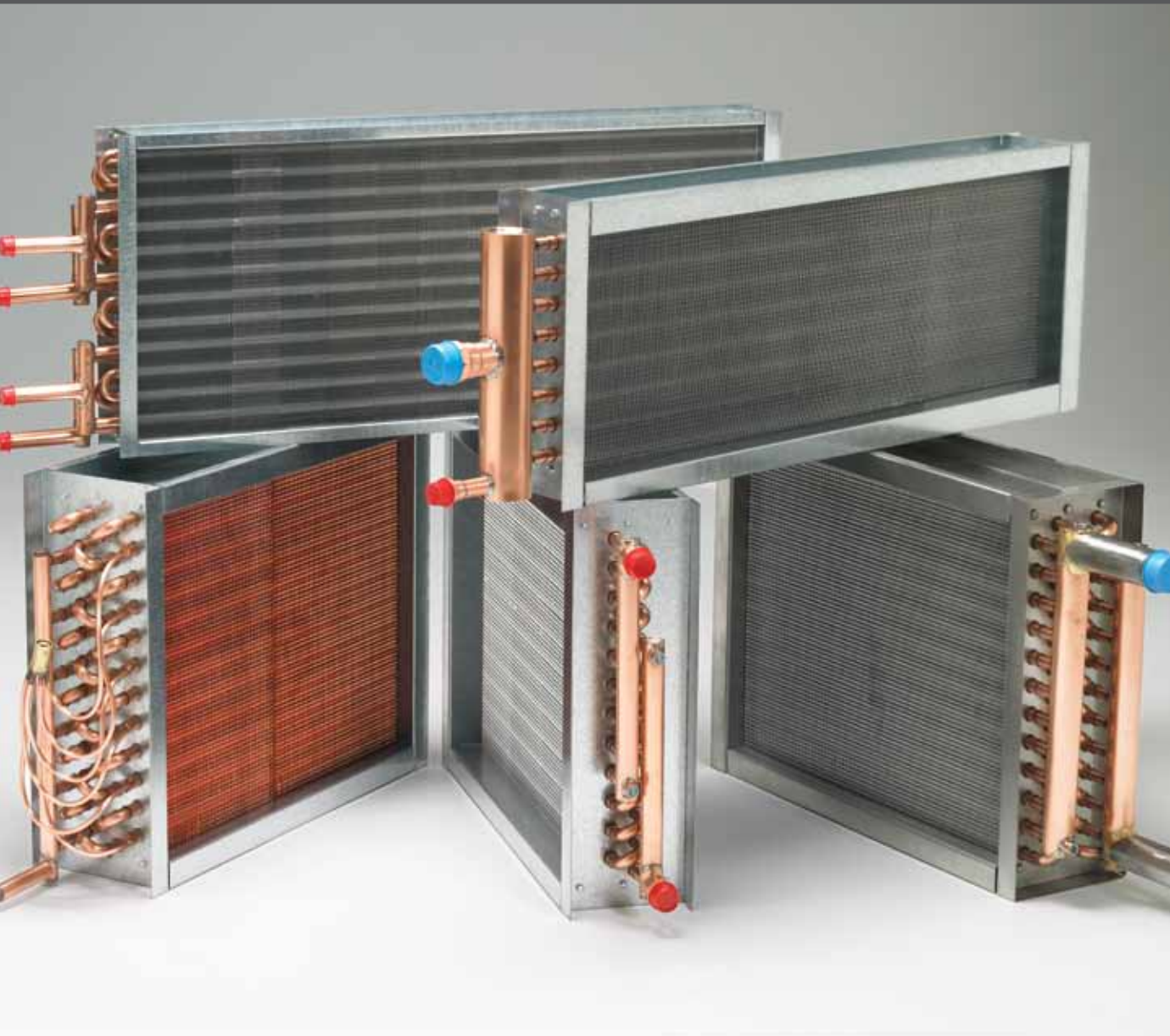


Greenheck Coils

A Complete Line of Custom Coils to Meet Your Needs

3/8, 1/2 and 5/8 inch OD Tubing



 **GREENHECK**
Building Value in Air.

March
2010

Custom Coils Configured to Meet Your Needs

Greenheck is proud to offer a complete line of competitively priced, quality engineered replacement and OEM coils. Coils are made from the finest materials to your specifications and then tested with high pressure dry nitrogen gas for 100% quality assurance. Greenheck's experienced team of application specialists are only a phone call away and ready to respond to any questions you may have.



