INTELLECTUAL CAPITAL

At Grasim, we implement advanced technology to drive innovative breakthroughs that enhance our operations. Our expansive presence across industries offers numerous opportunities for pioneering new developments and creating value in all our endeavours. Our ethos, 'Force for Good', encapsulates our mission to do good and inspire even greater outcomes. The difference we make is a result of our work, our people, our outlook, and our conviction. With robust intellectual resources, we are building a stronger Grasim that transcends the tangible.

Our targeted efforts in scaling our innovation and knowledge base, people skills and technology prowess have allowed us to build a formidable foundation of intellectual capital. Our investments in these areas have equipped us to harness our intellectual capital optimally. Our focus on forward-thinking allows our people to push boundaries and create pioneering products and solutions that solidify our position as a preferred brand for customers.

Alignment with SDGs





OUR APPROACH

Grasim's research and development (R&D) commitment has driven innovation and technological advancement across our operations. Our initiatives in new product development focus on creating leading-edge solutions to meet the evolving needs of our customers and address emerging market trends on time. Rigorous testing and collaborations with industry experts, research institutes, and our value chain partners enable us to focus on the quality and performance of our innovative products. Our multidisciplinary R&D team, consisting of expert scientists, designers, and engineers, spearheads advancements in key areas such as refining procedures, leveraging data analytics, and expanding operational capacities. Through cross-functional collaboration and a culture of experimentation, we remain agile, resilient and responsive to shifting market dynamics, customer preferences and regulations, ensuring sustained success.



Stakeholders Impacted -

Customers

Suppliers and Value

Chain Partners

Shareholders

Employees

Material Issues

Innovation and R&D Digitalisation, Data Privacy and Security Product Stewardship Quality and Customer Satisfaction

Key Risks -

Strategic Risk Operational Risk Knowledge Risk

Emerging Risk

Supporting / Aligned Policies

Environmental Policy

Information Security Policy

Quality Policy



FOCUS AREAS

New Product Development Product Stewardship Automation and Digitisation

INTELLECTUAL CAPITAL

1 NEW PRODUCT DEVELOPMENT

Grasim's Cellulosic Fibres and Chemicals businesses are pioneers in producing sustainable and innovative fibres and chemicals. We specialise in manufacturing high-quality man-made fibres, including Cellulosic Staple fibre, which are used in a variety of textile applications and can be blended widely with other man-made fibres and natural fibres like cotton, linen, etc. Our chemicals division produces essential materials such as caustic soda and allied chemicals, which are integral to various industries. As a future-fit organisation, we are advancing product innovation, with a focus on durability, resource efficiency, and minimal environmental impact.

This year, we introduced three such innovative products: Birla Viscose Intellicolor, Birla Viscose EcoSoft, and Birla SaFR (Flame Retardant Fibres).

Birla Viscose Intellicolor

Intellicolor is a fibre produced using a breakthrough dyeing technology that utilises cationic or basic dyes. Our patented Birla Viscose Intellicolor enhances conventional reactive dyeing by delivering brighter shades with deeper colours and lower environmental impact, eliminating the need for salt and soda ash. This reduces pollution and cuts treatment costs while streamlining operations. Additionally, Intellicolor reduces nitric oxide levels and boosts glutathione, delivering anti-ageing and antioxidant benefits. Fabrics dyed with Intellicolor maintain antibacterial and anti-odour properties, with a 95% reduction in ammonia even after 50 wash cycles.

Birla Viscose Ecosoft

Birla Viscose EcoSoft is an innovative bamboo viscose fibre that redefines sustainable fashion. Sourced from responsibly managed bamboo forests and FSC certified, EcoSoft is an eco-friendly alternative made entirely from bamboo pulp – known for its rapid growth and low resource needs. The fibres are breathable, aiding in thermo-regulation, and characterised by their soft textures, light weight, durability, and superior moisture management. Additionally, it features molecular tracer technology to ensure authenticity and transparency for each product through a transaction certificate.

Birla SaFR (Flame Retardant Fibres)

This phosphate-based, inherently flame-retardant fibre is designed for creating high-performance, eco-friendly flame-retardant fabrics. Our Birla SaFR fibres are 100% plant-based, made from sustainably sourced wood pulp, and produced in facilities that adhere to the highest global environmental standards.



