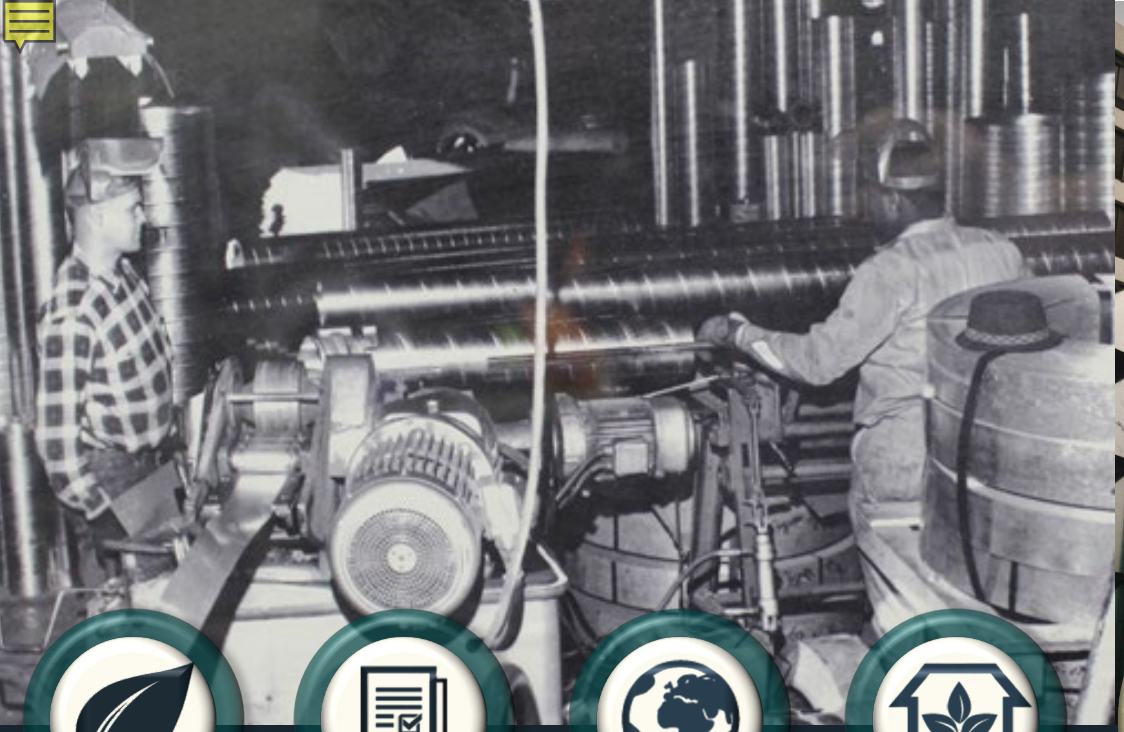
FLÄKTGROUP SEMCO:

