



a division of Radiator Specialty Company

VOC OVERVIEW

SATA AEROSOL 101

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OUTLINE

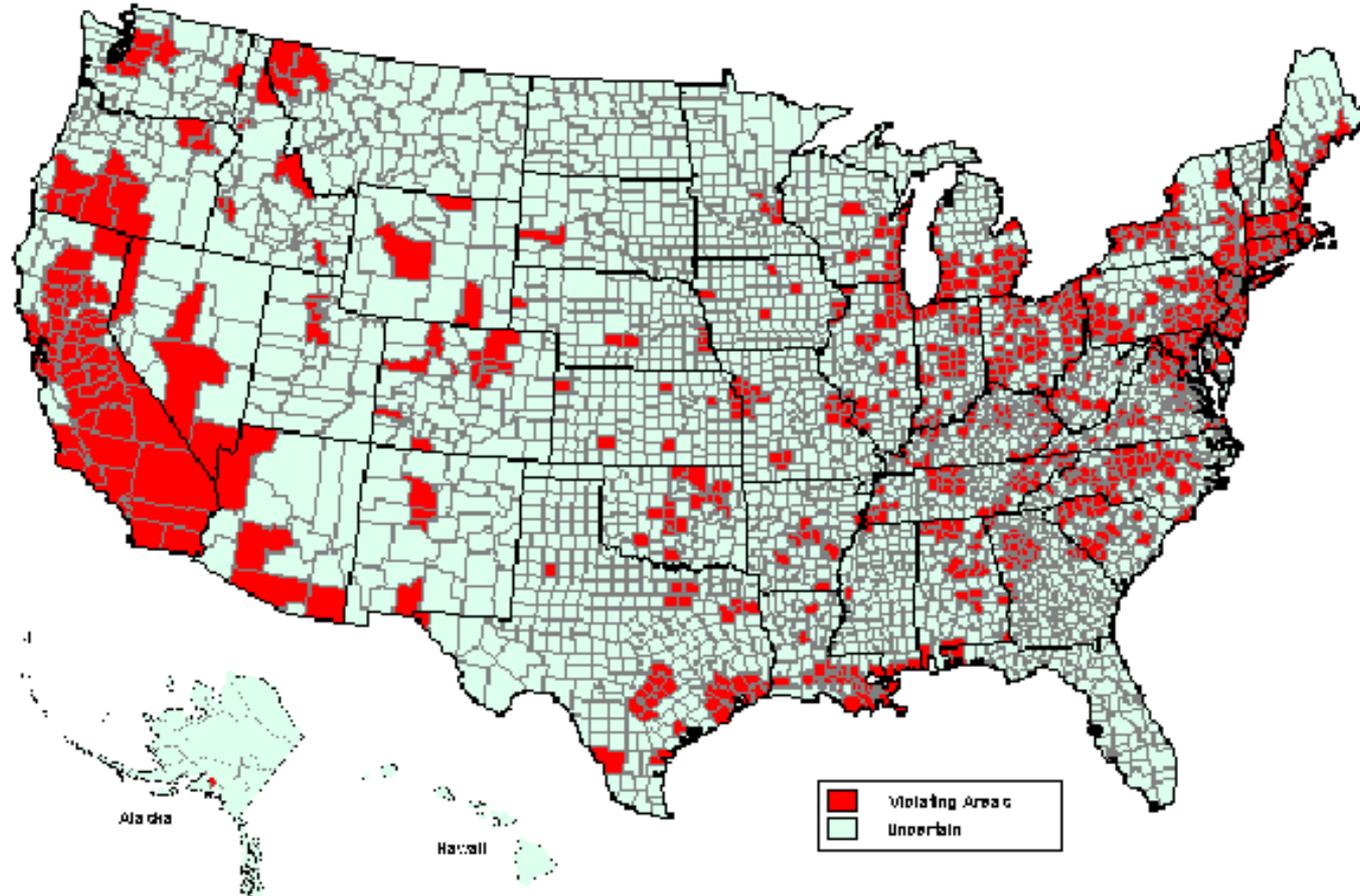
- **HISTORY AND CHANGE DRIVERS**
- **DEFINITIONS**
- **LEGISLATION / REGULATION**
- **OTHER REGULATORY ACTIVITY**

US EPA Mandates Clean Air and Leaves it up to the States

- **CARB is formed via the CCAA and begins regulating Air Quality in California**
- **Other States enter “Non-Attainment” and begin regulation**

Non-Attainment Areas for Both Revised Ozone and PM Standards

EPA Proposed Standards for Ozone and PM_{2.5}



WHAT IS DRIVING THE CHANGES?

