

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

MEMORANDUM

April 3, 1981

TO: Textile fabric printing AP-42 file
FROM: S. B. York, RTI
SUBJECT: Calculation of minimum, maximum, and annual emission factors (Table 4)

ROLLER PRINTING:

Wet pickup factors range from $.51 \frac{\text{kg print paste}}{\text{kg fabric}}$ to $.58 \frac{\text{kg print paste}}{\text{kg fabric}}$;
print paste organic solvent (VOC) contents range from 0% to 60% (weight).

Minimum Emission Factor

The minimum emission factor corresponds to the use of the minimum organic solvent content print paste at the minimum wet pickup rate, i.e., 0% solvent at $.51 \frac{\text{kg print paste}}{\text{kg fabric}} + 0 \text{ kg VOC}/1,000 \text{ kg fabric}$

Maximum Emission Factor

The maximum emission factor corresponds to the use of the maximum organic solvent content print paste at the maximum wet pickup rate, i.e., 60% solvent at

$$.58 \frac{\text{kg print paste}}{\text{kg fabric}} + \frac{580 \text{ kg print paste}}{1,000 \text{ kg fabric}} \times \frac{.6 \text{ kg organic solvent (VOC)}}{\text{kg print paste}} =$$

348 kg VOC/1,000 kg fabric

Average Emission Factor

Average annual production per print line = 890,146 kg fabric/yr
Average emission factor = 142 kg/1,000 kg fabric (Ref. 3 - ATMI survey of organic solvent use)

Average annual emissions per print line =

$$890,146 \frac{\text{kg fabric}}{\text{year}} \times \frac{142 \text{ kg}}{1,000 \text{ kg fabric}} = 126 \times 10^3 \text{ kg/yr} = 126 \text{ Mg/yr}$$

ROTARY SCREEN PRINTING:

Wet pickup factors range from $.10 \frac{\text{kg print paste}}{\text{kg fabric}}$ to $1.89 \frac{\text{kg print paste}}{\text{kg fabric}}$
Print paste organic solvent (VOC) contents range from 0% to 50% (weight).

Minimum Emission Factor

The minimum emission factor corresponds to the use of the minimum organic solvent content print paste at the minimum wet pickup rate, i.e., 0% solvent at $.1 \frac{\text{kg print paste}}{\text{kg fabric}} + 0 \text{ kg VOC}/1,000 \text{ kg fabric}$.

Maximum Emission Factor

The maximum emission factor corresponds to the use of the maximum organic solvent content print paste at the maximum wet pickup rate, i.e., 50% solvent

$$\text{at } 1.89 \frac{\text{kg print paste}}{\text{kg fabric}} \rightarrow \frac{1,890 \text{ kg print paste}}{1,000 \text{ kg fabric}} \times \frac{.5 \text{ kg organic solvent (VOC)}}{\text{kg print paste}} =$$

$$\frac{945 \text{ kg VOC}}{1,000 \text{ kg fabric}}$$

Average Emission Factor

Average annual production per print line = 1,228,178 kg fabric/yr
Average emission factor = 23 kg/1,000 kg fabric (Ref. 3 - ATMI survey of organic solvent use)

Average annual emissions per print line =

$$1,228,178 \text{ kg fabric/yr} \times \frac{23 \text{ kg}}{1,000 \text{ kg fabric}} = 28 \times 10^3 \text{ kg/yr} = 28 \text{ Mg/yr}$$

FLAT SCREEN PRINTING:

Wet pickup factors range from $.22 \frac{\text{kg print paste}}{\text{kg fabric}}$ to $.83 \frac{\text{kg print paste}}{\text{kg fabric}}$;

Print paste organic solvent content is all approximately 23% (weight).

Minimum Emission Factor

The minimum emission factor corresponds to the use of the average organic solvent content print paste at the minimum wet pickup rate, i.e., 23% solvent

$$\text{at } .22 \frac{\text{kg print paste}}{\text{kg fabric}} \rightarrow \frac{220 \text{ kg print paste}}{1,000 \text{ kg fabric}} \times \frac{.23 \text{ kg organic solvent (VOC)}}{\text{kg print paste}} =$$

$$\frac{51 \text{ kg VOC}}{1,000 \text{ kg fabric}}$$

Maximum Emission Factor

The maximum emission factor corresponds to the use of the average organic solvent content print paste at the maximum wet pickup rate, i.e., 23% solvent

$$\text{at } .83 \frac{\text{kg print paste}}{\text{kg fabric}} \rightarrow \frac{830 \text{ kg print paste}}{1,000 \text{ kg fabric}} \times \frac{.23 \text{ kg organic solvent (VOC)}}{\text{kg print paste}} =$$

$$\frac{191 \text{ kg VOC}}{1,000 \text{ kg fabric}}$$

Average Emission Factor

Average annual production per print line = 354,500 kg fabric/yr

Average emission factor = 79 kg/1,000 kg fabric (calculations on bottom of page 1 and top of page 2 of Background Information for Textile Fabric Printing Emission Factors)

Average annual emissions per print line =

$$354,500 \text{ kg fabric/yr} \times 79 \text{ kg/1,000 kg fabric} = 28 \times 10^3 \text{ kg/yr} = 28 \text{ Mg/yr}$$