



SEC *Heat Exchangers*

TECHNICAL CATALOGUE

Section 1

Technical Information

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Description Of SEC Heat Exchangers

Counter flow units made of stainless steel used in both heating and cooling systems. Non-removable parts. Ideal for steam or water heating systems. Helically corrugated tubes coiled in a spiral tube bundle. Vertical installation reduces space requirements.

Where They Can Be Installed

- Heating systems
- Chilled water systems
- Ground water systems
- Residential use

Advantages Of SEC Heat Exchangers

Low maintenance: helically corrugated tubes cause turbulence which results in an increase in heat transfer efficiency and in reduction of scale buildup and fouling.

Compact size and light weight requires less installation space and low installation costs.

Flexibility of design: wide range of types and configurations. Increase or decrease required capacity by adding or removing units.

Flexibility of conditions: wide range of pressures, flows and temperatures.

Low cost of maintenance: compact, lightweight and can be easily removed from piping systems and flushed if necessary.

High efficiency: helically corrugated tubes dramatically increase efficiency of heat transfer in comparison to existing plate or shell & tube heat exchangers.

Our heat exchangers are designed, tested, and manufactured to ASME Code Sec. VIII, Div.1 and will bear U or UM stamp accordingly. SEC heat exchangers are certified by many international and national technical inspection authorities. The heat exchangers are CSA approved, ISO-9002 registered and have obtained the CRN in the Canadian provinces.



SEC Heat Exchanger Technology

SEC heat exchangers were designed with the end-user in mind, a high efficiency shell and tube heat exchanger fabricated from stainless steel 316L that is flexible to use in a wide range of capacities and applications. Its unique features include circular layers of helically, corrugated tubes, a compact design and connection angles ranging between 100°-105°.

Turbulent flow is the dominant mode of fluid flow through the heat exchanger. Whereas in a laminar flow the flow structure is characterized by smooth motion of fluid layers with no mixing of adjacent fluid layers, a turbulent flow is characterized by random, three-dimensional motion of fluid particles. The mixing of fluid layers is a result of velocity fluctuations present in turbulent flow.

Turbulent flow, or mixing of fluid layers, is desired in the heat exchangers. It provides a better mixing, or distribution, of heat in both the shell and tube. The random movement of fluid particles also reduces deposit buildup by performing a “scoop ‘n lift” action with debris lodged along the heat exchanger surfaces. Although turbulence is a direct function of the density and viscosity of the fluid, the flow velocity, and size of the tubes, the corrugated tubes inside SEC heat exchangers induces more turbulence to the flow due to its “bumpy” shape. As a result, the heat exchangers are highly efficient units and may be categorized as self-cleansing.

SEC heat exchangers differ from other shell & tube heat exchanger by the shape and placement of the corrugated tubes inside the shell. The tubes are fabricated into helical coils. The coils are placed inside each other to form circular layers that makes up the tube bundle. Each layer flows in the opposite direction to the layers surrounding it resulting in an overall crisscross pattern.

This design offers many advantageous over the conventional, straight tube heat exchangers. The large number of tubes closely packed together provides a large heat transfer area within a compact space, resulting in higher performance at a relatively lower cost. The layers of tubes in the criss-cross pattern provides rapid and more uniform heating of fluids which increases the overall heat transfer coefficient.

The heat exchangers are designed for vertical installation. This, along with their compact size, enables them to be installed in any application. The design requires less installation space and low installation costs.

Depending on the type of heat exchanger, the center-to-center angle of the connections ranges from 100° to 105°, not the traditional 90° angle. This forms a gradual flow entrance and reduces any sharp corners where flow separation may occur, resulting in an appreciable head loss. The entrance angle also prevents debris from lodging in corners, which often occurs with sharp corners.

Construction Features

The heat exchangers are designed and fabricated as a single unit with non-removable parts.

The cylindrical shell encloses a tube bundle, which consists of circular layers of helically, corrugated tubes.

