

COMPETENCE CENTRE FOR NONWOVENS  
AT BTRA

- ✓ Pilot plants facilities
- ✓ Projects carried out in nonwovens
- ✓ Affiliation to nonwoven agencies
- ✓ Properties tested at BTRA for nonwovens
- ✓ Special instruments available for testing nonwovens & polymers
- ✓ Nonwovens tested at BTRA as per INDA/EDANA & other National/International standards
- ✓ INDA / EDANA test methods followed at BTRA



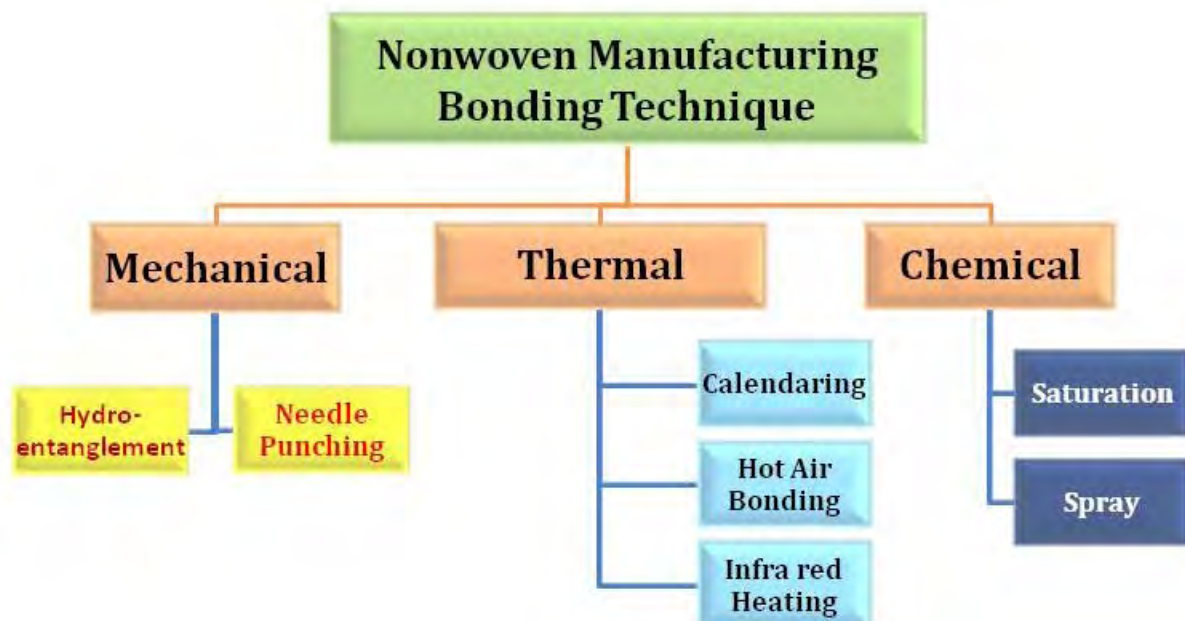
## PILOT PLANTS FACILITIES

### NON- WOVEN PILOT PLANT

- ✓ **NEEDLE PUNCHING: DILO, GERMANY**
- ✓ **CROSS LAPPER: DILO, GERMANY**
- ✓ **ROLLER CLEARER CARDS: CORMATEX, ITALY**
- ✓ **HOT AIR BONDING MACHINE: INDIGENOUS**
- ✓ **HYDROENTANGLEMENT: FLEISSNER**

### CHEMICAL PILOT PLANT

- ✓ **POWDER COATING**
- ✓ **THERMAL CALENDERING [Infrared Heating]**
- ✓ **STENTER**
- ✓ **CALENDERING FOR SATURATION BONDING**
- ✓ **DYEING & PRINTING**



## **PROJECTS CARRIED OUT IN NONWOVENS**

- ❖ Development of low cost nonwoven fabric for geo-textile and other application using needle punching and thermal bonding techniques (1987-1989)
- ❖ Development of nonwovens from cellulosic fibers (1989-1990)
- ❖ Design and development of nonwoven geo-composite canal liners (1991)
- ❖ Development of structure needled jute based nonwoven carpets (1997)
- ❖ Techno-economic feasibility and product profile on jute based nonwoven products (1999-2000)

## **AFFILIATION TO NONWOVEN AGENCIES**

- BTRA is a member of INDA - **Association of the Nonwoven Fabrics Industry, USA**
- BTRA is a member of EDANA - **European Disposables and Nonwovens Industry Association, Belgium**
- BTRA is member of Nonwoven Sectional Committee (TX 30) of **Bureau of Indian Standards, New Delhi**



