

# Kimberly Clark Eliminates Overfill of Screw Press Head Box

## RESULTS

- More reliable level measurement
- Spills and overloading eliminated
- Low frequency and condensation resistant antenna handles steamy vapors



## APPLICATION

Screw press head box level containing waste sludge and pulp from paper machines

**Application Characteristics:** The process medium is very thick, having the texture of paste. Heavy steam and vapors, steep surface angle, low to moderate dielectric constant

## CUSTOMER

Kimberly Clark, Loudon, Tennessee, USA

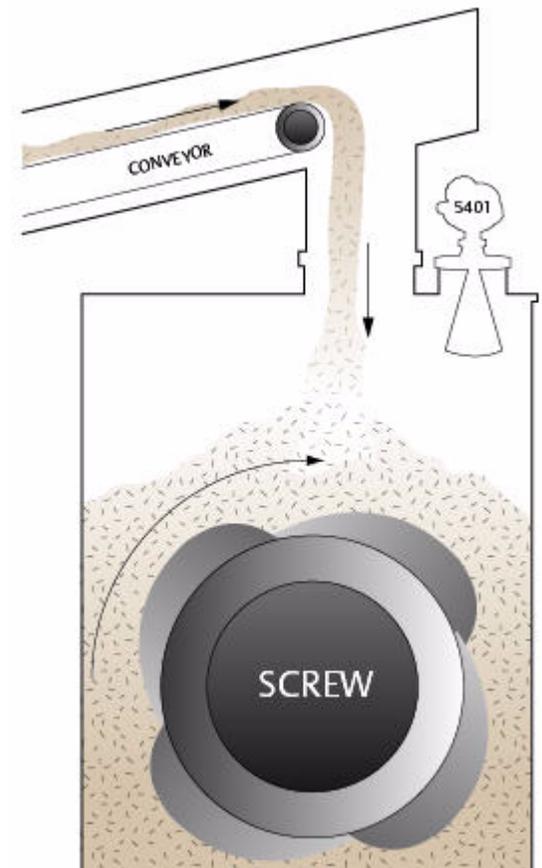
## CHALLENGE

Kimberly Clark of Loudon, TN employs about 400 people and produces commercial (Away-From-Home) hand towels and tissue paper. Their waste treatment facility treats excess waste sludge and pulp from various paper machines. The waste is transported via conveyor and dropped into a head box that maintains a level for the screw press just below. It is transported to the head box at 32% dryness. The screw at the bottom of the head box presses the dryness to 47%. From there it is mixed with saw dust and sent to a nearby boiler for burning.

The material that goes into the head box must be maintained at a steady level in order to keep the conveyors from overloading. Overloading the head box creates significant clean-up issues. With the current level measurement, clean-ups due to overloading were occurring about once a month. A more reliable level measurement would eliminate the overloading.

A large conveyor drops the waste pulp into the middle of the head boxes which are small, rectangular boxes. There is limited space for mounting any type of top-down continuous level device. Non-contacting is preferred due to the screw press below the surface.

Kimberly Clark has tried both ultrasonic and high frequency radar in this application without success. The previous high frequency radar device was installed with a 2" antenna. This was selected because of the small size and the small area allowed for installation. While the radar unit did work for



*Schematic of the screw press head box*

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short periods of time, it was unreliable because the steamy vapors eventually created too much condensation on the antenna surface causing the units to give false readings.

### SOLUTION

The Rosemount 5401 radar promised to be more reliable for the condensing environment and challenging level surface of this application. A suitable frequency, a better signal from the surface, and simple configuration all combine to make a more robust and reliable measurement.

A low frequency (6GHz) version was chosen because lower frequencies can handle the steamy vapors better than high frequency. In addition, the condensation resistant antenna of the 5401 is more tolerant to steam and vaporous conditions than standard low frequency antennas. The combination of low frequency operation and condensation resistant antenna allowed the transmitter to ignore significant condensation in the head box.

A unit with a 6" cone antenna was chosen because it was closest in size to the opening. The 6" cone antenna was mounted above a square opening located at the junction of the two corners of the head box. Since the beam width of a 6" unit is narrower than that of a smaller unit, it provides a stronger and more focused signal to the surface. Two other features of the 5401, the dual port technology and air filled waveguide, combined to provide more energy to the surface. This gave the 5401 an additional boost for a stronger return signal and subsequently, a more reliable signal.

Any false reflections from the mounting, or obstacles, such as the screw, were quickly registered and ignored using the Measure- and- Learn feature of the 5401 and the Rosemount Radar Master configuration tool. With false targets identified and ignored, the 5401 was able to track the remaining signal from the steep surface angle of the pulp as the head box filled.

The Rosemount 5401 loop powered non-contacting radar provided a reliable level measurement during several weeks of testing. Once its reliability was proven, Kimberly Clark made the installation permanent.



*During the temporary test installation the Rosemount 5401 was suspended over an existing tank opening.*

### RESOURCES

#### Rosemount 5400

<http://www.emersonprocess.com/rosemount/products/level/m5400.html>

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