

# Condensers

½ to 40 tons



[www.Alcoil.net](http://www.Alcoil.net)



## Advanced MicroChannel Condensers

High Efficiency  
Field Proven  
Robust  
Reliable  
Easy to Use



**Product Guide**



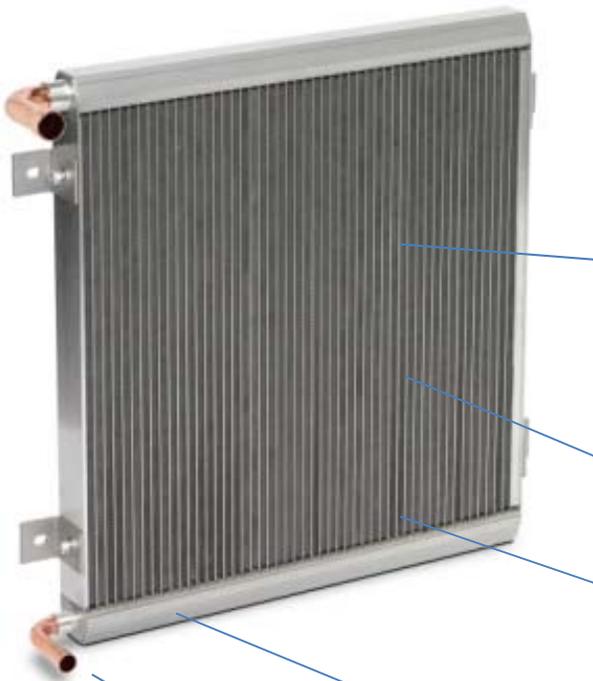
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# C Series - Condenser

## Alcoil Microchannel Features



### Custom & Standard Sizes

Flexibility and variable dimensions are tailored to our OEM customer needs using AlcoilSELECT Software. Custom and QuickShip sizes are available from as small as 4"x4" to over 80"x144". Capacities range from ¼ tons to over 40 tons.

### Easy OEM Mounting

The coil itself is a robust frame that provides air tight flush mounting, thereby eliminating unnecessary components and air bypass. Optional "L" brackets, ¼"-20 studs or ¼"-20 flush nuts are available for easy mounting.

### High Performance Fins

A state of the art louvered fin design provides low airside pressure drop and high heat transfer.

### Vertical MicroChannel Tubes

Alcoil's patented innovation incorporates vertical tubes enhance condenser operation and ensure predictable performance. Tube wall thickness are 40% above automotive and import microchannel designs to assure long life operation.

### Built-in Mini-Receiver

Unlike any HVAC/R coil, the lower header serves as a mini-receiver to reduce any "critical refrigerant charge" issues and provide easier system charging. An integral "P trap" baffle assures proper coil operation and liquid refrigerant return.

### Connections and More

Alcoil condensers are available with copper sweat connections and custom orientations.



Alcoil's MicroChannel Condensers are based on a "Next Generation" design that combines high performance flat tubes and state of the art airside fins. MicroChannel tubes have numerous mini-ports that enhance refrigerant side performance, while the Airside achieves closer approach temperatures and lower airside pressure drops. The end result is higher overall heat transfer performance,

# C Series - Condenser

## The MicroChannel Advantage

All aluminum coils are the future and rapidly becoming the norm. Alcoil's MicroChannel Technology sets the industry standard with wide reaching advantages for HVAC/R equipment.

Equipment designs incorporating Alcoil condensers span a wide range of systems designs. These include HVAC Chillers, Process Chillers, Data Center systems, Rooftop Systems, Airside equipment, Heat Pumps, Environmental Chambers, Food and Beverage, Industrial Process Equipment and Mission Critical Military equipment.

The common themes are five major reasons and advantages:

### **Higher Efficiency & Performance**

Up to 40% higher efficiency, compared to old style fin/tube designs. Advanced Micro-Channel technology combines integrally brazed airside fins to achieve higher heat transfer rates, closer approach temperatures and lower airside pressure drops.

### **Smaller Size**

Up to 20% smaller coil face depending upon the design conditions. And almost always, Alcoil heat exchangers are thinner and take up less space.

### **Less Weight**

Up to 50% less weight. This reduces shipping costs, minimizes equipment structural support, reduces labor to install, and cuts shipping costs.

### **Less Refrigerant Charge**

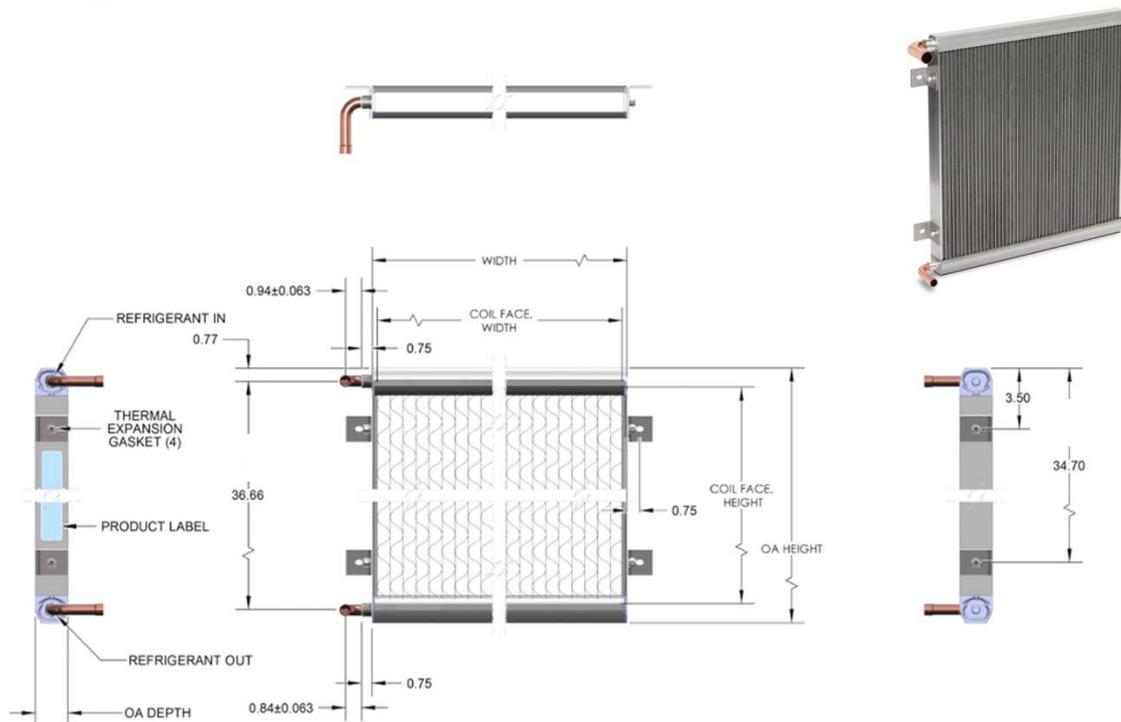
Typically 40% to 60% less refrigerant charge is required.

