

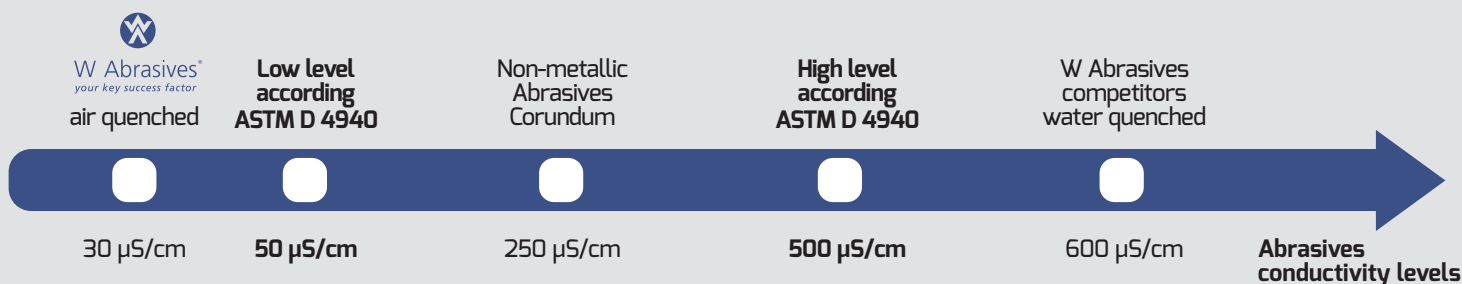


Abrasive conductivity



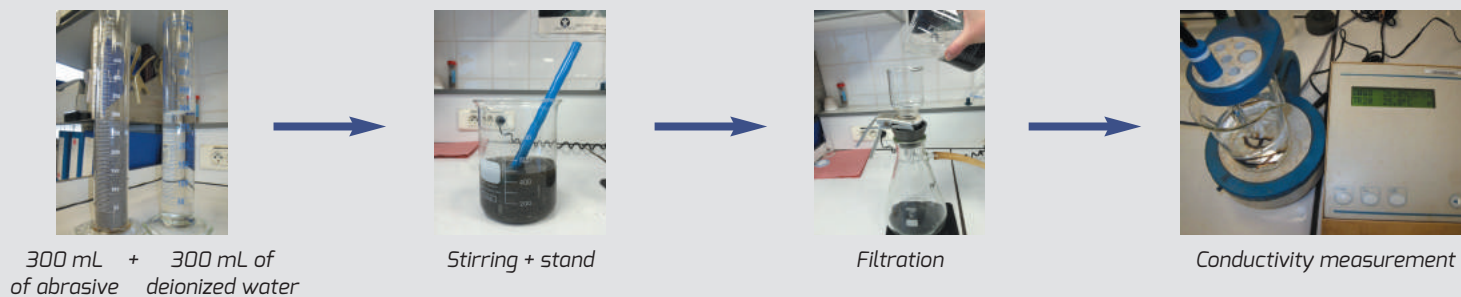
Water soluble contamination of abrasives and soluble salts concentration on steel substrates key requirements for surface preparation projects

Water soluble ionic contamination of abrasives



- Abrasives conductivity is related to the concentration of soluble ionic species (mainly chlorides and sulfates) contaminating abrasive surface
- Quenching media plays a major role on the final conductivity level of abrasives
- Air quenching minimizes the presence of soluble ionic species compared to the water quenching process used by our competitors
- **ASTM D 4940** standard describes the conductivity test used to assess the presence of ionic contamination on abrasives
- **ASTM D 4940** test method consists in combining equivalent volumes of abrasives and deionized water into a slurry, which is stirred to leach the soluble salts from the abrasives
- Slurry is filtered and the conductivity of the filtrate related to the concentration of soluble ionic species contaminating the abrasive surface is measured
- Abrasives conductivity measurement unit is $\mu\text{S}/\text{cm}$

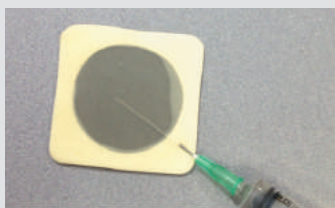
ASTM D 4940 abrasive conductivity measurement procedure



wabrasives.com

Soluble salts concentration on steel substrates

- The performance of protective coatings applied on steel is significantly influenced by the state of surface immediately prior to coating
- ISO 8502-6 and ISO 8502-9 standards describe the extraction and measure methods of salts concentration on steel surfaces
- Salts of a given area of the steel surface are dissolved using deionized water as solvent according to ISO 8502-6 also known as **Bresle method**
- Total surface density of the salts on the given area is calculated according to **ISO 8502-9**



*Bresle method
measurement
of soluble salts
concentration on
freshly blasted
surface*

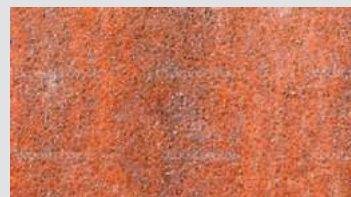
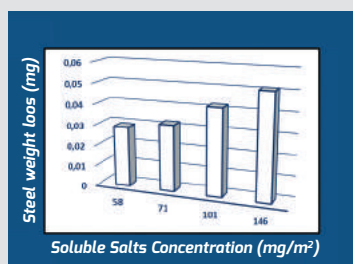
- Surface density of salts results are expressed in **mg/m²**
- Qualification requirements defined in the specifications of the final customers refers to threshold values related to surface density of salts (soluble salts concentration) determined on steel surface

Soluble salts impact on steel/paint interface

- Presence of soluble salts (mostly chlorides and sulfates) at the steel/paint interface is known to have a detrimental effect on the integrity of most paint systems
- Soluble salts concentration on steel substrates is primarily influenced by steelwork environmental conditions, as classified in ISO 12944 -2. This standard defines an aggressivity scale of different corrosive environments, from the least aggressive C1 to the most aggressive C5 (marine and industrial environments)

■ Effect on steel:

water - soluble
contaminants initiate
and accelerate corrosion



*Steel panel
corrosion*

■ Effects under coating system:

promotes osmotic blistering
and underfilm corrosion



*Osmotic
blistering*



*Loss of
adhesion due
to underfilm
corrosion*

- Acceptable thresholds specified in the surface preparation specifications vary with the industrial applications from 20 to 100 mg/m²

Conclusions

- Abrasive conductivity is measured according to ASTM D 4940 standard and is expressed in $\mu\text{S}/\text{cm}$
- W Abrasives blasting medias reveal an average conductivity level below 50 $\mu\text{S}/\text{cm}$, the low level of contamination described in ASTM D 4940.
- Soluble salts concentration on steel substrates is measured using Bresle method, it's expressed in mg/m^2 and is mainly influenced by the aggressivity of the environmental conditions
- Soluble salts, particularly chloride and sulfates affect the performance

of coatings systems on steel in two different manners: by accelerating the corrosion of the steel, and by promoting blistering and loss of adhesion of the coating.

- Acceptable threshold levels of soluble salts on steel surfaces depends on the industrial application
- The performance of a coating system depends on the service environment, the type and design of the coating system, the thickness of the coating, and the nature and amount of salt contaminants.

wabrasives.com