

Pioneering Water Sustainability at Birla Cellulose

Brief Background

Water is most fundamental need to human existence and is required by all forms of life on earth. Around 70% of earth's surface is covered by water, and yet only less than 3% of the world's water is fresh – the rest is seawater and undrinkable.

Of this 3% over 2.5% is frozen, locked up in Antarctica, the Arctic and glaciers, and not available to human being. Thus humanity must rely on this 0.5% for all of human's and ecosystem's fresh water needs.

Globally, fashion industry is one of the major consumer of water and large amount of water is required throughout the textile making processes. It is estimated that fashion industry consumes around 79 billion cubic metres water annually (source: pulse of the fashion industry 2017).

Cotton a major natural fibre used globally for clothing is the most consuming stage across textile supply chain. However, textile industry uses significant volume of water for other processing operations such as man-made fibre manufacturing, bleaching, dyeing, finishing.

With rising consumer awareness and demands from consumers about sustainability practices across the supply chain there is a growing need to conserve this depleting natural resource and demonstrate commitment on sustainability.

Water and Viscose Fibre Manufacturing

Water is the lifeline of the viscose production value chain. The success of viscose manufacturing is acutely tied to water accessibility. Hence for our manufacturing operations, we depend on sustainable access to water both in terms of quality and quantity.

Water scarcity and climate change are major risks to our business as water availability can negatively impact our operations. As water availability is being impacted due to ill-effects of climate change, focusing on our water use and water sources is critical for our business to be sustainable in present times as well as for the future. Hence water is one of our most material issue.

Many companies are struggling for water to run their businesses as demand for water is outstripping supply. Protecting and conserving water resources through excellent water management practices and governance systems are a priority for our business and is integral to our commitment towards water stewardship.

Untreated wastewater discharge impacts both human and environment health. Wastewater laden with excessive nutrients may lead to algae bloom and negatively impact aquatic species.

Birla Cellulose strives to ensure that wastewater discharged is within the applicable norms and that effluent quantities are monitored and reduced to the extent possible. Wastewater is treated at on-site effluent treatment plants at each of our manufacturing unit. We ensure treated effluent quality is similar to fresh water.

Regulatory restrictions on wastewater discharge coupled with corporate accountability pressures are increasing the cost of doing business and challenging industries in all sectors to find ways to conserve, treat and reuse the wastewater. Wastewater reuse not only minimizes the volume and

environmental risk of discharged wastewater, but also alleviates the pressure on ecosystems resulting from freshwater withdrawal. Among other strategies, Zero Liquid Discharge (ZLD) is one of them to address this challenge.

Zero Liquid Discharge (ZLD) means zero discharge of wastewater to aquatic bodies from industry. It is achieved by treating wastewater through recycling and then recovery and reuse for industrial purpose. Hence ZLD is a cycle of closed loop with no discharge. Drivers for the ZLD system are:

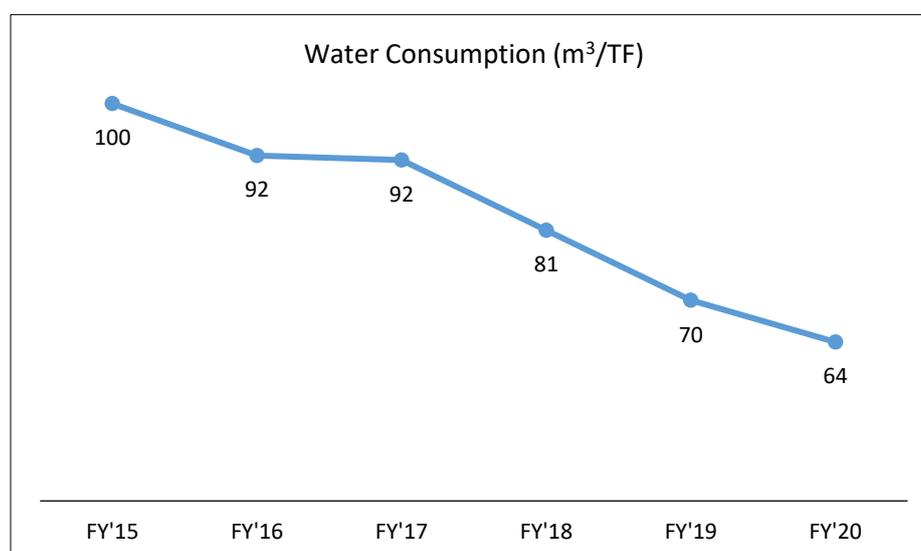
- water scarcity
- water economics
- environmental regulations
- increasing public environmental awareness

Birla Cellulose is the first company in viscose sector globally to implement ZLD at its Nagda site with a time frame to commission by January 2021. Post ZLD, the fresh water requirement will go down by about 90-95%.

