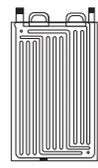


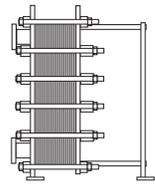
PLATECOIL®

PRIME SURFACE
HEAT EXCHANGERS



SUPERCCHANGER®

PLATE & FRAME
HEAT EXCHANGERS

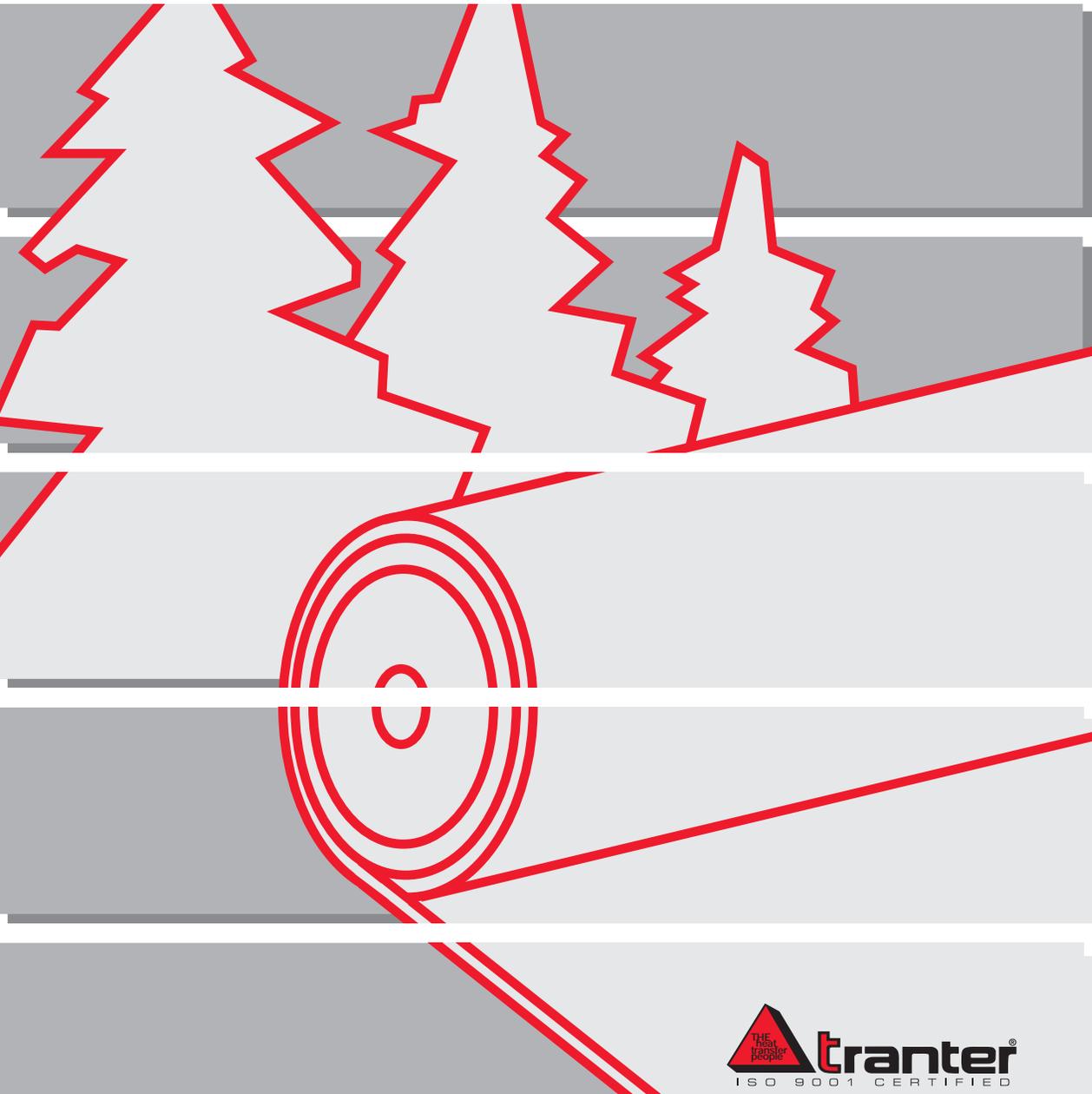


MAXCHANGER®

ALL-WELDED PLATE
HEAT EXCHANGERS



IN THE PULP AND PAPER INDUSTRY



TRANTER BRINGS EFFICIENCY AND RELIABILITY TO THE PULP AND PAPER INDUSTRY

Excellent efficiency and flexibility...optimum heat transfer...minimal maintenance...these are critical needs today in the pulp and paper industry. Tranter provides these benefits and more, with PLATECOIL, SUPERCHANGER and MAXCHANGER heat exchangers that are standards for the industry.



PLATECOIL® PRIME SURFACE HEAT EXCHANGERS

A multitude of design configurations and over 300 different sizes make PLATECOIL units ideally suited for a variety of applications in the pulp and paper industry. They offer versatility in providing the heating and/or cooling required for various applications in the industry.

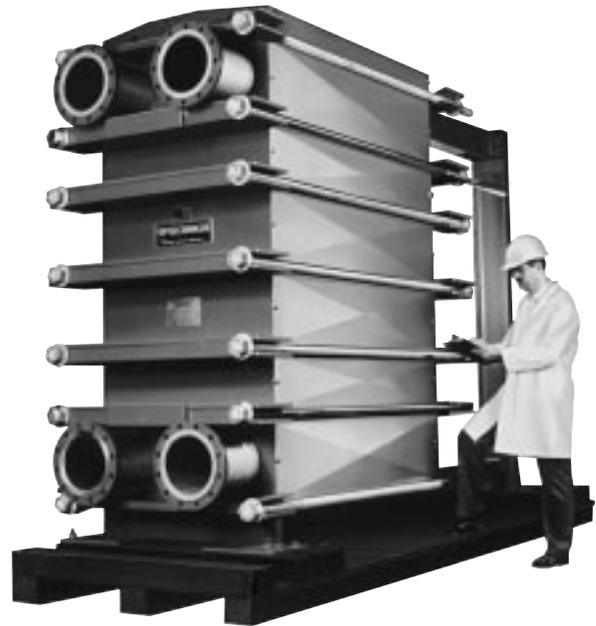
PLATECOIL units are perhaps best known as immersion-type, in-tank or as clamp-on heaters for maintaining product temperatures in tanks. Their use goes far beyond these applications, however, and includes designs for custom-engineered processing equipment.

PLATECOIL units can be fabricated from most weldable metals including carbon steel, stainless steel, titanium, Monel, nickel and various special corrosion-resistant alloys. Surface finishes are available in great variety to minimize fouling and reduce maintenance.

SUPERCHANGER® PLATE & FRAME HEAT EXCHANGERS

Plate and frame heat exchangers provide a more efficient and cost effective means of heat transfer than old, traditional shell-and-tube exchangers. This is particularly true in the pulp and paper industry.

SUPERCHANGER plate and frame units are the best choice because they give you: (1) higher "U" values typically 3 to 5 times greater than shell-and-tube; (2) a unique turbulent flow design resulting in lower fouling; (3) closer temperature approach capability of less than 2°F, compared to the typical 10°F or higher with shell-and-tube; (4) space savings of 50% to 90% over shell-and-tube; (5) expandability and easy servicing, and (6) immediate availability, since they are made in the U.S.



MAXCHANGER® ALL-WELDED PLATE HEAT EXCHANGERS

Where space is at a premium, or gasket limitations prevent the use of a SUPERCHANGER unit, the compact all-welded MAXCHANGER unit may be the best solution to many pulp and paper applications.



