



---

# Review of New Emissions Standard for the Painting Industry (Misc. Metal Coatings)

Society of Texas Environmental Professionals

Kevin Ware  
KJ Environmental Mgt., Inc.



# Overview

---

- Paint Application and Air Quality Regulations
- Clean Air Act – MACT Standards
- What is Subpart M MMM?
- Compliance Options
- Compliance Timeline
- TCEQ Permitting





# Industrial Paint Application



## Purpose

- Corrosion Resistance
- Aesthetics & Appearance
- Heat Resistance

## Coating Types

- Polyurethanes
- Epoxies
- Alkyds
- Acrylics



# Paint Basics

- Binder (a.k.a., Resin)
- Pigment
- Solvent
- Additives



(Not all coatings contain all four components)

(There are solvent-free and pigment free paints)



# Paint Basics

---

- Solvent
  - The Solvent is used to dissolve binder material, reduce the coating viscosity, and improve drying time.
  - Curing should not be confused with *drying*. Curing involves a chemical reaction and drying involves the loss of solvent or water.
- Solvent Types
  - Xylene, Toluene, Butyl Acetate, Etc...





# Air Quality Regulations

---

- Solvent = Volatile Organic Compounds (VOCs)
  - VOCs include every organic compound that evaporates heated at 105 C for 1 hour, except for specific chemicals EPA has determined are negligibly reactive in forming ozone (Exempt Solvents – Acetone, Oxsol 100).

