

2019

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 Ranking and Duct Leakage



FEMP - New Technologies for the Federal Buildings - by Category & Rank

* See Ranking Criteria Tab

HVAC			Ranking Criteria *			
Rank	Technology	Description	Overall Federal Building Energy Savings	Cost Effectiveness	Probability of Success	Weighted Score
2	Condensing Boilers	Commercial boilers that are high efficiency due to their design to extract heat from flue gas moisture	5.0	3	4.5	86
6	Commercial ground source heat pumps	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.	2.8	4	3.5	66
8	Duct Sealants	Aerosol sealant is injected into the duct work to seal leaks. Can save on heating, cooling and fan energy, depending on building.	1.6	5	4.3	63
13	Water Cooled Oil Free Magnetic Bearing Compressors	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.	1.0	4	5.0	54

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

School Example (Indiana)



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

Pharmaceutical Example (Puerto Rico)



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?