

**Step-by-Step G Compliance Demonstration:
Multiple Solvent Recovery Systems, Liquid-Liquid Material Balance
§63.3370(n)(1)**

Overview: This approach is valid when using a solvent recovery system with one or more never- or intermittently-controlled work stations, and multiple solvent recovery systems with always controlled work stations provided **a liquid-liquid material balance** is used to demonstrate compliance with MACT limits on a monthly average as-applied basis.

In this approach, a facility needs to:

1. Follow Step-by-Step A, B1, B2, or B3 compliance demonstration.
2. Follow Step-by-Step D compliance demonstration.
3. Determine the organic HAP emitted.
4. Convert the monitoring or other data into units of the selected control option.
5. Determine compliance with MACT limits.
6. Maintain monitoring and other compliance records.

MACT limits

Existing Sources

$$H_e/H_m \leq 0.05$$

or

$$S \leq 0.04 \text{ kg HAP/kg coating}$$

or

$$L \leq 0.20 \text{ kg HAP/kg solids}$$

or

$$H_e \leq H_a$$

New Sources

$$H_e/H_m \leq 0.02$$

or

$$S \leq 0.016 \text{ kg HAP/kg coating}$$

or

$$L \leq 0.08 \text{ kg HAP/kg solids}$$

or

$$H_e \leq H_a$$

Detailed Approach	Citation
<p>1. Follow Step-by-Step A, B1, B2, or B3 Compliance Demonstration.</p> <ul style="list-style-type: none"> • Identify all coatings and additives used in the process. • Gather “NESHAP quality” data for each coating and additive used in the process (mass and solids content) [‘ 63.3370(i)(1)(i) and (iv)]. • Determine HAP content data per unit of coating or per unit of solids [‘ 63.3370(i)(1)(ii)]. 	‘ 63.3370(n)(1)
<p>2. Follow Step-by-Step D Compliance Demonstration.</p> <ul style="list-style-type: none"> • Install a mass flow meter in-line with the solvent recovery system [‘ 63.3370(i)(1)(v)]. • Determine the volatile organic content of each coating material [‘ 63.3370(i)(1)(iii)]. • Calculate the volatile organic matter collection and recovery efficiencies [‘ 63.3370(i)(1)(vi)]. 	‘ 63.3370(n)(1)
<p>3. Determine the organic HAP emitted.</p> <ul style="list-style-type: none"> • For always-controlled work stations and multiple SRS, calculate the organic HAP emitted, H_e, on a monthly basis using Equation 8 for each control device. • For one or more never-controlled or intermittently-controlled work stations: <ul style="list-style-type: none"> ○ Determine the sum of the mass of all coating materials as-applied on intermittently-controlled work stations operating in 	<p>§63.3370(n)(1)(i)</p> <p>§63.3370(n)(1)(ii)</p> <p>‘ 63.3370(o)(1)</p>

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<p>bypass mode and the mass of all coating materials as-applied on never-controlled work stations, M_{Bi}.</p> <ul style="list-style-type: none"> ○ Determine the sum of the mass of all coating materials as-applied on intermittently-controlled work stations operating in controlled mode and the mass of all coating materials as-applied on always-controlled work stations, M_{Ci}. ○ Calculate the organic HAP emitted, H_e, on a monthly basis using Equation 14 for each control device. <i>This equation sums the HAP applied while the system is controlled times the control efficiency (to get HAP emitted during controlled periods) and adds the total HAP applied (which equals HAP emitted) during uncontrolled periods. Any solvent documented as retained in web is then subtracted.</i> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>NOTE:</p> <ul style="list-style-type: none"> • Equation 14 simplifies to Equation 8 if no material is applied at uncontrolled work stations. • There is no mathematical difference to including all material for all lines into a single calculation of H_e using Equation 14. </div> <ul style="list-style-type: none"> • For uncontrolled coating lines, determine the organic HAP applied on those web coating lines using Equation 6 (' 63.3370(d)). <i>The organic HAP emitted from an uncontrolled web coating line is equal to the organic HAP applied on that coating line.</i> • Calculate the cumulative organic HAP emissions for the affected source for the month by summing all the organic HAP emissions calculated. 	<p>' 63.3370(o)(2)</p> <p>§63.3370(o)(3)</p> <p>§63.3370(n)(4)</p> <p>§63.3370(n)(5)(i)</p>
<p>4. Convert the monitoring or other data into units of the selected control option.</p> <p><u>Control Option 1:</u> Capture and control to reduce emissions to no more than the allowable limit [' 63.3370(e)]</p> <ul style="list-style-type: none"> • Determine the mass percentage of total HAP emitted. <ul style="list-style-type: none"> ○ Using the value of H_e calculated from either equation 8 or equation 14 (see item 3 of this detailed approach) and H_m calculated from equation 6 (see item 3 of this detailed approach), calculate the percentage of HAP emitted for the reporting month: Percentage of HAP emitted = H_e/H_m <p><u>Option 2:</u> Capture and control to achieve mass fraction of coating solids applied [' 63.3370(f)]:</p> <ul style="list-style-type: none"> • Calculate the HAP emitted based on coating solids applied, L, for 	<p>' 63.3370(n)(5)</p> <p>§63.3370(n)(6)(iv)</p> <p>' 63.3370(n)(5)(iii)</p>