## Water borne Coatings

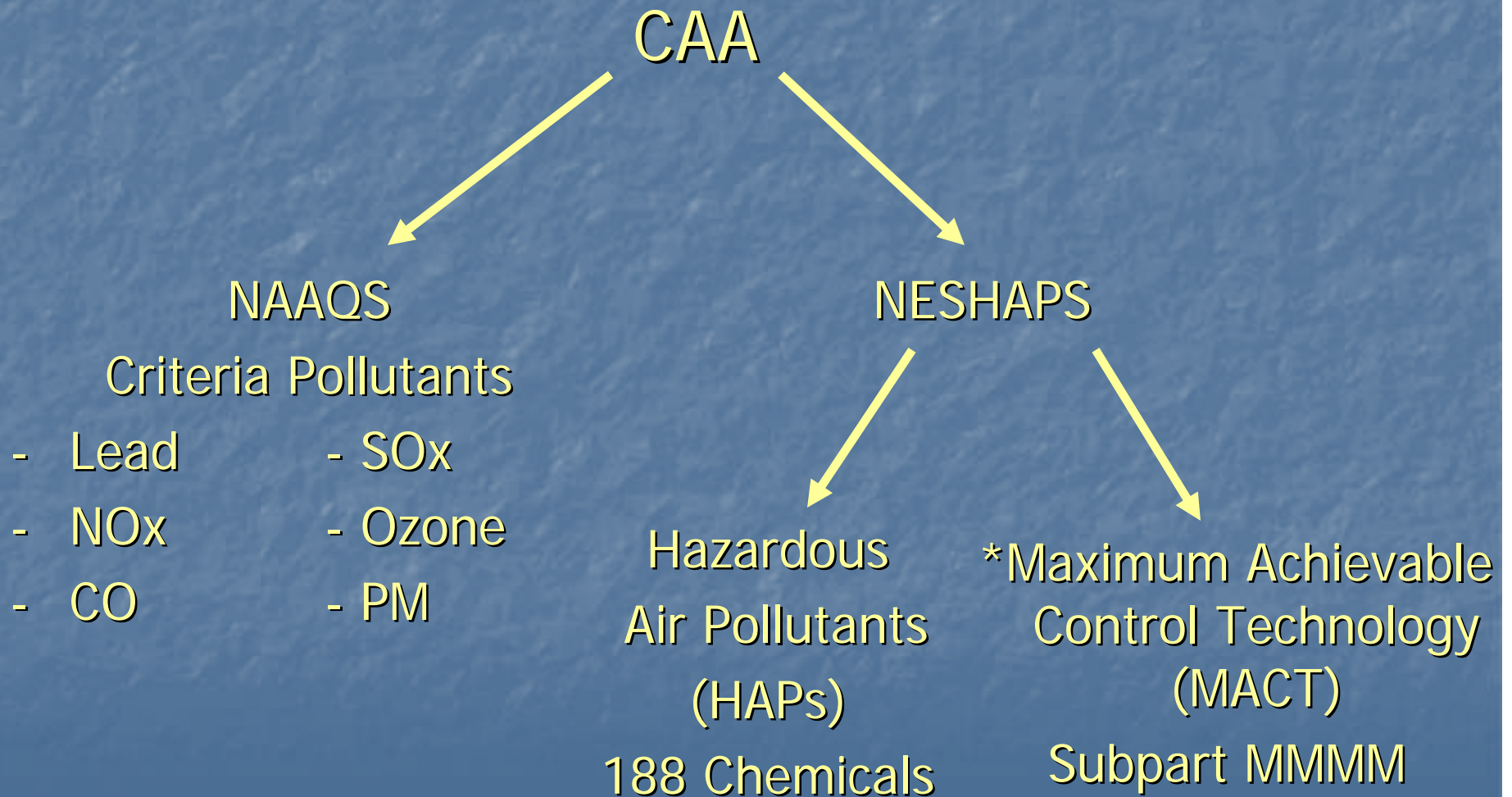
- Water
- VOC – Misc.
- Solids

## Solvent Coatings

- Solvent (VOC)
- Solids



# Clean Air Act





# What is Subpart M MMM?

- 40 CFR Part 63 Subpart M MMM – Major Sources  
(Miscellaneous Metal Parts and Products Surface Coating)

The US EPA defines a miscellaneous metal parts and products surface coating facility as any facility engaged in the surface coating of any miscellaneous metal part or product.





# Major Sources

---

- Major Sources
  - > 25 TPY of Combined HAPs
  - > 10 TPY of Single HAP



# Entities Potentially Impacted

Category	NAICS
Automobile Parts	335312, 336111, 336211, 336312, 33632, 33633, 33634, 33637, 336399
Extruded Aluminum	331316, 331524, 332321, 332323
Heavy Equipment	33312, 333611, 333618
Job Shops	332312, 332722, 332813, 332991, 332999, 334119, 336413, 339999
Large Trucks and Buses	33612, 336211
Magnet Wire	331319, 331422, 335929
Metal Buildings	332311
Metal Containers	33242, 81131, 322214, 326199, 331513, 332439
Metal Pipe and Foundry	331111, 331513, 33121, 331221, 331511
Rail Transportation	33651, 336611, 482111
Recreational Vehicles	3369, 331316, 336991, 336211, 336112, 336213, 336214, 336399
Rubber-to-Metal Products	326291, 326299
Structural Steel	332311, 332312
Other Transportation Equipment	336212, 336999, 33635, 56121, 8111, 56211



# Operations Affected by the MACT

---

- Application, drying, and curing of coatings;
- Spray gun in a spray booth or by dipping the substrate in a tank containing the coating;
- Open (flash-off) area;
- Drying/curing or air dry;
- Cleaning operations;
- Paint stripping;
- Cleaning of spray guns & transfer lines;
- Cleaning of spray booth interiors;
- Applying of solvents to surfaces prior to coating application;
- Mixing and storage.



# Emission Limits

## EMISSION LIMITS FOR EXISTING AFFECTED SOURCES

<u>Coating type</u>	<u>Emission limit (kilo-grams HAP/liter of coating solids)</u>	<u>Emission limit (lbs HAP/gal of coating solids)</u>
General use subcategory	0.31	2.6
High performance subcategory	3.3	27.5
Magnet wire subcategory	0.12	1.0
Rubber-to-metal subcategory	4.5	37.7
Extreme performance fluoropolymer subcategory	1.5	12.4

## EMISSION LIMITS FOR NEW AND RECONSTRUCTED AFFECTED SOURCES

<u>Coating type</u>	<u>Emission limit (kilo-grams HAP/liter of coating solids)</u>	<u>Emission limit (lbs HAP/gal of coating solids)</u>
General use subcategory	0.23	1.9
High performance subcategory	3.3	27.5
Magnet wire subcategory	0.050	0.44
Rubber-to-metal subcategory	0.81	6.8
Extreme performance fluoropolymer subcategory	1.5	12.4



# Compliance Options

## OPTION 1: COMPLIANT MATERIALS

This option is a pollution prevention option that allows the facility to demonstrate compliance by using low-HAP or non-HAP coatings and other materials. If the facility uses coatings that, based on their organic HAP content, individually meet the applicable emission limits and they use non-HAP thinners and other additives and cleaning materials, this compliance option is available.



