

the microgroove™ advantage

Welcome to the New Product & Technology Theater

AHR Expo 2013



Copper Alliance™

New Product & Technology Theater

Agenda

The MicroGroove Advantage

John Hipchen, The Copper Alliance, Booth 5524

Copper Tubing in R410A and CO₂ Applications

Dr. Charles Stout and Chris Mueller, Mueller Industries, Booth 2545

High Efficiency MicroGroove Coils for Commercial and Industrial Applications

Matt Holland, Super Radiator Coils, Booth 1737

A New Era of Coil Manufacturing

Newell Franks, Burr Oak Tool Inc., Booth 2957

New Copper Alloys for the ACR Industry

Ed Rottmann, Luvata, Booth 1545

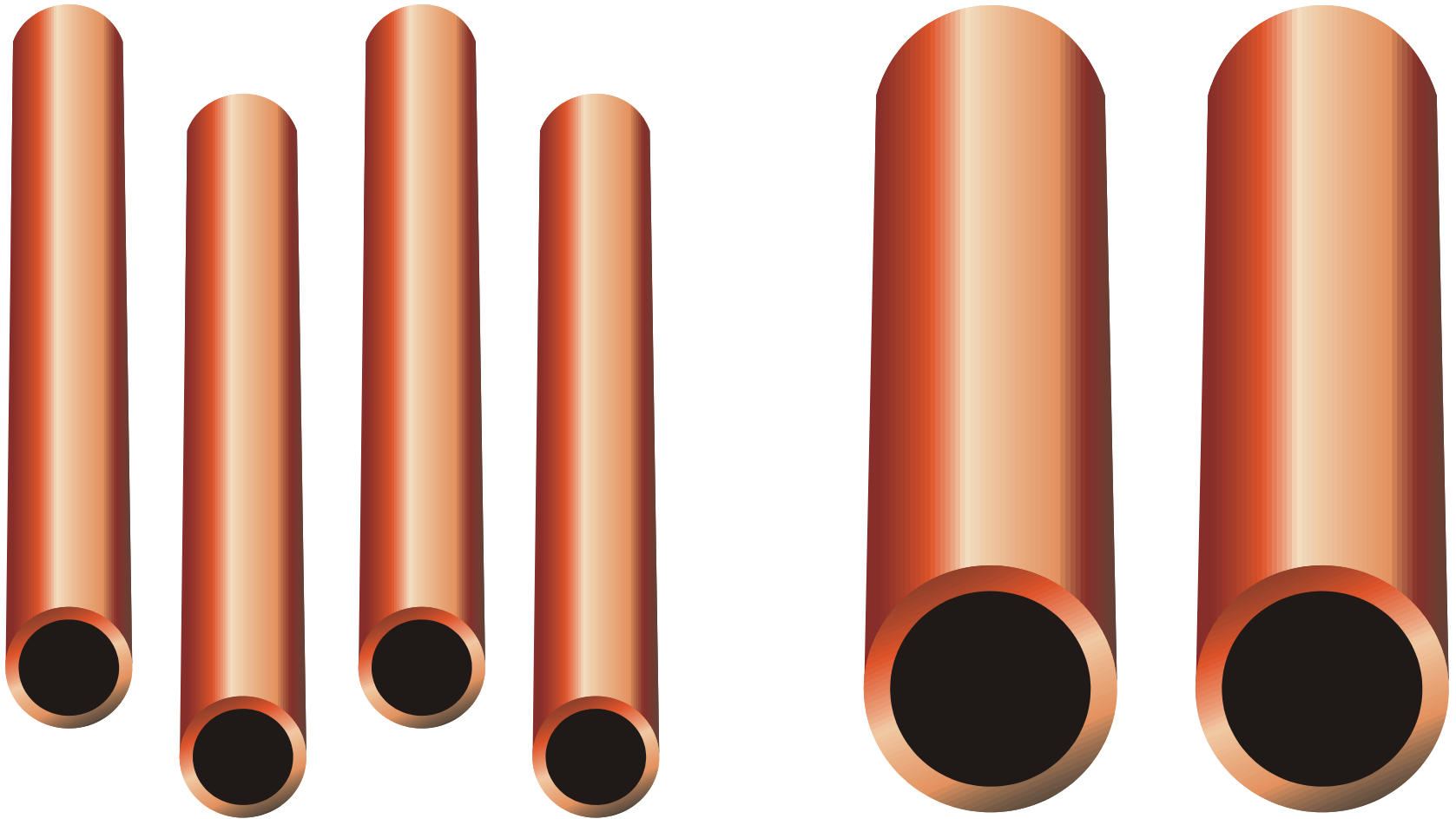
Optimization of Copper Tubes for ACR Tube Applications

