ABB India Ltd., Raman Boards being an integral part of transformer industry has developed capability to offer **Normal and Calendared crepe paper products** for power and distribution transformers to insulate irregular shapes and surfaces where a proper insulation cannot be reached with flat papers and also primary and secondary insulation of Instrument transformers.

**Raman Sigma Crepe paper in roll forms**
The coarse and fine crepe paper varieties in roll form is available in base paper thicknesses of 0.050, 0.075, 0.100, 0.125 and 0.150 mm (2.0, 3.0, 4.0 and 5.0 mil respectively) with elongation (stretch) as per customer requirement from 30 to 100 percent. The standard width of rolls is 500, 750 and 1500mm with a tolerance of ± 5mm and standard roll diameter of 400mm. Rolls are supplied with a core of internal diameter of 76mm.

**Raman Sigma Crepe tube**
Crepe paper is available in flexible tube form in a number of different internal diameters and wall thicknesses as per customer requirement. Standard tube length is 1000 and 2000mm, internal diameter 3–40mm and wall thickness 1-8mm.

The Raman Sigma Crepe paper is manufactured with Kraft paper conforming to IEC60554-3-5 specification, manufactured using prime electric grade, unbleached softwood Kraft pulp from Scandinavian countries.

The Kraft and crepe paper are evaluated for a range of properties prescribed by IEC 60554 from reputed laboratories in India and abroad namely:

- The Doble Engineering Company, USA
- Papiertechnische Stiftung, Germany
- Central Power Research Institute, India
- Electrical Research and Development Association, India

Raman Sigma Crepe paper conforms to requirements of IEC 60554-3-3 specification, is also evaluated for ageing tests, full wave impulse strength, compatibility tests like interfacial tension, neutralization number, power factor (Tan δ), moisture content in oil with insulating oil of petroleum origin, silicone and ester fluids. Crepe tubes subjected to flexibility and adhesion resistance tests in insulating oils.

Calendaring of Crepe paper results in uniform thickness across width, nominal values and tolerances on thicknesses will be as per the agreement with the customer. Calendaring increases the density to improve mechanical and dielectric strength properties. Calendaring also helps in retaining the embossed crepe pattern when paper is stretched and wrapped. Raman Sigma Crepe paper is suitable for hand wrapping and machine winding applications of insulation.
### Raman Sigma Crepe paper

<table>
<thead>
<tr>
<th>Item code</th>
<th>Base Paper thickness</th>
<th>Base Paper weight</th>
<th>SCP Elongation</th>
<th>SCP Tensile index MD</th>
<th>SCP Paper thickness</th>
<th>SCP Grammage</th>
<th>SCP Apparent density</th>
<th>Sigma Crepe paper Dielectric strength</th>
<th>Air</th>
<th>Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>2N5UC</td>
<td>0.050</td>
<td>40</td>
<td>50</td>
<td>40-60</td>
<td>0.20-0.25</td>
<td>61-69</td>
<td>0.22-0.27</td>
<td>3.0</td>
<td>5.0</td>
<td>28</td>
</tr>
<tr>
<td>2N10UC</td>
<td>0.050</td>
<td>40</td>
<td>100</td>
<td>45-80</td>
<td>0.22-0.31</td>
<td>70-90</td>
<td>0.27-0.35</td>
<td>3.0</td>
<td>5.0</td>
<td>30</td>
</tr>
<tr>
<td>3N3UC</td>
<td>0.075</td>
<td>60</td>
<td>30</td>
<td>45-70</td>
<td>0.20-0.26</td>
<td>80-95</td>
<td>0.29-0.35</td>
<td>4.2</td>
<td>4.0</td>
<td>34</td>
</tr>
<tr>
<td>3N5UC</td>
<td>0.075</td>
<td>60</td>
<td>50</td>
<td>50-70</td>
<td>0.26-0.32</td>
<td>80-100</td>
<td>0.30-0.35</td>
<td>4.4</td>
<td>4.0</td>
<td>35</td>
</tr>
<tr>
<td>3N7UC</td>
<td>0.075</td>
<td>60</td>
<td>70</td>
<td>50-80</td>
<td>0.33-0.40</td>
<td>110-119</td>
<td>0.26-0.35</td>
<td>4.3</td>
<td>4.5</td>
<td>30</td>
</tr>
<tr>
<td>3N10UC</td>
<td>0.075</td>
<td>60</td>
<td>100</td>
<td>50-80</td>
<td>0.33-0.45</td>
<td>118-135</td>
<td>0.27-0.40</td>
<td>5.0</td>
<td>4.7</td>
<td>30</td>
</tr>
<tr>
<td>4N5UC</td>
<td>0.100</td>
<td>80</td>
<td>50</td>
<td>50-84</td>
<td>0.35-0.42</td>
<td>120-140</td>
<td>0.30-0.40</td>
<td>4.2</td>
<td>5.5</td>
<td>30</td>
</tr>
<tr>
<td>4N10UC</td>
<td>0.100</td>
<td>80</td>
<td>100</td>
<td>50-84</td>
<td>0.40-0.50</td>
<td>150-190</td>
<td>0.35-0.40</td>
<td>4.4</td>
<td>5.5</td>
<td>30</td>
</tr>
<tr>
<td>5N10UC</td>
<td>0.125</td>
<td>100</td>
<td>100</td>
<td>50-84</td>
<td>0.43-0.61</td>
<td>200-220</td>
<td>0.35-0.40</td>
<td>4.2</td>
<td>6.0</td>
<td>30</td>
</tr>
</tbody>
</table>

(1)  
- 1st digit is thickness of base paper in mil  
- Suffix 'N' is normal density paper  
- 3rd and 4th digits multiply by 10 to obtain % elongation  
- Suffix 'UC' is Un calendared in unstretched condition  

(2)  
- Elongation value will within ± 15%  
- Crepe can be made in any elongation desired from 30% - 100%  
- Thickness - caliper of un calendared crepe is not controlled  

(3)  
- Weight of crepe paper is subjected to variation due to base paper and elongation

(4)  
- Apparent density calculations are based on nominal crepe weight and caliper  
- Ash content less than 1%  
- Moisture content dry basis - less than 8%  
- Above data is the values obtained during testing  

(5)  
- Dielectric strength is measured with 5 layers of crepe paper in air and oil  

Other varieties of crepe products in different thickness and elongation can be offered on request.  
Since test conditions cannot always duplicate actual field installations or end use, ABB India Ltd. make no warranties with respect to such data and assume no responsibility for performance characteristics resulting from conditions which may differ from those used in laboratory tests.