Quick Build Program

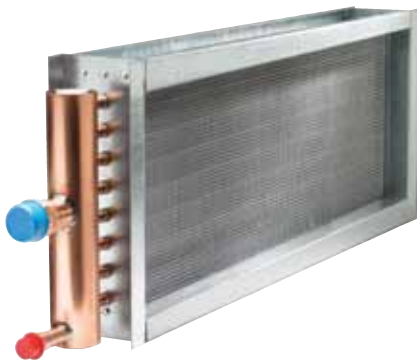
At Greenheck, our Quick Build (QB) program ensures that your coils will be manufactured to your specifications and shipped to meet your time requirements. We work together as a team to match the exact measurements and the performance requirements you need.

Our efficient system can design and manufacture most custom coils for you in 3-, 5-, or 10-day turnarounds. Contact your local Greenheck Representative for more information on our Quick Build program or to order a coil.



World Class Manufacturing

Greenheck's custom coils are manufactured using advanced processes, superior engineering, and quality control procedures to guarantee the highest quality product. Highly skilled production workers use cost-efficient machines and unique die designs to add innovative features. And just to be sure you get the performance you expect when you specify Greenheck, our coils are tested in accordance with AHRI Standard 410-2001 and every coil bears the AHRI label.



To guarantee your coil is going to perform as required, check for AHRI Certification.

Leading Edge Technical Support



Greenheck's products are supported by the industry's best product literature, electronic media, and selection software programs. Greenheck Coil technical literature, specifications, Installation, Operation, and Maintenance manual (IOM), and our Coil Selection software program is available at www.greenheck.com

You can always count on personal service and expertise from our network of Greenheck representatives. To locate your local Greenheck representative, call 715-359-6171 or visit our Web site.

Heating / Cooling

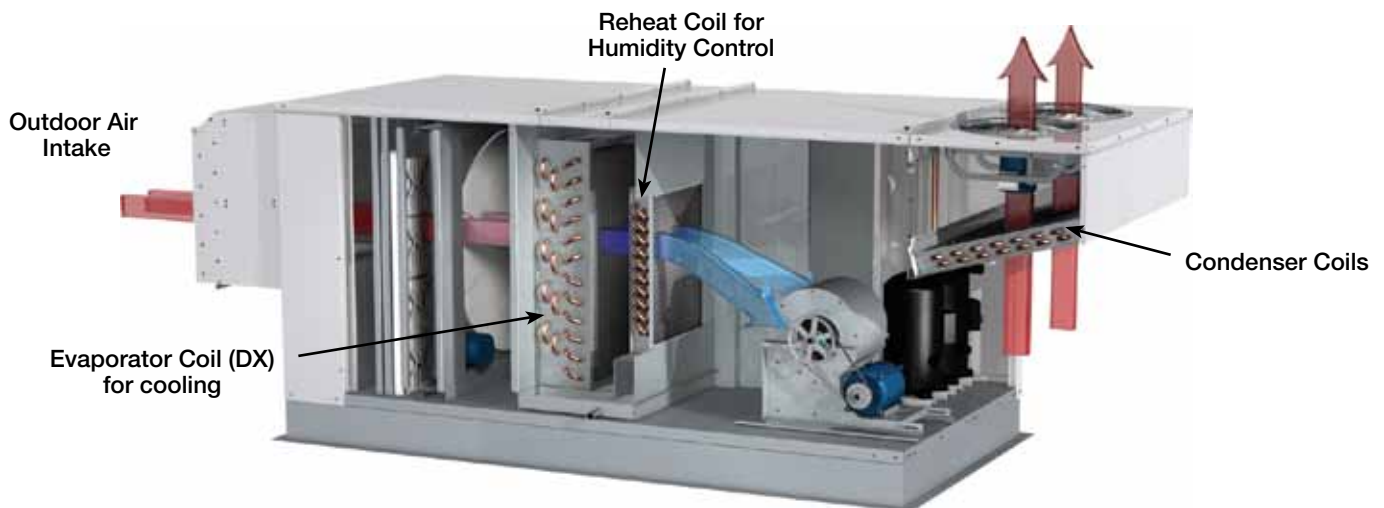
Greenheck coils are designed, manufactured and tested to meet a broad range of heating and cooling requirements. To achieve maximum efficiency and longevity, coils must be properly sized for the intended application.