FUSION WHEEL & FUSION 3Å

Corporate Overview

FläktGroup
SEMCO



Energy & Environmental Focus

Patented & Certified Products

U.S & Global Footprint

Engineered Air Quality & Data Center Solutions

Engineered Air Distribution & Sound Solutions

OEM, Key Account & Sales Rep Route To Market

Service & Support

Award Winning & Industry Recognized

Who we are & what we do

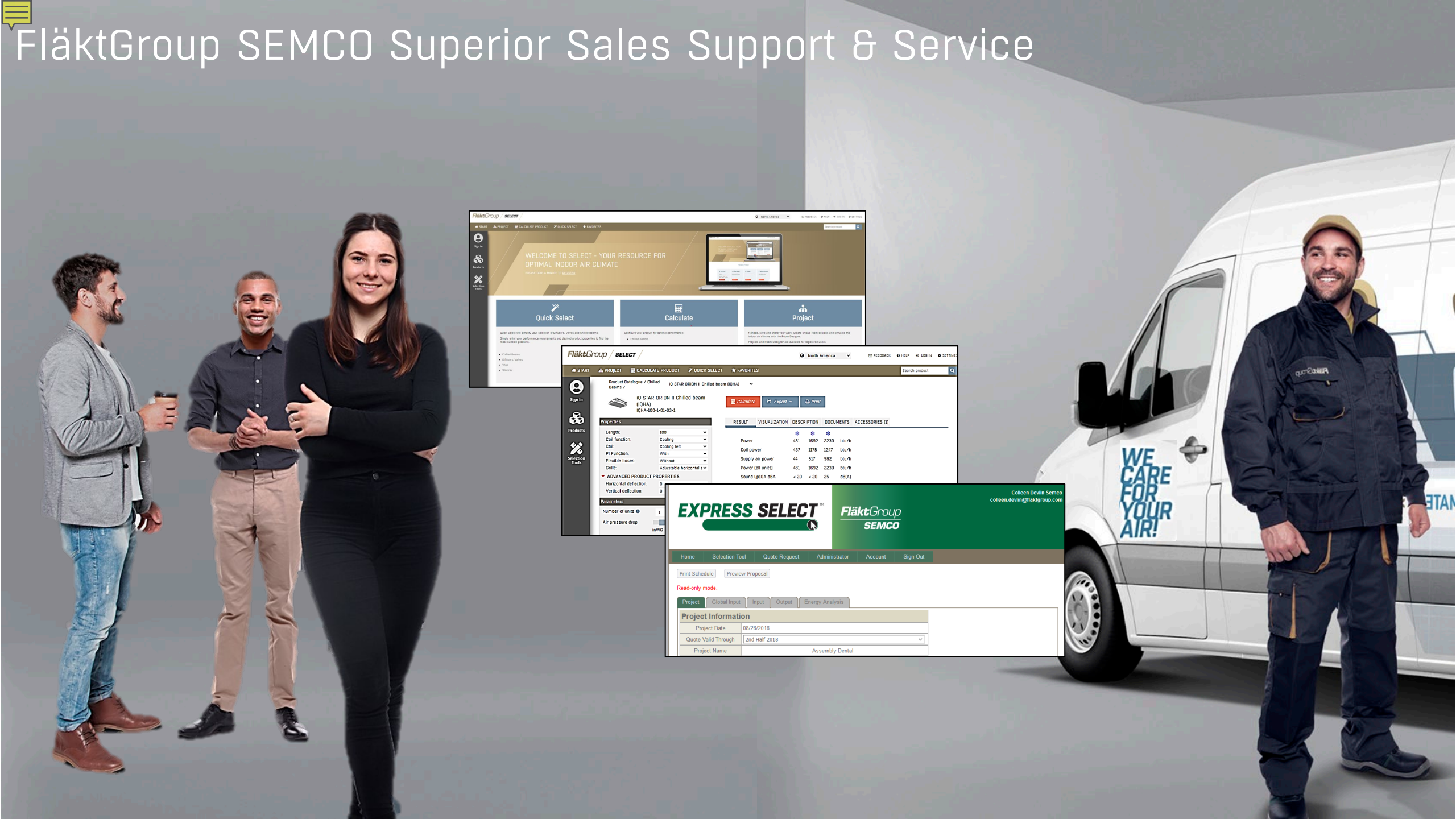
FläktGroup
SEMCO

FläktGroup SEMCO Products For Commercial Applications

FläktGroup SEMCO — SPECIALIZED HEALTHY AIR SOLUTIONS

EXCELLENCE IN SOLUTIONS

FläktGroup SEMCO Superior Sales Support & Service

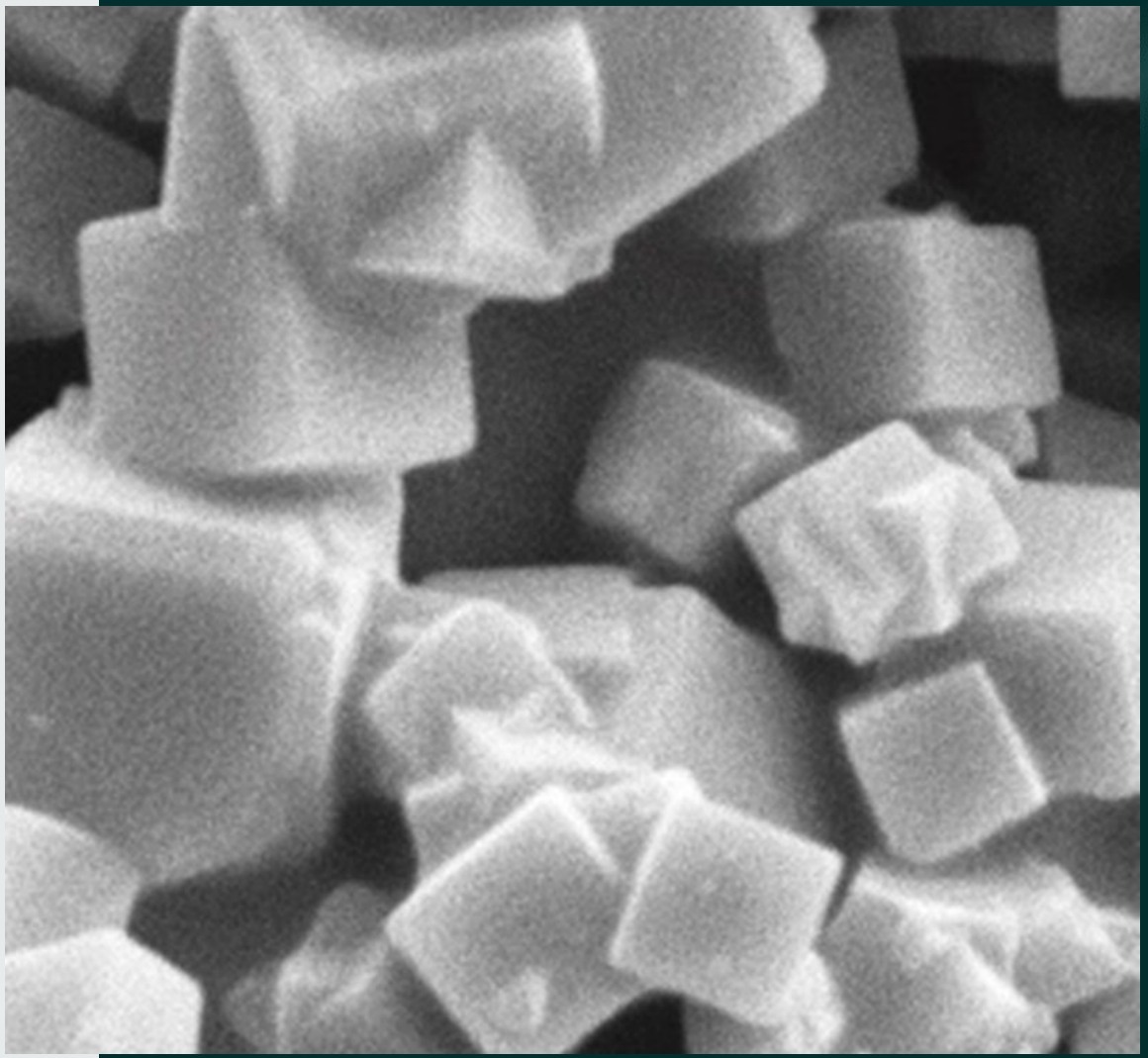


FläktGroup SEMCO Fusion & Fusion 3Å

- Sensible & latent energy transfer
- Substantially reduces the initial cost of the newly installed energy recovery system and its reliance on the cooling & heating plant.
- High latent transfer efficiencies allow for full recovery even in low outdoor temperatures without frosting . (i.e. -10°F with return air humidity at 20% relative humidity)
- Recovers temperature and humidity during both heating and cooling seasons.
- Saves up to 80% of the heating & cooling loads associated with outside air.
- Expected life greater than 20 years.

Surface & Coating

- Solid adsorbent layer allows for equal transfer of latent and sensible energy.
- 3Å / composite desiccant surface limits the transfer of contaminants.
- Acid resistant face coating for critical applications and seaside environments.
- Anti-stick face coating limits the buildup of particulate, simplifies cleaning.
- Anti-microbial face coating and media properties.



Electron microscopic image of a 3Å molecular sieve

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Coating Process Key to Performance

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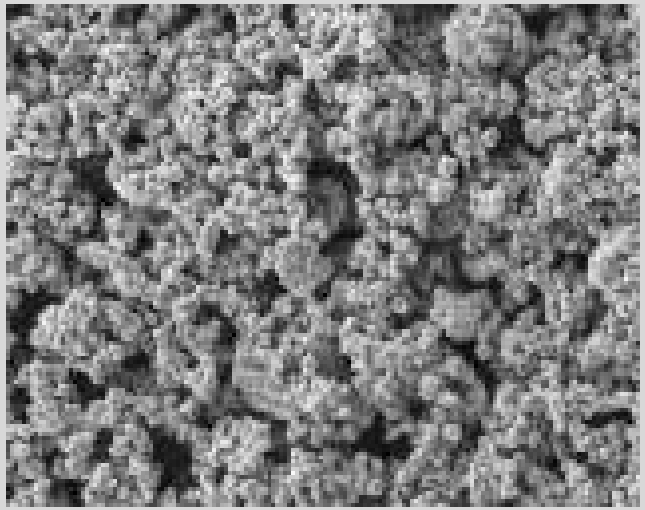
FläktGroup SEMCO: Uniform Coating

- Provides a uniform desiccant layer.
- Latent capacity is maximized (equal to sensible).
- Dense composite desiccant layer maximizes corrosion resistance.

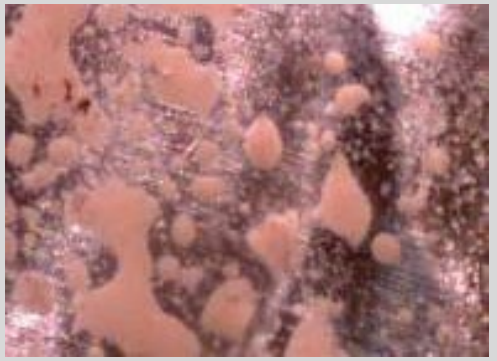


FläktGroup Semco uniform coating

WHEEL COATING

Competitors: Dipped Coating

- Dipping wheels after forming saves cost, but results in low latent performance and significant corrosion.
- If the wheel oxidizes, the rough surface will transfer contaminants regardless of the desiccant used.
- Poor coating causes greatly reduced latent performance.
- Increased potential for condensation.



Competitors dipped coating

Large Fluted Media Minimizes Buildup

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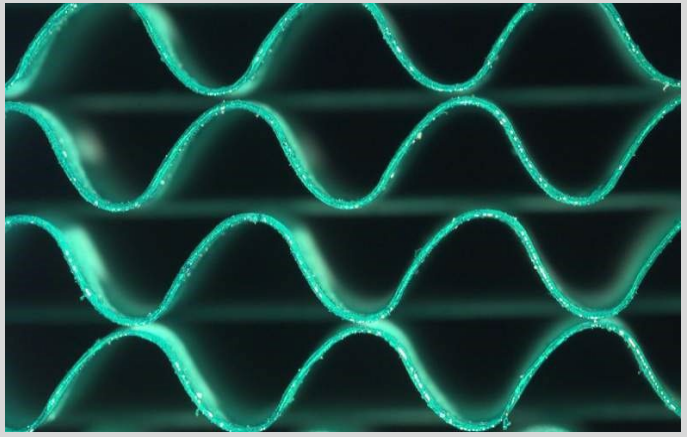
FläktGroup SEMCO: Large Flutes Without Plugging

- Flute spacing is larger than competitors.
- Alternating flat and corrugated layers maintains consistent flute sizing.
- A 600-micron pass allows MERV 8 filtration to be more than adequate to prevent plugging.
- Some applications have removed exhaust filters without plugging.



