Duct Sealants: The Low Hanging Fruit of Energy Savings
Agenda

• FEMP Ranking and duct leakage
• What is a duct sealant?
• How to identify good candidates for duct sealing
• Why seal? Examples
• Questions
### FEMP - New Technologies for the Federal Buildings - by Category & Rank

* See Ranking Criteria Tab

<table>
<thead>
<tr>
<th>Rank</th>
<th>Technology</th>
<th>Description</th>
<th>Overall Federal Building Energy Savings</th>
<th>Cost Effectiveness</th>
<th>Probability of Success</th>
<th>Weighted Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Condensing Boilers</td>
<td>Commercial boilers that are high efficiency due to their design to extract heat from flue gas moisture</td>
<td>5.0</td>
<td>3</td>
<td>4.5</td>
<td>86</td>
</tr>
<tr>
<td>6</td>
<td>Commercial ground source heat pumps</td>
<td>A ground source heat pump with loops feeding multiple packaged heat pumps and having a single ground source water loop. Unit capacity is typically 1-10 tons and may be utilized in an array of multiple units to serve a large load.</td>
<td>2.8</td>
<td>4</td>
<td>3.5</td>
<td>66</td>
</tr>
<tr>
<td>8</td>
<td>Duct Sealants</td>
<td>Aerosol sealant is injected into the duct work to seal leaks. Can save on heating, cooling and fan energy, depending on building.</td>
<td>1.6</td>
<td>5</td>
<td>4.3</td>
<td>63</td>
</tr>
<tr>
<td>13</td>
<td>Water Cooled Oil Free Magnetic Bearing Compressors</td>
<td>Magnetic bearing, oil free 60 to 80 ton chiller compressor (also 150 tons). Onboard VFD and micro processor. Also small, light, quiet, low startup draw.</td>
<td>1.0</td>
<td>4</td>
<td>5.0</td>
<td>54</td>
</tr>
</tbody>
</table>
FEMP Ranking and Duct Leakage

2 independent studies ➔ 100’s of buildings ➔ 1 conclusion

Light commercial duct leakage is typically 30% or more

75% of ducts leak 10-25%

Typical ductwork lose 25-40% of heating & a/c energy

New installed systems experience 10-30% of leakage
Good candidates for duct sealing

• “Good Candidates”
  - Large buildings: greater than 8k sq ft / 20T
  - High occupancy
  - High outside air
  - High static pressure
  - Older buildings
  - Dedicated exhausts (dorms, labs, multi-families)

• “Bad Candidates”
  - Opposite of good
  - Welded duct
  - Open ceilings
Facility: - High school with 460 students
    - 7 m/zone systems totaling 140 tons
Issues: - Energy savings
    - 15% initial leakage reported
Results: - 40% actual leakage
    - Payback of 3.3 years
Facility: - Main manufacturing facility
Issues:  - Energy savings during facility upgrade
         - No humidity allowed for dry pharma products
Results: - Reduced leakage from 2,424 to 77 CFM
         - $35,000 annual savings
         - Payback less than 1 year
Commercial Office Example (Tennessee)

Facility: - VAV system, 50 tons
Issues: - Energy savings
Results: - Payback of 4.3 years
Government Example (Washington)

County courthouse administration building

Issues:  
- Energy savings & comfort project
  - Replaced HVAC systems

Results:  
- Reduced leakage from 15,414 to 1,600 CFM
  - $3,500 savings; 4 year payback
  - Avoided cost and disruption of replacing ducts
Questions?