

CrownTech™ - Technical Bulletin No. 2

VOC Compliance

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INTRODUCTION

Volatile Organic Compounds, for classification and regulation are volatile compounds of carbon. VOC regulations cover both exempt and non-exempt solvents.

USA – ENVIRONMENTAL PROTECTION AGENCY

The EPA has defined “Volatile Organic Compounds” very broadly. In effect, “any volatile compound of carbon” is classified as a VOC for regulatory purposes, although a number of the compounds are specifically exempted (their use is unrestricted). See 40 C.F.R. 51.100 (s).

However, the EPA’s VOC restrictive regulations do not always apply to all compounds that meet the very broad definition found at 40 C.F.R. 51.100(s).

EXAMPLES

Regulations of coatings specific test methods, known as Test Method 24, that generally determines what is to be treated as a VOC. See 40 C.F.R. part 60, Appendix A. Test Method 24 (ASTM test methods) defines the VOC content of a coating formulation. Compounds that are “picked up” by these test methods are considered VOC for purposes of regulating coating formulations.

VOC-EXEMPT CARBON COMPOUND

EPA regulations include a list of compounds that are explicitly exempted from regulation as VOCs, even though they are “compounds of carbon.” These include a short list of compounds such as carbon monoxide and carbon dioxide that historically have not been regulated as VOCs, and a longer list of compounds that the EPA has classified as “negligibly reactive.” Negligibly reactive compounds are compounds that, based on scientific studies, have been found “not to contribute appreciably to ozone formation.” This list of compounds (often referred to as “VOC-exempt compounds”) is established and modified by regulation.

Although there are relatively few VOC-exempt solvents and where they can be used, they provide product formulators with additional flexibility in designing solvent blends that meet regulatory requirements.

USA and CANADA (STATES and PROVINCES)

A number of states and provinces have their own VOC definitions, including their own list of exemptions. The states and provinces definitions (including exemptions) are generally the same as the EPA definition.

VOC (Volatile Organic Compound) COMPLIANCE REQUIREMENTS

- **U.S.E.P.A.:** 40 CFR 59 Subpart C & D
- **CARB:** California Air Resource Board
- **LADCO:** Lake Michigan Air Directors Consortium (Illinois, Indiana, Michigan, Wisconsin); MRPO: Midwest Regional Planning Organization (Illinois, Indiana, Michigan, Ohio, and Wisconsin)
- **OTC:** Ozone Transport Commission members include the states of Connecticut, Delaware, the District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and Virginia
- **SCAQMD:** South Coast Air Quality Management District (Los Angeles, Orange, Riverside, and San Bernardino Counties)
- **CEPA/EC:** Canada Environmental Protection Agency

USA States (including the District of Columbia) Listed Above

| | | |
|----------------------|---------------|--------------|
| California | Maryland | Ohio |
| Connecticut | Massachusetts | Pennsylvania |
| Delaware | Michigan | Rhode Island |
| District of Columbia | New Hampshire | Utah |
| Illinois | New Jersey | Vermont |

Canadian Provinces and Territories Members of CEPA/EC

| | | |
|------------------|---------------------------|-----------------------|
| Ontario | Saskatchewan | Prince Edward Island |
| Quebec | Nova Scotia | Northwest Territories |
| British Columbia | New Brunswick | Nunavut |
| Alberta | Newfoundland and Labrador | Yukon |
| Manitoba | | |

POPULATION

The majority of the population in North America (Canada and USA) have implemented VOC regulations that are more restrictive than the US Federal Government, while 31 USA states meet the less stringent Fed VOC Regulations.

TESTS

The appropriate testing for Crown Polymers primers, coatings and sealers is ASTM D3960 Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.

Scope of the ASTM D3960 Standard

This practice measures the volatile organic compound (VOC) content of solvent-borne and waterborne paints and related coatings as determined from the quantity of material released from a sample under specified bake conditions and subtracting exempt volatile compounds and water if present.

NOTE 1—The regulatory definition, under the control of the U.S. EPA, states and provinces can change. To ensure current status of these

regulations, contact the local air pollution control agency.

This practice provides a guide to the selection of appropriate ASTM test methods for the determination of VOC content.

Certain organic compounds that may be released under the specified bake conditions are not counted toward coating VOC content because they do not participate appreciably in atmospheric photochemical reactions. Such negligibly photo-chemically reactive compounds are referred to as exempt volatile compounds in this practice.

NOTE 2—Information on the US EPA definition of VOC and a list of the current US EPA approved exempt volatile compounds which have been used in coatings. VOC content is calculated as a function of (1) the volume of coating less water and exempt volatile compounds (2) the volume of coating solids, and (3) the weight of coating solids.

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