



FABRICAIR® DEFROST DUCTS™

- Significantly reduce defrosting time to increase the efficiency of your cold storage air coolers



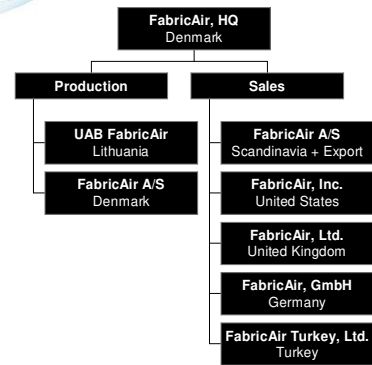
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FABRICAIR

- ✓ Established 1973
- ✓ Represented worldwide
- ✓ State of the art production
- ✓ UPS freight anywhere in the world



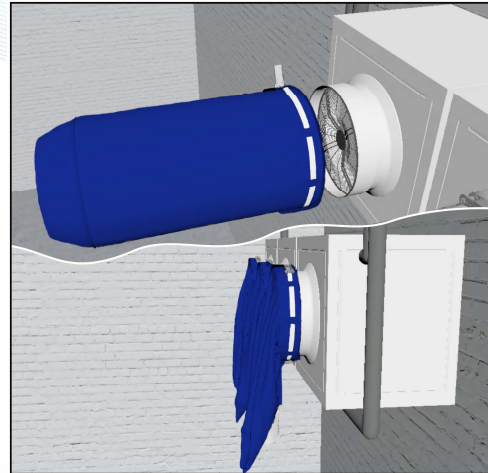
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- Danish Headquarters -Representation worldwide
- operation for 45 years to master art and science of
- Non-metal air distribution and dispersion solutions
- We have the most advanced production system in the industry
- ...continuously auditing and improving

TODAYS PRESENTATION

- ✓ What is a Defrost Duct?
- ✓ How does it work?
- ✓ Why should you use it?



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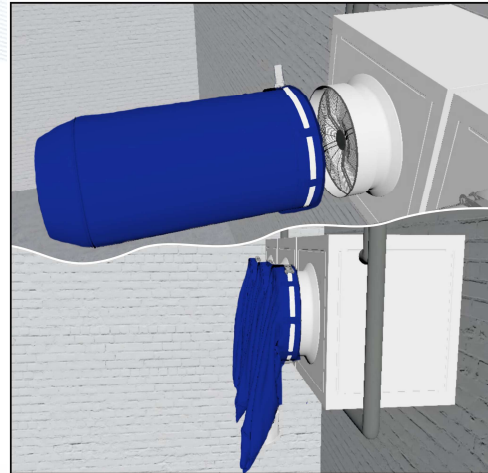
Presentation today focuses on The FabricAir Defrost Duct,
Answer 3 questions

-Unique product for us

- Not air dispersion device,
- primary function is preventing air movement
- Defrost Duct is an accessory for cold storage evaporator units:
 - Purpose is to increase the efficiency of the unit defrost cycle,
 - Works to keep defrost heat inside the unit
 - Pays for itself in a few months

■ EVAP UNITS AND DEFROST CYCLE

- ✓ Defrost cycle 3-4 times/day
- ✓ Typically 30-45 min
- ✓ Heat leaks out!!



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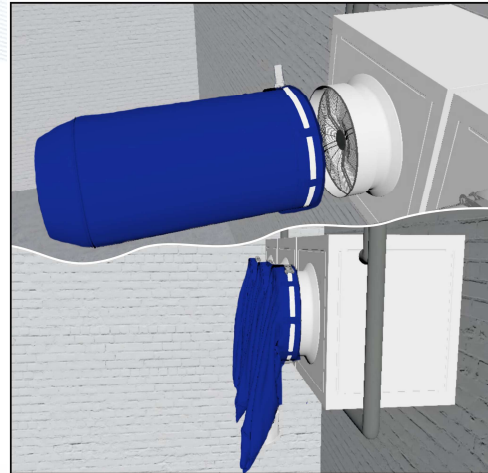
- During normal operation, ice builds up on the Evaporator unit coils.
 - Typically, a unit will defrost 3-4 times a day, for 30-45 minutes.
 - The most common method for defrost is to apply electric heat to the coils. The heat is applied until all ice is melted. At this point the coils are typically 100-120deg F.

In an ideal world, all this heat would stay in the unit, but in reality, much of this heat leaks out of the unit and into the freezer.

