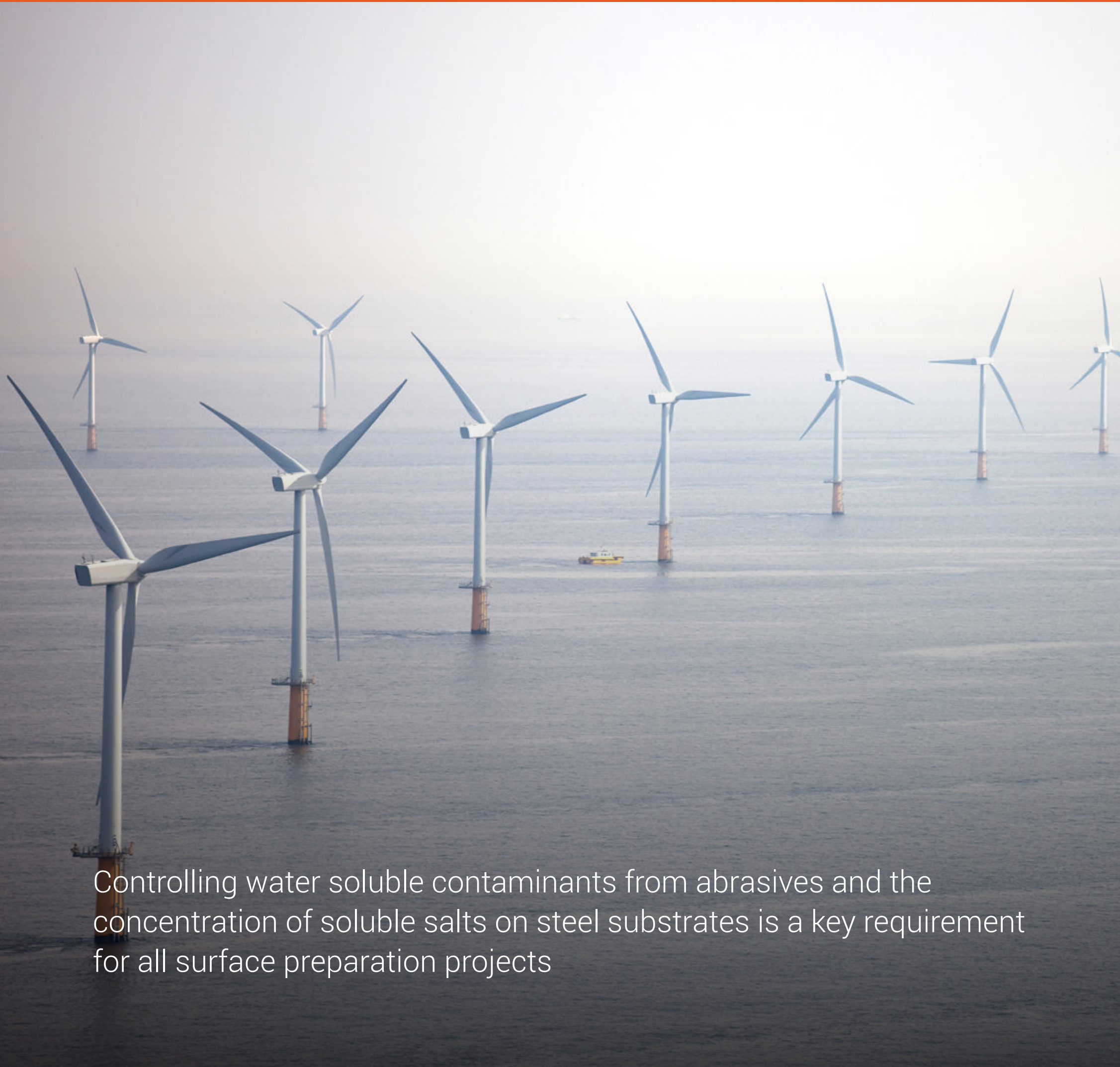


CONDUCTIVITY



Controlling water soluble contaminants from abrasives and the concentration of soluble salts on steel substrates is a key requirement for all surface preparation projects

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
- **Effects under coating system:** promotes osmotic blistering and underfilm corrosion
- **Acceptable thresholds specified** in the surface preparation specifications vary with the industrial applications from 20 to 100 mg/m²

