Antibacterial Innovation Overview
**What is Antibacterial Microfiber?**

**Antibacterial Microfiber** combines the performance of split microfiber (*polyester and polyamide*) with the natural antibacterial properties of silver.

**Our Antibacterial Production**
Tricol produces these functional microfiber filaments embedded with antibacterial silver ions. Test results show that these microfiber filaments offer a broad-spectrum antibacterial rate greater than 99.9%, even after 100 washes!
How does Antibacterial Microfiber Work?

Industry research shows that silver ion particles can sterilize over 650 types of bacteria, germs and fungi. The below graphics illustrate how the silver particles in our Antibacterial Microfiber interact with a single bacterium.

1. Bacterium Exposed to Microfiber
Once microfiber picks up the bacterium from the wiped surface, the silver ions embedded in the microscopic fibers of the fabrics are exposed to the cell membrane.

2. Silver Ions inhibit Normal Cell Activity
The silver ions disrupt the flow of vital functions in and out of the cell membrane, the production of vital enzymes, and the reproductive ability of the DNA.

3. Inactivation of the Bacterium
The silver ions ultimately prevent the bacterium from reproducing, stopping the bacteria from spreading in the fabric; thus, keeping the cloth in usable condition.
## How Effectives is Antibacterial Microfiber?

Internal and third party test results show that Tricol’s antibacterial microfiber filaments have an antibacterial rate of greater than or equal to 99.9%.

<table>
<thead>
<tr>
<th>Principal Bacteria</th>
<th>Known for:</th>
<th>Testing Standard</th>
<th>Results</th>
</tr>
</thead>
</table>
| *Staphylococcus aureus* (Staph Infections) | • Respiratory infections  
  • Skin infections including pus, boils, furuncles and abscesses  
  • Methicillin-resistant strains (MRSA) | GB/T 20944.3-2008  
ISO 20743:2007*                      | 99.9%                             |
| *Escherichia coli* (E.Coli)        | • Foodborne illnesses                                                     | GB/T 20944.2-2007  
ISO 20743:2007*                      | 99%                               |
| *Klebsiella pneumoniae* (Pneumonia) | • Urinary Tract Infections  
  • Abdominal Infections  
  • Surgical-Site and Soft-Tissue Infections  
  • Drug-resistant strains | GB/T 20944.3-2008  
ISO 20743:2007*                      | 99.9%                             |

*ISO 20743:2007 determines the antibacterial activity of finished textile products, meaning the ability of the product to clean itself.*
Our Masterbatch Process: starts with raw materials

1. PET Chips
   ![PET Chips]

2. PA6 Chips
   ![PA6 Chips]

3. Silver Ion Particles
   ![Silver Ion Particles]

100% Antibacterial Microfiber
(70% Polyester / 30% Polyamide with Silver Ion Technology)

Weighed, Crystallized, Mixed & Dried

PET Chips 70
PA6 30
Our Masterbatch Process: chips extruded into filament (melt spinning)

Cross Section of 100% Antibacterial Microfiber Filament
(70% Polyester / 30% Polyamide with Nanosilver Technology)

- 150D/72f Yarn
- Masterbatch MOQ: 3,000 kgs
- Cleans without the need of harsh antibacterial chemicals & agents
- Inhibits bacterial odor, mold and mildew growth
- Heat resistant up to 194° F (90° C)
Fabric Manufacturing Methods: from yarn to fabric

