

ii) Cleaning and Passivation:

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- (a) Surface contaminants such as free iron, oxide scale, rust, grease, oil, carbonaceous or other residual chemical films, soil, particles, metal chips, dirt or other nonvolatile deposits might adversely affect the metallurgical or sanitary condition or stability of a surface. These may impair the normal corrosion resistance or result in later contamination of the stainless steel or cause product contamination at a later stage and should be cleaned and de-scaled.
- (b) Remove all solid floating particles steel chipping, filing, dust, welding slag before start of the acid cleaning process.
- (c) Acid Cleaning: Nitric-Hydrofluoric acid solution is to be used to remove both metallic contamination and welding and heat treating scales.
- (d) Surface to be de-scaled are to be pre-cleaned prior to chemical treatment. The component/assembly should be totally immersed in the pickling solution. The surface should be in contact with the immersion solution until inspection shows that complete scale removal has been accomplished
- (e) Rinse the assembly thoroughly with water. Over pickling must be avoided.
- (f) A neutralizing treatment, after completion of acid cleaning and passivation, by using aqueous caustic solution containing NaOH 10% by weight for a period of 5-60 minutes should be used as a final dip to remove smut. After that thorough water rinsing and drying operation is to be carried out. The pH of the rinsing water shall be from 6-8
- (g) **NOTE:**The process of acid cleaning, water rinsing, neutralization treatment, final fresh water rinsing must be done in sequence without giving any waiting time between the processes to avoid staining on the surface.
- (h) Free iron examination test (Ferroxyl test) should be carried out immediately after acid pickling and neutralization treatment to confirm that there is no free iron available on the surface. In case of positive test for free iron the whole process of acid pickling neutralization and water rinse should be repeated.

iii) Solutions in water are as follows:

For acid cleaning:

Conc. HF4	6% by volume
Conc. HNO3	15-20% by volume.
Immersion Time	10-15 Minutes (max.)
Temperature	30-40 °C (When temp. is low exposure time may be increased)

For neutralizing treatment:

NaOH	10% by weight
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For ferroxyl test solution;

Distilled water	01 liter
Nitric acid (Conc.)	20 ml
Potassium Ferricyanide	30g

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