Source - University of Tennessee, Institute for Public Service (2008)



# Compliance Options

---

## OPTION 2: EMISSIONS W/OUT ADD-ON CONTROLS

This option is a pollution prevention option that allows the source to demonstrate compliance based on the organic HAP contained in the mix of coatings, thinners and/or other additives, and cleaning materials they use. This option offers the flexibility to use some individual coatings that do not, by themselves, meet the applicable emission limits. The facility can combine with low-HAP or non-HAP coatings so that overall emissions from the affected source over a 12-month period meet the emission limits.



# Compliance Options

## OPTION 3: EMISSIONS WITH ADD-ON CONTROLS

This option allows sources to use a capture system and an add-on pollution control device, such as a combustion device or a recovery device, to meet the emission limits.



Source - University of Tennessee, Institute for Public Service (2008)



# The Challenge

---

- Emissions Without Add-On Controls
  - Emission Limit (General Use)
    - Existing Source - 2.6 lbs of Organic HAP/ Gallon Coating Solid
    - New Source – 1.9 lbs of Organic HAP / Gallon Coating Solid
  
- Units – Lbs of Organic HAP / Gallon Coating Solid
  - Numerous Calculations
  - Additional Information Needed from Paint Manufacturer
  - MSDSs Alone Will Not Work



# The Challenge

---

- Calculations & Data Needed:
  - Determine the mass fraction of organic HAP for each material.
  - Determine the volume fraction of coating solids.
  - Determine the density of each material.
  - Determine the volume of each material used.
  - Calculate the mass of organic HAP emissions.
  - Calculate the total volume of coating solids used
  - Calculate the organic HAP emission rate.
  
- See 40 CFR 63.3951 for Equations
- Must Demonstrate Compliance with 12-Month Rolling Totals



# Data Needed

PRODUCT CODE	90A00	90A001	90B06
Volatile HAPS Pounds per Gallon (lb/gal) %HAPS x WT.GAL	2.88	0.14	3.23
Volatile HAPS Pounds per Gallon of Solids (lb/gal) HAPS divided by Vol Solids	9.35	0.44	11.61
Volatile HAPS Pounds per Pound of Solids (lb/lb) HAPS divided by lbs solids per gallon	0.97	0.05	1.19
Density of Organic Solvent Blend (HAPS) (lb/gal)	7.25	7.25	6.71
VOC Content (lb/gal) - Total (Material)	4.71	3.43	4.67
VOC Content (lb/gal) less exempts and wafer (Coating)	4.71	4.03	4.67
VOC Content (lb/gal) solids Material VOC divided by % Vol Solids	9.35	10.71	16.77



