



# OTC/VOC Regulations And Their Impact On Bridge Coatings

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## Ozone Transport Commission

*The Next Generation of VOC Regulations*





# What is OTC?

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- Ozone Transport Commission
- Regulatory commission created by Congress in 1990
- Provides air pollution assessment, technical support and a forum through which states in the Northeast can coordinate their air pollution regulations
- Main focus is to develop regional VOC regulations to alleviate the ground-level ozone problem in the Northeast
  - VOCs are Volatile Organic Compounds – Solvents which evaporate from a coating as it dries.





# The OTC Region

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- Vermont
- Connecticut
- Maine
- New Hampshire
- Massachusetts
- Rhode Island
- New York
- New Jersey
- Pennsylvania
- Delaware
- Maryland
- Wash. D.C.
- Northern Virginia suburbs of D.C.      Arlington, Fairfax, Loudon, and Prince William Counties; and the cities of Alexandria, Fairfax, Falls Church, Manassas and Manassas Park.





# OTC Regulations

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- Effective January 1, 2005 for most states in the OTC Region
  - Effective 1/1/06 in Maine
- Apply to all manufacturers, distributors and retailers of architectural and industrial maintenance coatings within the region
- VOC limits vary according to Coating Category
- OTC Regulations are modeled after the stringent CARB regulations in California – the VOC limits for architectural products are the same





# Coating Categories

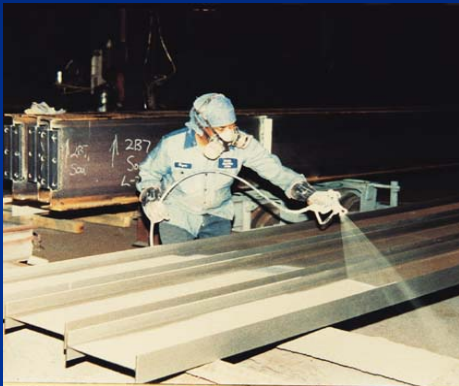
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OTC defines 53 Coating Categories. The more common categories and their VOC limits are:

- Flat coatings (100 grams per liter)
- Non-flat coatings (150 grams per liter)
- Primers, Sealers and Undercoaters (200 grams per liter)
- Traffic Marking Coatings (150 grams per liter)
- Industrial maintenance coatings (340 grams per liter)
- Rust preventive coatings (400 grams per liter)
- Dry fall coatings (400 grams per liter)
- Concrete Curing Compounds (350 grams per liter)
- Concrete Surface Retarder (780 grams per liter)



# Exemptions



- Grandfather Clause
  - Batch dates prior to January 1, 2006 are exempt
- Small Package Clause
  - Containers of one quart or less are exempt
- Shop-Applied coatings are exempt
  - Manufacturing Plants, Finishing Shops, etc.
- Aerosols are exempt
- Colorant added in the store is exempt





# Coating Categories

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- FLAT COATINGS  
(100 grams per liter)  
Coatings that register a gloss of less than 15 on an 85-degree meter or less than 5 on a 60-degree meter
- Examples:
  - Interior and Exterior Flat Latex House Paints





# Coating Categories

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- NON-FLAT COATINGS  
(150 grams per liter)  
Coatings that register a gloss of 15 or greater on an 85-degree meter and 5 or greater on a 60-degree meter
- Examples:
  - Acrylics
  - Polyurethanes
  - Epoxies
  - Alkyds







# Coating Categories

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## INDUSTRIAL MAINTENANCE COATINGS

(340 grams per liter)

Primers and topcoats formulated for application to surfaces that are exposed to one or more of the following five Extreme Environmental Conditions:

1. Exterior exposure of metal
2. Immersion in water or chemicals, or chronic exposure to interior moisture or condensation
3. Exposure to harsh chemicals or fumes
4. Repeated heavy abrasion or scrubbing
5. Repeated exposure to temperatures in excess of 250°F





*How OTC affects you*

## INDUSTRIAL MAINTENANCE COATINGS

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### LIMITED USE

#### INDUSTRIAL MAINTENANCE COATINGS:

- Can only be used in industrial, commercial, or institutional facilities, and only then in areas exposed to one or more of the five Extreme Environmental Conditions listed on the previous slide
- Can not be used in normal exposure areas such as offices and meeting rooms
- Can not be used for any residential applications