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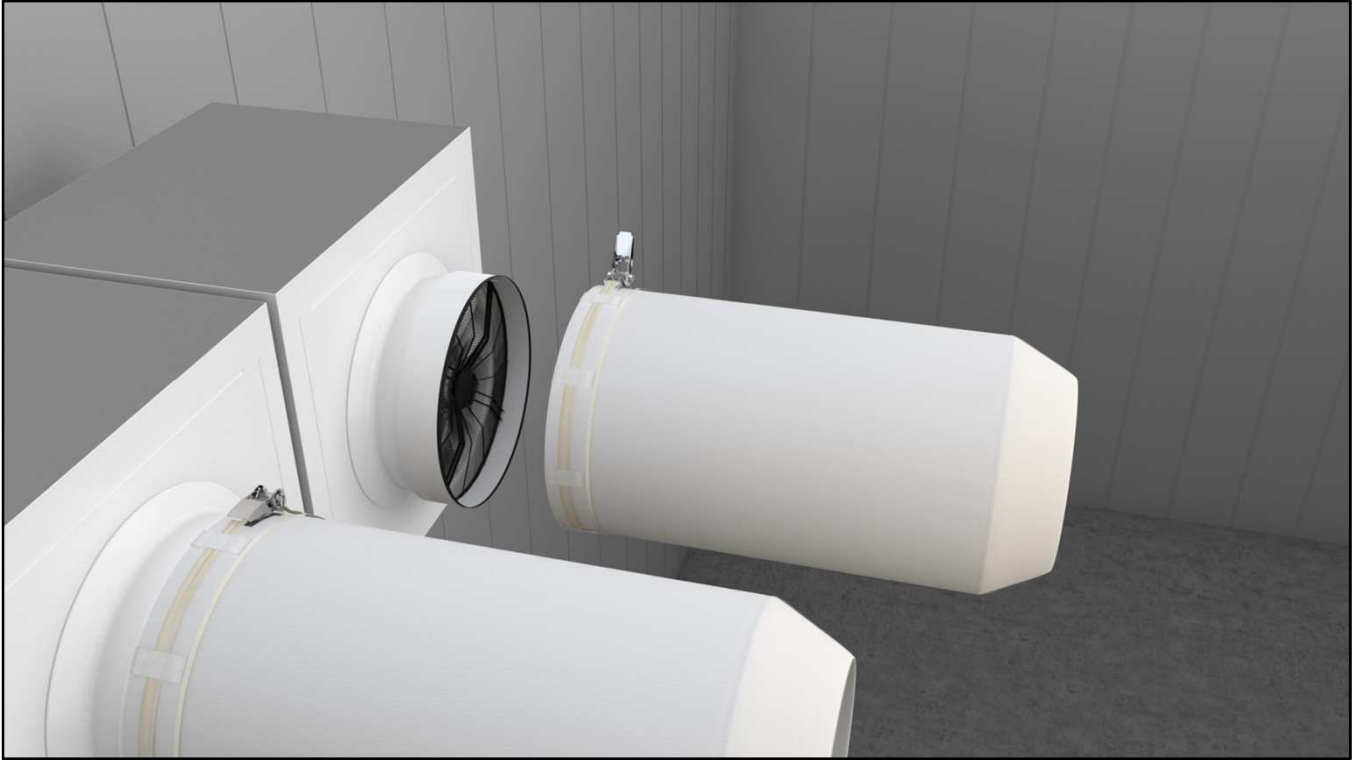
OUR GOALS

- ✓ Increase defrost efficiency
- ✓ Decrease temperature fluctuation in refrigerated space
- ✓ Have as little effect on cooling cycle as possible



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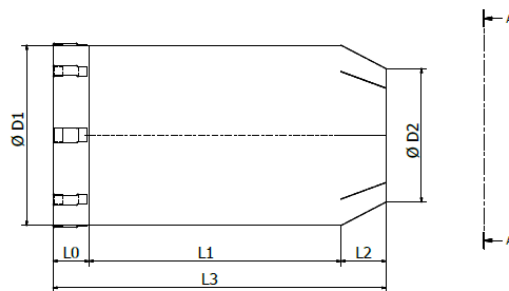
- 1) Increase efficiency:
 - keep heat inside
 - makes cycle shorter cuts time in half
- 2) Decrease temp fluctuation: Evap unit can spend less time heating, more time cooling
 - Results: better for your product
- 3) Little effect on cooling cycle as possible:
 - Designed for minimal restriction of airflow
 - lowest pressure drop... Fabric selection, construction
 - Lightweight, water repellant



integrated duct band, stainless steel
Normal operation, duct is inflated
Coils ice over, fans stop, duct deflates
Heat applied to coils
Unit with our product finishes its heating cycle faster
Unit without leaks heat into the room
can take twice as long to complete...

FABRICAIR® DEFROST DUCTS™

Ø [In]	L0 [In]	L3 [In]
10	4	20.6
12	4	23.7
16	4	30.5
20	4	37
24	4	43.6
28	4	50.7
32	4	57.2
36	4	63.7
40	4	70.5
44	4	76.8
48	4	83.3



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Standard Diameters for units
Length is ~2 diameters

FABRICAIR® DEFROST DUCTS™

✓ Flame Retardancy

- EN-13501-1:2009 - B-s1,d0
- GB 8624 - B-s1,d0,t1

✓ Additional Approvals

- OEKO-TEX® Standard 100

✓ Warranty*

- 1 years



Fabric specs:

