VAPOR ABATEMENT

S.A.V.E™ SYSTEMS

No Open Flame
Small Footprint & Portable
Minimal Supplemental Fuel Usage
Built-in Automatic Fire Suppression System
Removal Rate Efficiency Greater Than 99.9%
No Electrical Connection or Generator Required
Totally Automated for unattended Applications
Wide Range of Automatic Safety Shutdown Alarms
Uses 100% Process Vapors as Primary Fuel Source
Control up to 2,400 lb/day of VOC per Dual Engine Unit
Telemetry/Remote Control via Land Line or Wireless Internet
Oxidizer / Internal Combustion Engine (ICE) Comparison at average 50,000 PPMv VOC Concentration In Process Flow During Typical Tank Degassing Event

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Max PPMv (as Toluene) after dilution air</th>
<th>Btu/hr to operate system at zero PPMv</th>
<th>Process Flow (SCFM)</th>
<th>Dilution Air (SCFM)</th>
<th>Lbs/hour (as Toluene Oxidized)</th>
<th>Gallons/hr &quot;make up fuel&quot; (Propane)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal Oxidizer-Furnace</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1000 SCFM Thermal without safety control(^1)</td>
<td>2,656</td>
<td>1,805,080</td>
<td>53</td>
<td>947</td>
<td>38.73</td>
<td>12.9</td>
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<tr>
<td><strong>Thermal Oxidizer-Furnace</strong></td>
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</tr>
<tr>
<td>1000 SCFM Thermal with safety control(^1)</td>
<td>5,313</td>
<td>1,805,080</td>
<td>106</td>
<td>894</td>
<td>77.46</td>
<td>5.5</td>
</tr>
<tr>
<td><strong>Internal Combustion Engine (ICE)</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>300 SCFM (model V4 dual engine w/load)</td>
<td>22,810</td>
<td>1,784,979</td>
<td>137</td>
<td>163</td>
<td>99.77</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Assumptions:

Mass removed = (ug/L * Flow (SCF/M) * 28.3L/SCF * 60 Minutes/Hour * 2.2 Pounds/Kg) * 1/10^6
Toluene at 92.1 mole weight; 17901 Btu/lb; LEL 1.25% (12,500 PPMv)
20.9% Oxygen in process stream
Dilution Air = Process Capacity - Process Flow
One gallon of propane (vaporized) is equal to 91,500 Btu
594,993 BTU/hr per 100 SCFM throughput for stoichiometric burn for ICE oxidation (105 Btu/cubic foot)
180,508 BTU/hr per 100 SCFM throughput for thermal oxidation (30 Btu/cubic foot)
Thermal Oxidizers shown operating at 85% of NFPA LEL recommendations (see footnote 1)
Oxidizers' burner have a 30 to 1 turn down ratio with no heat exchanger installed
Engine uses slightly less than 1 to 1 ratio of Btu contaminants for reduction of alternate fuel

\(^1\)Flame type oxidizers normally operate safely below the LEL so that an explosion does not occur within or outside of the oxidizing chamber. The National Fire Protection Association (NFPA) recommends that oxidizers operate at a maximum of 25%, or up to 50% of the LEL depending on the safety control features of the system. Oxidizers are limited to this safe operating range in order to have adequate time to respond to fluctuations in the input flow rates and/or VOC concentrations. Common practice for refinery or tank farm use is to operate at less than NFPA recommendations. Above chart assumes 85% of NFPA recommendations.

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