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**Title: Eco-enhanced Sustainable MMCF for Fashion & Nonwoven Industry**

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Fashion industry is looking for solutions that can address the problems it is facing, to name a few – fast fashion driven excessive consumption, 2<sup>nd</sup> largest water consumer, high GHG footprint, chemicals usage, de-forestation, pollution due to emissions to environment etc. Also, fashion industry generated nearly 92 million tons of waste every year and less than 1% is only recycled, rest being landfilled / incinerated, most of which is not biodegradable.

Sustainably produced manmade cellulosic fibres (MMCFs) can address many of these issues as they are based on natural renewable raw material sourced sustainably, manufactured using closed-loop process and biodegradable at the end-of-life. It can also be used to upscale cotton waste into fresh fibers.

Birla Cellulose's business strategy is focussed on setting new benchmark in all these areas – sustainable forestry, low environment impact products (closed-loop process), climate actions and circularity, thereby providing the fashion industry with an option of more sustainable choices for their products in textile sectors as well as nonwoven industry. We realized that these cannot be achieved without integrating the sustainability criteria in our day to day operations and include these requirements in our business processes. Our sustainability strategy has five pillars – *Responsible Sourcing, Responsible Manufacturing, Sustainable Products & Circular Economy, Valuable Partnerships and Social Responsibility*.

We are ranked #1 globally by Canopy's Hot Button Report based on our forest conservation practices, transparency and next generation fibres development. Birla Cellulose is adapting closed-loop production at all its fiber sites meeting the most stringent EU BAT norms with an investment of \$170 million by 2022. Three of our sites already meet these standards. Next, we have launched a range of eco-enhance and circular products to fulfil the needs of sustainable raw materials. Some of the recent products are:

- Livaeco viscose & modal fibres for textile applications which comes from FSC® certified forests and is produced in EU BAT compliant facilities. Livaeco has 50% less GHG emission and consumes 60% less water than conventional viscose. Livaeco comes with supply chain transparency and traceability through a unique molecular tracer and blockchain based platform.
- Purocel Eco is eco-enhanced viscose fibre for nonwoven applications. Purocel Eco comes from FSC® certified and has 60% lower GHG emission and water consumption compared to conventional viscose. They have a unique molecular tracer that can be identified in the end products like wipes and helps the end consumers trace the origin of the product through blockchain based platform.
- Liva Reviva is a viscose fibre which contains up to 30% pre-consumer cotton fabric waste and is RCS (Recycled Claim Standard) certified. Liva Reviva comes with significant environmental benefits like low GHG consumption, low water consumption and complete supply chain transparency and traceability features like Livaeco.

We have recently announced to increase the production of Liva Reviva to 100,000 tons by 2024 and this is the most ambitious target by any MMCF producer in the industry.

We are also working on other alternative feedstock for MMCF such as agri-waste, microbial cellulose. We have collaborated with Australia based Nanollose Ltd. and filed a joint patent application for a high tenacity lyocell fibre made from bacterial cellulose.