



## Caustics/Metal Etch Hood


### Standard Operating Procedure













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### Section 1: Process Description





### Section 2: Safety Protocols












#### Chemical Hazards

Hazardous Chemical	Hazard Sign	Hazard Statements
Nitric acid		May intensify fire; oxidizer May be corrosive to metals Causes severe skin burns and eye damage Toxic if inhaled Corrosive to the respiratory tract

		
Hydrochloric acid	 	<p>May be corrosive to metals</p> <p>Causes severe skin burns and eye damage</p> <p>May cause respiratory irritation</p> <p>Corrosive to the respiratory tract</p>
Phosphoric acid	 	<p>May be corrosive to metals</p> <p>Harmful if swallowed</p> <p>Causes severe skin burns and eye damage</p>
Tetramethylammonium hydroxide	   	<p>Fatal if swallowed or in contact with skin</p> <p>Causes severe skin burns and eye damage</p> <p>Causes damage to organs (central nervous system)</p> <p>Causes damage to organs (liver, thymus) through prolonged or repeated exposure in contact with skin</p> <p>Toxic to aquatic life with long lasting effects</p>
Ammonium hydroxide	  	<p>Causes severe skin burns and eye damage</p> <p>Harmful if swallowed</p> <p>May cause respiratory irritation</p> <p>Toxic to aquatic life with long lasting effects</p>



Potassium hydroxide	 	<p>May be corrosive to metals  Harmful if swallowed  Causes severe skin burns and eye damage  May cause respiratory irritation  Harmful to aquatic life</p>
Sodium hydroxide	 	<p>May be corrosive to metals  Causes severe skin burns and eye damage  May cause respiratory irritation  Harmful to aquatic life</p>
Hydrogen peroxide	   	<p>May intensify fire; oxidizer  Harmful if swallowed or inhaled  Causes severe skin burns and eye damage  Toxic to aquatic life  Harmful to aquatic life with long lasting effects</p>
Citric acid		<p>Causes serious eye irritation  May cause respiratory irritation</p>
Transene Chromium Etchant 1020 [contains: nitric acid; ceric ammonium nitrate]	  	<p>May be corrosive to metals  Harmful if swallowed, in contact with skin or inhaled  Causes severe skin burns and eye damage  Causes serious eye damage  May causes damage to organs (lungs, eyes, mucous membranes) through prolonged or repeated exposure</p>

<p>Transene Aluminum Etchant Type A [contains: nitric acid; phosphoric acid; acetic acid]</p>		<p>May be corrosive to metals Harmful if swallowed or in contact with skin Toxic if mist is inhaled Causes severe skin burns and eye damage May causes damage to organs (lungs, eyes, mucous membranes) through prolonged or repeated exposure</p>
<p>Transene Aluminum Etchant Type D [contains: sodium-m-nitrobenzene sulfonate; phosphoric acid; acetic acid]</p>		<p>May be corrosive to metals Harmful if swallowed or in contact with skin Toxic if mist is inhaled Causes severe skin burns and eye damage May causes damage to organs (lungs, eyes, mucous membranes) through prolonged or repeated exposure</p>
<p>Transene Nickel Etchant TFB [contains: nitric acid; surfactant]</p>		<p>May be corrosive to metals Toxic if swallowed Fatal if inhaled Causes severe skin burns and eye damage Causes serious eye damage Causes damage to organs (lungs, eyes, mucous membranes) through prolonged or repeated exposure</p>
<p>Transene Gold Etchant Type TFA &amp; Silver Etchant TFS [contains: iodine; potassium iodide]</p>		<p>Harmful if swallowed Causes mild skin irritation Causes eye irritation Harmful to aquatic life May causes damage to endocrine or gastrointestinal system through prolonged or repeated exposure</p>

Transene Copper Etchant APS-100 [contains: ammonium peroxydisulfate]	 	May intensify fire; oxidizer Harmful if swallowed, in contact with skin or inhaled Causes skin irritation and serious eye irritation
Transene Titanium Etchant TFTN [contains: hydrochloric acid]	 	May be corrosive to metals Fatal if swallowed Toxic if inhaled Causes severe skin burns and eye damage Causes serious eye damage
Transene Transetch N [contains: phosphoric acid]	   	May be corrosive to metals Harmful if swallowed or in contact with skin Toxic if mist is inhaled Causes severe skin burns and serious eye damage Causes damage to organs (lungs, eyes, mucous membranes) through prolonged or repeated exposure
Transene Copper Etchant CE-100 & ITO Etchant TE-100 [contains: ferric chloride; hydrochloric acid]	  	May be corrosive to metals Harmful if swallowed Harmful if inhaled Causes severe skin burns and eye damage Causes serious eye damage Causes damage to organs (liver) through prolonged or repeated exposure

## Physical Hazards

Hazard	Hazard Sign	Hazard Statements
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Pressurized gas		Nitrogen guns in the hood are pressurized
Hot Plate		Can cause severe thermal burns

## Routes of Exposure

There is a risk of skin or eye exposure when handling chemicals that can be mitigated by wearing proper PPE.

There is an inhalation risk when using chemicals, which must only be opened and handled under a fume hood to reduce or eliminate exposure.

There is a risk of launching objects by spraying them with the nitrogen guns in the hood that can be mitigated by always aiming the nitrogen gun into the hood and away from people.

There is a risk of splattering chemicals by spraying them with the nitrogen guns in the hood that can be mitigated by always aiming the nitrogen gun into the hood and away from people and never directly spraying chemicals with the nitrogen guns.

There is a risk of severe skin burns if a hotplate is touched, which can be prevented by never using tweezers when handling samples on the hotplate and never touching it directly with hands or other body parts. When heating chemicals in glassware on a hotplate, do remove from the hotplate until the hotplate has been turned off and the chemicals have returned to room temperature.

## Personal Protective Equipment Requirements

Trionic (tripolymer of nitrile, neoprene and rubber) gloves must be worn over the regular nitrile cleanroom gloves required throughout the cleanroom.

Vinyl apron that covers the entire torso and arms must be worn over the cleanroom suit required throughout the cleanroom. The apron must be securely tied at the back of the neck and around the waste so that it does not hang loosely on the body. The sleeves of the apron must be

tucked into the trionic gloves at the forearm such that there is no space between the coverage of the apron and the coverage of the gloves.

Full faceshield must be worn over the cleanroom hood required throughout the cleanroom and any facemask or safety glasses worn by the user. The faceshield must not be raised while handling chemicals and should never be touched with soiled gloves.

Safety glasses should be worn under the faceshield.

## Waste Disposal

Dispose of wipes soiled with chemicals in a red hazardous waste bin.

Dispose of personal protective equipment that is damaged or cannot be decontaminated in a red hazardous waste bin.

Dispose of used or failed substrates in a sharps waste container.

Dispose of broken chemical glassware in a sharps waste container.