Technical Bulletin

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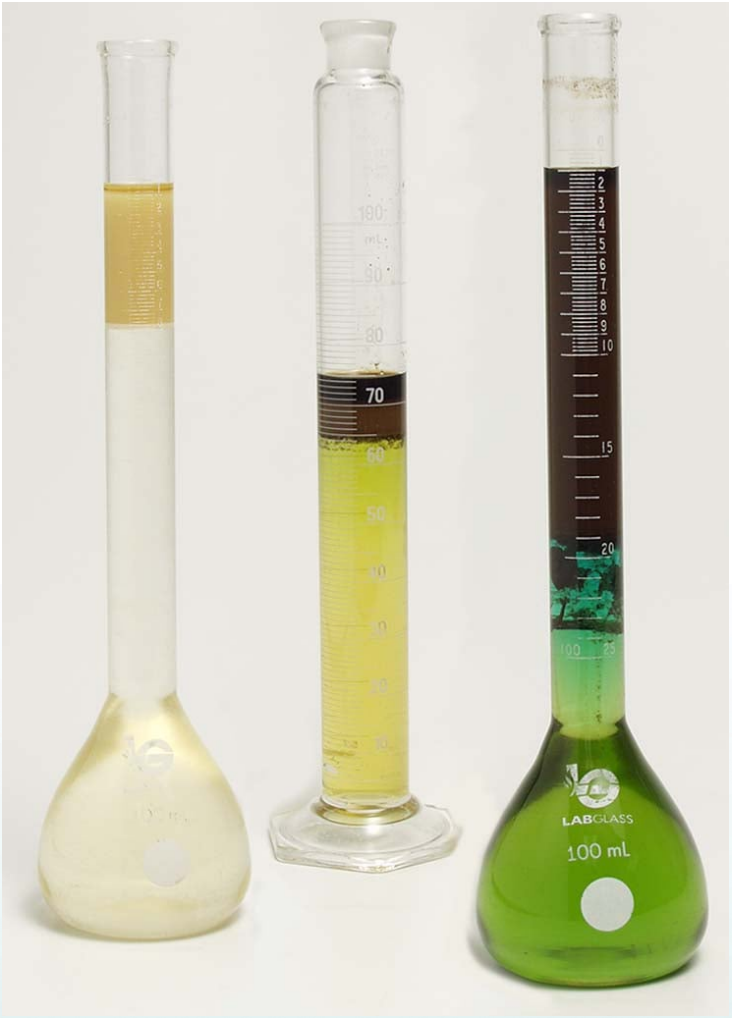
Concentration Control of Coolants by Acid Split

The acid split method of checking concentration works only with soluble oil or high oil semisynthetic products. Products where a substantial amount of the coolant concentrate is made up of oil.



Typically the method requires the addition of a measured amount of a representative sample of the working solution into either a 100ml graduated cylinder or a special “acid split” flask. A measured amount of either 50% sulfuric acid (H2SO4) or 50% hydrochloric acid (H Cl) is added to the working solution. The test container is then allowed to rest for a specific length of time either at ambient temperature or in an oven. The containers are then read to determine in total how much material split out of the working solution and then to categorize the “split material” according to the procedure’s standards as to: product oil, tramp oil, surfactants, etc. The concentration of the working solution is calculated using the total amount of product oil, surfactant, etc. in the concentrate to generate the factors for the working solution.

The nature of this test is quite subjective and relies a good deal on operator technique. The process gives very good and repeatable results but does take six to 18 hours between sample grab and result. The method also provides additional and potentially very useful information, e.g. tramp oil levels, concentration by product oil, and concentration by surfactant content.

Specific acid split procedures differ from supplier to supplier so you should contact your metalworking fluid supplier for a copy of their acid split procedure.

NOTES:

1. The acid split method of checking concentration uses some strong reagents and should only be done by people familiar with good laboratory techniques and health and safety procedures.
2. The acid split procedure is best done in a controlled laboratory situation.
3. Contact your fluid supplier for their acid split procedure and sourcing on the reagents and special glassware.

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