Hidden Fire Testing


By: Dave Blake. FAA Technical Center. Atlantic City, NJ. Email: Dave.Blake@faa.gov

Date: April 2-3, 2008
NEA System in 727 Test Article

- Thermocouple
- NEA Solenoid
- Vacuum Solenoid

Control Logic

Vacuum Source

NEA Supply
727 Interior cabin ceiling mockup
727 Instrumentation in area of cabin ceiling mockup
Hidden Fire Testing
International Aircraft Systems Fire Protection Working Group
April 2-3, 2008

NEA capacity 17 CFM @ 5.6% Oxygen

Higher capacity air compressor operational.
2 Inner NEA Inlets, Average Oxygen From Probes 2,3,4

<table>
<thead>
<tr>
<th>Time (minutes)</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Oxygen</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.3 CFM, 0.4% O2, 140 psi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 CFM, 1.8% O2, 133 psi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0 CFM, 2.8% O2, 129 psi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.2 CFM, 5.0% O2, 125 psi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2 Inner NEA Inlets, Average Oxygen From Probes 2,3,4

- 6.3 CFM, 0.4% O2, 140 psi
- 9 CFM, 1.8% O2, 133 psi
- 10.0 CFM, 2.8% O2, 129 psi
- 11.2 CFM, 5.0% O2, 125 psi

% Oxygen vs Time (minutes): 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0

- 1.8 mins
- 2.2 mins
- 2.5 mins
- 3.1 mins
4 NEA Inlets, Average Oxygen from Probes 1-4

- 5.8 CFM @ .22% O2
- 7.0 CFM @ .31% O2
- 10.5 CFM @ 1.0% O2
- 13.5 CFM @ 2.6% O2
- 17.0 CFM @ 5.6% O2
Summary

• Inert atmosphere can be produced in a 13 foot section above the cabin ceiling of this fuselage using 2 NEA insertion points in times between 1.8 to 3.1 minutes (plus system lag time)*.

• Inert atmosphere can be produced in a 22 foot section above the cabin ceiling of this fuselage using 4 NEA insertion points in times between 1 to 1.7 minutes (plus system lag time)*.

• Inert atmospheres can be produced with a wide variety of high nitrogen purity/low flow rate or low nitrogen purity/higher flow rates combinations*.

*Ground tests without aircraft ventilation system operating.
Future Plans

Project has been suspended due to higher priority testing requested. Testing will resume when resources are available.