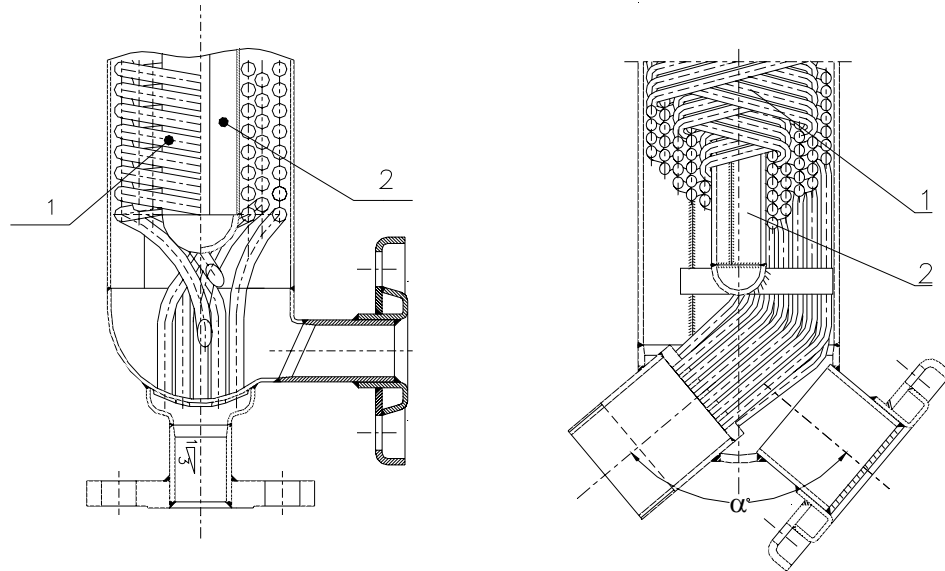


Figure 1 Cross-section of C.xx.xx.90 (left) and C or Pxx.xx.50 (right) type heat exchangers. 1-Tube bundle, 2-Core

Each layer flows in the opposite direction to the layers surrounding it in a criss-cross manner. The tube bundle has perforated bottoms which are welded near the connections. Both ends of the cylindrical shell are enclosed within hemispherical heads.