FläktGroup Semco large flutes (10x magnification)

WHEEL FLUTES

Competitors: Smaller Flutes With Plugging

- Some competitor's wheels require MERV 13 filters to prevent plugging.
- Pressure drop is very high.
- Some state "when pressure drop is 150% of new, clean the wheel."

Competitor's small flutes with plugging

Acid Resistant Face Coating

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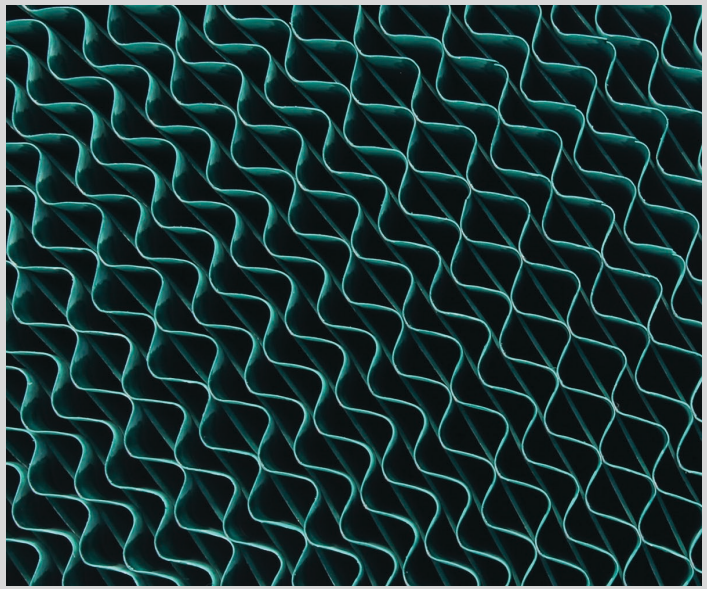
FläktGroup SEMCO: Corrosion-Resistant Face Coating

- Wheel surface is coated to prevent corrosion.
- This face coating is essential for seaside environments.
- As shown in the picture on the lower right, without this coating the recovery wheel can oxidize/corrode causing a significant increase in pressure loss, contaminant carry-over.



Surface with FläktGroup Semco face coating

ACID RESISTANT FACE COATING

Competitors: No Face Coating

- Without corrosion resistance, oxidation can form.
- Oxidation can adsorb and cross-contaminate.
- Pressure will increase, and wheel may delaminate.

Corroded surface –no face coating

Corrosion Resistance Testing

Molecular sieve media with face coating was determined to be **150 times more corrosion resistant** than plain aluminum based on the ASTM test method (muratic acid/high humidity)

Plain Aluminum Foil
Muratic acid test PH of 0, high humidity chamber, 80°F
3-month period, samples ½" over liquid surface,

FläktGroup Semco Wheel Surface in Lab With Edge Coating
Current 3Å coated foil (with Roymal edge coat)
muratic acid test PH of 0, high humidity chamber 80°F
3-month period, samples ½" over liquid surface

(See technical report entitled "Corrosion Resistance of the FläktGroup Semco Energy Wheel" for more information)

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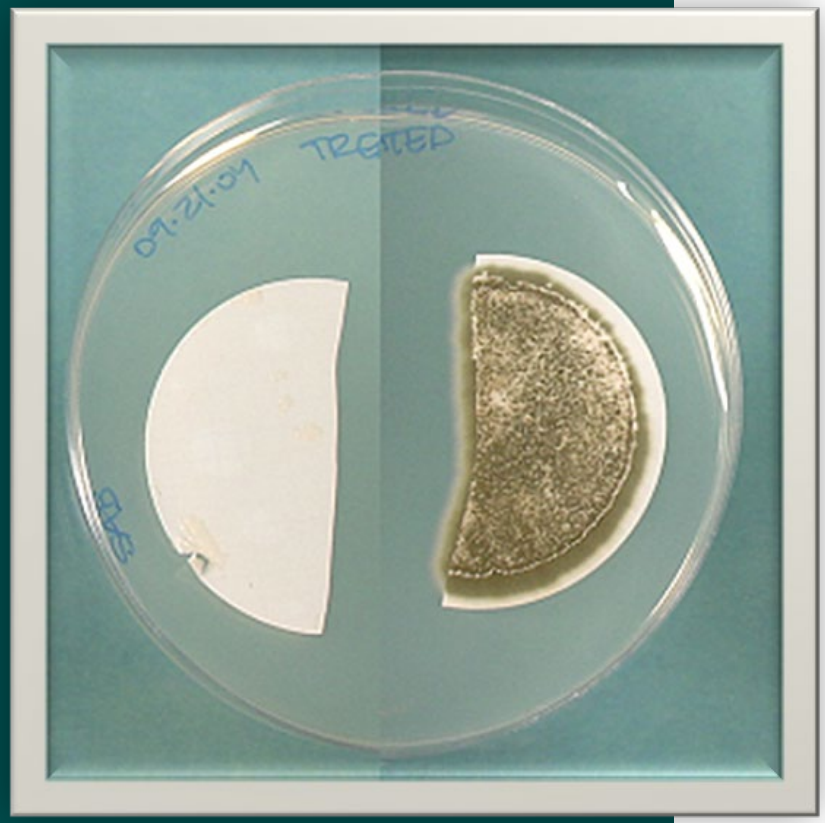
Anti-Microbial Face Coating



Aluminum wheel media with and without FläktGroup Semco anti-microbial face coating additive.

- EPA- approved active anti-microbial coating is a standard feature on 3Å Fusion wheels.
- FläktGroup Semco has developed an effective anti-microbial face coating additive which has been shown to be very effective as supported by independent test data.
- The TE 3Å molecular sieve surface has also been shown to have unique properties that will not support the growth of micro-organisms.
- This feature is beneficial for all projects, but especially important for hygienic applications like hospitals and research laboratories

Anti-Stick Face Coating

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Developed for casino applications to greatly reduce time to clean wheels (if needed).

Tobacco build-up on a wheel surface with anti-stick coating face additive.

Tobacco build-up on a wheel surface without anti-stick coating face additive.

