

# WEATHERING EXTREME CONDITIONS

- ◆ HEAVY DUTY
- ◆ PRECISION COOLING
- ◆ INDUSTRIAL COOLING



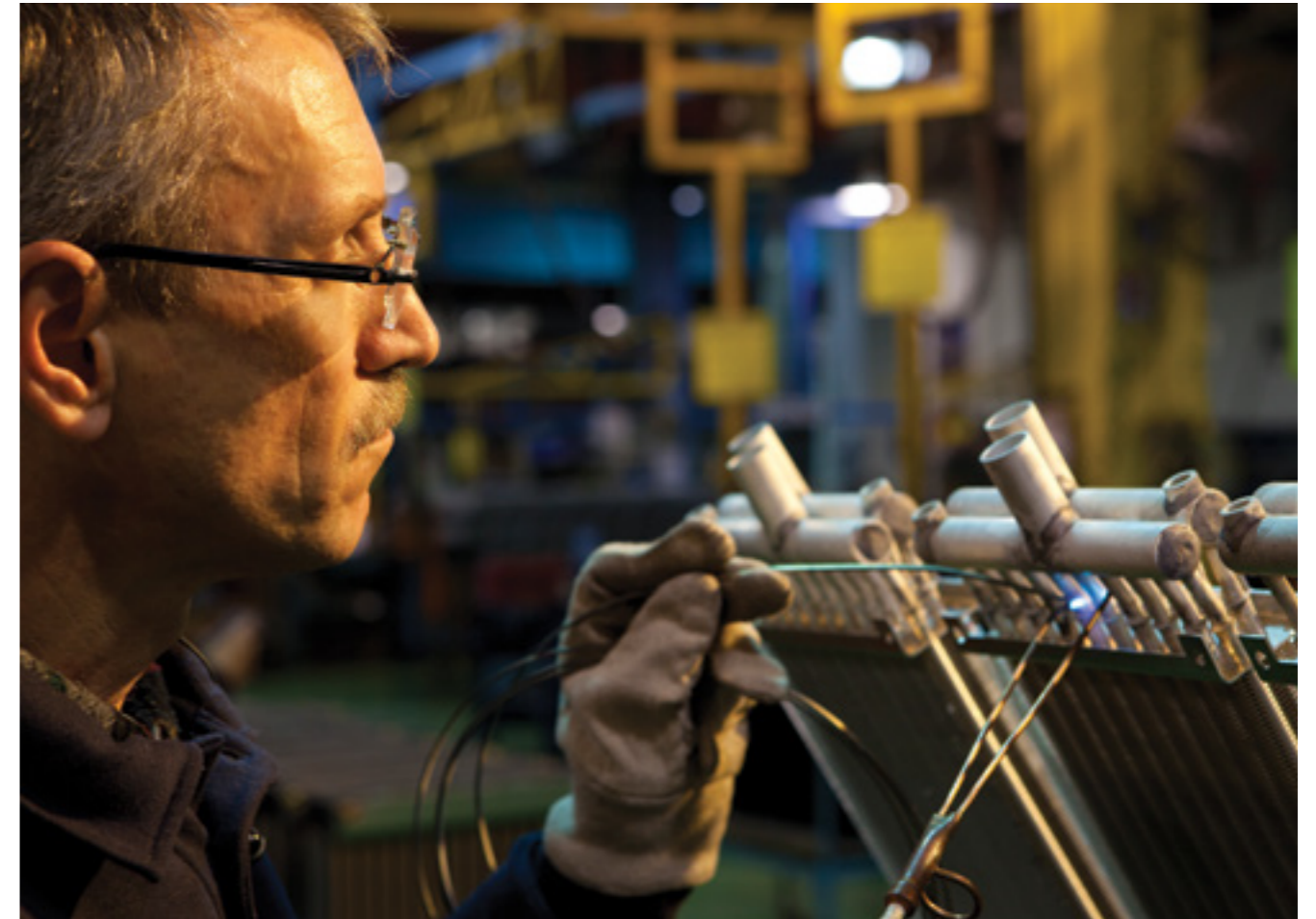
**LORDAN**  
BEYOND THERMAL  
ENGINEERING

## OUR CORE VALUES

- **COOPERATE WITH OUR CUSTOMERS IN AREAS OF TECHNICAL AND BUSINESS INNOVATION** BY INTRODUCING CUSTOM-MADE SOLUTIONS TO COMPLEX HEATING, COOLING AND REFRIGERATION CHALLENGES.
- **ADD VALUE FOR OUR CUSTOMERS** THROUGH VENDOR MANAGED INVENTORY (VMI) SYSTEMS AND LOCAL PRESENCE THAT REACH THEIR MARKET DEMANDS.
- **INTRODUCE FLEXIBLE COIL DESIGNS AND COATINGS TO WITHSTAND ANY ENVIRONMENTAL EXTREME** FROM CORROSIVE ENVIRONMENTS AND EXTREME TEMPERATURES TO HEAVY VIBRATION AND DELICATE APPLICATIONS.
- **CULTIVATE A WORK ENVIRONMENT THAT SUPPORTS AND VALUES OUR EMPLOYEES' SKILLS AND TALENTS** WITHIN OUR DYNAMIC AND GROWING COMPANY.
- **COMMITMENT TO QUALITY IN THE MATERIAL WE USE AND INTERNATIONAL STANDARDS WE ABIDE BY** PROMISING HIGHLY DURABLE AND EFFICIENT PRODUCTS USING LIGHTWEIGHT MATERIALS.
- **RESPONSIBILITY TO THE ENVIRONMENT** THROUGH THE INTRODUCTION OF ECO-FRIENDLY RESOURCES INTO OUR DESIGNS AND INTEGRATION OF ENERGY SAVING TECHNIQUES TO LOWER OPERATING COSTS.



## COMPANY PROFILE



**Since 1958** Lordan (A.C.S.) has been engineering and manufacturing high quality custom-made fin and tube heat exchangers for the HVAC&R markets with applications for commercial, industrial, telecommunications, and transportation industries.

**Going beyond thermal engineering,** Lordan is known internationally for its design flexibility and as a solver of complex heating, cooling and refrigeration challenges, whatever the scope. A global company, Lordan has a sophisticated logistics management system, as well as local representation in over four continents and a substantial customer base spread out all over the world.

Lordan's highly experienced engineering team thrives on innovative thinking and creative approaches in the design of heat transfer technologies, adapting technological applications to withstand severe environmental conditions. Incorporated into every Lordan design are lightweight materials and eco-friendly resources best suited to your requirements, promising you significant energy savings, lower operating costs and a highly durable quality assured product.

Our coil designs and high quality coatings are built to **weather through any condition**, from corrosive environments and extreme temperatures to heavy vibration and delicate applications. Our core business areas include:

**Heavy Duty Applications** involving coils with high durability to undergo tough mechanical and environmental conditions required for transportation, energy industries, and the like.

**Precision Cooling Applications** relating to the production of efficient cooling within strict space and weight limitations to meet the demands of the high-tech and medical industries, sensitive machineries and close control products.

Our production bases are located in Israel's Galilee region, in Wales (UK) and in Northern Spain, with warehouses throughout the markets and regions we serve, namely Europe, the US, Australia and Asia.

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## HEAT EXCHANGE APPLICATION HEAVY DUTY

Since 1958 Lordan has been specializing in developing heat exchange applications for transportation, military and energy industries that must withstand harsh mechanical and environmental conditions.

From the low temperatures in Antarctica to the sun baked and sand blasted Sahara desert, from tropical South America to the Coal Mines in Australia, our heat exchange designs and custom made coils for climate control systems are built to deliver maximum performance, value and reliability in the most extreme conditions.

These conditions can be highly contaminated and corrosive environments, demanding marine conditions, strong mechanical vibrations, arid, humid or freezing climates etc.

Lordan assigns highly experienced engineers to your project, who will work with your team to identify specific needs. The Lordan team is guaranteed to come up with creative approaches utilizing eco-friendly, lightweight or especially strong materials, specialized coatings and features such as slanted coils to fit specific areas, and a variety of fin surfaces (patterns and shapes).

The following shows some of the applications where our dedicated design and specialized manufacturing capabilities have successfully met unique coil requirements:



### TRANSPORTATION MARKET

- Trains
- Buses and Coaches
- Trucks
- Ambulances
- Freight Trucks
- Refrigerated Containers
- Heavy-Duty Vehicles
- Military Vehicles
- Off-Road Vehicles



### MARINE EQUIPMENT

- Ships
- Submarines
- Off-Shore Oil and Gas Rigs
- General Marine Environment



### MILITARY MARKET

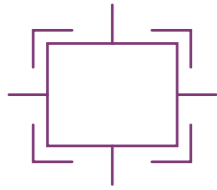
- Land Combat
- Transportation Vehicles
- Field Hospitals
- Mobile Technical Shelters



### ENERGY INDUSTRY

- Oil and Gas Rigs
- Mining Equipment





# HEAT EXCHANGE APPLICATION PRECISION COOLING

Lordan specializes in designing precision cooling coils for systems meant to strictly regulate ambient conditions within a very narrow working range. Our coils can produce highly accurate cooling for high density server environments that accommodate sensitive electronics.

Over the years, we have worked on hundreds of projects around the world requiring precision cooling applications for electronic components and for high sensible, tight tolerance control environments in the medical industry and data centers.

Our exclusive Triple Seven (Triple 7) advanced coil pattern is suited for medical applications such as MRI machines, laser technologies and other sensitive heat generating equipment. Triple 7 is among the smallest diameter tube coil available on the market today, delivering superior output and reduced refrigerants charge.

In our dynamic work environment, our experienced engineers work with your development teams to meet the design requirements of your new technology. We thrive on developing cooling solutions to meet the continuously changing cooling requirements of the high-tech industry.

Our precision cooling coils are designed to provide the precise temperature and humidity set point required for the following high sensible applications:



## EQUIPMENT

- Electronic and Computer Components
- Laser
- MRI
- CAT Scans
- Medical Equipment
- Military Sensitive Technology

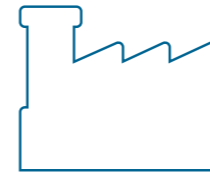


## FACILITIES

- Data Centers
- Telecommunication Switching Stations
- ISP Facilities (Internet Service Providers)
- Computer Rooms
- Clean Rooms
- Laboratories
- Medical Operating Theatres



PRECISION COOLING



# HEAT EXCHANGE APPLICATION INDUSTRIAL COOLING

Lordan offers custom-made solutions to meet the many different heat-exchange applications requirements – from indoor climate control solutions of large scale construction projects such as commercial and public facilities, residential complexes and office buildings, to industrial cooling processes and equipment cooling applications.

