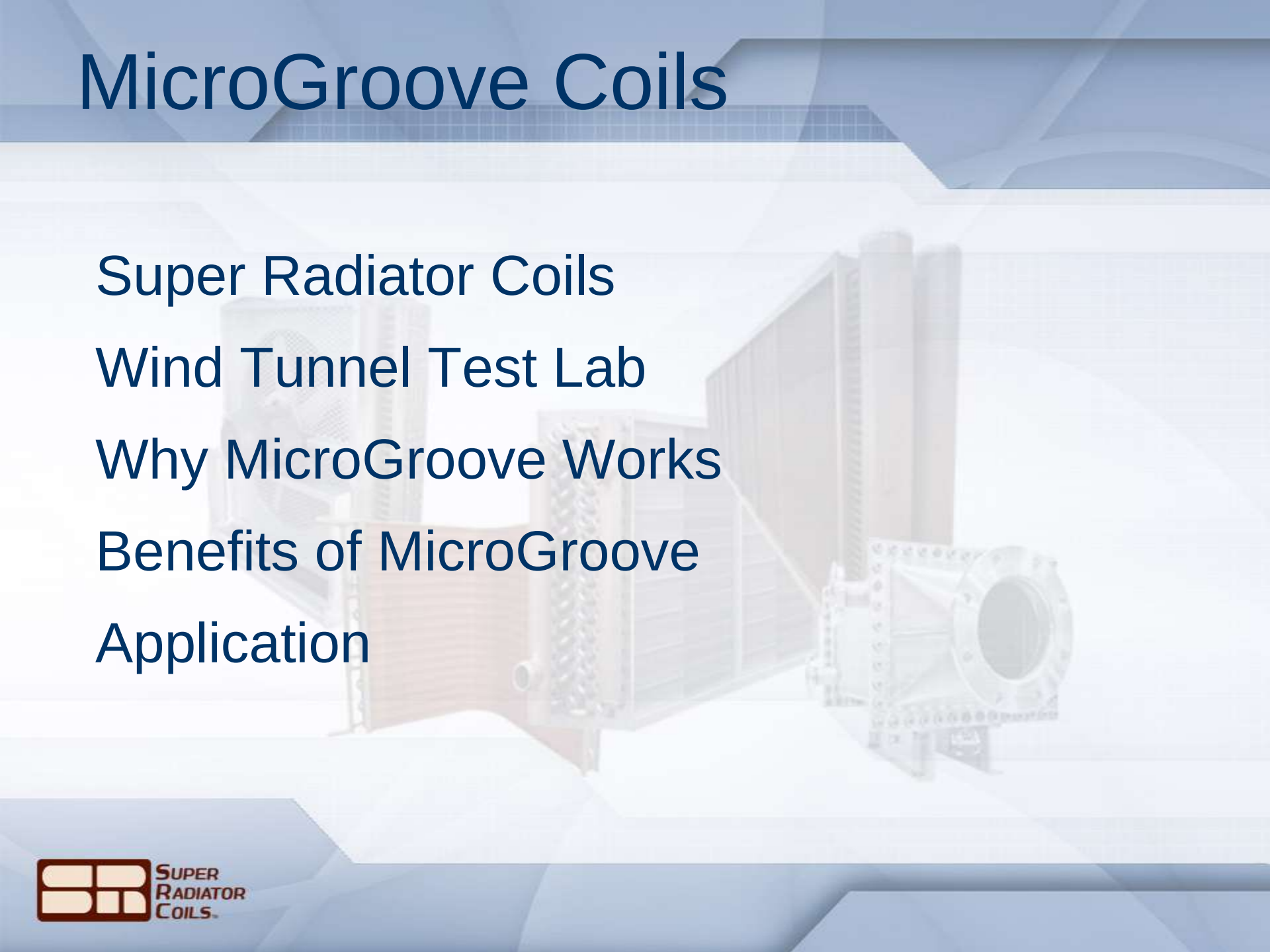
High Efficiency MicroGroove Coils
For
Commercial & Industrial Applications

AHR Show
January 29, 2013

SUPER RADIATOR COILS

MicroGroove Coils



Super Radiator Coils

Wind Tunnel Test Lab

Why MicroGroove Works

Benefits of MicroGroove

Application

SUPER RADIATOR COILS

Super Radiator Coils

Heat Transfer Specialists Since 1928

3 Facilities
240,000 ft² of Manufacturing
ISO 9001:2008

Super Radiator Coils

Super Radiator Coils

We Know Heat Transfer

26 Fin Patterns

8+ Tube Diameters

24 Applications Engineers

SUPER RADIATOR COILS

Super Radiator Coils

A Full Range Of Commercial & Industrial Coils

SUPER RADIATOR COILS

MicroGroove Coils (5mm)

A Compact and Efficient Heat Exchanger

<u>5mm MicroGroove Relative to Traditional 3/8” OD</u>

- 40-50% reduction in tube weight
- 40-50% reduction in fin weight
- 50+ % reduction in internal volume
- 50% reduction in required wall thickness to meet pressure requirements

Tiny Tube, Does Not Necessarily Mean Tiny Coils.

