# EFFECT OF METHANOL AND GLYCOLS ON WATER VAPOR TUBES

## INTRODUCTION

Colorimetric tubes for water vapor are commonly used to measure the humidity of natural gas because of their rapid response compared to instrumental methods. To minimize corrosion and to obtain a better selling price for the gas, water vapor levels are often reduced by passing the gas through a liquid scrubber containing ethylene glycol or triethylene glycol. In addition, methanol is sometimes added to the natural gas pipeline as an antifreeze so that ice does not accumulate during cold weather. This Technical Note describes how to read water vapor tubes that may have interference from these chemicals.

### Resistance to Glycol Response and "Rich" Gas

Newer versions of RAE water vapor tubes have been improved to remove any response to ethylene glycol or triethylene glycol. These changes were implemented in the 6 to 40 lbs/MMCF tubes (p/n 10-120-20) shipped after November 2003 and in the 2 to 10 lbs/MMCF tubes (p/n 10-120-10) shipped after November 2004. Higher alkanes such as pentane, hexanes and octanes present in "rich" natural gas also cause no response.

### Effect of Methanol

Methanol alone causes a light green response in both 120-10 and 120-20 tubes when its concentration is above about 80 ppm. When water and methanol are present together, a two-tone stain is seen. On the 120-10 (2 to 10 lbs/MMCF) tubes, the water forms a medium-dark green stain followed by a light green stain for methanol (see Figure 1). On the 120-20 (6 to 40 lbs/MMCF) tubes, the water forms a purple stain followed by a light green stain for methanol (see Figure 2). This light green color can be ignored and only the darker stain read to obtain the water vapor concentration.

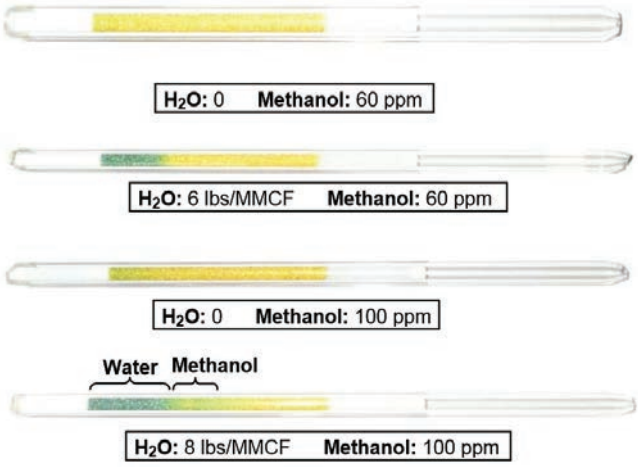


**Figure 1. Methanol response on the 120-10 (2 to 10 lbs/MMCF) tube.**

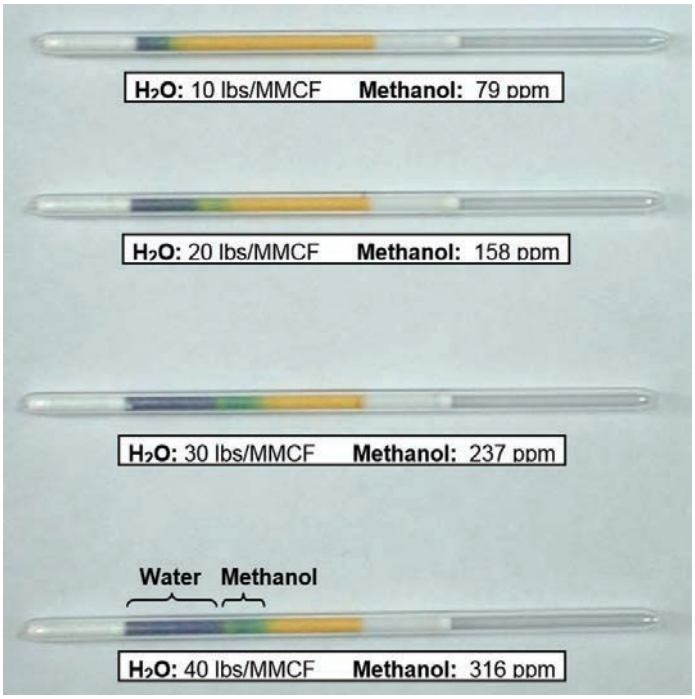


**Figure 2. Methanol response on the 120-20 (6 to 40 lbs/MMCF) tube.**

Figure 3 shows that the color stain for water vapor is greener at higher temperatures and tends towards purple as the temperature is lowered. Therefore, the distinction between methanol and water vapor response is more clear at lower temperatures.

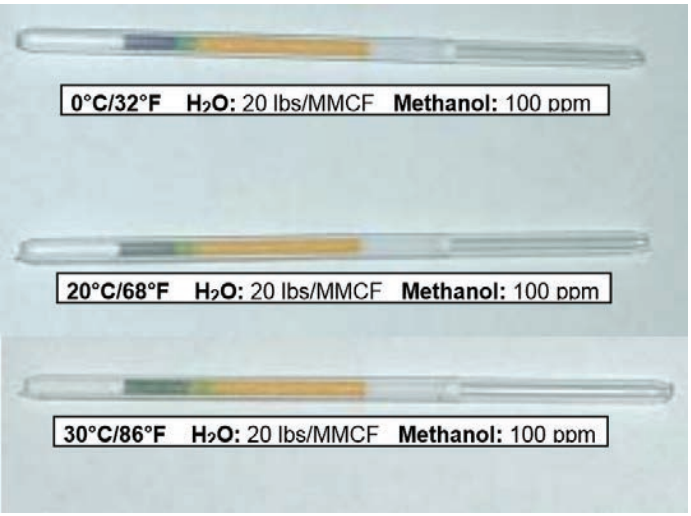


**Figure 3. Effect of temperature on the 120-20 tube.**

Note: For more information on RAE Systems colorimetric tubes and techniques, refer to Gas Detection Tubes & Sampling Handbook (p/n 010-4003-000), available from RAE Systems (www.raesystems.com).