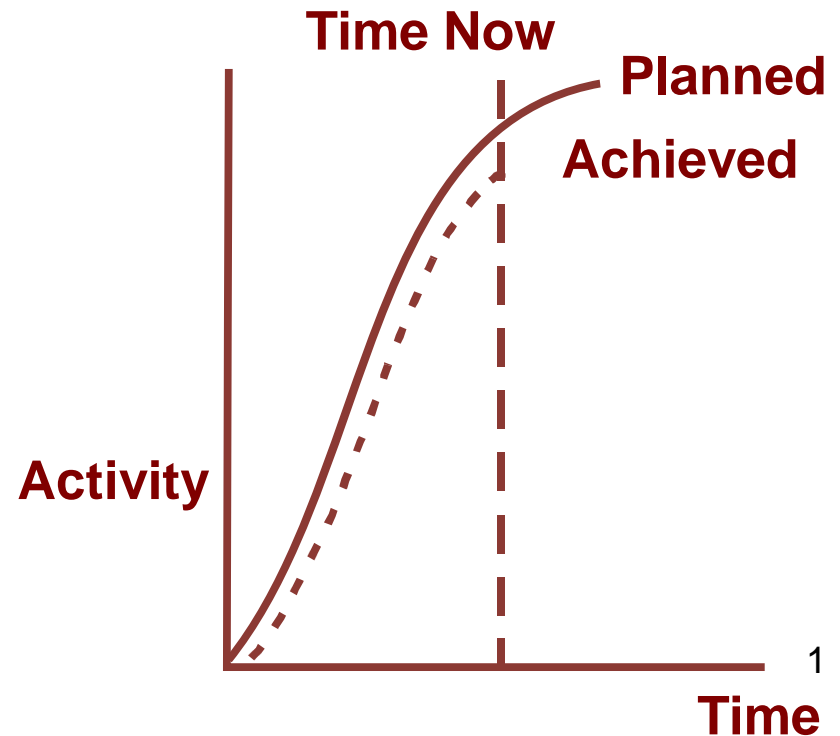


# 3rd Review Meeting CoE (Protech)

**NITRA & IIT'D**

**October 23rd 2009**



# CoE Activities

- **Product Development**
- **Preparation of standards/Specifications**
- **Testing**
- **Training & workshops/seminars**
- **Resource center - Information Dissemination**