SUPER RADIATOR COILS

Wind Tunnel & Test Lab

The MicroGroove coils were developed in Super Radiator Coils wind tunnel test lab in Richmond, VA

- Airflow from 100 – 8,000 cubic feet per minute.
- Air temperatures from 35°F – 140°F and humidity from 40 – 95%.
- Separate fluid testing loops for: Refrigerants, Water, Glycol, Oil, & Steam
- Available for 3rd Party Testing Services

Dr. Jian Yu
Director of Product Development

Learn more about the test lab at: http://www.srcoils.com/news-events/2012/11/test-lab/

SUPER RADIATOR COILS

What Drives The Efficiency?

$$Q = U\,A \times \Delta T$$

Less Metal Required For the Same Effective Area (A)

Better Inside Heat Transfer Coefficient (h_i) and Better Outside Heat Transfer Coefficient (h_o)

Super Radiator Coils

Improving Overall HT Coefficient

$$Q = \underline{U}\, A \times \Delta T$$

- *Inside Heat Transfer Coefficient (h_i)*

  Relationships to diameter (d) well known

- *Outside Heat Transfer Coefficient (h_o)*

  Primary (Tube) Surface: Boundary Layer

  Extended (Fin) Surface: Average Fin Efficiency

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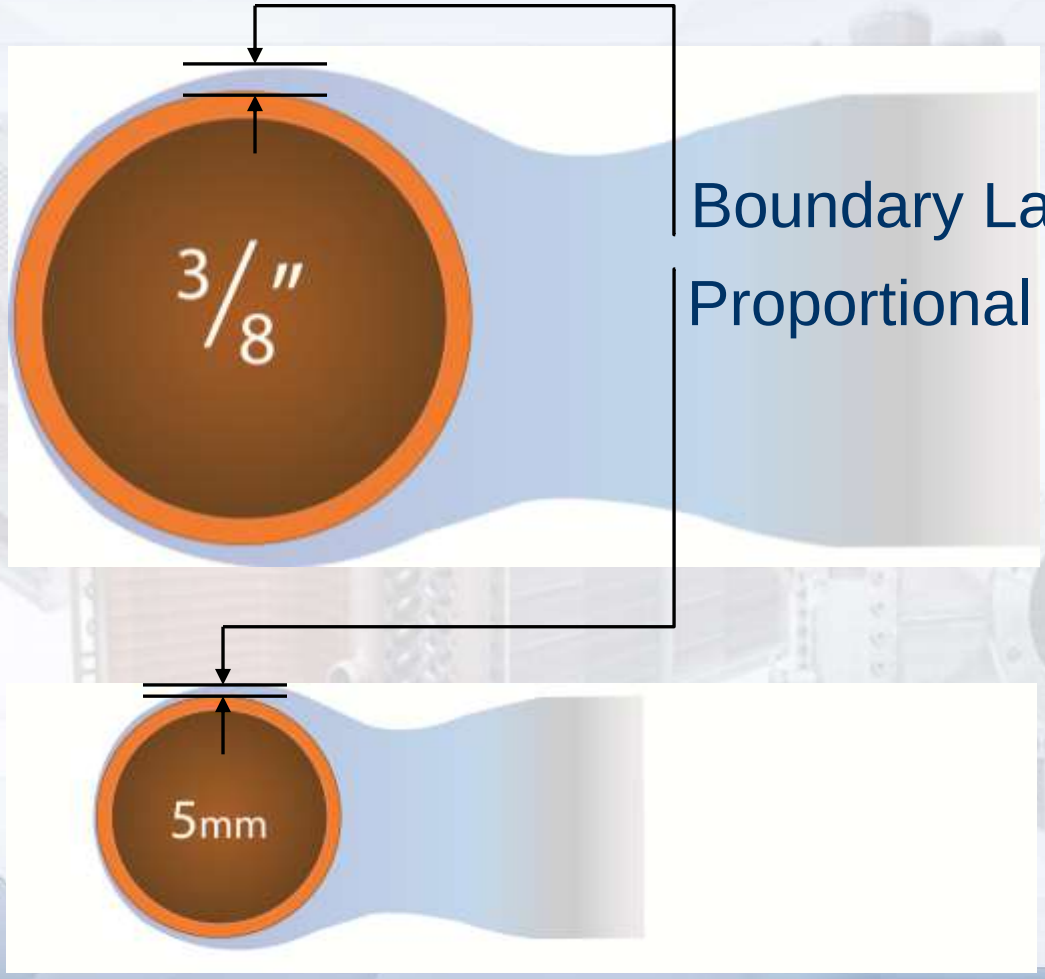
Improving h_o On Primary Surface

