The following case study is from a presentation given by Dr. T.G. Sundara Raman of Seshasayee Paper & Boards, Ltd, which highlights the energy saving and environmental benefits experienced as a result of using Nansulate® Translucent PT in their manufacturing facility.

NOTE: They used an application of six coats of Nansulate® Translucent PT, at a dry film thickness of 300 microns (12 mils). The cure time for this thickness is typically 45-60 days, depending upon environmental conditions. Their temperature readings were taken 30 days after application, which was prior to cure time completion. This means that once the full cure time was achieved, the temperature differentials would improve beyond what was measured in this case study.

This paper was presented the 5th annual Papertech conference for the Pulp & Paper Industry, which is organized jointly by CLL-Sohrabji Godrej Green Business Centre and the Indian Paper Manufacturers Association (IPMA).

We have included select slides from the full paper presentation to illustrate the case study details.

Dr T.G. Sundara Raman
Seshasayee Paper & Boards Ltd.

Paper Tech 2011
CII
Hyderabad
26 June 2011

Nansulate Principle

Heat always transfers to cold.
Materials with low thermal conduction do not transfer heat energy well. Which makes them excellent insulators.

![Diagram showing heat transfer with and without insulation.](image)
SNAP SHOT

Nanocomposite with low thermal conductivity + High Quality, Low VOC, Water-based Coating System = Nansulate® is a new type of insulation material in coating form.

ADVANTAGES OF NANSULATE [NI]

- Low VOC, Odour & Non-Toxic, Water based
- Excellent Chemical Resistance to acids & bases
- Corrosion under insulation minimal
- Severe Service durability
- User friendly
- Green Nano-technology
Corrosion Under Insulation [CUI]

rockwool, fiberglass, or other traditional types of insulation promote corrosion, and also act as a carrier and spread the corrosion to other areas of the pipeline

ADVANTAGES OF NANSULATE [NI]

- Steam saving through reduction in radiation loss
- Marginal Carbonfootprint reduction
- Very Low thermal conductivity
- Can be applied in non-uniform profiles
- Space occupancy & weight addition minimal
NI in PM 5 – Case Study

- Drier end covers related to PM 5
- Size Press scanner side cover
- The application of NANSULATE was carried out during the shut of PM5 on 5th April 2011.

CONDUCT OF TESTS

Readings were taken on

- Uncoated (Reference) &
- Coated (Project) Surfaces–

- After 1 day of NANSULATE PT application [Curing commenced]
- After 30 days of NANSULATE PT application [Curing completion]
NI - DFT [Microns] vs. No. of Coats

Ready Reckoner

Case - Study - 1

- Paper Machine [PM5] DRYER Unit
### DRYER #12—End Covers [Temp°C]

<table>
<thead>
<tr>
<th>Location</th>
<th>Uncoated surface</th>
<th>Coated surface</th>
<th>• T</th>
<th>Date</th>
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<tbody>
<tr>
<td>A</td>
<td>125 145</td>
<td>107 120</td>
<td>18 25</td>
<td>6&lt;sup&gt;th&lt;/sup&gt; Apr 5&lt;sup&gt;th&lt;/sup&gt; May</td>
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<tr>
<td>B</td>
<td>126 143</td>
<td>111 117</td>
<td>15 26</td>
<td>6&lt;sup&gt;th&lt;/sup&gt; Apr 5&lt;sup&gt;th&lt;/sup&gt; May</td>
</tr>
<tr>
<td>C</td>
<td>126 145</td>
<td>109 115</td>
<td>17 28</td>
<td>6&lt;sup&gt;th&lt;/sup&gt; Apr 5&lt;sup&gt;th&lt;/sup&gt; May</td>
</tr>
</tbody>
</table>

### DRYER #14—End Covers [Temp°C]

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<th>Date</th>
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<tbody>
<tr>
<td>A</td>
<td>126 139</td>
<td>108 117</td>
<td>18 22</td>
<td>6&lt;sup&gt;th&lt;/sup&gt; Apr 5&lt;sup&gt;th&lt;/sup&gt; May</td>
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<tr>
<td>B</td>
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<td>105 119</td>
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<td>19 24</td>
<td>6&lt;sup&gt;th&lt;/sup&gt; Apr 5&lt;sup&gt;th&lt;/sup&gt; May</td>
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</tbody>
</table>
Impact of NI coat on surface temp drop [°C]

Graphic Representation of Dryer End Cover Temperature [°C] of Dryer Section – Comparison of Actual vs Design
Case Study -2

SCANNER  SENSOR  UNIT
**SCANNEER PROXIMITY**  
*Temp. °C*  
**Date of Trials : 5th May 2011**

<table>
<thead>
<tr>
<th>Location</th>
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<th>Coated surface</th>
<th>T</th>
<th>Ambient temperature</th>
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<tbody>
<tr>
<td>A</td>
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<td>46</td>
<td>17</td>
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<tr>
<td>B</td>
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<tr>
<td>C</td>
<td>65</td>
<td>48</td>
<td>17</td>
<td>36</td>
</tr>
</tbody>
</table>
GAINS

- Effective Sensor functioning through lowered temperature
- Comfort for approaching and operating the unit
- Increased Longevity of the scanner unit
Application Areas of NI in Paper Mill

- Paper Machine Dryer Unit
- Hot & Warm Condensate, Boiler Feed water & Process Fluid Lines
- LP Steam Pipelines & Accessories
- Heat Carrying Valves & Fittings
- Satellite Cooler annulus exterior of Lime kiln
- Heated HFO lines & storage tanks
- Chiller lines in ClO2 unit
- CPU-PHE & EOP Head Covers
NI on Feed line valve to Deaerator
Way Forward for

NAN SULATE®

Nano Green Technology