COMPLIMENTS AND CONGRATULATIONS TO WORLD TRADE CENTRE
FOR ORGANIZING WORLD TRADE DAY (WTD) ON ‘ENHANCING EXPORT OPPORTUNITIES FOR MSME’s’ IN MAHARASHTRA IN JUNE, 2018.
ITAMMA

Oldest and Largest Association in Textile Engineering Industry in India

Heritage Building with State-of-the-Art Conference facilities and Knowledge Centre

Accredited by Diamond Grade at National level by NABET

> 500 members of Indian Textile Engineering Industry

Liaison Offices in Indian Textile Clusters at Ahmedabad, Coimbatore, Mumbai and North India.

Affiliated to important Satellite Associations

Co-promoter of India ITME Exhibitions
Effective Communication

"ITAMMA VOICE" - Magazine

Buyers' Guide: "Textile Stores and Machinery Directory"

Website and Social Media

Technology Development Initiatives

Training Programmes

Design Awareness and Lean Manufacturing

Centre of Excellence and Textile Clinics

R & D Activities

Signed MOU's with more than 25 Research/Educational Institutions worldwide

ITAMMA Expert Panel targeting 400 Techno-Commercial Experts
IMPORTANCE OF CUTTING EDGE TECHNOLOGY IN TEXTILE MANUFACTURING

N D Mhatre, Director General (Tech) ITAMMA
**What does Cutting-Edge Technology mean?**

Cutting-edge technology refers to technological devices, techniques or achievements that employ the most current and high-level IT developments; in other words, technology at the frontiers of knowledge. Leading and innovative IT industry organizations are often referred to as "cutting edge."

**Cutting edge is also known as leading-edge technology or state-of-the-art technology.**
Edges in a square such as road turnings or a piece of cloth or a piece of paper are at right angles or they are sharp, thus forcing you to take a 90 degree turn. Supposing the roads have a smooth and a curved turning, taking a turn will be smooth and convenient!! So also cutting involving anything. So cutting an edge removes sharpness and makes things smoother, easier and may be helps in being fast, such as in a race track!
WHAT WAS THE NEED OF USING CUTTING EDGE TECHNOLOGIES

ENHANCE PRODUCTIVITY
IMPROVE PRODUCT QUALITY

----------------------------------------
ENERGY CONSERVATION
REDUCE WASTE
MAINTENANCE FREE
USER – FRIENDLY
ECO-FRIENDLY

ENVIRONMENT FRIENDLY
GOING-GREEN
RESPONSIBLE MANUFACTURING
ROAD MAP OF TECHNOLOGICAL DEVELOPMENTS

MECHANICAL LINKAGES/FUNCTIONS
PNEUMATICS
HYDRAULICS
ELECTROMAGNETIC
ELECTRONICS
COMPUTERIZATION
DIGITAL MANUFACTURING
SMART MANUFACTURING
INDUSTRY 4.0 MANUFACTURING
RESPONSIBLE MANUFACTURING/GREEN MANUFACTURING
SUSTAINABLE MANUFACTURING
TEXTILE INDUSTRY - STATUS

- Global Textile Industry – expected to reach USD 2.1 trillion by 2025

- India’s present Textile Market is 1% of total World’s market which will be at 5% by 2025 growing @12% (higher than any other country)

- Presently Indian production of textile machines is 1.2 billion USD against 2.7 billion USD market size

- India Exports 0.5 billion USD and Imports 2.1 billion USD
‘Make in India’

‘Make in India’ announced by Prime Minister, Mr. Narendra Modi “Scheme for Enhancement of Competitiveness of the Capital Goods Sector” Budgetary Support (GBS) from Government 13th Plan period estimated outlay of Rs.930.96 crore.[ Rs. 581.22 crore as subsidy & balance Rs.349.74 crore by stakeholder industries]

• INDIAN Textile Industry

• Supply (DHI) & User Industry (MOT)

TOPICS OF PRESENTATIONS

• Developments done in the Gearing & Drive transmission systems of the hi-tech Weaving machines