$Q = \underline{U} A \times \Delta T$

Reducing the Effect of the Boundary Layer



SUPER RADIATOR COILS

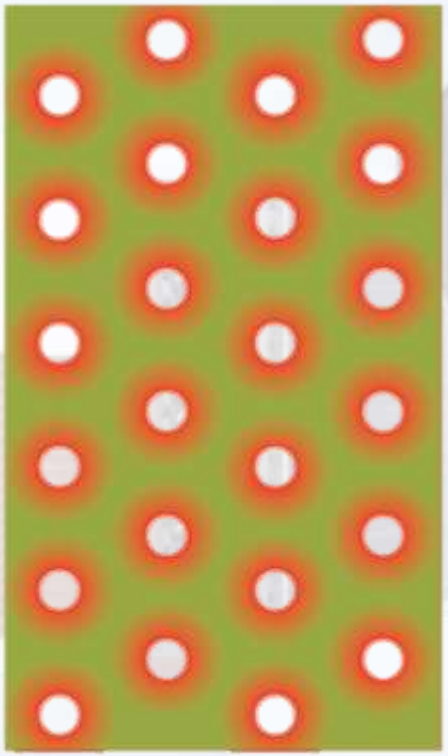
Improving h_o On Extended Surface

$Q = \underline{U} A \times \Delta T$

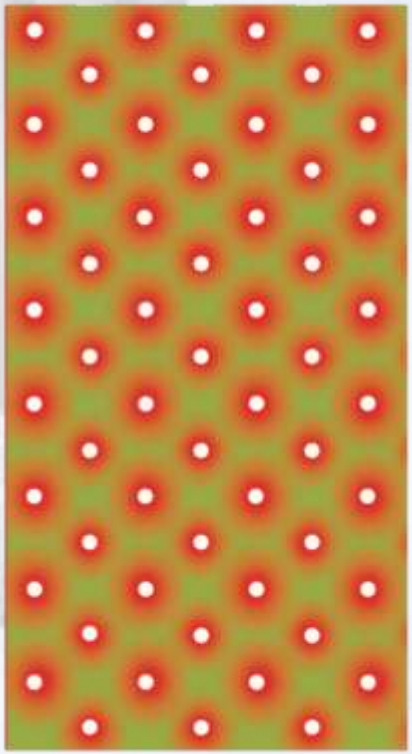
Fin Efficiency

High Low

Standard 3/8” Pattern



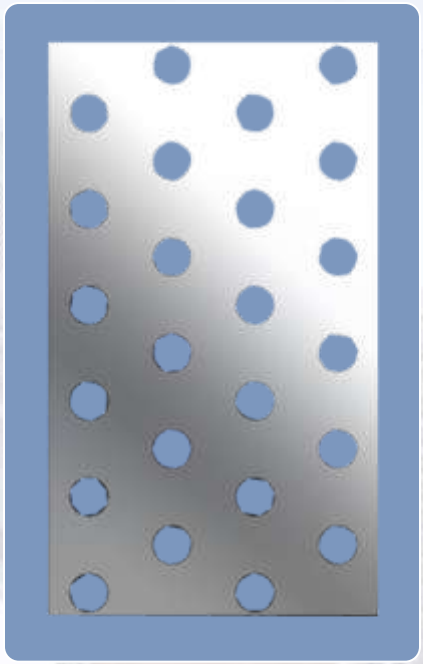
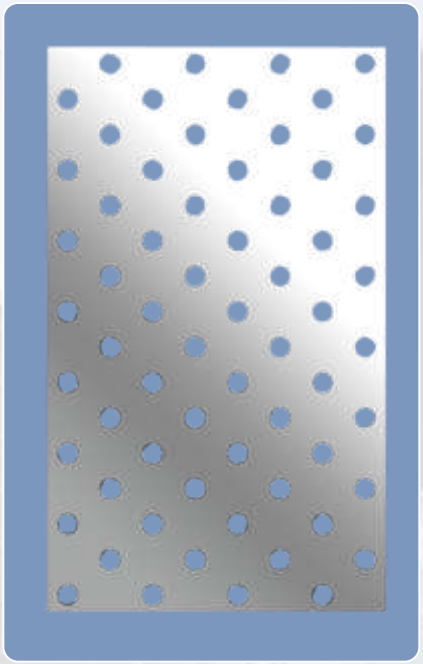
5mm MicroGroove



