Derusting and descaling with simultaneously degreasing?

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Schedule

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Source: meinefototapeten.de
Introduction PETROFER

- Since 1948 serving the metalworking, automotive and many other technical markets with industrial oils, lubricants and specialty chemicals
- Chemicals for the papier industry
- Full-range-trader, development and production of industrial oils, lubricants and special chemicals
- Petrofer is a privately held company, headquartered in Hildesheim, Northern Germany
- We are a leading company in terms of industrial lubricants, special liquids and process engineering
- Employees in 2016: 987 in 12 countries (BRD: 283, PRC: 504)
- Sales activities in 42 countries
- Number of direct customers in 12 countries: > 5.550
State of the art

- Actual water based cleaning systems are most times not proper enough to remove persistent contaminations like oxide- and scale layers and rust.

- Neutral pickling agents that are in the market for quite a few years are only partly capable to do so. Oily layers like corrosion protection or metal working oils could mostly not be removed.

- Resulting problems:
  - Stain
  - Streak
  - Traces
  - Only partly derusted parts
  - Problems in the next steps
New developed product FEROCLEAN S 660

- Combination of neutral pickling agent and neutral cleaner
- Usable for iron, steel and aluminum parts
- Contaminations, resulting for example from thermal deburring, but also rust and scale, are quick and residue-free removed with low concentrations at typical temperatures
- The part is simultaneously degreased
- Operates as machine descaling
- New scale is not be built, existing scale are dissolved through out the time
- Is also to be used instead of alkaline cleaners before iron- or zinc-phosphating respectively before so called thin-layer-applications
Advantages for the customer

- Derusting and descaling with a label-free product
- pH-neutral solution

Application
  - Spraying
  - Dipping
  - Flooding
  - Ultrasonic

- Appropriate for rust and scale removal, i.e. after
  - Electrochemical deburring (ECM)
  - Thermal deburring (TEM)
  - Laser welding
  - Laser cutting

- No pickling attack on base metal or on line construction material
- Dissolves and/or avoids plant incrustations
- Bath control / operation and definition of bath dump intervals with method developed by Petrofer Chemie
Thermal Deburring (TEM)
Product Properties and Application Parameters

• Concentrate
  • Basis: neutralized phosphonic acids surfactants
  • pH: 6,6 ± 0,4
  • Appearance: colorless
  • Labelling: no label

• Bath solution
  • Concentration: 3...10...15 %
  • Temperature: 20...50...70 °C
  • pH range: 5,0...6,5...7,0
  • Time: 1...5...30 min
  • Application: spray, dip, flooding, ultrasonic
  • Materials: iron and steel, aluminum
  • Bath control: conductivity, Fe content
Application Examples on Steel plates

- Scale removal: 1 min, 10%, 45°C
- Rout removal: 3 min, 10%, 45°C
Concentration vs. Conductivity

Conductivity of FEROCLEAN S 660 in Hildesheim city water (3.5°dH)
Derusting effect vs. Concentration/Time

Rust removal with FEROCLEAN S 660 for various concentrations and times at 45°C
Bath Control

- Bath control is accomplished via conductivity (+ pH adjustment)
- Bath lifetime and dump frequency determined by Fe content
- Determination of the Fe content via
  - Instrumental analysis (AAS or ICP)
- Neutral derusting bath must be renewed when the Fe content exceeds approx. 300 ppm per percent point of FEROCLEAN S 660 (approximate value; must be verified with bath samples and may vary for different applications)

Remark
- Bath control via conductivity applicable for all applications where contamination of the neutral derusting agent with electrolytes does not take place. Not applicable after ECM processes without / with intermediate rinsing step.
Application Example

- A lot of motor- and gear parts for the automotive industry are produced externally
- Requirements regarding technical cleanliness most times allow only amine based corrosion protection
- If delays or displacements in the supply chain happen, parts frequently start to rust
- The manual derusting is often time- and cost intensive and could direct to surface damages
- Since the development of FEROCLEAN S 660, this product is used more and more for these applications
Thank You
for Your attention

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