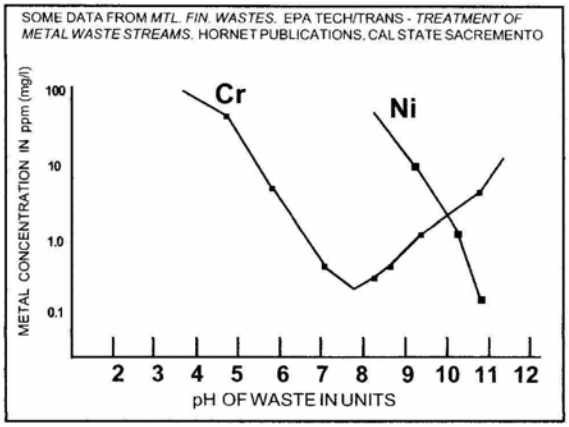
IPEC *GLOBAL INC*

1285 N. Fitzgerald Ave. Suite J, Rialto, CA. 92376
Tele: (909) 421-9960 Fax: (909) 421-8095

METHODS OF BATCH TREATMENT
NITAL ETCH

TYPICAL SOURCES:

Nital Etch is a process for the finishing of various grades of stainless steel. Stainless is an alloy containing concentrations of chromium and nickel, both are expected to be present in the waste stream. The nital etch is primarily nitric acid (pH = <2), and as such will require neutralization as well as metals removal. Waste occures in the Nital Etch line as a concentrate and a dilute rinse.



ASSUMPTIONS & NOTES:

Metal is in solution and not suspended. If particulate metals are present it is advised to filter and remove them prior to treatment. It is also assumed that the nickel is not complexed either as an electroless bath or a cyanide complex. Small amounts of Chromium may be present in both hexavalent and trivalent forms. Waste is expected to be relatively free of oils and grease.

METHODS & PROCEDURES

The first step in the treatment of any waste stream is to document and know the waste stream constituents. Perform an analysis of the stream to determine the metal concentration. All safety precautions stated in chemical supplier's MSDS documents must be enforced. Maintaining a log of each batch is also important in being able to repeat the treatment method. Perform complete jar testing of this recipe prior to full scale treatment. Note any reactions such as exotherm, or sufide gas liberation. Do not proceed with full scale treatment until all reactions are known.

Treatment of the Nital Etch must take into account the fact that there are three principle target pollutants that may have to be dealt with. Chromium, Nickel, and low pH. While each of these targets can be dealt with seperately, they can also be combined in the same recipe. If no chromium is present, proceed with step 2.

The first step will be to reduce the hexavent chromium to trivalent if it is present. This will take advantage of the existing low pH. If the concentrated Nital Etch is treated the pH is expected to be acidic. If the rinse is treated, acid may have to be added. Using the method for chromium reduction, be sure that the pH is between 2.0 and 3.0. If the pH is too high, the reaction will be slowed or not take place. If the pH is too low, the danger of liberating sufur bearing gases is possible. Always use low strength sulfuric acid (10-15%) to lower the pH and magnesium hydroxide to raise pH. The reduction of the hex chrome will be accomplished using sodium metabisulfide. This will be measured using a color change, (& metal test), to a light or dark green. If color change is not evident, a hand held ORP meter is used. A value of 250 to 300 mv is optimum. (This takes place at a pH of 2.0 to 3.0).

Step two will be the neutral ization of the acid ic cond ition of the N ital Etch or rinse. This proceedure will use magnesium hydroxide to elevate the pH to 6.5 to 7.0. If chromium treatment has been used, the proceedure will remain the same. As the pH reaches 6.0 a milky color will form in the batch. This is the metal and solids precipitating. Allow at least 20 minutes of equalibrium time after the pH has reached 7.0. This is because some batches may rise or fall as all the available chemicals react. After the bath is stable, proceed to step #3.

Step three will involve the use of a small quantity of DTC (Mid-floc 1300L), to precipitate out the remaining metals, especially the nickel metal which usually needs a higher pH to fall out completely. It is not advised to raise the pH above 7.5 as chromium may redesolve at pH levels above 8.0. Using the jar test to determine the amounts of nickel metal, prepare the amount of DTC necessary using the values table supplied with the DTC (Midfloc 1300L). Allow at least 30 minutes to blend.

Step 4 is optional. Use a 1 % solution of Midfloc 1315 polymer to increase the size of the precipitant and aid in filter pressing. Add slowly until a visible floc is present. Do not over mix, as this will break down the floc.

The fifth step will be to begin filter pressing the batch to remove all metals and sludges. As filter pack begins to form, the waste stream should start to clear. When clearant is formed remove a sample and test for metals content. If metals are present, return waste to batch and treat for each metal.