Silica Gel is Widely Used on Enthalpy Wheels

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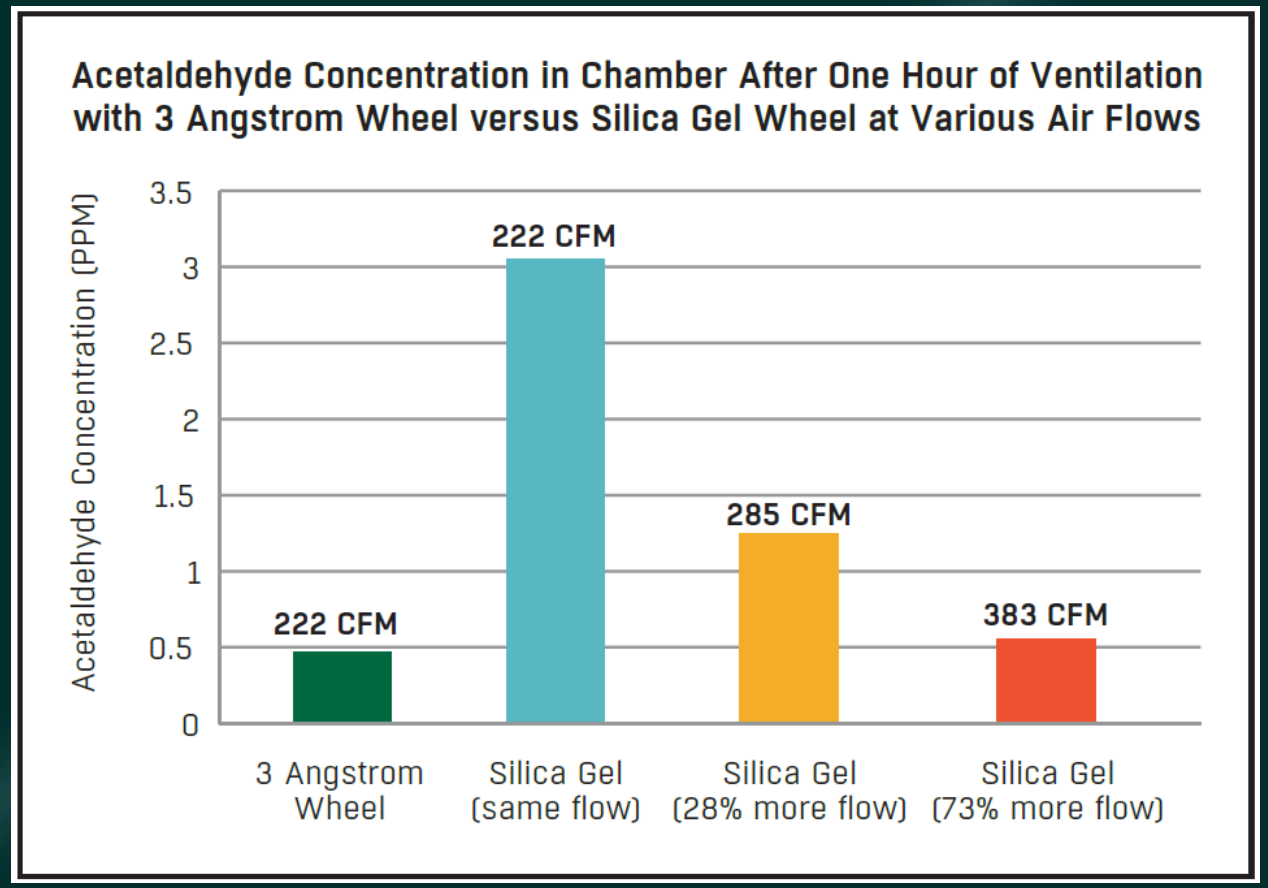
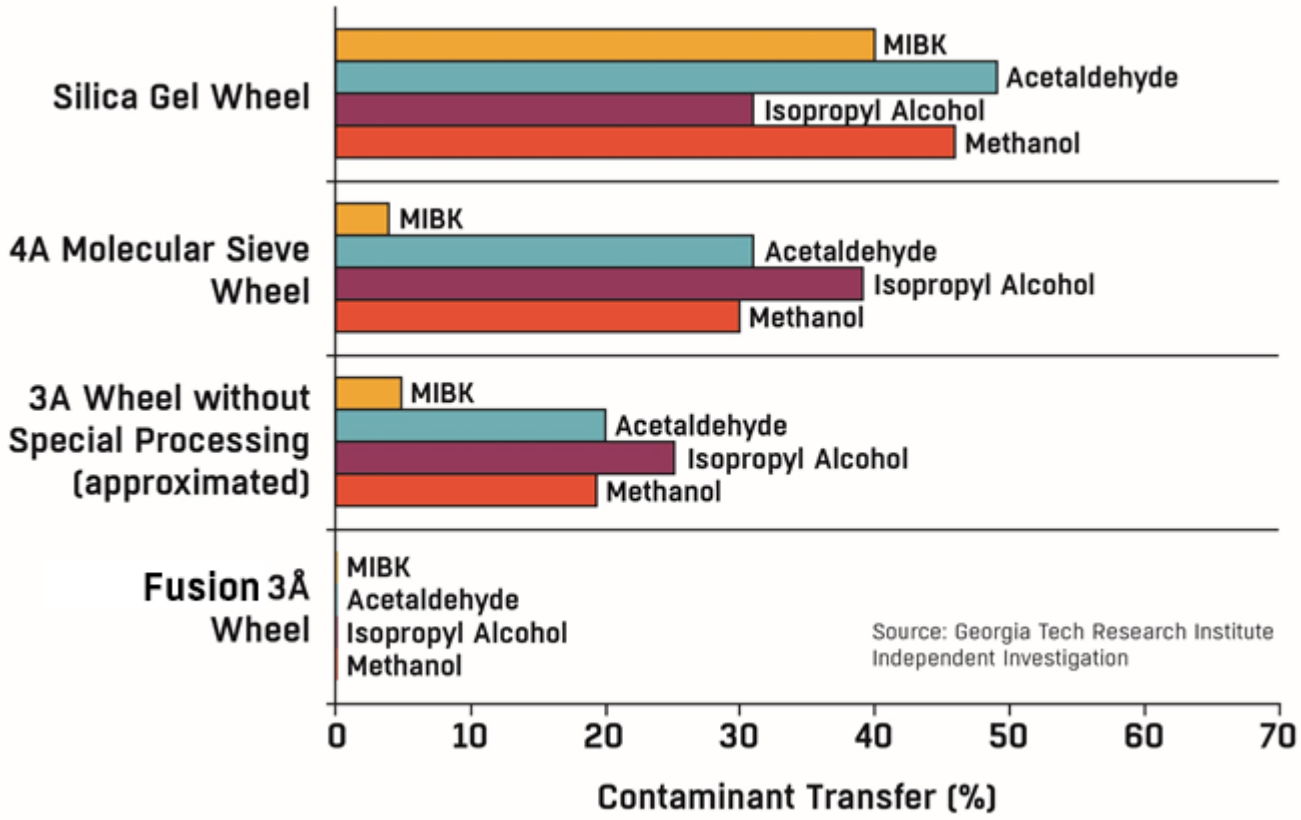
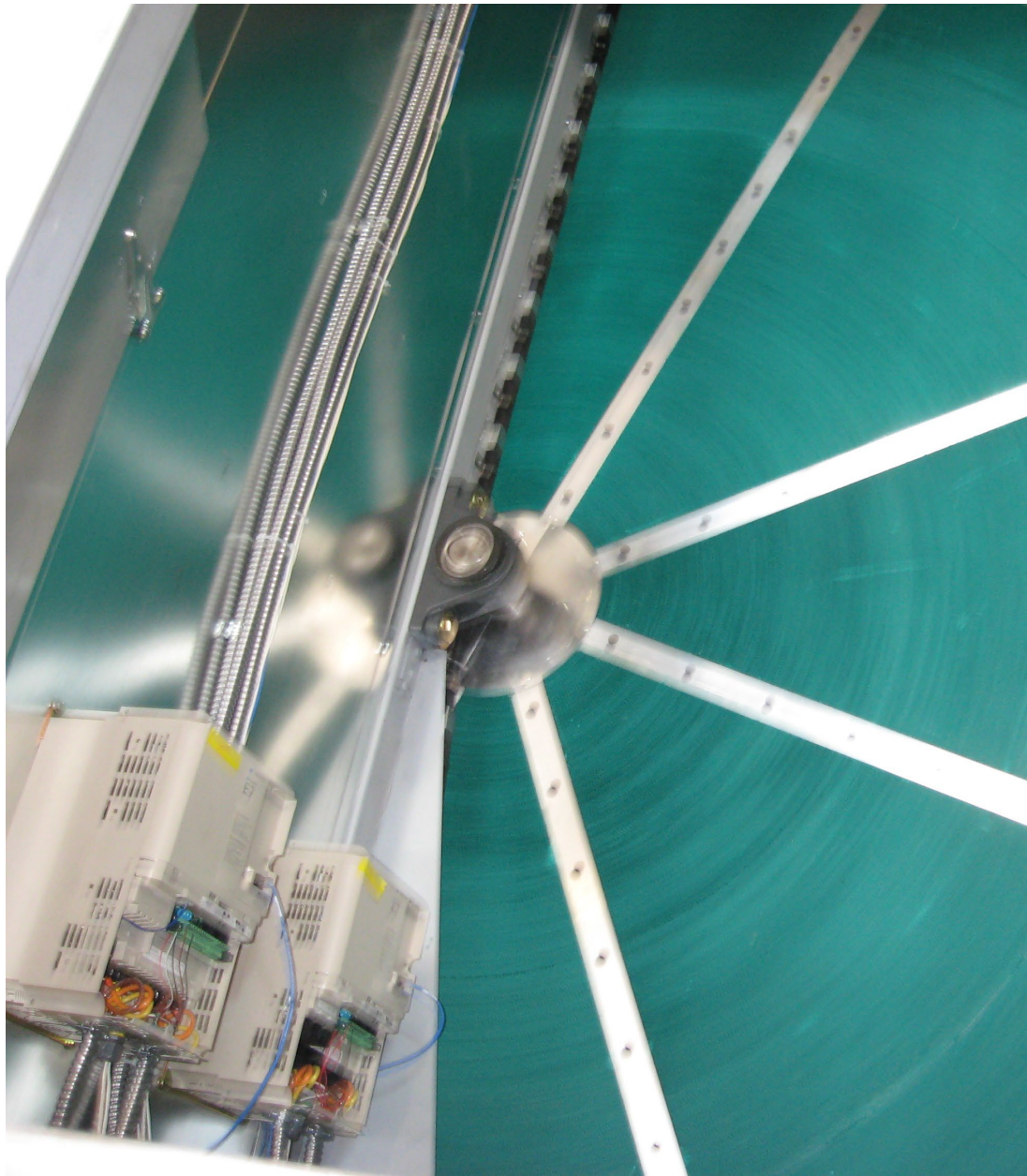
Independent research confirms
silica gel wheels require 72% more air
to deliver the same indoor air quality
as a FläktGroup SEMCO Fusion 3Å wheel.