Steffen Rieger, Wieland-Werke AG, Booth 4156

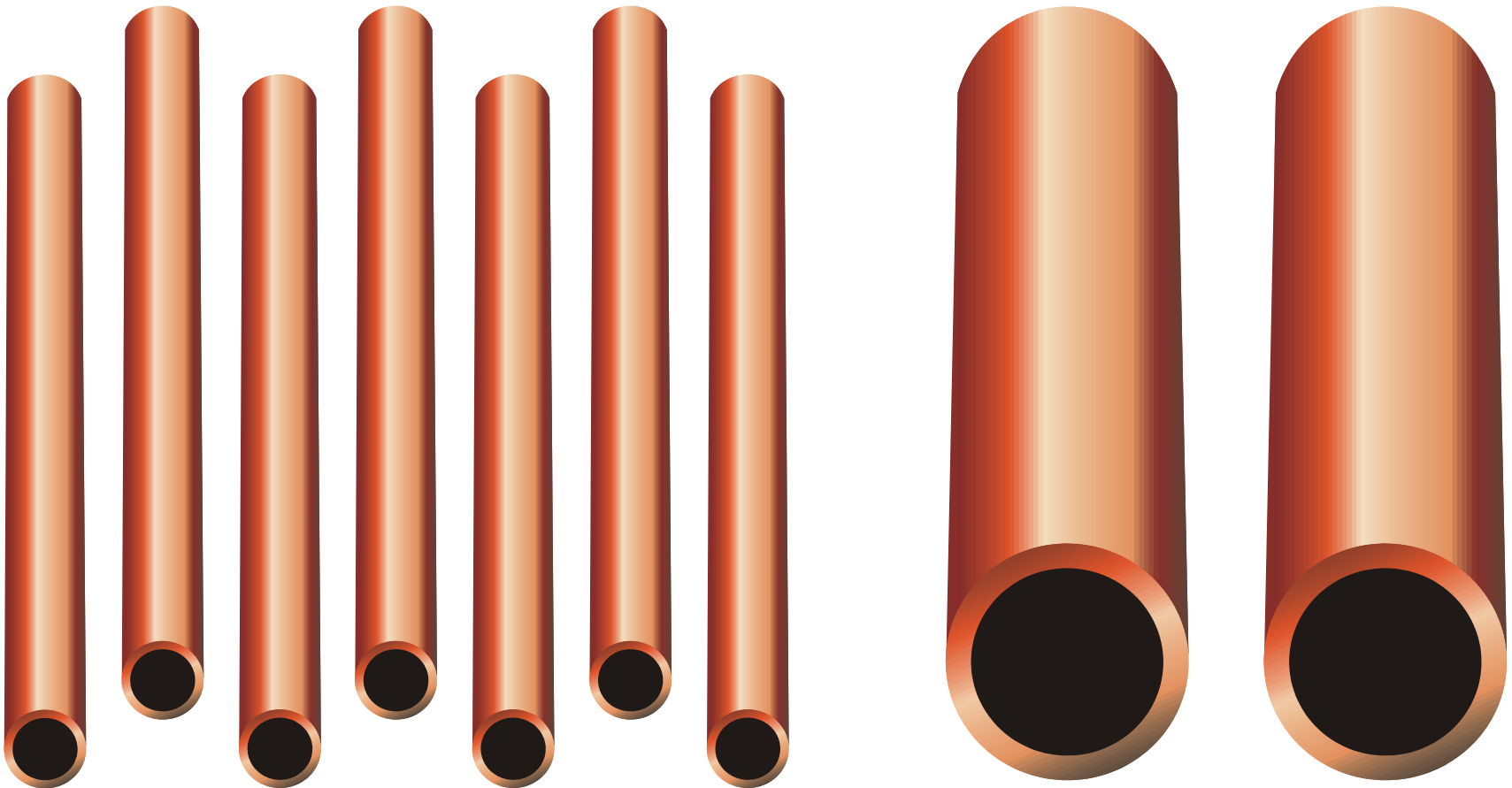


**For more
information visit:
www.microgroove.net**

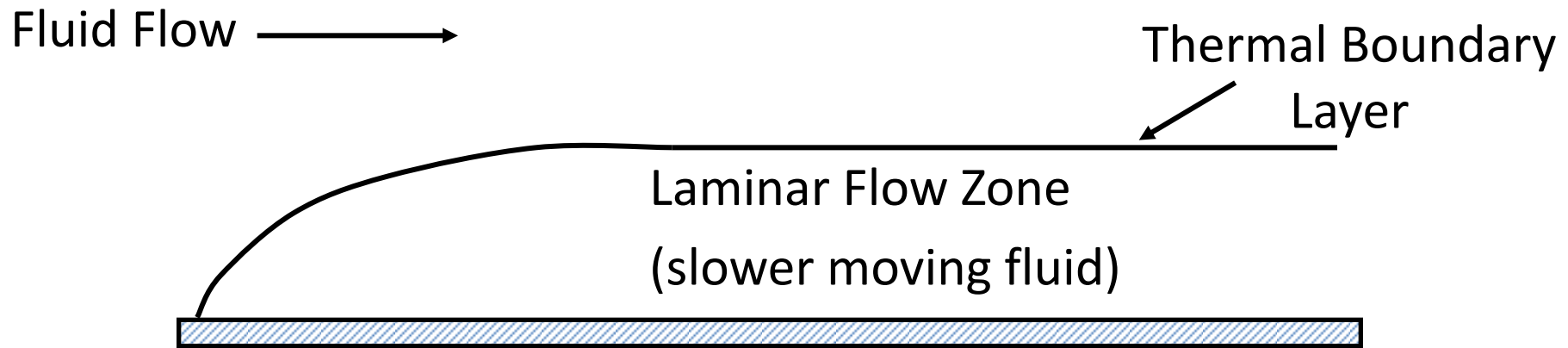
Reduced Tube Diameters = Increased Heat Transfer



