

Potential to Emit Calculation

Equipment: One (1) Electric Powdered Perchloroethylene Dry Cleaner (Dry-to-Dry Process) with a capacity of 80 lbs clothing/hr.

One (1) Stoddard Solvent Dry Cleaner (Transfer) with a capacity of 100 lbs clothing/hr.

Two (2) Dryers that can dry 100 pounds of clothing/hr each.

One (1) DF 2000 Solvent Dry Cleaner (Dry-to-Dry Process) with a capacity of 95 lbs clothing/hr.

Calculations:

The emissions for this company are based on the following assumptions.

AP-42 Emission Factors (Table 4.1-1)

Capacity: 80 lb clothing/hr Perchloroethylene Dry-to-Dry

1 lb Perchloroethylene/100 lb of clothes cleaned (Filter Disposal)

0.5 lb Perchloroethylene/100 lb of clothes cleaned (Still Residue Disposal)

3 lb Perchloroethylene/100lb of clothes cleaned (fugitive, Pumps, and Pipes)

4.5 lb Perchloroethylene/100 lb of clothes cleaned (Total)

Capacity: 95 lb clothing/hr Stoddard Dry-to-Dry Process

1 lb DF 2000 Solvent/100 lb of clothes cleaned (Filter Disposal)

0.5 lb DF 2000 Solvent/100 lb of clothes cleaned (Still Residue Disposal)

3 lb DF 2000 Solvent/100lb of clothes cleaned (fugitive, Pumps, and Pipes)

4.5 lb DF 2000 Solvent/100 lb of clothes cleaned (Total)

Capacity: 100 lb clothing/hr Stoddard Solvent Transfer Process

18 lb Stoddard Solvent/100 lb of clothes cleaned (Washer/Dryer)

8 lb Stoddard Solvent/100 lb of clothes cleaned (Filter Disposal)

1 lb Stoddard Solvent/100 lb of clothes cleaned (Still Residue Disposal)

1 lb Stoddard Solvent/100lb of clothes cleaned (fugitive, Pumps, and Pipes)

28 lb Stoddard Solvent/100 lb of clothes cleaned (Total)

| | | <u>Emission Factor Rating</u> |
|-------------------------------|------------------|-------------------------------|
| Perchloroethylene Dry Cleaner | Dry-to-Dry | B |
| Df 2000 Solvent Dry Cleaner | Dry-to-Dry | B |
| Stoddard Solvent Dry Cleaner | Transfer Process | B |

*The emission factor for the transfer process includes both the washer and dryer.

*Perchloroethylene is not considered to be a VOC according to Regulation 1.02 Section 1.79.24.

For Perchloroethylene Machines:

Filters are typically cleaned every 300-500 hrs of operation. Assume that the machine will be shut down every 1000 hrs of operation for 24 hrs at a time to replace the filters, since 40 CFR 63.322 (Subpart M) requires the filter to drain for 24 hrs before disposal; during which the machine can not be used.

$$(8760 \text{ hr/yr}) / (1000 \text{ hrs/filter change}) = 9 \text{ shutdowns/yr}$$
$$\text{Total operating hours: } 8760 - (9 \text{ shutdowns/yr} * 24 \text{ hrs}) = 8544$$

For Stoddard Machines:

Assuming the machines will follow regulations similar to Title 40 CFR 60.622 (Subpart JJJ)

$$(8760 \text{ hr/yr}) / (1000 \text{ hrs/filter change}) = 9 \text{ shutdowns/yr}$$
$$\text{Total operating hours: } 8760 - (9 \text{ shutdowns/yr} * 8 \text{ hrs}) = 8688$$

Total clothing cleaned in the Perchloroethylene machines: 80

Total clothing cleaned in the Stoddard machines: $100 + 95 = 195$

Calculations

PTE for VOC:

DF 2000 Solvent (Dry-to-Dry Process):

$$(4.5 \text{ lb /100 lb of clothing})(95 \text{ lb clothes/hr})(8688 \text{ operating hr/yr})(1 \text{ ton/2000 lb})$$
$$= 18.57 \text{ tpy}$$

Stoddard Solvent (Transfer Process):

$$(28 \text{ lb/100 lb clothes})(100 \text{ lb clothes/hr})(8688 \text{ operating hr/yr})(1 \text{ ton/2000 lb})$$
$$= 121.63 \text{ tpy}$$

Spot Cleaning for Perchloroethylene:

$$(0.1 \text{ ounce/lb of clothing})(80 \text{ lb clothes/hr})(8544 \text{ hr/yr})(1 \text{ gal/128 ounces})(7 \text{ lb/gal})$$
$$(1 \text{ ton/2000 lb}) = 1.87 \text{ tpy}$$

Spot Cleaning for Stoddard:

$$(0.1 \text{ ounce/lb of clothing})(195 \text{ lb clothes/hr})(8688 \text{ hr/yr})(1 \text{ gal/128 ounces})(7 \text{ lb/gal})$$
$$(1 \text{ ton/2000 lb}) = 4.63 \text{ tpy}$$

$$\text{Total} = 18.57 \text{ tpy} + 121.63 \text{ tpy} + 1.87 \text{ tpy} + 4.63 \text{ tpy} = 146.7 \text{ tpy}$$

PTE for Single HAP (Perchloroethylene):

Electric Powered Perchloroethylene (Dry-to-Dry Process):

$$(4.5 \text{ lb /100 lb of clothing})(80 \text{ lb clothes/hr})(8544 \text{ operating hr/yr})(1 \text{ ton/2000 lb})$$
$$= 15.38 \text{ tpy}$$

$$\text{Total} = 15.38 \text{ tpy}$$

PTE for Total HAP:

Electric Powered Perchloroethylene (Dry-to-Dry Process):

$$(4.5 \text{ lb /100 lb of clothing})(80 \text{ lb clothes/hr})(8544 \text{ operating hr/yr})(1 \text{ ton/2000 lb})$$
$$= 15.38 \text{ tpy}$$

$$\text{Total} = 15.38 \text{ tpy}$$