

**Workgroup Recommendations and Other Potential Control Measures**  
**VOC Workgroup**

**VOC006 – Industrial Surface Coatings**

**DESCRIPTION**

Apply EPA MACT standards for industrial surface coatings, which currently apply to existing major hazardous air pollutant (HAP) sources, to the rest of the point sources and to area sources. This category includes the following source types: Fabric Printing, Coating and Dyeing; Large Appliances; Metal Can Coating, Metal Coil Coating; Metal Furniture Coating; Miscellaneous Metal Parts coating; Paper and Other Web Coating; Plastic Parts Coating; & Wood Building Products Coating.

This control measure would require amendments to allowable volatile organic compound (VOC) limits in NJAC 7:27-16.7, to the above referenced categories. It would also require lower applicability requirements, and possible amendments to the optional transfer efficiency requirements. For details on the existing New Jersey rules and on the USEPA MACT standards see Attachment 1.

**EFFECTIVENESS**

Estimated emission reductions are as follows:

Category	2002	2009	2009	2009	2009	2009	2009	2009
	Estimated Area Emissions	Estimated Area Emissions	Estimated Percent Reduction (low end)	Estimated Percent Reduction (high end)	Estimated Emission Reduction (low end)	Estimated Emission Reduction (low end)	Estimated Emission Reduction (high end)	Estimated Emission Reduction (high end)
	tpy	tpy	%	%	tpy	tpd	tpy	tpd
Fabric Printing, Coating and Dyeing		0	60%	60%	0	0	0	0
Large Appliances	75	79	0%	45%	0	0	35	0
Metal Can	3,425	3,596	70%	70%	2,517	10	2,517	10
Metal Coil	1,337	1,404	53%	53%	744	3	744	3
Metal Furniture	1,120	1,176	0%	73%	0	0	858	3
Miscellaneous Metal Parts	531	558	0%	48%	0	0	268	1
Miscellaneous Metal Parts	2,565	2,693	0%	48%	0	0	1,293	5
Paper and Other Web			80%	80%	0	0	0	0
Plastic Parts			0%	80%	0	0	0	0
Wood Building Products	450	473	63%	63%	298	1	298	1
							0	
<b>Total</b>	<b>9,503</b>	<b>9,978</b>			<b>3,559</b>	<b>14</b>	<b>6,013</b>	<b>23</b>

May 22, 2006

Contacts – Judy Rand/Max Eslambolchi

**Workgroup Recommendations and Other Potential Control Measures**

**VOC Workgroup**

**VOC006 – Industrial Surface Coatings**

**Assumptions:**

\* Inventory based on New Jersey 2002 Area Source Inventory. Inventory estimates based on employment and operations occurring 5 days per week per USEPA guidance. For more details on the inventory, a copy of the proposed inventory is posted the Department's website at [http://www.state.nj.us/dep/baqp/sip/Prop05\\_SIPRev.htm](http://www.state.nj.us/dep/baqp/sip/Prop05_SIPRev.htm).

\* Point sources were not included in the estimations. USEPA MACT standards already apply to existing major HAP sources. The threshold for major HAP sources is different than the threshold for point source reporting, therefore, there may be point sources that will be affected by a New Jersey specific rule, that are not applicable to the existing EPA MACT. To be conservative for these estimates point sources have not been included.

\* Percent Reductions based on a table prepared by Pechan Associates, Post-2002 MACT Standards and Expected VOC, NOx, and PM Reductions, for the Midwest RPO and later used by USEPA. The table was revised after the date of the report and is currently in draft form.

**COST EFFECTIVENESS**

The OTC Control Measure summary shows estimated costs for implementing the existing MACT standards ranging from \$908/ton to \$8,632/ton.