1. Woven
2. Warp Knitting
3. Weft Knitting
# Warp Knitted Fabric Applications

<table>
<thead>
<tr>
<th>Fabric Name</th>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antibacterial FBZ</strong></td>
<td>Warp knitted microfiber terry fabric with light to medium plushness; ideal standard for microfiber cleaning cloths with a wide range of applications</td>
<td>Silver Ion Master Batch 70/30 Polyester/Polyamide</td>
</tr>
<tr>
<td><strong>Antibacterial Dual Side FBZ</strong></td>
<td>Warp knitted microfiber fabric with sides of varying weights. Ideal for low-to-high viscosity liquid spills and general dusting.</td>
<td>Silver Ion Master Batch 70/30 Polyester/Polyamide</td>
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</tbody>
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<table>
<thead>
<tr>
<th>GSM</th>
<th>220 – 330</th>
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<table>
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<tr>
<th>Weave Type</th>
<th>Warp Knitted</th>
</tr>
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<table>
<thead>
<tr>
<th>Product Applications &amp; Recommended Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Chemical-Free Cleaning</td>
</tr>
<tr>
<td>• Cleaning Tools</td>
</tr>
<tr>
<td>• Pet Grooming &amp; Pet Linens</td>
</tr>
<tr>
<td>• Household &amp; Outdoor Towels</td>
</tr>
<tr>
<td>• Soft handfeel</td>
</tr>
<tr>
<td>• Designed for absorption &amp; cleaning</td>
</tr>
<tr>
<td>• Antibacterial Rate ≥ 99.9%</td>
</tr>
<tr>
<td>• Machine Washable &amp; Easy-to-Clean</td>
</tr>
<tr>
<td>• Effective antibacterial doesn’t wash out</td>
</tr>
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<tr>
<th>Special Features</th>
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<tbody>
<tr>
<td>• Chemical-Free Cleaning</td>
</tr>
<tr>
<td>• Cleaning Tools</td>
</tr>
<tr>
<td>• Kitchen Coordinates</td>
</tr>
<tr>
<td>• Antibacterial Rate ≥ 99.9%</td>
</tr>
<tr>
<td>• Wiping away grease &amp; grime</td>
</tr>
<tr>
<td>• Lint-Free / Streak-Free Finish</td>
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<tr>
<td>• Effective antibacterial doesn’t wash out</td>
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### Warp Knitted Fabric Applications

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<th>Product Applications &amp; Recommended Uses</th>
<th>Special Features</th>
</tr>
</thead>
</table>
| **Antibacterial KTL** | Warp knitted microfiber terry fabric with light to medium plushness; ideal standard for microfiber cleaning cloths with a wide range of applications | Silver Ion Master Batch 70/30 Polyester/Polyamide | 220 – 330 | Warp Knitted | • Chemical-Free Cleaning  
• Cleaning Tools  
• Pet Grooming & Pet Linens  
• Household & Outdoor Towels | • Soft handfeel  
• Designed for absorption & cleaning  
• Antibacterial Rate ≥ 99.9%  
• Machine Washable & Easy-to-Clean  
• Effective antibacterial doesn’t wash out |
| **Antibacterial Ribbed Terry** | Warp knitted microfiber fabric with ribbed texture and soft handfeel; ribbed construction increases surface area for more absorption and faster drying | Silver Ion Master Batch 70/30 Polyester/Polyamide | 200 – 330 | Warp Knitted | • Chemical-Free Cleaning  
• Cleaning Tools  
• Kitchen Coordinates | • Antibacterial Rate ≥ 99.9%  
• Wiping away grease & grime  
• Lint-Free / Streak-Free Finish  
• Effective antibacterial doesn’t wash out |
# Warp Knitted Fabric Applications

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<th>Fabric Name</th>
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<tbody>
<tr>
<td>Recycled Antibacterial Flat Cloth</td>
<td>Lightweight fabric with diamond salient to provide proper friction; DTY (fluffier, more elastic) or FDY (rigid) during texturizing process</td>
</tr>
<tr>
<td>Scrubbing Stripe Cloth</td>
<td>Extra-wide polypropylene (PP) stripes combined with FBZ fabric for heavy duty scrubbing, scouring and cleanup of the toughest messes.</td>
</tr>
</tbody>
</table>

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<th>Weave Type</th>
<th>Product Applications &amp; Recommended Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver Ion Master Batch 70/30 Polyester/Polyamide</td>
<td>230</td>
<td>Woven</td>
<td>• Pet Linens: Bedding &amp; Towels &amp; Covers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Cleaning Tools</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Inhibits bacterial odors, mold and mildew growth</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Suitable for everyday use; cleans without chemicals</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Made with 50% Recycled Materials to support green living</td>
</tr>
</tbody>
</table>

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<th>Product Applications &amp; Recommended Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver Ion Master Batch 70/30 Polyester/Polyamide</td>
<td>220 – 380</td>
<td>Warp Knitted</td>
<td>• Cleaning Tools</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Scrubbing PP lifts stains with little friction and user effort</td>
</tr>
</tbody>
</table>
# Weft Knitted Fabric Applications