Steps for Water Stewardship

- Clear Targets – all the sites have specific water reduction targets where monthly performance is observed and tracked, and shared with the Chief Operating officer (COO).
- Measuring & Monitoring – all the incoming water is measured and the process wise mapping is done. Section/department wise daily monitor of water consumption & analysis on regular basis. This helps in monitoring the losses and water wastage at each point and identifying better methods to save water.
- Behavioural Change – the mindset change is a challenge and this needs to be driven so that people understand the criticality of the issue
- Knowledge Sharing – we encourage our teams to share the water saving techniques and good practices across the sites so that we can learn from each other.
- Investments in water initiatives – we have continually invested in various water conservation schemes as we understand that it is our responsibility to save this precious resource.

With the help of these steps, we have reduced our specific water consumption by about 35% in last 5 years.



Graph – Index FY'15 =100

Philosophy of 4R (Reduce, Reuse, Recycle and Regenerate)

Viscose fibre manufacturing is a highly water intensive process. As our sites are located in high water stressed areas, it becomes more important & crucial for Birla Cellulose to minimize water usage.

During peak summer when surface water bodies – our only source of water – would become very lean, the factory operations were getting severely affected. After conducting deep analysis, it was decided that we need to work aggressively towards reducing water consumption with newer technologies, disciplined usage, making small improvements (kaizen), awareness programs etc.

Based on this, we decided to minimize the impact of our activities on this precious resource by adopting **4 'R' (Reduce, Reuse, Recycle & Regenerate) principle**:

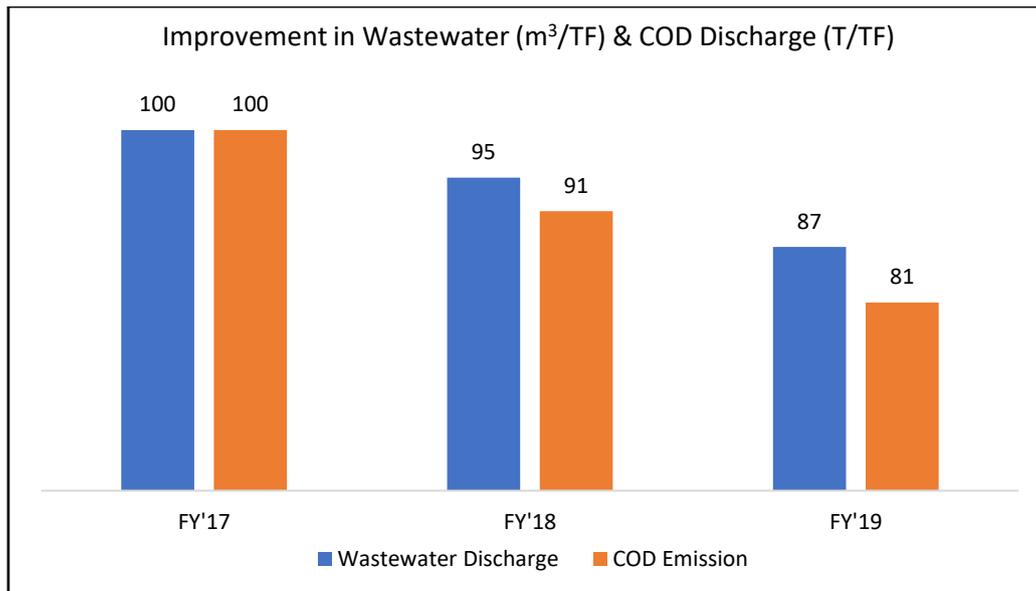
- reduce water consumption as well as wastewater discharge
- reuse water in the process or other applications
- recycle water with or without treatment
- regenerate water through

Some of the measures using the **4R principle** to reduce water consumption and effluent discharge are given below:

Reduce	<ul style="list-style-type: none"> • Better technology machines are introduced which require lesser water for fibre washing • Optimizing of water usage in spinning after-treatment section • Drip irrigation system in the office gardens • Minimization of wastewater generation • Reduce cooling tower blowdown in Auxiliary department by reducing carryover losses from equipment • Elimination of filter presses for reject viscose filtration by installation of centrifuges
Reuse	<ul style="list-style-type: none"> • Reuse of the water used in various equipment in Viscose department for fire pond • Use cooling tower blowdown water of viscose department, energy centres and carbon disulphide / sulphuric acid plants into fire pond, ash handling plant and acid plant scrubbers • Fiber washing optimized with more back purging • Treated water from ETP is used for greenery development, floor cleaning, coal quenching • Spinbath filter backwash done by excess scrubber water / first wash water • Reusing of excess condenser water to water treatment plant (WTP) • Reusing of excess scrubber water to waste fibre tow washing area
Recycle	<ul style="list-style-type: none"> • Cooling Tower blowdown recycling through RO • Recycling of water used in Auxiliary department vacuum pumps' gland cooling into cooling towers • Use sewage treatment plant (STP) for cooling tower makeup in Auxiliary departments • Installation of state-of-the-art membrane RO plants to recycle wastewater and permeate is used directly for process • Recycling of MSFE condensate through RO and reusing the same as soft water • Collecting underflow of water clarifiers, water filter back wash, and installing Lamella filter to remove solids and reuse • Recycling of ETP wastewater for floor washing & other less important activities • Recycling of process steam condensate in after-treatment process
Regenerate	<ul style="list-style-type: none"> • Ground water recharge (rainwater harvesting) projects have been implemented at few sites

With these efforts, new benchmark was established in the water intake going much lower than EU BAT specified limits. Reduction in fresh water intake by more than 50% at several sites was achieved.

