BIRLA CELLULOSE – DRIVING TRANSPARENCY & TRUST

Birla Cellulose™ places utmost importance on driving product & process efficiencies in its quest to become most sustainable raw material provider to the textile value chain. Birla Cellulose™ actively collaborates with all the stakeholders throughout the entire MMCF value chain - from plantation of forests to manufacturing of pulp and fibre, and finally up to the fashion in the hands of the end consumers, to drive sustainability improvements across the value chain. At every stage of the textile value chain, Birla Cellulose is deeply engaged with the value chain partners by working together to improve the sustainability of our products, in order to create value for all our stakeholders and a positive social impact.

A detailed view on our (Environmental, Social & Governance) performance can be accessed in our Sustainability report
Link: https://www.livabybirlacellulose.com/business/policies-reports

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This document highlights the credentials supporting our claims on product sourcing, performance & ESG goals

SOURCING & ESG

Birla Cellulose has implemented a strict 'Wood Sourcing Policy' and sources wood from sustainably managed forests following internationally renowned forestry standards and a 'Supplier Code of Conduct' for all its suppliers. Our practices are certified by various global bodies and form the backbone of our claims related to sourcing.
The claims mentioned below cover all similar, iterative, para-phrased claims and all applicable for all fibres manufactured by Birla Cellulose™ only.

CLAIMS	SOURCE DATA
• Fibres are derived from nature / Fibres are 100% plant based • Birla Cellulose™ is committed to sustainability, producing nature-based fibres sourced from responsibly managed forests and using efficient technologies to reduce environmental impact compared to conventional methods	**Sourcing from certified forests** FSC® License codes FSC-C135325 Grasim Cellulosic Division, Vilayat FSC-C145152 Thai Rayon Public Company Limited, Thailand FSC-C123357 Birla Jingwei Fibres Co., Ltd. China FSC-C084644 PT Indo Bharat Rayon, Indonesia FSC-C185984 Birla Cellulosic, Kharach FSC-C144869 Staple Fibre Division, Nagda FSC-C145993 Grasim Harihar Full certificates can be viewed at https://www.livabybirlacellulose.com/business/certificates **Section:** FSC® Certificates **Manufacturing Facilities** All Birla Cellulose™ fibre manufacturing sites are HIGG (3.0) FEM & OEKO-TEX® certified Full certificates can be viewed at https://www.livabybirlacellulose.com/business/certificates **Section:** Higg (3.0) FEM Certificate | OK certificate **Global Ratings**

Disclaimer:
All the claims made by Birla Cellulose™ are limited to MMCF (Man-made cellulosic fibres) fibres made by exclusively by Birla Cellulose™ only. Birla Cellulose™ doesn't make any claims on the final apparel, as it depends on the material composition used by value chain partners

	Birla Cellulose™ has been ranked #1 amongst MMCF (Man-made cellulosic fibres) manufacturers, by Canopy Hot Button report 2023. Birla Cellulose has secured a Dark Green Shirt for 4th consecutive year- https://hotbutton.canopyplanet.org/

CLAIMS	SOURCE DATA
• Birla Cellulose™ fibres have helped in contributing to the circular economy	**Recycled Claim Standard (2.0)** Birla Cellulose™ fibres confirm to Recycled Claim Standard (2.0) Full certificates can be viewed at https://www.livabybirlacellulose.com/business/certificates **Section:** RCS Certificates
• Birla Cellulose™ fibres are compostable in home & industrial conditions. Birla Cellulose™ fibres are biodegradable in water, soil & marine environment*	**Biodegradability Certificate** https://www.livabybirlacellulose.com/business/certificates **Section:** Biodegradability Certificate **USDA Certificate** Full certificates can be viewed at https://www.livabybirlacellulose.com/business/certificates **Section:** USDA Certificate

**The compostability and biodegradability of the final product made by our value chain partners however, depends on the material composition used to make it. Birla Cellulose™ doesn't warrant any claims made by value chain partners*

VISCOSE FIBRES

The below support data covers performance (only) claims made on all viscose products made by Birla Cellulose™ including

- Greige viscose (Birla Viscose & Livaeco Viscose)
- Dope-dyed viscose (Spunshades & eco-enhanced Spunshades)