# **PRODUCT DEVELOPMENT (Personal & Property Protective Textiles)**



# Product development using specialty fibers.....



**Fibers from Crab shell  
(Crabyon)**



**Fibers from Bamboo**



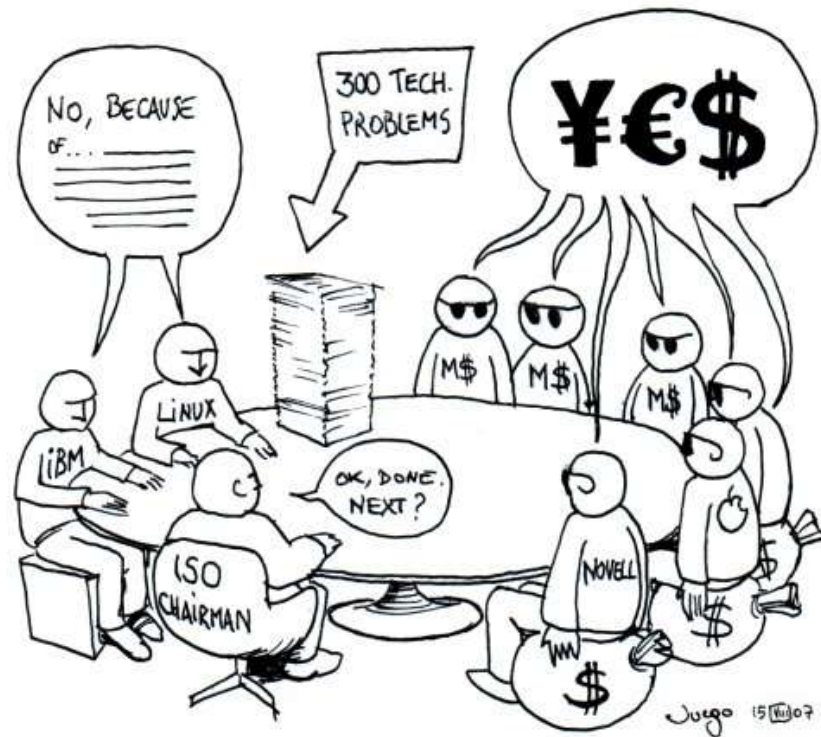
**Nano silver embedded fibers**



**Nylon Fiber**

- **Fibers**
  - blend of specialty fibers with conventional fibers
- **End use**
  - Defense & paramilitary uniforms, sportswear, antimicrobial & UV protective fabrics
- **Anticipated outcome**
  - Guidelines to process – spg., wvg., knitting, processing & garmenting
  - Cost estimations
- **Sources of funding**
  - MoT Grant: sanction letter received for three products; awaiting clearance for one product
  - Industry contribution: consented to extend facilities at no cost to undertake bulk production & field trials
- **Anticipated date of completion**
  - 30<sup>th</sup> June 2010

# Formulation of Technical Specifications/Standards



# Technical Specifications

prepared by NITRA for



**CoBRA**



**Specifications**

**Finalized & approved**



**NYCO Uniform**



**Life Jacket**



**Nylon Belt**



**Specifications**

**Under preparation**



**Multi purpose light weight load bearing frame  
with carrier facilities and  
convertibility as stretcher**

**Water proof multipurpose  
rain poncho  
with convertibility as  
bivouac**





**Specifications**

**Under preparation**

**Anti-Mosquito Veil**



**Jungle Hat**



**Balaclava with convertible properties as cap comforter, face mask and cold weather muffler**



**Specifications**

**Under preparation**



**Special operation Rope**



**Tactical  
3 points sling**



**Durable Combat  
Rucksack**



**Pouches**



**Compact light weight Blanket  
with good insulating properties**

# Technical Specifications

prepared by NITRA for



**Indian Navy**



**Finalized & approved**

**UNARMED COMBAT DRESS  
FOR  
MARINE COMMANDOES**



# Specifications for Divers



**Cap FS Blue**

**T-Shirt**



**Short**



**Socks**



**Finalized & approved**

## **Action initiated to prepare standards for**

- UV Protective Wear**
- Seat Belts**
- Cut Proof Resistance fabric**
- Cold Weather Proof Clothing**
- Air Bags**
- Nuclear Biological Chemical Resistance Clothing**
- Gown for Microorganism Protection**

# **CoE Test Laboratories**

**(instruments installed & commissioned)**

**@**

**NITRA & IIT-D**

# CoE - NITRA



**Toxicity Tester**



**Abrasion tester**



**High Capacity  
UTM**



**Water cooled Xenon Tester**

## DSC & TGA



## Snag Tester



# New Testing Facilities

@

CoE

- **Toxicity Test** - NCD 1409
- **Thermal Resistance & Vapor Permeability** - ISO 11092, ASTM F1868
- **Impact Test** - ISO 6603, ISO 7765, ASTM D3763, ASTM D5628, ASTM D2444, ISO 179, ISO 180, ISO 8256, ASTM D256
- **Snagging Resistance** - ASTM D3939
- **Oscillatory Abrasion Resistance** - ASTM D4157
- **Load and Strain measurement** - ASTM D5034, ASTM D5035, ISO 5081, ASTM D1775, ASTM D1424, IS 1969, IS 6489, ISO 9290, ASTM D2261
- **Colour Fastness & Weathering Property** - AATCC 16, ASTM G151, ASTM G155, ASTM D6695, ASTM D6662, ASTM D6577, ASTM D6551, ASTM D6083, ASTM D5794, ASTM D5071
- **Thermal Analysis**

