



APEX Heat Exchangers



Conquer the market through knowledge

Leaders in heavy-duty plate-type and tubular gas / gas exchangers



APEX Group is a group of companies specialized in designing and manufacturing heat transfer equipment of proprietary design. APEX® & CORPEX® plate-type, enameled and tubular exchangers are custom designed units, taking into account the specific requirements of each application. We provide advanced engineering solutions for high performing heavy-duty gas/gas and gas/liquid equipment for heat recovery and environmental projects.

Patented technology, based on 45+ years of experience in heat transfer, provides APEX Group a solid technical foundation and a strong competitive edge in today's market. As a result of substantial growth, APEX Group has been able to expand its fabrication, engineering and research and development facilities, to satisfy 300+ customers' requirements with APEX tailored designs. APEX Group remains committed to improving and expanding its range of advanced products and technologies, world-wide.

APEX Group Offers:

- High quality products and services
- Competitive price
- Timely delivery
- Customized designs according to client`s needs (process-wise and structurally)
- High temperature (up to 900°C) application
- Extra-strong units with heat transfer plate thickness up to 6mm
- Equipment insulated internally and/or externally
- Site activities supervision

APEX Group Technology is Supported by:

- Advanced Laser Doppler Anemometry (LDA/PIV)
- In-house research and development laboratory using advanced measuring equipment
- Analyses using advanced software for:
 - Fluid flow simulation (CFD)
 - Steel structures strength and behavioral analysis (FEA)

Plate-Type Heat Exchanger



High performance gas/gas heat exchangers increasing thermal efficiency

Enameled Heat Exchanger



Glass coated metallic tubes and plates for units operating below acid dew point

Tubular Heat Exchanger



Pressurized tubular heat exchangers, such as steam/water coils, flue-gas boilers, economizers

Applications:

- Combustion Air Preheaters
- Gas/Gas Reheaters
- Gas Coolers
- Heat Recovery from Incinerators
- Feed/effluent Exchangers
- DeNOx Exchangers

for

Industries:

- Petrochemical Industry
- Power Industry
- Pulp & Paper Industry
- Ammonia & Fertilizers Industry
- Process Industry
- Metallurgical Industry

AIR CURTAIN® TECHNOLOGY

Apex Technical Solution for Cold-End Protection

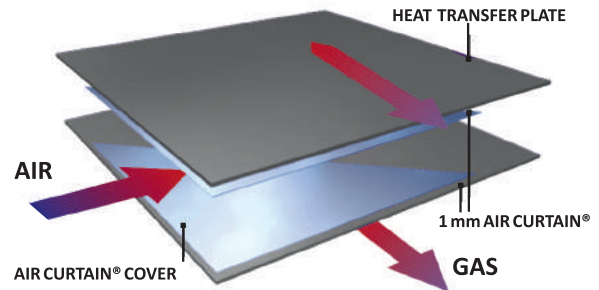
APEX Group technology focuses on safe and condensation-free operation by the use of Air Curtain® technology in cold-end section which operates below acid dew point.

Air Curtain® technology controls the temperature of the heat transfer plates keeping it above the acid and water dew point.

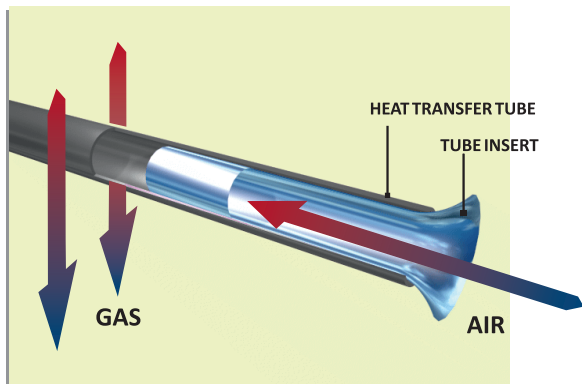
The Air Curtain® consists of a stagnant layer of air between heat transfer plate and the main air stream.