NOTE: THE DIAGRAMS SHOWN ARE PURPOSELY BRIEF: NO ATTEMPT HAS BEEN MADE TO SHOW ALL THE VALVES, PUMPS, CONTROLS, ETC., THAT MAY BE REQUIRED. IN MOST SYSTEMS, ALL PIPING ACTUALLY IS FROM THE SUPERCHANGER FIXED FRAME. THIS FACILITATES OPENING THE UNITS, WHEN REQUIRED, WITHOUT DISASSEMBLING PIPING.

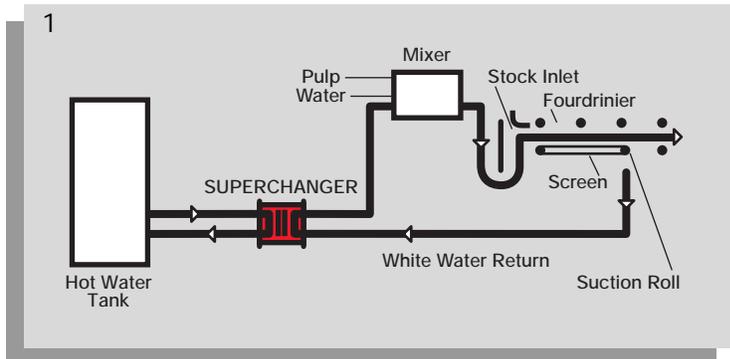
TYPICAL HEATING APPLICATIONS



SUPERCHANGER UNITS

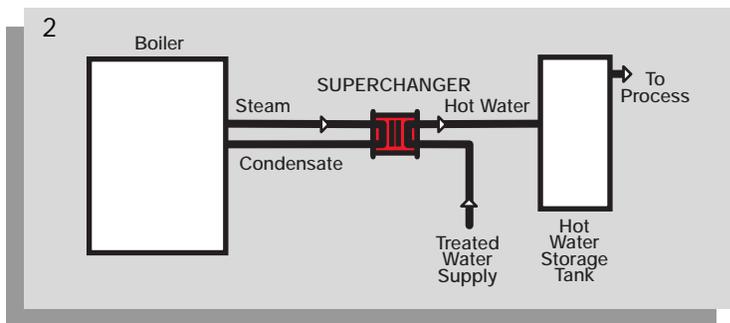
AT THE PAPER MACHINE (FORMING SECTION): HEATING WHITE WATER WITH HOT WATER

White water from the Fourdrinier frequently needs to be reheated before reusing. In this application, the use of hot water rather than steam is preferable to reduce scaling tendencies. The hot water may be supplied by a SUPERCHANGER unit heating water with steam or as a hot waste stream as alternates to the hot water supply tank as shown.



IN THE BOILER ROOM: HEATING MILL WATER WITH STEAM

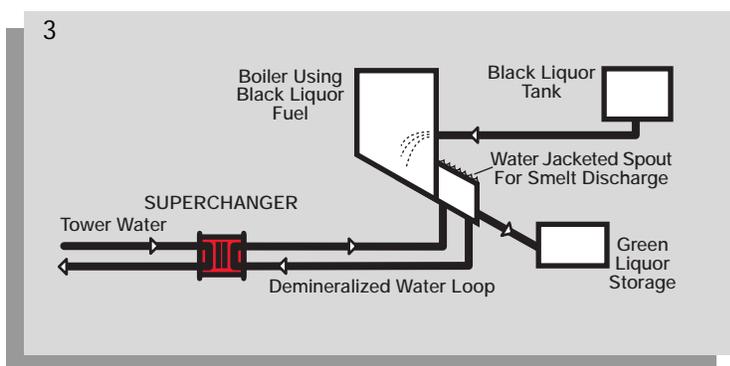
In this application, the SUPERCHANGER heat exchanger's high heat transfer rates result in a compact, low cost, corrosion-resistant heater. Steam temperatures need to be limited to about 350°F. Also, the water should be treated to minimize scaling on the plates.