Desiccants and Cross Contamination Levels

FläktGroup SEMCO pioneered an application of 3Å desiccant to improve indoor air quality in buildings by not transferring exhausted VOCs back into the fresh outdoor air.





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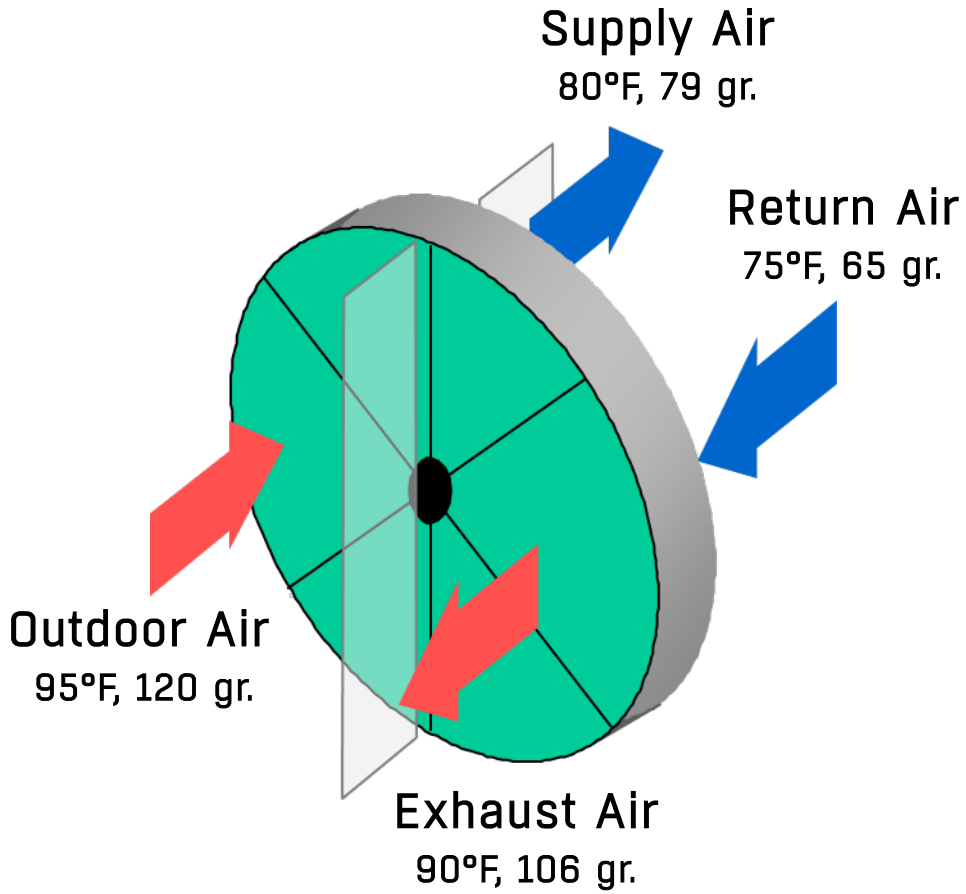
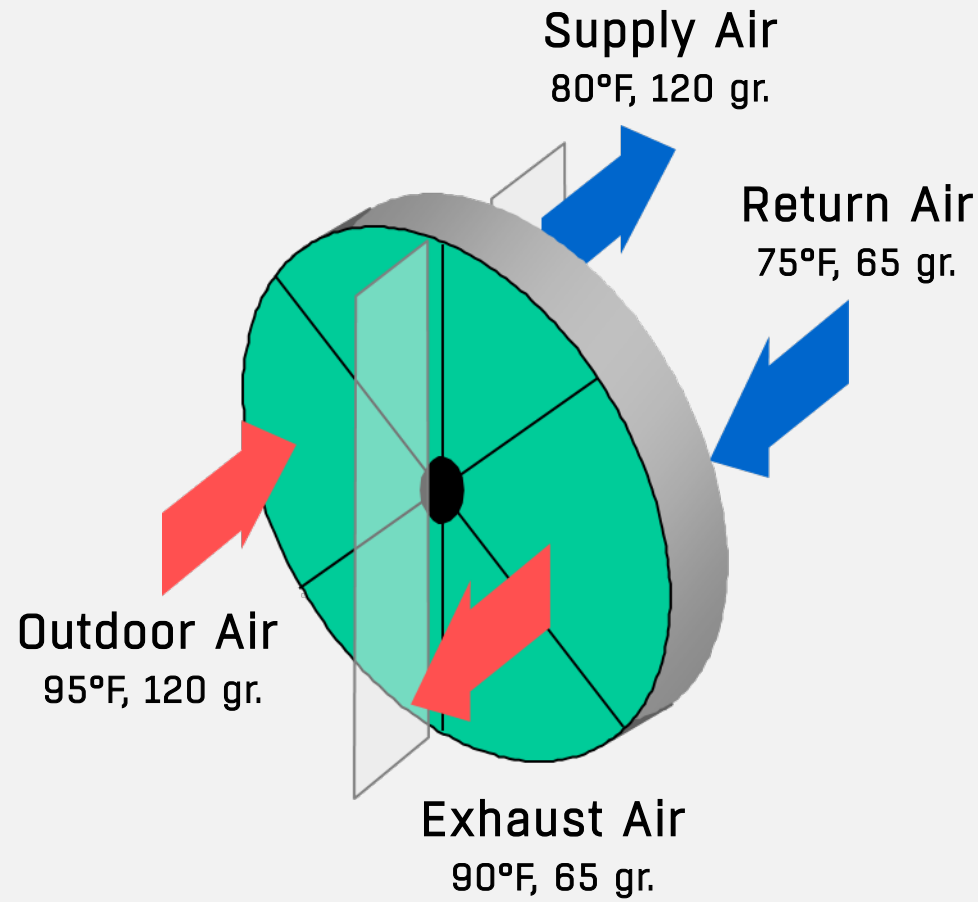
Total Recovery
(temperature & humidity)

