FERRIC CHLORIDE AND THE EDINBURGH ETCH

Ferric chloride can be used as a non-toxic alternative to nitric acid in the etching process. It gives off no toxic vapours; causes little hazard during occasional skin contact and gives an accurate bite. When ferric chloride is mixed in solution with citric acid it becomes known as the "Edinburgh Etch" and is suitable for etching most types of metals including copper, zinc, mild steel, aluminium, iron and brass.

What is the Edinburgh Etch?

The Edinburgh Etch is achieved by simply adding citric acid to the ferric chloride solution. This speeds up the biting effect. Also the addition of citric acid prevents the build up of sediment inside the etched grooves, which occurs when using ferric chloride on its own. Without the citric acid, this sediment would have to be constantly removed so as to prevent it from stopping the plate from being etched further. This can also be avoided by the use of a vertical etching tank.

Notes on usage

Ferric chloride crystals need to be mixed with purified water into an initial saturated ferric chloride solution. This can be stored indefinitely, preferably in a closed container.

Do not use full strength ferric chloride on zinc plates as it works too fast and can overheat and damage the fine detail when etching plates with large open areas.

Before a fresh etch solution is used, the sting needs to be taken out either by inserting a blank piece of metal or by adding a small amount of exhausted acid.

When etching zinc, plates should be face up and require no agitation.

Traditional or acrylic (Z-acryl) resists may be used.

Do not use the same etching solution for different types of metal, always use separate tanks or trays. If a metal plate is accidentally placed in the wrong tank, this causes electrolytic processes, contaminates the ferric solution, and in cases of zinc or aluminium plates, can lead to violent chemical reactions.

In a busy workshop, the solution needs to be changed every ten to fourteen days.

Aquatints on zinc etch very quickly and so you should consider mixing a weaker solution for aquatint.

When the etch is exhausted, it must be disposed of by taking it to a chemical disposal company or by ringing your local council to see if the own facilities for disposing of chemicals.

Recipes for the Edinburgh Etch

Zinc

Regular Edinburgh Etch for Zinc: 1 litre saturated ferric chloride solution (40%). 500g citric acid powder (can be reduced to 300g). 7 litres tap water.

Weak Edinburgh Etch for Zinc: 1 litre saturated ferric chloride solution (40%). 300g citric acid powder. 14 litres tap water.

Strong Edinburgh Etch for Zinc:1 litre saturated ferric chloride solution (40%).500g citric acid powder.3 litres tap water.

Copper

The mixture is based on the overall ratio of; 4/5 saturated ferric chloride solution (40%). 1/5 citric acid solution which consists of 3/4 tap water and 1/4 Citric acid powder.

This works out in actual quantities as for example:

6 litres saturated ferric chloride solution (40%).1.2 litres tap water.400ml citric acid powder (by volume) which equals 400g powder.

Steel

8 litres saturated ferric chloride solution (40%) 500g citric acid powder (can be reduced to 300g). 3 litres tap water.