Increased Heat Transfer with Less Material

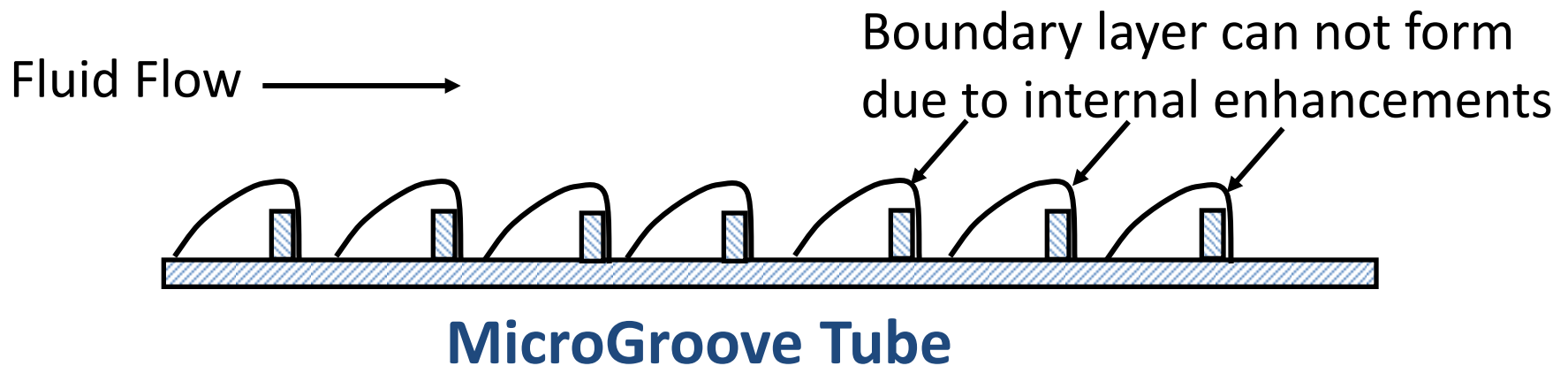


Development of Boundary Layers

