

TEMP-PLATE® ENERGY BANKS

ENERGY SAVERS FOR PULP AND PAPER MILLS



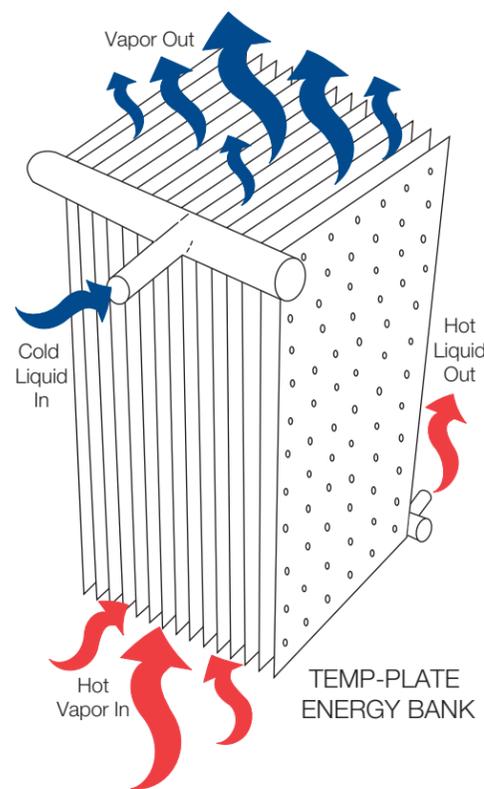
MUELLER®
HEAT TRANSFER PRODUCTS

The Mueller® Temp-Plate® Advantage for Pulp, Paper, and Lumber Mills

Rising energy costs have led the pulp and paper industry to re-examine their processes to locate cost-effective methods of cutting energy consumption. Fuel costs represent a high percentage of total production costs in the pulp and paper industry.

A recent report on heat exchangers lists pulp and paper mills as one of the five largest industrial consumers of energy. The same report also indicates that this industry has been slow to install heat exchangers due to the presence of cellulose and resin in the waste-stream and air-stream mixtures. Even small amounts of cellulose and resin will clog and foul most traditional heat exchangers. However, due to the large passageways inherent in the Temp-Plate bank design, these problems are diminished.

Mueller Temp-Plate energy banks are designed to provide significant savings by recovering energy from the exhaust stream of a paper machine. These energy banks offer a number of distinct advantages for the user.



Benefits of Using Mueller Temp-Plate

Return on Investment

- High heat transfer rates maximize the amount of heat recovered.
- Cost-effective heat transfer equipment with minimal payback time.
- Reduces energy consumption without the maintenance expense associated with other higher fouling designs.

Easy Maintenance

- Stays clean longer, less cleaning even in the presence of cellulose and resins.
- Low fouling potential due to Temp-Plate's low-profile cross section.
- Open passageways allow easy mechanical brushing or spray cleaning.

Ease of Installation

- Temp-Plate energy banks can be used in a variety of energy recovery projects involving available atmospheric steam or air/water vapor mixtures in pulp and paper mills.
- Available in any configuration or size, they are ideal for large surface area applications.
- Narrow profile results in space efficiency in addition to high heat transfer coefficients. You get more square feet of heat transfer surface in the allowable space than other types of heat exchangers.

Versatile Temp-Plate Energy Recovery Banks Are Used In:

- Paper drying process.
- Thermal mechanical pulping (TMP) units.
- Flow digesters.
- Drain areas.

Energy Savings Formula

$$\frac{(\text{Cost of Mueller Energy Bank}) + (\text{Cost to Install})}{(\text{Savings per month}^{**}) \times (\text{Heating Season in Months})} = \frac{\text{Total Installed Cost}}{\$ \text{ Saved Per Heating Season}}$$

Typical Application

A typical installation features Temp-Plate energy banks on the mezzanine of a paper mill.

In this example, the Temp-Plate energy bank uses hot paper machine exhaust to heat 575 gpm water from 80°F to 120°F to produce a recycling of 10 million BTUs for each hour of operation.

Using the formula above, and the following assumptions:

- Steam Cost: \$5/1,000,000 btuh (See chart above.)
- Cost of Temp-Plate Energy Bank: \$85,000*
- Cost of Installation: \$85,000
- Six-Month Heating Season

The results are as follows:

$$\frac{(\$85,000) + (\$85,000)}{36,500 \times (6 \text{ Months})} = \frac{\$170,000}{\$219,000} = .77 \text{ or a } 4\frac{1}{2} \text{ Month Payback (Estimate) Plus a } \$49,000 \text{ Savings the First Year}$$

Now try your numbers:

$$\frac{(\$ \quad \quad \quad) + (\$ \quad \quad \quad)}{(\$ \quad \quad \quad / \text{Month}) \times (\quad \quad \quad \text{Months})} = \frac{\$ \quad \quad \quad}{\$ \quad \quad \quad} = \text{Fraction of Heating Season to Reach Break Even}$$

When looking at the cost savings conservatively over a 10-year life span, we see the results below:

CUMULATIVE SAVINGS					
Year	Annual Savings	Cumulative Savings	Year	Annual Savings	Cumulative Savings
1	\$ 49,000	\$ 49,000	6	\$219,000	\$1,144,000
2	219,000	268,000	7	219,000	1,363,000
3	219,000	487,000	8	219,000	1,582,000
4	219,000	706,000	9	219,000	1,801,000
5	219,000	925,000	10	219,000	2,020,000

SAVINGS PER MONTH					
Cost per 1,000,000 Btu or 1,000 lbs. of Steam					
Btu	\$3.00	\$5.00	\$7.00	\$9.00	
Heat Recovery x 1,000,000 Btu/hr					
2	\$ 4,380	\$ 7,300	\$10,200	\$13,400	
4	8,760	14,600	20,440	26,280	
6	13,140	21,900	30,660	39,420	
8	17,520	29,200	40,880	52,560	
10	21,900	36,500	51,100	65,700	
12	26,280	43,800	61,320	78,840	

*Retrofits are even lower cost.