Water Coils can be used for a single purpose such as heating or cooling, or their function can be alternated between heating and cooling by changing the temperature of the water flowing through the coil. Depending on the application, it may be necessary to use a glycol mixture to prevent the liquid from freezing. Greenheck water coils are engineered to operate at pressures up to 250 PSIG and temperatures up to 300°F, but ancillary equipment such as valves and pumps will often dictate lower operating temperatures. All water coils are pressure tested at the factory with 450 PSIG of dry nitrogen.

Steam Coils are used for heating applications and are built to operate at pressures of up to 125 PSIG with a maximum temperature of 353°F. They are pressure tested with 600 PSIG of dry nitrogen. The most frequent use of steam coils is for retrofitting or modifying existing steam heat systems.

Direct Expansion (DX) Coils are part of a refrigerant filled system consisting of a condenser coil, evaporator coil and a refrigerant compressor. The evaporator coil must be paired with a thermal expansion valve (TXV) intended for the specific capacity and refrigerant type. When used in conjunction with a heat pump and reversing valves, a coil serves for both heating and cooling.

DX Cooling Cycle



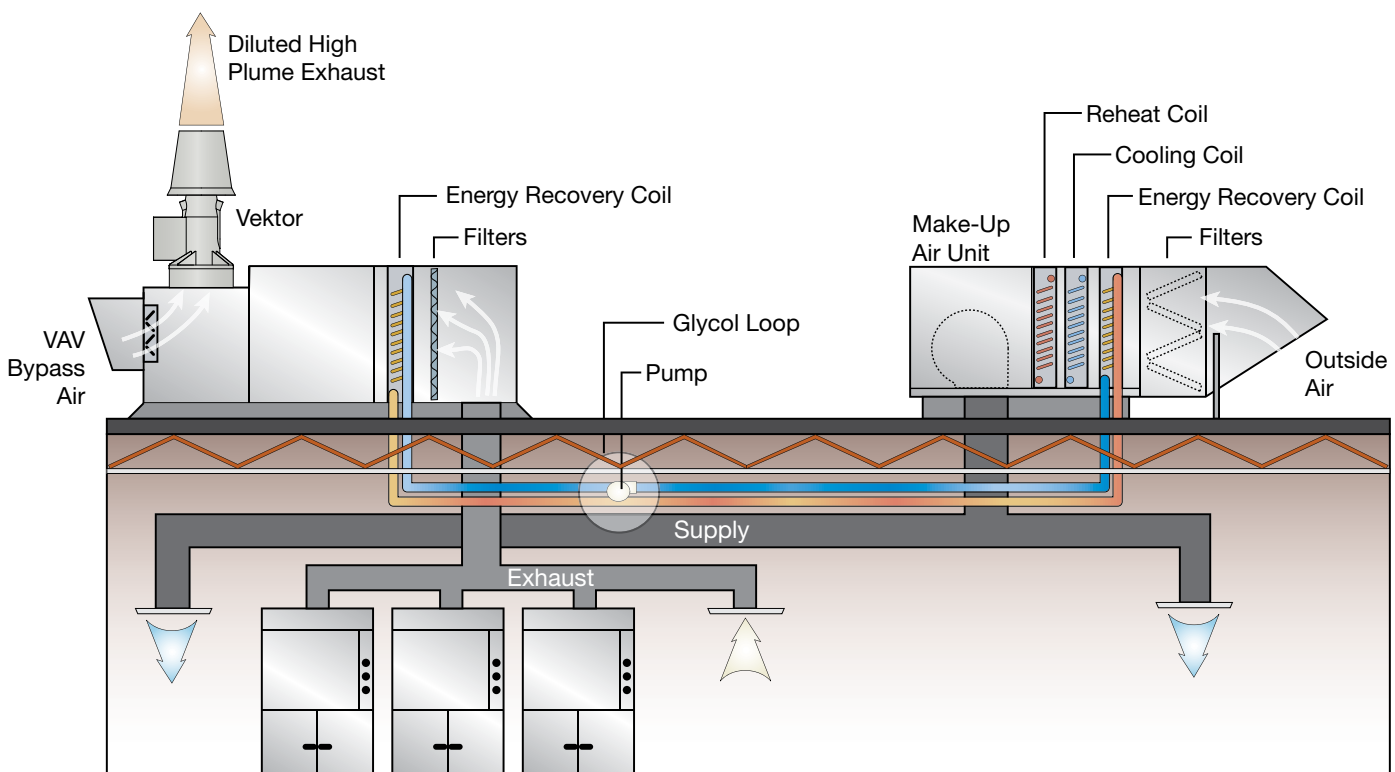
Evaporator Coils (DX) are made for heat absorption and generally function at a lower pressure. Coils made with 3/8-inch diameter tubing are rated for 400 PSIG and 300°F maximum operating temperature. Coils made with 1/2- or 5/8-inch diameter tubing are rated for 250 PSIG and a maximum operating temperature of 300°F. All evaporator coils are factory tested at 600 PSIG. These coils are generally used for spot cooling or as part of an air handling system.