- **GROUND LEVEL OZONE**
 - **STILL EXCEEDS FEDERAL LIMITS**
- **STATE IMPLEMENTATION PLANS (SIP)**
 - **NOT EFFECTIVE**
- **CONSUMER PRODUCTS**
 - **EASY TARGETS VS. STATIONARY AND MOBILE SOURCES**

What Are Consumer Products?

•Consumer products are chemically formulated products used in households and institutions

Examples include: hair sprays, engine degreasers, antiperspirants, deodorants, aerosol coatings, air fresheners, windshield washer fluids, household cleaners, disinfectants, floor cleaning and finishing products, and home and garden products

DEFINITIONS

Volatile

A substance that evaporates readily at normal temperatures and/or one that has a measurable vapor pressure. The term volatile usually applies to liquids. However, some solid materials can change directly from solid to vapor without ever becoming liquid, a process called sublimation. Liquids range from water to petroleum-based.

Organic Solvent

Solvents that contain carbon. Compounds that we use are commonly refined as petroleum oil, solvents derived from coal, fatty acids, etc.. Examples include paraffinic and naphthenic oils, mineral spirits, hexanes, toluene, etc.

VOC (Volatile Organic Compound)

Volatile Organic Compound means any compound containing at least one atom of carbon that evaporates readily at normal temperature and/or one that has a measurable vapor pressure. There are certain solvents that have been exempted from this status by the EPA or California because of physical properties (LVP-VOC's) or they have been determined not to contribute to ground-level ozone (acetone, methane, etc)

Volatile Organic Compound (VOC) Exclusions:

Carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, and/or any of the following:

methane	1,1,1-trifluoro-2,2-dichloroethane (HCFC-123)
methylene chloride (dichloromethane)	1,1-dichloro-1-fluoroethane (HCFC-141b)
1,1,1-trichloroethane (methyl chloroform)	1-chloro-1,1-difluoroethane (HCFC-142b)
trichlorofluoromethane (CFC-11)	2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124)
dichlorodifluoromethane (CFC-1,1,2)	trifluoromethane (HFC-23)
trichloro-1,2,2-trifluoroethane (CFC-113)	1,1,2,2-tetrafluoroethane (HFC-134)
1,2-dichloro-1,1,2,2-tetrafluoroethane (CFC-114)	1,1,1,2-tetrafluoroethane (HFC-134a)
chloropentafluoroethane (CFC-115)	pentafluoroethane (HFC-125)
chlorodifluoromethane (HCFC-22)	1,1,1-trifluoroethane (HFC-143a)
	1,1-difluoroethane (HFC-152a)

AND . . .

cyclic, branched, or linear completely methylated siloxanes, and the following classes of perfluorocarbons:

- cyclic, branched, or linear, completely fluorinated alkanes
- cyclic, branched, or linear, completely fluorinated ethers with no unsaturations
- cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations
- sulfur-containing perfluorocarbons with no unsaturations and with the sulfur bonds to carbon and fluorine

AND . . .

Low-reactive organic compounds which have been exempted by the U.S. EPA:

- **acetone**
- **ethane**
- **methyl acetate**
- **parachlorobenzotrifluoride (1-chloro-4-trifluoromethyl benzene)**
- **perchloroethylene (tetrachloroethylene)**

“VOC Content” means the total weight of VOC in a product expressed as a percentage of the product weight (exclusive of the container or packaging), as determined pursuant to sections 94515(a) and (b).

LVP – VOC SOLVENT

LVP –VOC Solvent means a chemical “compound” or “mixture” that contains at least one carbon atom and meets any of the following:

- Has a vapor pressure less than 0.1 mm Hg at 20°C, as determined by ARB Method 310; or
 - Is a chemical “compound” with more than 12 carbon atoms; or
 - Is a chemical “mixture” comprised solely of “compounds” with more than 12 carbon atoms, and the vapor pressure is unknown; or
 - Is a chemical “compound” with a boiling point greater than 216°C, as determined by ARB Method 310; or
 - Is the weight percent of a chemical “mixture” that boils above 216°C, as determined by ARB Method 310.

