

Metal Furniture NESHAP Compliance Demonstration Flowchart for EMISSION RATE WITH ADD-ON CONTROLS OPTION ^{(1),(2)} Under §63.4891(c)

(A) For controlled coating operations not using liquid-liquid material balance:

(1) Calculate the combined mass organic HAP in all coatings, thinners, and cleaning materials minus organic HAP in certain waste materials ($A + B + C - R_w$) (see Steps 1 through 7 from the Emissions Without Add-on Controls Option)

(2) Determine capture efficiency (CE) using test methods and procedures per §§63.4963 and 63.4964

(3) Determine HAP destruction or removal efficiency (DRE) using test methods and procedures per §§63.4963 and 63.4965

(4a) For coatings, thinners, and cleaning materials used during deviations, determine volume of each material (Vol_h) per §63.4951(d)

(4b) Determine density of each material (D_h) per §63.4951(c)

(4c) Determine mass fraction organic HAP of each material (W_h) per §63.4951(a)

(5) Calculate the total mass organic HAP in coatings, thinners, and cleaning materials used in all deviations (H_{um}) per §63.4961(h)(4) using $\sum(Vol_h)(D_h)(W_h)$

(6) Calculate the organic HAP emission reduction (H_R) for each controlled coating operation³ per §63.4961(h) using $(A+B+C-R_w) * (CE/100 * DRE/100) + H_{umc}$

Continue with (B), if applicable;
otherwise continue with (C)

(B) For controlled coating operations using liquid-liquid material balance (solvent recovery system [SRS]):

(1) For each SRS, determine mass volatile organic matter recovered (M_{VR}) per §63.4961(j)(2)

(2) Determine mass fraction volatile organic matter for each coating (WV_c), thinner (WV_t), and cleaning material (WV_s) used in coating operation controlled by SRS per §63.4961(j)(3)

(3) Determine density of each coating (D_i), thinner (D_j), and cleaning material (D_k) used in coating operation controlled by SRS per §63.4961(j)(4)

(4) Determine volume of each coating (Vol_i), thinner (Vol_j), and cleaning material (Vol_k) used in coating operation controlled by SRS per §63.4961(j)(5)

(5) For each SRS, calculate the volatile organic matter collection and recovery efficiency (R_v) per §63.4961(j)(6) using $100 * M_{VR} / [\sum(Vol_i)(D_i)(WV_i) + \sum(Vol_j)(D_j)(WV_j) + \sum(Vol_k)(D_k)(WV_k)]$

(6a) Determine total volume of each coating (Vol_c), thinner (Vol_t), and cleaning material (Vol_s) used in coating operation controlled by SRS per §63.4961(j)(7)

(6b) Determine density of each coating (D_c), thinner (D_t), and cleaning material (D_s) per §63.4961(j)(7)

(6c) Determine mass fraction organic HAP in each coating (W_c), thinner (W_t), and cleaning material (W_s) per §63.4961(j)(7)

(7a) Calculate the total mass organic HAP in coatings (A_{CSR}) used in coating operation controlled by SRS using $\sum(Vol_c)(D_c)(W_c)$ per §63.4961(j)(7)

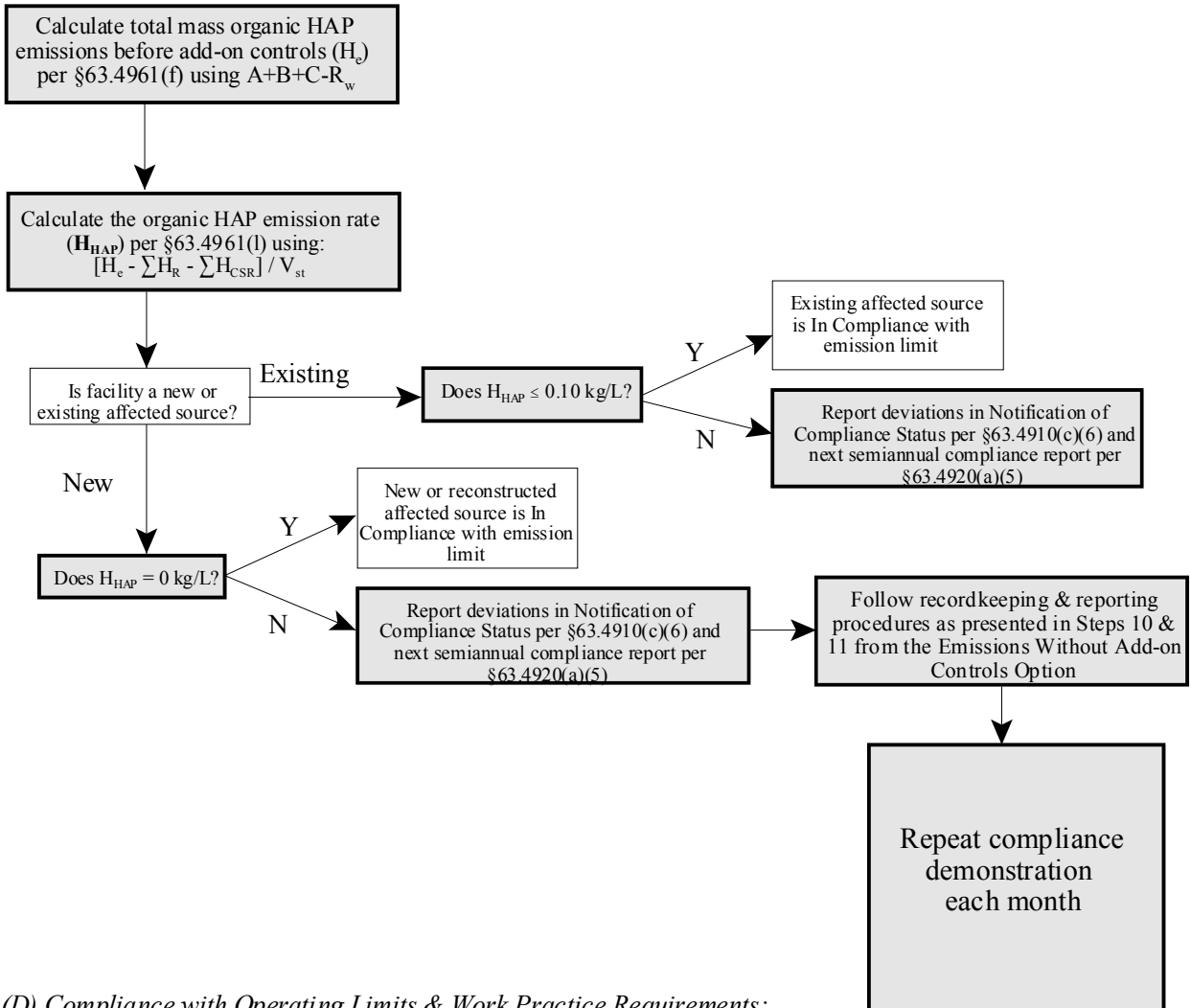
(7b) Calculate the total mass organic HAP in thinners (B_{CSR}) used in coating operation controlled by SRS using $\sum(Vol_t)(D_t)(W_t)$ per §63.4961(j)(7)