Critical application

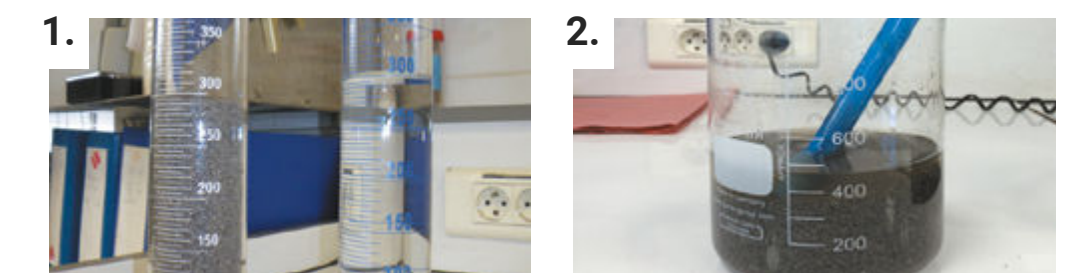


Shipyards



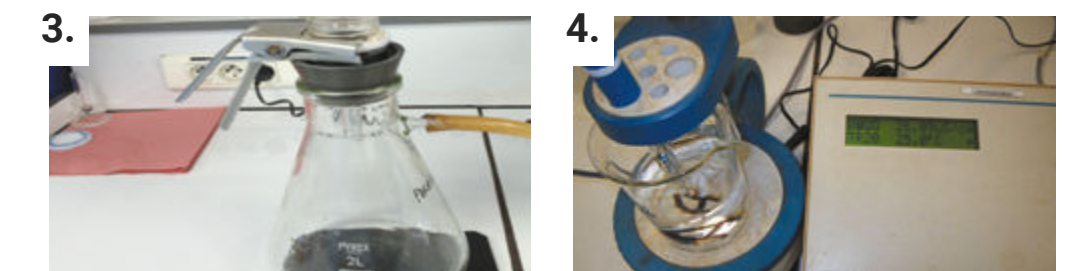
Pipeline & Energy Sector

Conductivity measurement procedure



1. 300 mL of abrasive + 300 mL of deionized water

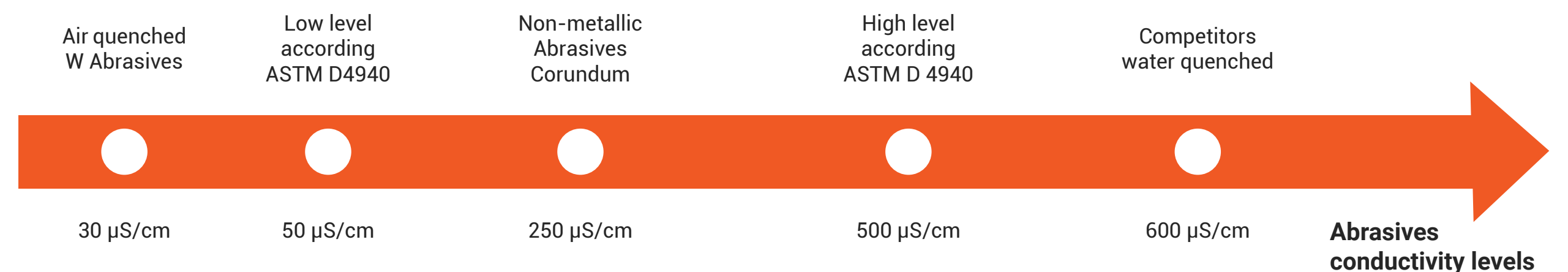
2. Stir & rest



3. Filtra-

4. Conductivity measurement

Water soluble ionic contamination of abrasives



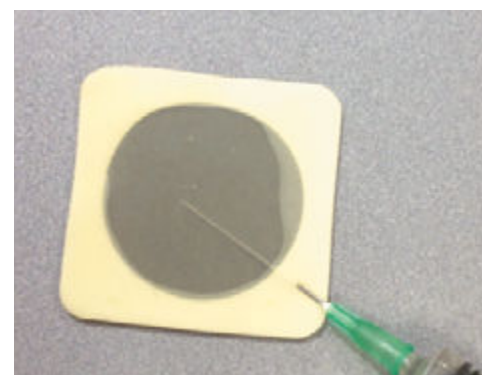
Abrasives conductivity levels



CONDUCTIVITY

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**
- 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



Bresle method measurement to assess the level of soluble salts concentration on freshly blasted surface

Conclusions

- Abrasive conductivity is measured according to ASTM D 4940 standard and is expressed in $\mu\text{S/cm}$
- W Abrasives cast steel shot and grit are manufactured without the addition of cosmetic chemical coatings of any kind. No soluble salts, in the form of nitrates or chlorides, are introduced into the manufacturing process to counteract the effects of water quenching.
- W Abrasives blasting medias reveal an average conductivity level below $50 \mu\text{S/cm}$, 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.