Having worked on massive skyscraper construction projects in Europe and the US, as well as airports and shopping malls, hotels and hospitals, we understand that every large scale construction project is different and has its own unique requirements. This is why we dedicate a large team of experienced engineers to plan, design and support clients throughout the life of the project, during the installation phase, and beyond.

We offer a large selection of coil patterns to meet the diverse heat exchange requirements of large scale projects, and have significantly cut lead times with our Vendor Management Inventory (VMI) system that allows you to pull inventory from our distribution centers closest to you.

Our specialty is in the design and manufacturing of advanced heat exchangers for chillers with our exclusive Triple Seven (Triple7) technology that delivers superior output and reduced refrigerant charge. We also manufacture custom made giant coils best suited to air-conditioning exceptionally large public areas.

Lordan's design and manufacturing capabilities can meet project applications for:



## INDOOR CLIMATE CONTROL

- Residential Complexes and Office Buildings
- Commercial and Public Facilities
- Chilled Beams
- HVAC Chillers
- Large Water Coils
- Air Curtains
- Air Handling Units (AHU)



## INDUSTRIAL EQUIPMENT & PROCESSES

- Heat Pumps
- Cooling Towers
- Refrigeration Units
- Oil Coolers
- Exhaust Gas Cooling

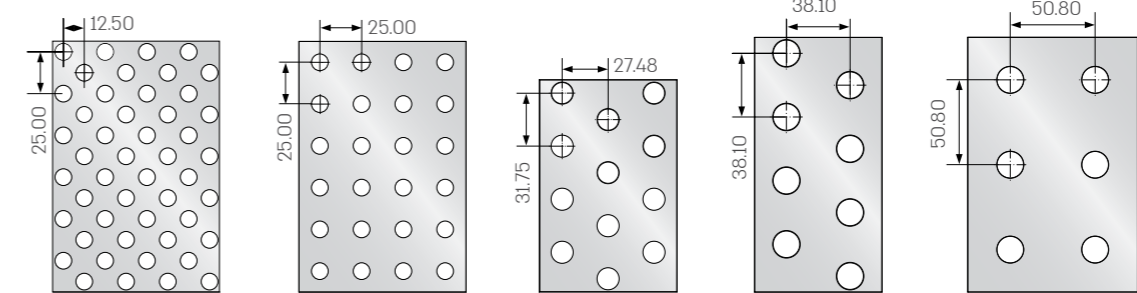
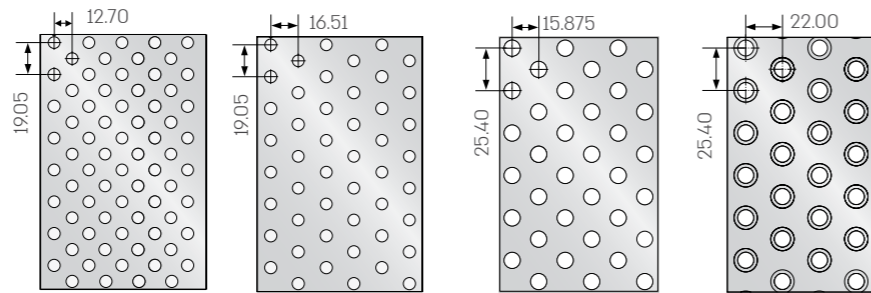


INDUSTRIAL COOLING

# COIL PATTERNS INDEX

Coil Index

## LORDAN COIL PATTERNS



Pattern No.	55 Lord FiVe		15 Triple 7		8		9	
Tube diameter mm	5mm		7mm		9.5mm 3/8"		9.5mm 3/8"	
Tube material	Cu		Cu/Al/St.St.		Cu/Al		Cu/Al/St.St.	
Tube matrix mm [inch]	19.05 X 12.70 (3/4" X 1/2")		19.05 X 16.51 (3/4" X 0.65")		25.4 X 15.88 (1" X 5/8")		25.4 X 22 (1" X 0.866")	
Tube pitch	Staggered		Staggered		Staggered		Staggered	
Tube geometry			Equilateral				Equilateral	
Fin shape			Louvered				Louvered	
	Corrugated		Corrugated		Corrugated		Corrugated	
	Sine wave		Sine wave				Sine wave	
	Flat		Flat				Flat	
Fin edge	Rippled / straight		Ripple / Straight		Ripple / Straight		Ripple / Straight	
Fin density / spacing	FPI	(mm)	FPI	(mm)	FPI	(mm)	FPI	(mm)
Aluminum 0.12 mm (.0045")	11-21	(2.5-1.2)	11-22	(2.5-1.2)	10-17	(2.8-1.5)	10-18	(2.8-1.4)
Aluminum 0.15 mm (.0060") Natural, Hydrophobic, Hydrophilic, marine Al	8-21	(3.2-1.2)	8-22	(3.6-1.2)	8-17	(3.6-1.5)	8-18	(4.2-1.4)
Aluminum 0.20 mm (.0080") Natural, Hydrophobic, Hydrophilic, marine Al	7-16	(3.6-1.6)	6-16	(4.2-1.6)	9-13	(3.6-1.5)	5-18	(6.3-1.4)
Aluminum 0.30 mm (.0120") Natural, Hydrophobic, Hydrophilic	7-16	(3.6-1.6)	6-16	(4.2-1.6)			4-16	(6.3-1.4)
Copper 0.13 mm (.0052")	11-21	(2.5-1.2)	10-16	(2.5-1.6)	11-16	(2.5-1.6)	10-16	(2.5-1.6)
Copper 0.15 mm (.0060")	8-21	(3.2-1.2)	8-16	(3.2-1.6)	8-16	(3.2-1.6)	8-16	(3.2-1.6)
Copper 0.20 mm (.0080")	8-18	(3.2-1.6)	7-16 7.5-16	(4.2-1.6)			7-16	(3.6-1.6)

Pattern No.	13		14		7		5		6	
Tube diameter mm	9.5mm 3/8"		9.5mm 3/8"		12.7mm 1/2"		15.9mm 5/8"		15.9mm 5/8"	
Tube material	Cu		Cu/Al/St.St.		Cu/St.St.		Cu		Cu	
Tube matrix mm [inch]	25 X 12.5 (-1" X -1/2")		25 X 25 (-1" X -1")		31.75 X 27.48 (1 1/4" X 1.082")		38.1 X 38.1 (1 1/2" X 1 1/2")		50.8 X 50.8 (2" X 2")	
Tube pitch	Staggered		In line		Staggered		Staggered		In line	
Tube geometry					Equilateral					
Fin shape										
					Corrugated		Corrugated			
			Sine wave							
	Flat		Flat						Flat	
Fin edge	Straight		Ripple / Straight		Ripple		Ripple / Straight		Straight	
Fin density / spacing	FPI	(mm)	FPI	(mm)	FPI	(mm)	FPI	(mm)	FPI	(mm)
11-15	11-15	(2.5-1.7)	10-16	(2.8-1.6)	10-14	(2.8-1.8)	10-12	(2.8-2.1)		
8-15	8-15	(3.2-1.7)	8-15	(3.6-1.6)	7-14	(4.2-1.8)	8-12	(4.2-2.1)	8-9	(3.6-3.2)
7-14	7-14	(3.6-1.7)	5-14	(6.3-1.6)	6-14	(5.1-1.8)	5-12	(5.1-2.1)	4-8	(6.3-3.2)
			4-14	(6.3-1.6)					4-8	(6.3-3.2)
10-14	10-14	(2.8-1.8)	10-15	(4.2-1.6)	10-14	(4.2-1.8)	10-12	(3.2-2.1)		
8-13	8-13	(2.8-1.8)	8-15	(4.2-1.6)	8-14	(4.2-1.8)	8-12	(3.2-2.1)		
			5-14	(5.1-1.6)	6-12	(5.1-1.8)	6-12	(5.1-2.1)	7-8	(3.6-3.2)

Coil Index

Coil Patterns

# STANDARDS & TESTING

## QUALITY STANDARDS

Lordan is committed to manufacturing superior custom-made specialized products that comply with international standards.

Dedicated to maintaining high quality operations, Lordan complies with international quality management standard ISO 9001-2008.

Our concern for the environment has led us to obtain ISO-14001 environmental management standard and fully support its directives.

Since 1999, Lordan has been UL certified for all standard refrigerants to the UL207 heat exchanger pressure standard. This includes quarterly visits from the UL representatives to assure consistent adherence to this standard.



## TESTING FACILITIES

To support our promise guaranteeing the long life and high reliability of all our products, each Lordan coil undergoes either helium test or bubble leak test.

The helium leak test is conducted according to international standard (B6), with the test device calibrated to test minute amounts of leakage at an internal pressure of 42 bars, an equivalent of 0.5 gram refrigerant leakage rate per year.

The helium testing process is:

- Based on a temperature stable dry technique
- Capable of finding small leaks that can go undetected by other testing processes
- Have a high level of accuracy



# ADVANCEMENT BEYOND THERMAL ENGINEERING

## TESTING THE LIMITS OF THERMAL ENGINEERING

Lordan has distinguished itself as a leading developer of advanced fin and tube technology with the introduction of Triple 7 and now with its latest innovation, the Lord FiVe.

More than a decade ago, Lordan unveiled its advanced Triple 7 coil pattern providing a high capacity coil in a small area also available in stainless steel. With Lord FiVe Lordan has outdone itself again, introducing to the market a compact, lightweight coil pattern with a 5 mm diameter tube - the smallest coil on the market today.