### **Lower Cost**

All aluminum, high performance, and less weight translate to 5% to 30% lower cost, depending upon design conditions.

Compared to "traditional fin/tube" and "automotive type" aluminum coils, Alcoil's Condensers are a robust design with major technical and financial advantages. With proven field experience, Alcoil offers a competitive advantage for OEM equipment and new applications.

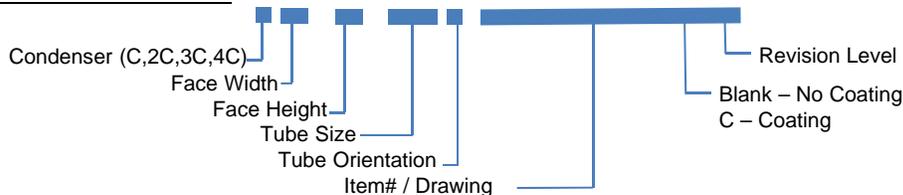
# C Series - Condenser



SSU

Capacity Range:	½ to 40 tons	
Refrigerants	R410a, R407C, R134a, R404a, R508B, R290, & others (R717 as special model)	
Design Working Pressure	650psig, 450psig & 300psig models	
Design Working Temperature	250F	
Maximum Face Width (C model)	46.4"	
Maximum Face Width (2C,3C, 4C models)	144" (up to 188")	
Maximum Face Height	77" (up to 96" upon request)	
Tube Sizes	1.25" (High Performance) .83" (Economy)	1.9" O.A. Depth 1.5" O.A. Depth
Fins	24 fpi, high performance, louvered	
Connection Sizes	3/8", 1/2", 5/8", 7/8", 1-1/8" IDS	
Connection Locations	EndCap (shown) & Header Face (optional)	
Mounting Options	LBrackets, ¼"-20 Threaded, Flush Nut Inserts ¼"-20 x ½" Studs	
Testing	Per UL 207 at full pressure, Helium Leak tested	
Code Approvals	Underwriters Laboratories (U.L. Listed, U.S. & Canada)	

**Model Nomenclature: C32x48x1.25V-15B22-G4560C-01**



# Typical Configurations

## C Models

Typical C Series Single “Module” models are typical for ½ ton to 15 ton capacity coils, depending on actual design conditions, air flow rate and target performance.



**C Model**  
w/ Elbow Connections at 3 o'clock  
w/ LBrackets



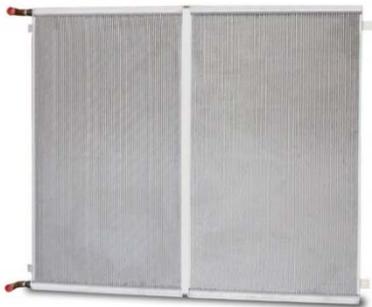
w/ Straight Connections  
w/ LBrackets



w/ Face Connections  
w/ ¼-20 Threaded Flush  
Inserts

## 2C, 3C & 4C Models

“Multi-Module” versions are designatd as 2C, 3C and 4C models. These models are typical for 15 ton to 40 ton capacity coils, depending on actual design conditions, type refrigerant, air flow rate and target performance.



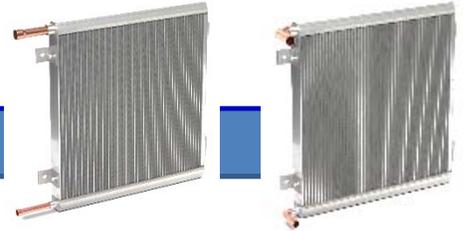
**2C Model**  
w/ Elbow Connections  
w/ LBrackets



**3C Model**  
w/ Elbow Connections  
w/ LBrackets

# Connection Options

All Condensers for OEMs have options for EndCap or Face Connections for easy packaging, piping and fit-up. A full range of copper connection sizes and connection locations are shown below. All connections options are available using AlcoilSELECT™ software, except for Specials and custom angles..



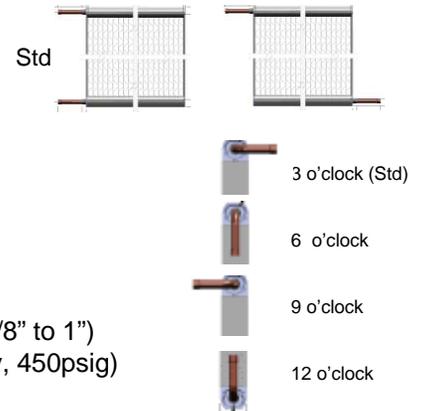
## ▶ EndCap Connections

1.25V Models                      3/8", 1/2", 5/8", 7/8", & 1-1/8" ID Solder  
 .83V Models                        3/8", 1/2", 5/8", 7/8" & 1-1/8" ID Solder

**Location**                              Same Side Connections (std)  
     Opposite Side Connections

**Straight (Std #1)**                      Same Side Connections (std)  
**Elbow (Std #2)**                        Same Side Connections (std)  
     3 o'clock, 6 o'clock, 9 o'clock, 12 o'clock  
     Opposite Side Connections  
     Custom angles (w/ volume production)

**Specials**                                Aluminum IDS to Copper OD  
     Stainless Steel or Carbon Steel Pipe, Butt Weld (3/8" to 1")  
     SS & Carbon Steel Pipe, Butt Weld (LV model only, 450psig)  
     Copper 1-5/8" OD (LV model only, 450psig)



## ▶ Face Connections

Face Connections are ideal for compact packaging where dimensions and space are critical. Standard location is Left side on the headers. Optional locations are header center or right side of headers. Straight and elbow connections, up to 7/8" IDS are available.