Claims	Source Data
Viscose fibres have a soft feel	Viscose fibres have a higher hand value as measured vs cotton fibres, indicating a softer hand feel **Source:** Hand values for Viscose fibres (3.9) vs cotton fibres (3.4) *Comparative Study of Fabric comfort properties of different man made cellulose fibres 2022* *Nagpure, Rituraj; Patel, Mitesh; Chakrabati, Abir; Bhaumik, Somes:* *P176, Table 4 - Total Hand Value* *Test Methodology – Kawabata Evaluation system of Fabrics (KES – FB)* **Detailed report** - https://www.livabybirlacellulose.com/business/policies-reports
Viscose fibres are skin friendly	Based on "Analysis of the status of skin friendly textile" Lizhu Hu et al 2021 J. Phys.: Conf. Ser. 1790 012082 **Article - https://iopscience.iop.org**
Viscose fibres have good moisture absorption properties	Viscose fibres have a better moisture absorption levels as measured vs cotton fibres, indicating a softer hand feel **Source:** Moisture absorption values for Viscose fibres (0.6274) vs cotton fibres (0.5791) *NAGPURE, RITURAJ; Patel, Mitesh; Chakrabarti, Abir; Bhaumik, Somes:* *Comparative Study of Fabric comfort properties of different man made cellulose fibres (2022)* *P175, Table 2, Thermal Comfort properties of comparative fabric samples: Overall Moisture Management Testing*

	Test Methodology – Moisture Management capability evaluated by AATCC TM 195 using Moisture Management Tester (MMT) M-290 SDL Atlas **Detailed report** https://www.livabybirlacellulose.com/business/policies-reports
Viscose fibres are breathable in nature	Viscose fibres have a better air permeability as measured with cotton fibres indicating a breathability **Source:** Air permeability values for Viscose fibres (1654) vs cotton fibres (1156) NAGPURE, RITURAJ; Patel, Mitesh; Chakrabarti, Abir; Bhaumik, Somes: Comparative Study of Fabric comfort properties of different man made cellulose fibres (2022) Test Methodology – Air Permeability evaluated by ISO – 9237 using Air Permeability Tester M021A SDL Atlas Page 175, Table 2, Thermal Comfort properties of comparative fabric samples: Air Permeability (l/m2/s) **Detailed report** - https://www.livabybirlacellulose.com/business/policies-reports

MODAL FIBRES:

The below support data covers performance (only) claims made on all modal products made by Birla Cellulose™ including

- All variants of Modal (Birla Modal & Livaeco modal)
- All variant(s) of Micro-Modal

CLAIMS	SOURCE DATA
Modal fibres have a soft feel	Modal fibres have a higher hand value as measured vs cotton fibres, indicating a softer hand feel **Source:** Hand values for Modal fibres (3.9) vs cotton fibres (3.4) *Comparative Study of Fabric comfort properties of different man made cellulose fibres 2022* *Nagpure, Rituraj; Patel, Mitesh; Chakrabati, Abir; Bhaumik, Somes:* *P176, Table 4 - Total Hand Value* *Test Methodology – Kawabata Evaluation system of Fabrics (KES – FB)* **Detailed report** - https://www.livabybirlacellulose.com/business/policies-reports
Modal fibres have good moisture absorption properties	Modal fibres have a better moisture absorption levels as measured vs cotton fibres, indicating a softer hand feel **Source:** Moisture absorption values for Modal fibres (0.6298) vs cotton fibres (0.5791) *Nagpure, Rituraj; Patel, Mitesh; Chakrabati, Abir; Bhaumik, Somes:* *Comparative Study of Fabric comfort properties of different man made cellulose fibres (2022)* *Test Methodology – Moisture Management capability evaluated by AATCC TM 195 using Moisture Management Tester (MMT) M-290 SDL Atlas* *P175, Table 2, Thermal Comfort properties of comparative fabric samples: Overall Moisture Management Testing* **Detailed report** - https://www.livabybirlacellulose.com/business/policies-reports
Viscose fibres are breathable in nature	Viscose fibres have a better air permeability as measured with cotton fibres indicating a breathability **Source:** Air permeability values for Viscose fibres (1459) vs cotton fibres (1156) *Nagpure, Rituraj; Patel, Mitesh; Chakrabati, Abir; Bhaumik, Somes:* *Comparative Study of Fabric comfort properties of different man made cellulose fibres (2022)* *Test Methodology – Air Permeability evaluated by ISO – 9237 using Air Permeability Tester M021A SDL Atlas* *P175, Table 2, Thermal Comfort properties of comparative fabric samples: Air Permeability (l/m2/s)* **Detailed report** - https://www.livabybirlacellulose.com/business/policies-reports

Birla Cellulose
Fibres from nature

LYOCELL (BIRLA EXCEL) FIBRES

The below support data covers performance (only) claims made on all Birla Excel (Lyocell) products made by Birla Cellulose™

