Technical Bulletin

Concentration Control of Coolants by Alkaline Titration

The ability to accurately measure and control concentration is critical to having an effective coolant management program. There are two basic methods of checking concentration outside of the metalworking fluids laboratory. They are by alkaline titration and refractive index. TRIM® CGF-1 titration kit is designed to do the alkaline titration of coolants “tank side” or any other place where special laboratory equipment may not be available. The alkaline titration of washing compounds and water based corrosion inhibitors is done with a TRIM® CL-1 kit.

Alkaline titration typically works best with synthetic and semisynthetic products; however it is sometimes a useful technique in other types of fluids including some soluble oils. Check the TRIM product Data and Information (D&I) sheet. The titration factor will be called out for the products where this technique is affective.



The optical refractometer is most often used to check coolant concentration because of its ease of use. However, it is often very useful to be able to measure concentration by other methods, just comparing the results of multiple methods will often suggest areas of interest before they become a problem.

Each kit contains complete instructions but the basic method is as follows:

1. Fill 15 ml dropper bottle marked with the 1.0 N sulfuric acid.

2. Fill the measuring cylinder with the sample to be tested.

3. Place the measuring cylinder into the mixing bottle by inverting the cylinder into the mixing bottle.

4. Add 1-2 drops of the indicator dye and swirl to mix.

5. Using the filled 15 ml acid dropper bottle, add drops while counting, until the solution turns from green to pink. NOTE: The dropper bottle must be kept at a 45° angle.

6. Record the number of drops.

7. Consult your TRIM product D&I sheet for the titration conversion factor and multiply the conversion factor by the number of drops to determine the percent concentration. There is also a graph to do the conversion on the D&I as well.

NOTES:

1. For more specific information consult the detailed instructions included with the Drop Count Method Kit.
2. While this kit is designed for use with TRIM brand metalworking fluids it can be used with any metal removal fluid after developing the proper factors.
3. The concentration of the TRIM synthetic and semisynthetic fluids may also be checked by refractometer. See the TRIM Technical Bulletin titled *Concentration Control of Coolants by Optical Refractometer*

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