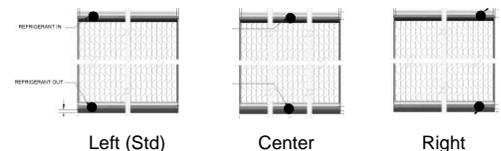


1.25V Models                      3/8", 1/2", 5/8", 7/8" ID Solder  
 .83V Models                        3/8", 1/2", 5/8", 7/8" ID Solder

**Location**                                Left, Same Side (std),  
     Center  
     Right  
     Opposite Sides, Left/Right, Right/Left

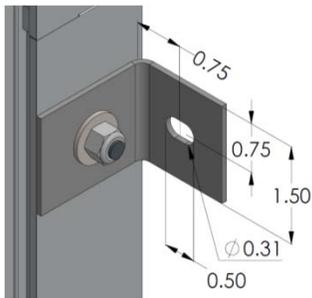
**Straight (Std)**                        Same side (Std)  
**Elbow**                                    3 o'clock, 6 o'clock, 9 o'clock, 12 o'clock  
     Opposite Side Connections  
     Custom angles (w/ volume production)

**Specials**                                None.



# Mounting Options

Alcoil models have four practical options for easy mounting and fit into OEM systems.



## Mounting Bracket

**1-1/2 x 1-1/2"** with 3/4" L Stud & Nut  
 2 Brackets, each side up to 53" models  
 3 Brackets, each side & center for 54" and taller models  
 Thermal expansion gaskets included, under bracket



## 1/4"-20 Threaded Flush Nut Insert

Located 3.5" from either end for compact mounting from side wall or strut, or use with customer supplied Bracket.  
 2 inserts, each side up to 53" models  
 3 inserts, each side & center for 54" and taller models  
 5/16" maximum thread depth



## 1/4"-20 Studs

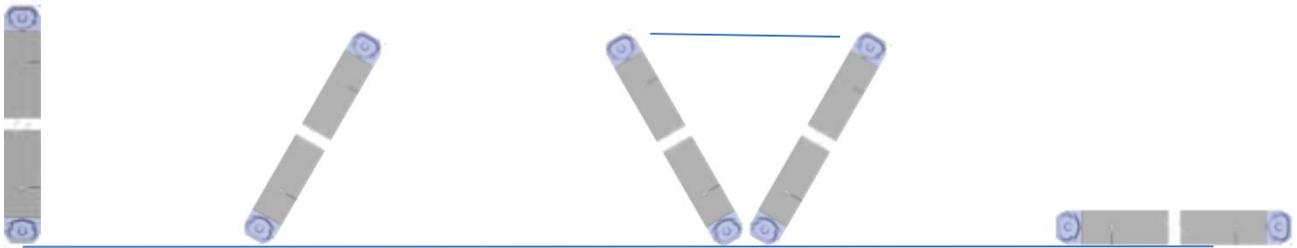
Located 3/4"L, 3.5" from either end. For use with customer supplied Brackets or through-the-wall mounting.  
 2 Studs, each side up to 53" models  
 3 Studs, each side & center for 54" and taller models

**None**

# Application Tips

## Typical Configurations

There are several popular OEM configurations and orientations for the C Series condenser, depending upon equipment packaging requirements.



**Vertical**

**Angled  
Min: 15 Degrees**

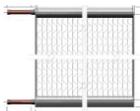
**“V” Bank**

**“Flat” – Contact the Factory  
for Alternate Models**

## Coil Orientation

Alcoil models are based on a vertical tube design for high heat transfer efficiency and use of a built-in mini-receiver. Proper orientation of the condenser should be vertical, or angled from vertical, and no less than 15 degrees from horizontal for downward refrigerant flow. Horizontal operation will cause loss of capacity. For Horizontal or “Flat” orientation, contact the factory for custom horizontal models.

## Typical Connection Options



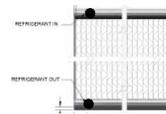
Vertical, Angled  
and “V” Bank



Vertical, Angled  
and “V” Bank



Vertical or  
Angled



Tight Fit, Vertical  
and Angled

Single coil applications are typical from 1/2 to 20 tons, and for some systems, up to 40 tons.

Two coil applications are typical up to 20 and to 80 tons, including two refrigerant circuit systems.

Two coil “V” Bank applications are typical of 20 to 60 ton “V” configurations. “V” banks are typical used in systems up to 400 tons, with 48” to 77” tall coils.

## Connections

All models have copper IDS solder connections, optional elbow or straight connections for refrigerant piping. All connections have a Viton protective sleeve for long-term corrosion protection.

When soldering or brazing to Alcoil copper connections, a wet rag should be used at the base of the copper connection (at the black protective sleeve) to minimize heat at the copper to aluminum transition joint.

For models ordered with Aluminum solder connections, copper piping can be easily soldered into the aluminum connections using the appropriate Zn/Al brazing rods and flux. Contact Alcoil for information on soldering Al to Cu joints.

# Application Tips

## Refrigerant Charge

When using an Alcoi microchannel condenser, the refrigerant system charge will typically use 40% to 60% less refrigerant than a traditional fin/tube condenser (excluding a receiver, if used). Overcharging the system will result in higher head pressure and loss of system capacity. The following procedure is recommended: 1) At full load or near full load operating conditions and by weight of refrigerant, put approximately 1/3<sup>rd</sup> the calculated charge in the refrigeration system. Let the system stabilize and check for gas bubbles in the liquid line sight glass. 2) Incrementally, add small amounts (.1oz) of refrigerant and wait for the system to stabilize. 3) When there are few or no gas bubbles entering the expansion valve, then the charge is most likely correct. 4) If the system is operating with higher head pressure than design, extract refrigerant charge from the system. As a second check, typical refrigerant subcooling is 5F to 7F. Above 10F subcooling typically indicates an over-charged system.