TYPICAL COOLING APPLICATIONS

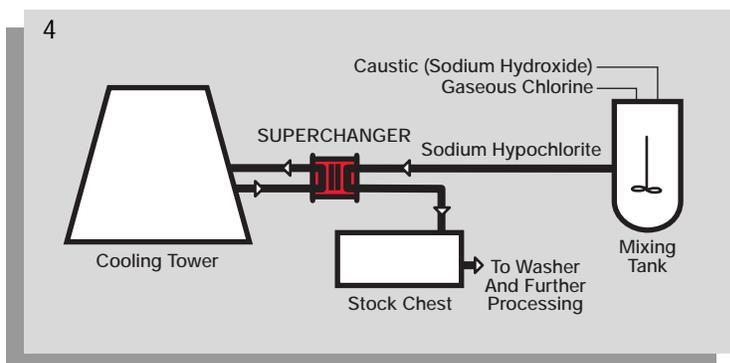
IN THE BLACK LIQUOR RECOVERY DEPT: INTERCOOLER FOR CLOSED LOOP COOLING (ISOLATION)

After black liquor (spent cooking liquid) from digesters is concentrated in the evaporators, it is burned as a boiler fuel. Recovered chemicals (smelt) are discharged through a spout which generally requires cooling. To keep the water jacket clean, demineralized water is recirculated through it. This water can be cooled by means of a SUPERCHANGER heat exchanger which uses tower water (or any cooling water). The characteristic close approach temperatures obtained with SUPERCHANGER units make this an ideal application.



IN THE PULP MILL: COOLING BLEACH SOLUTIONS DURING MIXING

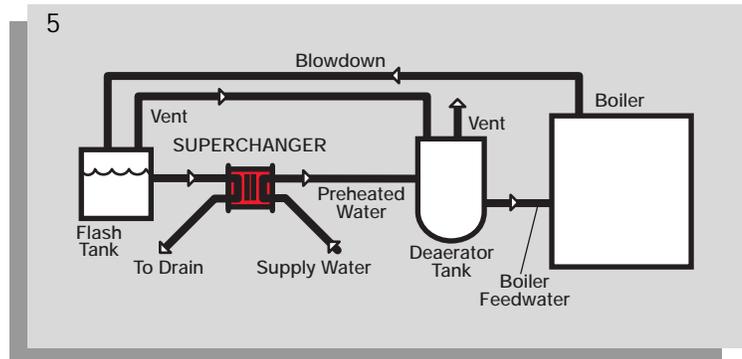
When chlorine gas is injected into sodium hydroxide to make sodium hypochlorite for bleaching, heat is generated by the mixing process. SUPERCHANGER plate and frame heat exchangers with titanium plates are very effective in removing this heat. When other chemicals are handled in a similar manner, special metals are available for plates as needed. The high "U" values obtained with the SUPERCHANGER design help keep costs down because less area is required than with shell-and-tube units.



TYPICAL HEAT RECOVERY APPLICATIONS

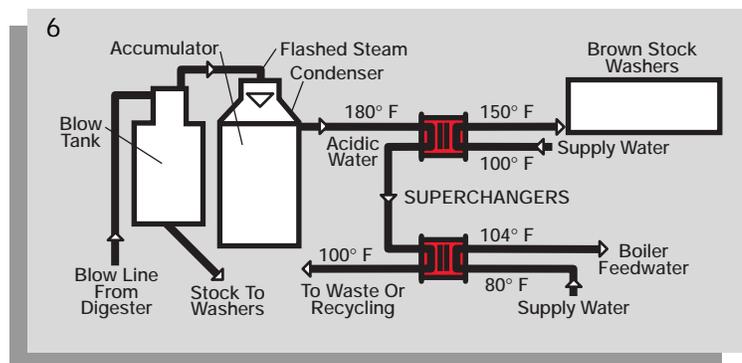
IN THE BOILER ROOM: HEAT RECOVERY FROM BOILER BLOWDOWN

This is a common application for SUPERCHANGER units and is applicable to surface blowdown conditions. The flash tank will generally reduce the pressure and temperatures below the 350°F gasket temperature limit. Wastewater temperatures are reduced to meet environmental requirements and rapid payback is realized.



