Suggested Litho Press Potential to Emit Calculations

Ink Coverage = 0.001 lb/ft^2
Ink Retention = 89-97% per Battelle for the Graphic Arts Education and Research Foundation March 1993 2nd printing; the District will use **90%**. Note, the retention was tested after 4 weeks of storage with no difference in retention.

Fountain Solution Usage = (0.00002 oz/in^2)(y in^2/sheet)(# sheet/hr)
Blanket Wash = x oz/in^2 (y in^2/blanket)(# blankets)(5 cleaning cycles/day)
Roller Cleaner = w oz/in^2 (y in^2/roller)(# rollers)(5 cleaning cycles/day)
Plate Cleaner = u oz/in^2 (y in^2/plate)(# plate)(5 cleaning cycles/day)

Assume 80% runtime, 10% cleanup, and 10% setup time (5 cleaning cycles/day) is about 2.4 hrs (10% of a day for cleaning) assuming approximately 30 min/cleaning cycle.

The District believes these are reasonable estimates of the Blanket Wash/Roller Cleaner/Plate Cleaner usage rates:
x = 0.04 oz/in^2
w = 0.02 oz/in^2
u = 0.02 oz/in^2

Assume the surface area of the blankets/rollers/plates (y) = (length of sheet (in))*[width of sheet (in) + 2 (in)]; where the 2 (in) is an inch on each side of the sheet.

Assume the # of rollers/blankets/plates each = # of colors.

Assume for total coverage of ink and fountain solution that the press can only operate at 75% of maximum speed.

Assume starch, rubber rejuvenator, glue, etc are all considered to be insignificant.

Example 1:

- 10-color press (15,000 sheets/hr)
- A (sheet) = (41"x29") = 1189 in^2 = 8.26 ft^2
- A (blanket/roller/plate) = (41"x31") = 1271 in^2
- VOC Ink = 5.45%
- VOC Fountain Solution = 4.87% (as applied)
- Density of FS (as applied) = 8.2 lb/gal
- VOC Blanket Wash = 6.37 lb/gal
- VOC Roller Wash/Plate Wash = 5.91 lb/gal

Ink = (0.001 lb/ft^2) (0.0545 VOC content) (8.26 ft^2/sheet) (15,000 sheet/hr) (0.10 retention) (0.80 runtime) (0.75 coverage) (8760 hr/yr) (ton/2000 lb)
= **1.78 tpy VOC**

Fountain Solution = (0.00002 oz/in^2) (1271 in^2/sheet) (15,000 sheet/hr) (1 gal/128 oz) (0.0487 VOC) (8.2 lb/gal) (0.80 runtime) (0.75 coverage) (8760 hr/yr)(ton/2000 lb)
= **3.13 tpy VOC**

Blanket Wash = (0.04 oz/in^2) (1271 in^2/blanket) (10 blankets/cleaning cycle) (5 cleaning cycles/day) (1 gal/128 oz) (6.37 lbVOC/gal) (365 day/yr) (ton/2000 lb)
= **23.09 tpy VOC**

Roller Wash = (0.02 oz/in^2) (1271 in^2/roller) (10 rollers/cleaning cycle) (5 cleaning cycles/day) (1 gal/128 oz) (5.91 lbVOC/gal) (365 day/yr) (ton/2000 lb)
= **10.71 tpy VOC**

Plate Cleaner = (0.02 oz/in^2) (1271 in^2/plate) (10 plates/cleaning cycle) (5 cleaning cycles/day) (1 gal/128 oz) (5.91 lbVOC/gal) (365 day/yr) (ton/2000 lb)
= **10.71 tpy VOC**

Total VOC = 1.78 + 3.13 + 23.09 + 10.71 + 10.71 = 49.42 tpy

Example 2:

- 6-color press (15,000 sheets/hr)
- A (sheet) = (10"x12") = 120 in^2 = 0.83 ft^2
- A (blanket/roller/plate) = (10"x14") = 140 in^2
- VOC Ink = 5.45%
- VOC Fountain Solution = 4.87% (as applied)
- Density of FS (as applied) = 8.2 lb/gal
- VOC Blanket Wash = 6.37 lb/gal
- VOC Roller Wash/Plate Wash = 5.91 lb/gal

Ink = (0.001 lb/ft^2) (0.0545 VOC content) (0.83 ft^2/sheet) (15,000 sheet/hr) (0.10 retention) (0.80 runtime) (0.75 coverage) (8760 hr/yr) (ton/2000 lb)
= **0.18 tpy VOC**

Fountain Solution = (0.00002 oz/in^2) (120 in^2/sheet) (15,000 sheet/hr) (1 gal/128 oz) (0.0487(VOC)) (8.2 lb/gal) (0.80 runtime) (0.75 coverage) (8760 hr/yr) (ton/2000 lb)
= **0.29 tpy VOC**

Blanket Wash = (0.04 oz/in^2) (140 in^2/blanket) (6 blankets/cleaning cycle) (5 cleaning cycles/day) (1 gal/128 oz) (6.37 lb VOC/gal) (365 day/yr) (ton/2000 lb)
= **1.53 tpy VOC**

Roller Wash = (0.02 oz/in^2) (140 in^2/roller) (6 rollers/cleaning cycle) (5 cleaning cycles/day) (1 gal/128 oz) (5.91 lb VOC/gal) (365 day/yr) (ton/2000 lb)
= **0.71 tpy VOC**

Plate Cleaner = (0.02 oz/in^2) (140 in^2/plate) (6 plates/cleaning cycle) (5 cleaning cycles/day) (1 gal/128 oz) (5.91 lb VOC/gal) (365 day/yr) (ton/2000 lb)
= **0.71 tpy VOC**

Total VOC = 0.18 + 0.29 + 1.53 + 0.71 + 0.71 = 3.42 tpy