Condenser Coils are made for heat rejection, such as the heat absorbed by an evaporator coil, and they typically operate under higher internal pressures. Coils made with 3/8-inch tubing are rated for use at 600 PSIG and 300°F while coils made from 1/2- or 5/8-inch tubing are rated for 300 PSIG and 300°F. Condenser coils are sometimes used as part of a heat pump to provide heat in a specific location, but more often they are used to simply exhaust heat energy that is collected elsewhere. These coils are also factory tested to 600 PSIG.

Energy Recovery with Run Around Coil Loop

Many scientific and industrial ventilation systems require the introduction of large amounts of outdoor air into the building. The expense of tempering that outdoor air can be greatly reduced by recovering energy from the exhaust airstream. Greenheck offers a run around coil loop that is resistant to exhaust air contaminants and also maintains isolation of the exhaust airstream from the intake airstream. A run around coil loop consists of a specially coated corrosion-resistant coil that is inserted into the building exhaust airstream and is connected to a matching coil in the building air intake. The coils are connected by means of a fluid loop filled with a glycol solution and a pump which is used to circulate the fluid. In the winter, the run around coil loop absorbs sensible (heat) energy from the exhaust airstream and transfers it into the intake airstream, and in the summer, sensible energy is absorbed from the intake airstream and transfers into the exhaust airstream. This results in significant energy savings in both summer and winter.

Greenheck's custom coils are available with a corrosion-resistant specialty coating that ensures safe and consistent recovery of sensible energy.