**PROPERTIES TESTED AT BTRA  
FOR NONWOVENS**

- ✓ Abrasion resistance ( Flat / Flex )
- ✓ Absorbency
- ✓ Air Permeability
- ✓ Bending Length
- ✓ Breaking strength: Wide width tensile
- ✓ Bursting Strength ( Ball & Diaphragm )
- ✓ Compressional Recovery
- ✓ Dynamic Loading
- ✓ Electrical Resistivity
- ✓ Electrostatic charge
- ✓ Flammability
- ✓ Grab strength - Single rip / double rip
- ✓ GSM
- ✓ Hexapod Tumbler Test
- ✓ Impact Resilience test
- ✓ Liquid Strike Through Time
- ✓ Lisson Test
- ✓ Peel bond strength
- ✓ Pilling
- ✓ Pore Size of Filters
- ✓ Thickness
- ✓ Trapezoidal Tear strength
- ✓ Water Permeability (Through-Plane)



## **SPECIAL INSTRUMENTS AVAILABLE FOR TESTING NONWOVENS & POLYMERS**

- ✓ FTIR SPECTRPHOTOMETER
- ✓ DSC & TGA THERMOGRAPH
- ✓ X-RAY DIFFRACTROMETER
- ✓ HONESTOMETER ( static charge )
- ✓ ELECTRICAL RESISTIVITY TESTER
- ✓ SCANNING ELECTRON MICROSCOPE
- ✓ ESTAMETER (static charge)
- ✓ LOI TESTER

### **ECO LAB**

- ✓ HPTLC , AAS
- ✓ GC MS , TOC

### **PHYSICAL TESTING**

- ✓ Universal Testing Machine [Tinius Olsen / Instron / STAR]
- ✓ Tensorapid
- ✓ UT3
- ✓ EDAX / SEM
- ✓ Martindale Abrasion cum Pilling Tester
- ✓ Mullen ( Diaphragm ) Bursting Tester
- ✓ Vibromat

### **CHEMICAL TESTING**

- ✓ UV Weatherometer
- ✓ XENON Arc Light Fastness Tester
- ✓ Spray Tester and Others



**NONWOVENS TESTED AT BTRA**  
**AS PER INDA/EDANA & OTHER**  
**NATIONAL/INTERNATIONAL STANDARDS**

**Filter (Woven, Nonwoven)**

- ◆ Weight (GSM)
- ◆ Thickness
- ◆ Tensile Strength
- ◆ Pore Size
- ◆ Air Permeability
- ◆ Water Permeability
- ◆ Diaphragm/Ball Bursting strength

**Floor Mats/Rugs/Carpets**

- ◆ Weight
- ◆ Thickness
- ◆ Tensile Strength
- ◆ Abrasion Flat / Flex / Martindale / Taber
- ◆ Pilling - Martindale / Hexapod
- ◆ Colour Fastness by Light / Rubbing
- ◆ Colour Fastness – Acid / Alkali
- ◆ Dynamic / Static Loading
- ◆ Static Charge (Honestometer / Estameter)
- ◆ Hexapod Tumbler Test (H.T.T.)  
Change in Structure / Color
- ◆ Lisson Test (Treading Wheel Test Apparatus)
- ◆ Pilling / Fuzing (Pilfuz Tester)
- ◆ Compressional Recovery
- ◆ Co-efficient of Friction

**Wadding (High loft)**

- ◆ Mass
- ◆ Thickness
- ◆ Compressional Recovery
- ◆ Air Permeability
- ◆ Cyclic Loading

**Automotive**

- ◆ Weight
- ◆ Thickness
- ◆ Tensile Strength
- ◆ Colour Fastness to Light (Xenon Arc)
- ◆ Colour Fastness to Rubbing
- ◆ Abrasion/Pilling - Flat / Flex / Taber / Martindale
- ◆ Resistance to Cold
- ◆ Resistance to H<sub>2</sub>S
- ◆ Water repellency
- ◆ Seam strength
- ◆ Peel bond strength
- ◆ Flame spread rate
- ◆ Ageing test
- ◆ Cold flexibility
- ◆ Compression deflection
- ◆ Indentation – Static

**Interlining/Cover stock**

- ◆ Weight
- ◆ Thickness
- ◆ Tensile Strength
- ◆ Liquid strike through test
- ◆ Water absorbency as per EDANA
- ◆ Wicking Rate