*How OTC affects you*

## **Concrete Coatings / Sealers**

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### **–Curing Compounds**

- Old curing compounds were solvent based, very low volume solids materials
- Current curing compounds are waterbased, at three times the volume solids.
- **Many DOT's have not changed application rates**
- **Problem:** Coatings applied to curing compounds applied too heavy ( did not dissipate) **Coatings delaminate**



*How OTC affects you*

## **Concrete Coatings / Sealers**

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### **– Penetrating Sealers**

- Common specification – 40% Silane
- 100% Silane will fall just under 250g/l, but may not perform as well
- New formulations **Increase Cost**
- Vary from State to State depending on exempt solvent allowed In formulation.
- Vary in performance
- Some exempt solvents are very volatile



*How OTC affects you*

## **Concrete Coatings / Sealers**

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### **–Concrete appearance / anti-graffiti coatings**

- Many current solvent based products no longer allowed.
- New formulations - **Increase Cost**
  - No track record
  - Vary in performance



*How OTC affects you*

## **Steel Coatings**

- Most alkyd and oil-based finish coats are not compliant
  - Compliant only in quart containers or smaller
- Many older-technology epoxy coatings are not compliant
- Most newer-technology epoxy finishes are compliant
- Certain Zinc's only allowed to be used for shop application
- Most high solids polyurethane finishes are compliant
- Most Water-based Acrylic finishes are compliant



*How OTC affects Paint Manufacturers*

## **Current Trends**

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- Re-formulate existing coatings with exempt solvents
- Formulate very high solids Zincs/Epoxyes/Urethanes
- Use new manufacturing processes (moisture cure products)
- Use new technology waterbased resins (self cross-linking acrylic)



# New Manufacturing Process For Moisture Cured Polyurethanes

- Improves
  - Product Stability
  - Productivity



# Vacuum Process

The vacuum process is a vacuum distillation manufacturing procedure that will aid in the production of excellent, consistent, and stable quality products, specifically moisture cure urethanes.





**SHERWIN-  
WILLIAMS.**

# Vacuum Process Features and Benefits

- Water Removed
  - Good Shelf Life
  - Reduced Waste
  - Less Gassing
  - Less Bulging
- CO<sub>2</sub> Removed
  - Less Foaming
  - Improved Appearance



**SHERWIN-  
WILLIAMS.**

# Vacuum Process Features And Benefits

- Faster Dry Times
  - Faster Recoat
  - Faster Handling
  - Less Dirt Pick-Up
- Temperature Control
  - Consistent
  - Quality



# SHERWIN-WILLIAMS Vacuum vs. Conventional Process

## CONVENTIONAL

VISCOSITY	96
SAG	>24
DRY TOUCH	15
TACK FREE	150
DFT	5.0
2 WEEKS 120F	143
<i>SLIGHT GAS &amp; NO FOAM</i>	

## VACUUM

VISCOSITY	95
SAG	>24
DRY TOUCH	15
TACK FREE	130
DFT	8.0
2 WEEKS 120F	108
<i>NO GAS &amp; NO FOAM</i>	

# Vacuum Process versus HSD Open Process Stability Photos





# Current HSD Process



**Bulged Lid**

**Current HSD Process  
with Nitrogen Purge**

**B65W60**

**6/17/03**



## Closed Tank Vacuum Process



Non-Bulged Lid

Closed Tank  
Vacuum Process

B65W60

4/23/03



# Vacuum vs. HSD Foam Evaluation







## *How OTC affects Paint Manufacturers*

### **Future Directions**

- Waterbornes 0 VOC attainable, cost increases, weather limitations, some slight performance limitations
- Work with new voc exempt solvents. Some are unstable, cost increases, may have weather limitations, un-proven performance
- Urethanes- urethane monomers (Isocyanates) are perceived negatively, 100% solids are expensive, application equipment is expensive, Polyurea not polyurethane at 100% solids.
- Alkyds- Higher solids=poor through cure, cost increases, 250 g/l is attainable without exempt solvents, 100 g/l is attainable with exempt solvents.



