

Annualized Operating Costs for VOC Abatement System

Catalytic Recuperative Thermal Oxidizer Costs At 100% VOC Capture Efficiency

4,000 SCFM Oxidizer Capital Costs⁽¹⁾

| Cost Item | Cost |
|----------------------------|---------------------|
| Oxidizer Cost | \$209,000.00 |
| Shipping | \$7,800.00 |
| Installation | \$125,000.00 |
| PTE Requirements | \$20,000.00 |
| Coating Line Modifications | \$10,000.00 |
| Totals | \$371,800.00 |

⁽¹⁾ All capital costs estimated by MEGTEC.

Annualized Capital Cost (@ a 10-year life, 10% interest) = \$60,510.45

4,000 SCFM Oxidizer Annual Operating Costs⁽²⁾

| Cost Item | Cost | Calculation Method |
|-----------------------------|--------------------|--|
| Direct Costs | | |
| Operating Labor, Operator | \$574.75 | Assumes 0.5hr/8hr shift, 50 shifts/yr, \$22.99/hr |
| Operating Labor, Supervisor | \$86.21 | Assumes 15% of the operator labor costs |
| Maintenance Labor | \$632.50 | Assumes 0.5hr/8hr shift, 650 shifts/yr, \$25.30/hr |
| Maintenance Materials | \$632.50 | Assumes 100% of the maintenance labor cost |
| Utilities | \$16,268.00 | Estimated based upon MEGTEC data |
| Indirect Costs | | |
| Overhead | \$1,155.58 | Assumes 60% of operating labor and maintenance costs |
| Administrative Charges | \$3,718.00 | Assumes 2% of the capital costs |
| Property Taxes | \$3,718.00 | Assumes 1% of the capital costs |
| Insurance | \$3,718.00 | Assumes 1% of the capital costs |
| Totals | \$30,503.54 | |

⁽²⁾ Costs estimated based upon the OAQPS control cost manual, Chapter 3 - Thermal and Catalytic Incinerators. The labor costs have been escalated from 1988 dollars to 2006 dollars.

Total Annual Operating Costs of the Proposed Oxidizer = \$91,013.99

Uncontrolled VOC Emission Rate (tpy) = 3.00

Controlled VOC Emission Rate (tpy) = 0.15

Annual Oxidizer VOC Reduction (tpy) = 2.85

Oxidizer Cost Effectiveness (\$/ton VOC) = \$31,934.73

Flexible Packaging Association: PFF Comments attachment 1

CTG Worksheet on Operating Costs

Quantum 4,000

70% Uptime \$ 1.10/therm for gas

100% Capture \$ 0.075/Kwh electric

2,000 hrs/year operation

Data based on computer simulation



3 TPY

| | <u>Hours</u> | <u>\$/hr</u> | <u>\$/yr</u> |
|---------|--------------|----------------|-----------------|
| Idle | 600 | \$2.66 | \$1,596 |
| Running | <u>1,400</u> | \$10.48 | <u>\$14,672</u> |
| Total | 2,000 | | \$16,268 |