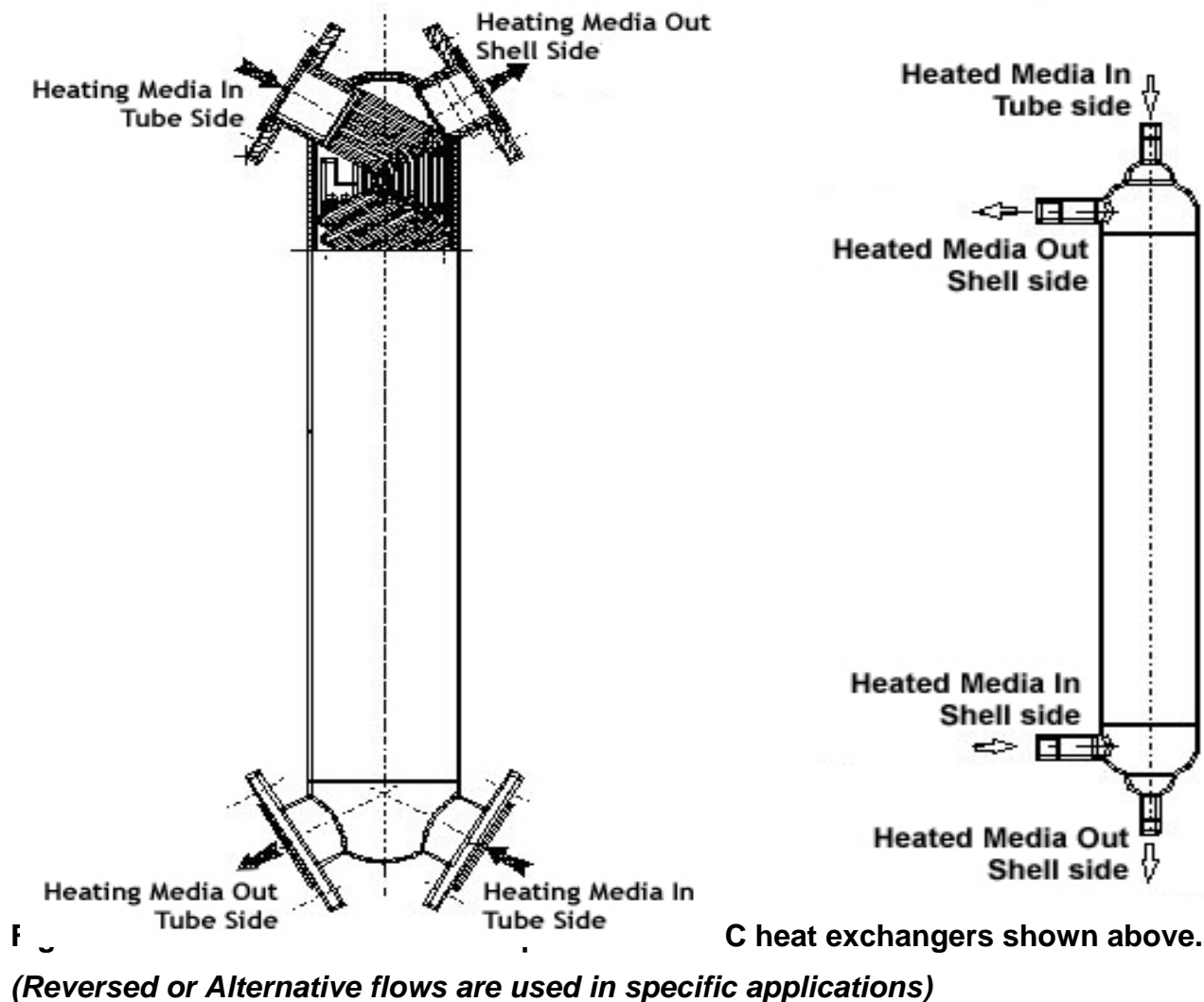
P-type heat exchangers consist of tube bundles made of smooth tubes. **C-type** heat exchangers consist of tube bundles with corrugated tubes. **CS-type** heat exchangers are shortened versions of the C-type and are usually installed in applications where there are height limitations. C.xx.xx.90 type heat exchangers have straight, 90° angle connections. C.xx.xx.50 type heat exchangers have connections at 50° from the central axis.

Each heat exchanger has a total of four (4) symmetrically located connections, two on each hemispherical head. One pair of opposing connections is connected to the tube side while the other pair is connected to the shell side.

SEC Heat Exchangers Operating Principle

A heat exchanger is a device in which heat is transferred from one flowing fluid to another. Shell and Tube heat exchangers are the most common type of heat exchangers for liquid/liquid service although many applications also involve steam and certain gases. SEC heat exchangers are counter flow units, which from a thermodynamic point of view extract more heat from a given fluid stream than the other common types of heat exchangers.

Normally, the heating medium flows through the tubes, although for specific properties or conditions (e.g. high viscosity, high pressure drops), the heating medium can flow through the shell side. Thermal energy is transferred through the tube walls. The total heat load is dependent on the flow parameters of the fluid.



SEC Heat Exchanger Quote Form



**To find out which type of our heat exchangers
will best suit your requirements
please complete this form and send it to us**

Name: _____ Company: _____

Address: _____ City: _____

State: _____ Country: _____ Zip Code: _____

Phone: _____ Fax: _____ Email: _____

Project Reference: _____ Quantity: _____

Material of Construction: _____

Type Of Heat Exchanger: _____ Delivery Required by: _____ In Weeks

SIDE 1

SIDE 2

FLUID TYPE: _____

FLOW RATE: _____

INLET TEMPERATURE: _____ C° or F°

_____ C° or F°

OUTLET TEMPERATURE: _____ C° or F°

_____ C° or F°

ALLOWABLE

PRESSURE DROP: _____

DESIGN PRESSURE: _____

Optional Data

If Known: _____

HEAT TRANSFERRED

(CAPACITY): _____

DENSITY @

TEMPERATURE: _____

THERMAL

CONDUCTIVITY: _____

SPECIFIC HEAT: _____

VISCOSITY: _____

PHASE CHANGE: _____

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