**See chart above for monthly savings.

Let Paul Mueller Company's heat transfer specialists determine the savings for your application! Call 1-800-MUELLER or visit www.hxrx.com today!

Temp-Plate® Energy Bank Specifications

Exhaust Side

Design Pressure (inches of water): _____ Pressure Drop (inches of water): _____

Flow Rate (ACFM, SCFM, or lbs. of dry air per minute): _____

Dry Bulb Temperature (°F): _____

Wet Bulb Temperature (°F or lbs. of water/lb. of dry air): _____

Liquid Side

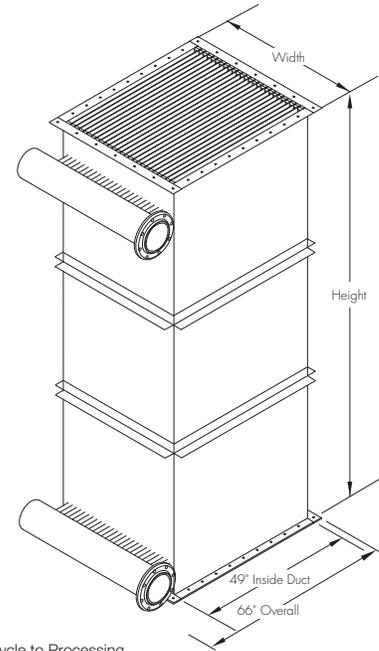
Design Pressure (psig): _____ Pressure Drop (psi): _____

Flow Rate (gpm): _____

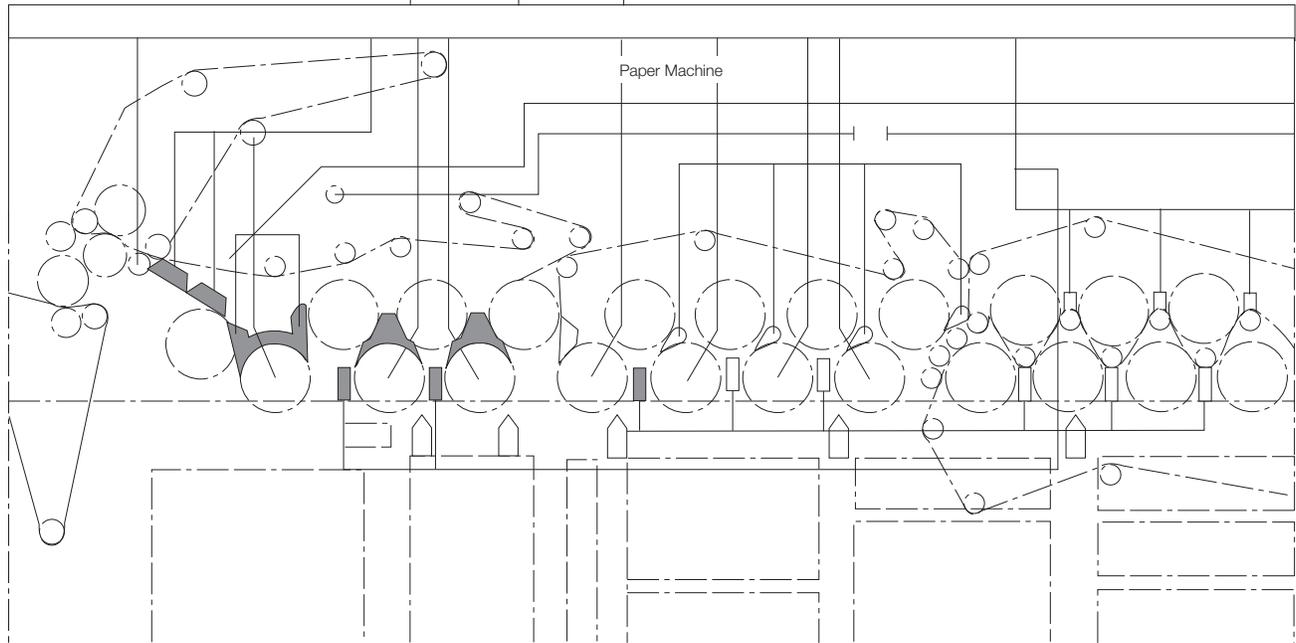
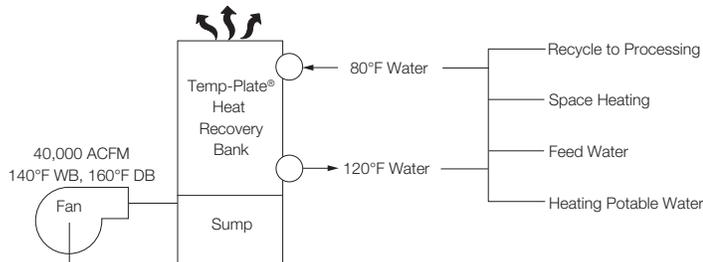
Inlet Temperature (°F): _____ Outlet Temperature (°F): _____

Size Restrictions

Width: _____ Height: _____



Typical Application



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