**SOURCES**

OTC Control Measure Summary, January 12, 2006

New Jersey 2002 Inventory

New Jersey Administrative Code 7:27-16

The Development of Growth and Control Factors for Lake Michigan Air Directors Consortium, December 14, 2004, prepared by E.H. Pechan and Associates, Table III-4 Post-2002 MACT Standards and Expected VOC, NOx, and PM Reductions, and draft revised table after date of report.

May 22, 2006

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**Workgroup Recommendations and Other Potential Control Measures**  
**VOC Workgroup**

**VOC006 – Industrial Surface Coatings**

**ATTACHMENT 1**

**CONTROL MEASURE SUMMARY FOR  
Industrial Surface Coatings**

**Control Measure Summary:** Apply EPA MACT standards for industrial surface coatings, which currently apply to existing major HAP sources, to the rest of the point sources and to area sources. This category includes the following source types: Fabric, Printing, Coating and Dyeing; Large Appliances; Metal Can coating, Metal Coil coating; Metal Furniture coating; Misc. Metal Parts coating; Paper and Other Web coating; Plastic Parts coating; & Wood Building Products coating

<b>Industrial Surface Coatings Category Total</b>		
<b>Industrial Surface Coatings Category Total – 2002 existing measures:</b> NSPS: PSD/NSR; State RACT rules in 1-hour non-attainment counties		
<b>Industrial Surface Coatings Category Total – 2009 On-the-Books measures:</b> MACT Stds: Fabric Printing, Coating and Dyeing Subpart OOOO (68 FR 32172, 5/29/03) Large Appliances Subpart NNNN (67 FR 48254, 7/23/02) Metal Can Subpart KKKK (68 FR 64432, 11/13/03) Metal Coil Subpart SSSS (67 FR 39794, 6/10/02) Metal Furniture Subpart RRRR (67 FR 28606, 5/23/03) Miscellaneous Metal Parts Subpart MMMM (69 FR 130, 1/2/04) Paper and Other Web Subpart JJJJ (67 FR 72330, 12/4/02) Plastic Parts Subpart PPPP (69 FR 20968, 4/19/04) Wood Building Products Subpart QQQQ (68 FR 31746, 5/28/03) <b>Emission Reductions:</b>		

Disclaimer – The recommendations contained within this white paper do not constitute official state decisions nor reflect any pending regulatory or nonregulatory actions. The NJDEP welcomes public feedback on this (or any other) white paper.

May 22, 2006

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**Workgroup Recommendations and Other Potential Control Measures**  
**VOC Workgroup**

**VOC006 – Industrial Surface Coatings**

<p><b>Control Cost:</b>          OTC Regional = \$4,592/ton  <b>Timing of Implementation:</b> Compliance Dates (existing)          5/29/06; (existing)          7/23/05; (existing)          11/13/06; (existing)          6/10/05; (existing)          5/23/06; (existing)          (existing) 1/2/07;          12/5/05; (existing)          4/19/07; (existing)          (existing) 5/28/06</p> <p><b>Implementation Area:</b> Ozone Transport Region</p>		
<p><b>Industrial Surface Coatings Category Total – Candidate measure 1:</b>          Apply EPA MACT standards, which apply to existing major HAP sources, to the rest of the point sources and to area sources. Use estimated emission reduction percentage and costs for major HAP sources shown above.</p>		

<b>Fabric Printing, Coating and Dyeing</b>		
<p><b>Fabric Printing, Coating and Dyeing – 2002 existing measures:</b>          NSPS; PSD/NSR; State RACT rules in 1-hour non-attainment counties  <b>EPA CTG RACT limit: 2.9 lbs VOC/gal coating [0.35 kg/liter]</b>          (minus H<sub>2</sub>O &amp; exempt solvents)  <b>Applicability: Sources 3 lbs/hour, 15 lb/day or 10 tons/year uncontrolled emissions</b>  <b>OTC state RACT limits: MD, NJ, NH = 2.9; MA = 4.8 lbs VOC/gal coating</b>  <b>NJ RACT Limits: -2.9 lbs. VOC/gal coating [0.35 kg/liter]</b></p>		