## Built-in Mini-Receiver

Alcoi's built-in Mini-Receiver is based on a patented method of using the lower header (manifold) to accumulate and hold liquid refrigerant. The lower header has an internal outlet baffle with a slot on the bottom to allow only liquid refrigerant to leave the heat exchanger, and to hold back any potential refrigerant gas. Thus, excess refrigerant charge is allowed to backup into the lower header, and help optimize the system charge and operation. This feature also improves part-load operation, and helps reduce "critical charging" of the system.



Proper coil orientation and Refrigerant INLET and OUTLET is required. Orienting the coil upside down will result in loss of capacity and high condensing temperatures.

## Refrigerants

Alcoi's Microchannel condensers are manufactured as 650psig or 450psig models can be used with R410a (650psig model), R407C, R134a, R404A, R508B, and number out other refrigerants. For other refrigerants such as Ammonia and Propane, please contact the factory for custom models.

Because all Alcoi condensers use vertical tubes with downward flow, oil return is not an issue, regardless of type oil or refrigerant.

## System Operation & Control

- a) Low Ambient Operation (below 20F) can be achieved with variable speed fan operation and sequencing fans off. Lower ambient operation (below -10F) can also be implemented by a combination of small receiver and modulating control valve after the condenser, to control back-flooding of the condenser.
- b) High Ambient Operation is possible with Alcoi's 1.25 model, using proper head pressure control, high air flow rate and appropriate system design point.
- c) Fan Control – Recommended fan control is fan staging, and preferably variable speed fan(s) to 5-10% fan speed.
- d) Air Flow Distribution can effect coil overall performance. Fan placement, obstructions, change of air flow, and other factors can effect overall coil performance. On new or complex designs, air anometer checks are recommended.
- e) TXV, EV, & Hot Gas operation – In special systems, an over-reacting TXV or EV, or oversized TXV can cause system head pressure oscillation or high head pressure conditions which might activate the system high pressure cutout./safety. Slower response EV control will typically remedy this situation. Where hot gas bypass is used on a evaporator, a slower response modulating valve is recommended to prevent high pressure cutout due to rapid refrigerant transfer to the condenser.

# Application Tips

## Thermal Expansion

Alcoil models can be ordered with Brackets have expansion gaskets included under the bracket.

For models using Threaded, Insert Flush Nuts, Stud Bolts or other mounting methods, equipment design consideration must be made for thermal expansion. Because aluminum has a high coefficient of thermal expansion, the equipment frame and mounting method of the coil MUST accommodate thermal expansion of the coil in both Height and Width Dimensions.

The table herein shows the Minimum Recommended Allowance for Thermal Expansion based on the Coil Height and Width assuming a 150F (83C) temperature differential. If high ambient or low ambient operation is expected, thermal expansion allowance should be increased based on the Refrigeration system Maximum Condensing Discharge (Superheat) Temperature at the High Pressure safety cutout, minus the lowest expected ambient operating temperature.

Reference: Thermal Expansion based on 150F (83C) rise or differential of coil inlet header temp vs steel frame.

Coil Width: Maximum Refrig Discharge Temp minus Lowest Ambient Operating Temperature (150F typical difference)

Coil Height: Maximum Condensing Temp (Ct at HP cutout) minus Lowest Ambient Operating Temperature (70-100F typical difference)

Coil Dimensions (Width & Height)			
		Minimum Allowance for Thermal Expansion	
inches	mm	inches	mm
10	250	0.011	0.27
15	375	0.016	0.40
20	500	0.021	0.53
25	625	0.026	0.67
30	750	0.032	0.80
40	1000	0.042	1.07
50	1250	0.053	1.33
60	1500	0.063	1.60
70	1750	0.074	1.87
80	2000	0.084	2.13
90	2250	0.095	2.40
100	2500	0.105	2.67
110	2750	0.116	2.93
120	3000	0.126	3.20

## Galvanic/Electrical

For most equipment applications, galvanic or stray current considerations are not necessary. Painted sheet metal parts, plastic parts and stainless steel interfaces with the aluminum coil(s) are normally accepted practice. With galvanized sheet metal, rubber can be used to prevent localized loss of galvanized zinc or interaction with the coil. For mobile, shipboard, or applications where equipment grounding may be an issue, coil electrical isolation from the equipment frame may be necessary, except for refrigerant connections.

## Corrosion

Due to the all aluminum construction, brazed aluminum heat exchangers are subject to significantly less galvanic corrosion than traditional fin/tube coils, in that there are no dissimilar metals. Normal installations should not require coatings, except in environments corrosive to aluminum.

Sea coast and marine use is acceptable. Epoxy or Thermoguard Coating(s) is optional.

For applications with pollution, chemical emissions, exposure to moist air, or corrosive environments, coil coatings must be used. See Coatings Option Section.

## Coil Cleaning

Routine cleaning of particulates from the coil can be performed with high pressure air. Routine cleaning of dirt and grime may be performed with high pressure water, including general detergents. Avoid chemical cleaning. In any cases, water pressure must be controlled to prevent damage to the fins. A coil filter or protective mesh cloth can also be used in the equipment design, if cotton wood trees, large bugs or other debris is known or present.

# Coating Options

Alcoil offers two coating options:

- 1) Epoxy Electrocoat
- 2) Thermoguard Polyurethane

## Epoxy Electrocoat

While all-aluminum Microchannel coils are not subject to the same galvanic corrosion issues as traditional copper/aluminum coils, there are situations or installations that may require the highest level of protection with Epoxy Electrocoat.