R&D INITIATIVES

Cellulosic Fibre Business

- Grasim's CFY business targets the silk market with innovative Cellulosic Fashion Yarn, progressing from successful lab proof to pilot plant investment.
- We are developing Excel fibre variants that reduce the need for special treatments, streamlining manufacturing and enhancing resource efficiency.
- Our Dull Yarn now features a tracer mechanism to improve traceability, resource use efficiency, and production transparency.
- At our new Harihar facility, we are scaling from a 3 kg to a 100 kg pilot plant to develop sustainable feedstocks and enhance pulp-making processes for greater efficiency and sustainability.

Chemicals Business

- Our Chemicals Business leads in sustainable plasticisers for vinyl polymers with Twist plasticiser AD84, optimising chlorinated fatty acid methyl esters to enhance PVC properties and address health and environmental concerns. Investment in specialised labs supports the rapid development and adoption of this greener solution.
- Speciality Chemicals has developed a toughened epoxy system for lightweight, rust-free Type 4 composite LPG and CNG cylinders, offering improved crack resistance, lower permeation loss, and better impact strength.
- We transformed out-of-specification ALCP material into valuable Polyaluminium Chloride, avoiding landfill costs and reducing environmental waste.
- We implemented a recycling plan for out-ofspecification Aluminium Chlorohydrate.
- Solid byproducts from phosphoric acid production were repurposed into organic fertilisers meeting CPCB guidelines.
- We developed uses for a new liquid byproduct from high stability bleaching powder production, employing it for bleaching in textiles and paper, and for COD reduction in effluents.



Pioneering Sustainable Athleisure Wear with Man-made Cellulosic Fibres

We recognise the fashion industry's responsibility to adopt sustainable practices while reducing environmental impact. However, the increasing prevalence and reliance on non-biodegradable synthetic fibres like polyester poses challenges for the industry to progress towards a greener future.

Solution

Birla Cellulose has developed sustainable Man-Made Cellulosic Fibres (MMFC), such as Modal and Micro Modal, derived from wood pulp for athleisure wear. These products act as biodegradable alternatives delivering superior comfort and performance.

Impact

The MMC fibres have revolutionised the athleisure wear market offering a blend of comfort, performance, and sustainability. These fibres align with global trends and strengthen the industry's commitment to circularity and eco-consciousness.



Integrated Annual Report 2023-24

INTELLECTUAL CAPITAL

2 **PRODUCT STEWARDSHIP**

Our commitment to product stewardship drives us to integrate socially and environmentally responsible practices across the entire lifecycle of our products. We conduct Life Cycle Assessments (LCAs) to continuously evaluate our environmental impact. By embracing closed-loop systems, we minimise waste and enhance resource efficiency, promoting circularity throughout our operations. Our sustainable supply chain practices ensure ethical sourcing and responsible manufacturing. Moreover, we focus on improving energy efficiency, reducing emissions, and optimising resource utilisation to further reduce our environmental footprint. We hold ourselves to the highest standards of quality and safety, driving excellence in every aspect of our operations while prioritising customer satisfaction and environmental stewardship.

> Life Cvcle Assessment to identify risks and concerns arising from our production and disposal activities

Product safety to secure handling and transportation of finished products



Reducing Footprint: Optimise resource utilisation and generate sustainable value for society

Key Partnerships

Black Pigment Pilot Project: In partnership with the Fashion for Good consortium, including key players like BESTSELLER, Birla Cellulose, Kering, and PVH Corp., as well as Paradise Textiles and startups Graviky Labs, Living Ink, and Nature Coatings, we launched the Black Pigment Pilot project. This initiative focuses on creating black dopedyed fibre using pigments derived from waste sources like industrial carbon, algae, and wood, offering a sustainable alternative to synthetic dyes with reduced carbon impact.

Algaeing Collaboration: We work with Algaeing to develop innovative lyocell fibres coloured with natural nutrients from micro-algae, ideal for skin-contact apparel due to their enhanced comfort and environmental benefits.

