Acrylic

- Contains at least 85% acrylonitrile plus a copolymer
- **Fibers** produced by wet or dry spinning methods
- Inherently lustrous

**Less expensive substitute for wool**
- Knitting and crocheting yarns; sweaters
- Bicomponent fibers with an inherent crimp
- Cut to staple length to make wool-like spun yarns
Acrylic Performance Highlights

- Low strength
- Medium abrasion resistance
- Susceptible to pilling
- Drape varies
- Good wrinkle resistance
- Good elastic recovery and resilience
Acrylic Performance Highlights

- Good dimensional stability
- Low moisture absorbance, hydrophobic
- Thermal insulation – crimped fibers
- Not damaged by sunlight
- Rot resistant, not biodegradable
End Uses

- **Apparel**
  - Cold weather apparel, sweaters, cardigans, sportswear, socks
  - Hand knitting and crocheting yarn
  - Pile knits; fur-like

- **Textiles for Interiors**
  - Upholstered furniture, draperies, carpets, rugs, office chairs, room dividers

- **Household & Institutional Textiles**
  - Blankets

- **Technical Textiles**
  - Awnings, outdoor furniture, car and boat covers
Care

- **Care requirements vary**
  - Not damaged by detergents, stain removal agents or dry cleaning solvents
  - Dries quickly

- **Iron at a low temperature**
Olefin

- Includes **polyethylene** and **polypropylene**
- Produced from chemicals **derived from petroleum**
- **Lastol**, an elastomeric fiber, is a sub-class of olefin
- **Inherently lustrous** - Delusterant added to produce fibers with medium or low luster
- Produced in **varying shapes, sizes, and opacity**
Performance Highlights

- Strength varies
- Excellent abrasion resistance
- Low specific gravity - lighter than most of the other fibers
- Excellent wrinkle resistance
- Good elastic recovery and resilience
- Good dimensional stability
Performance Highlights

● Excellent wickability

● Lower static buildup than nylon and polyester fabrics

● Extremely low moisture absorption

● Excellent resistance to prolonged exposure to light

● Rot resistant, not biodegradable
End Uses

- **Apparel**
  - Activewear, sportswear, socks, lingerie, and thermal undergarments
  - Dyneema® high-tenacity polyethylene fiber, ice skaters’ leotards
  - 3M Thinsulate™ low bulk fiberfill materials, gloves, jackets

- **Textiles for Interiors**
  - Indoor and outdoor carpets, outdoor furniture, secondary carpet backings, upholstered furniture

- **Household & Institutional Textiles**
  - Disposable household and institutional textile products
End Uses

- **Technical Textiles**
- Packaging materials
- Automobile and boat interiors
- Geotextiles
- Lightweight, tear-resistant envelopes
- Protective apparel
- Sutures
- Wind and moisture barriers
- High tenacity Dyneema® and Spectra® used for bullet proof vests
Artificial Turf Grass for Lawns Produced with Solution Dyed Olefin Slit Tape Yarns
Nonwoven Olefin Fabric – Tyvek used as moisture and wind barrier
Sutures – Polypropylene is one of the fibers used to manufacture sutures.
Care

- **Can be washed**
  - Not damaged by strong detergents; withstands agitation during washing and drying
  - Not damaged by chlorine bleach, stain removal agents
  - Low washing and drying temperatures are required
  - Dries easily

- **Cannot be dry cleaned** with perchloroethylene

- **Iron at very low temperature**
## Performance – Comparison of Synthetic Fibers

<table>
<thead>
<tr>
<th></th>
<th>Nylon</th>
<th>Polyester</th>
<th>Acrylic</th>
<th>Olefin</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drape</strong></td>
<td>varies</td>
<td>varies</td>
<td>varies</td>
<td>varies</td>
</tr>
<tr>
<td><strong>Wrinkle and Crush Resistance</strong></td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>high*</td>
</tr>
<tr>
<td><strong>Dimensional Stability</strong></td>
<td>high**</td>
<td>high**</td>
<td>high**</td>
<td>high**</td>
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<tr>
<td><strong>Shape Retention</strong></td>
<td>high</td>
<td>high</td>
<td>varies</td>
<td>high</td>
</tr>
<tr>
<td><strong>Moisture Absorbance and Transport</strong></td>
<td>low absorbency</td>
<td>low absorbency</td>
<td>low absorbency</td>
<td>high wicking</td>
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<tr>
<td><strong>Static Buildup</strong></td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>average</td>
</tr>
<tr>
<td><strong>Strength</strong></td>
<td>medium to high</td>
<td>medium to high</td>
<td>varies</td>
<td>medium to high</td>
</tr>
<tr>
<td><strong>Abrasion Resistance</strong></td>
<td>high</td>
<td>high</td>
<td>medium</td>
<td>high</td>
</tr>
</tbody>
</table>

* crush resistance lower than nylon and polyester
**once heat set

Comment: Stretch and recovery is high for nylon at low and high levels of elongation; high for polyester at low levels of elongation.