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**VOC006 – Industrial Surface Coatings**

<p align="center">(minus H<sub>2</sub>O) or;          -for fabric printing collect off gases by 70% and prevent VOC by:          a) 95% if using Oxidizer;          b) 90% if other than Oxidizer          Applicability: Any source using &gt;0.5 gal/hour &amp; &gt;2.5 gal/day of VOC formulations</p>		
<p><b>Fabric Printing, Coating and Dyeing – 2009 On-the-Books measures:</b>          MACT Std. – Subpart OOOO (68 FR 32172, 5/29/03)  <b>EPA MACT limits existing sources (major HAP sources):</b>          Coating and printing operations - 0.12 kg HAP/liter solids          Dyeing and finishing operations - 0.016 kg HAP/liter solids          Dyeing operations only - 0.016 kg HAP/liter solids          Finishing operations only - 0.0003 kg HAP/liter solids  <b>Emission Reductions:</b>  <i>Nationwide – 60% HAP reduction from 1997 baseline</i>          MACT Organic HAP control efficiency option: 97% for existing sources  <b>MACT Estimated VOC reduction 60% (Pechan Table)</b>  <b>Control Cost:</b>          Nationwide –\$14.5 million/yr for 4,100 tons/yr = \$3,537/ton  <b>Timing of Implementation:</b> Compliance Date (existing) May 29, 2006  <b>Implementation Area:</b> Nationwide</p>		
<p><b>Fabric Printing, Coating and Dyeing - Candidate measure 1</b>          Apply EPA MACT standards, which apply to existing major HAP sources, to the rest of the point sources and to area sources. Use estimated emission reduction percentage and costs for major HAP sources shown above.</p>		
<p><b>Large Appliances</b></p>		
<p><b>Large Appliances – 2002 existing measures:</b>          NSPS; PSD/NSR; State RACT rules in 1-hour non-attainment counties;  <b>EPA CTG RACT limit: 2.8 lbs VOC/gal coating [0.34 kg/liter] (minus H<sub>2</sub>O &amp; exempt solvents)</b></p>		

May 22, 2006

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**Workgroup Recommendations and Other Potential Control Measures**  
**VOC Workgroup**

**VOC006 – Industrial Surface Coatings**

<p>NJ RACT limit: 2.8 lbs.VOC/gal coating [0.34 kg/liter] (minus H<sub>2</sub>O) , or -Control by 90 percent by weight of VOC -Transfer efficiency of &gt; 60 percent</p> <p>Applicability: Any source using &gt;0.5 gal/hour &amp; &gt;2.5 gal/day of VOC formulations</p>		
<p><b>Large Appliances - 2009 On-the-Books measures:</b> MACT Std. – Subpart NNNN (67 FR 48254, 7/23/02) <b>EPA MACT limits existing sources (major HAP sources): 0.13 kg HAP/liter solids</b> <b>Emission Reductions:</b> Nationwide – 45% HAP reduction from 1995 baseline <b>MACT Organic HAP control efficiency option: xx% for existing sources</b> <b>Estimated VOC reduction: 0% (Pechan Table) - 60%??</b> <b>Control Cost:</b> Nationwide – \$1.63 million/yr for 1,190 tons/yr = \$1,370/ton <b>Timing of Implementation:</b> Compliance Date (existing) July 23, 2005 <b>Implementation Area:</b> Nationwide</p>		
<p><b>Large Appliances Dyeing Candidate measure 1</b> Apply EPA MACT standards, which apply to existing major HAP sources, to the rest of the point sources and to area sources. Use estimated emission reduction percentage and costs for major HAP sources shown above.</p>		
<p><b>Large Appliances Dyeing Candidate measure 2</b> Adopt More Stringent RACT regulations (e.g., ICAC letter 2/16/2001) Measure ID: ICAC Option 1 - Nationwide – 80% HAP reduction from 1995 baseline ( Additional 250 tons/per HAP) ICAC Option 2 - Nationwide – 98% HAP reduction from 1995 baseline ( Additional 1,190 tons/per HAP) <b>Emission Reductions:</b> <b>Control Cost:</b> <b>Timing of Implementation:</b> Assuming 2007 or 2008 effective date of rule, emission reductions in 2009 or 2010</p>		