For the purposes of the definition of LVP-VOC, chemical “compound” means a molecule of definite chemical formula and isomeric structure, and chemical “mixture” means a substrate comprised of two or more chemical “compounds”

REGULATION TYPES

- **Bans via ATCM (Airborne Toxics Control Measures)**
 - Methylene Chloride and Perchloroethylene banned in California and New Jersey for automotive products (Chlorinated Solvents Ban)
- **VOC Content Limits**
 - USEPA, California Air Resource Board (CARB), Ozone Transport Commission and LADCO
 - Primarily consumer products, paints & coatings
- **Use and Labeling Regulations**
 - Texas Hazmat Regulation (“Vapor Harmful” on front panel)
 - California South Coast AQMD (Rule 1171)
 - OTC States (parts washer solvents)

EXPANDING JURISDICTIONS

- **California**
 - **Air Quality Management Districts (AQMD)**
- **Individual States**
 - **TX, GA, etc**
- **Ozone Transport Commission states (OTC)**
- **Counties**
 - **Atlanta metro area and Phoenix - WWF**
- **Lake Michigan Air Directors Consortium (LADCO)**
 - **IL, IN, MI, OH, WI**
- **Canada (CEPA)**
 - **Effective Dates and Sell Through**
- **U.S. Environmental Protection Agency (USEPA)**
 - **National Model Rule**

OZONE TRANSPORT COMMISSION (OTC)

Delaware (1/05, 5/1/09)

New Hampshire (1/07)

Pennsylvania (1/05, 1/09)

Massachusetts (1/09)

District of Columbia (1/05, 1/09)

Virginia (7/05 in select areas)

Rhode Island (7/1/09)

Vermont (Intends to develop rules)

Maryland (1/05, 1/09)

New York (1/05)

Maine (5/05, 1/09)

Connecticut (1/09)

New Jersey (1/05, 1/09)



LAKE MICHIGAN AIR DIRECTORS CONSORTIUM (LADCO)

LADCO and Midwest Regional Planning
Organization (MRPO) synonymous

Wisconsin

Michigan 1/09

Illinois 1/09

Indiana 7/1/11

Ohio 1/09



WHERE ARE WE GOING?

- **CALIFORNIA**
 - **CONS-1**
 - ✓ **Multiple limits change in California over next two - four years**
 - **CONS-2**
 - ✓ **Phase 1 complete; Phase 2 in underway**
 - ✓ **Additional negotiations expected this year**
- **USEPA**
 - **Recognized Reactivity methods in Federal Regulations**
 - **Regulation still not published**
- **OTC**
 - **Additional revisions to existing rules (New Model Rule)**
 - **New states adopt**
- **LADCO**
 - **Wisconsin last holdout**
- **CANADA**
 - **Regulation expected to be published in 2011**
 - **Implementation dates 24 months later**

A One-page Example

(for illustration purposes only; not all-inclusive)

