

Aircraft Maintenance Centre - Sample Calculation

Table 1: Information from Questionnaires

EDMS Stationary Source Category/Type	Annual Quantity Consumed (m³ = kL)
Adhesive	8.751
Enamel	3.239
Lacquer	0.534
Paint (Liquid Base)	0.000
Paint (Solvent Base)	29.669
Primer	4.682
Thinner	57.144
Varnish	0.043
Acetone	28.398
Alcohol (Ethyl)	19.374
Alcohol (Methyl)	4.641
HAECO Solvent	180.298
Glycol	0.189
Toluene	0.901

Table 2: Efficiency of Air Pollution Control Equipment

	Pollution Control Equipment Type	Removal Efficiency (%) [1]
Adhesive	HX Scrubber	98
Enamel	HX Scrubber	98
Lacquer	HX Scrubber	98
Paint (Liquid Base)	HX Scrubber	98
Paint (Solvent Base)	HX Scrubber	98
Primer	HX Scrubber	98
Thinner	HX Scrubber	98
Varnish	HX Scrubber	98
Acetone	HX Scrubber	98
Alcohol (Ethyl)	HX Scrubber	98
Alcohol (Methyl)	HX Scrubber	98
HAECO Solvent	HX Scrubber	98
Glycol	HX Scrubber	98
Toluene	HX Scrubber	98

Notes:

[1] Based on information from HAECO, paint and solvent are applied with an Airless sprayer, where >99% of paint and solvent droplets are 4µm or larger
The HX Scrubber removes 98% of paint droplets sized 4µm or larger. Thus removal efficiency of HX Scrubber is assumed to be 98%

Table 3: Emission Indices

	CO (kg/kL)	VOC (kg/kL)	NOX (kg/kL)	SO2 (kg/kL)	RSP (kg/kL)	TOG (kg/kL) [5]
Adhesive [2]		530				
Enamel [2]		420				
Lacquer [2]		730				
Paint (Liquid Base) [2]		160				
Paint (Solvent Base) [2]		670				
Primer [2]		790				
Thinner [2]		882				
Varnish [2]		400				
Acetone [2]						791.3
Alcohol (Ethyl) [2]						791.3
Alcohol (Methyl) [2]						808.9
HAECO Solvent [3]		900				
Glycol [2]						0.00011
Toluene [4]						870

Note:

[2] Emission indices extracted from EDMS v.5.1.4.1 (Glycol used assumed to be aircraft deicing glycol, concentration assumed to be 50%)

[3] HAECO Solvent assumed to have VOC content of 900kg/kL

Based on Information from HAECO, solvent consists of Desoclean45 and Citrasafe (with a VOC content of 784kg/kL and 900kg/kL respectively. Thus VOC content is assumed to be 900kg/kL

[4] Toluene assumed to have density of 870kg/kL (http://www.epa.gov/chemfact/s_toluene.txt)

[5] EDMS assumes that TOG emission index is the same as density

Table 4: Emission from Existing Aircraft Maintenance Facility [6]

	CO (kg)	VOC (kg)	NO _x (kg)	SO ₂ (kg)	RSP (kg)	FSP (kg)	TOG (kg)
Adhesive [7]	0.00	92.76	0.00	0.00	0.00	0.00	-
Enamel [7]	0.00	27.21	0.00	0.00	0.00	0.00	-
Lacquer [7]	0.00	7.79	0.00	0.00	0.00	0.00	-
Paint (Liquid Base) [7]	0.00	0.00	0.00	0.00	0.00	0.00	-
Paint (Solvent Base) [7]	0.00	397.57	0.00	0.00	0.00	0.00	-
Primer [7]	0.00	73.97	0.00	0.00	0.00	0.00	-
Thinner [7]	0.00	1008.01	0.00	0.00	0.00	0.00	-
Varnish [7]	0.00	0.34	0.00	0.00	0.00	0.00	-
Acetone [8,9]	0.00	272.38	0.00	0.00	0.00	0.00	449.43
Alcohol (Ethyl) [8,9]	0.00	185.83	0.00	0.00	0.00	0.00	306.61
Alcohol (Methyl) [8,9]	0.00	45.50	0.00	0.00	0.00	0.00	75.08
HAECO Solvent [7]	0.00	3245.36	0.00	0.00	0.00	0.00	-
Glycol [8,10]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Toluene [11]	0.00	15.68	0.00	0.00	0.00	0.00	15.68

Notes:

[6] Chemical consumption at new aircraft maintenance facility is assumed to be the same as that at existing facility. Thus emission from new aircraft maintenance facility is the same as emission from existing facility

[7] VOC emission = Quantity consumed * VOC emission index * (1 - Removal Efficiency of Air Pollution Control Equipment)

[8] TOG emission = Quantity consumed * TOG Emission Index * (1 - Removal Efficiency of Air Pollution Control Equipment)

[9] To convert from TOG to VOC, the conversion factor is 0.61 (Reference from FAA "Guidance for quantifying speciated organic gas emissions from airport sources")

[10] To convert from TOG to VOC, the conversion factor is 0.89 (Reference from FAA "Guidance for quantifying speciated organic gas emissions from airport sources")

[11] It is assumed that 100% of toluene consumed post-scrubber is evaporated as VOC/TOG.