# CoE - IIT'D



**Sweating Guarded Hotplate**

**Dynamic Impact Tester**



# **COE**

## **(Instruments in transit)**



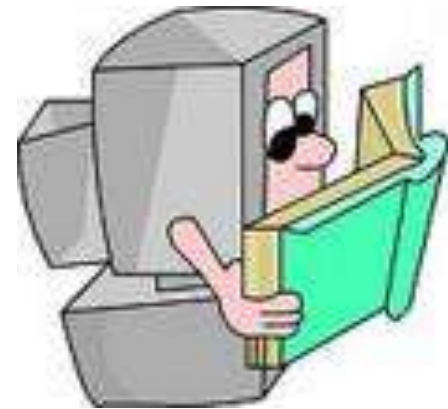
**Digital Microscope Systems  
(NITRA)**



**Ball Burst Tester  
(IIT-D)**

# Resource Center

- **Standards**
- **Books & Periodicals**
- **Web site**
- **Products**





## **Standards**

- ASTM Vol. 7.01 & 7.02 for Textiles**
- ASTM Vol. 11.03 for Protective Clothing**
- AATCC Manual**
- ISO 12402 Part 1 to 10 for Lifejackets**
- ASTM Vol. 4.13 for Geosynthetics**

## **Books**

- Military Textiles**
- Advances in Fire Retardant Materials**
- Handbook of Technical Textiles**
- Handbook of Non Wovens**
- Non Woven Textiles**
- Textiles in Sport**
- Fabric Testing**
- Engineering Textiles**
- Smart Textile for Medicine Health Care**
- Eco Textiles**
- Thermal Moisture Transport in Fibrous Materials**
- Intelligent Textiles of Clothing**
- Medical Textiles & Bio Material for Health Care**
- Polymer Data handbook**
- Protective Clothing**

Website  
on  
Protective Textile

# Active Collaboration

**Manufacturers**  
**End Users**  
**Institutes**



## **Manufacturers**

- M/s. RSWM
- M/s. JCT
- M/s. Shri Lakshmi Cotsyn
- M/s. Tara Lohia
- M/s. ALPS
- M/s. Adigear
- M/s. Jaya Shree
- M/s. Arvind Mills
- M/s. Bhilwara Processors
- M/s. Entremonde
- M/s. Reliance Industries
- M/s. Alok Industries
- M/s. M. Kumar Udyog
- M/s. Anjani Technoplat
- M/s. Southern Group Ind.
- M/s. Kusumgar Cor. Ltd.
- M/s. Motilal Dulichand
- M/s. Obeetee Textiles
- M/s. Puralator
- M/s. Sangam(India)

# **MOU with speciality fibre Manufacturers**

**MoU will be signed with one of the fiber manufacturers of Japan, MITSUI BUSSAN TECHNO PRODUCTS CO. LTD to develop FR textiles using FR polyester, FR viscose & FR modacrylic.**

**On 8<sup>th</sup> Oct, 2009 their chief consultant, Mr. Jonathan Smith from UK visited NITRA to have a detailed discussion with NITRA scientists.**

## **End Users**

Defense Research & Development Organisation;  
Ordnance Clothing Factory, Ordnance  
Equipment Factory, Air Force, Navy, Army,  
Bureau of Police Research and Development,  
Aerial Delivery Research & Development Estt.,  
Border Security Force, Central Reserve Police  
Force, Central Industrial Security Force, National  
Security Guard, Railway Design & Standards  
Organisation, Defense Materials & Stores  
Research & Development Estt.

