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**AMR LABORATORY PROCEDURES FOR SAMPLING & TESTING NATURAL GAS**

**SCOPE: The purpose of this manual is to recommend the best procedures for obtaining samples from flowing Natural Gas streams. GPA 2166 is designed for sampling Natural Gas from systems that are at or above the Hydrocarbon Dew Point temperature. As the hydrocarbons Dew Point increases, it becomes difficult to obtain a representative sample from a flowing stream. The following procedures only apply to spot sampling of natural gas and other gaseous products, not composite sampling.**

**Sample Cylinder Cleaning and Preparation for Gas Sampling (As per GPA 2166-05, Appendix A)**

To prepare sample cylinders for gas sampling, they must be cleaned properly after each use. Customers supplying their own sample containers also require clean sample cylinders when we return them. We utilize methodology provided in GPA 2166, in Appendix A, Cleaning procedure.

All sample cylinders should be evacuated safely under the fume hood prior to cleaning. Make sure to open both end valves and check for any condensable hydrocarbons. (Gasoline, condensate) or water from the body of the cylinders. If the cylinder has any visible liquid present when expelled, the valves should be removed and the cylinders should be cleaned with soapy, hot water followed by heating and Nitrogen (or Helium) purging.

After purging the warm cylinder with Helium or Nitrogen, attach the cylinder to the vacuum pump and remove all gaseous components by evacuating the cylinder on the pump for a minimum of 1 minute. Allow the sample cylinder to pull down on the vacuum pump for one minute, then close the inlet valve and remove it from the vacuum pump.

After the sample cylinder has been evacuated, it must be placed on the Steam cleaning system for 2 minutes, allowing hot Steam to purge through the cylinder. This should remove any traces of heavier Hydrocarbons, like compressor oils or Condensate left behind during the initial cleaning stages. While some cylinders might not fall under this category where they were used on gas sampling with heavier Hydrocarbons, like Coal Seam gases, all cylinders must be cleaned in this same manner regardless of prior usage, before certification. A drop of Oil or Condensate remaining in the sample cylinder can affect the results of the next sample placed in the cylinder, especially Gas samples where the BTU content is directly correlated to the C6+ fraction. All sample cylinders, regardless of past usage, must go through Steam cleaning to assure that any traces of heavier Hydrocarbons have been removed.

After Steam cleaning, the sample cylinder should be returned to the oven and allowed to continue drying, with both valves on each end opened. The cylinder must remain in the oven for a minimum of 1 hour, to complete the drying. Once the cylinder is dried, it should be purged again with Helium and placed on the vacuum pump to evacuate all contents inside. Once the vacuum has been pulled, the cylinder is filled with 10 psi of Helium and analyzed on the Extended Hydrocarbon chromatograph (FID) to be sure all traces of Hydrocarbons have been removed. If there is evidence of any Hydrocarbon remaining on the FID scan, then the cylinder must be cleaned again, beginning at start of this cleaning procedure. If the cylinder does NOT show any traces of Hydrocarbons, then print a copy of the chromatogram for our records. Then, and only then, can you place a certificate of cleanliness sticker on the outside of the sample cylinder. This cleaning procedure must be performed after every use of that bottle, using the steps outlined above. Make sure to place the certificate of cleanliness sticker in a visible place on the outside of the cylinder and record the date when the cleaning was performed on the chromatogram and sticker.

Sample cylinders used in the field must be cleaned and certified prior to use again. Do not use cylinders that appear to have damage to the body or valves. All cylinders should be pressure tested to 1500 PSIG and checked for leaks, at least twice a year. Replace any leaking valves with new ones.