**Workgroup Recommendations and Other Potential Control Measures**  
**VOC Workgroup**

**VOC006 – Industrial Surface Coatings**

<b>Metal Cans</b>			
<b>Metal Can – 2002 existing measures:</b>			
NSPS; PSD/NSR; State RACT rules in 1-hour non-attainment counties;			
EPA CTG RACT limit: <u>lbs VOC/gal coating (minus H<sub>2</sub>O&amp;exempt solvents)</u>			
Sheet basecoat & over varnish	2.8		
[0.34 kg/l]			
2 and 3-piece can interior & 2-piece can end exterior	4.2		
[0.50 kg/l]			
3-piece can side-seam spray			
5.5 [0.66 kg/l]			
End sealing compound			
3.7 [0.44 kg/l]			
Applicability: 10 tons/year uncontrolled emissions			
OTC state RACT limits: MD, NJ, NH same limits as CTG; MA (4.5, 9.8, 21.8, 7.7)			
NJ RACT limit: <u>lbs VOC/gal coating (minus H<sub>2</sub>O&amp;exempt solvents)</u>			
Sheet basecoat & over varnish	2.8		
[0.34 kg/l]			
2 and 3-piece can interior & 2-piece can end exterior	4.2		
[0.50 kg/l]			
3-piece can side-seam spray			
5.5 [0.66 kg/l]			
End sealing compound			
3.7 [0.44 kg/l]			
or;			
-Control by 90 percent by weight of VOC			
Applicability: Any source using >0.5 gal/hour & >2.5 gal/day of VOC formulations			
<b>Metal Can – 2009 On-the-Books measures:</b>			
MACT Std. – Subpart KKKK (68 FR 64432 , 11/13/03)			
EPA MACT limits <u>existing sources (major HAP sources):</u>			
Sheet coating	0.03 kg		
HAP/l solids			
Body Coating			
2-piece beverage cans	0.07 kg		

**Workgroup Recommendations and Other Potential Control Measures**  
**VOC Workgroup**

**VOC006 – Industrial Surface Coatings**

<p>HAP/l solids                  2-piece food cans 0.06 kg                  HAP/l solids                  1-piece aerosol cans 0.12 kg                  HAP/l solids                  3-piece can assembly                  Inside Spray 0.29 kg                  HAP/l solids                  Aseptic side seam strips on food cans 1.94 kg                  HAP/l solids                  Nonaseptic side seam strips on food cans 0.79 kg                  HAP/l solids                  Side seam strips on non-food cans 1.18 kg                  HAP/l solids                  Side seam strips on aerosol cans 1.46 kg                  HAP/l solids                  End sealing compound                  Aseptic end seal compounds 1.94 kg                  HAP/l solids                  Nonaseptic end seal compounds 0.00 kg                  HAP/l solids                  Repair spray coatings 2.06 kg                  HAP/l solids  <b>Emission Reductions:</b>                  Nationwide – 70% HAP reduction from 1997 baseline                  MACT Organic HAP control efficiency option: xx% for existing sources                  Estimated VOC reduction 70% (Pechan Table)  <b>Control Cost:</b>                  Nationwide – \$58.7 million/yr for 6,800 tons/yr = \$8,632/ton  <b>Timing of Implementation:</b> Compliance Date (existing) Nov. 13, 2006                  Implementation Area: Nationwide</p>		
<p><b>Metal Can – Candidate measure 1:</b>                  Apply EPA MACT standards, which apply to existing major HAP sources, to the rest of the point sources and to area sources. Use estimated emission reduction percentage and costs for major HAP sources shown above.</p>		