Super Radiator Coils

More Primary Area (A) For the Metal

$Q = U \underline{A} \times \Delta T$

	Standard 3/8” Pattern	5mm MicroGroove	
			
Sum of Tube Circumference	28 in.	40 in.	⇧ 40% Primary Contact
Sum of Tube Cross Sectional Area,	0.41 in^2	0.37 in^2	⇩ 10% Copper

SUPER RADIATOR COILS

Compounding Benefit

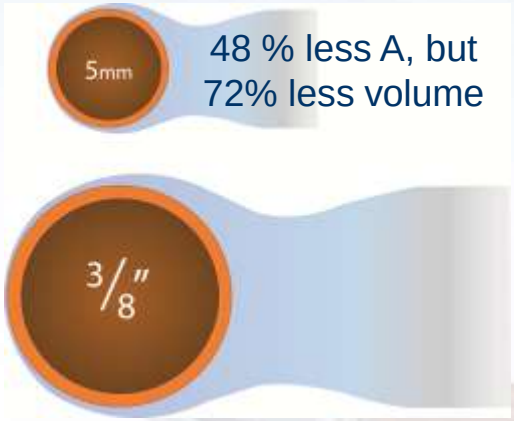
$$Q = U\,A \times \Delta T$$

Less Metal Required For the Same Effective Area (A)

Better Inside Heat Transfer Coefficient (h_i) and Better Outside Heat Transfer Coefficient (h_o)

Lower Refrigerant Charge

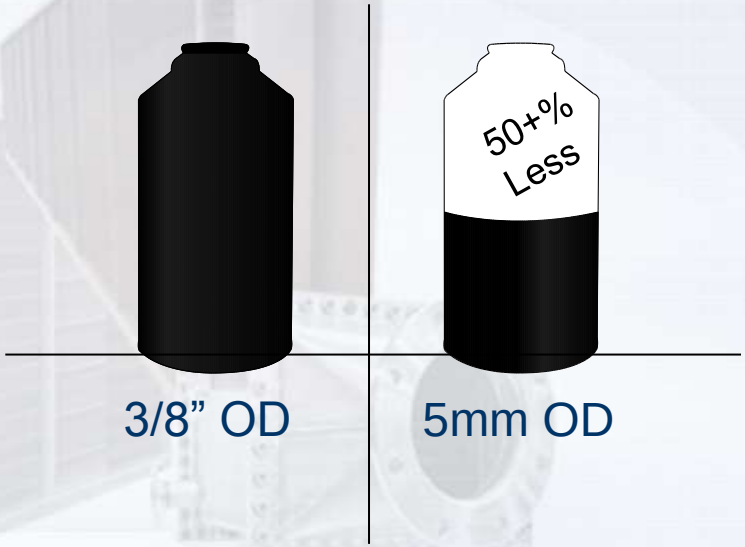
Less Volume Required For
The Primary Surface Area, A



Less Primary (A) Required Due To:

- Better h_i, and
- Better h_o

Significant Reductions in
Refrigerant Charge



Super Radiator Coils

Higher Pressure With Thinner Tube

Comparison of Tube Wall Thickness Required for 600 PSIG Design Rating

Perfect for CO_2 and 410A Applications

Super Radiator Coils

Flexible Sizes and Configurations

Large Multi-Row Condensers

Evaporator Coils

Formable Coils & Copper Fins

Other Compact Designs

SUPER RADIATOR COILS

More Than Refrigerant Coils

Oil Coolers

Compressed Air Coolers

Closed Loop Water Coils

SUPER RADIATOR COILS

What Problem Are You Solving?

SEER Rating Improvements

INCREASE PERFORMANCE in the same space

REDUCE FACE AREA without sacrificing performance

DROP-IN REPLACEMENT for lower cost

Tube O.D.	3/8"	5mm	5mm	5mm
Height	36"	36"	36"	36"
Length	60"	60"	42"	60"
Rows	4R	4R	6R	6R
Cu, lbs.	50	23 ↓↓↓	25 ↓↓↓	35 ↓
Al, lbs.	50	30 ↓↓	32 ↓↓	42 ↓
Internal Volume, l	14.9	6.0 ↓↓↓	6.3 ↓↓↓	8.5 ↓↓
Capacity, BTUH, 000's	196	196	196	240 ↑↑↑
Air Friction, in. H_2O	0.65	0.48 ↓	1.08 ↑	0.64

Super Radiator Coils

MicroGroove Coils Available Today

Preliminary Selections

Controlled Testing

Rapid Prototypes

Volume Production

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Contact

Super Radiator Coils

Booth #1737

www.superradiatorcoils.com/microgroove

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We Know Heat Transfer

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