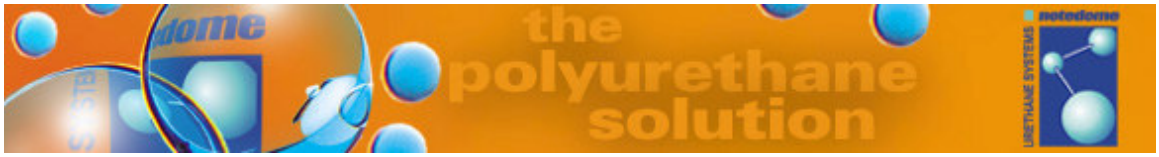



# SURFACE PREPARATION GUIDE
# FOR ADHESIVES, SEALANTS, AND COATINGS

For most applications, good bonding may be obtained by the following surface preparation: solvent degreasing with trichlorothylene or solvent wash with acetone or methyl ethyl keytone; mechanical abrasion either by sandblasting or roughing with medium grit emery paper; additional solvent degreasing or solvent wash to remove grit contamination.

However, for optimum adhesion to many substrates, a chemical etch is the preferred surface preparation. The following guide includes the more commonly encountered surfaces :

**Substrate Procedure**

**Aluminum, Aluminum Alloys**

1. Degrease or solvent wash.
2. Acid etch for 5-10 minutes at 70º C in the following solution:

1 part by weight – sodium dichromate
30 parts by weight – distilled water
10 parts by weight – concentrated sulfuric acid

3. Rinse the metal thoroughly with clear running water and dry thoroughly at or below 65º C.

**Cast Iron**

1. Degrease
2. Abrade
3. Degrease again.

NB Because of contamination inherent in cast iron it may be necessary to prebake the cast iron above the bonding temperature before final degreasing.

**Concrete**

1. Remove oily contamination by commercial concentrated degreasing compound using a stiff brush.
2. Acid etch with a 15% solution of hydrochloric acid (muriatic) using a stiff brush.
3. Allow surface to dry thoroughly.

**Copper, Copper Alloys (Brass)**

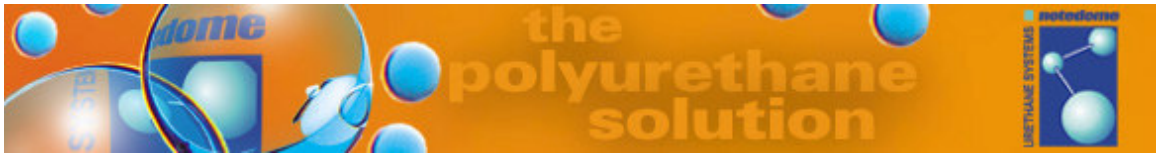
1. Degrease
2. Immerse in the following solution for 1-2 minutes at room temperature:

115 parts by weight – water
24 parts by weight - concentrated nitric acid
12 parts by weight - 42% ferric chloride solution

3. Rinse thoroughly with clear running water..
4. Force-air dry at 60º-65º C.

**Glass**

1. Degrease.
2. Frost surface, either by sandblasting (fine grit) or wet sanding (emery).
3. Water rinse.
4. Solvent wash.




**Magnesium, Magnesium Alloys**

1. Degrease 10 minutes in trichlorethylene.
2. Immerse in the following solution for 10 minutes at 75º-85º C:

250 parts by weight – water
2 parts by weight – sodium metasilicate
1 part by weight – tetrasodium pyrophosphate
1 part by weight – Nacconol NR (National Aniline)

3. Rinse in distilled water at 75º-85º C.
4. Immerse in the following solution for 10 minutes at 65º C

160 parts by weight – distilled water
40 parts by weight – chromium trioxide

5. Force - air dry for 10 minutes at 75º C

**Nickel**

1. Degrease
2. Acid etch for 5 seconds in concentrated nitric acid.
3. Rinse thoroughly in warm water.
4. Force-air dry at 60º-65º C.

**Steel**

1. Degrease
2. Immerse in the following solution for 15 minutes at 73º C:

8 parts by weight – concentrated hydrochloric acid
8 parts by weight – concentrated sulfuric acid
84 parts by weight – concentrated nitric acid

3. Rinse with warm water and descale if necessary.
4. Force-air dry at 70º C.

**Stainless Steel**

1. Degrease.
2. Immerse in the following solution for 15 minutes at 25º C:

35 parts by volume – saturated sodium dichromate solution
100 parts by volume – concentrated sulfuric acid.

3. Force-air dry at or below 65º C

**Titanium, Titanium Alloys**

1. Degrease 10 minutes in triclorothylene.
2. Immerse in the following solution for15 minutes at 50º C:

35 parts by volume – saturated sodium dichromate solution.
100 parts by volume – concentrated sulfuric acid.

3. Rinse in distilled water heated to 70º C.
4. Force-air dry for 10 minutes at 35º C.

**Zinc and Galvanized Metals**

1. Degrease.
2. Immerse in the following solution for 3 minutes at 25º C:

80 parts by weight – distilled water
20 parts by weight – concentrated hydrochloric acid

3. Rinse thoroughly in cold running water.
4. Force-air dry for 15 minutes at 70º C.

**CAUTION: In preparing acid etch solutions, always slowly add acid to water, while stirring, to dissipate heat of solution.**

Methyl Ethyl Ketone (MEK) and Acetone are flammable solvents (Flashpoint MEK = 23º F and Flashpoint Acetone = 8º F). When using MEK or Acetone, handle with extreme care. Remove all ignition sources; sparks, flames, or hot surfaces can ignite these materials. These solvents and chlorinated solvents, such as Trichloroethylene, 1,1,1-Trichlorethane, and Methylene Chloride, all pose substantial risks to the nervous system, liver, and kidneys. Do not inhale vapors. Do not let these types of materials contact the skin. Use appropriate controls or personal protection equipment when handling these materials. Always read the Material Safety Data Sheets before using any hazardous materials.

NOTE: Etched parts should always be used immediately. Do not expose to air longer than necessary.