

Chemical Processing Plant Saves Over \$1,000,000 Per Year Using Mueller® Temp-Plate® Energy Recovery Banks

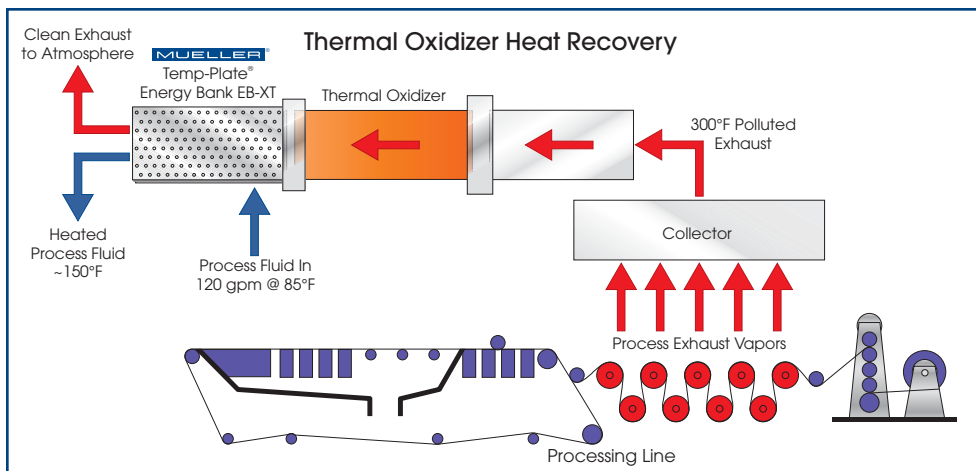
Many processing plants use thermal oxidizers* to convert process emissions into environmentally safe exhaust. A processing plant in Alabama uses six large thermal oxidizers to process the plant's gas emissions and to comply with local environmental regulations. The exhaust gases from the oxidizers contain high grade heat that normally is discharged into the atmosphere. High grade heat like this can be efficiently recovered using a Mueller® Temp-Plate® energy recovery bank. A Mueller Temp-Plate energy recovery bank transfers the heat content of the gas to the media used in the process or to an intermediate heat transfer solution. At this particular plant, 600°F exhaust gas from the thermal oxidizer is being vented into the atmosphere. At the same time, at the front end of the plant, process fluid is being heated with steam at a total cost of more than \$1,000,000 a year.



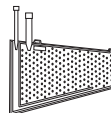
A Mueller model EB-XT Temp-Plate energy bank in use at the chemical plant.

Application

The processing plant consumes large amounts of energy in its manufacturing process and that generates hot gases containing various VOC's and fibrous material. To comply with local air regulations, the 300°F exhaust gases must pass through a thermal oxidizing* process (TO) to burn any residual pollutants before the hot air is exhausted into the atmosphere. The temperature of the air after the oxidation process is approximately 600°F. The TOs were originally equipped with finned tubes to recover some of the heat, but eventually these units clogged up due to the fouling content of the gases and were taken out of service.



**Thermal oxidizers are used within the industry to modify product and process gas emissions into environmentally safe gases. Typical thermal oxidizers process contaminants by burning them under a controlled optimal temperature. The contaminated gas is thereby converted to environmentally safe gases, such as water or carbon dioxide.*



MUELLER TEMP-PLATE ENERGY RECOVERY BANKS

Payback and Savings

The process plant is divided into six process lines, each equipped with a thermal oxidizer located on the roof of the plant. It turned out that each TO released enough heat content in the exhaust air to heat up 120 gpm of process solution from 85°F to 150°F (the equivalent of 4.4 MBtu/hour). The plant was paying about \$7.00/MBtu for energy (natural gas converted to steam in the boiler) at the time. At this rate, the plant could save around \$30 (4.4 x 7) for every hour each of the TO's were in use. Each TO would run around 120 hours per week on average. Total savings amounted to \$86,000 (30 x 120 x 4 x 6) per month, or over \$1,000,000 a year for the entire plant once all six Mueller energy banks were installed.

Equipment cost for six (6) Temp-Plate banks was \$240,000; installation cost around \$220,000. The total heat recovery project cost of \$460,000 would yield a pay-back time of less than 6 months and save the plant \$1,000,000 per year (at current rates) thereafter. As energy prices continue to rise, the project will most likely generate increased savings over time.

MUELLER TEMP-PLATE ENERGY BANK EB-XT

Hinged cover for easy access during cleaning and inspection.

The Temp-Plate bank's special flexible mounting allows for thermal expansion.

Double-Embossed Surface

Mueller Temp-Plate double-embossed construction maximizes the heating and cooling process by utilizing both sides of the heat transfer plate. Inflated both sides and using two sheets of material the same thickness, the double-embossed design is available in stainless steel, other alloys, and carbon steel; in many material gauges and working pressures.

