METSTRIP - S

AN ADDITIVE TO STRIP NICKEL AND OTHER METALS FROM IRON AND STEEL

Metstrip S is a light, fluffy, powdered compound which, when dissolved in water along with Sodium Cyanide, will chemically remove plated deposits of Nickel, Brass, Copper, Zinc, Cadmium and Silver from steel and other iron alloys. Normally, no electric current is required. Freshly plated electroless nickel deposits can also be stripped with Metstrip S and cyanide mixture. This can sometimes be accelerated by use of anodic current.

The Solution is alkaline in nature and strips most nickel coatings rapidly with a stripping rate of apporximately 1.5 mils/hr. at 70 - 75 °C. Brass and Copper are removed at a rate of 3 mils/hr. at about 60 °C. In both cases, there is some reduction in stripping rate as the bath becomes old. However, additions of Metstrip S and Sodium Cyanide in the same ratio as originally used will result in a marked increase in the stripping rate.

Most economical use in accomplished by room temperature stripping if the longer time is permissible. A convenient method is to place the parts in the room temperature solution at the end of the working day and allow them to strip overnight.

Solutions of Metstrip S and Sodium Cyanide will not attack most steel and iron alloys provided that the free cyanide content of the bath is maintained above 60 g/l. However, there are some high alloysteels and cast irons and some case hardened and nitrided alloys on which attack has been experienced. Before using Metstrip S with such alloys, tests should first be conducted to determine their susceptibility to attack by the stripping solution.

HOW TO USE METSTRIP S

OPERATING CONDITIONS :

	Concentration
Metstrip S	60 g/l
Sodium Cyanide	120 to 180 g/l Room
Temperature	to 70°C

Make - up

The lower cyanide content is recommended for stripping nickel deposits and the higher cyanide content for removal of the cyanide soluble metals such as copper and its alloys, zinc, cadmium and silver. In making up the solution, the water may be heated to 65°C to facilitate dissolving of

the salts, and the cyanide should be completely dissolved by stirring with an iron paddle before the Metstrip S is added and stirred. If it is to be operated cold, the Metstrip S may be dissolved at 65°C followed by cooling before adding the cyanide. Do not use potassium cyanide with Metstrip- S as a heavy, flocculent precipitate will form due to reaction between the two materials.

Temperature

The stripping solution may be operated at any temperature within the range of 30-70°C. The higher temperature will result in faster stripping, but, since cyanide decomposition increases with temperature a medium temperature may be economically desirable. For stripping nickel, we recommended 60-70°C; for stripping copper, 30-60°C stripping will be most economical if nickel plated work is stripped overnight at room temperature.

Stripping

Metstrip S strips by simple immersion. Merely hang the plated work in the stripping solution until the plate has completely dissolved. Deposits of nickel, copper, zinc, cadmium and silver are completely removed. Agitation of the work will increase stripping speed by as much as 50%.

The work may be hung on hooks, placed in baskets or stacked in the tank. However, do not pack the parts so tightly together that circulation of the solution around them is prevented. Shake basket full of parts occassionally to change contact areas and permit uniform stripping. Keep stacked work off the bottom of the tank by the use of salts or some other arrangement : otherwise, the solution will become stagnant, or, in a cold bath, precipitated metal salts may cover the parts on the bottom and cause etching of the steel.

Do not think that the stripper is failing to work if nickel remains on sharp edges or corners after the metal has been removed over the rest of the surface. Longer stripping time may be required to remove the nickel from the high spots, such as edges, corners, or points because the thickness of nickel at such points may be many times that of the rest of the surface.

If the work to be stripped is greasy or oily, clean it first in an alkaline soak cleaner, emulsifiable solvent, or vapour degreaser so that the Metstrip S solution will wet it uniformly. Metstrip S does not strip chromium plate; parts which are chromium plated must first be stripped of chromium by immersion in hydrochloric acid or by anodic treatment in caustic soda or Ginbond Cleaner 808.

Barrel Stripping

Somewhat lower costs in stripping may result if work which can be tumbled in an obligue open- end tumbling barrel. From 8 to 60 g/l of Metstrip S and 45 to 150 g/l of Sodium Cyanide can be used depending upon the thickness of nickel to be removed and whether the solution is to be saved or discarded after each load. If hot water is used for making up a dilute solution, the rate of stripping will be atleast equivalent to that of still tank stripping at the much higher concentrations.

The solution need not cover all parts in the barrel load. The speed of rotation of the barrel will have very little effect upon the stripping rate, and therefore, it should be determined by the shape and size of the parts.

Equipment

Metstrip S solutions may be contained in plain steel tanks and heated by steel steam coils or Platecoils. Stainless steel is also suitable. Work holders, baskets and racks should also be made of steel or stainless steel. Do not use lead lined tanks, lead coils, or soldered or brazed joints below solution level. Copper hooks and work holders will dissolve in the stripping solution. For stripping at elevated temperatures, use exhaust ventilation to remove steam and gases which might be formed by contact with acid vapours in the surrounding air.

CONTROL AND REPLENISHING

No analytical control of the solution is necessary under normal conditions since the slowing down of the stripping rate will indicate the necessity for making salt additions to the bath. Additions of both Metstrip S and sodium cyanide in the same ratio as originally used for bath make-up can be made at any time in order to speed up the stripping rate. After additions of Metstrip S totalling 60 g/l have been made, the bath should be used to its economical limit with respect to stripping time and then should be discarded.

If the free sodium cyanide concentration falls below 37.5 g/l the surface of the nickel becomes passive and may stop dissolving. A galvanic cell is set up between the passive nickel and the exposed steel such that the steel becomes anodic and may be etched.
When it is desired to control the bath by chemical means, the sodium cyanide content may be determined by titration with standard silver

nitrate using the same method employed to determine free cyanide in plating baths. Maintain the sodium cyanide concentration at 75-120 g/l Add Metstrip S as needed to maintain the stripping rate.

ANALYSIS

1. Pipette a 2 ml sample of Metstrip S into a 250 ml Conical flask.
2. Add 80 ml cold distilled water
3. Add 10 ml of 10% potassium iodide
4. Titrate to the first faint turbidity with 0.1 Normal Silver Nitrate
5. Multiply ml. of 0.1 N Silver Nitrate by 4.9 to obtain gms/litre of free sodium cyanide.

SOLUTION LIFE

On the average, 450 gms of Metstrip S will dissolve 225 gms of nickel or approximately 100 sq. ft. of 0.0001” thick nickel plate. Also, 450 gms of Metstrip S will dissolve 450 gms of copper or approximately 200 sq.ft. of 0.0001” thick copper plate. These figures will vary with operating temperature and amount of dragout losses.

CAUTION

A solution of Metstrip S is oxidizing in nature. Therefore, avoid contact with organic materials, such as paper, cloth or sulphur whenever the solution might dry on these materials. The wet solution is not dangerous and can be readily rinsed off.

The stripping solution is alkaline and therefore, the operator should protect himself by means of safety clothing against getting the solution in contact with the skin or splashed into the eyes. In cases of such contact, flush the affected parts of the body with large quantities of water. Since hot solution contains cyanide, contact with acids or acidic rinses will form a poisonous gas and should be avoided. DO NOT allow Metstrip S solution to come in contact with acids or acidic rinses. Do not take internally. If swallowed, treat for cyanide poisoning.

When exhausted Metstrip S cyanide solutions are discarded the same care should be taken as must be taken with the disposal of any cyanide type plating solution.