrous and non-ferrous components acquired during the process of manufacture. If residues are left on the surface, this will affect the adhesion and the corrosion resistance.

These residues can be:

- Mill scale and scale
- Oil, grease and waxes
- Corrosion/rust
- Soluble salts
- Soiling, e.g. dust

Classification and definition according Swedish Standard (SIS 05 5900 / ISO 8501-1+2):

SA =	**Blasting of coated and uncoated steel surfaces**
SA 1	**Brush-off Blast Cleaning**
	The surfaces are free of non-ferrous components such as oil, grease, dirt and loose paint. Loose ferrous layers from the production process such as mill scale, scale and rust are removed. The remaining scale, rust and paint are adherent and the surface may be roughened sufficiently to achieve a good adhesion of the subsequent coating
SA 2	**Commercial Blast Cleaning**
	SA 1 process plus extra processes: rust/scale or adherent coating residues are almost removed: 70% (⅔) of every square inch should be free of visible residues, although slight residues may remain in indentations.
SA 2½	**Near White Blast Cleaning**
	SA 2 process plus extra processes: only slight traces and shadings of inherent residues may be visible on the substrate. 95% of each square inch should be free of visible residues.
SA 3	**White Metal Blast Cleaning** SA 2½ process plus extra process: the substrates have a uniform grey-white metal surface. All ferrous and non-ferrous residues are 100%removed.
P SA 2½	**Partial removal of damaged areas (existing coatings)**
	Spot removal of rust, loose coating and contaminants. The exposed spot areas of the substrate may have moderate shading corresponding to SA 2½. Residual coating must be intact. Carrying out an adhesion test is recommended.
ST =	**Hand- or machine tool de-rusting**
ST 2	Loose coatings and loose scale and mill scale are removed; rust is removed to the extent that after the cleaning it has a faint metallic lustre.
ST 3	Like ST 2, but the metal has a higher metallic shine.

Fl	**Flame blasting**
	Mill scale, scale, rust, paint coatings and foreign matter are removed. Residues may emerge only as discoloration and shadings.
Be	**Pickling with acids (chemical rust removal)**
	All ferrous and non-ferrous components are removed. Before coating, the surface must be re-treated with neutral detergents.

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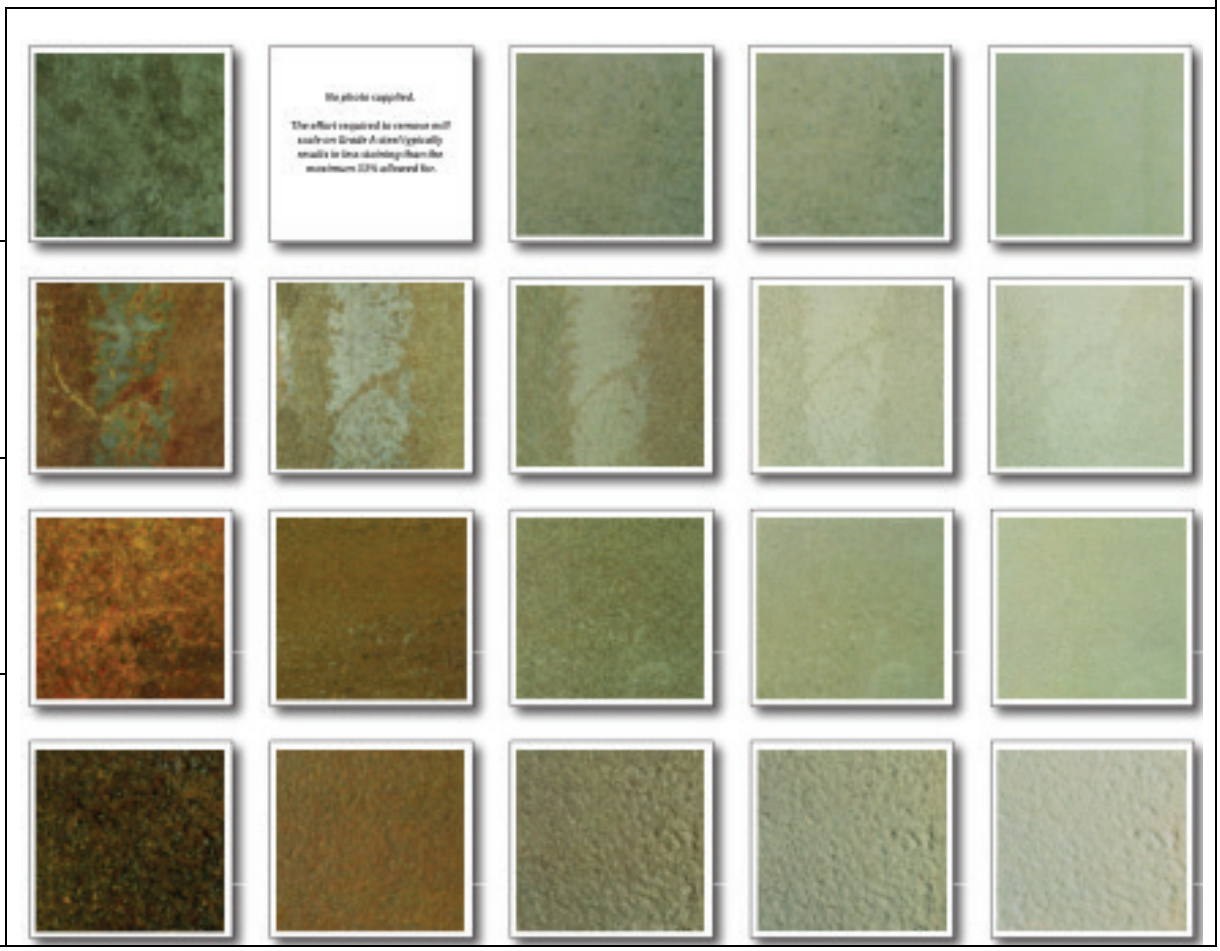
Examples of untreated to treated steel surfaces



Blasted steel surfaces with at least SA 2½, that have been prepared and administered with the recommended coating materials and coating systems in accordance with the technical data sheets, offer up to four times longer protection.

Large impacts on the blasted steel surface: using the blasting technique can give a blast profile up to 100µm.
For construction steel the profile is commonly between 25-60µm, and less commonly 80µm.
Very good results can be achieved with sharp corundum. Ferrous and non-ferrous components and other types of contaminants are ideally removed and the blasted surface provides good adhesion with the subsequent corrosion resistant coating.

Standards

The table below gives an overview of internationally recognized standards of surface preparation. The most used are: NACE (National Association of Corrosion Engineers), the Swedish standard for Europe (SIS 05 5900); SSPC (Steel Structures and Paint Council); and the British Standard (BS 4232). The German standard DIN 55928 and the ISO 8501-1+2 are identical to the Swedish standard.

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Degree of purity - Standard – comparison

Sweden Standard SIS 055900 ISO 8501-1 BS7079 / A1	**UK** BS 4232	**USA** SSPC SP	**USA** NACE	**Canada** CGSB	**China** GB 8923	**Japan** SPSS
SA1	Light blast to brush off	SSPC SP 7	NACE 4	31 GP 404 Type 3		Sd1 / Sh2
SA2	Third Quality	SSPC SP 6	NACE 3	31 GP 404 Type 2	SA2	Sd1 / Sh2
SA2½	Second Quality	SSPC SP 10	NACE 3		SA2½	Sd3
SA3	First Quality	SSPC SP 5	NACE 1	31 GP 404 Type 1	SA3	
ST2		SSPC SP 2			ST2	
ST3		SSPC SP 3			ST3	