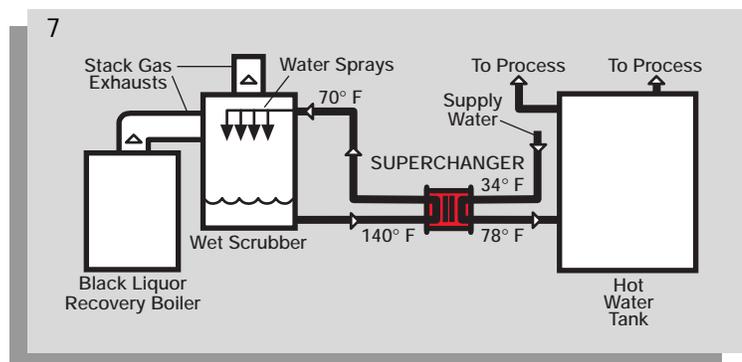
IN THE PULP MILL (BLOW HEAT RECOVERY): HEAT RECOVERY FROM DIGESTER GAS CONDENSATE

As illustrated here, two SUPERCHANGER units save over \$300,000 per year through enhanced heat recovery. This is possible due to the installation of a condenser in combination with the SUPERCHANGER units. Previously, digester gases with entrained moisture and some 13,000,000 BTU/hr were discharged directly into the atmosphere. The plates are electropolished to help reduce scaling and a back-flush system is used regularly. With these safeguards, fouling is not a problem.



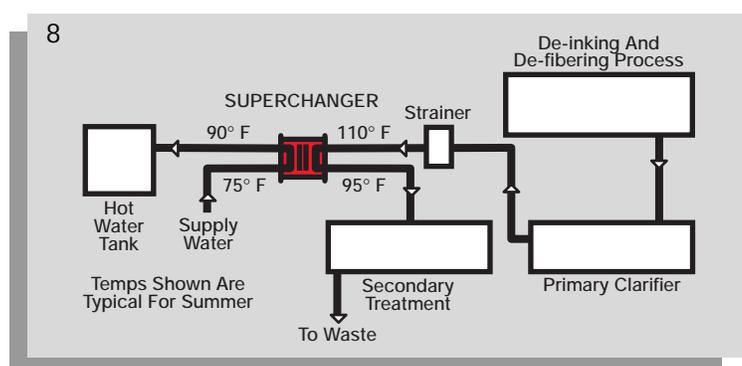
AT THE BLACK LIQUOR BOILER: HEAT RECOVERY FROM SCRUBBER WATER

When water is sprayed into hot stack gases, its temperature increases. Rather than waste this scrubber water, it can be passed through a SUPERCHANGER plate and frame heat exchanger as shown. Typical temperatures, as shown here, demonstrate that plant water can be heated about 44°F by this waste heat. In one case, the recovery is about 60,000,000 BTU/hr. It is an excellent application for SUPERCHANGER units with fast payback.



FOR MILLS REWORKING WASTE PAPER: HEAT RECOVERY FROM DE-INKING EFFLUENT

Illustrated is just one example of how a SUPERCHANGER plate and frame heat exchanger recovers millions of BTUs from the numerous hot, dirty waste streams in pulp and paper mills. Frequently, a dual purpose is served since wastes must be cooled before discharge for environmental reasons. While recovering useful heat at the same time, the payback for SUPERCHANGER heat exchangers and related equipment is very significant.



