

CO2

Industrial Refrigeration Solutions





COLMAC COIL MANUFACTURING, INC

"The Heat Transfer Experts"

Who We Are

Founded in 1971, Colmac Coil Manufacturing initially supplied heating and cooling coils to OEM customers and the HVAC industry. By the early 1980's Colmac Coil had expanded their refrigeration product line to include industrial air coolers and condensers for the ammonia refrigeration industry, developing a reputation for high quality products and the ability to engineer a wide range of heating and cooling solutions using their in-house developed heat and mass transfer modeling software.

Our Mission

The mission of Colmac Coil is to provide heat transfer markets worldwide with innovative, cost effective products that are configured, manufactured, and shipped with the shortest lead times in the industry, with fast, friendly service, for the mutual benefit of our employees, customers, and shareholders.

Our Products

- Refrigeration Evaporators
- Fluid Coolers & Condensers
- Heating & Cooling Coils
- Heat Pipes



Manufacturing Factory - Colville, WA



Manufacturing Factory - Paxton, IL

Our Customers

Colmac Coil serves a wide variety of markets and customers with an emphasis in the following industries:

- Industrial Refrigeration
- HVAC
- Power Generation
- Process Cooling

CO2 AS A REFRIGERANT



Low toxicity and non-flammable



Future proof: A1 classification and unregulated status



Equipment is becoming more available and cost effective



Removes ammonia from the space



Natural refrigerant with a low global warming potential (GWP) and ozone depletion potential (ODP)



Highly efficient at low temperature applications

A Refrigerant For The Future

CO2 as a refrigerant is becoming an increasingly popular option for a wide range of industrial refrigeration applications. Colmac Coil has developed tools and a comprehensive product offering to provide the market with the evaporators needed for any type of CO2 Industrial refrigeration system being installed today.

R744

Trans-critical

CO2 Cascade With
Lowside Compression

CO2 Cascade
Volatile Brine

Solutions For Every CO2 System Type

CO2 INDUSTRIAL REFRIGERATION SOLUTIONS



A+P

Insulated Penthouse
No. of fans: 1-6



A+B

Bare Coil
No. of fans: 0



A+D

Dual Coil - Dual Discharge
No. of fans: 1-8



A+R

Above the Rail
No. of fans: 1-8



A+S

Low Profile
No. of fans: 1-8



A+M

Medium Profile
No. of fans: 1-8



A+L

Large Profile
No. of fans: 1-8

A+SERIES® INDUSTRIAL AIR COOLERS

SPIRAL & TUNNEL FREEZER COILS

CO2 GAS COOLERS



IQF

Spiral/Tunnel Freezer Coil



SPR

Spiral/Tunnel Freezer Coil



V-BANK

Adiabatic CO2 Gas Cooler
No. of fans: 1-16



V-BANK

Dry CO2 Gas Cooler
No. of fans: 1-16



**FLAT DECK
VERTICAL**

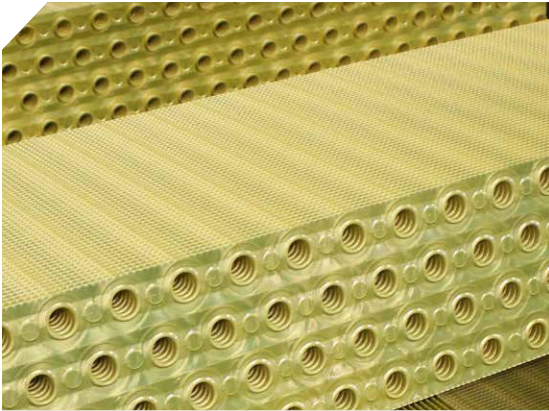
CO2 Gas Cooler
No. of fans: 1-16



**FLAT DECK
HORIZONTAL**

CO2 Gas Cooler
No. of fans: 1-16

CO2 DESIGN FEATURES



Fins

Colmac Coil's CO2 Heat Exchangers are available with multiple fin and tube patterns, allowing each unit to be easily optimized to any operating condition. Matching the cooler to the application will ensure the best performance and longest runtimes from the CO2 cooler.