As part of our vision to retain a leading edge in the development of technical and business innovation, we invest long and extensive engineering hours in research and development that guarantees you:

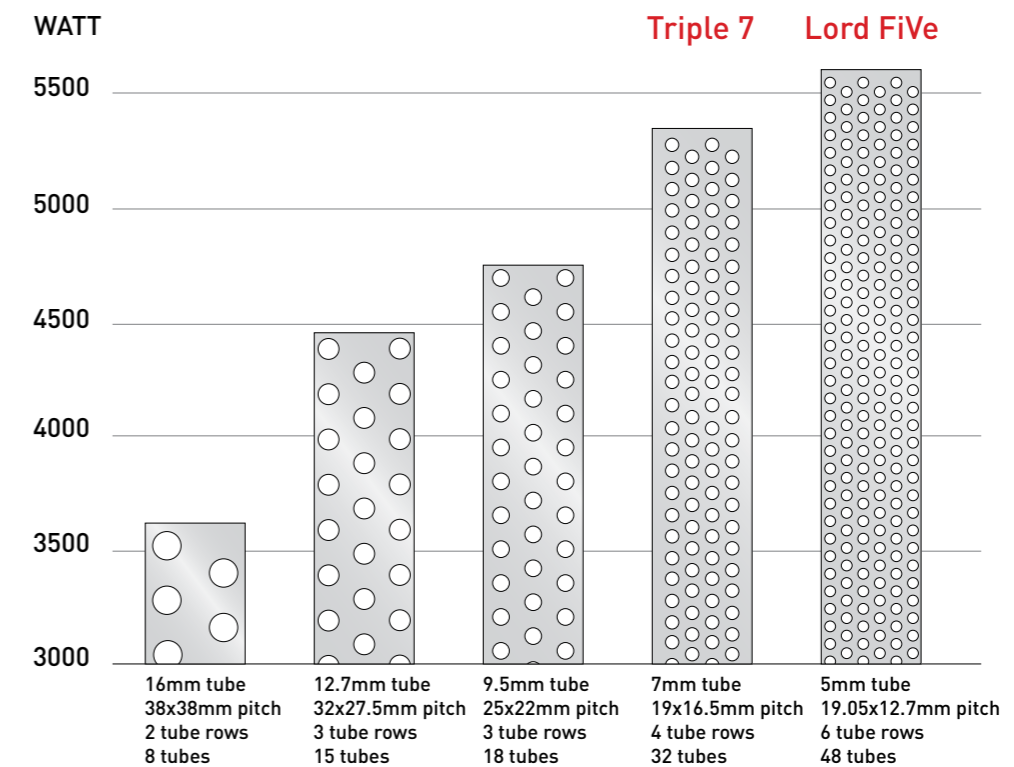
- Long term savings in energy costs, with solutions that save you space and volume, environmentally friendly, less reliant on dwindling resources and low in maintenance.
- High quality coils that are built to last for many years to come.



New compact and lightweight, the Lord FiVe, is a 5 mm diameter tube design, whose small diameter provides excellent heat exchange while utilizing smaller amounts of refrigerant making it more environment friendly and cost-effective.

## TRIPLE 7

**Best performing high capacity coil pattern generating increased airflow**, the Triple 7 combines 7mm tubes in an equilateral tube arrangement creating an optimal ratio between tube diameter and distance. This highly versatile coil can be adapted to hand-sized heat transfer applications and giant chillers alike.



\* Capacities are for 30cm x 30cm x8cm evaporator with the same fan at standard ASHRAE conditions

# Lord FiVe

# TRIPLE 7

Lord FiVe

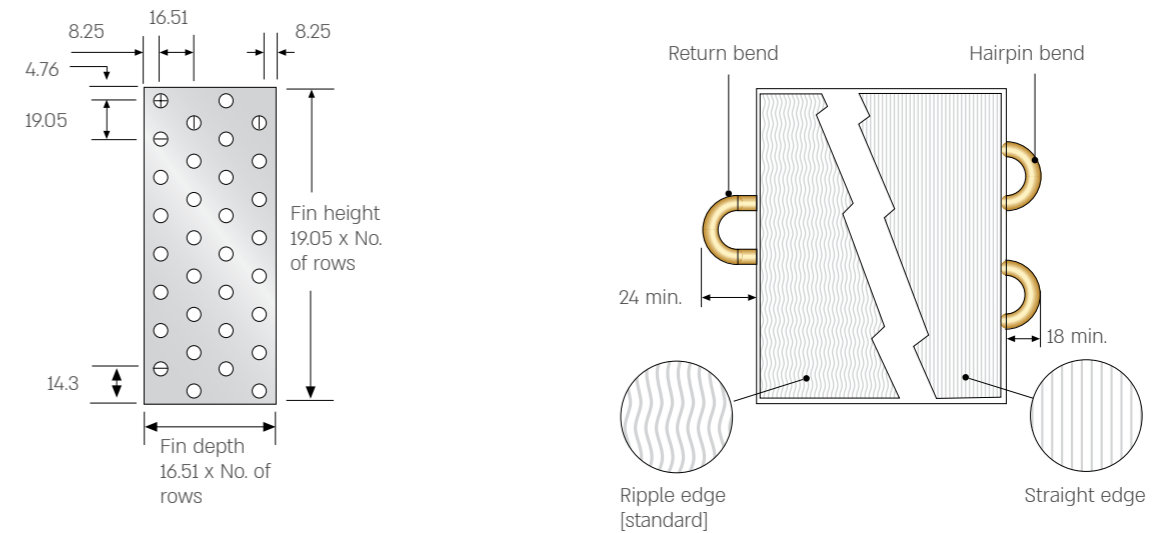
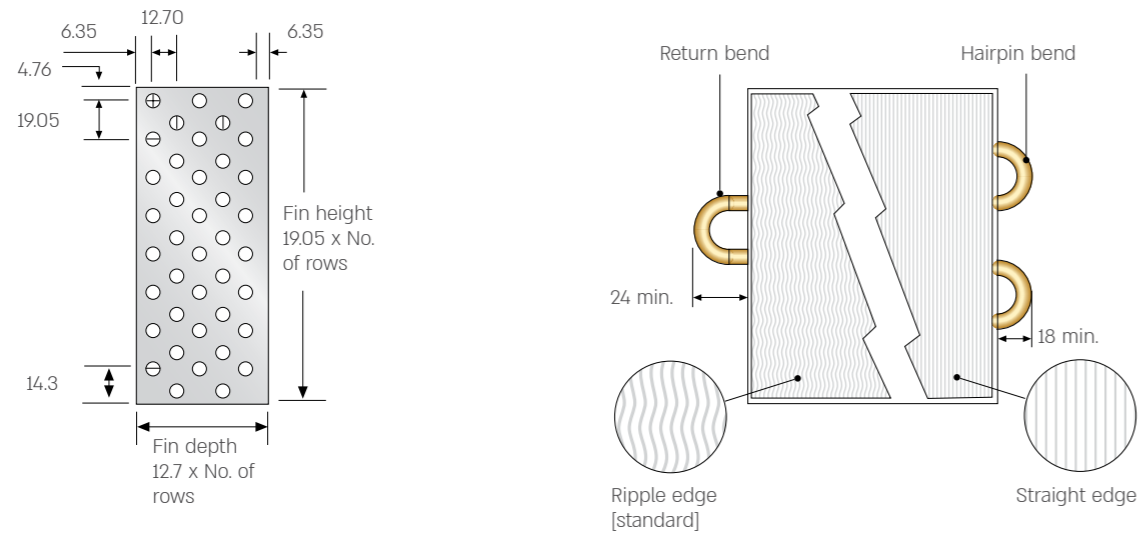
Triple 7

LORD FIVE / PATTERN 55 / 19.05 X 12.7

TUBE Ø 5MM

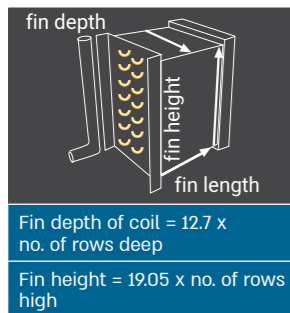
TRIPLE 7 / PATTERN 15 / 19.05 X 16.5

TUBE Ø 7MM

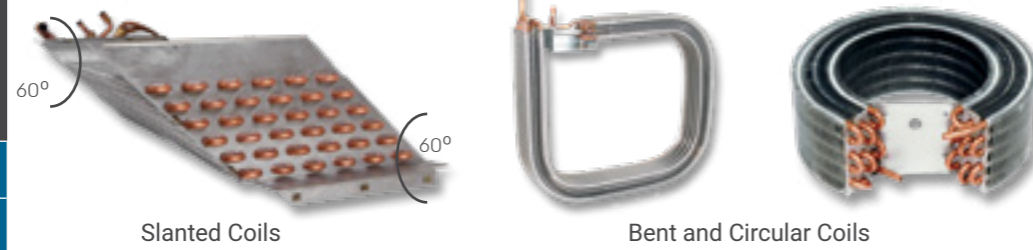


### Fin Density Details

Fin Per Inch (FPI)	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Distance (mm)	3.6	3.2	2.8	2.5	2.3	2.1	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.3	1.2
Aluminum Fin Thickness (mm)	0.20, 0.30	0.15, 0.20, 0.30		0.12, 0.15, 0.20, 0.30						0.12, 0.15					
Copper Fin Thickness (mm)		0.15, 0.20		0.13, 0.15, 0.20						0.13, 0.15					
Fin Shapes	Flat		Sine wave, Corrugated, Flat									Flat			

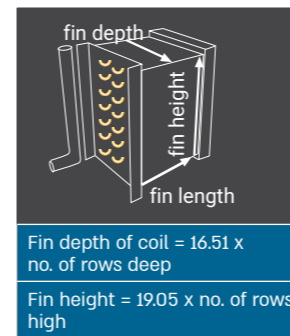


### Optional Specifications

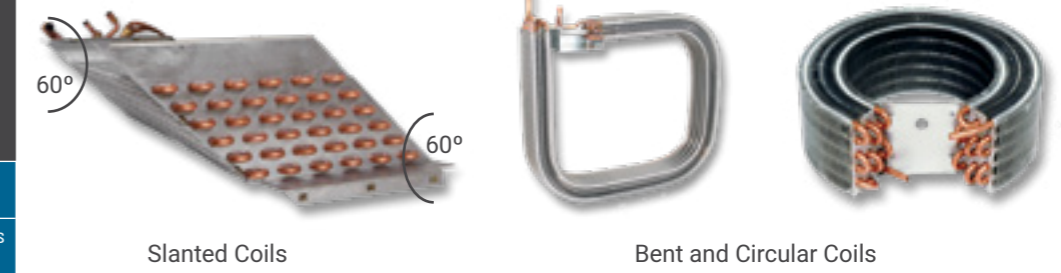


### Fin Density Details

Fins Per Inch (FPI)	6	7	8	9	10	11	12	13	14	15	16	17	18	20	22
Distance (mm)	4.2	3.6	3.2	2.8	2.5	2.3	2.1	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.2
Aluminum Fin Thickness (mm)	0.20, 0.30		0.15, 0.20, 0.30			0.12, 0.15, 0.20, 0.30					0.12, 0.15				
Copper Fin Thickness (mm)	0.2		0.15, 0.2		0.13, 0.15, 0.2										
Fin Shapes	Louvered, Corrugated, High Corrugated, Sine Wave, Flat														