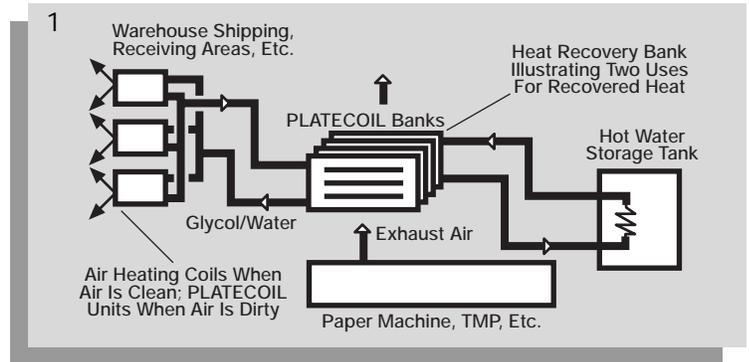
TYPICAL HEAT RECOVERY APPLICATIONS



PLATECOIL UNITS

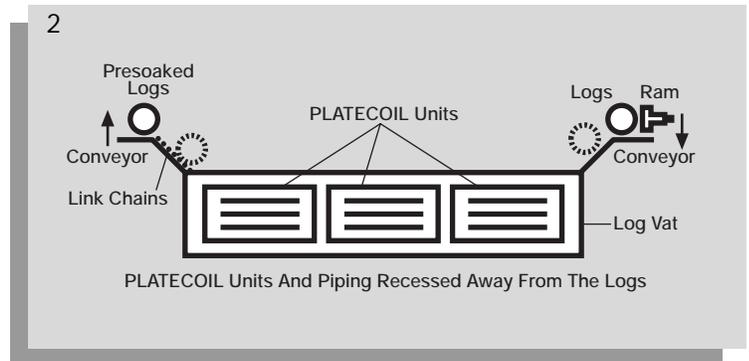
AT THE PAPER MACHINE (DRYER SECTION): RECAPTURING BTUs OF HOT, MOIST AIR EXHAUST

Millions of BTUs an hour and thousands of dollars each year can be saved with low cost, fast payback, trouble-free PLATECOIL (or ECONOCOIL®) heat recovery banks. These banks are designed to recapture a major portion of the high BTU content of hot, moist air exhausted from paper machines and thermal mechanical pulping (TMP) units as illustrated here. The result is a big savings in fuel costs.



AT THE LOG VAT: PRESOAKING LOGS BEFORE PROCESSING

Plywood mills frequently soak logs in hot water before processing. The PLATECOIL units shown here are recessed in the concrete walls of the vats. Also, they have heavy plates (about 3/8") for the flat side facing the logs. This method and design protects the PLATECOIL units from severe conditions. Further, they do not foul up from bark, etc. when installed in this manner.



DESIGN AND INSTALLATION GUIDELINES FOR SUPERCHANGER UNITS

As indicated by the heating, cooling and heat recovery application examples, SUPERCHANGER plate and frame heat exchangers perform efficiently in a diverse range of conditions. Experience has shown that adherence to the following guidelines will result in optimum performance.

1. Design with washboard models and with velocities as high as practical when fluids containing suspended fibers are processed.
2. The use of hot water rather than steam to heat white water will result in fewer scaling problems.
3. Some fluids have tendencies to develop scale at

elevated temperatures. When these fluids are to be heated above 150°F, the SUPERCHANGER unit will perform better if it is provided with a CIP or back-flush system.

4. Install filters or screens ahead of SUPERCHANGER heat exchangers when the fluids contain sizable fibers and/or particulate matter.
5. It is preferable that water which is heated with steam be soft water or treated water to minimize scaling.
6. For fluids containing small amounts of fibers such as white water, highest possible pressure drops should be allowed.

ADDITIONAL SUPERCHANGER HEATING APPLICATIONS

The following products also can be heated with SUPERCHANGER units using steam or hot water. Design considerations outlined on this page should be followed:

- Glue
- Fuel Oil
- Polyvinyl Alcohol for Coatings
- Sodium Hydroxide
- Resin
- Tall Oil
- River Water
- Calcium Sulfate

SUPERCHANGER OUTPERFORMS SHELL-AND-TUBE

SUPERCHANGER heat exchangers require much less space than shell-and-tube units. They can pack greater than 20,000 sq. ft. of super efficient heat transfer surface in a single unit with flow rates up to 25,400 gpm. They provide greater flexibility; are more easily cleaned; experience much less fouling; have no interleakage; are lighter in weight; and cost less.