# Calculations

MACT - SUBPART Mmmm - COMPLIANCE  
OCTOBER 2007

Vendor	Product #	Description	Total Gallons Used	Density (lb/gal)	Mass Fraction of Organic HAP <sup>(1)</sup>	Mass of Organic HAP (lbs) <sup>(2)</sup>	Total Material VOC content (lb/gal)	Density of Volatile HAPs (lb/gal)	Volume Fraction <sup>(3)</sup>	Total Volume of Coating Solids (gallons) <sup>(4)</sup>	HAPS					
											100-10-1 Methyl Isobutyl Ketone		1300-20-7 Xylene		67591 Methylcel	
											%	Total Lbs.	%	Total Lbs.	%	Total Lbs.
<b>COATINGS</b>																
	90L91	QD LO HAP KILIM BEIGE ENAMEL		8.45	0.0350	0.00	3.85	8.45	0.54	0.00	0.00	3.50	0.00	0.00	0.00	
	90R24	QD LO HAP KIMRAY RED ENAMEL		7.46	0.0420	0.00	4.01	7.46	0.46	0.00	0.00	4.20	0.00	0.00	0.00	
	90R14-S5	E/S QD KIMRAY RED ENAMEL		7.96	0.3860	0.00	4.56	7.96	0.43	0.00	0.00	33.60	0.00	5.00	0.00	
	90R19	E/S QD ENAMEL HI-HIDE RED	55.00	7.81	0.3400	146.05	4.75	7.81	0.39	21.55	0.00	29.00	124.57	5.00	21.48	
	90R25	QD LO HAP HI-HIDE SAFETY RED		7.46	0.0420	0.00	3.55	7.46	0.52	0.00	0.00	4.20	0.00	0.00	0.00	
	90E07	E/S ENAMEL LIBERTY BLUE		7.84	0.4090	0.00	4.66	7.84	0.41	0.00	0.00	35.00	0.00	5.90	0.00	
		<b>TOTAL</b>				146.05				21.55						
<b>THINNERS / ADDITIVES</b>																
	H8000	URETHANE CONVERTER		8.90	0.0000	0.00	2.67	8.90	0.70	0.00	0.00	0.00	0.00	0.00	0.00	
	H8002	URETHANE CATALYSTS		8.80	0.0000	0.00	2.20	7.60	0.71	0.00	0.00	0.00	0.00	0.00	0.00	
	T818-S5	SOLVENT 100 THINNER		7.25	0.0000	0.00	7.25	7.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		<b>TOTAL</b>				0.00				0.00						
<b>CLEANING MATERIALS</b>																
	T812-S	ACETONE THINNER		6.55	0.0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		<b>TOTAL</b>				0.00				0.00						
		Variable - H <sub>o</sub>				146.05										
		Variable - V <sub>st</sub>								21.55						
		Organic HAP Rate (lbs HAP / gal Coating Solid) <sup>(5)</sup>				6.78										
		Organic HAP Rate (lbs HAP / gal Coating Solid) Limit				2.6										

**Notes:**

- 1) Mass Fraction determined in accordance with § 63.3941 (a).
- 2) Mass of Organic HAP determined in accordance with Eqn. 1,1A,1B,1C - § 63.3951 (e).
- 3) Volume fraction determined in accordance with Eqn. 1 - § 63.3941 (b)(4).
- 4) Total volume of coating solids determined in accordance with Eqn. 2 - § 63.3951 (e).
- 5) Organic HAP rate determined in accordance with Eqn. 3 - § 63.3951 (e).

Prepared by:  
KJ Environmental Mgt, Inc.  
616 North Bell Ave  
Denton, Texas 76209  
940-387-0805



# Compliance Timeline

---

- \*Compliance Date – January 2, 2007\*
- First Semi-Annual Report was due July 31, 2008
- Sites Must be Maintaining Compliance Now





# TCEQ Permitting Strategy

---

- PBR § 106.433 – Surface Coating Facility
  - Emission Limits
    - 6.0 lbs/ hr average over 5hr period- VOCs
    - 500 lbs/ Week - VOCs
  - PBR Language
    - 500 lbs/ week VOC = 13 TPY = Potential for Major Source of Single HAP
- If the facility did not certify emissions prior to January 2, 2007, surface coating facilities operating as a PBR must comply with Subpart Mmmm.



# TCEQ Permitting Strategy

---

## TCEQ Permit Review - NSR

“Please be aware that if XXXXXX has not certified their volatile organic compound (VOC) emissions via the APD CERT form, the site has the potential to emit 10 tons-per-year (tpy) or more of any hazardous air pollutant (HAP). Given this, the site would be subject to and must comply with the applicable requirements of Title 40 Code of Federal Regulations Part 63 (40 CFR Part 63), Subpart MMMM (National Emission Standards for Hazardous Air Pollutants for Surface Coating of Miscellaneous Metal Parts and Products).”



# THANKS

---

QUESTIONS?????



# Contact Information

---

- Kevin Ware

KJ Environmental Mgt., Inc.

616 North Bell Ave

Denton, Texas 76209

Phone (940) 387-0805

Fax (940) 387-0830

[kevin@kjenvironmental.com](mailto:kevin@kjenvironmental.com)