**Workgroup Recommendations and Other Potential Control Measures**  
**VOC Workgroup**

**VOC006 – Industrial Surface Coatings**

<p>EPA CTG RACT limit: 3.0 lbs VOC/gal coating [0.36 kg/liter] (minus H<sub>2</sub>O &amp; exempt solvents) Applicability: Sources 10 tons/year uncontrolled emissions OTC state RACT limits: NH - same limits as CTG</p> <p>NJ RACT: 3.0 lbs VOC/gal coating [0.36 kg/liter] (minus H<sub>2</sub>O &amp; exempt solvents) , or</p> <p>-Control by 90 percent by weight of VOC</p> <p>Applicability: Any source using &gt;0.5 gal/hour &amp; &gt;2.5 gal/day of VOC formulations</p>		
<p><b>Metal Furniture – 2009 On-the-Books measures:</b> MACT Std. – Subpart RRRR (67 FR 28606 , 5/23/03) EPA MACT limits <u>existing sources (major HAP sources): 0.10</u> kg HAP/liter solids <b>Emission Reductions:</b> Nationwide – 73% HAP reduction from 1997/1998 baseline MACT Organic HAP control efficiency option: xx% for existing sources Estimated VOC reduction 0% (Pechan Table) <b>Control Cost:</b> Nationwide – \$14.8 million/yr for 16,300 tons/yr = \$908/ton <b>Timing of Implementation:</b> Compliance Date (existing) May 23, 2006 <b>Implementation Area:</b> Nationwide</p>		
<p><b>Metal Furniture Candidate measure 1:</b> Apply EPA MACT standards, which apply to existing major HAP sources, to the rest of the point sources and to area sources. Use estimated emission reduction percentage and costs for major HAP sources shown above.</p>		
<p align="center"><b>Miscellaneous Metal Parts</b></p>		
<p><b>Miscellaneous Metal Parts – 2002 existing measures:</b> NSPS; PSD/NSR; State RACT rules in 1-hour non-attainment counties EPA CTG RACT limit: <u>lbs VOC/gal coating (minus</u> <u>H<sub>2</sub>O&amp;exempt solvents)</u></p>		

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**VOC Workgroup**

**VOC006 – Industrial Surface Coatings**

<p>Clear or transparent top coat 4.3          [0.52 kg/l]          Air dries Coatings          3.5 [0.42 kg/l]          Coating used in extreme environmental conditions 3.5          [0.42 kg/l]          All other coatings          3.0 [0.35 kg/l]          Applicability: 10 tons/year uncontrolled emissions</p> <p>NJ RACT limit: <u>lbs VOC/gal coating (minus H<sub>2</sub>O&amp;exempt solvents)</u></p> <p>Clear or transparent top coat 4.3          [0.52 kg/l]          Air dried Coatings 3.5          [0.42 kg/l]          Coating used in extreme environmental conditions 3.5          [0.42 kg/l]          All other coatings 3.0          [0.35 kg/l]          or;          -Control 90% by weight of VOC</p> <p>Applicability: Any source using &gt;0.5 gal/hour &amp; &gt;2.5 gal/day of VOC formulations</p>		
<p><b>Miscellaneous Metal Parts – 2009 On-the Books measures:</b>          MACT Std. – Subpart MMMM (69 FR 130 , 1/2/04)  <u>EPA MACT limits existing sources (major HAP sources):</u>          General use Coating 0.31 kg          HAP/l solids          High Performance Coating 3.30 kg          HAP/l solids          Rubber-to-Metal Coating 4.50 kg          HAP/l solids          Extreme Performance Fluoropolymer Coatings 1.5 kg          HAP/l solids  <b>Emission Reductions:</b>          Nationwide – 48% HAP reduction from 1997 baseline          MACT Organic HAP control efficiency option: xx% for existing sources          Estimated VOC reduction 0% (Pechan Table)</p>		

