



innovative chemical technologies, inc.

## **Flexiwet NF**

### **MIST SUPPRESSION FACTS SHEET**

#### **1. What is a mist suppressant, and why is it necessary?**

In 1990, the Clean Air Act was modified in such a way as to direct the Environmental Protection Agency (EPA) to regulate emissions of nearly 200 toxic chemicals, including chromium compounds. The hexavalent form of chromium is highly toxic and strongly suspected of causing lung cancer.

Chromium electroplating and anodizing tanks are a sizeable contributor to chromium emissions, and EPA estimates that full compliance with emissions regulations throughout the over 5,000 electroplating/anodizing tanks located in the United States should reduce emissions by 173 tons of chromium (99 percent) from pre-compliance levels.

The emission reduction regulation requires, among other things, that ongoing monitoring is demonstrated through continuous review monitoring of the operating parameters of the tank. If a wetting agent is used for compliance purposes, the surface tension of the bath must be monitored every four hours. If a foam blanket is used, the foam thickness must be monitored every hour.

#### **2. How do mist suppressants work?**

As mentioned above, two different approaches to mist suppression exist: foam blankets and wetting agents. Either can function effectively.

Foam blankets are easier to monitor, as measuring foam height is easier, and provide a visual demonstration that they are working; they also require more frequent monitoring, and can entrap hydrogen gas within them (which can then pose an explosion risk).

Wetting agents need less frequent monitoring and offer the added benefits of enhancing the wetting of the plating solutions on the substrate and reducing dragout from the bath, but require a more sophisticated measurement and offer no obvious visual indication of performance.

#### **3. How do I use Flexiwet NF as a mist suppressant?**

Flexiwet NF is a wetting agent mist suppressant. It performs by reducing the surface tension of the plating solution, which reduces the initial bubble size, making them collapse faster and with less impact on the surface, thereby minimizing emissions. Details on its use are in the next section.

## **APPLICATION/TECHNICAL INFORMATION**

Unlike conventional surfactants, Flexiwet NF has exceptional stability to function in the extreme chemical environments found in electroplating and anodizing solutions. It is much more stable than many alternatives in use today, which affords superior longevity in use. For example, it has been combined with concentrated Nitric acid, evaporated, and recovered intact. Similarly, 25% Sulfuric, 25% Nitric, and 10% Hydrochloric acids can be reduced in surface tension to the mid 30s dynes/cm with 0.05% Flexiwet NF and to 19 dynes/cm with 0.5% Flexiwet NF.

Low surface tensions can also be achieved and maintained in alkaline systems, which can have application in precision cleaning systems. For example, the surface tension of 10% Sodium Hydroxide can be lowered to 30 dynes/cm with as little as 0.05% Flexiwet NF and to 20 dynes/cm with as little as 0.5% Flexiwet NF.

To begin with, we recommend evaluating Flexiwet NF in chromium plating baths at levels between 0.5% and 1.5%, depending upon the specific bath composition. As an example, a standard chrome plating solution measured 91 dynes/cm before addition of Flexiwet NF; after addition of 0.75% (as delivered) Flexiwet NF on total weight of solution, the surface tension dropped to 33-34 dynes/cm. Plating baths should be monitored and additional wetting agent added as needed to maintain required performance levels per regulatory requirements.

## **TYPICAL PROPERTIES**

Appearance	Clear, Pale Yellow Liquid
Density @ 25C	1.02 +/- 0.02 g/ml (8.5 lbs/gal)
pH (5 % solution)	2.0-3.0
Water Solubility	Soluble
Boiling Point	Approx. 100C

## **PACKAGING/HANDLING**

Flexiwet NF is available in totes (Net Wt. 2200 lbs),  
55 gallon drums (Net Wt. 440 lbs) and 5 gallon pails (Net Wt. 40 lbs).  
DOT Classification is Non Regulated.