

2023 Tech Talk Panel Emerging Technology



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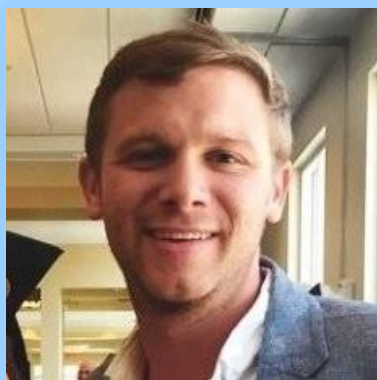
Presenters



Jim Castellano
ASCS, CVI



Frank Forrest



Matt Jackson
ASCS, CVI



David Monson
ASCS



Disclaimer

This presentation is not intended to be a comprehensive program covering all aspects of this topic. All technicians are encouraged to read and follow all applicable standards, codes and regulations related to this topic.

- ✓ It is the responsibility of each individual contractor to follow local building codes and licensing requirements and to work safely in accordance with OSHA guidelines.
- ✓ It is the contractor's responsibility to take proper precautions on each project to prevent cross contamination. Always take the health and safety of the building occupants into consideration before you conduct any cleaning procedures.
- ✓ All of the following tips are only general tips. They do not cover every situation and it is your responsibility to adapt these tips to the individual system you are working on.
- ✓ The Instructor is not responsible in any way for the work you perform after viewing this slide show. You are responsible for your own work.
- ✓ The views and opinions following are the instructors' opinions and not necessarily the official position of the National Air Duct Cleaners Association.



What We'll Learn

- Knowledge Really is Power?
- Liquid Nitrogen
- Reporting
- Don't Forget the Old Technology



Tech Talk
Emerging Tech

Knowledge Really is Power?



Tech Talk:
Emerging Tech,
Knowledge
Really is Power?

Knowledge can help you finish the job and educate an engineer!





Tech Talk: Emerging Tech, Knowledge Really is Power?

The Background

- **Building trying to achieve LEED Gold status.**
- **Airflow required by design 66K CFM.**
- **2 rooftop units capable of supplying 50K CFM each and running on VFDs.**
- **Both units running at 100%!**



Tech Talk: Emerging Tech, Knowledge Really is Power?

The Request

- Clean and seal the ductwork throughout the facility to achieve LEED Gold status.
- Secondly reduce the airflow into the building, rebalance, and save \$.
 - 33K CFM of LEAKAGE!!!!
- The engineer set an allowable leakage rate to meet in the job specification based on sound engineering principles.
- FYI – these principles do not take the amount of airflow into account.



Tech Talk:
Emerging Tech,
Knowledge
Really is Power?

The Call

- For one 75' run of duct:
 - Is 6 PAILS too much!
 - You mean 6 GALLONS, RIGHT?!!!!





Tech Talk: Emerging Tech, Knowledge Really is Power?

The Problem

System (or section) Surface Area
500 sq.ft.

Test Pressure
6.0 (in.wg.)

SMACNA Leakage Class*
4

Allowable leakage based on your input
is:
64.10
cfm

SMACNA Leakage Class Calculation

- A single 75' duct run example
- Allowable leakage uses:
 - Surface Area
 - Test Pressure (what the system SHOULD be running at)
 - And Leakage Class
- Target 64ish CFM



Tech Talk: Emerging Tech, Knowledge Really is Power?

The Solution

Duct System (or section) CFM:

4000 cfm

Percent Allowable Leakage:

1.9 %

Allowable leakage based on your input
is:

76.00

cfm

% Allowable Leakage Calculation

- **4,000 CFM running through this 75' duct run**
- **Contractor tried and tried and could get down to 76 CFM**
- **This was less than 2% of airflow!**



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Liquid Nitrogen



Tech Talk: Emerging Tech Liquid Nitrogen

Liquid Nitrogen

• ADVANTAGES

- Mobility
- Building access
- Constant pressure

• DISADVANTAGES

- Safety concerns
- Price
- Reliability*



Tech Talk: Emerging Tech Liquid Nitrogen

Liquid Nitrogen

USE CASES

- Commercial buildings with limited access:
 - Hospitals
 - Urban environments (high/mid-rise)
 - Jails
 - Manufacturing facilities
- Better solutions for residential environments:
 - Gas compressor
 - Electric compressor



Tech Talk: Emerging Tech Liquid Nitrogen

Liquid Nitrogen

SAFETY

- Transportation
 - Liquid nitrogen tanks are HEAVY.
 - Review local regulations regarding the transportation of hazardous materials.
- Displaces oxygen = risk of inhalation and asphyxiation
- Block liquid valve
 - Hook regulator into gas phase, NOT LIQUID.
- PPE: gloves, goggles, long sleeves



Tech Talk: Emerging Tech Liquid Nitrogen

Liquid Nitrogen

TIPS

- High flow regulator
 - 25 cubic feet per minute at 150 psi
 - CONNECT TO GAS PHASE OUTLET
- LIQUID NITROGEN
 - Not gaseous nitrogen
- Dolly
 - Allows ease of movement



Tech Talk: Emerging Tech Liquid Nitrogen

The Solution

- Contractor called the engineer
 - You required Allowable Leakage: 64 ish CFM
 - System sealed with leakage at 76 ish CFM
- That is Less Than 2% of the airflow!
- Engineer changed the job specification immediately