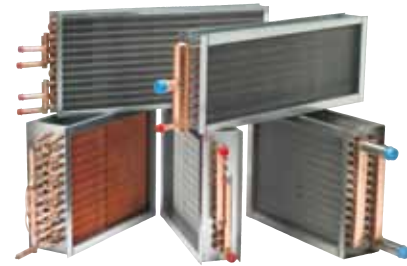


Vektor Energy Recovery System with Run Around Coil Loop

Energy savings resulting from a custom designed run around coil loop are significant. The Greenheck coil selection program can be used to calculate the energy efficiency of the recovery loop. Thermal and economic savings for the run around coil loop used in the Vektor Energy Recovery System can be evaluated in the Greenheck CAPS program.

Complete Line of Standard and Custom Built Coils

- Chilled Water
- Hot Water
- DX Evaporator
- Heat Reclaim
- Condenser
- Standard Steam
- Non-Freeze Steam Distributing
- Booster / Duct Mounted



Construction Features and Options

Rows

- Chilled water and DX coils – 1 to 12 rows
- Hot water coils – 1 to 12 rows
- Steam coils – 1 to 2 rows
- Condenser coils – 1 to 12 rows

Headers

- Type “L” or “M” from 7/8 in. OD to 4 1/8 in. OD copper

Brazing

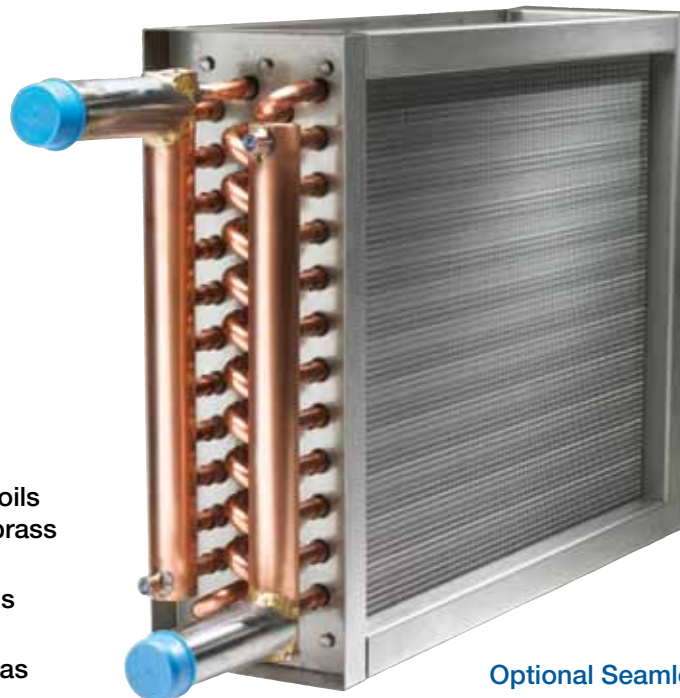
- All joints are hand-brazed

Connections

- Water and steam coils
 - Copper, steel or brass
 - MPT, FPT or sweat connections
- DX distributors
 - Standard or hot gas
- DX, condenser and heat reclaim
 - Copper sweat connections
- Supply connections on both ends of steam distributing coils

Casings

- 16 and 14 gauge galvanized steel
- 16 gauge 304 stainless steel
- Copper



Fin Materials

- .006 in., .008 in. and .010 in. aluminum
- .006 in. copper

Fin Spacing

- 1/2 in. OD Tubing
 - 6 to 14 fins per in.
- 5/8 in. OD Tubing
 - 6 to 14 fins per in.
- 3/4 in. OD Tubing
 - 10 to 20 fins per in.

Tube Material

- 3/8 in. OD x .016 in. wall, copper
- 3/8 in. OD x .016 in. wall rifled, copper (*optional*)
- 1/2 in. OD x .016 in., .020 in. wall, copper
- 5/8 in. OD x .020 in., .025 in., .035 in., .049 in. copper