(7c) Calculate the total mass organic HAP in cleaning materials (C_{CSR}) used in coating operation controlled by SRS per §63.4961(j)(7) using: $\sum(Vol_s)(D_s)(W_s)$

(8) Calculate the mass organic HAP emission reduction (H_{CSR}) for the coating operation controlled by SRS per §63.4961(j)(7) using:
 $(A_{CSR} + B_{CSR} + C_{CSR}) * R_v / 100$

Continue with (C)

(C) Compliance with Emission Limits:



(D) Compliance with Operating Limits & Work Practice Requirements:

Follow procedures in §§63.4892, 63.4893, and 63.4967, and Table 1

Notes:

affected source: coating operation or group of coating operations (see §63.4882)

HAP: hazardous air pollutant

W = *mass fraction organic HAP for each material (coating, thinner, or cleaning material)*
(kg/kg)

mass organic HAP / mass of material

V_s = *volume fraction coating solids (L/L)*

volume of coating solids / volume of coating

D = *density of each material (coating, thinner, or cleaning material) (kg/L)*

mass material / volume material

Vol = *volume of each material (coating, thinner, or cleaning material) (L)*

R_w = *total mass organic HAP in waste materials sent offsite (kg)*

H_e = *mass organic HAP emissions (kg)*

total mass organic HAP in coatings + total mass organic HAP in thinners + total mass organic HAP in cleaning materials - total mass organic HAP in waste materials sent offsite

mass organic HAP (coating, thinner, or cleaning material) = Vol * D * W

total mass organic HAP is the sum of this product for all coatings, thinners, and cleaning materials

CE = *capture efficiency (percent)*; the portion of the pollutants from an emission source that is delivered to an add-on control device

DRE = *destruction or removal efficiency (percent)*; the portion of the pollutants delivered to an add-on control device that are destroyed or removed

H_{unc} = *mass organic HAP used during deviations (kg)*

mass organic HAP (coating, thinner, or cleaning material) = Vol * D * W

total mass organic HAP is the sum of this product for all coatings, thinners, and cleaning materials used during all deviations

H_R = *mass organic HAP emission reduction for the controlled coating operation (kg)*

mass organic HAP before add-on control (H_e) * (capture efficiency/100 * destruction/removal efficiency/100) + mass organic HAP used during deviations (H_{unc})

M_{VR} = *mass of volatile organic matter recovered by the solvent recovery system during the compliance period (kg)*

controlled by the solvent recovery system for the compliance period (kg/kg)

R_v = volatile organic matter collection and recovery efficiency of the solvent recovery system during the compliance period (percent)

$100 * M_{VR} / (\text{total mass fraction volatile organic HAP in coatings used in operations controlled by SRS} + \text{total mass fraction volatile organic HAP in thinners used in operations controlled by SRS} + \text{total mass fraction volatile organic HAP in cleaning materials used in operations controlled by SRS})$

H_{CSR} = mass organic HAP emission reduction for the coating operation controlled by the solvent recovery system during the compliance period (kg)

$\text{volatile organic matter collection and recovery efficiency } (R_v) / 100 * (\text{total mass fraction organic HAP in coatings used in operations controlled by SRS} + \text{total mass fraction organic HAP in thinners used in operations controlled by SRS} + \text{total mass fraction organic HAP in cleaning materials used in operations controlled by SRS})$

V_{st} = total volume coating solids (L)

total volume used for each coating * volume fraction coating solids

V_{st} is the sum of this product for all coatings

H_{HAP} = organic HAP emission rate for the compliance period (kg/L)

$\text{mass organic HAP before add-on control } (H_e) - \text{total mass organic HAP emission reduction not using liquid-liquid material balances } (H_R) - \text{total mass organic HAP emission reduction using liquid-liquid material balances } (H_{CSR}) / \text{total volume coating solids } (V_{st})$

(1) Compliance dates (see §63.4883)

existing source - May 23, 2006

new or reconstructed source - May 23, 2003, if date of initial startup is before May 23, 2003. If initial startup is after May 23, 2003, then compliance date is date of initial startup.

(2) Evaluation of compliance considers materials in the condition received from manufacturer or supplier.