• Common Drive - individual Drive

• Flat belt drive – V-belt drive – Trapezoid belt-pinion

• Crank motion – Cam motion

• Rotational motion - Oscillatory motion -
**Topics of Presentations**

Contribution of the developments towards the Productivity & Machine Maintenance

**Productivity**
Production/Efficiency/Speed/Downtime /Production cost

**Maintenance**
- Automation
  - elimination of process
  - introduction of electronics/pneumatics/hydraulics

**Drive**
- Maintenance Cost
- Life of spares
- Loss of material & Downtime
- Manpower
- Lubrication
COMMON DRIVE TO DRUM

HIGH SPEED CONE WINDER MACHINE

Individual drive to drum
YARN TENSIONER (5), YARN CLEARER (7), STOP MOTION (10)

MECHANICAL TYPE

ELECTRONIC TYPE
<table>
<thead>
<tr>
<th>Conventional</th>
<th>Hi-tech</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yarn clearers, tensioners and stop motions are mechanical type – more lubricants</td>
<td>Pneumatically and electronically control</td>
</tr>
<tr>
<td>Cradle functioning mechanical</td>
<td>Cradle functioning with oil filled hydraulic dampers</td>
</tr>
</tbody>
</table>

**MACHINE MAINTENANCE**

[Image of a machine component with text: Conventional vs. Hi-tech features.]

- Conventional Yarn Clearers: Mechanical type with more lubricants.
- Hi-tech Yarn Clearers: Pneumatically and electronically controlled.
- Conventional Cradle Functioning: Mechanical.
- Hi-tech Cradle Functioning: With oil-filled hydraulic dampers.
STARTING AND STOPPING THE MACHINE MANUALLY THROUGH STARTING HANDLE

CONA AND BOBBIN DOFFING MANUALLY
Bobbins and Cone Auto Doffing
Mechanically Control

YARN TENSIONER

Pneumatically Control

Optic Feeler

Rod bar Tensioning System

1. STOP

2. RUN

3. OPEN
MANUAL LOADING AND UNLOADING BEAM
AUTO LOADING/UNLOADING BEAM
MACHINE DEVELOPMENT

Sow Box

Sizing Cylinders
Shuttle (L-30 cms, W-430 gms,)

Pirn (W-25 gms, Weft-2500 mts)

Cone - 1 lakh mtrs.

Air-jet Nozzle

Rapier Head

Projectile : 9 cms long and 40 gms weight
DEVELOPMENTS IN MACHINE DESIGN AND MAINTENANCE

Shuttleless with oil pockets

Shedding Linkages

Shedding Cams in Oil Bath

Shuttle Loom
BEAT-UP MOTION

Cam Beat-up in Oil Bath

PICKING MOTION

Air-jet Air Flow System

Open Crank Arm Beat-up

Picking Motion
Ruti ‘C’ : 25 ltrs/loom/year
30 kg/loom/year

**Picking Stick Spring/Bowl/ Cam**

Special Textile Oil : Weltac Oil

- Avoids splashing of oil, reduces heat generation due to heavy impact of two metal parts and thereby wear and tear and reduces the noise level

**Mechanical Parameters :**

- Very high impact of picking bowl with cam to achieve a required picking force (chances of transferring stains on the fabric)

- Unwinding and winding action of picking stick spring at high force @ 125 times/min.
ZAMA BUFFERS & HYDRAULIC DAMPERS

Oil Category: Hydraulic Oil (32 to 450 cst at 40°C)

- Easily transmissible through the hydraulic pipe line. At the same time gives required pressure/force to carry out braking action or mechanical movement

Mechanical Parameters:

- Absorbs the back force of picking stick @ 125 times/min and avoids rebounding

- Absorbs damping action of back rest roll having its own weight along with warp tension @ 240 times/min
Open Lubrication for Take-up Wheels