FIN MATERIAL

- Aluminum
- Epoxy Coated Aluminum
- Cu-Ni
- Stainless Steel

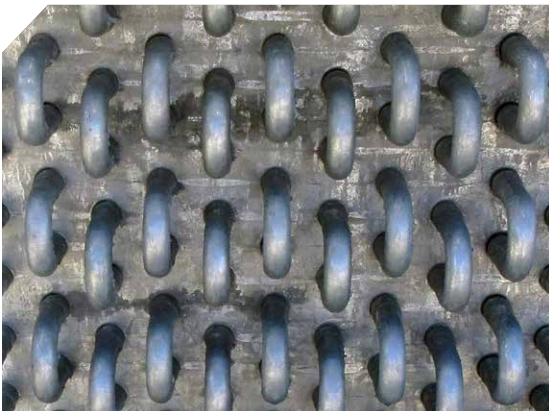


Stainless Steel Tubes

All CO2 selections feature 5/8" diameter tubes in an inline arrangement. This pattern provides the lowest air pressure drop and offers a large amount of secondary (fin) surface area for maximum frost carrying capacity and extended runtime.

TUBE MATERIAL

- Stainless Steel



Casing

All galvanized Colmac Coil housings are coated to G235 specifications. This heavier coating means it will be more durable and can be expected to perform 2.6x longer than a more typical G90 coating.

CASING MATERIAL

- Galvanized Steel
- Stainless Steel



Liquid and Suction Connections

We provide any of the 3 types of connections:

- Pipe connections with stubs or socket weld fittings
- Piping connections with adapters for high pressure copper piping
- Pipe to tube adapters, allowing the installing contractor to only make tube to tube weld joints in the field

FAN MOTORS



EC Fan Motors

EC fan motors are standard on all fluid cooler and condenser configurations, and select A+Series® Air Coolers. EC fans are a complete fan/motor assembly, including a highly engineered fan and bell mouth matched to an electronically commutated (EC) motor. The EC motor is a brush-less DC motor with on-board programmable speed control.

Benefits:

- Fan speed control functionality without a VFD
- Extremely low sound levels
- Long air throw with built in straightening veins
- Corrosion resistant construction



AC Fan Motors

AC fan motors are true industrial cooling tower duty. All AC fan motors supplied are premium efficiency, internal rotor, totally enclosed and VFD compatible. Motors are supplied with low temperature grease when appropriate.

Features:

- Insulation class F
- Double-sealed bearings permanently
- Totally enclosed fan cooled (TEFC) frame
- Shaft end rain shield

CO2 DEFROST OPTIONS



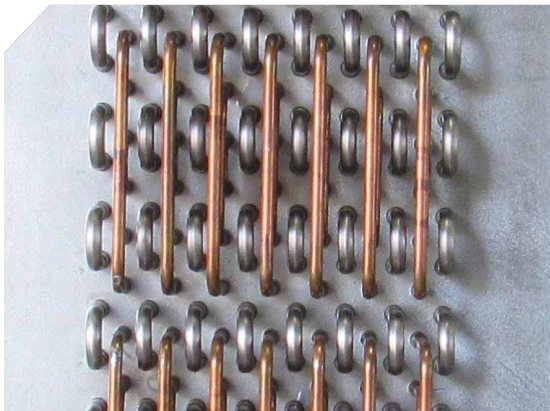
Air Defrost

- Fast and efficient
- Requires 35° F room temp and above
- Drainable design with oil return during operation
- Coil must have relief installed



Hot Gas Defrost

Hot gas defrost is the preferred method of defrosting an evaporator when the design of the system allows for adequate hot gas temperatures and flow rates to be produced at all times of the year



Heated Glycol Defrost

- Heated glycol pumped through secondary coil
- Useful for defrosting CO2 evaporators where hot gas is not feasible



Electric Defrost

- Used often where hot gas defrost is not feasible
- Higher operating cost
- Requires ongoing maintenance
- Optional inlet air hoods and automated defrost initiation & termination to reduce power costs

CO2 DESIGN OPTIONS



Tube Pressure Levels

The design code of the evaporator must meet at the maximum allowable working pressure (MAWP). This is an important aspect of selecting equipment and needs to be established at the beginning of the project to make sure the equipment being proposed meets the operating pressures intended using a given standard. We build a CO2 evaporator differently depending on what codes are required for a given project..

PRESSURE LEVELS

→ 55 BARG	798 PSIG
→ 90 BARG	1305 PSIG
→ 120 BARG	1740 PSIG



Safety Certifications

UL 207 - The code is nonelectrical and establishes safe operating limits by building and testing to failure at several times the MAWP for the equipment.

CRN - Issued by each province or territory in Canada by an authorized safety authority for any boiler, pressure vessel or fitting that operates at a pressure greater than 15 psig.

ASME U Stamp - The certification of a manufacturer's quality control system in accordance with ASME Boiler and Pressure Vessel code.