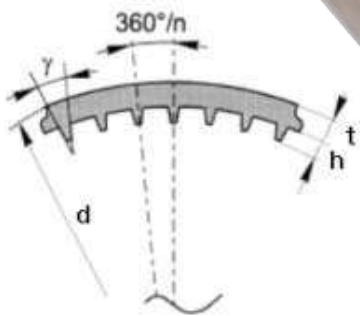
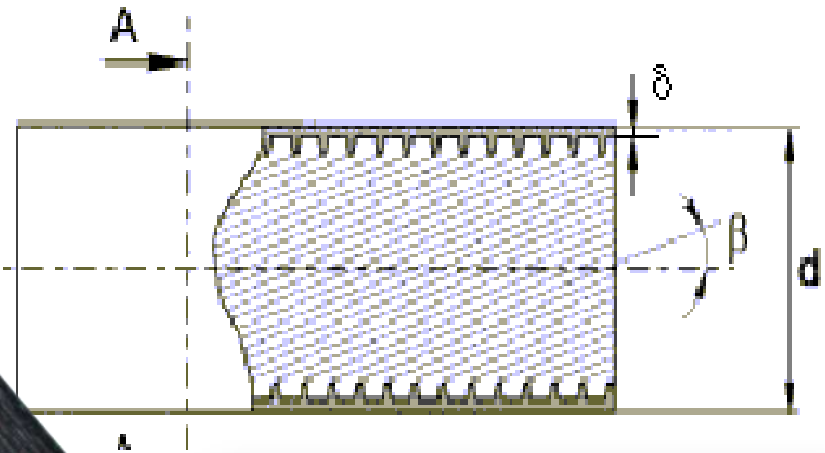
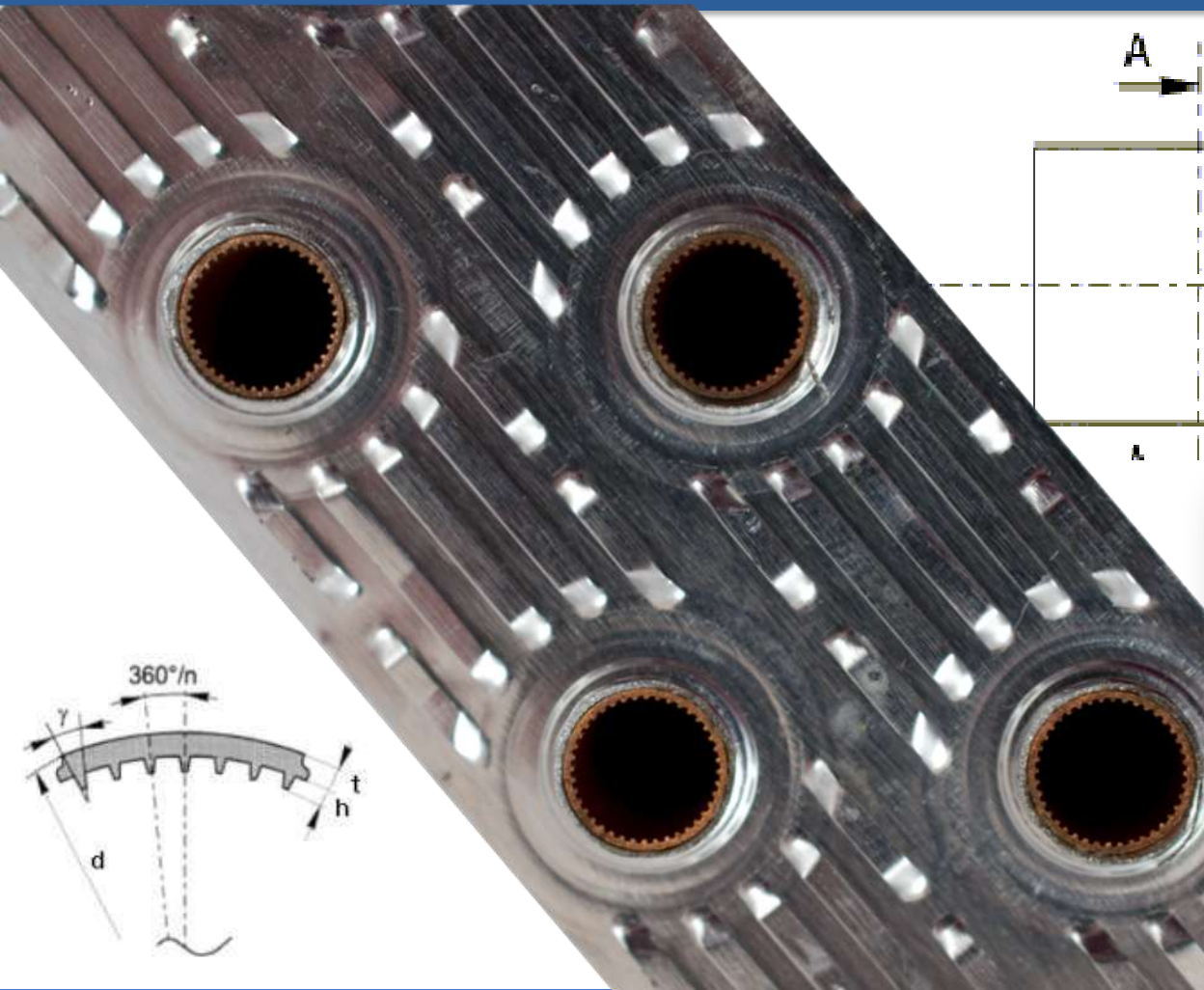


