



Jeb Bush  
Governor

# Department of Environmental Protection

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

David B. Struhs  
Secretary

September 12, 2002

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. John Perry  
Vice President of Operations  
Nailite International, Inc.  
1111 NW 165<sup>th</sup> Street  
Miami, Florida 33169

Re: DEP File No. 0250407-003-AC (PSD-FL-289)  
VOC Capture and Destruction Efficiency Tests

Dear Mr. Perry:

Nailite's response to the Department's August 29 letter requesting the EPA Method 25A emission calculations was received by fax on September 6. As detailed below, unexplained discrepancies in the reported data still exist preventing final resolution of permit limits and conditions.

The compliance tests that Nailite has conducted to date are: April 2001, Capture and Destruction – Line No. 2 (EU 004); June 2002, Capture – Line No. 1 (EU 001) and Destruction – Lines Nos. 1 and 2 running together (except for Run No. 3 during which Line No. 1 did not operate). The reported efficiencies for the 2001 tests were 87.3 percent capture and 99.3 percent destruction of toluene VOC. The 2002 reported efficiencies were 90.6 percent (revised) capture on Line No. 1 and 99.24 percent destruction on Line No. 2. The Department does not question the reported destruction efficiencies. However, several questions exist concerning the methods used for calculating RTO inlet quantities and capture efficiencies.

To properly calculate capture efficiency, the measured VOC inlet quantities and the VOC material usage must be expressed on the same basis; e.g., lbs/hr "as carbon" or "as toluene." The April 2001 test used methane as the calibration gas and the quantities were reported in lbs/hr "as methane," whereas the 2002 tests were reported in lbs/hr "as propane." Use of the different calibration gases is permissible as long as: (1) the Flame Ionization Analyzer (FIA) response factor for the specific organic compound is included in the calculation, and, (2) the inlet concentration is expressed in terms of the specific compound(s) that the material usage is based on.

Propane is the protocol calibration gas for EPA Method 25A since it provides a very stable mixture with diluent air or nitrogen such that the specified concentration will not change more than 2% over extended periods. The FIA instrument is calibrated to detect the carbon atoms in the exhaust gas as if they existed in the form of the calibration gas. For emissions of toluene (C<sub>7</sub>H<sub>8</sub>), the propane-calibrated analyzer senses the seven carbon atoms of each toluene molecule as though they were 7/3 or 2.33 propane molecules (C<sub>3</sub>H<sub>8</sub>). Therefore, the analyzer's ppm output, when calibrated using propane, must be multiplied by a factor of 3/7 or 0.428 to get the actual concentration in terms of toluene. Likewise, when methane is used for calibration, the concentration is multiplied by a factor of 1/7. These conversion factors must be further adjusted for the analyzer's individual response factors, determined from freshly prepared and known toluene samples, or obtained from the analyzer manufacturer's published values.

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The following illustrates how Nailite's test results are affected by these required conversions:

2001 Test – RTO Inlet on Line No. 2 - Methane Calibration (w/o FIA Response Correction)

Run No. 1:  $7,583.2 \text{ ppm}(1/7)(92 \text{ lb/mole})(1/386.3)(E-06)(653,978 \text{ scf/hr}) = 168.7 \text{ lbs/hr "as toluene" vs. } 205.92 \text{ lbs/hr "as methane"}$   
Run No. 2:  $6,934.8 \text{ ppm}(1/7)(92 \text{ lb/mole})(1/386.3)(E-06)(653,978 \text{ scf/hr}) = 154.3 \text{ lbs/hr "as toluene" vs. } 188.31 \text{ lbs/hr "as methane"}$   
Run No. 3:  $7,824.5 \text{ ppm}(1/7)(92 \text{ lb/mole})(1/386.3)(E-06)(653,978 \text{ scf/hr}) = 174.1 \text{ lbs/hr "as toluene" vs. } 212.47 \text{ lbs/hr "as methane"}$   
Average RTO Inlet:  $165.7 \text{ lbs/hr "as toluene" vs. } 202.2 \text{ lbs/hr "as methane"}$   
Average VOC Used:  $(36.267 \text{ gal/hr} \times 8.92 \text{ lb/gal} \times 65.24\% \text{ wt.}) + (12.8 \text{ gal/hr} \times 7.23 \text{ lb/gal}) = 211.05 + 92.6 = 303.65 \text{ lbs/hr "as toluene"}$   
Average Capture Efficiency (w/o FIA correction):  $165.7/303.65 = 54.57\% \text{ vs. } 87.27\%$