Advantages:

- Reduced corrosion of downstream fans and stack
- Reduced emission of acid mist in the environment
- Reduced discharge of contaminated water to sewer

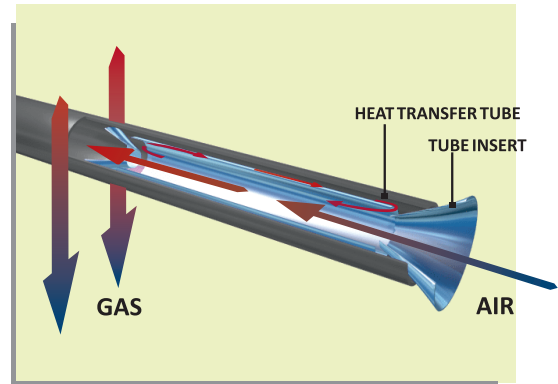


Air Curtain® Concept



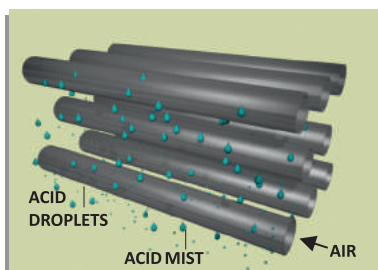
Static Air Curtain®

A stagnant layer of air between the heat transfer tube and tube insert reduces the heat flux and increases the temperature of the tube at the cold end.

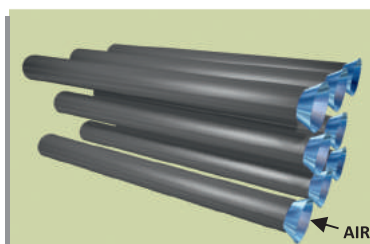


Kinetic Air Curtain®

The air inlet jet induces the recirculation of part of the preheated air for a more effective control of the tube metal temperature above the dew point.



Without Air Curtain®



With Air Curtain®

Condensation-free Operation

Exchangers without air curtain condense part of the acid and humidity content in the exhaust gas on the heat transfer surface in the region of the cold air inlet. This condensation is very corrosive and may damage the downstream equipment and gas circulation system. Frequent cleaning is required resulting in discharge of contaminated water to sewer.

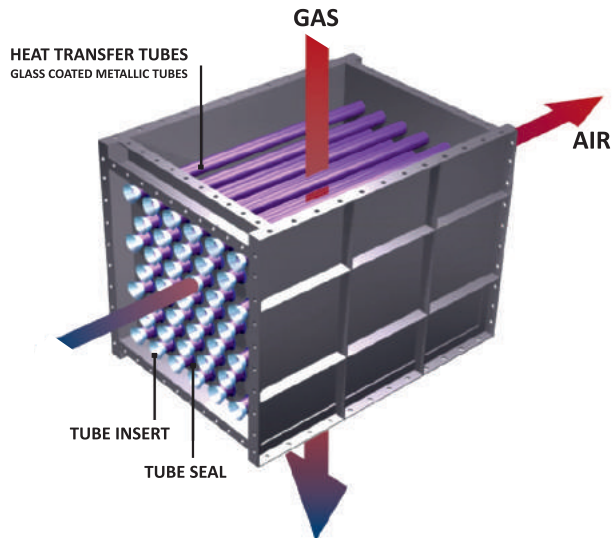
Superior Environmental Protection

Part of the condensate is in the form of very fine mist discharged into the environment through the stack. These fine acid droplets and acid mist result usually in acid rain in the immediate vicinity of the plant or over a larger area.

A-CORREX® TECHNOLOGY

Apex Technical Solution for Cold-End Protection

Corrosion-resistant glass layers are applied on a metallic substrate (plate or tube). The glass layers can handle highly corrosive fluids (acid or water condensate) while metallic substrate imparts mechanical strength to heat transfer surfaces during operation or during water washing.