May 22, 2006

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**Workgroup Recommendations and Other Potential Control Measures**  
**VOC Workgroup**

**VOC006 – Industrial Surface Coatings**

<p><b>Control Cost:</b> Nationwide – \$57.3 million/yr for 26,000 tons/yr = \$2204/ton</p> <p><b>Timing of Implementation:</b> Compliance Date (existing) Jan. 2, 2007</p> <p><b>Implementation Area:</b> Nationwide</p>		
<p><b>Miscellaneous Metal Parts Candidate measure 1:</b> Apply EPA MACT standards, which apply to existing major HAP sources, to the rest of the point sources and to area sources. Use estimated emission reduction percentage and costs for major HAP sources shown above.</p>		
<p><b>Paper &amp; Other Web</b></p>		
<p><b>Paper &amp; Other Web – 2002 existing measures:</b> NSPS; PSD/NSR; State RACT rules in 1-hour non-attainment counties</p> <p><b>EPA CTG RACT limit: 2.9 lbs VOC/gal coating [0.35 kg/liter]</b> (minus H<sub>2</sub>O &amp; exempt solvents)</p> <p><b>Applicability: Sources 3 lbs/hour, 15 lb/day or 10 tons/year uncontrolled emissions</b></p> <p><b>NJ RACT limit: 2.9 lbs VOC/gal coating [0.35 kg/liter]</b> (minus H<sub>2</sub>O &amp; exempt solvents),</p> <p>or</p> <p><b>-Control 90% by weight of VOC</b></p> <p><b>Applicability: Any source using &gt;0.5 gal/hour &amp; &gt;2.5 gal/day of VOC formulations</b></p>		
<p><b>Paper &amp; Other Web – 2009 On-the-Books measures:</b> MACT Std. – Subpart JJJJ (67 FR 72330 , 12/4/02)</p> <p><b>EPA MACT limits <u>existing sources (major HAP sources): 0.2 kg organic HAP/kg coating solids</u></b></p> <p><b>Emission Reductions:</b> Nationwide – 80% HAP reduction from current levels??</p> <p><b>MACT Organic HAP control efficiency option: 95% for existing sources</b></p> <p><b>Estimated VOC reduction 80% (Pechan Table)</b></p> <p><b>Control Cost:</b> Nationwide – \$64 million/yr for 34,500 tons/yr = \$1,855/ton</p> <p><b>Timing of Implementation:</b> Compliance Date (existing) Dec. 5, 2005</p>		

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**VOC006 – Industrial Surface Coatings**