Equations may be simplified by not distinguishing between coating products and additive products ($C_{si} = C_{sij}$ and $M_i = M_{ij}$).

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<p>the reporting month (kg HAP/kg coating) using Equation 9 (§63.3370(i)(1)(viii)).</p> <ul style="list-style-type: none"> ○ Use the coating solids content of each coating material collected under item 2 of this detailed approach ○ Use the organic HAP emitted, H_e, calculated under item 3 of this detailed approach. <p><u>Option 3:</u> Capture and control to achieve mass fraction of coating materials applied [' 63.3370(g)]:</p> <ul style="list-style-type: none"> ● Calculate the HAP emitted based on coating materials applied, S, for the reporting month (kg HAP/kg coating) using Equation 10 (§63.3370(i)(1)(ix)). ○ Use the organic HAP emitted, H_e, calculated under item 3 of this detailed approach. <p><u>Option 4:</u> Capture and control to achieve allowable emission rate [' 63.3370(h)]:</p> <ul style="list-style-type: none"> ● Determine allowable HAP emissions. ● Monthly organic HAP emissions \leq allowable HAP. ● Calculate the monthly allowable organic HAP emissions <ul style="list-style-type: none"> ○ Use the as-purchased mass of each coating material applied and the as-purchased coating solids content of each coating material applied each month (see item 1 of this detailed approach) ○ Determine the as-purchased mass fraction of each coating material which was applied at 20 mass percent or greater coating solids content on an as-applied basis. ○ Determine the total mass of each solvent, diluent, thinner, or reducer added to coating materials which were applied at less than 20 mass percent coating solids content on an as-applied basis each month. ○ Calculate the monthly allowable organic HAP emission rate (H_a) using Equation 13a for existing sources or Equation 13b for new sources. 	<p>§63.3370(n)(5)(iv)</p> <p>§63.3370(l) and (n)(6)(iii)</p>

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<p>5. Determine compliance with MACT limits</p> <p>For <i>existing</i> affected sources, you are in compliance if:</p> <ul style="list-style-type: none"> • <u>Option 1</u>: $H_e/H_m \leq 0.05$, OR • <u>Option 2</u>: $L \leq$ to 0.20 kg HAP/kg solids, OR • <u>Option 3</u>: $S \leq$ to 0.04 kg HAP/kg coating, OR • <u>Option 4</u>: $H_e \leq H_a$ <p>For <i>new</i> affected sources, you are in compliance if:</p> <ul style="list-style-type: none"> • <u>Option 1</u>: $H_e/H_m \leq 0.02$, OR • <u>Option 2</u>: $L \leq$ 0.08 kg HAP/kg solids, OR • <u>Option 3</u>: $S \leq$ 0.16 kg HAP/kg coating, OR • <u>Option 4</u>: $H_e \leq H_a$ 	<p>§63.3370(n)(6)</p>
<p>6. Maintain monitoring and other compliance records.</p> <ul style="list-style-type: none"> • Maintain continuous monitoring records of volatile matter recovered by the solvent recovery device. • Maintain records of organic HAP content data. • Maintain records of volatile matter and coating solids content data. • Maintain records of all material usage, organic HAP usage, volatile matter usage, and coating solids usage and compliance demonstrations. • Maintain maintenance and calibration records for each mass flow meter • Maintain records of all liquid-liquid material balances. 	<p>§63.3410(a)(1)(i)</p> <p>§63.3410(a)(1)(iii) §63.3410(a)(1)(iv)</p> <p>§63.3410(a)(1)(vi)</p> <p>§63.3410(a)(2) and §63.10(c) §63.3410(b)</p>

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