**Medical Textiles**

- ◆ Weight
- ◆ Thickness
- ◆ Absorbency
- ◆ Liquid strike through test
- ◆ Wicking rate
- ◆ Water Vapour Transmission / Absorption
- ◆ Bacterial Filtration efficiency



**INDA / EDANA TEST METHODS FOLLOWED**  
**AT BTRA**

Properties Tested	Description	WSP Method	ISO Reference
<b>ABSORPTION</b>	<ul style="list-style-type: none"> <li>➤ Nonwoven Absorption</li> <li>➤ Rate of Sorption of Wiping Materials</li> </ul>	WSP 10.1 WSP10.2	9073-6:2000
<b>ABRASION RESISTANCE</b>	<ul style="list-style-type: none"> <li>➤ Inflated Diaphragm</li> <li>➤ Flexing and Abrasion</li> <li>➤ Double Rotary Platform</li> <li>➤ Martindale</li> </ul>	WSP 20.1 WSP 20.2 WSP 20.4 WSP 20.5	
<b>BURSTING STRENGTH</b>	<ul style="list-style-type: none"> <li>➤ Diaphragm Burst</li> <li>➤ Ball Burst</li> </ul>	WSP 30.1 WSP 110.5	
<b>ELECTROSTATIC PROPERTIES</b>	<ul style="list-style-type: none"> <li>➤ Surface Resistivity</li> <li>➤ Decay</li> </ul>	WSP 40.1 WSP 40.2	
<b>STIFFNESS</b>	<ul style="list-style-type: none"> <li>➤ Cantilever Bending</li> </ul>	WSP 90.1	
<b>PERMEABILITY</b>	<ul style="list-style-type: none"> <li>➤ Air Permeability</li> <li>➤ Liquid Strike-Through</li> <li>➤ Water Vapour Transmission Rate</li> </ul>	WSP 70.1 WSP 70.3 WSP 70.4	9073-8:1995
<b>REPELLENCY</b>	<ul style="list-style-type: none"> <li>➤ Penetration by water (Spray Impact)</li> <li>➤ Water Resistance (Hydrostatic Pressure)</li> </ul>	WSP 80.3 WSP 80.6	
<b>TEAR STRENGTH</b>	<ul style="list-style-type: none"> <li>➤ Elmendorf</li> <li>➤ Trapezoid Tear</li> <li>➤ Tongue Tear</li> </ul>	WSP 100.1 WSP 100.2 WSP 100.3	9073-4:1997
<b>THICKNESS</b>	<ul style="list-style-type: none"> <li>➤ Thickness</li> <li>➤ Thickness of High Loft</li> <li>➤ Compression and Recovery, High loft</li> <li>➤ Thickness</li> </ul>	WSP 120.1 WSP 120.2 WSP 120.3 WSP 120.6	
<b>WEIGHT</b>	<ul style="list-style-type: none"> <li>➤ Mass per Unit Area</li> </ul>	WSP 130.1	9073-1:1989
<b>TENSILE</b>	<ul style="list-style-type: none"> <li>➤ Grab Tensile</li> <li>➤ Strip Tensile</li> </ul>	WSP 110.1 WSP 110.4	9073-3:1989
<b>BACTERIAL</b>	<ul style="list-style-type: none"> <li>➤ Filtration Efficiency</li> </ul>	WSP 300.0	
<b>SUPERABSORBENT MATERIALS</b>	<ul style="list-style-type: none"> <li>➤ pH of polyacrylates (PA) Powders</li> <li>➤ Residual Monomers</li> <li>➤ Particle Size Distribution</li> <li>➤ Mass Loss upon Heating</li> </ul>	WSP 200.2 WSP 210.2 WSP 220.2 WSP 230.2	17190-1:2001 17190-2:2001 17190-3:2001 17190-4:2001
<b>GEOTEXTILES</b>	<ul style="list-style-type: none"> <li>➤ Conditioning</li> <li>➤ Bursting Strength</li> <li>➤ Air Permeability</li> <li>➤ Cantilever Stiffness</li> <li>➤ Trapezoid Tear</li> <li>➤ Force and Elongation Grab</li> <li>➤ Breaking Force Strip</li> <li>➤ Thickness</li> <li>➤ Thickness of High Loft</li> <li>➤ Mass per Unit Area</li> </ul>	WSP 3.0 WSP 30.0 WSP 70.1 WSP 90.1 WSP 100.2 WSP 110.1 WSP 110.4 WSP 120.1 WSP 120.2 WSP 130.1	ISO 554