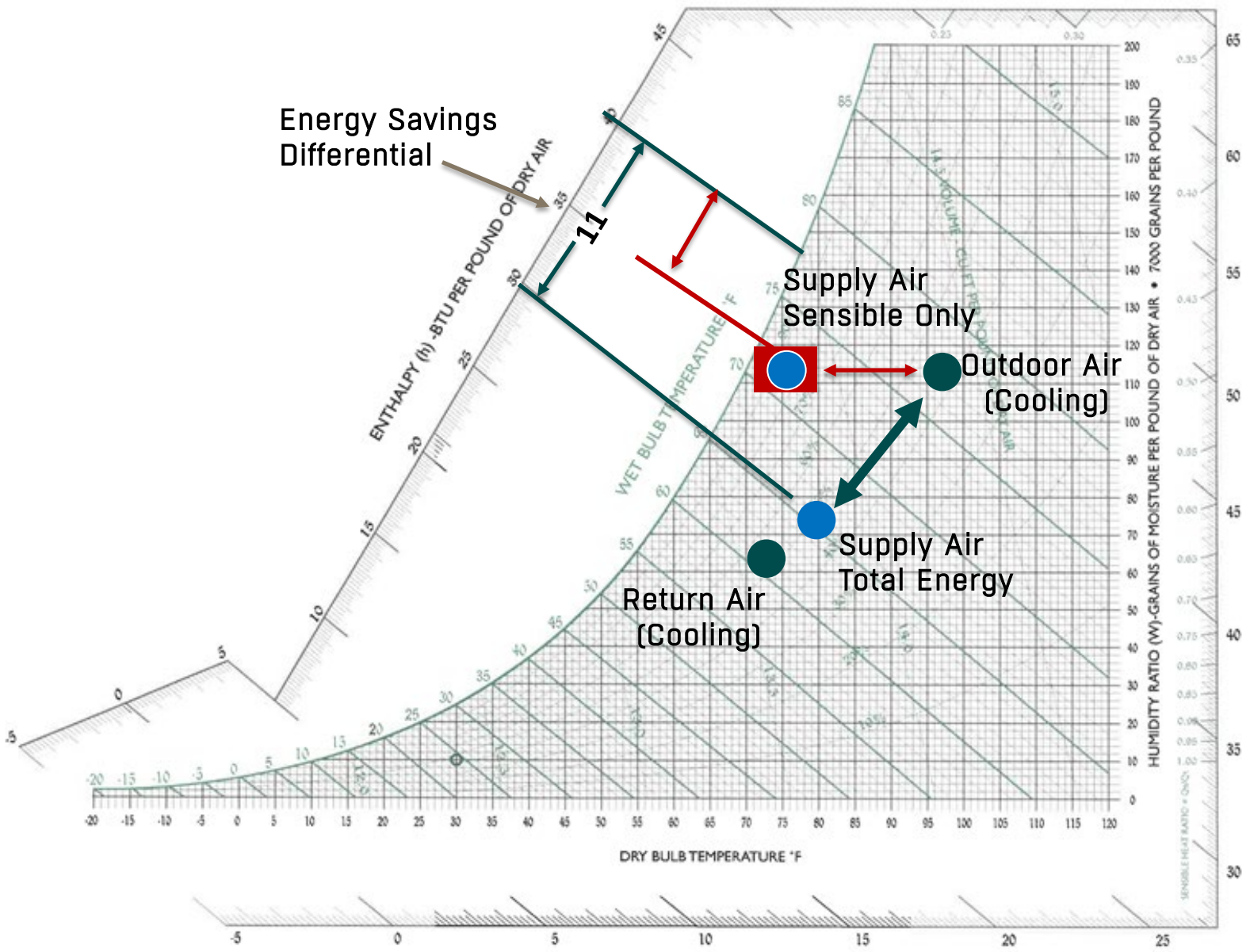


Sensible Recovery
(temperature only)



Enthalpy vs. Sensible: Cooling Season

Total energy saves 175% more energy and allows for a substantial reduction in the required cooling capacity(chiller, tower, etc.).



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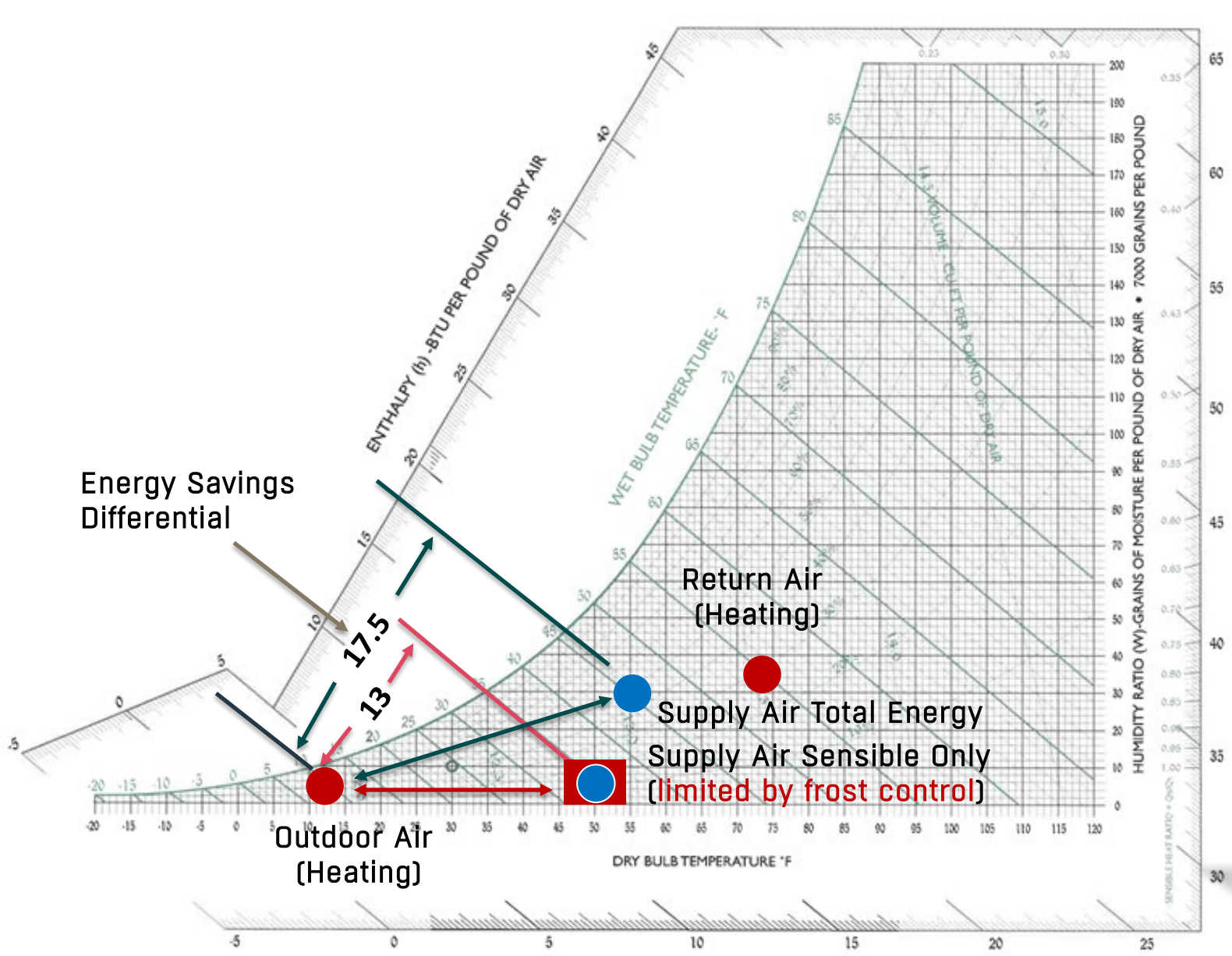
Enthalpy vs. Sensible: Heating Season



Total energy saves 35% more energy and avoids the frost derate on the coldest days. Avoiding frost Is why total energy should be used in dry, cold climates like Denver.