Most importantly, however, SUPERCHANGER units do a more efficient job of transferring heat in most applications,

due in large measure to the turbulent flow created by the corrugated patterns of their plates.

For a side-by-side comparison between SUPERCHANGER plate and frame heat exchangers and shell-and-tube exchangers, the charts below show the difference in dimensions and comparative performance data for two units in an identical application.

SUPERCHANGER®

PLATE AND FRAME HEAT EXCHANGER

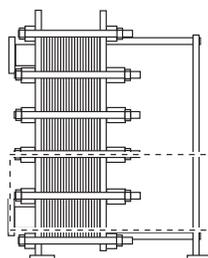
SHELL-AND-TUBE HEAT EXCHANGER

■ High efficiency—"U" values 3 to 5 times greater than shell-and-tube; often greater than 1,000 Btu/ft. ² hr.°F	■ Low efficiency
■ Uses only 10% to 50% of shell-and-tube space	■ Needs twice as much space to pull tube bundle
■ Easy disassembly—just loosen bolts	■ Complex disassembly—tube bundle must be pulled
■ Lower cost when stainless steel or higher grade of material is required	■ Higher cost except in all carbon steel construction
■ Low fouling due to corrugations and inherent turbulence	■ High fouling due to circular cross-section and channeling—approximately 10 times greater
■ Variable heat transfer surface—plates easily added or removed	■ Fixed surface only
■ Low weight—typically 1/6th of shell-and-tube	■ High weight—up to 6 times that of plate and frame
■ Intermix between fluids impossible due to gasket design	■ Fluids can intermix, both at welds and at tube sheet
■ Inspection—simply disassemble and inspect	■ Inspection difficult—must usually pull tube bundle
■ Excellent chemical cleaning due to corrugations/turbulence	■ Satisfactory chemical cleaning but must be cautious of dead spots
■ Maximum viscosity—30,000 cps Nominal	■ Maximum viscosity—10,000 cps
■ Pressure drop—low to medium	■ Pressure drop—low to medium
■ Practically no heat loss—no insulation required	■ Great amount of heat loss—insulation required
■ Can be designed for less than 2°F temperature approach with more than 90% heat recovery attainable	■ Typically only a 5°F to 10°F minimum temperature approach can be achieved
■ Computer custom-designed sizing per application	■ Computer designed, but must always be oversized to be safe
■ Low internal volume—10% to 20% of shell-and-tube	■ Very high internal volume
■ Multiple duties possible with connecting frames	■ One unit required for each duty

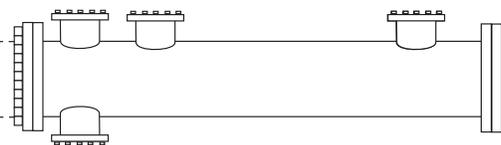
TYPICAL UNITS DESIGNED FOR THE SAME HEAT TRANSFER CONDITIONS

ITEM	SUPERCHANGER	SHELL-AND-TUBE
Surface Area	1,000 sq. ft.	3,000 sq. ft.
Total Length Required	86"	157"
Width	32" Diameter	30" Diameter
Height	84"	42"
Gross Volume	18 ft. ³	116 ft. ³
Net Weight	1,600 lbs.	6,000 lbs.

Plate and frame heat exchangers take as little as one-tenth the space required for shell-and-tube exchangers, particularly when considering the space required for tube removal.



DOTTED LINE REPRESENTS SPACE REQUIRED FOR TUBE REMOVAL



REPRESENTED BY:

For further information on PLATECOIL prime surface heat exchangers and SUPERCHANGER plate and frame heat exchangers, contact:

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