Optional Seamless Rifled Tubing

- For enhanced performance



Other Options

- Nonstandard casing flange widths and casing depths
- Special coil coatings
- Additional distributors
- Nonstandard circuiting
- Intertwined circuiting (DX Only)
- Insulated coil sections

| | Tube Diameter | | |
|---------------------------------|---------------|------|------|
| | 3/8 | 1/2 | 5/8 |
| Wall Thickness (inches) | | | |
| 0.016 | ✓ | ✓ | |
| 0.020 | | ✓ | ✓ |
| 0.025 | | | ✓ |
| 0.035 | | | ✓ |
| 0.049 | | | ✓ |
| Fin Type | | | |
| Aluminum | ✓ | ✓ | ✓ |
| Copper | | | ✓ |
| Fins Per Inch (FPI) | | | |
| Min | 10 | 6 | 6 |
| Max | 20 | 14 | 14 |
| Fin Type | | | |
| Sine wave | ✓ | | ✓ |
| Lanced | ✓ | | |
| Corrugated | | ✓ | |
| Flat | ✓ | | ✓ |
| Connection Size (inches) | | | |
| Min | 0.5 | 0.5 | 0.5 |
| Max | 4.0 | 4.0 | 4.0 |
| Fin Height (inches) | | | |
| Min | 4.0 | 5.0 | 4.5 |
| Max | 60 | 120 | 120 |
| Increments of | 1.00 | 1.25 | 1.50 |

| Casing Material | |
|---------------------------|-----------------------------|
| Standard | Optional |
| 16 gauge galvanized steel | 14 gauge galvanized steel |
| | 16 gauge stainless steel |
| | .06 or .09 in. thick copper |

| Casing Types |
|----------------------------------|
| Std. (1.5-inch flange) |
| Standard Booster (1-inch flange) |
| Slip and drive |
| Endplates only |
| Inverted S.P. flange |

| Refrigerant Types |
|-------------------|
| R-22 |
| R-134a |
| R-404A |
| R-407C |
| R-410A |
| R-502 |

| Connection Types |
|--------------------------|
| FPT - Female pipe thread |
| MPT - Male pipe thread |
| Sweat |

| Tube Diameter | Fin Material | |
|----------------------|--------------|----------------------|
| | Aluminum | Copper |
| 3/8 | ✓ | |
| 1/2 | ✓ | ✓ |
| 5/8 | ✓ | ✓ |
| Fin Thickness | | |
| 0.006 | ✓ | ✓ |
| 0.008 | ✓ | |
| 0.010 | ✓ | |
| Fin Type | | |
| Sine wave | ✓ | ✓ (5/8 inch only) |
| Lanced | ✓ | |
| Corrugated | ✓ | |
| Flat | ✓ | |

| Fluid Flow Rates | | | | | | | |
|--|-----|-----|-------|-------|-------|-------|--------|
| For water coils, connections sizes are based on GPM of water | | | | | | | |
| GPM | 1-4 | 4-8 | 8-16 | 16-30 | 30-40 | 40-70 | 75-150 |
| Connection | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 |

Coil Selection Program

Software

Visit www.greenheck.com/software to obtain Greenheck's coil selection software. Use of the self-explanatory software will guide the user in proper sizing and feature selection.

Coil Drawing Worksheets

Replacement Blank Coil Drawings—which are helpful for recording coil construction details when sizing and ordering replacement coils—are available from our Web site. The drawings are located on the Coils product Web page under the Other Product Information section.

WATER COILS

| ROWS AVAILABLE | 1 | 2 | 3 | 4 | 5 |
|---------------------------------------|--------------------|------------------------|-------|--------|-------|
| FPI AVAILABLE | 6 | 7 | 8 | 10 | 12 |
| TUBES CD & Wall Thickness COPPER ONLY | 5/8 | .020 | .025 | .035 | .049 |
| FINS Material & Thickness | ALUM. | .006 | .010 | COPPER | .006 |
| CASING | 16 GA. GALV. STEEL | 16 GA. STAINLESS STEEL | | | |
| HEADERS COPPER ONLY | 5/8 | 7/8 | 1 1/8 | 1 3/8 | 1 5/8 |
| | 2 5/8 | 3 1/8 | | | |