### Optional Specifications



LORDAN COIL DESCRIPTION KEY

**55 / 3 X 9 X 800 / 11 - 5 [0]**

pattern#    rows deep    rows high    fins length mm    fpi    circuits    empty holes

LORDAN COIL DESCRIPTION KEY

**15 / 3 X 9 X 800 / 11 - 5 [0]**

pattern#    rows deep    rows high    fins length mm    fpi    circuits    empty holes

Coil Patterns

Coil Patterns

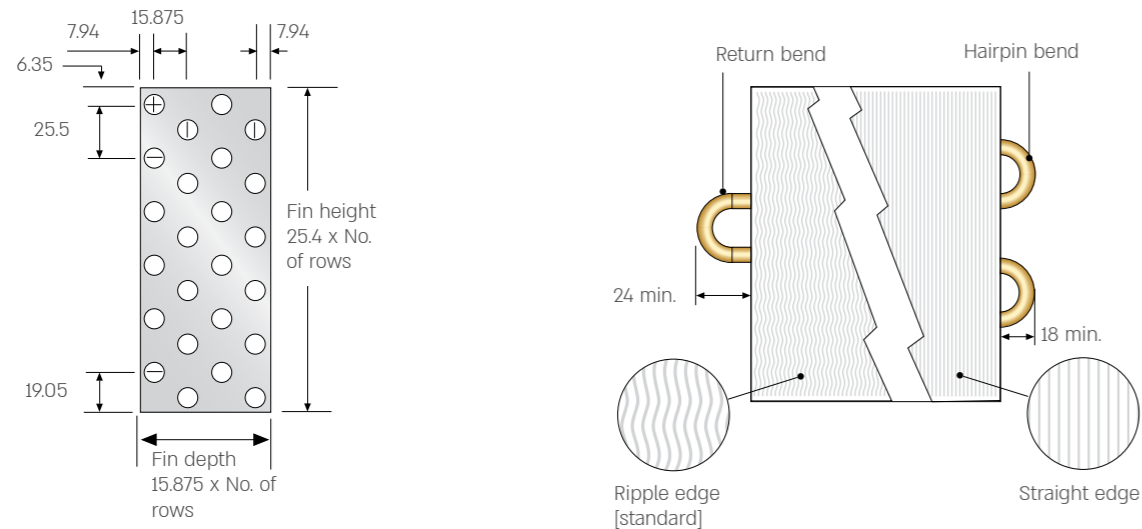
# PATTERN 8

Pattern 8

PATTERN 8 / 25.4 X 15.875

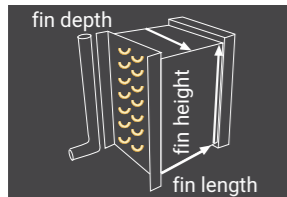
TUBE Ø 9.52MM (3/8")

SPECIAL DENSE PATTERN FOR AUTOMOTIVE



Coil Patterns

Fins Per Inch (FPI)	8	9	10	11	12	13	14	15	16	17
Distance (mm)	3.2	2.8	2.5	2.3	2.1	2.0	1.8	1.7	1.6	1.5
Aluminum Fin Thickness (mm)	0.15	0.12, 0.15	0.12, 0.15, 0.20				0.12, 0.15			
Copper Fin Thickness (mm)	0.15		0.13, 0.15							
Fin Shapes	Corrugated									



Fin depth of coil = 15.875 x no. of rows deep

Fin height = 25.4 x no. of rows high

Optional Specifications



Bent and Circular Coils

LORDAN COIL DESCRIPTION KEY

8 / 3 X 9 X 800 / 11 - 5 [0]

pattern# rows deep rows high fins length mm fpi circuits empty holes

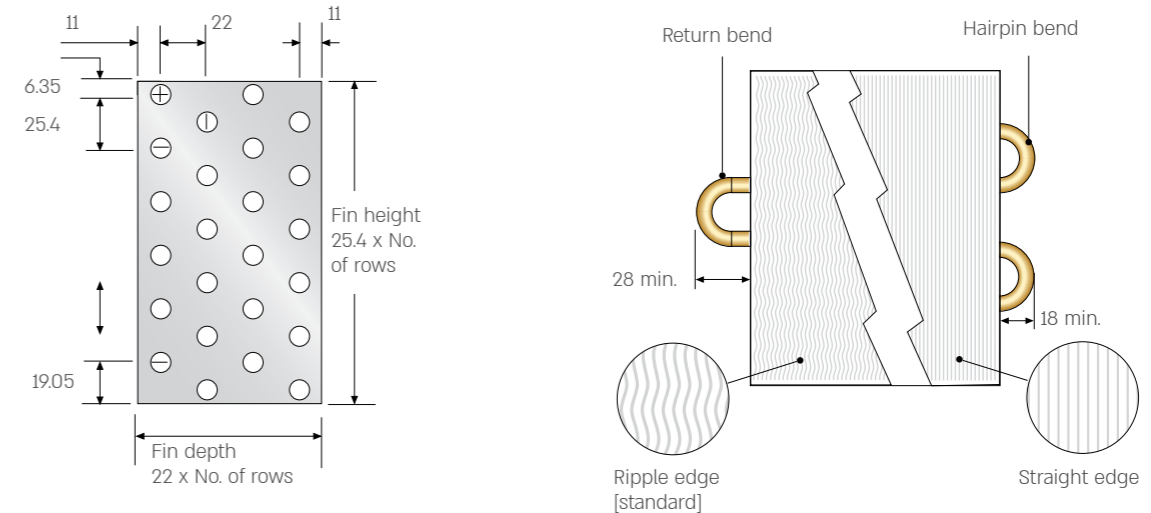
# PATTERN 9

Pattern 9

PATTERN 9 / 25.4 X 22

TUBE Ø 9.52MM (3/8")

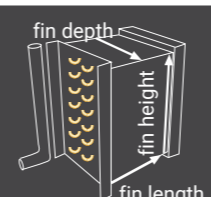
WORLD STANDARD



Coil Patterns

Fin Density Details

Fins Per Inch (FPI)	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Distance (mm)	6.3	5.1	4.2	3.6	3.2	2.8	2.5	2.3	2.1	2.0	1.8	1.7	1.6	1.5	1.4
Aluminum Fin Thickness (mm)	0.3	0.2, 0.3		0.15, 0.2, 0.3			0.12, 0.15, 0.2, 0.30						0.12, 0.15, 0.20		
Copper Fin Thickness (mm)				0.2	0.15, 0.20		0.13, 0.15, 0.20								
Fin Shapes	Louvered, Corrugated, Sine Wave, Flat														



Fin depth of coil = 22 x no. of rows deep

Fin height = 25.4 x no. of rows high

Optional Specifications



Slanted Coils

Bent and Circular Coils

LORDAN COIL DESCRIPTION KEY

9 / 3 X 9 X 800 / 11 - 5 [0]

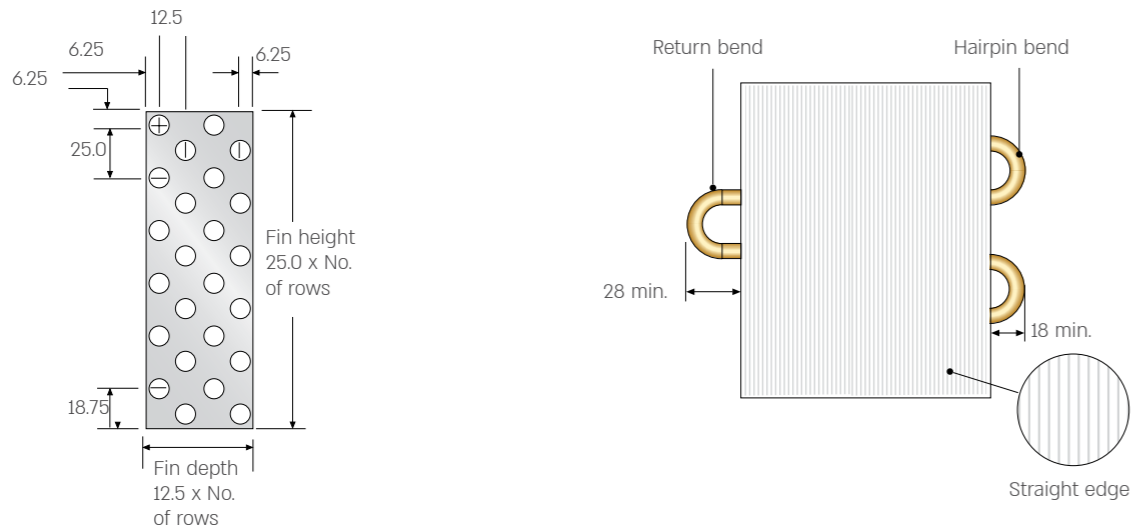
pattern# rows deep rows high fins length mm fpi circuits empty holes

# PATTERN 13

PATTERN 13 / 25 X 12.5

TUBE Ø 9.52MM (3/8")

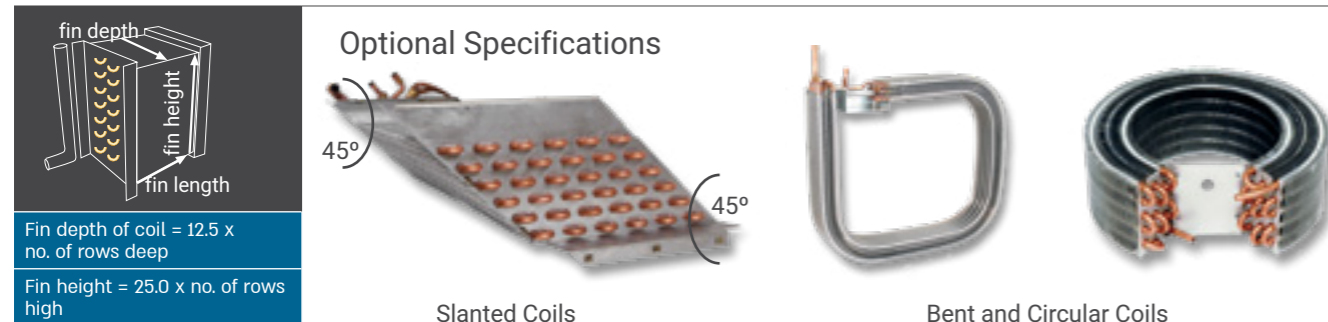
EXTRA DENSE FOR HIGH OUTPUT IN MINIMUM DEPTH



Fin Density Details

Fins Per Inch (FPI)	7	8	9	10	11	12	13	14	15
Distance (mm)	3.6	3.2	2.8	2.5	2.3	2.1	2.0	1.8	1.7
Aluminum Fin Thickness (mm)	0.2	0.15, 0.20		0.12, 0.15, 0.20				0.12, 0.15	
Copper Fin Thickness (mm)					0.13, 0.15				
Fin Shapes	Flat								

