VOC BASICS

INTRODUCTION

The EPA definition of volatile organic compounds (VOCs) states that VOCs are emitted as gases from certain solids and liquids. VOCs include a variety of chemicals, some of which may have short- and long-term adverse health effects. VOCs are emitted by a wide range of products including metalworking fluids and lubricants. Under the Clean Air Act, the EPA established air quality standards and emission limits based on industry specific standards. Regulations have been developed at each state and some local metropolitan areas which are either equal to or more stringent than the federal regulations.

METHODS FOR DETERMINING VOC

There are currently two major test methods used by the metalworking and lubricant industry to determine the VOC content of a product:

EPA Reference Method 24: This method heats a sample for 1 hour at 110°C to determine the volatile content from weight loss. This is the acceptable method to regulators and allows testing of many fluids; however, this test does not match in use conditions for metalworking fluids. This method works well for cured coatings such as paint, varnish, and lacquer, but rarely is there an application for metalworking fluid where this temperature is utilized.

ASTM E 1868-10: This method was generated to attempt to better match metalworking fluid conditions, and is based on the test data provided by the South Coast Air Quality Management District (SCAQMD) in Southern California. This method uses TGA analysis, and due to lower testing temperatures, generally results in lower VOC values. However, these values are currently only applicable in the SCAQMD jurisdiction – which is limited to Orange County and the urban portions of Los Angeles, Riverside and San Bernardino counties, California (http://aqmd.gov/)

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As a result of the adoption of the ASTM E1868 method by SCAQMD, Castrol has done a comprehensive review and re-testing of all products to obtain both the EPA Method 24 VOC content and the ASTM E1868-10 VOC content. Some products have been reformulated to comply with the limitations placed on the product categories by the SCAQMD rule.

To comply with the SCAQMD regulations, VOC content via ASTM E 1868-10 is displayed on the product labels in grams/liter. The VOC as displayed will be of the product in the drum (concentrate) and not the as-diluted (in-use) product VOC.