Superior functions of “HEATTECH” and “Ultra Light Down” Made Possible By Advanced Textile Technologies

Hisae Sasaki
Vice President in charge of Manufacturing Division, TORAY Industries, Inc.
UNIQLO’s Marketing and Merchandising Capabilities

TORAY’s Japanese Textile Technologies, High Quality & Worldwide Production Network

Share each other’s expertise to work as a virtual company

Jointly develop and provide dream products that please customers around the world!
[TORAY Fibers & Textiles Japan & Overseas Production Network]

**Japan**
- Toray N-FY & SF, P-FY & SF, A-SF, non-woven fabrics, synthetic leather, PPS fiber, fluorine fiber

**Italy**
- Alcantara (Synthetic leather)

**Malaysia**
- PFR (P-SF)
- PAB (Spinning, weaving & dyeing of P/C)

**Czech**
- TTCE (Weaving & dyeing of FY)

**United Kingdom**
- TTEL (Weaving & dyeing of FY)

**China**
- TFNL (N-FY, P-FY)
- TSD (Weaving, dyeing & knitting of FY)
- TJQ (Spinning, weaving & dyeing of P/C)
- TPN (Non-woven fabrics)

**Korea**
- TAK (P-FY, non-woven fabrics)

**USA**
- TFA (fluorine fiber)

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**USA**
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**Indonesia**
- ITS (N-FY, P-FY, P-SF)
- ISTEM (Spinning, weaving & dyeing of P/R)
- ACTEM (Spinning of A)
- ETX (Spinning & weaving of P/C)
- CTX (Spinning, weaving & dyeing of P/C)
- OST (FY sewing thread for materials application)
- TPJ (Non-woven fabrics, scheduled for operation launch in June 2013)

**Thailand**
- TTS (N-FY, P-FY)
- TTTM (Spinning/weaving/dyeing of P/R, knitting)
- Luckytex (Spinning/weaving/dyeing of P/C, Weaving/dyeing of FY)

**United States**
- TFA (fluorine fiber)

**N=**Nylon; **P=**Polyester; **A=**Acrylic; **C=**Cotton; **R=**Rayon
Other textiles=PPS fiber, fluorine fiber; FY=Filament Yarn, SF=Short Fiber

Production network spanning across Japan and the world
[New Material & Product Development]

Integration of technologies of the TORAY Group

Product Development (China): Toray Fibers & Textiles Research Laboratories (China) Co., Ltd. (TFRC)
HEATTECH

JAPAN TECHNOLOGY

HEATTECH is the smart way to stay warm and comfortable in cold weather. Developed by UNIQLO and Toray Industries, the world's leading fiber maker, this revolutionary material keeps you warm by retaining body heat. Now you can dress more inventively in cold weather by taking advantage of this sheer, innovative fashion technology from Japan. Open up exciting possibilities. Give yourself a fashion edge with HEATTECH.
[Changes in the HEATTECH Material]

Sales of HEATTECH (in 10,000 units)

Men's
- From cotton to acrylic
- Switch to acrylic for Men's

Women's
- From cotton to acrylic
- Switch to acrylic for Men's

New functions are added every year for continued evolution
[Changes in HEATTECH Material]

<table>
<thead>
<tr>
<th></th>
<th>Year 2004</th>
<th>Year 2006</th>
<th>Year 2012</th>
</tr>
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<tbody>
<tr>
<td><strong>30S/44</strong></td>
<td>880 microns</td>
<td>700 microns</td>
<td>590 microns</td>
</tr>
<tr>
<td><strong>47S/121</strong></td>
<td>880 microns</td>
<td>700 microns</td>
<td>590 microns</td>
</tr>
<tr>
<td><strong>CLO Value (Heat Retention Property)</strong></td>
<td>0.170</td>
<td>0.160</td>
<td>0.170</td>
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</tbody>
</table>
### 2012 HEATTECH Improvements

<table>
<thead>
<tr>
<th></th>
<th>&lt;Men’s&gt;</th>
<th>&lt;Women’s&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New!</strong> Moisture</td>
<td><strong>New!</strong> Moisture absorbing &amp; releasing</td>
<td></td>
</tr>
<tr>
<td><strong>Updated!</strong> Odor Control</td>
<td><strong>Updated!</strong> Odor Control</td>
<td><strong>Updated!</strong> Moisturizing</td>
</tr>
<tr>
<td>Quick Dry</td>
<td>Quick Dry</td>
<td>Lightweight</td>
</tr>
<tr>
<td>Heat Generation</td>
<td>Heat Generation</td>
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</tr>
<tr>
<td>Heat Retention</td>
<td>Heat Retention</td>
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<tr>
<td>Antimicrobial</td>
<td>Antimicrobial</td>
<td></td>
</tr>
<tr>
<td>Stretchable</td>
<td>Stretchable</td>
<td></td>
</tr>
<tr>
<td>Anti-Static</td>
<td>Anti-Static</td>
<td></td>
</tr>
<tr>
<td>Dimensional stability</td>
<td>Dimensional stability</td>
<td></td>
</tr>
</tbody>
</table>
<Reduced stickiness (Improved moisture absorbing & releasing function)>

Further improve the satisfaction with the current functions and reduce the feeling of stickiness at the same time.
[Updated for 2012! Moisture absorbing & releasing /Odor control functions]

### Women’s
- **Update**: Increase the percentage of moisturizing content
- **Effect**: Improved level of moisture in fabric

### Men’s
- **Update**: Incorporate odor control
- **Effect**: Improved wash durability, Softer texture

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**Increased Whey Content**

- **Whey protein, 11%**
- **Casein protein, 21%**
- **Carbohydrates, 55%**
- **Mineral, 4%**
- **Ash, 7%**

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**Ammonia Deodorizing Rate**

- **Target**: 70%

- **2012 Ammonia**
- **2011 Ammonia**

- 100% 80% 60% 40% 20% 0%

- Washed 0 times Washed 10 times Washed 30 times Washed 50 times
HEATTECH’s role in reducing the effects on the environment

Effects on saving energy and reducing CO2

The superior heat retention function of HEATTECH allows us to comfortably lower the room heater temperature by 1 degrees Celsius. We calculate the effect of this on saving of energy and reducing CO2.
[Energy Conservation]

58 W/household × 12.5 million households = 730,000 kw

100 million units divided by [8 units/household] = 12.5 million households
The amount of energy conserved by lowering the heater temperature by 1°C is 58 W/household.

[CO₂ Reduction]

13 kg-co₂eq/HEATTECH item & season × 100 million units
= 1.3 million tons

Reduce CO₂ emission by lowering the room heater temperature
The amount of CO₂ reduced by every piece of HEATTECH is equivalent to the amount of CO₂ absorbed by a cedar tree.

It is equivalent to a forest area of approximately 1,093 km², or half the area of Tokyo.
2011: About 50 colors, 2012: Over 100 colors + prints
Integration of advanced Japanese textile technologies with skilled craftsmanship

We succeeded in dyeing nylon evenly, using the dyeing expertise that we have accumulated thus far and using a special dyeing machine.
The use of an ultra fine nylon thread with similar thickness to a human hair makes it soft and light!

Heat and pressure are applied to further close the mesh between threads, making it difficult for the down to escape.

- Soft
- Light
- Warm
Evolution continues with advanced textile technology