Recommended use of Epoxy Electrocoat  
 Industrial Pollution & Sulfurs  
 Petrochemical Installation  
 Adiabatic assisted Systems  
 Sea Shore Installations (optional)

### Specifications:

Material: Epoxy Electrocoat, PPG Powercron series  
 Thickness: 0.001-inch, nominal  
 Appearance: Black, semi-gloss  
 Process: Dip bath with Electrodes, Oven Cured



### Chemical Resistance Guide:

Epoxy Electrocoat is resistant to the following at 70°F:

Acetates (ALL)	Diethanolamine	Lactose	Propyl Alcohol
Acetic Acid	Distilled Water	Lauryl Acid	Propylene Glycol
Alcohols	Esters	Magnesium	Salicylic Acid
Amines (ALL)	Ethyl Acetate	Maleic Acid	Salt Water
Ammonia	Ethyl Alcohol	Menthol	Sodium Bisulfite
Ammonium Hydroxide	Ethyl Ether	Methanol	Sodium Chloride
Amino Acids	Fatty Acid	Methyl Ethyl Ketone	Sodium Hypochlorite 5%
Benzene	Fluorine Gas	Methyl Isobutyl Ketone	Sodium Hydroxide<10%
Borax	Formaldehyde 27%	Mineral Oil	Sodium Sulfate
Boric Acid	Fructose	Motor Oil	Stearic Acid
Butyl Alcohol	Gasoline	Mustard Gas	Sucrose
Butyl Cellosolve	Glucose	Naphthol	Sulfuric Acid 25-28%
Butyric Acid	Glycol	Nitrates	Sulfates (ALL)
Calcium Chloride	Glycol Ether	Nitrides	Sulfides (ALL)
Calcium Hypochlorite	Hydraulic / Brake Fluid	Oleic Acid	Sulfites (ALL)
Carbolic Acid	Hydrazine	Oxalic Acid	Starch
Carbonates	Hydrochloric Acid<10%	Oxygen	Tannic Acids
Carbon Dioxide	Hydrogen Peroxide 5%	Ozone	Toluene
Carbon Monoxide	Hydrogen Sulfide	Perchloric Acid	Transmission Fluid
Cetyl Alcohol	Hydroxylamine	Phenol 85%	Triethanolamine
Chlorides (ALL)	Iodine	Phosgene	Urea
Chlorine Gas	Isobutyl Alcohol	Phenolphthalein	Vinegar
Citric Acid	Isopropyl Alcohol	Phosphoric Acid	Water
Creosol	Kerosene	Potassium Chloride	Windshield Solvent
Diesel Fuel	Lactic Acid	Potassium Hydroxide	Xylene

The following substances are **not recommended** for use with Epoxy Electrocoat:

Chromic Acid	Hydrofluoric Acid	Nitric Acid	Sodium Hydroxide>10%
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### NOTES:

- 1) Epoxy Electrocoat is not intended for liquid immersion applications.
- 2) Elevated temperatures can have an adverse effect on the coating.
- 3) This guide is provided for **GENERAL REFERENCE ONLY** and is not a guarantee of performance in a specific situation.
- 4) Effect on heat transfer rate is typically 1% to 2% and up to 10% on airside PD.

# AlcoilSELECT™ Software

AlcoilSELECT is the most advanced and easiest to use Coil Selection and Design Program in the HVAC/R industry. As a downloadable software program for PC's, it is an essential tool to SELECT and CONFIGURE Airside Coil applications for Alcoil Microchannels.

It allows the user to provide INPUT for design conditions, COMPARE MODELS, review PERFORMANCE, and CONFIGURE the coil's connection, mounting, and other options.

AlcoilSELECT can save and print COIL PERFORMANCE and DRAWINGS, plus share the PROJECT file with Alcoil Sales Support for Quotes and Product Orders.



Application	Input	Compare Models	Performance	Configuration	Print / Save
<b>Refrigerant Side</b> Refrigerant: R-404A Condensing Temp. - Design: 105 °F Inlet Gas Temp.: 170 °F Subcooling: 5 °F		<b>Condenser Selection</b> 		<b>Air Side</b> Inlet Dry Bulb: 50 °F Volume Flow - Actual: 10000 aCFM Air Fouling Factor: 0 h ft° F/Btu Altitude: 0 ft	
Total Heat of Rejection: 220000 Btu/h			<b>Coil Size</b> Dimensions: Face Dimensions Max. Width: 122 inches Max. Height: 48 inches Number of Coils: 2 Coil Orientation: Vertical Model Selection: Custom Tube Type: 1.25		
<input type="button" value="Change to Metric Units"/>		<input type="button" value=" &lt; Back"/>		<input type="button" value=" Next &gt;"/> <input type="button" value=" Cancel"/>	

Refrigerant Side Design Conditions

AirSide Design Conditions

Heat Transfer Load

Preferred Coil Dimensions

IP - Metric Toggle

# AlcoilSELECT™ Software

After an Alcoil model is selected, the CONFIGURATION screen is used to instantly view and change connection locations, change connection size and orientation, select Mounting Options, select Coating options and more.

What you see, is what Alcoil will build, based all dimensions, features and options on the Product Drawing.

The screenshot displays the Alcoil configuration software interface. At the top, there are tabs for Application, Input, Compare Models, Performance, Configuration, and Print / Save. The main area is divided into two sections: a technical drawing on the left and a configuration panel on the right.

**Technical Drawing:** Shows a cross-section of the coil with various dimensions and labels. Labels include: REFRIGERANT IN, THERMAL EXPANSION GASKET, PRODUCT LABEL, REFRIGERANT OUT, COIL ORIENTATION VERTICAL, COIL FACE WIDTH, COIL FACE HEIGHT, COIL DEPTH, and COIL HEIGHT. Dimensions are provided in inches and millimeters.