<table>
<tr><th>Claims</th><th>Source Data</th></tr>
<tr><td>Birla Excel (Lyocell) fibres have a soft feel</td><td>Birla Excel (Lyocell) have a higher hand value as measured vs cotton fibres, indicating a softer hand feel
Source:
Hand values for Birla Excel (Lyocell) fibres (4.4) vs cotton fibres (3.4)
Comparative Study of Fabric comfort properties of different man made cellulose fibres 2022
Nagpure, Rituraj; Patel, Mitesh; Chakrabati, Abir; Bhaumik, Somes:
P176, Table 4 - Total Hand Value
Test Methodology – Kawabata Evaluation system of Fabrics (KES – FB)
Detailed report - https://www.livabybirlacellulose.com/business/policies-reports</td></tr>
<tr><td>Birla Excel (Lyocell) fibres have good moisture absorption properties</td><td>Birla Excel (Lyocell) fibres have a better moisture absorption levels as measured vs cotton fibres, indicating a softer hand feel
Source:
Moisture absorption values for Birla Excel (Lyocell) fibres (0.6881) vs cotton fibres (0.5791)
Comparative Study of Fabric comfort properties of different man made cellulose fibres (2022)
Nagpure, Rituraj; Patel, Mitesh; Chakrabati, Abir; Bhaumik, Somes:
Test Methodology – Moisture Management capability evaluated by AATCC TM 195 using Moisture Management Tester (MMT) M-290 SDL Atlas
P175, Table 2, Thermal Comfort properties of comparative fabric samples: Overall Moisture Management Testing
Detailed report - https://www.livabybirlacellulose.com/business/policies-reports</td></tr>
<tr><td>Birla Excel (Lyocell) fibres are breathable in nature</td><td>Birla Excel (Lyocell) fibres have a better air permeability as measured with cotton fibres indicating a breathability
Source:
Air permeability values for Birla Excel (Lyocell) fibres (1536) vs cotton fibres (1156)
Comparative Study of Fabric comfort properties of different man made cellulose fibres (2022)
Nagpure, Rituraj; Patel, Mitesh; Chakrabati, Abir; Bhaumik, Somes:
Test Methodology – Air Permeability evaluated by ISO – 9237 using Air Permeability Tester M021A SDL Atlas
P175, Table 2, Thermal Comfort properties of comparative fabric samples: Air Permeability (l/m2/s)
Detailed report- https://www.livabybirlacellulose.com/business/policies-reports</td></tr>
<tr><td>Excel (Lyocell) fibres are the stronger vs viscose / modal fibres
Excel (Lyocell) is the strongest cellulosic fibres vis-à-vis viscose / modal</td><td>Demonstrated tenacity of fibres
<table>
<tr><th>Fibre</th><th>Tenacity</th><th>Test</th></tr>
<tr><td>Viscose</td><td>2.7 - 2.8 gpd</td><td>BISFA, tested at GCD Vilayat, Jan 2024,</td></tr>
<tr><td>Modal</td><td>3.8 - 4.0 gpd</td><td>BISFA, tested at BC Kharach, 2024</td></tr>
<tr><td>Excel</td><td>4.2 - 4.5 gpd</td><td>BISFA, tested at GCD Vilayat, Jan 2024</td></tr>
</table>
Report Links:
https://www.livabybirlacellulose.com/business/policies-reports
Section: Viscose Product Specifications, Modal Product Specifications, Excel (Product Specifications)</td></tr>
</table>

Birla Cellulose
Fibres from nature

<table>
<tr><th>CLAIMS</th><th>SOURCE DATA</th></tr>
<tr><td>Birla Excel fibres have high dimensional stability with wet to dry tenacity</td><td>Demonstrated tenacity of fibres
<table>
<tr><th>Fibre</th><th>Tenacity</th><th>Test</th></tr>
<tr><td>Viscose</td><td>2.7 - 2.8 gpd</td><td>BISFA, tested at GCD Vilayat, Jan 2024,</td></tr>
<tr><td>Modal</td><td>3.8 - 4.0 gpd</td><td>BISFA, tested at BC Kharach, 2024</td></tr>
<tr><td>Excel</td><td>4.2 - 4.5 gpd</td><td>BISFA, tested at GCD Vilayat, Jan 2024</td></tr>
</table>
Report Links:
https://www.livabybirlacellulose.com/business/policies-reports
Section: 2024 Viscose Product Specifications, 2024 Modal Product Specifications, 2024 Excel (Product Specifications)</td></tr>
<tr><td>Excel Fibres has 2X times moisture regain of Cotton</td><td>Excel fibres regain moisture better when compared to cotton fibres
<table>
<tr><th>Fibre</th><th>Moisture regain</th></tr>
<tr><td>Cotton</td><td>7%</td></tr>
<tr><td>Excel</td><td>13%</td></tr>
</table>
Report Links:
1. https://www.livabybirlacellulose.com/business/policies-reports
Section: 2024 Excel (Product Specifications)
2. Textile calculations: Standard Moisture Regain and Moisture Content of Fibres (textilecalculations.com)</td></tr>
</table>