Optional Specifications



Fin depth of coil = 12.5 x no. of rows deep  
Fin height = 25.0 x no. of rows high

LORDAN COIL DESCRIPTION KEY

13 / 3 X 9 X 800 / 11 - 5 [0]

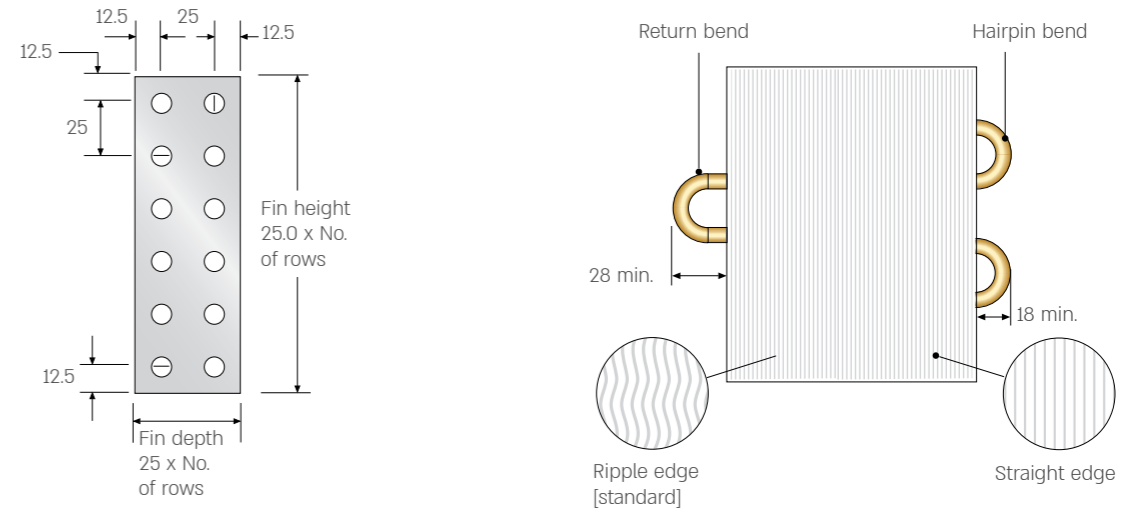
pattern# rows deep rows high fins length mm fpi circuits empty holes

# PATTERN 14

PATTERN 14 / 25 X 25

TUBE Ø 9.52MM (3/8")

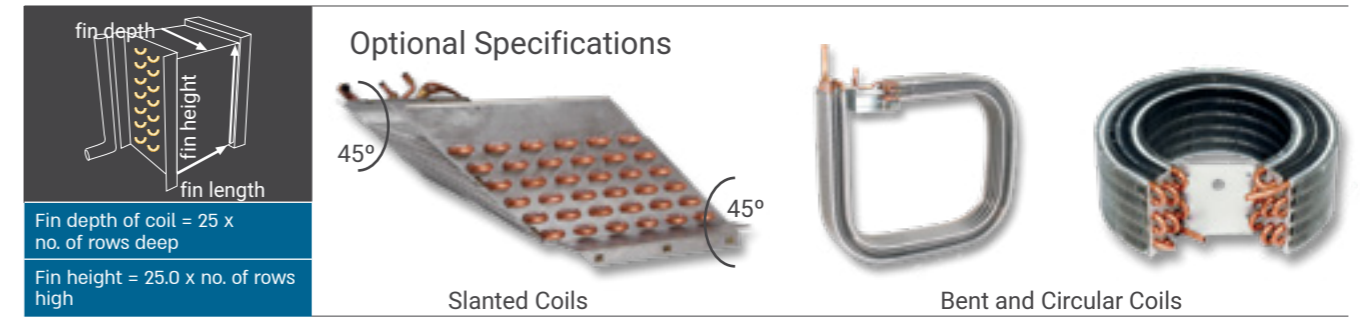
FOR VERY LOW AIR PRESSURE DROP



Fin Density Details

Fins Per Inch (FPI)	4	5	6	7	8	9	10	11	12	13	14	15	16
Distance (mm)	6.4	5.1	4.2	3.6	3.2	2.8	2.5	2.3	2.1	2.0	1.8	1.7	1.6
Aluminum Fin Thickness (mm)	0.3	0.2, 0.3		0.15, 0.20, 0.30			0.12, 0.15, 0.20, 0.30				0.12, 0.15		0.12
Copper Fin Thickness (mm)						0.13, 0.15, 0.2							
Fin Shapes	Flat, Sine wave												

Optional Specifications



Fin depth of coil = 25 x no. of rows deep  
Fin height = 25.0 x no. of rows high

LORDAN COIL DESCRIPTION KEY

14 / 3 X 9 X 800 / 11 - 5 [0]

pattern# rows deep rows high fins length mm fpi circuits empty holes

Pattern 13

Pattern 14

Coil Patterns

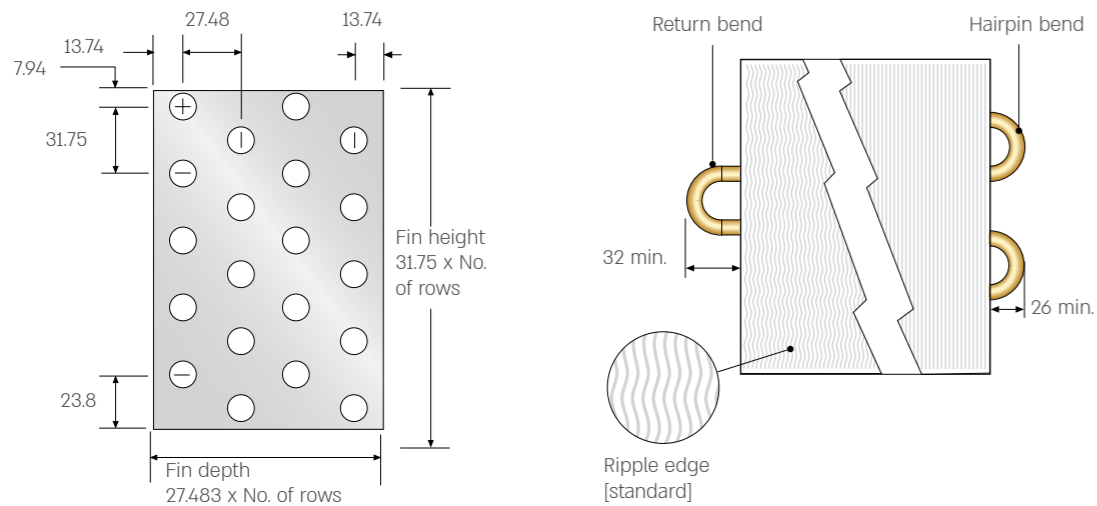
Coil Patterns

# PATTERN 7

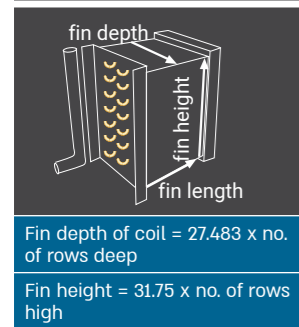
PATTERN 7 / 31.75 X 27.48

TUBE Ø 12.7MM (1/2")

FOR HIGH WATER FLOW COILS



Fins Per Inch (FPI)	6	7	8	9	10	11	12	13	14
Distance (mm)	4.2	3.6	3.2	2.8	2.5	2.3	2.1	2.0	1.8
Aluminum Fin Thickness (mm)	0.20	0.15, 0.20		0.12, 0.15, 0.20					
Copper Fin Thickness (mm)	0.13, 0.15, 0.20								
Fin Shapes	Corrugated								



### Optional Specifications



Bent and Circular Coils

LORDAN COIL DESCRIPTION KEY

7 / 3 X 9 X 800 / 11 - 5 [0]

pattern# rows deep rows high fins length mm fpi circuits empty holes

Pattern 7

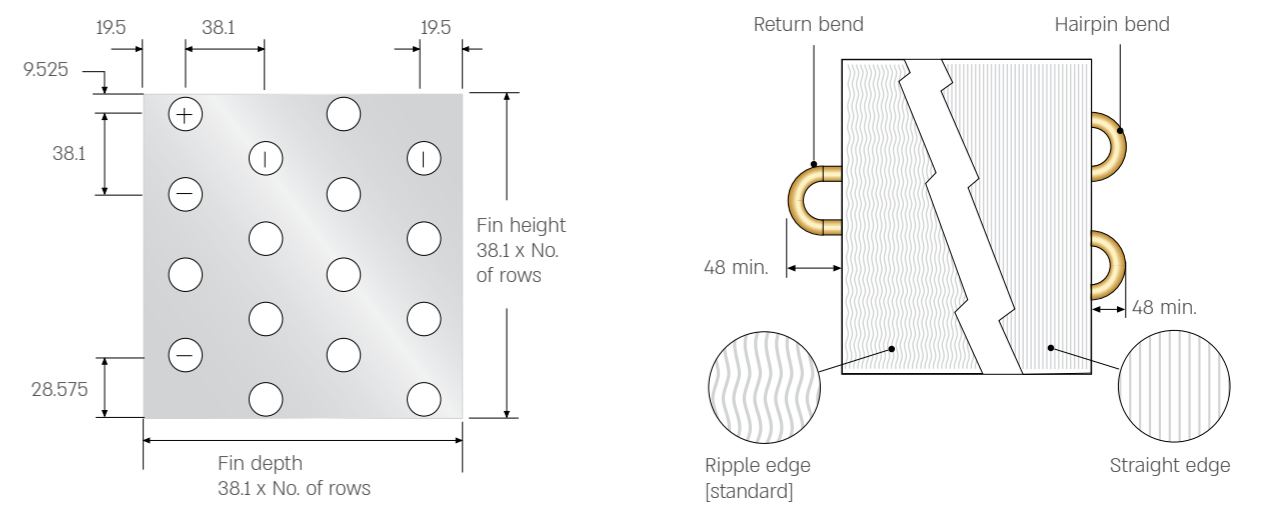
Coil Patterns

# PATTERN 5

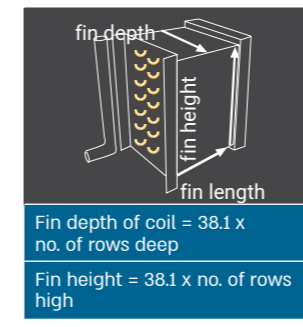
PATTERN 5 / 38.1 X 38.1

TUBE Ø 15.88MM (5/8")