**Configuration Panel:**

- Model:** 4C29.9x48x1.25V-11J06-L4819C-01
- Customer P/N:** 380907MA
- Face Dimensions WxH:** 122.1 in x 48.0 in
- Overall Dimensions WxH:** 124.5 in x 50.2 in
- Inlet Connection:**
  - Location: Left Endcap (Std.)
  - Size: Auto-Size (7/8")
  - Type: Copper Straight IDS
- Outlet Connection:**
  - Location: Left Endcap (Std.)
  - Size: Auto-Size (5/8")
  - Type: Copper Straight IDS
- Other:**
  - Mounting Hardware: Mounting Brackets (Std.)
  - Coil Coating: Epoxy E-coat
  - Model Version: U.S. Models
  - Code Approvals: UL Listed

At the bottom of the configuration panel, there is a **Drawing Status** dropdown menu set to "Preliminary Drawing" and a checkbox for "Include As 'Standard Model' In Selection Program".

At the bottom of the software window, there are buttons for "Change to Metric Units", "< Back", "Next >", and "Cancel".

Alcoil Model & Item#  
My Part Number Here too

Inlet Connection Options

Outlet Connection Options

Mounting Options  
Coating Options  
UL Listed Option

# AlcoilSELECT™ Software

Alcoil  
3627 Sandhurst Drive  
York, PA 17409  
717-547-1550 Fax  
717-547-7555 FX  
Website: www.alcoil.net

Date: 3/29/2015  
User: Steve Wand

**Microchannel Air-Cooled Condenser**

Customer: Alcoil  
Project: AOT V configuration  
Selection #: WAN846

MODEL: C46-4x76x1.25V-14K16-P1410-01

Heat Rejection: 288000 Btu/h  
Oversurface: 123.3 %  
Coil Orientation: Vertical

Face Dimensions WxH: 46.4 in x 76.0 in  
Overall Dimensions WxH: 47.1 in x 78.2 in  
Dry Weight: 125.9 lb

Design Conditions	Air Side	Refrigerant Side
<b>Air</b>		
Volume Flow - Actual	16000 acfm	
Volume Flow - Standard	15270 acfm	
Altitude	0 ft	
Inlet Dry Bulb	95.0 °F	
Outlet Dry Bulb	112.4 °F	
Pressure Drop	0.46 in w.g.	
<b>Refrigerant</b>		
Mass Flow		R-410A
Inlet Gas Temperature		58.8 lb/min
Condensing Temperature - Design		170.0 °F
Condensing Temperature - Actual		125.0 °F
Outlet Subcooling		115.2 °F
Condensing Pressure - Design		5.0 °F
Mini Receiver Volume		448.0 psig
Total Volume		60.4 in³
Pressure Drop		289.2 in³ 6.5 psi

Product Drawing and Performance Documents (PDF) can be saved for use and final production release approval.

Alcoil Product Model Number and Item# are shown for Product Orders to Alcoil.

3D Drawings (STP and other formats) can also be requested from Alcoil.

FINS AND TUBES NOT TO SCALE FOR DRAWING CLARITY

**CUSTOMER** Alcoil  
**MODEL NUMBER** C46-4x76x1.25V-14K16-P1410-01  
**DESCRIPTION** Microchannel Air-Cooled Condenser

**DESIGN CONDITIONS**  
 Air Flow: 16000 acfm  
 Air Temp: 95.0 °F  
 Condensing Temp: 112.4 °F  
 Refrigerant: R-410A  
 Condensing Pressure: 5.0 °F  
 Mini Receiver Volume: 60.4 in³  
 Total Volume: 289.2 in³  
 Pressure Drop: 6.5 psi

**DESIGN SPECIFICATIONS**  
 Tube: 1/2" OD  
 Tube Length: 76.0 in  
 Tube Pitch: 1.25 in  
 Tube Material: Aluminum  
 Tube Fin Material: Aluminum  
 Tube Fin Pitch: 0.5 in  
 Tube Fin Height: 0.125 in  
 Tube Fin Thickness: 0.015 in  
 Tube Fin Spacing: 0.125 in  
 Tube Fin Width: 0.125 in  
 Tube Fin Depth: 0.125 in  
 Tube Fin Angle: 90°  
 Tube Fin Orientation: Vertical  
 Tube Fin Spacing: 0.125 in  
 Tube Fin Width: 0.125 in  
 Tube Fin Depth: 0.125 in  
 Tube Fin Angle: 90°  
 Tube Fin Orientation: Vertical

**REVISIONS**

REV	DESCRIPTION	DATE
01	CREATED	10/16/2014
	MODIFIED	3/26/2015

**PROPRIETARY AND CONFIDENTIAL**  
 THE INFORMATION CONTAINED IN THIS DRAWING IS CONFIDENTIAL AND SHALL BE KEPT AS SUCH BY THE RECIPIENT AND SHALL NOT BE DISCLOSED TO A THIRD PARTY WITHOUT WRITTEN APPROVAL BY ALCOIL.

Alcoil  
PRODUCT DRAWING  
14K16-P1410-01  
SHEET 1 OF 1

# AlcoilSELECT™ Software

AlcoilSELECT has two additional unique features:



## Actions & Options:

[Create Rating Table](#)

[Email Selection](#)

## Coil Rating

“Create Rating Table” allows a user to take a specific coil selection, then create up to 99 rating points. Input variables such as Refrigerant type, Total Heat of Rejection, Air Temperature, Air Flow Rate and others can be changed to create additional rating points.

The Rating table can then be exported to an Microsoft Excel Spread Sheet for other uses or printed as a PDF.

Rating Point #	1	2	3	4	5
Refrigerant	R-410A	R-410A	R-410A	R-410A	R-410A
Total Heat of Rejection (Btu/h)	75000	6000	50000	40000	30000
Inlet Gas Temp. (°F)	170	170	170	170	170
Subcooling (°F)	5	5	5	5	5
Inlet Dry Bulb (°F)	95	95	95	95	95
Volume Flow - Actual (acfm)	3000	3000	3000	3000	3000
Air Fouling Factor (h ft² F/Btu)	0	0	0	0	0
Altitude (ft)	0	0	0	0	0
Cond. Temp. - Actual (°F)	122.0	100.0	113.3	109.8	106.5
Cond. Pressure - Actual (psig)	431.7	318.3	383.7	365.8	349.1
Ref. Mass Flow (lb/min)	15.9	1.1	10.1	7.9	5.9
Ref. PD (psi)	0.7	0.0	0.5	0.4	0.3
Outlet Dry Bulb (°F)	119.2	96.9	111.1	107.9	104.7
Air PD (in w.g.)	0.22	0.21	0.22	0.21	0.21
Number of Coils	1	1	1	1	1

Rating point #1: Actual Condensing Temp. = 122.0 °F

Buttons: Add Rating Point, Delete Rating Point, Print Results to PDF, Export to MS Excel, Close Rating Window

## Email Selection

Coil selections can be E-mailed to other users of AlcoilSELECT or Alcoil Support for assistance and review.