Take-up Wheels in Oil Bath

Positive Type Gears in Oil Bath

Semi Positive Type

LET-OFF MOTION

TAKE-UP MOTION
CENTRALISED LUBRICATION

- CLEAN FILTERED OIL FORCED WITH REQUIRED PRESSURE FOR LONG PERIOD
- REDUCE FREQUENCY OF OIL CHANGE
- LESS OPERATIVE COST
- LESS MACHINE DOWNTIME
- NO OIL CONTAMINATION
- NO PART STARVING FOR LUBRICATION
## Advantage of development in the Gearing & Drive Systems

<table>
<thead>
<tr>
<th></th>
<th>CONVENTIONAL</th>
<th>HI-TECH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Width (cms)</td>
<td>180</td>
<td>540</td>
</tr>
<tr>
<td>Speed (rpm)</td>
<td>110-150</td>
<td>600-1000</td>
</tr>
<tr>
<td>Weft colour Selection</td>
<td>1</td>
<td>4-16</td>
</tr>
<tr>
<td>% of Efficiency losses on Cleaning/Lubrication/OH, etc.</td>
<td>9.3</td>
<td>nil</td>
</tr>
<tr>
<td>Weft Packages for weaving 100 mtrs fabric</td>
<td>379</td>
<td>5.5</td>
</tr>
<tr>
<td>Looms/weaver</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Average Salary (Rs)</td>
<td>7000</td>
<td>10000</td>
</tr>
<tr>
<td>Labour cost for inserting 10,000 picks (Rs/pc)</td>
<td>43.40-</td>
<td>11.90</td>
</tr>
<tr>
<td>Power consumption per loom shift of 8 hrs (Units)</td>
<td>8-8.8</td>
<td>17.6</td>
</tr>
<tr>
<td>Hard Waste (mtrs)</td>
<td>50</td>
<td>15</td>
</tr>
<tr>
<td>Loom type</td>
<td>Maintenance Cost / Loom Shift of 8 hrs (Rs)</td>
<td>Lubricant cost/ Loom Shift of 8 hrs (Rs)</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>Conventional</td>
<td>20-30</td>
<td>5 - 7</td>
</tr>
<tr>
<td>Hi-tech</td>
<td>60-80</td>
<td>1.56-3.94</td>
</tr>
</tbody>
</table>
Savings – E- control process

**Economical**
- Short Process
- Low Chemical Costs

**Environmentally Friendly**
- Minimal Chemical Usage

**Energy Saving**
- No Steamer Required

**Efficient**
- Excellent Reproducibility
- One Stage Process
- Minimum Machinery Requirements
Chemical consumption in continuous dyeing

Comparison of different processes:

Chemical consumption in continuous dyeing: 14 tons

- Pad
- Dry
- Chemical Pad
- Steam
- Batch
- Pad
- Dry
- Bake

520 tons
308 tons
154 tons
The energy consumption of the circulating air fans increases by an exponent 3 with the speed: \( P \sim n^3 \)

Consequently a reduction in the fan speed from 100% to 75% allows a reduction in the energy consumption of 58%.
Verdol’s cutting-edge technology for tire cord manufacturing offers complete range of direct cabling machines CP 10 and CP 20, for tire cord processing of two plies with balanced twist in one operation to produce up to 12 kg bobbins for use directly in downstream processes.
TECHNOLOGIES READY TO CHANGE FASHION

3D-PRINTED CLOTHING

(Nike’s use of the technology to help them refine and perfect performance athletic footwear)
a way to harness electricity from the movement of the human body and use it to power a new kind of “electronic fabric.” Using a very subtle current, the material would trigger super-fine wires woven into its makeup to change its color or illuminate according to the wearer’s actions—a fabric that can charge itself via the body and store energy independently, using it to completely change in appearance at the wearer’s discretion.
Cutting-Edge Technology for Food, Cosmetics, Chemicals and Sanitary Paper Products
Some of the latest apparel manufacturing technologies
Cutting

Portable cutting knives

- Power system
- Handle
- Sharpening
- Cutting blade
- Blade guard
- One way thrust as the circular blade makes contact with the fabric
- Up and down movement
- Base plate
- Straight knife
Thank you for sparing your valuable time 

and thanks to World Trade Centre Mumbai (WTC)