APEX Furnace for Glass Coated Products



The glass coated metallic tubes are placed in a rigid frame. A special non-welded sealing system of the tubes in the tube sheet prevents air leakage. The glass coated metallic tubes are easy to replace, provide a good resistance against acid corrosion and are less fragile compared to glass tubes.

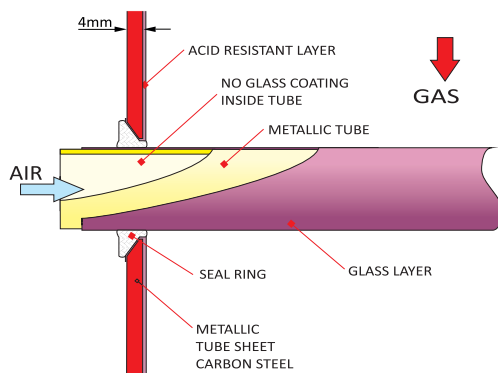
Glass Coated Plate-Type Exchanger



Advantages:

- Corrosion-free operation
- Reduced fouling and corrosion at cold-end
- Reduced cleaning requirements
- Replaceable glass coated metallic tubes
- Easy maintenance

Glass Coated Metallic Tubes Concept



Glass Coated Tubular Exchanger



PLATE-TYPE HEAT EXCHANGERS

The proprietary design plate-type heat exchangers developed, fabricated and supplied by APEX Group are heavy-duty exchangers for handling large volumes of gases for heat recovery and gas handling applications.

APEX Heat Transfer Concept

BASIC PROCESS:

- Flow of gas between parallel smooth plates
- Heat transfer from hot gas to cold gas through Heat Transfer Plate

Free-flow™ Technology

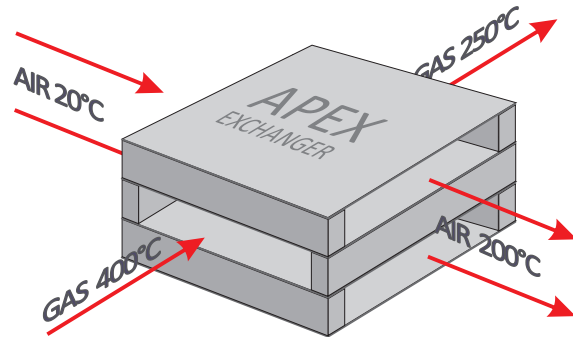
The gas flow between smooth parallel plates is a pure plug-flow uniformly distributed over the entire width of the plate. There is no flow separation and the velocity profile is well defined: a thin laminar sub-layer adjacent to the wall and a turbulent flow core.

This flow configuration results in a relatively low level of energy dissipation. Therefore this flow type is most efficient, resulting into an optimum compromise between a high heat transfer coefficient and a reduced pressure drop.



Free-flow™ Technology

The net effect is that the required heat transfer area at same thermal duty and same pressure drop is less. Compared with corrugated-plate design, the smooth-plate design requires 20-30% less heat transfer surface, particularly for large installations.



Advantages:

- Minimized fouling
- Easy to clean
- Virtually zero leakage
- Compact design
- Flexible design
- Wide material selection



Technical Specification of APEX Plate-Type Heat Exchangers:

- Typical design temperature: up to 900°C
- Typical pressure drop: 0-0.1 Bar
- Standard design pressure: up to 1.5 BarG
- Virtually 0% leakage: 0.05 - 0.5%
- Duty range: unlimited
- Typical plate thickness: 0.8 to 6.0 mm

MAX. OPERATING TEMPERATURE	TYPICAL MATERIALS USED FOR H.T. PLATES
420°C	Glass Coated Plates / Tubes
425°C	Mild Carbon Steel
540°C	Corten/A606-4/PATINAX (STEN)
800°C	SS304 (SUS304)
Up to 900°C	253MA



**“APEX Group is dedicated to offering
engineering solutions, not just a commodity.”**

Mircea Dinulescu, Founder of APEX Group

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