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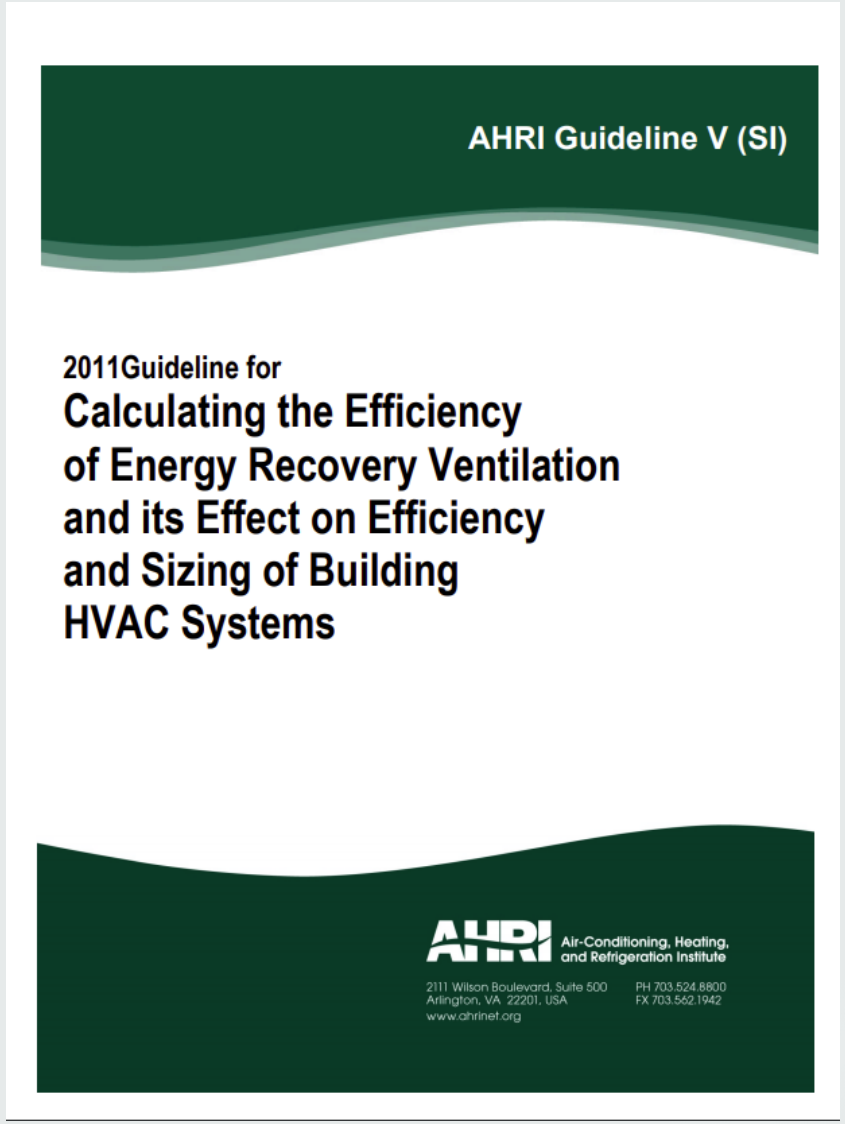
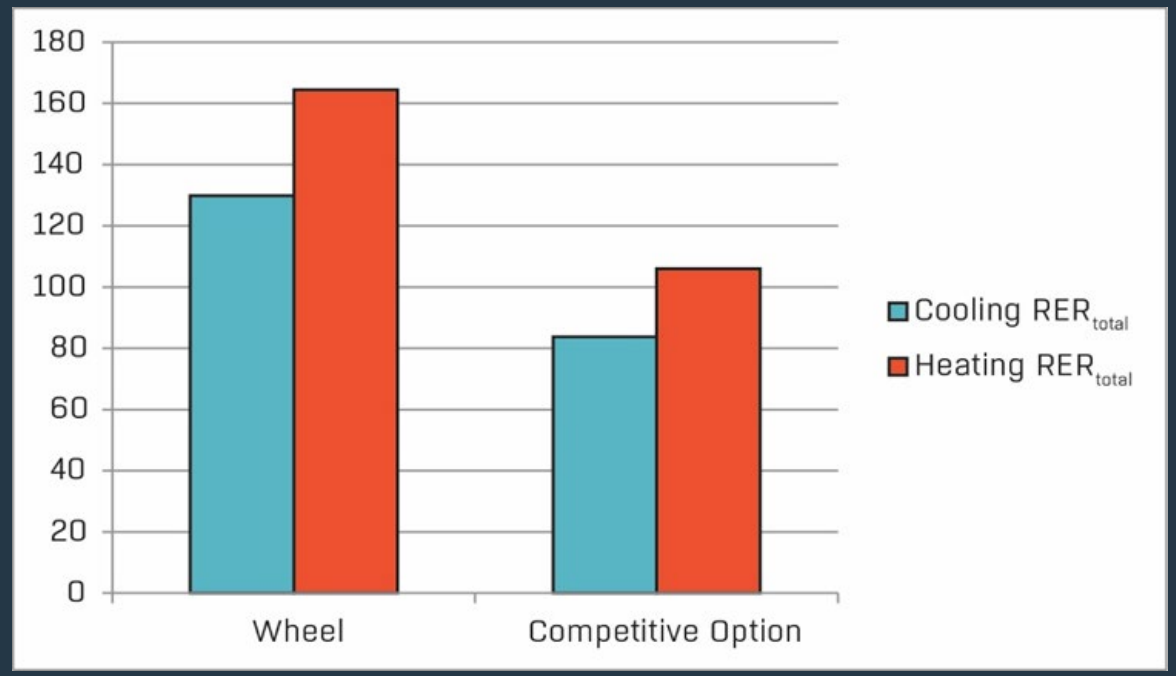
AHRI Guidline V — Recovery Efficiency Ratio (RER)



- A metric developed to report: “recovered energy divided by the power used to recover that energy.”
- Can be used as a method to compare energy recovery devices.
- Reflects the impact of pressure loss (fan power) and wheel drive power.
- RER_{total} reflects total recovery at cooling or heating design conditions, expressed in BTUs/Watts.
- **A higher RER value reflects a more efficient overall system design.**

Sample RER Comparative



Plant Capacity Savings	Wheel	Competitive Option
Total Effectiveness	73.30%	77.30%
Supply Air Pressure Loss	0.63 inwg	1.04 inwg
Return Air Pressure Loss	0.56 inwg	0.96 inwg
RER_{total} Comparison	Wheel	Competitive Option
Cooling RER_{total}	129.8	83.7
Heating RER_{total}	164.4	106

