

# **FS - 600**

## **Fume Suppressant**

### **Description:**

FS-600 is a liquid fume suppressant for use in chrome baths. It forms a thick foam blanket and lowers the surface tension for compliance with the air discharge regulations. FS-600 is fast acting and provides a dense foam blanket with extremely small & thick bubbles.

### **Advantages:**

- ★ **FS-600 uses the same chemical as the highly successful 3M ® FC product, now discontinued, for which we have exclusive import rights.**
- ★ **FS-600 is a permanent fume suppressant that is not oxidized by the bath.**  
  
**FS-600 does not break down to add trivalent or sulfate.**  
  
**FS-600 does not coat the anodes or form a surface scum.**  
  
**FS-600 is compatible with all other fume suppressants.**
- ★ **FS-600 is very effective in reducing chromium emissions.**
- ★ **FS-600 is easy to add and easy to control.**
- ★ **FS-600 provides a very dense and thick foam blanket.**
- ★ **FS-600 lowers surface tension which improves wetting & rinsing.**
- ★ **FS-600 is the lowest cost permanent product on the market.**

**Mechanism:**

FS-600 operates by forming a dense foam blanket and reducing the bath's surface tension. The lower surface tension reduces chrome emission at the tank surface, the foam blanket keeps this mist from entering the plant atmosphere. Typical chrome baths have a surface tension between 75 and 90 dynes/cm., depending on the amount of contaminants present. FS-600 can lower this to below 35 dynes/cm if needed. The foam blanket is formed by the gassing action during plating and this may dissipate when the rectifier is off, but will re-build again when plating is resumed. Foam thickness is dependent on the rectifier setting, the tank configuration and bath temperature.

**Bath Additions & Control:****New Baths:**

The initial charge for new chrome bath, without contaminants or an existing fume suppressant, is typically 1% by volume (10 gal/1,000). This should provide a surface tension of around 35 dynes/cm. Use only 0.5% by volume if 45 dynes/cm is desired. Generally, it is best to add only 3/4 of this amount initially and observe the results.

**Older Baths:**

Older baths with higher levels of trivalent, iron and copper may require slightly more of the FS-600 Suppressant initially, possibly up to 2% by volume depending on the desired surface tension (if this is being controlled). Again, add a little less and observe the effect.

**Conversions:**

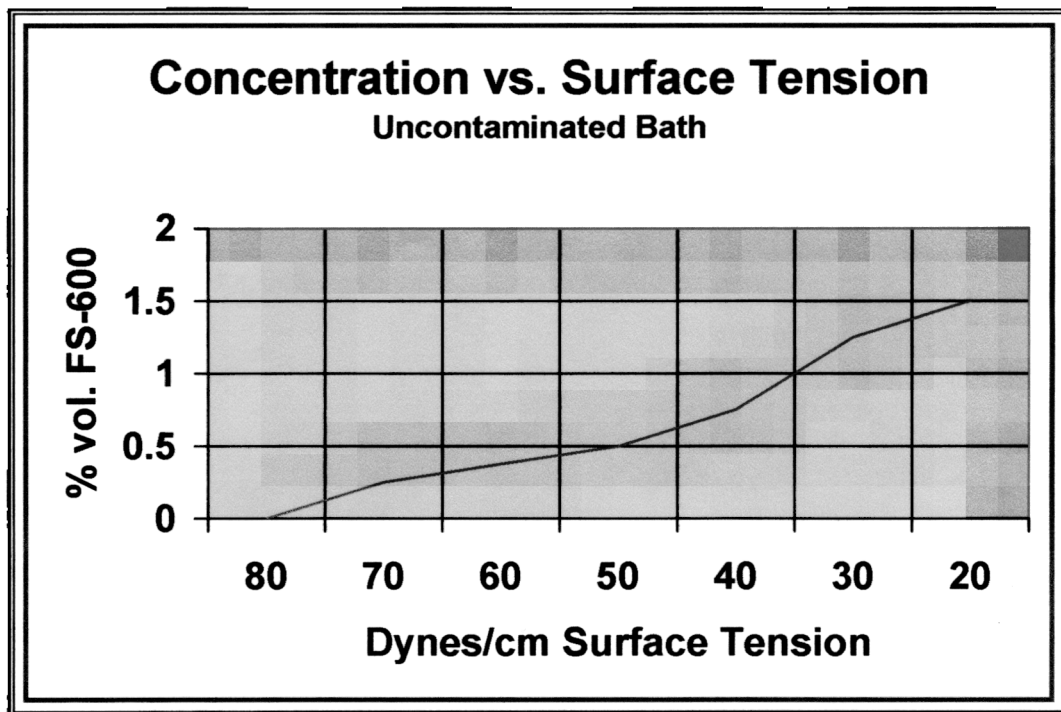
The conversion addition should be based upon the amount of foam blanket or surface tension reduction needed. It is best to make additions in smaller equal steps until the desired result is obtained. FS-600 is compatible with all other mist suppressants. On rare occasions, a slight amount of scum may form due to reaction with an existing fume suppressant. This is not a cause of concern, simply skim this off if any is present.