<p><b>Implementation Area:</b> Nationwide</p>																																
<p><b>Paper &amp; Other Web – Candidate measure 1:</b> Apply EPA MACT standards, which apply to existing major HAP sources, to the rest of the point sources and to area sources. Use estimated emission reduction percentage and costs for major HAP sources shown above.</p>																																
<p align="center"><b>Plastic Parts</b></p>																																
<p><b>Plastic Parts - 2002 existing measures:</b> NSPS; PSD/NSR; State RACT rules in 1-hour non-attainment counties <u>EPA CTG RACT limit: lbs VOC/gal coating (minus H<sub>2</sub>O&amp;exempt solvents)</u></p> <table border="0"> <thead> <tr> <th></th> <th align="center"><u>Auto Interior</u></th> <th align="center"><u>Auto</u></th> </tr> </thead> <tbody> <tr> <td><u>Exterior</u></td> <td></td> <td></td> </tr> <tr> <td>High Bake Prime</td> <td align="center">3.8 [0.46 kg/l]</td> <td></td> </tr> <tr> <td>--</td> <td></td> <td></td> </tr> <tr> <td>High Bake Prime - Flexible [0.60 kg/l]</td> <td align="center">--</td> <td align="center">5.0</td> </tr> <tr> <td>High Bake Prime – Nonflexible [0.54 kg/l]</td> <td align="center">--</td> <td align="center">4.5</td> </tr> <tr> <td>High Bake Color [0.55 kg/l]</td> <td align="center">4.1 [0.49 kg/l]</td> <td align="center">4.6</td> </tr> <tr> <td>Low Bake Prime [0.66 kg/l]</td> <td align="center">3.5 [0.42 kg/l]</td> <td align="center">5.5</td> </tr> <tr> <td>Low Bake Color red or black</td> <td align="center">3.5 [0.42 kg/l]</td> <td align="center">5.6</td> </tr> <tr> <td>Low Bake Color others</td> <td align="center">--</td> <td align="center">4.5 all</td> </tr> </tbody> </table> <p>Applicability: 50 tons/year uncontrolled emissions</p> <p>OTC state RACT limits: NJ – same limits as CTG</p> <p>NJ RACT: Vinyl Coating                      3.8 [.045kg/l]                   Urethane Coating                3.8 [0.45kg/l]</p> <p>or;</p> <p align="center">-Control 90% by weight of VOC</p>		<u>Auto Interior</u>	<u>Auto</u>	<u>Exterior</u>			High Bake Prime	3.8 [0.46 kg/l]		--			High Bake Prime - Flexible [0.60 kg/l]	--	5.0	High Bake Prime – Nonflexible [0.54 kg/l]	--	4.5	High Bake Color [0.55 kg/l]	4.1 [0.49 kg/l]	4.6	Low Bake Prime [0.66 kg/l]	3.5 [0.42 kg/l]	5.5	Low Bake Color red or black	3.5 [0.42 kg/l]	5.6	Low Bake Color others	--	4.5 all		
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**VOC006 – Industrial Surface Coatings**

<p>Applicability: Any source using &gt;0.5 gal/hour &amp; &gt;2.5 gal/day of VOC formulations</p>		
<p><b>Plastic Parts – 2009 On-the Books measures:</b>                  MACT Std. – Subpart PPPP (69 FR 20968 , 4/19/04)  <b>EPA MACT limits <u>existing sources (major HAP sources):</u></b>                  General Use Coating - 0.16 kg HAP/kg coating solids                  Automotive Lamp Coating - 0.45 kg HAP/kg coating solids                  Thermoplastic Olefins - 0.26 kg HAP/kg coating solids                  New Assembled On-Road Vehicles - 1.34 kg HAP/kg coating solids</p> <p><b>Emission Reductions:</b>                  Nationwide – 80% HAP reduction from 1997 baseline                  MACT Organic HAP control efficiency option: xx% for existing sources                  Estimated VOC reduction 0% (Pechan Table)</p> <p><b>Control Cost:</b>                  Nationwide – \$10.9 million/yr for 7,560 tons/yr = \$1,442/ton</p> <p><b>Timing of Implementation:</b> Compliance Date (existing) April 19, 2007</p> <p><b>Implementation Area:</b> Nationwide</p>		
<p><b>Plastic Parts - Candidate measure 1:</b>                  Apply EPA MACT standards, which apply to existing major HAP sources, to the rest of the point sources and to area sources. Use estimated emission reduction percentage and costs for major HAP sources shown above.</p>		
<p><b>Wood Building Products</b></p>		
<p><b>Wood Building Products – 2002 existing measures:</b>                  NSPS; PSD/NSR; State RACT rules in 1-hour non-attainment counties  <b>EPA CTG RACT limit: <u>lbs VOC/gal coating (minus H<sub>2</sub>O&amp;exempt solvents)</u></b>                  ????????</p> <p><b>NJ RACT limit: <u>lbs VOC/gal coating (minus H<sub>2</sub>O&amp;exempt</u></b></p>		



May 22, 2006

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**Workgroup Recommendations and Other Potential Control Measures**  
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**VOC006 – Industrial Surface Coatings**

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