# Institutes

- AITEX, Spain**
- Fire Testing Technology (FTT), London, UK**
- Member of Technical committee of ASTM on “Personal Protective Equipment”**

# **Seminar on Flame Retardant Home Textiles & Protective Clothing**

- **Conducted on 22.05.09  
New Delhi**
- **coverage: Developments**
- **Standards/norms**
- **Legislations / mandatory provisions prevailing across the world & suitability in Indian context**
- **Demand & Investment opportunities**



## **Speakers from**

- **Standards developing bodies**
  - ASTM International Standard Worldwide**
  - Bureau of Indian Standards (BIS)**
- **Industries**
  - M/S RSWM Ltd**
  - M/S Jaya Shree Textiles**
- **Chemicals and instruments manufacturers**
  - M/S Clariant Chemicals (India) Ltd**
  - M/S Rossari Ltd**
  - M/S Jay Instruments & Systems Pvt. Ltd**
- **Institutes**
  - IIT-D**
  - NITRA**

# **Accreditation**

## **(ISO/IEC – 17025:2005)**



- **Has International accreditation for existing test facilities**
- **Participating in inter-lab testing on FR**
- **Will get accreditation for FR test parameters after installing complete range of FR testing equipment**

## **Fund Utilization (Rs)**

<b>Grant Received</b>	<b>4,31,82,500/-</b>
<b>Amount approved (TXC)</b>	<b>4,84,98,000/-</b>
<b>Expenditure (as on 22<sup>nd</sup> Oct 09)</b>	<b>3,95,67,505/-</b>
<b>Balance (unspent)</b>	<b>36,14,995/-</b>

## **Revenue generation thro' Testing (Aug – Oct 2009)**

<b>Revenue from testing of Technical Textiles</b>	<b>Rs. 4,80,000/-</b>
<b>Revenue from newly installed instrument</b>	<b>Rs. 2,14,000/-</b>

# Instruments to be Procured

- Automatic Flammability Testers for vertically oriented samples
- Inclined (45<sup>0</sup>C) Automatic Flammability Tester
- Multipurpose Flammability Tester
- Vertical Flammability Chamber
- Automatic Limited Oxygen Index Tester
- Automatic Limited Oxygen Index Tester
- Electronic Crockmeter
- Retro-refractometer
- Fogging Tester
- Spray Tester
- Humidity (RH 0-95%), temperature control (temperature range -40<sup>0</sup>C – 50<sup>0</sup>C) Chamber
- Moisture Management Tester

## **Instruments to be Procured**

- Porosity tester
- Con Calorimeter
- Smoke Density Chamber
- Hydrostatic Head Tester
- Thermal Conductivity apparatus
- Manikins for Cold and Heat Protection Clothing
- Kawabata Testers KES FB1 and FB4
- Submicron particle Counter
- Liquid, Gas and Vapour Permeameters
- Capillary Porometer
- Sound Insulation Apparatus
- Viscometer
- Humidity Chamber
- Horizontal Flammability Tester
- FTIR
- Dry Cleaning Machine
- Scratch Tester
- Photometer
- Rotary Crock Meter
- High Temperature Oven
- Ozone Analyser
- GC-MS

## **Instruments to be Procured**

- Inoculation chamber, Colony counter, Autoclave, Incubator, Membrane Filtration assembly and Laminar flow
- Computer colour matching system
- UT-5-800 yarn evenness tester with hairiness measurement
- High volume instrument M 700
- Uster tensorapid-4
- Uster classimate-aaaquantum
- Seam Fatigue Tester
- Fabric Friction Tester
- Brush Pilling Tester
- Low stress mechanical property Kawabata testers
- Yarn torsion Tester
- Electronic sample loom
- Single-end sizing with warping
- Multi-needle computerized quilting machine
- Single needle lockstich sewing machine for heavy weight materials
- Projectile test cabinet
- EMC Analyser and system
- RF network Analyser

# **Request for additional Funds**

**To create complete range of testing facilities for Protech at NITRA campus the sanctioned amount (Rs. 5.5 Crore) will not be sufficient; an additional grant of Rs. 3.5 crore will enable to meet the industry requirements**

Thank You