Weaving Partnerships: Birla Cellulose collaborated with 1,500 weavers across seven states in India, supporting traditional crafts through sustainable practices. This effort aligns with the 'Make in India' initiative and involves comprehensive support including rural outreach, marketing, and post-production assistance. Our materials like viscose and modal, marketed under the LIVA brand, empower weavers to deliver high-quality, competitively priced products. Additionally, our innovations like the blended silk fabric make traditional fabrics more accessible, contributing to the economic, cultural, and social well-being of communities and promoting sustainable fashion.

Closed-loop involves the reuse of by-products within the production cycle

Birla Cellulose's Strategic Alliance with Nisan Spintex

Birla Cellulose has formed a strategic alliance with Nisan Spintex, a leading spinning mill in Gujarat, to expand into India's major textile processing hub. By utilising AirJet Spinning technology to produce 100% Cellulosic Yarns, we are tapping into a sector that comprises over 60% of India's capacity. This collaboration, which began in April 2023, has included milestones such as TRADC visits, a partnership with Reiter, national tours, product quality assurance, and commercial support. Together, Birla Cellulose and Nisan Spintex have set a new standard in the textile industry, showcasing the effectiveness of collaboration and strategic innovation in driving sustainable progress.

Birla Cellulose's Journey to EcoSodium

The extraction of natural sodium sulphate poses significant environmental challenges, including resource depletion and biodiversity loss. Traditional methods of obtaining this vital chemical compound contribute to environmental degradation and strain on natural resources.

Solution

Birla Cellulose, in collaboration with BluWin Ltd., UK, evaluated the sustainable potential of recovered sodium sulphate from its CSF manufacturing process. A comprehensive evaluation and exploration process yielded possible ways to recover sodium sulphate (EcoSodium) and address the environmental concerns associated with traditional extraction methods, delivering benefits as outlined below:

Benchmark Standard

Wastewater Salinity Reduction

Birla Cellulose surpassed industry standards by recovering a substantial amount of sodium sulphate, setting a new benchmark for sustainability in the MMCF industry.

Increased recovery of sodium sulphate led to a reduction in wastewater salinity, enhancing water recycling efforts and

Impact

This initiative marks a significant milestone in our commitment to sustainability and responsible manufacturing practices. EcoSodium leverages advanced technologies to deliver superior performance while prioritising environmental responsibility, positioning the textile and fibre industry towards a sustainable and eco-friendly future.

Product and Method Innovations

Product and method innovation act as catalysts for growth and differentiation, refining our offerings and processes through constant experimentation. By embracing new technologies and methodologies, we aim to stay ahead of the curve and meet the evolving needs of our customers. We prioritise sustainable products and integrate new technology into our manufacturing processes to drive innovation. Our collaborations with start-ups and innovators enable us to pioneer circular and sustainable fibre solutions, harnessing the latest technologies and expertise to reduce waste and

minimise environmental footprint.



promoting sustainable wastewater management practices.

Lowest Water Consumption

Higher recovery rates facilitated the production of CSF with the world's lowest water consumption, further contributing to environmental conservation efforts.

3 AUTOMATION AND DIGITISATION

Automation

Synergy

- Our approach involves integrating functions through a collaborative and innovative process, navigating change effectively.
- Our cross-functional teams, comprising experts from marketing, manufacturing, and R&D, collaborate from ideation to market launch.

Agility

- We prioritise ongoing workforce development and technological advancement to swiftly adapt to market shifts.
- This enables us to enhance our strength and readiness for the future.

Core Competencies

Consolidation

- We leverage our experience and embrace advanced technology to ensure continuous improvement in our manufacturing processes.
- The Internet of Things, AI/ML, Big Data analytics, and digitisation have enabled the enhancement of manufacturing processes.

Collaboration

 We forge partnerships with customers, vendors, researchers, and technology providers to achieve our goals.

