

## Thermic (Hot) Oil Dryers in Paper Mills

Paper drying is the most temperature-critical and energy capitalintensive aspect of papermaking.

**More than 60 percent of North America's paper mills are dryer-limited; they could produce more paper if their papermaking machines could dry the wet paper stock faster.**

Paper plants use several methods to bring heat to the dryer drums. The most common are Steam Cylinders (Yankee Dryers), Air dryers and Infrared (IR) dryers. Infrared dryers are typically Gas-fired. But in some dryer lines Oil heated (Thermic oil) dryers offer a lower cost energy source, and provide a finer degree of temperature control.

### Thermic Oil dryers:

- Thermic oil (as a heat transfer fluid) is heated to operating temperature and continuously circulated through the dryer drum. The surface of the hot drum produces infrared radiation. The IR wavelength produced by the dryer is between 2 – 3.5 microns. This is the same wavelength segment that both paper and water have a high receptiveness. When the surface water absorbs the IR energy, its temperature rapidly increases and it evaporates. When the paper absorbs IR, its temperature also increases and drives out the moisture from within the sheet.
- Using thermic oil as a heat source requires a continuous closed loop that is constantly heated to operating temperature and re-circulated to the dryer drum. Each drum is fed by it's own closed loop and there will typically be 12 or more dryers that will be found in a paper line. The greater the number of dryer drums, the faster the throughput of paper.
- A finely tuned dryer drum section of the paper line can boost the line speed and output by up to 15%.

### Thermic Oil level measurement:

- The output signal is used for level indication only. Since the hot oil is continually recirculated, we expect a consistent level in the reservoir. If the level rises or lowers, it could be due to blockage in the "loop" piping or a possible leak. A constant hot oil supply to the drums is necessary to maintain the required drum temperature, which directly affects paper quality and throughput.
- A typical level measurement span range will be 36" to 96" – making this a good and easy application for RF measurement. RF systems supplied with a 3-terminal bare, uninsulated probe allows a "stocked" system to be cut to length for various size reservoirs that are found within a given plant.
- Traditional technologies such as Pressure, Bubblers and Differential Pressure, have been unreliable due to short span measurement ranges combined with variations in specific gravities.

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