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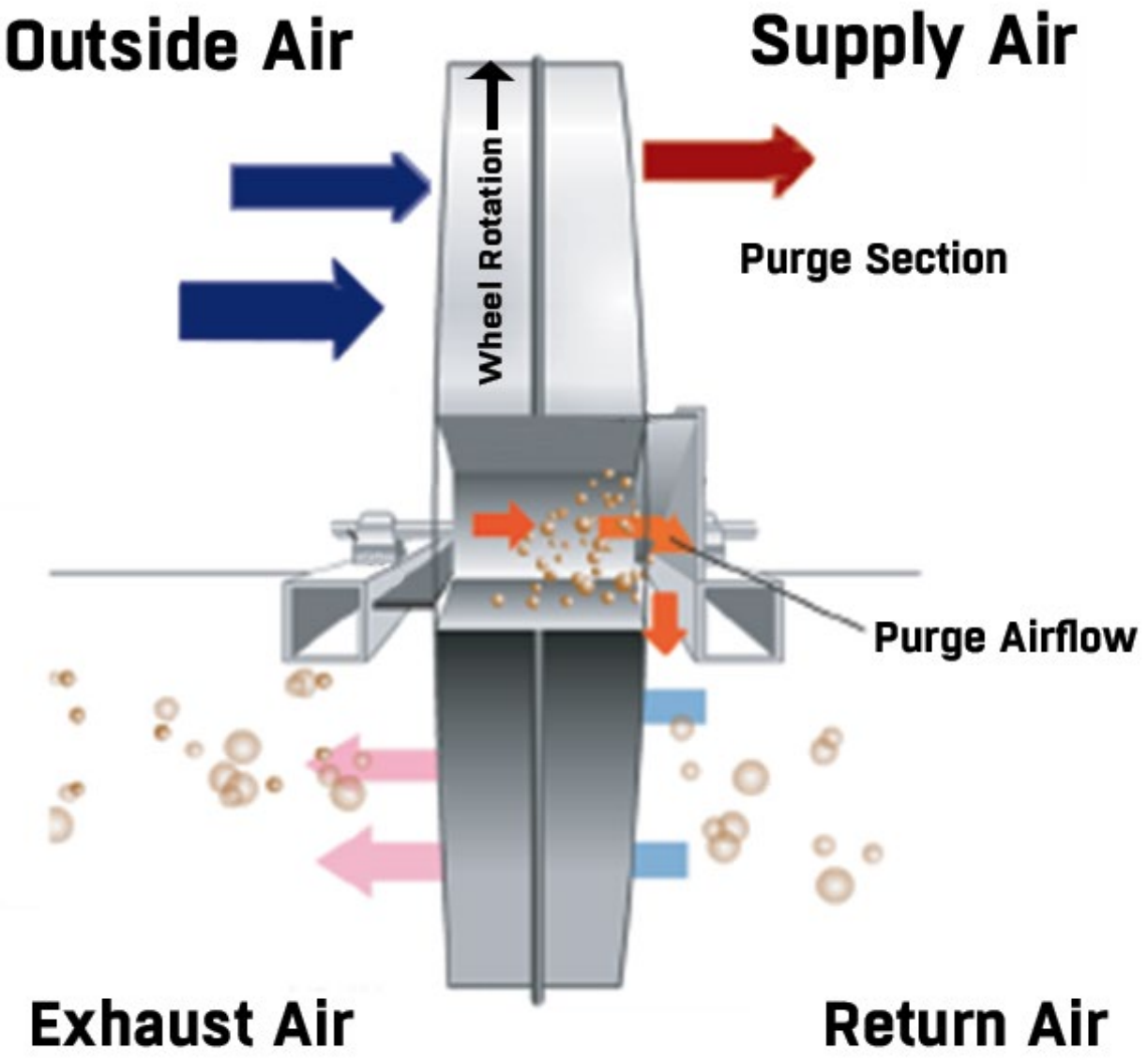
VAV Application — Purge Impact

Purge Calculation
- Depth of wheel
- Rotational speed
- Pressure differential (OA-RA)

High Pressure
- Most efficient purge
- Highest rotational speed
- Smallest angle

Low Pressure
- Least efficient purge
- Requires larger angle



Health and Safety Monitor: Installed

Temperature and humidity sensors

Health and Safety Monitor panel with LED display and remote communications/trending capability

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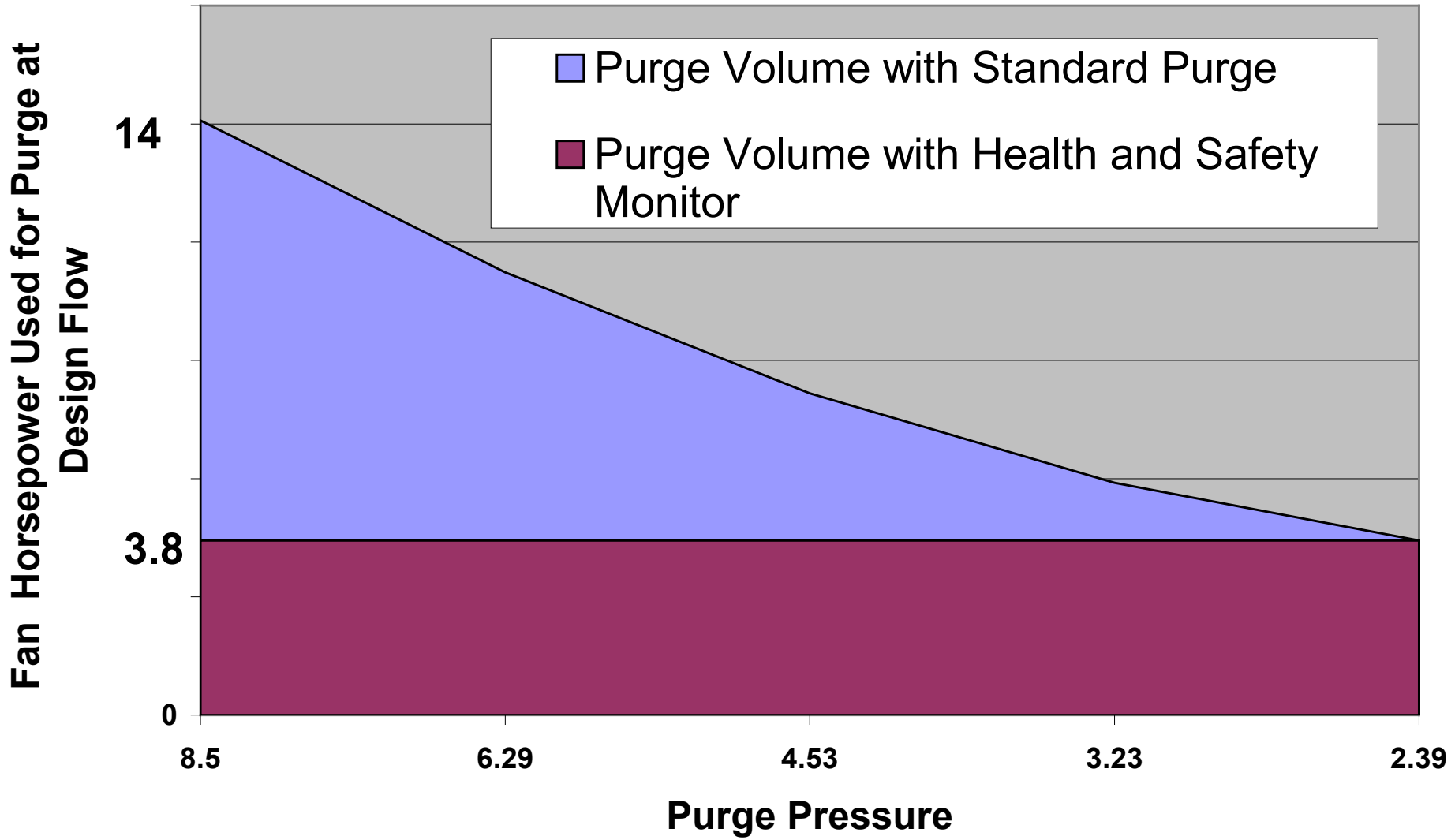
Energy Impact From Over Purging — Benefit of HSM

Example: 26,000 CFM system airflow, 10’ diameter wheel, 10.5” deep, 20 rpm



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Thank you for your attention!