FOCUS AREAS

Continuous innovation is deeply ingrained in our organisational framework and aligns us with the evolving needs of our stakeholders. Our innovation endeavours focus on:

- Developing novel value-added products and enhancing product quality through innovative methods, while minimising material usage and reducing effluents and emissions to promote sustainability
- Embracing the digital revolution, leveraging advanced R&D facilities to drive innovation and maintain a competitive edge
- Committing to sustainability and excellence



ESG 360 Project: Streamlining Sustainability Reporting

Our journey toward enhanced sustainability reporting has been shaped by recognising historical challenges. Traditionally, manual data collection and analysis was time-consuming and error-prone, creating obstacles to standardised reporting across our operations. The complexities of our digital landscape and diverse data sources further complicated data sourcing and compilation of our annual Business Responsibility and Sustainability Report (BRSR).

ESG 360 Project Coverage



Reporting automation

Digitisation and automation of various reporting frameworks such as BRSR, DJSI, CDP, etc.

Benchmarking

ESG

Sustainability performance benchmarking with internal peers and external companies

Digitisation

To maintain our relevance and fortify our position in both the market and sustainability leadership, we are accelerating the digital transformation of our business. This involves integrating technologies such as digital dashboards, IoT, Artificial Intelligence, and Machine Learning throughout our operations lifecycle, including sourcing, manufacturing, distribution, customer engagement, and beyond. These initiatives streamline processes, enhance efficiency, and foster ongoing innovation.

Digitise Digitalise



To overcome these challenges, our Data & Analytics team introduced a solution utilising modern data management infrastructure, including the Grasim Sustainability Data Lake (G-SDL) and flexible data processing patterns. This simplifies the data collection process and integrates it into a unified data lake, enabling automated data flows to our online reporting platform with minimal human intervention, without any immediate amendments to our existing IT infrastructure.

By digitising and centralising our data collection processes, we are setting a foundation for more comprehensive reporting, enhanced data analytics, sustainability dashboard development, and future ESG benchmarking.



ESG Data Management and Digitalisation

- ESG Data Management Module
- Direct capture and integration with data lake



ESG Analytics Dashboard

Dashboards for performance monitoring and comprehensive sustainability insights

Digital dashboards offer real-time insights into our operations, enabling proactive decision-making and optimisation of resources. IoT sensors facilitate predictive maintenance, minimising downtime and maximising productivity. Additionally, AI and ML algorithms analyse data to uncover patterns and trends, empowering us to make data-driven decisions for continuous improvement.

Digital Transformation

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INTELLECTUAL CAPITAL

CASE STUDY

Digitisation at GCD Vilayat

Grasim Cellulose Division (GCD), Vilayat, has integrated futuristic technologies to enhance efficiency, quality and sustainability across its operations. Through digital solutions and data-driven insights, we are revolutionising processes and optimising resource utilisation while strengthening the culture of innovation.

The multi-fold benefits of the digitisation journey are outlined here:

Cost Savings

Steam Dashboard

Real-time monitoring of steam consumption, deviation analysis, and trap health, leading to an estimated benefit of saving 10,000 MT of steam annually

Power Plant Optimiser

Load optimisation and coal consumption reduction, enhancing operational efficiency

Automated Weighbridge

Unmanned weighment integrated with SAP, improving the turn-around-time

Quality Improvement

Laboratory System

Automated lab data integration with SAP, resulting in a 20% productivity improvement

Soft Sensor for OPU

Data science model for predictive maintenance, ensuring proactive process control

Reliability and Productivity

Digital Shopfloor

Real-time data capture and reporting, leading to a 20% productivity improvement.

Vibration Monitoring Real-time monitoring of critical assets, enhancing reliability

Smart Asset Maintenance Asset lifecycle tracking and real-time reporting, resulting in a 5% OEE improvement

Power Factor Monitoring

Real-time monitoring and alerts for power factor improvement, leading to potential savings of ₹4 crore

Supply Chain and People Safety

OTIF Scorecard Real-time analysis of order fulfilment, ensuring customer satisfaction

VR-based Training Virtual reality-based safety training, minimising incidents

Logistics Control Tower Tracking outbound fibre logistics from creation to customer delivery, strengthening customer centricity

Connected Workmen

Real-time tracking of contract labour well-being, improving safety and productivity

Dryer Vision

Real-time monitoring of chain system, identifying wear and tear for proactive maintenance