FOR LARGE OUTPUTS UP TO 5 METERS LONG



Fins Per Inch (FPI)	5	6	7	8	9	10	11	12
Distance (mm)	5.1	4.2	3.6	3.2	2.8	2.5	2.3	2.1
Aluminum Fin Thickness (mm)	0.20	0.15, 0.20			0.12, 0.15, 0.20			
Copper Fin Thickness (mm)	0.2			0.13, 0.15, 0.2				
Fin Shapes	Corrugated							



### Optional Specifications



Bent and Circular Coils

LORDAN COIL DESCRIPTION KEY

5 / 3 X 9 X 800 / 11 - 5 [0]

pattern# rows deep rows high fins length mm fpi circuits empty holes

Pattern 5

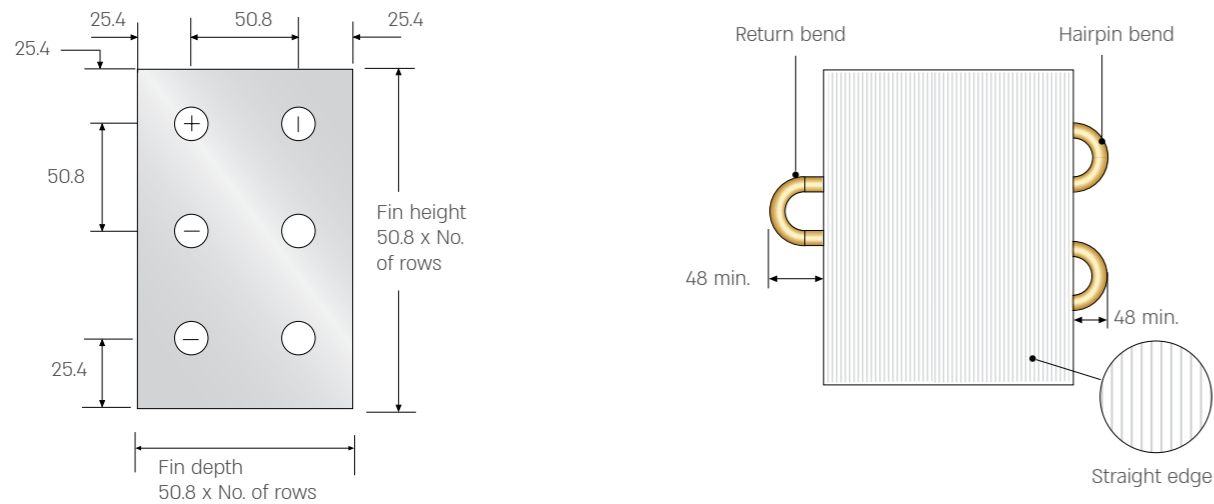
Coil Patterns

# PATTERN 6

PATTERN 6 / 50.8 X 50.8

TUBE Ø 15.88MM (5/8")

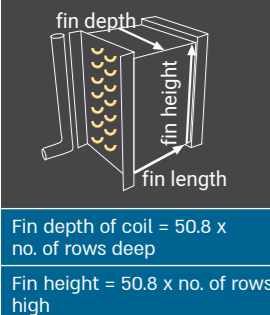
ULTRA LOW FIN DENSITY FOR FREEZERS



### Fin Density Details

Fins Per Inch (FPI)	4	5	6	7	8	9
Distance (mm)	6.4	5.1	4.2	3.6	3.2	2.8
Aluminum Fin Thickness (mm)	0.30, 0.20					0.15
Copper Fin Thickness (mm)	0.2					
Fin Shapes	Flat					

### Optional Specifications



Bent and Circular Coils

LORDAN COIL DESCRIPTION KEY

6 / 3 X 9 X 800 / 11 - 5 [0]

pattern# rows deep rows high fins length mm fpi circuits empty holes

Pattern 6

Coil Patterns

# TUBES & APPLICATIONS

Applications

Tube Shape	Applicable Diameters mm (inch)	Applicable Lordan Patterns	Common Uses
Smooth	15.88mm (5/8") 12.70mm (1/2") 9.52mm (3/8") 7mm 5mm	5,6,7,8,9,11,13,14 Triple 7 (15) Five (55)	Standard in all coils
Rifled	12.70mm (1/2") 9.52mm (3/8") 7mm 5mm	7,8,9,11,13,14 Triple 7 (15) Five (55)	Condensers and evaporators for increased capacities
Turbo Spirals in Tube	15.88mm (5/8") 12.70mm (1/2") 9.52mm (3/8") 7mm	5,6,7,8,9,11,13,14 Triple 7 (15)	Improved capacities for liquid carrying coils with limited size restrictions

Tubes

### Tube Materials Options

Standard Tube Material	Specification and Standard	Tube diameter mm (inch)	Available Wall Thickness mm (inch)
Copper	ASTM B-280	15.88mm (5/8")	0.40mm 0.46mm .016", .018"
		12.70mm (1/2")	0.35mm 0.40mm .014", .016"
		9.52mm (3/8")	0.28mm 0.35mm .011", .014"
		7mm	0.25mm, 0.28mm 0.50mm, 0.71mm .010", .011" .020", .028"
		5mm	0.25mm, 0.35mm 0.40mm .010", .014" .016"
Stainless Steel	316L	12.70mm (1/2")	0.89mm .035"
		9.52mm (3/8")	0.71mm .028"
		7mm	0.51mm .020"

# TUBES BENDING CAPABILITY



Available Tube O.D.

inch		3/16"	1/4"		5/16"	3/8"			1/2"		5/8"		3/4"
mm	4			7			10	12		15		18	

End Forming Of Copper Tubes – Standard Options





		O.D. range
O-Ring Long Pilot		9.53 to 19.05 (3/8" to 3/4")
O-Ring Short Pilot		9.53 to 19.05 (3/8" to 3/4")
Flare		6.35 to 19.05 (1/4" to 3/4")
Water O-Ring		9.53 to 22.22 (3/8" to 7/8")
Water Cone Head		9.53 to 19.05 (3/8" to 3/4")
Reduced Diameter		Any
Expanded Diameter		Any

Capabilities

Tubes

# FINS: SHAPES & APPLICATIONS



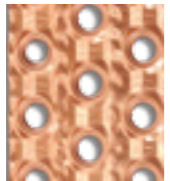
Shapes & Applications

Fin Shapes	Characteristics	Common Applications
Louvered 	Louvered fins increase the heat-transfer capacity by creating air turbulence which reduces the boundary layer on the fin's surface, but at a cost of increased air-pressure drop across the coil.	<ul style="list-style-type: none"> <li>• Evaporators</li> <li>• Heaters and Coolers</li> <li>• Condensers operating in areas with light to normal dust conditions</li> <li>• This fin shape is for all applications with normal dust conditions</li> </ul>
Corrugated (low and high) 	Corrugated fins improve the heat transfer factor to a lower degree than louvered fins. They also have a lower resistance to air flow.	<ul style="list-style-type: none"> <li>• Used where icing or heavy-dust conditions are expected, like condensers for off road vehicles and for heavy dust applications</li> </ul>
Sine Wave 	Sine wave fins improve the heat transfer factor to a higher degree than corrugated fins. These have about the same resistance to air flow as the corrugated fins.	<ul style="list-style-type: none"> <li>• Good all purpose selection for all types of coils, provides the best output to air pressure drop ratio</li> <li>• Default fin shape when not otherwise specified</li> </ul>
Flat 	Flat fins reduce ice accumulation on fins. They have the lowest resistance to air flow.	<ul style="list-style-type: none"> <li>• Deep freezers</li> <li>• Cooling / freezing systems</li> <li>• Passive air flow systems</li> </ul>



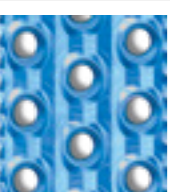
Fins

# FINS: MATERIAL OPTIONS

## Natural Materials

Fin Type	Characteristics	Common Applications
 <p>Regular Aluminum</p>	Regular Aluminum of the 8xxx alloy series is the most common and cost effective fin material. It exhibits good endurance under normal environmental conditions.	<ul style="list-style-type: none"> <li>Residential applications (both indoors and outdoors)</li> <li>Vehicles of all kind</li> <li>Large coils for central systems</li> <li>Freeze &amp; deep-freeze</li> </ul>
 <p>Marine Quality Aluminum</p>	Marine Quality Aluminum has improved resistance to salty, humid conditions. It is cost effective and has demonstrated first-rate Salt Spray test results.	<ul style="list-style-type: none"> <li>Coils for marine equipment</li> <li>Coils for coastal residences</li> <li>Coils for mining equipment</li> <li>Coils for corrosive industries</li> <li>Applications exposed to salty, humid and/or corrosive conditions</li> </ul>
 <p>Copper</p>	Copper has higher heat conductivity and mass, and is more costly than Aluminum.	<ul style="list-style-type: none"> <li>Coolers for special industrial machines</li> <li>Areas with space limitations</li> <li>High-tech environments</li> </ul>

## Precoated Materials

Fin Type	Characteristics	Common Uses
 <p>Hydrophobic</p>	The epoxy based hydrophobic coating effectively repels water and inhibits dust and bacterial accumulation. Salt Spray test results are excellent (over 1,000 hours).	<ul style="list-style-type: none"> <li>Condensers for coastal residencies</li> <li>Condenser coils for polluted areas</li> <li>Coils for corrosive industries</li> <li>Coils for laboratories and hospitals</li> </ul>
 <p>Hydrophilic</p>	The special two-micron pre-coated polymer hydrophilic coating improves airflow by reducing thickness of condensing water layers, known as water carry-over phenomenon.	<ul style="list-style-type: none"> <li>Evaporators and coolers</li> <li>Avoids carry-over of condensed water at high air velocities</li> </ul>
 <p>Nano Coating</p>	The nano coating is only 5µ thin with high heat transfer capabilities. Resists corrosion, salt water, and dust; Salt Spray test results are superior (over 5,000 hours).	<ul style="list-style-type: none"> <li>Protection against organic solvents and chemicals</li> <li>Self-cleaning</li> <li>Reduced dirt accumulation</li> <li>Lower energy consumption</li> <li>Lower maintenance costs</li> </ul>

Materials

Fins

# FINS: SPECIAL COATINGS

Today, a long-lasting coil is as important as the air quality it handles. Lordan offers specialized coatings for extended product life and protection against bacteria buildup and corrosion, especially important for central cooling systems, offices, shopping centers, as well as central systems for residential buildings.