# Terms & Conditions



The following terms and conditions apply to all purchase orders, contracts or shipments between Alcoil ("Alcoil") and any customer ("Customer") for which Alcoil provides equipment, products, or services:

**OFFER AND ACCEPTANCE.** The products and services described are offered for sale by Alcoil subject to all of the terms and conditions stated herein. This writing constitutes an offer of sale, which is expressly limited to the products, services, terms, and conditions stated herein. By submitting a purchase order or other written response to this offer of sale, or by accepting delivery of the products and services offered herein, Customer accepts all of the terms and conditions contained herein. No additional, changed, or conflicting terms and conditions appearing in Customer's purchase order or other written response to this offer shall be binding upon Alcoil unless expressly agreed to in writing by Alcoil.

**PAYMENT TERMS.** Payment terms are NET 30 Days from Date of Invoice, Subject to credit approval by Alcoil's Credit Dept. Shipments, deliveries, and performance of work by Alcoil shall be subject to the continuing approval of Alcoil's Credit Dept., which may require full or partial payment in advance if the financial condition of Customer (in the sole opinion of Alcoil's Credit Dept.) does not justify continuance of work by Alcoil on the terms of payment agreed upon.

**PRICES.** All Prices are F.O.B, York, Pennsylvania, USA. All transportation expenses shall be paid by Customer, either Freight Collect, or Pre-paid/Add to Invoice. Alcoil reserves the right to adjust prices (surcharge or credit) at time of order entry due to material cost fluctuations.

**TITLE AND RISK OF LOSS.** Title to any products shipped by Alcoil shall pass to Customer upon delivery by Alcoil to the carrier. Risk of loss or damage to products in transit is assumed by Customer, and Customer shall bear responsibility for filing and pursuing any claims for loss or damage with the carrier.

**DELIVERY.** Shipping dates are approximate only based upon prompt receipt from Customer of all information required by Alcoil to meet Customer expectations. Alcoil shall not be liable for delays in delivery or failure to perform hereunder where such delay or failure results from: (i) causes beyond the reasonable control of Alcoil, (ii) acts of God, acts of Customer, or acts of civil or military authorities, (iii) inability of Alcoil to obtain necessary labor, materials, components, or facilities, or (iv) any other commercial impracticability. In the event of any such delay, the date of delivery shall be deferred for a period of time equal to the time lost by reason of the delay.

## LIMITED WARRANTY OF PRODUCTS AND SERVICES

**Limited Warranty.** Alcoil warrants its products to be free from defects in materials and workmanship under normal use and operation for a period of one (1) year from the date of product installation and no more than one (1) year and six (6) months from date of product delivery, as evidenced by Alcoil shipping records (the "Warranty Period"). For any materials or workmanship determined by Alcoil to be defective within the Warranty Period, Alcoil shall, at its option, either: (i) repair any such defective material, component part, or service, or (ii) make available to Customer, FOB York, Pennsylvania, any repaired or replacement parts or materials to replace such defective material, component part, or service, or (iii) refund to Customer the amount paid by Customer for the defective product or service provided by Alcoil hereunder.

**Exclusions.** The above warranty shall not apply to any product that has been: (i) subjected to misuse, negligence or accident; (ii) misapplied by Customer or others for an improper use; (iii) installed in an improper manner; (iv) modified or repaired contrary to Alcoil recommendations or generally accepted practices or procedures in the industry, or (v) operated under conditions which may cause product failure. Alcoil shall not be responsible for any costs associated with the product damage, loss or replacement due to freeze-up, improper water treatment, improper cleaning, fluid chemistry exceeding Alcoil's recommendations, clogging and debris, fouling, corrosion, galvanic induced corrosion, vibration, thermal cycling, hydraulic shock, over-pressurization, compressor failure, system contamination, loss of protective coating (where applied) and any other operating or system condition which may cause product failure.

**Warranty Procedures.** If any Alcoil product is believed to be defective, written notice of such warranty claim must be made and an RMA# (Return Authorization) must be issued by Alcoil, 3627 Sandhurst Dr, York, PA 17406. Ph: 717-347-7500 Alcoil, at its option, may require return of any product believed to be defective for purposes of testing, inspection and verification, as a requirement for potential warranty coverage.

**Disclaimer of Further Warranties.** THE LIMITED WARRANTY SET FORTH ABOVE IS THE EXCLUSIVE WARRANTY APPLICABLE TO THIS CONTRACT, AND ALCOIL EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES OR REMEDIES, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHETHER THE SAME ARE WRITTEN, VERBAL, IMPLIED, OR STATUTORY.

**Limitation of Liability.** Under no circumstances shall Alcoil be liable for any incidental, consequential, or special damages, losses, or expenses incurred by Customer or any third party arising from this offer of sale or the performance of Alcoil hereunder. Under no circumstances shall the amount of any claim for damages or liability exceed the amount paid by Customer for products and services provided by Alcoil hereunder.

**Time Limitation on Warranty Claims.** No legal action or claim, whether based in tort, contract, strict liability, breach of warranty or otherwise, arising out of this offer of sale or the performance by Alcoil hereunder may be commenced more than one (1) year following expiration of the Warranty Period. Customer hereby waives any such claim or cause of action commenced after the Warranty Period.

**TAXES AND DUTIES.** Customer shall be responsible for collection or payment of any federal, state, provincial or local taxes or duties. Any taxes which Alcoil may be required to pay or collect, under any existing or future law, with respect to the sale, purchase, delivery, storage, or use of any product or services covered hereunder shall be the responsibility of Customer.