Smooth Internal Tube Wall

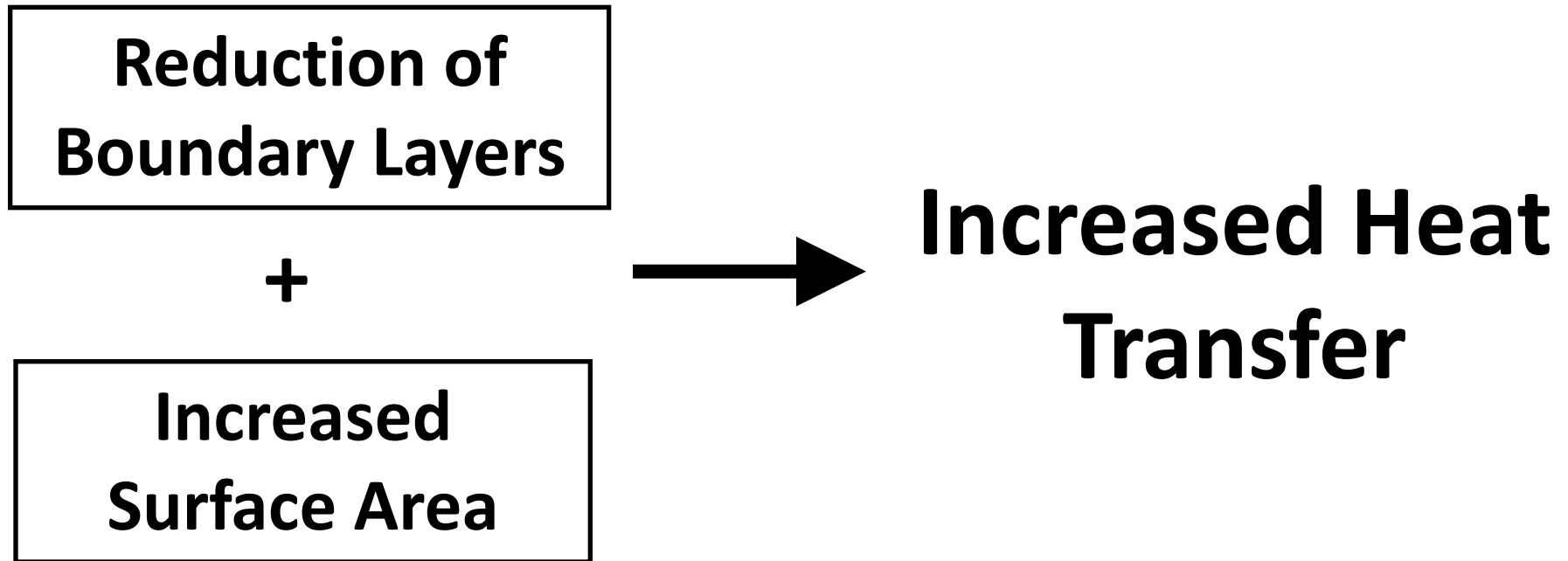
Reduction of Boundary Layers



MicroGroove Features



MicroGroove Technology Advantages



Residential Applications



Refrigerant Charge is Reduced with Small Diameter Tubes

Manufacturer	Kelon	Midea	Haier
Description	5K - BTU window unit	2600 W split unit	2600 W split unit
Refrigerant	R22	R410a	R290
Coil design, original	7mm evap. 7mm cond.	7mm evap. 7mm cond.	7mm evap. 7mm cond.
Refrigerant Charge (g)	349.8	920.0	360.0
Coil design, optimized	5mm evap. 5mm cond.	7mm evap. 5mm cond.	7mm evap. 5mm cond.
Refrigerant Charge (g)	243.8	730.0	275.0
Refrigerant Reduction (%)	30.3	20.6	23.6

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Commercial & Industrial Applications - Outdoor Condensing Units



Commercial & Industrial Applications - Refrigeration Applications



Benefits of Manufacturing Coils with Small Diameter MicroGroove Tubes

- **Energy Efficient**
- **Less Material**
- **Less Refrigerant**
- **Proven, Economical Manufacturing Process**
- **Minimal Equipment and Process Changes**
- **Established World-Wide Supply and Support**



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