

DEGREASING OF STAINLESS STEEL

Introduction

Before it is possible to pickle and passivate, the object first has to be rendered grease-free. This to avoid the material being covered in some areas by for example grease, resulting in the acid failing to gain access overall and hence irregular pickling. Pre-cleaning of Austenitic stainless steel serves primarily for the removal of:

- ▶ preservation oil and greases
- ▶ oils and greases used during mechanical processing
- ▶ carbon and combustion residues etc.
- ▶ paint and ink marks

One of the following options is generally selected

- ▶ cleaning with a neutral detergent
- ▶ cleaning with an alkaline detergent
- ▶ cleaning with a solvent-based detergent (whether or not diluted with water)



The duration of the degreasing phase will depend on the level of contamination and can generally be assessed visually by hoisting the object out of the degreasing solution at regular intervals. When circulatory cleaning is being employed and the entire object cannot be visually assessed, a treatment time will have to be determined before cleaning, on the basis of laboratory tests. The pickling phase can begin as soon as the stainless steel is grease-free.

When an object is only contaminated with grease to a minor extent, the separate degreasing phase can sometimes be avoided. For this purpose a degreasing agent has been added to the formulation of Vecom Pickling Liquid.

Since water-based degreasing agents have to a large extent supplanted solvent-based degreasing agents, we shall in this Technical Bulletin deal only with the water-based degreasing agents.

Water-based degreasing agents

Vecom has 3 types of water-based degreasing agents.

- ▶ Powder degreasing agents
Dissolves in water to give a water-based degreasing agent.
- ▶ Solvent-free degreasing agents
These are composed of surfactants, water, complexing agents and sometimes alkaline substances and corrosion inhibitors for application on aluminium.
- ▶ Solvent-containing degreasers
These are composed of surfactants, water, often calcium complexing agents and where appropriate alkaline substances and corrosion inhibitors for application on aluminium and water-soluble solvents such as glycol ethers.



In order to be able to appreciate the differences between the various materials, a brief explanation is given below of the various terms. See for a more extensive explanation Technical Bulletins PRD 2004/05 and PRD 2004/09.

Surfactants

These are materials that form a union (bridge) between oil/grease and water. This enables these substances to be absorbed by water.

The pH – value

This is the value that indicates whether a liquid is acidic, neutral or alkaline.



Caustic lye

Caustic lye is an alkaline substance that increases the pH value. The Vecom degreasing agents contain mainly caustic soda and caustic potash. Amines are used in some degreasing agents to increase the pH value. It is generally the case that a higher caustic lye (higher pH) will result in more rapid and effective cleaning.

Water-soluble solvents

These materials are generally glycol ethers. Glycol ethers are solvents that dissolve extremely well in water (unlike hydrocarbon solvents that are used in solvent-based degreasing agents) and have superior degreasing properties.

Corrosion inhibitor for aluminium

Aluminium is a weak material that corrodes (dissolves) in both acid and alkaline media. Addition of a so-called corrosion inhibitor can prevent aluminium corroding in alkaline media.

Temperature

Each temperature increase of the temperature by 10 °C will increase the cleaning rate by a factor of 2 – 3. When fats are present, cleaning should be conducted in general above their melting point.

Abridged product table for the degreasing of stainless steel

Product	pH 1 %	Glycol ethers	Aluminium inhibitors
Alkaline HD Powder	13,3	No	No
C-Clean ECO	9,8	Yes	No
Multi Cleaner / TP – 02	9,0	No	No
Steamclean HPC-NF	11,3	No	Yes
Tankclean NF	11,3	No	Yes
Waterbased Alkaline Foam	11,5	Yes	Yes
Waterbased Alkaline HD / B-2 L	12,7	No	No
Waterbased Neutral HCF / B-4	7,0	Yes	No



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