*How OTC affects Paint Manufacturers*

## **Future Directions (continued)**

- Epoxy: 100% solids, no pot life, plural component, high cost, appearance.
- New raw materials making a difference: Micro Spheres, Nano particles.
- Problem raw materials: Alkyl Phenol Ethoxylate (banned in Europe), barium and other heavy metals, high lead containing zinc.



*How OTC affects you*

## **Concrete Coatings / Sealers/ Steel Coatings**

- Higher Cost
- Unproven history
- Changes in OTC laws will continue



# Legal issues

- Stockpiling
- Illegal Actions
- FAQs



## A word about Stockpiling...

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- **Grandfather Clause allows for paint companies and contractors to stockpile non-compliant products manufactured prior to January 1, 2006**
- **This is just a temporary fix, not a long-term solution**
- **Our first recommendation is to switch to these compliant coatings for a permanent solution**





# *Illegal Actions*

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- **The following actions are illegal:**
  - **Applying non-compliant products in an OTC state or county**
  - **Transferring non-compliant products into an OTC state or county**
  - **Using industrial products for residential use**
  - **Using Rust Preventive Coatings on non-metallic substrates**





## FAQ's

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- **Q: What are the responsibilities of painting contractors regarding OTC?**
- **A: The regulations require that painting contractors use only compliant coatings within OTC areas. It is unlawful for a contractor to buy a non-compliant coating in a non-OTC area and then use it in an OTC-regulated area.**



## FAQ's

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- Q: I am finishing a job in 2006 that I started in 2005. I need more paint to finish the job, but the product is not OTC-compliant. What can I do?**
- A: If your coatings supplier still has the product in stock, then it will be from a batch date prior to 01/01/06, and you can use it because of the Grandfather Clause.**





## FAQ's

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- **Q: Under what circumstances can I use industrial coatings?**
- **A: You can only use industrial coatings on commercial, industrial or institutional work, and only if one or more of the following conditions exist:**
  - **Exterior exposure of metal**
  - **Immersion in water or chemicals, or chronic exposure to interior moisture condensation**
  - **Exposure to harsh chemicals or fumes**
  - **Repeated heavy abrasion or scrubbing**
  - **Repeated exposure to temperatures in excess of 250°F**



## FAQ's

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- **Q: What are some practical examples of when I can use an industrial maintenance coating?**
  
- **A: The following are approved uses of industrial coatings on commercial, industrial or institutional facilities:**
  - **Any exterior metal**
  - **Handrails because they are subjected to heavy abrasion**
  - **School hallways and classroom doorframes, because they are subjected to heavy abrasion and frequent cleanings**
  - **Doorframes of patient rooms in hospitals, because they are subjected to heavy abrasion or scrubbing**
  - **Commercial kitchens, because they are subjected to harsh cleaning chemicals and scrubbing**



## **FAQ's**

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- Q: What are some practical examples of when I CANNOT use an industrial maintenance coating?**
  
- A: The following are non-compliant uses of industrial coatings:**
  - Any part of a single-family home**
  - Interior metal of any facility, normal exposure**
  - Wood trim, interior or exterior, normal exposure**
  - School classrooms, office areas, or storage areas**
  - The office areas of a manufacturing plant**
  - Office areas or storage rooms of a hospital**
  - Storage areas for linens and paper products**



## FAQ's

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- **Q: What if I go into a coatings supplier's store and ask for a specific industrial product? Is the store going to question me to make sure I'm using it in a compliant way?**
- **A: No, it is not our responsibility to police any of our customers regarding OTC. However, if you ask us for a coating recommendation, then we will only recommend compliant products.**



## FAQ's

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- **Q: What are the consequences of violating the OTC regulations?**
- **A: The regulations call for stiff fines for companies who violate the OTC regulations. The fines vary by State, but are typically \$1,000 for the first offense, \$2,000 for the second offense, \$5,000 for the third offense and \$15,000 for the fourth and subsequent offenses.**



## **FAQ's**

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- Q: Where can I get information directly from the Ozone Transport Commission?**
- A: The Ozone Transport Commission has a website:**

**[www.otcair.org](http://www.otcair.org)**

**which also includes links to state websites containing the complete text of the regulations.**



# OTC

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What other questions do you have?