Tech Talk
Emerging Tech

Reporting



Ceiling supply vent

Filth on supply register

Jim Castellano
8/15/2023, 10:57am



Ceiling supply vent

Dirt, dust and debris

Jim Castellano
8/15/2023, 10:57am



Impacted coil

Completely impacted coil with growth and debris

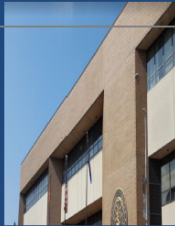
June 28- July 2, 2021

Hempstead
District Court
House

Cleaning of Air Conveyance Systems-
NADCA National Air Duct Cleaners Association



30 Main Street
Hempstead, NY



Prepared for

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NY

Better Air Quality, NY

Jim Castellano

Middle Island,

File Information

Name: **West Center Department Office Work Management**

Attention: **William Adams, Richard Lombardi,
Jeffrey Harris, James McFadden**

Address: **West Center Department Park East Middle Island 11953**
Phone: **631-379-8282**

Outlet Information

Project Type: **Air Conveyance Cleaning**
Project Location: **Hempstead District Court House**
Service Dates: **June 28, 29, 30, July 1, 2, 2021**

Contractor Information

Better Air Representative: **Jim Castellano, ASCS, VSMR, CMR, COF**
Telephone: **(631) 379-8282**
ASCS on site: **Jim Castellano**

Twelfth Week of cleaning. Report received from [redacted]

Monday (5) Techs on site. West center hallway cleaning all HD & CD supply ducts, return ducts [redacted] return vents in ceiling and diffusers.

Tuesday (6) Techs on site. Worked in DA's, completed cleaning return duct on over west offices and south offices. Also cleaned all branch lines, HD & CD supply lines in secretary pool section, main entrance, RG, in all west offices and SW offices.

Wednesday (7) Techs on site. They started in SE hallway on HD & CD main lines all branch lines also completed SW hallway.

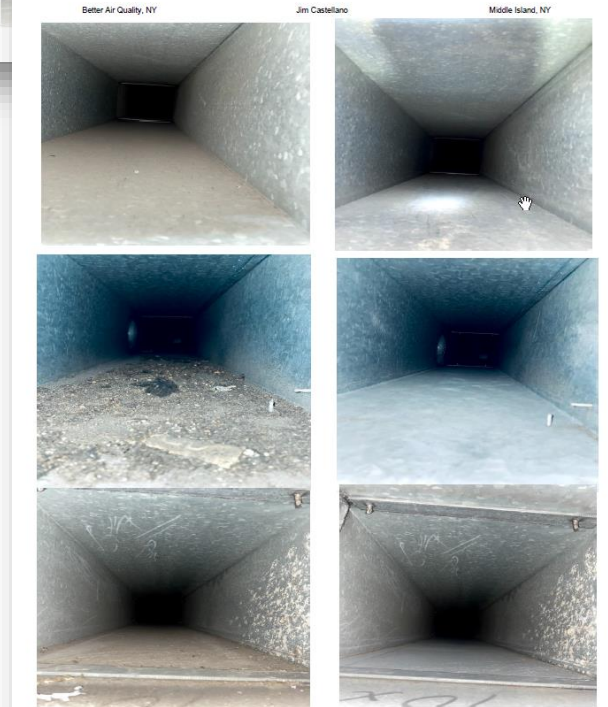
Thursday (7) Techs on site. [redacted] RG, return vents in ceiling, diffusers, all branch lines HD & CD supply lines

Friday (6) Techs on site. [redacted] RG, return vents in ceiling, diffusers, branch lines and HD & CD supply lines.

BAQ Better Air Quality



BAQ Better Air Quality



BAQ Better Air Quality



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But Don't Forget the
Old Technology!



Tech Talk:
Emerging Tech,
But Don't Forget
the Old

There are always problems to be solved on a jobsite.

- **Sometimes we possess the tech to solve the problem.**
- **Sometimes we call associates for new ideas and obtain new tech.**
- **But sometimes new tech just doesn't have the solution. Don't forget the past.**



Tech Talk: Emerging Tech, But Don't Forget the Old

The Problem



- A 4' diameter outside air intake duct 120' long that needs to be cleaned.
- It is 10' away from the catwalk in the penthouse.
- We are looking down on the top of the plaster ceiling below.



Tech Talk: Emerging Tech, But Don't Forget the Old

What We Can't Do...



- **Someone before us had attempted to work out over that ceiling...**
- **It was pretty obvious that didn't work out so good...**



Tech Talk:
Emerging Tech,
But Don't Forget
the Old

What's a Duct Cleaning Technician to Do?



- Check out how substantially that duct is supported in the structure.

Tech Talk:
Emerging Tech,
But Don't Forget
the Old

Then Crawl Right In (Just Like In The Spy Movies)



- Quintessential air duct cleaning, agitation and sweeping.
- Air hose and hand brush
- Total elapsed time: 1 hour, 15 minutes for 120 feet.



Tech Talk
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Q&A

You have

Questions

We have

Answers



Tech Talk: Emerging Tech

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Thank you
for
Participating!