## PROPRIETARY RIGHTS

Alcoil retains the exclusive right to all trade names, service marks, trademarks and patents for which Alcoil is the lawful owner or Licensee, and Customer acknowledges that Customer acquires no right, title or interest in or to any such trade names, service marks, trademarks or patents for any reason.

**JURISDICTION AND VENUE.** As to litigation arising from any disputes, claims or controversy, both Customer and Alcoil: (i) submit to the exclusive general jurisdiction of the state courts of York County, Pennsylvania, the federal courts of the United States of America for the Middle District of Pennsylvania, and any appellate courts from any decision thereof; (ii) consent that any such action or proceeding may be brought in such courts; and (iii) waive any objection that either may have to the venue of any such action or proceeding in any such court or that such action or proceeding was brought in an inconvenient forum and each party agrees not to plead or claim the same.

**ENTIRE AGREEMENT.** These terms constitute the entire agreement between the parties and all prior negotiations and representations of the parties are merged herein.

**PENNSYLVANIA LAW TO APPLY.** Any purchase order, shipment or contract resulting from Customer's acceptance of this offer of sale shall be deemed to have been executed and delivered in York County, Pennsylvania, and shall be construed under, and in accordance with, the laws of the Commonwealth of Pennsylvania.

**WAIVER.** One or more waivers of any breach of any term or condition herein shall not be construed as a waiver of any subsequent breach of the same term or condition. To be effective, any express waiver must be in writing.

**COLLECTION COSTS.** Should Customer default in the payment of any amount owing to Alcoil for products or services, and Alcoil is required to expend costs and expenses in collecting such amount, Alcoil shall be entitled to reimbursement for all such costs of collection (including reasonable attorney fees).

**PRODUCT SELECTION AND USE.** Customer shall be responsible for accurate design and operating conditions used in the selection and use of Alcoil products. Customer selection and use of Alcoil product from published literature or Alcoil Selection software shall be at the customer's risk as to appropriate application, design conditions and performance criteria use.

**STANDARDS AND TOLERANCES.** All Product Dimensions and published information is subject to change without notice. All Alcoil products furnished to Customer shall also be subject to tolerances and variations consistent with usages of the trade concerning dimensions, composition and mechanical properties, and normal variations in performance characteristics and quality.

**SPECIAL ORDERS.** On special orders and products of custom design, a minimum of 50% of the sale price may be required upon engineering approval by the customer.

**RESTOCKING AND CANCELLATION CHARGES.** Alcoil reserves the right to collect costs against returned product and cancelled orders. Restocking charges of returned product costs shall be 25% of the product(s) sales price, and cancellation charges shall be a minimum of 25% of the product(s) sales price, or work in progress costs incurred by Alcoil, whichever is higher.

# MicroChannel Coil Family

Alcoil has a full line of MicroChannel coil models for cooling and heat rejection for HVAC/R systems for R410a, R134a, R404a,, R717, and other refrigerants. Water and Glycol fluid models are available as both cooling coils and heating coils. Model sizes as small as 3"x 3" to 80" x 144" size.

## Condensers

**½ to 40 tons**

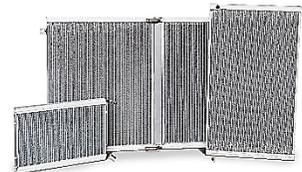
Alcoil manufactures a full range of refrigerant condensers from ½ ton to 40 tons for the HVAC/R industry, rated for 450 psig and 650 psig applications. The C Series Condenser is a robust design with built-in mini-receiver and numerous design options.



## Evaporator/Heat Pump

**½ to 30 tons**

Alcoil's E Series Evaporator and HP Series Heat Pump represent leading edge technology as a direct expansion (DX) cooling coil and/or reverse cycle heat pump coil. With a built-in refrigerant distributor and integrally high water condensate shedding, the E and HP Series provide high performance with all the advantages of MicroChannel technology.



## Fluid Coils

**up to 50 gpm**

For water and glycol systems, free cooling, heat recovery and other applications, Alcoil manufactures a high performance microchannel specifically for fluid to air. With advanced water shedding as a cooling coil or high performance as a heating or cooling coil, fluid models feature ¾", 1" and 1-1/2" connections. Rated for 300psig.



## Specialty Coils

**up to 40 tons**

Alcoil can configure microchannel coils for other required HVAC/R applications, including:

- Reheat & Desuperheater Coils
- Flooded & Pumped Loop Evaporators.
- Subcoolers

## MicroCoils™

**up to ¾ ton**

For electronics, medical, computer and small appliance products, Alcoil has a family of MicroCoils™ as condensers, evaporators and fluid coils. The MicroCoil™ is lightweight and ultra small for specialty products from 20 to 2000 watts.



Alcoil products manufactured under Patent 8,662,148 and others pending in the U.S. Patents pending in Europe, China and other countries



## Alcoil Sales Support

Alcoil serves the U.S., Canada and Mexico with regional Sales Engineers, Applications Engineers and HDQ personnel to assist OEM customers with product selection, applications, and production delivery.

Shipping is via Freight Carriers or UPS. Freight Pre-paid or Freight Collect.

All Prices are FOB, York, Pennsylvania, USA

**General Inquiries** Email: [Info@Alcoil.net](mailto:Info@Alcoil.net)

**Production Lead-times** 4 weeks typical;  
up to 6 weeks (seasonal)  
up to 6 weeks (large qty)

**Purchase Orders** Email to: [Orders@Alcoil.net](mailto:Orders@Alcoil.net)

**Expedited Orders** Contact your regional Sales Engineer or Alcoil Factory



Alcoil is leading manufacturer of Airside Microchannel Coils for the HVAC/R and process industries. Located in beautiful York, Pennsylvania, Alcoil employees take Pride in Workmanship, Quality and Customer Service. We sincerely appreciate the opportunity for Alcoil to be of service.

[www.Alcoil.net](http://www.Alcoil.net)

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