## SOLUTIONS FOR EXTREME ENVIRONMENTS



Complex heating, cooling and refrigeration challenges demand high enduring coils suitable to withstand exposure to extreme environments. Harsh conditions found in coastal or industrial environments release airborne contaminants that are corrosive to the materials of the coil.

Lordan's specialized coatings are designed to reduce deterioration by sealing out moisture and airborne contaminants such as salt and salt-spray, humidity, corrosive fumes emitted from highly polluted industrial areas and chemical production, and other damaging elements.

Special Coatings

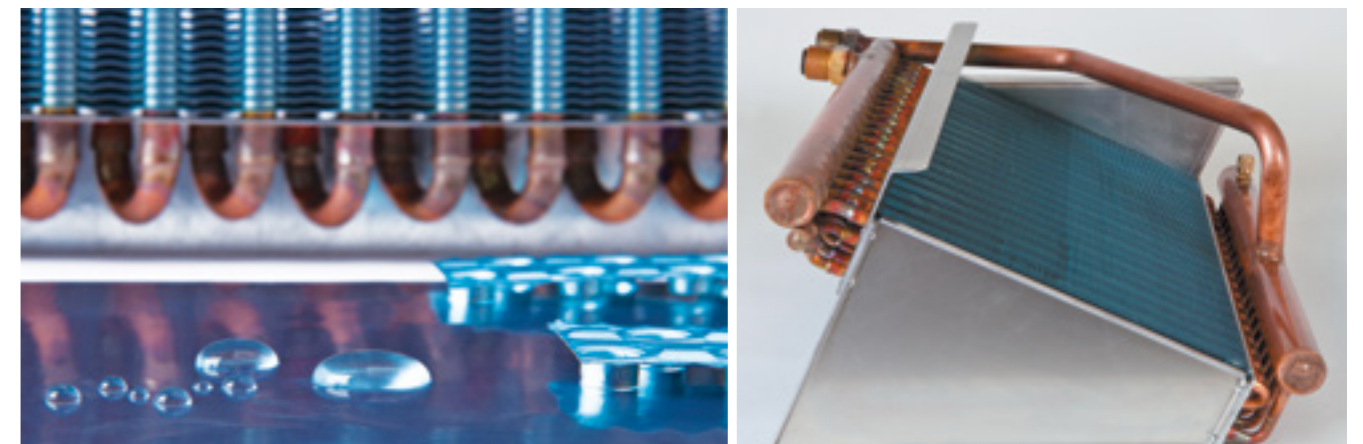
Fins

## NANO-COATING

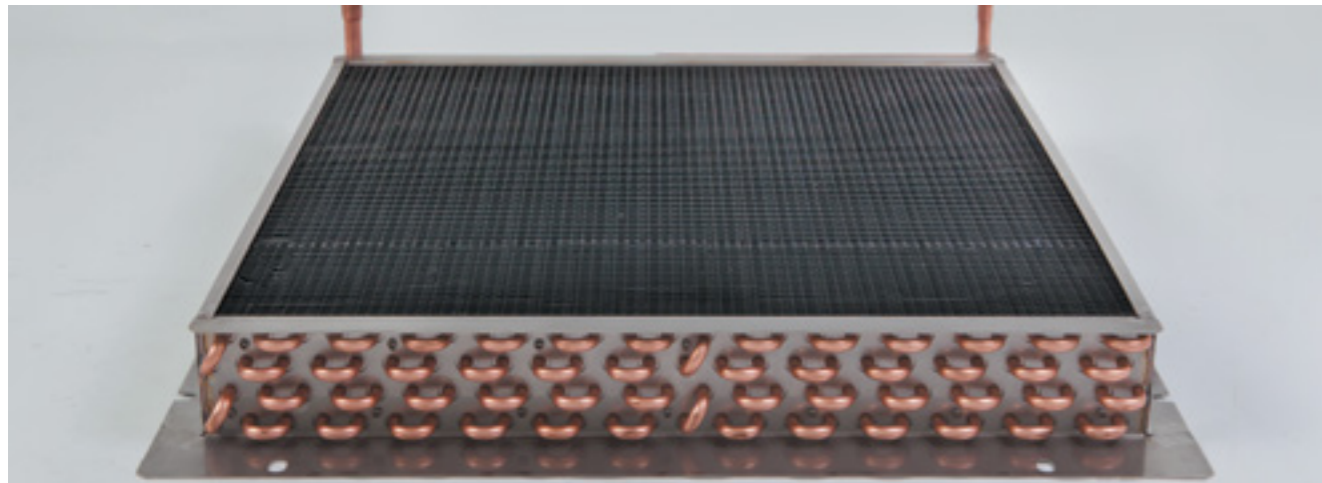


Lordan offers an innovative super water repellent coating with an enhanced hydrophobic layer that is only 5µ thin. Our nano-coating guarantees extended product life while maintaining excellent heat transfer capabilities.

The coating has proven self-cleaning and its low dirt accumulation attributes significantly reduce energy consumption and maintenance costs, while protecting against many organic solvents and chemicals.

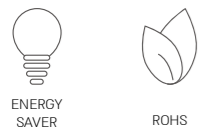


## EPOXY COATING LORD-PHOB EPOXY COATING



Lord-Phob is an epoxy based coated fin providing first-grade resistance to corrosive conditions. The ultra thin epoxy-based coating preserves the appropriate gap needed for effective heat transfer between the fin and the surrounding air.

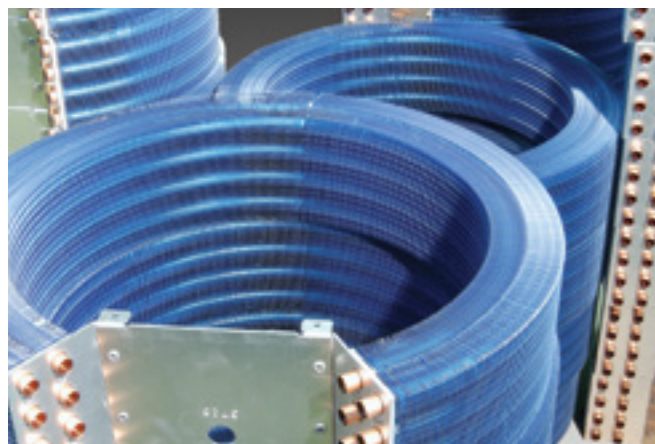
## LORD-PHILL HYDROPHILIC COATING



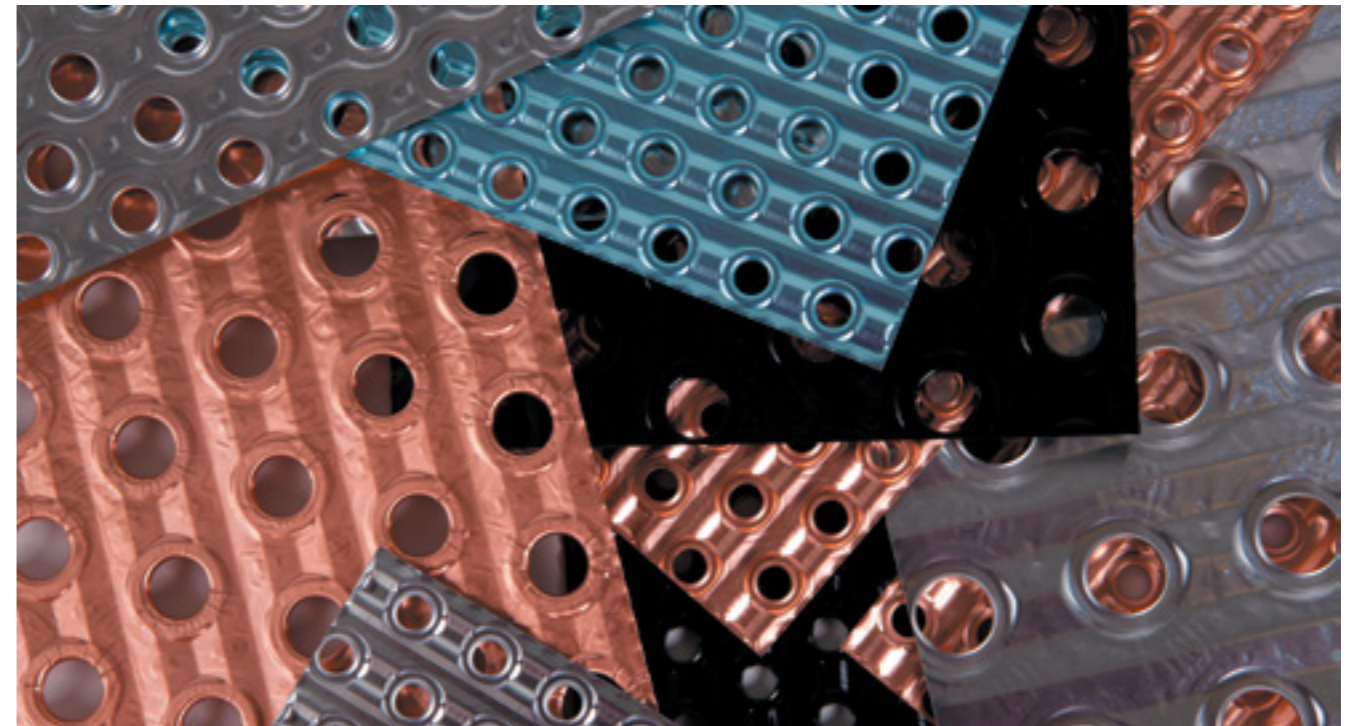
Our hydrophilic coating is a 2-micron special pre-coated polymer. The hydrophilic surface-tensile qualities flatten condensing water droplets on the fin, thereby reducing water layer buildup that can restrict air flow between the fin layers.

The coating also prevents the phenomenon of water carry-over from drops getting into the evaporator's airflow at high air speeds.

This is especially significant for evaporators with tangential blowers.