Product Category	Current CARB Limits	Future-effective CARB Limits	Current EPA National Rule	DC, IL, NH	CT, DE, IN ¹ , MA, MD ME, MI, NJ, NY ² OH ³ , PA ⁴ , RI, VA ⁵	Proposed OTC Model Rule Jan. 1, 2014	Proposed Canadian Limits VOC Limits
Aerosol Coatings (Various Categories) (19 Sub-Categories Regulated)	Reactivity-based limits		Reactivity-based limits	-	-	-	-
Adhesive							
Aerosol (five subcategories)	55-70		75	55-70	55-70	55-70	55-70
Construction, Panel & Floor Covering	7		40	15	15	7	15
Contact	N/A ⁵		80	80	N/A ⁶	N/A ⁶	N/A ⁶
Contact – General Purpose	55		-	-	55	55	55
Contact – Special Purpose	80		-	-	80	80	80
General Purpose	10		10	10	10	10	10
Structural Waterproof	N/A		15	15	15	TBD	15
Adhesive Remover							
Floor or Wall Covering Adhesive Remover	5		-	-	5	5	5
Gasket or Thread Locking Adhesive Remover	50		-	-	50	50	50
General Purpose Adhesive Remover	20		-	-	20	20	20
Specialty Adhesive Remover	70		-	-	70	70	70
Air Freshener							
Single Phase Aerosol	30	20 (Dec. 31, 2012)	70	30	30	30	30
Double Phase Aerosol	25		30	25	25	25	25
Liquid / Pump Spray	18		18	18	18	18	18
Solids/ Semisolid (Gel)	3		3	3	3	3	3
Dual Purpose / Disinfectant (Aerosol)	60		-	-	-	-	60
Antiperspirant							
Aerosol	40 HVOC 10 MVOC		60 HVOV	40 HVOC 10 MVOC	40 HVOC 10 MVOC	40 HVOC 10 MVOC	50
Non-aerosol	0 HVOC 0 MVOC		-	0 HVOC 0 MVOC	0 HVOC 0 MVOC	0 HVOC 0 MVOC	0
Anti-static Product:							
Aerosol	80		-	-	-	80	80
Non-aerosol	11		-	-	11	11	11
Astringent / Toner	35		-	-	-	-	-
Automotive Rubbing or Polishing Compound	17		-	17	17	17	17
Automotive Wax / Polish / Sealant / Glaze							
Hard Paste Wax	45		-	45	45	45	45
Instant Detailer	3		-	3	3	3	3
All Other Forms	15		-	15	15	15	15
Automotive Windshield Cleaner	-					35	
Automotive Windshield Washer Fluid ⁷							
Type "A" areas	25		35	35	35	35	-
All other areas (All Forms) Dilutable and Pre-Mixed	1		35	35	35	35	-

OTHER ISSUES

- **RESPONSIBLE PARTY**
- **DATE CODE REPORTING**
- **CHLORINATED SOLVENT REPORTING**
- **SELL THROUGH**
- **MOST RESTRICTIVE LIMIT**
- **OZONE DEPLETING COMPOUNDS**
- **REACTIVITY**

DILUTION

For consumer products for which the label, packaging, or accompanying literature specifically states that the product should be diluted with water or non-VOC solvent prior to use, the limits specified in subsection (a) shall apply to the product only after the minimum recommended dilution has taken place. For purposes of this subsection (b), “minimum recommended dilution” shall not include recommendations for incidental use of a concentrated product to deal with limited special applications such as hard-to-remove soils or stains.

For consumer products for which the label, packaging, or accompanying literature states that the product should be diluted with any VOC solvent prior to use, the limits specified in subsection (a) shall apply to the product only after the maximum recommended dilution has taken place.

SELL THROUGH

Sell-through of products. Notwithstanding the provisions of Section 94509(a) or 94509(j), a consumer product manufactured prior to each of the effective dates specified for that product in the Table of Standards may be sold, supplied, or offered for sale for up to three years after each of the specified effective dates. This subsection (c) does not apply to any consumer product which does not display on the product container or package the date on which the product was manufactured, or a code indicating such date.

MOST RESTRICTIVE LIMIT

Most restrictive limit based on all product claims. Previously only primary label panel, and now any and all product claims – from marketing materials, websites, or any other media.

WHERE ARE WE GOING - SUMMARY

⇒ **NATIONAL RULE** - *delay has changed this prospect*

⇒ **OTC AND LADCO MAY RESCIND**

⇒ **OTHER STATES WON'T DEVELOP**

⇒ **CALIFORNIA STILL A DRIVING FORCE**

⇒ **GREEN INITIATIVES ABOUND**

⇒ **GLOBAL WARMING IS ISSUE**

⇒ **CURRENT LIMITS ARE NOT ENOUGH**

⇒ **CANADA TO ADOPT VOC REGS**

⇒ **EFFECTIVE DATE?**

⇒ **ONE YEAR SELL THROUGH**

⇒ **MORE REGULATIONS**

⇒ **MORE ADMINISTRATIVE EFFORT**

⇒ **MORE REFORMULATIONS**

⇒ **LESS EFFECTIVE PRODUCTS**

⇒ **DISCONTINUED PRODUCTS**

QUESTIONS??

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