**Control:**

**FS-600 can be controlled by either the foam blanket thickness or by surface tension.** FS-600 additions should be made, as needed, to maintain the desired foam blanket which should be around 3" thick. Variances of +/- 3/4"-1" are usually suitable. A simple tape measure can be used for this control. If surface tension is being controlled then this should be checked regularly with a stegamometer in accordance with local regulations.

These measurements should be done daily, as a minimum, with bath additions made to keep the bath within the control points established. Small and more frequent additions are better than larger less frequent ones are. A maintenance schedule should be developed for each bath. This amount will vary with the operation, but is typically around 8-10 fl. ounces (250-300 mls.) per 500,000 ampere hours which usually equates to about 100 lbs. of chromic acid consumed.

It is best to dilute FS-600 (4-5 times) with water before adding to the bath. Spread the addition evenly across the bath's surface and use mild agitation to mix it in thoroughly. An excess of the FS-600 is not recommended.



#### **Deposit Pitting:**

FS-600 does not cause pitting with deposits up to 0.005" per side. All fume suppressants, however, tend to increase any pitting tendency caused by substrate imperfections, particularly with thicker deposits. Base metal pitting does not occur simply because a fume suppressant is being used. If pitting occurs it is usually related to improper cleaning or imperfection in the substrate material. Abusive preplate grinding or polishing can leave non visual surface debris that needs to be fully removed prior to plating in order to avoid pitting whenever a fume suppressant is used. If pitting becomes a problem and the surface was properly cleaned and activated, then pitting is likely due to minute base metal pin holes, microscopic substrate cracks, surface oxides or non-metallic inclusions in the base metal. Pitting can also be caused by stop-off residue, degradation of floating plastic balls, tank linings or plastic plumbing, as well as debris from wire brushes and grit blasting material, or buss bar arching or the introduction of certain oils or other organic materials into the bath. In some cases, this can be overcome by using an increased catalyst level in the bath and/or changing the reverse etch time. For more severe cases, the solution is to use Dura Prep scrubbing, glass beading or vapor blasting prior to plating. The use of Dura Prep removes all surface debris while also providing better adhesion.

#### **Caution:**

FS-600 is an industrial product; review the MSDS before using. FS-600 is not considered hazardous by the DOT but it is used in a hot chromic acid bath. Avoid splashes, wear adequate personal protection and refer to the MSDS as well as the one for chromic acid before using.

**Avoid hydrogen explosions from the foam blanket due to sparking near the bath's surface. Hydrogen explosions are alarming and can also be dangerous due to potential splashing of hot chromic acid solution. Avoid by using sound electrical contacts, an adequate buss height and good air circulation around the tank. Turn the rectifier off before removing racks if these precautions are not possible.**