Reduction in wastewater generation and pollution load (COD/BOD, Zinc) to the extent of more than 50% was achieved at several of our units.



Graph – Index FY'17 =100

EU Best Available Technology (BAT)

We are conscious of the fact that our production process is water intensive, and we recognize the need to continuously improve the water efficiency of our operations.

We have a dedicated system for monitoring and tracking initiatives to reduce resource consumption in our operations including water-efficiency, waste generation and effluents.

We strive to ensure that wastewater discharged is within the applicable norms and that effluent quantities are monitored and reduced to the extent possible. In fact, we have decided to go beyond the regulatory requirements and adapt the most stringent European norms by installing the best available technologies at all the viscose fibre manufacturing sites.

We are striving to adopt standards and systems which are recognised globally. Our collaboration with experts, external agencies, and reference systems like the EU BAT are some of the steps to make our processes more environment friendly.

The Best Available Technology (BAT) is approved for limiting pollutant discharges concerning an abatement strategy. BAT, for a given industrial sector, is described in BAT Reference documents (BREFs). For viscose fibre sector, the EU BAT norms are approved for both consumption of key raw materials and, discharges to both air and water.

Our water consumption is well below the EU BAT norms at all the sites. We will also meet wastewater quality norms as per EU BAT by 2021.

Water Saving Product Innovation

Viscose has been a fibre loved by consumers on account of its excellent attributes of comfort, fluid drape and aesthetic appeal. Made from a renewable natural resource – wood, viscose has been a preferred choice across applications like women's fashion wear, menswear in blends, home textiles.

Birla Cellulose is a world leader in viscose staple fibre and has focused in cleaner technologies, newer products which benefit the consumer and the value chain. Spunshades™ is an innovation of Birla Cellulose which has manifold benefits to the trade and consumers.

Water scarcity challenges are growing and impacting several countries. Our products help in reducing environmental footprint and creating positive impact on the society.

Wet processing, a common step in the textile industry, has the potential to cause a significant impact on the environment and human health. Large amounts of chemicals and dyes are used in the wet processing operations resulting in generation of effluents with a complex chemical composition.

The cellulosic textile industry consumes a large quantity of water in wet processing operations like desizing, scouring, mercerizing, bleaching and dyeing employed during conversion of fibre to fabric.

The last decade has seen a growing concern about environmental issues, which have increased many fold because of increasing industrial pollution, waste problems, effects of global warming, etc.

Dope-dyed Viscose is the right solution to reduce environmental pollution and waste water discharges in the textile industry.

Benefits of Dope-dyed Viscose:

Sustainability – Greenhouse gas emissions are reduced up to 20% by using spun-dyed viscose as compared to the conventional dyeing; wastewater generation is reduced up to 10% and a significant reduction is achieved in heavy metal concentrations in the effluent generated; less chemicals and energy are needed as the process is short and less wastewater is generated. This enables direct savings on production costs and ensures a substantial reduction of the environmental footprint of the final products.

Ease of processing – As the fibre is already dyed, the process of dyeing is completely eliminated leading to the saving of a large amount of resources such as water, energy and chemicals. This results in less loading of effluents into the environment.

Cost – Apart from the above advantages, on the cost front, dope-dyed viscose fabric is cheaper compared to piece-dyed viscose fabric.

So, dope-dyed viscose can be very helpful to the manufacturers who are using piece dyeing processes and facing the issues of environmental pollution, shade consistency and cost in their production. Dope-dyed fibre can be a significant part of the solution to all such problems.

WASH Pledge at the Workplace

In 2015, Aditya Birla Group signed the World Business Council for Sustainable Development (WBCSD) Pledge for Access to Safe Water, Sanitation and Hygiene (WASH) in the Workplace.

In the last 4 years, we have conducted about 200 awareness campaigns/workshops and built about 125 urinals/toilets for male, female and physically challenged people. Along with this, existing facilities for sanitation & hygiene were improved, along with access to safe drinking water for all employees at the workplace.

The WASH Pledge has been implemented at all our sites across the business. A comprehensive review of water, sanitation and hygiene infrastructure at all the workplaces was audited and an improvement plan was developed. An assessment of our business indicates that our sites score more than 90% on WASH.

Way Forward

The company has continually invested in water conservation technologies and millions have been invested in building dams, installation of new technologies such as membrane technologies, and proposed plan for ZLD.

Birla Cellulose has targeted to reduce its water intensity by 50% by 2025 from the baseline year 2015. This will be achieved by the application of new technologies based on the principles of 4R.

Aligned to the United Nations' SDG 6 (Clean Water & Sanitation) SDG 12 (Responsible Consumption & Production), Birla Cellulose is committed to improve the availability of water, the most precious shared resource, for the people and the planet. It is in alignment to the strategy of Birla Cellulose of making the business more sustainable by being the leader in implementation of the sustainable business practices in the manmade cellulosic fiber industry.

x-----End of Document-----x