U. S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF AIR QUALITY PLANNING & STANDARDS
EMISSION STANDARDS DIVISION
RESEARCH TRIANGLE PARK, NC 27711

COVER SHEET

DATE	August 18, 1998 **(Revised August 20 1998)**
TO:	Persons Interested in the Surface Coating of Metal Furniture Rule Development
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MESSAGE:	Coating Calculation Sheet for Use in Completing the Industry Questionnaire

The attached Coating Calculation Sheet is provided as an aid to the recipients of the industry questionnaire. The Coating Calculation Sheet may be used as a guide for determining the physical property data requested in the questionnaire for coatings used at the facility.

Coating Calculation Sheet for HAPs # ____

Date:8/20/98

Component 1.	Coating	Manufacturer_____ Batch No._____; ID_____ Type_____
2.	Thinner	Manufacturer_____ Batch No._____; ID_____

Steps	Instructions (see END NOTES before starting)
1	Input density of coating, Dc equals 1.60 kg/L on line 1a. 1a. **1.6** kg/L Determine total volatile HAP from Manufacturers information, input on line 1b. 108-88-3 Toluene 22 % (by mass) 100-41-4 Ethyl benzene 6 % (by mass) 133020-7 Xylene 23 % (by mass) _____ 51% (by mass) 1b. **51**% Hence, mass of volatile HAPs equals 0.51 x 1.6 kg/L = 0.816 kg/L (Always use **3 significant figures**) Determine total nonvolatile HAP from Manufacturer's information, input on line 1c. *Compound A* [% lead] 7% (by mass) [4% lead] *Compound A* [% Cr] 7% (by mass) [0.8% Cr] 1c. **0.336**%
2	Input volume fraction solids, **Vs**, as supplied (liters solids/liter coating) on line 2a. 2a. **29.4**% by vol.
3	Calculate the volume of volatiles in a coating (%) by subtracting 2a from 100%, input on line 3a. 3a. **70.6**% by vol

4	Determine the total mass of HAPs per liter of coating (as-supplied), $M_{HAP,s}$ Add 1b and 1c and multiply by 1a, input on line 4a. 4a. **0.821** kg HAP/L coating
5	Determine the M_{HAP} per liter of coating (as-applied) $M_{HAP,a}$ Define the thinning ratio, R_{th}, L thinner/L coating, input on line 5a. 5a. **20**% (by vol). Input thinner density, D_{th} (kg /L) on line 5b 5b. **1.00** kg/L thinner Determine % mass of HAPs in thinner as shown in 5b, input on line 5c 5c. **100**%
6	Determine mass HAPs in a liter of thinner Thinner added to coating is 0.2L/L coating, therefore, to determine kg HAP in 0.2L thinner: multiplying 5a x 5b x 5c, input result on line 6a. 6a. **0.200** kg HAP/L thinner Determine total volume of HAPs in the thinned coating (0.706 + 0.200), input on line 6b. 6b. **0.906** L HAP/L coating Determine total mass of HAPs in the thinned coating (0.821 + 0.200), input on line 6c. 6c. **1.02** kg HAP Determine the total volume of thinned coating, input on line 6d. 6d. **1.20** L coating
7	Calculate the mass of HAP in a liter of thinned coating (*as-applied*) by dividing 6c by 6d, input on line 7a. 7a. **0.851** kg HAP/L coating (*as-applied)*
8	Calculate the *as-supplied* mass of HAPs per volume solids Divide 4a by 2a (0.821/0.294), input on line 8a. 8a. **2.79** kg HAP/L solids

9	Calculate the *as-applied* mass of HAPs per volume solids Determine volume solids (%) for the thinned coating 100 (1L x 0.294 L)/1.2 L, input on line 9a. 9a. **24.5**% by vol Divide 7a by 9a (0.851/0.245), input on line 9b. 9b. **3.47** kg HAP/L solids
END	NOTES-- 1. If the HAP percentage is provided as a range, use the mid-point of the range for each HAP. 2. To determine HAPs from multicomponent coatings, define the mix ratio (e.g., 4:1 ratio, 80% A and 20% B). Perform Step 1 for each component and determine percentage of total volatile HAPs and percentage of total nonvolatile HAPs. 3. We have assumed under Step # 3 that the volume of volatiles and volume of nonvolatiles (solids) in a liter of coating are additive. This may not be the case for your coating. However, the assumption is adequate for the purpose of this information collection request (ICR). If the volume of volatiles in a coating is provided by the manufacturer, it should be used instead of the calculated value in Step#3. 4. If you know the volume of volatiles in a liter of coating and you do not know the volume of nonvolatiles (solids), you can determine the latter from the total volume of coating, by difference. This approximation is adequate for purposes of this ICR.