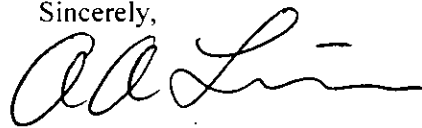
2002 Test – RTO Inlet on Line No. 1 – Propane Calibration (w/o FIA Response Correction)

Average RTO Inlet:  $2,106 \text{ ppm}(3/7)(92 \text{ lb/mole})(1/385)(E-06)(1,064,160 \text{ scf/hr}) = 229.52 \text{ lbs/hr "as toluene" vs. } 256.14 \text{ lbs/hr "as propane"}$   
Average Capture Efficiency (w/o FIA correction):  $229.52/282.81 = 81.16\% \text{ vs. } 90.6\%$

The next set of discrepancies concern the capture efficiencies that can be calculated from the material usages during the 2002 destruction efficiency tests. The combined-operation capture efficiencies for Lines Nos. 1 and 2 are 88.9% for Run No. 1 and 72% for Run No. 2. Run No. 3 showed a capture efficiency of only 61.4% for Line No. 2 (Line No. 1 was not running).

The Department is requesting that these discrepancies be clarified as soon as possible so that final limits and conditions can be established. If there are any questions regarding the above, please call John Reynolds at 850/921-9530.

Sincerely,



A. A. Linero, P.E. Administrator  
New Source Review Section

AAL/JR

cc: Gregg Worley, EPA  
John Bunyak, NPS  
Tom Tittle, SED  
Mallika Muthia, DCDERM  
Victor Rossinsky, Jr., CRB

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Mr. John Perry  
 Vice President of Operations  
 Nailite International, Inc.  
 1111 NW 165th Street  
 Miami, FL 33169

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PS Form 3800, January 2001

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Jeb Bush  
Governor

# Department of Environmental Protection

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

David B. Struhs  
Secretary

August 29, 2002

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

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Vice President of Operations  
Nailite International, Inc.  
1111 NW 165<sup>th</sup> Street  
Miami, Florida 33169

Re: DEP File No. 0250407-003-AC (PSD-FL-289)  
VOC Capture and Destruction Efficiency Test

Dear Mr. Perry:

The Bureau of Air Regulation reviewed the referenced test report received on July 16 and found that the EPA Method 25A mass flow rate calculations aren't shown. This is necessary for a proper review, particularly since an error was discovered in the 2001 test report for the No. 2 line (EU 004). In that report, a volume percent VOC content was used instead of a weight percent, resulting in an erroneous capture efficiency determination. For your information, that calculation is shown below:

"Paint 36.267 gal/hr x 7.2346 lb/gal x 72.34 % VOC by volume = 189.802 lb/hr"

If the weight percent VOC was 65.24, as indicated in the most recent report, then the paint VOC mass would be 171.2 lb/hr and the capture efficiency would have been 93.4 percent rather than the reported figure of 87.27 percent.

With respect to Specific Condition No. 3 in the permit whereby the Department has 45 days following receipt of the test results to establish final emission limits, the test report will be considered incomplete until the calculations are received.

If there are any questions regarding the above, please call John Reynolds at 850/921-9530.

Sincerely,

A. A. Linero, P.E. Administrator  
New Source Review Section

AAL/JR

cc: Gregg Worley, EPA  
John Bunyak, NPS  
Tom Tittle, SED  
Mallika Muthia, DCDERM  
Victor Rossinsky, Jr., CRB

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 V.P. of Operations  
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