| DIMENSIONAL DATA IN INCHES | | | | | | | | | | | | | | | SUPPLY | | | | RETURN | | | | CONNECTION SIZES | | |
|----------------------------|-----|------|-----|-----|---------|-----|----|-----|----|-----|---------|-----------|---|----------|--------|----|-----|---|--------|---|-----|-------|------------------|--|--|
| ITEM | QTY | ROWS | FPI | SP1 | FH | SP2 | CH | EP1 | FL | EP2 | CL | MAX | C | OAL | L | CD | S | E | R | F | MPT | SWEAT | FPT | | |
| P.O. # | | | | | | | | | | | | CUSTOMER | | | | | | | | | | | | | |
| W.O. # | | | | | | | | | | | | MODEL NO. | | | | | | | | | | | | | |
| APPROVED BY | | | | | | | | | | | | TAG: | | | | | | | | | | | | | |
| DATE | | | | | | | | | | | | NOTES | | | | | | | | | | | | | |
| Performance Data | CFM | | | | EDB/EWB | | | | | | LDB/LWB | | | CAPACITY | | | EWT | | | | LWT | | GPM | | |

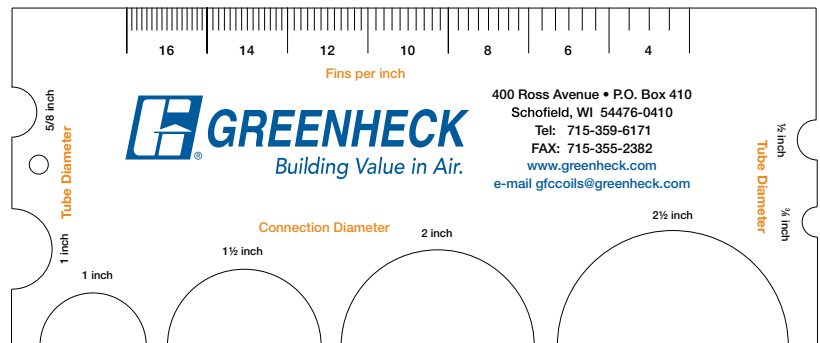
| | Coil Type (Style) | | | | | | | |
|---|---|-----------|------------------|-----------|----------------|--------------------|-----------|----------------|
| | Custom | | | | | | Booster | |
| | Chilled Water | Hot Water | Direct Expansion | Condenser | Standard Steam | Steam Distributing | Hot Water | Standard Steam |
| Tube Diameter (inches) | | | | | | | | |
| 3/8 | ✓ | ✓ | ✓ | ✓ | | | | |
| 1/2 | ✓ | ✓ | ✓ | ✓ | | | | |
| 5/8 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Rows | | | | | | | | |
| Min Rows | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Max Rows | 12 | 12 | 12 | 12 | 2 | 2 | 2 | 2 |
| Fin Height (inches) | | | | | | | | |
| Min | <i>Fin height is dependent on tube diameter (see Tube Diameter chart)</i> | | | | | | 6 | 6 |
| Max | | | | | | | 24 | 24 |
| Increments of | | | | | | | 3 | 3 |
| Fin Length (inches) | | | | | | | | |
| Min | <i>Minimum fin length is 1 inch</i> | | | | | | 6 | 6 |
| Max | <i>Max fin length is 250 inches with center supports every 50 inches</i> | | | | | | 48** | 48** |
| Increments of | <i>No restriction on fin length increments</i> | | | | | | 1 | 1 |
| Recommended Face Velocity (FPM) | | | | | | | | |
| Min | 400 | 500 | 400 | 600 | 500 | 500 | 500 | 500 |
| Max | 550 | 800 | 550 | 750 | 850 | 850 | 800 | 850 |
| Recommended Fluid Velocity (FPS - for water coils) | | | | | | | | |
| Min | 1.5 | 1.5 | NA | NA | NA | NA | 1.5 | NA |
| Max | 4.0 | 4.0 | NA | NA | NA | NA | 4.0 | NA |
| Recommended Pressure Drop (ft. of H₂O or psi) | | | | | | | | |
| Min | 1 | 1 | 1.5 | 3 | 1 | 1 | 1 | 1 |
| Max | 20 | 10 | 9 | 10 | 125* | 125* | 10 | 125* |

* Higher steam pressures will require heavier tube wall thicknesses.
 ** Booster coil fin lengths are dependent on fin height.