Special Coatings

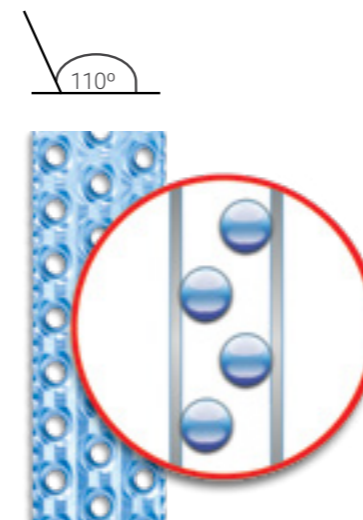


Technical Specifications	Nano	Lord Phob	Lord Phil
Material type	polymer	epoxy based + chemical conversion	polymer + chemical conversion
Layer thickness	~ 5 micron	~ 3 micron	~ 2 micron
Thermal conductivity effects	< 1%	< 1%	< 1%
Standard color	light blue	black	light blue
Temperature resistance	-20°C to 250°C	-20°C to 200°C	-20°C to 120°C
Salt spray humidity endurance test	5,000 hours	1,000 hours	500 hours

Fins

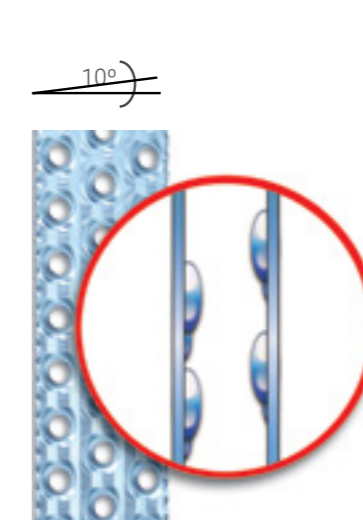
### Nano

Nano coating prevents the adhering of the water droplets on the fin surface, keeping the fin dry and not prone to dust accumulation.



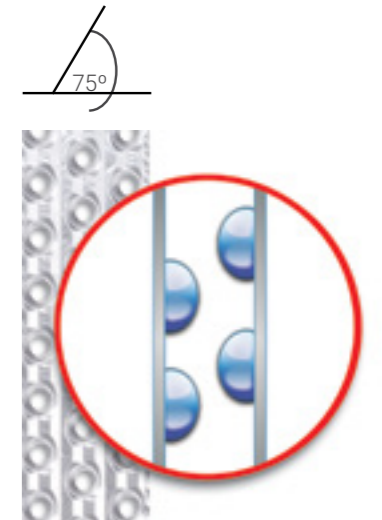
### Lord Phill

Lord Phill coating reduces surface tension by flattening water droplets and allowing increased air flow.



### Uncoated

On uncoated fins, large round water droplets accumulate that can restrict air flow and produce water spray.



# PREMIUM COILS

## ALL-AL ALUMINUM COILS



Rising concern over energy savings and the environment has prompted us to take waste reduction measures without compromising performance. Lordan is pleased to offer recyclable round aluminium tubing that is one hundred percent recyclable, designed for both water and gas applications.

Our recyclable All-Al (all aluminum) coils significantly reduces coil weight and provides better corrosion resistance that translates to energy efficiency in terms of lower operating costs and volume savings.

### Benefits of Aluminum

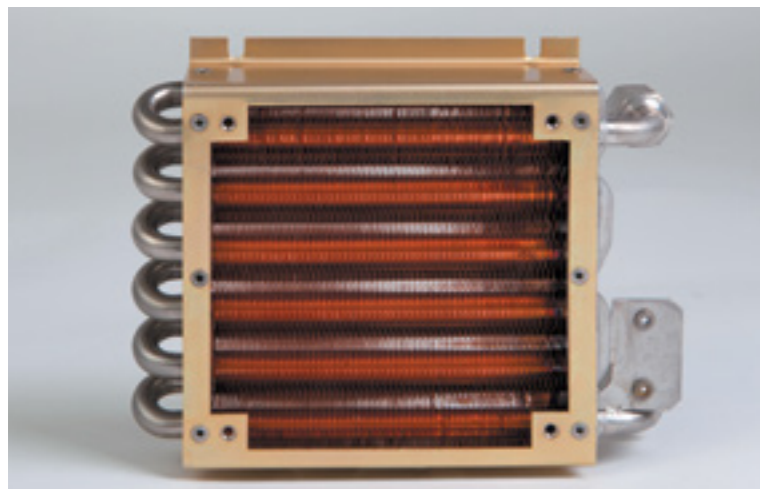
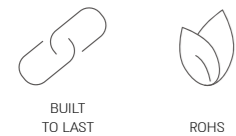
- Cost-effectiveness: Best cost/quality ratio
- 100 percent recyclable
- High strength
- Lightweight and easy to handle
- Non-corrosive
- Good heat and cold conductor
- Suited for heavy duty applications



All-Al Aluminum Coils & Stainless Steel Coils

Premium Coils

## STAINLESS STEEL COILS



We offer stainless steel tubing especially suited for highly corrosive fluids and applications.

### Benefits of Stainless Steel

- Cost-effective
- High strength, solid material
- Better wear resistance
- Non-corrosive
- Non-abrasive
- Inert metal
- Superior heat and cold conductor
- Suited for heavy duty applications

# QUOTATION REQUEST

Quotation Request

Name \_\_\_\_\_

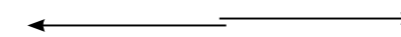
Company \_\_\_\_\_

E-mail \_\_\_\_\_

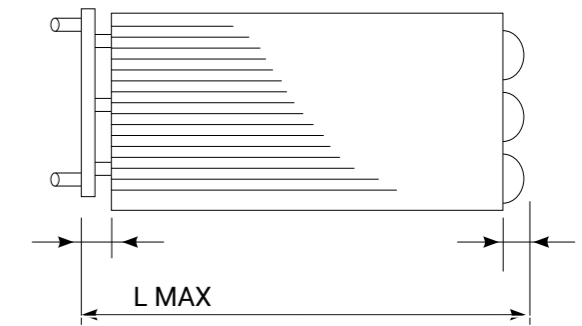
Phone \_\_\_\_\_

Tube Material	Aluminum / Copper / St.St.
Frame Material	C-Alv/Al/mine/CU/Brass/ St.St.
Fin Material + Coating	Aluminum / Copper
Fin Thickness	0.12 / 0.15 / 0.20 / 0.30 mm
Painted	Yes / No

Airflow Direction



1	○	○	○	○	○	○	○
2	○	○	○	○	○	○	○
3	○	○	○	○	○	○	○
4	○	○	○	○	○	○	○
5	○	○	○	○	○	○	○
6	○	○	○	○	○	○	○
7	○	○	○	○	○	○	○
8	○	○	○	○	○	○	○
9	○	○	○	○	○	○	○
10	○	○	○	○	○	○	○
11	○	○	○	○	○	○	○
12	○	○	○	○	○	○	○
13	○	○	○	○	○	○	○
14	○	○	○	○	○	○	○
15	○	○	○	○	○	○	○
16	○	○	○	○	○	○	○
17	○	○	○	○	○	○	○
18	○	○	○	○	○	○	○
19	○	○	○	○	○	○	○
20	○	○	○	○	○	○	○
21	○	○	○	○	○	○	○
22	○	○	○	○	○	○	○
23	○	○	○	○	○	○	○



### Operating Conditions Evaporator / Condenser

Airflow	m3/h	CFM
Air Inlet Temp. DB	°C	°F
Air Inlet Temp. WB	°C	°F
Or Air Inlet Relative Humidity	RH%	
Refrigerant Type		
Evaporating / Condenser Temp.	°C	°F
Superheat Sub-Cool	°K	°R
Capacity Required	kW	BTU/h

### Fluid to Air Coil

Airflow	m3/h	CFM
Air Inlet Temp. DB	°C	°F
Air Inlet Temp. WB	°C	°F
Or Air Inlet Relative Humidity	RH%	
Fluid Flow Rate	L/min	GPM
Fluid Inlet Temp.	°C	°F
Fluid Type	Water %	
	Ethylene glycol %	
	Propylene glycol %	
For any other fluid, indicate the following properties at two relevant temperatures: viscosity, specific heat, thermal conductivity or density.		
Capacity Required	kW	BTU/h

# UNIT CONVERSION

## LENGTH

1 inch (1") = 25.4 mm  
 1 foot (1') = 12 inches = 304.8 mm  
 1 yard = 3 feet = 0.914m, 914.4 mm

## AREA

1 square foot = 0.09290 square meter  
 1 square meter = 10.76 square feet

## VOLUME

1 cubic foot = .02832 cubic meter, 1 cubic meter = 35.31 cubic feet  
 1 US gallon = 3.7854 liter

## FLOW RATE

1 GPM, Gallon per Minute = .2273 CBM/H, cubic meter per hour = 1/4.4  
 1 CFM, Cubic Feet per Minute = 1.7 CBM/H

## VELOCITY

1 FPM, Foot per Minute = 1/197 meter per second

## MASS

1 lb, pound = 16 oz, ounce = 0.4536 kg  
 1 oz, ounce = 28.35 gram

## TEMPERATURE

Deg. C =  $\frac{\text{deg. F} - 32}{1.8}$  ; Deg. F = Deg. C x 1.8 + 32

## THERMAL CAPACITY

1 Btu/h = .2926 Watt  
 1 Kcal/h = 1.163 Watt  
 1 TR, Ton Refrigeration = 3.515 kW

## PRESSURE

1 PSI = 6.89 kPa  
 1 Bar = 100 kPa  
 1" WG = 25.4 mm WG = 248.8 Pa  
 1' WG = 0.434 PSI = 304.8 mm WG = 2.989 kPa

Unit Conversions

# LORDAN WORLDWIDE LOCATIONS

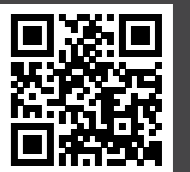
● MANUFACTURING FACILITY ● LOCAL REPRESENTATIVE ● WAREHOUSE



NAME YOUR REQUIREMENT – WE HAVE THE EXPERTISE TO MEET HEATING, COOLING AND REFRIGERATION CHALLENGES WITH TOP QUALITY, ENERGY EFFICIENT SOLUTIONS, BASED ON TECHNOLOGICALLY ADVANCED FIN AND TUBE COILS SUITED TO THE SPECIAL NEEDS OF OUR CUSTOMERS.

[WWW.LORDAN-COILS.COM](http://WWW.LORDAN-COILS.COM)

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**LORDAN**

BEYOND THERMAL  
ENGINEERING