<table>
<thead>
<tr>
<th>Fabric Name</th>
<th>Weft Mesh</th>
<th>Flat Cloth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Weft knitted fabric ideal for window, glassware, lenses, and electronics cleaning</td>
<td>Weft knitted fabric ideal for industrial window, glassware and electronics cleaning</td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>Silver Ion Master Batch 70/30 Polyester/Polyamide</td>
<td>Silver Ion Master Batch 70/30 Polyester/Polyamide</td>
</tr>
<tr>
<td><strong>GSM</strong></td>
<td>175 – 220</td>
<td>220 – 250</td>
</tr>
<tr>
<td><strong>Weave Type</strong></td>
<td>Weft Knitted</td>
<td>Weft Knitted</td>
</tr>
</tbody>
</table>
| **Product Applications & Recommended Uses** | • Cleaning Tools  
• Digital & Electronics Cleaning  
• Lens & Eyewear Cleaning | • Cleaning Tools  
• Digital & Electronics Cleaning  
• Lens & Eyewear Cleaning  
• Can be made with up to 50% Recycled Polyester |
Antibacterial Product Applications

 Powered by Tricol Intelligent Microfiber

Bath Linens

Other Bath Applications
• Bath Sheets
• Everplush® Technology Towels
• Bathrobes
• Face Towels
• Hand Towels
• Microfiber Hair Drying Towels
• Exfoliating Towels
Antibacterial Product Applications

Powered by Tricol Intelligent Microfiber

Other Kitchen Applications
- Scrub Sponges
- PU Sponge Covers
- Light Duty Scrub Cloths
- Heavy Duty Scrub Cloths
- Napkins
- Placemats
- Tablecloths & Runners
Antibacterial Product Applications

*Powered by Tricol Intelligent Microfiber*

Cleaning Cloths
Antibacterial Product Applications

*Powered by Tricol Intelligent Microfiber*

Dusting Mitts & Gloves
Antibacterial Product Applications

*Powered by Tricol Intelligent Microfiber*

Mop Pads
Antibacterial Product Applications

*Powered by Tricol Intelligent Microfiber*

Bonnet Pads
Environmental Benefits Beyond Sanitation

- Cleans without the need of harsh chemicals and agents
- Resistant to odors so smells don’t build up over time
- Can be made with up to 50% Recycled Polyester
What Sets Us Apart

The Tricol Advantage:

<table>
<thead>
<tr>
<th>ONE</th>
<th>TWO</th>
<th>THREE</th>
<th>FOUR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Research &amp; Development DNA</strong></td>
<td><strong>Performance Materials Innovator</strong></td>
<td><strong>Responsible Supply Chain Practices</strong></td>
<td><strong>Vertical Sourcing Partner</strong></td>
</tr>
<tr>
<td>• Onsite R&amp;D Team</td>
<td>• Top 20 global producer of combination microfiber</td>
<td>• Ongoing Supply Chain Transparency Commitment</td>
<td>• Collaborative Partnerships</td>
</tr>
<tr>
<td>• Major partnerships with global brands, research institutions and universities</td>
<td>• Patented innovations in natural and synthetic fabrics</td>
<td>• Environmentally-Conscious Products &amp; Manufacturing Processes</td>
<td>• Optimize Cost-to-Market</td>
</tr>
<tr>
<td>• Guided Journey Approach with every customer</td>
<td>• Focus on Performance Technology</td>
<td>• Quality-First Approach</td>
<td>• Increase Speed-to-Market</td>
</tr>
<tr>
<td>• Growing Library of patented textile technologies, proprietary materials and fabrics</td>
<td>• On the Edge of Innovation, Always</td>
<td>• Safe &amp; Positive Work Environment Initiative</td>
<td>• Improve Quality-to-Market</td>
</tr>
</tbody>
</table>

Strengths at a Glance:

• Large manufacturing capacity
• Vertical production line for household cleaning products, home textiles and premium microfiber products
• Management Systems: ISO9001 / 14001 / 18001; EPA Registered Facility
• 20+ years of experience in research & development of textile technology, retail and commercial global sourcing, private label and global partner collaboration
• Purveyor of Innovation
Global Operations

China Operations

- 11 facilities located in the Shandong Province of China, including China’s first and largest combination microfiber production, supporting fully vertical product lines
- 4 finished product facilities, within 2 hours of Qingdao port
- On-Site Research & Development Team
- Owner & Operator of the largest Chitosan fiber and weaving plant in China

EU Operations

- Sourcing Office and Testing Lab for OTC m.doc products

US Operations

- US Operations & Sales Office of Tricol Clean in Seattle, WA
- US HQ of Tricol Biomedical in Portland, OR
- Domestic Warehousing (4,000 ft²) & Distribution from WA & CA
- Collaborative Sales & Inventory Forecasting for Retail Customers
- Dropship Capable

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