Ferric Chloride Solution

Technical Data Sheet

Description:

Chemtools Iron(III) Chloride solution is widely used as an etchant for copper circuit boards and for Intaglio printing plates.

Chemical & Physical Properties:

Description	Unit	Typical
Appearance: yellowish brown liquid		
Ferric Chloride	%	Min 42.0
Specific Gravity @ 25°C		Min 1.42
Ferrous Chloride	%	Max 0.25
Iron (III)	%	Min 14.0
Free Acid	%	Max 0.3
Cadmium, Cd	ppm	Max 35
Chromium, Cr	ppm	Max 50
Copper, Cu	ppm	Max 25
Lead, Pb	ppm	Max 50
Mercury, Hg	ppm	Max 3
Nickel, Ni	ppm	Max 75
Arsenic, As	ppm	Max 1
Copper Holding Capacity	g/litre	Max 100
Copper Etch Rate @ 55°C	µin/min	175-200
Recommended Temperature	°C	20 - 50

Instructions:

For etching copper clad printed circuit board use undiluted at temperatures up to 50°C,
Fill a suitable (non-metallic) container with the required amount ferric chloride solution.
Immerse the printed circuit board in the solution (copper side up) and gently agitate. In most cases, etching will take approximately 20 minutes. However, this depends on several factors including solution strength, copper thickness, agitation and temperature.
Monitor etching process closely and when suitably etched, remove the circuit board and rinse well with running water and dry.
Use only non-metallic containers and utensils.

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Safety:

Consult the product MSDS before use.
Harmful to the eyes. Skin contact should be avoided. Harmful if Swallowed.
First Aid:
Skin: Wash affected areas with copious quantities of water. Seek medical advice if effects persist. Remove contaminated clothing.
Eyes: Irrigate the affected eye(s) with cold running water. If soreness or irritation persists seek medical aid.
Swallowed: Seek immediate medical aid.
Precautions:
Personal Protection: Safety glasses, rubber gloves and clothing.
Will permanently stain clothing and equipment.
Storage:
The material is best stored in a well closed container in a cool, well ventilated area. Do not store near other chemicals. Mop up any spills with a throw away paper towel.

Disposal:

Do not put waste Ferric Chloride Solution down the drain, as it will contain high concentrations of copper and iron. For disposal, either contact your local Hazardous Waste Disposal Company or render it safe for disposal by carefully neutralising with sodium carbonate (washing soda) or sodium hydroxide (caustic soda), until the pH value goes up to between 7.0 and 8.0 (test using with pH indicator paper). Copper will be deposited as sludge. Allow the sludge to settle, pour off the liquid, further dilute it with water and then it can be poured down the drain. Collect the sludge in plastic bags and dispose of it as required by your local waste authority.

PRECAUTIONS: This product capable of producing adverse health effects ranging from minor skin irritation to serious systemic effects. None of these materials should be used, stored, or transported until the handling precautions and recommendations as stated in the Material Safety Data Sheets (MSDS) for this and all other products being used are understood by all persons who will work with the material.

Warranty: All products purchased from or supplied by Chemtools are subject to terms and conditions set out in the contract. Chemtools warrants only that its product will meet those specifications designated as such herein or in other publications. All other information supplied by Chemtools is consider accurate but are furnished upon the express condition the customer shall make its own assessment to determine the product's suitability for a particular purpose. Chemtools makes no other warranty, either express or implied, including those regarding such other information, the data upon which the same is based, or the results to be obtained from the use thereof; that any product shall be merchantable or fit for any particular purpose; or that the use of such other information or product will not infringe any patent.

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