CO2 DX EVAPORATOR FEATURES



Electronic Expansion Valves

- Factory mounted electronic expansion valve (EEV)
 - Installing the EEV as part of the evaporator for DX CO2 coils can reduce the complexity of the piping that needs to be installed in the field and allows most of the required components to be either installed at the coils or as part of the compressor package.
 - Single or double EEV installed on the evaporator



Venturi Distributors

- Factory provided Venturi Distributor
 - Allows a wide operating range of temperatures and capacities.
 - Permanently installed and no change of orifice
 - No maintenance required
- Optional hinged panel for component protection

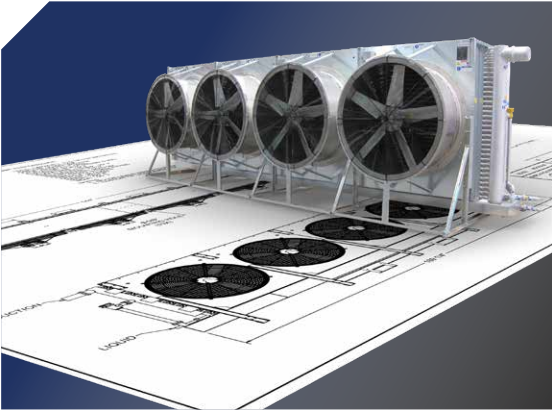


Temperature and Pressure Sensors

- Along with the expansion valves, it is beneficial to locate the pressure and temperature sensors for the evaporator in the piping installed on the evaporator where fittings can be welded into the piping, tested at the factory and ship installed and wired.

With our ability to accurately predict the performance of our heat exchangers and build with a wide variety of materials, we welcome the opportunity to help you find creative and efficient heat transfer solutions for your process or products.

SELECTION SOFTWARE & DESIGN TOOLS



A+Pro Selection Software

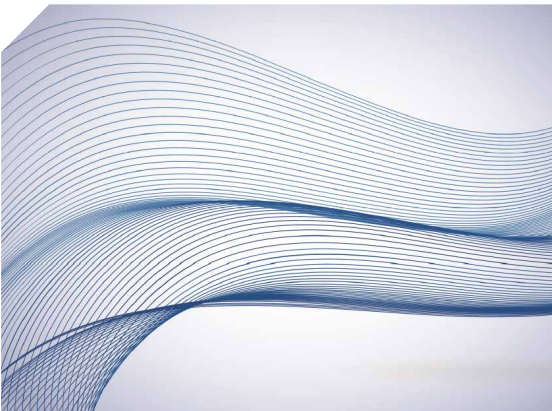
A+Pro software allows you to select or rate evaporators to match your project requirements and provides you with complete performance, dimensional, electrical, and installation information. Evaporator selections can be sorted and prioritized in order of:

- Lower first cost
- Lowest operating cost (Fan kW/TR)
- Lowest noise level
- Smallest refrigerant charge
- Lightest weight



Dryware Selection Software

Dryware software puts the power of Parametrics at your fingertips and allows you to configure condensers and fluid coolers in a way that is totally flexible, not only exactly meeting your required capacity but also allowing dimensions to be adjusted to "fit your footprint". This unique approach to design of our equipment removes the constraints of traditional catalog product lines with fixed models and dimensions..



Engineering Toolbox

- Easy access to online refrigeration system design calculations
- The suite of powerful engineering calculators includes: Air Properties, Brine Properties, Climate Data, Refrigerant Properties, Single Phase Pressure Drop, Sound Calculator, Plate Fin Surface Area, Two Phase Pressure Drop, Vertical Riser Calculator



Interlaced Glycol Defrost Tool

- Included in A+Pro is an interlaced glycol defrost design tool
- Change any evaporator type of defrost to interlaced glycol with a heated fluid pan

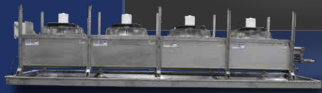
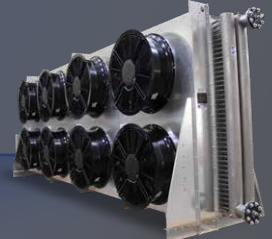
QUALITY PRODUCTS FROM COLMAC COIL



**A+Series®
Air Coolers**



**Fluid Coolers
and Condensers**



**Custom Evaporators
and Blast Freezers**



Heat Pipes



**Heating and
Cooling Coils**



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CRN



CSA

ASME Sec. VIII, Canadian Registration Number, UL508, Canadian Standards Association