Lightweight ~3oz/yd

non-permeable

Anti-microbial

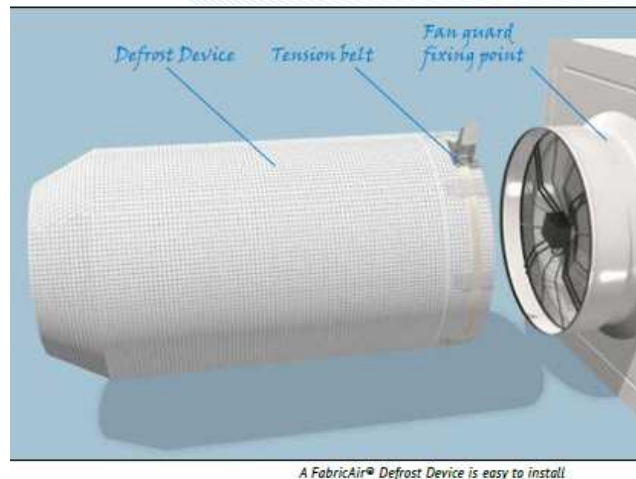
Fire retardant

Less than 0.5% shrinkage after washing

1 year warranty, pro-rated after 6 months

Blue and white

EASY INSTALLATION



A FabricAir® Defrost Device is easy to install

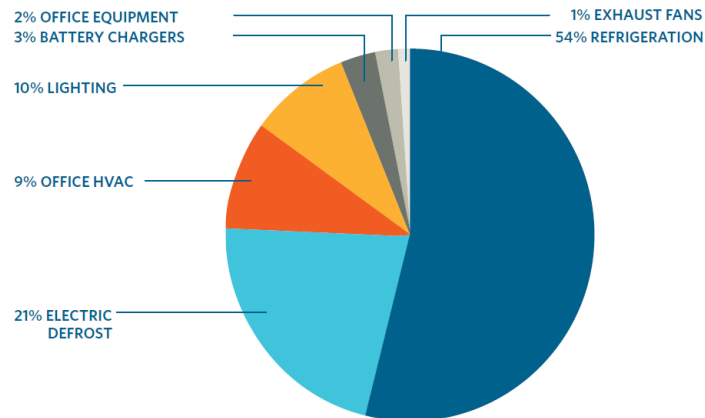
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- Does require an attachment point.
- Some cases can attach to fan guard, but typically a collar should be added.

COLD STORAGE ENERGY USAGE

ENERGY USE PROFILE FOR A TYPICAL COLD STORAGE FACILITY



* Compiled by Energy Trust of Oregon.

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cost of electric defrost

- 21% of total energy costs
- some of this heat is dumped into the conditioned space,
- Any way to make this more efficient can have a profound payback

AVERAGE COST SAVINGS

Defrost Heater	Standard Operation	With Defrost Duct
Heater Watts per Evaporator	10,950	10,950
Defrosts per day	4	4
Length of defrost - minutes	30	15
KiloWattHours (kWh) per day	21.9	10.95
Price Per kWh	\$0.15	\$0.15
Price per day per evaporator	\$3.29	\$1.64
Number of Evaporators	2	2
Total Cost per day	\$6.57	\$3.29
Defrost Heater Cost per Year	\$2,398.05	\$1,199.03
Recovery Factor	30%	15%
Defrost Recovery Energy cost	\$719.42	\$179.85
Defrost Cost Per Year	\$3,117.47	\$1,378.88
Annual Energy cost Savings:		\$1,738.59
Estimated installed cost:		\$400.00
Payback Period:		2.8 Months

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Demonstration

For a typical medium storage facility

2-units 46K BTU cooling each

Electric heater using ~11KW

Assumed cost of Power: 15 cents Per/kWh hour

of 50% reduction in defrost cycle time

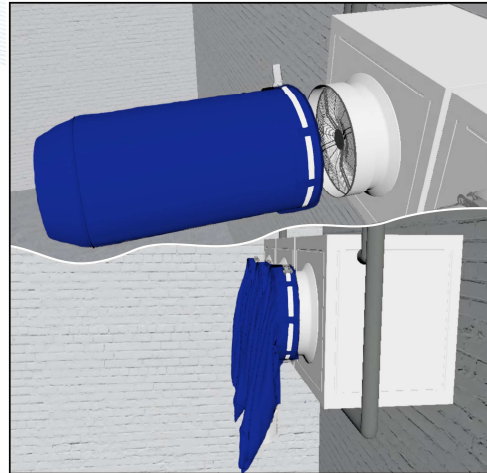
Things to point out:

- Length of defrost cut to 15 min from 30... 4x a day
- Only 1 hour of defrost time, which means 23 hours of cooling
- Recovery Factor: cool the coils back down and recover the heat
 - Typically 30%
 - Half can be eliminated, fan outlets are covered, but air intake remains open

Results: 56% reduction in Defrost costs. Annually Over \$1700 per year

CONCLUSIONS

- ✓ Increase efficiency
- ✓ Decrease temperature fluctuations
- ✓ Save energy
- ✓ Maintain highest hygienic standards
- ✓ Payback in Months



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Let us save you energy and money, and improve the conditioned environment.
Do this without compromises.



■ CONCLUSIONS

QUESTIONS?



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