

## ***Performance of M-238 in the Cutting Fluid***

**Background:** Customer would like to improve corrosion protection of their water reducible cutting fluid Tubeform 8000.

**Purpose:** Evaluate the performance of M-238 in water reducible cutting fluid Tubeform 8000 submitted by Cortec's Midwest Office.

**Method:** ASTM D1748 (Humidity Cabinet)

**Materials:** Cutting Fluid 'Tubeform 8000', manufactured by Quaker Chemical Corporation.  
Panels (Carbon Steel SAE 1010)  
Methanol

**Procedure:**

1. M-238 was added to Tubeform 8000 at concentration level of 5 and 7.5% by weight. It was found that M-238 is compatible with Tubeform 8000 and forms clear stable solution.
2. For corrosion testing the samples of cutting fluid containing M-238 and without it, were diluted with tap water in ratio: 15%Cutting Fluid + 85%Tap Water (by volume).
3. Panels were cleaned with methanol and air dried. Cutting fluid was poured at the panels with a pipette and after drying overnight, panels were placed in humidity cabinet.

**Results:**

**Humidity Chamber ASTM D-1748 (Carbon Steel)**

<b>Material</b>	<b>Time before corrosion started, days</b>
<b>15% in tap water of:</b>	
<b>1. Tubeform 8000 with 5% M238</b>	72
<b>2. Tubeform 8000 with 7.5%M238</b>	120
<b>3. Tubeform 8000 (Control)</b>	<48

**Conclusion:** M-238 provides excellent protection for carbon steel when incorporated in Tubeform 8000 cutting fluid at concentration level 7.5%