Coil Measuring Tool

Greenheck's coil measuring tool helps the user determine the specifications to properly size a replacement coil. It will quickly, easily and accurately check tubing and connection diameters, and fins per inch (FPI).

Contact your local Greenheck representative to request a free coil measuring tool today.



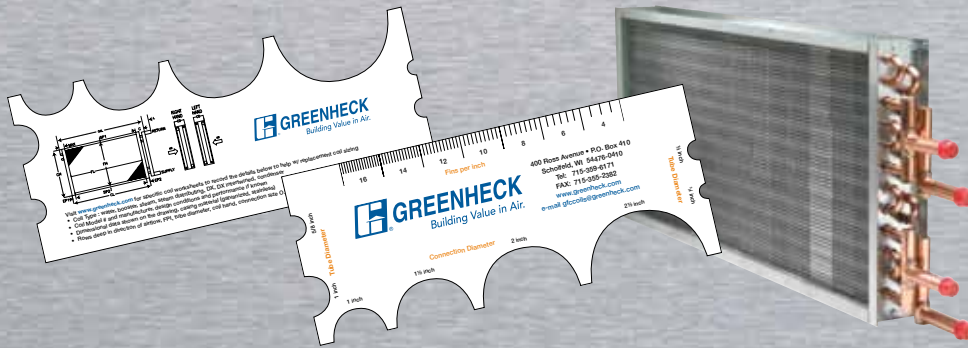
Greenheck Coils

Model Number Code

| | | | | | | | | |
|---|---|--|---|--|--------------------------------|--------------------------------|--|-----------|
| Z | CW | 58 | S | 04 | F | 10 | 24 x 36 | RH |
| Z = Special Feature | Tube Diameter 58 = 5/8" 12 = 1/2" 38 = 3/8" | Fin Type S = Sine wave L = Lanced C = Corrugated F = Flat | Rows Deep 01, 02, 03, 04, 05, 06, 08, 10, 12, etc. | Circuit D = Double O = One-and-a-Half F = Full T = Three-Quarter H = Half Q = Quarter S = Special A = Single Feed B = 2 Feed | Fins Per Inch 6 - 18 | Fin Height x Fin Length | RH = Right Hand LH = Left Hand Connection hand is determined by looking at the inlet face of the coil, with the air hitting you in the back. | |
| Coil Type CW = Chilled Water HW = Hot Water DX = Evaporator HR = Heat Reclaim CD = Condenser SS = Standard Steam SD = Steam Distributing DR = Evaporator, Riffed Tubes CR = Condenser, Riffed Tubes | | | | | | | | |



Greenheck's Coil Measuring Tool



Building Value in Air

Greenheck delivers value to mechanical engineers by helping them solve virtually any air quality challenges their clients face with a comprehensive selection of

top quality, innovative air-related equipment. We offer extra value to contractors by providing easy-to-install, competitively priced, reliable products that arrive on time. And building

owners and occupants value the energy efficiency, low maintenance and quiet, dependable operation they experience long after the construction project ends.

Our Warranty

Greenheck warrants this equipment to be free from defects in material and workmanship for a period of one year from the shipment date. Any units or parts which prove defective during the warranty period will be replaced at our option when returned to our factory, transportation prepaid. Motors are warranted by the motor manufacturer for a period of one year. Should motors furnished by Greenheck prove defective during this period, they should be returned to the nearest authorized motor service station. Greenheck will not be responsible for any removal or installation costs.

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.



Prepared to Support Green Building Efforts

