



Powered by our innovation and technology drive

Our innovation strength, fast-paced digitalisation and aggressive brand building have always kept us ahead of the curve. FY 2021-22 saw us celebrate our 'partnerships' – with the planet and various stakeholders – through a unique brand campaign that brought us closer to our customers and business partners.



Partnership with the planet

We aim to inculcate a sense of belonging and commitment to the environment among our people, customers, our business associates and the larger society so that we can help create a sustainable future together. Our environmental stewardship is an integral part of our operations and we seek to further embed it.

World's #1 eco-friendly cement company

We are proud to be recognised as the World's #1 eco-friendly cement company, with our specific net CO₂ emissions being one-third of the world's cement industry average*. This is true testimony to our commitment to make the planet greener. We conduct our business responsibly and continue to make strides in facilitating change.



**World's #1
eco-friendly
cement company**

*Global and Indian cement industry Sp. Net CO₂ emission verified by GCCA. JSW Cement Sp. Net CO₂ emissions verified by D&B

A pan-India tree plantation campaign

During the Van Mahotsav in July 2021, we rolled out a nationwide tree plantation campaign. We organised plantation drives to create awareness and promoted forest conservation. We invited our channel partners and engineers along with their families to participate in the drive that saw us distribute saplings among the trader community on the outskirts of Bengaluru. More than 700+ trees were planted at all our plants locations during the campaign.

Air pollution awareness campaign on Diwali

During Diwali 2021, we took the opportunity to spread awareness on noise and air pollution created by firecrackers through a film. Our campaign revolved around promoting the idea of reducing the practice of bursting crackers and supporting a healthier planet by planting more trees. The campaign and the film were well received.

INTELLECTUAL CAPITAL



Partnership with channel partners

Our channel partners are integral to the value chain and we seek to build on our strong ties with the community. We undertook the following initiatives during the year.

The Leader's Premier League

The Leader's Premier League V2 received a tremendous response and helped us engage with our business partner community more effectively.

JSW Cement's Saathi app

The launch of JSW Cement's Saathi app was a milestone achievement for us. This cutting-edge digital solution ensures convenience and comfort for our business partners. The launch was accompanied by special offers for our partners, encouraging and incentivising them to order through the Saathi app and WhatsApp.

Dealer Ace and Elite Loyalty Club

We launched our first-ever loyalty program for top partners within our organisation. The Dealer Ace and Elite Loyalty Club were introduced as exclusive clubs for select dealers, who were made eligible for special privileges on completion of targets. Diwali Milan, a special event on the occasion of Diwali, was organised for the Ace and Elite club dealers. As an additional incentive, members of these clubs can also open bank accounts for their spouses under the StreeDhan Scheme.

Women's Day celebrations

On International Women's Day, we acknowledged and encouraged our women channel partners. Through a heart-warming film, we showcased their stories, journeys and goals on social and digital media.

Special webinars and events

- › A special GGBS SPO event, Unnati was attended by 50 SPOs. They were given a guided tour of the JSW Steel and JSW Cement Dolvi Works, which was followed by celebrations at Alibaug
- › As part of our efforts to keep our partners abreast of the latest trends and technologies, we conducted a host of webinars on subjects such as 'Durability for Coastal Construction', 'Construction Quality Improvement with Sustainable Material', and on the advantages of blended cement in modern construction among others
- › We hosted the Construction Chemical Builders meet in Bengaluru, a Technical Symposium in Anantapur and many such events while also strategically executing several marketing campaigns throughout the year



Our notable campaigns

Power Pro launch

In a significant move in FY 2021-22, we launched Power Pro and kickstarted the journey in Karnataka across nine locations. A total of 1,040 dealers, retailers and prospective dealers attended this multi-city launch.

JSW RMC

JSW RMC, another promising vertical of our Company, was set in motion. The first plant was inaugurated at Deonar, near Chembur in Mumbai. The Bhayander unit started operating in February 2022. Over 20 RMC-branded transit mixers are now active on the streets of Maharashtra.

Creating a hyperlocal connect

- › We launched a Karnataka-specific TVC with the central message of 'Swalpa Adjust Maadkoli' (No Adjustment Cement) to forge a closer connect with potential and existing customers. The campaign garnered over 4 million views on social media and television

- › Our 'Yaariyaan' campaign launched in FY 2020-21 continued to be a crowd favourite in FY 2021-22. This memorable track created by the music maestro A.R. Rahman featured in our employees' caller tunes and Corporate Office hold tunes. The campaign aired across multiple TV channels and radio stations
- › We also launched our first-ever home-guide book in Karnataka. This book is a comprehensive guide with the best examples and practices of home building and construction

Honoured as the 'Best Infrastructure Brand'

JSW GGBS has been instrumental in shaping some of our most iconic feats of engineering in this country. The Economic Times honoured us as one of the Best Infrastructure Brands 2021 for our efforts in fuelling economic growth and sustainable innovation.

We have also been awarded The Economic Times Iconic Brand of 2021-22 for our path-breaking work in sustainability, innovative strategies and stellar efforts in digitalisation.

INTELLECTUAL CAPITAL



Partnership with people

As during the first wave of the pandemic in 2020, we spared no effort in FY 2021-22 in providing adequate support to our fellow citizens.

'We Care' program

We promptly launched an outreach program called 'We Care' to reach essentials like food to communities and made online doctor consultations and mobile facilities accessible. Through the program, we also arranged for RT-PCR tests and supplied oxygen concentrators where necessary.

Awareness of about healthy lifestyle

We provided online yoga sessions and facilities to encourage people to follow healthy lifestyle. We used the social media to spread awareness and provided tips on how to boost immunity and take to healthy practices in collaboration with medical experts.

'Joy of Hope', a Bengali series in partnership with Roopsha Dasgupta, an ex-RJ and social media influencer, was launched to help people cope with the difficult times. A total of 13 episodes featuring real-life inspirational stories of combating COVID-19 were released every Thursday.

Aiding cyclone victims

Essentials such as food, clothing and clean drinking water were made available to victims of the Yaas Cyclone in Kolkata.

Providing palliative care

We contributed ₹13 lakh towards to the construction of the first floor of the Palliative Care Centre at Puthenpeedika, Thrissur, to help meet the growing need for geriatric care. This centre treats around 200 patients throughout the year and also offers free food and medication for the underprivileged sections of society.

Marketing and labelling of products

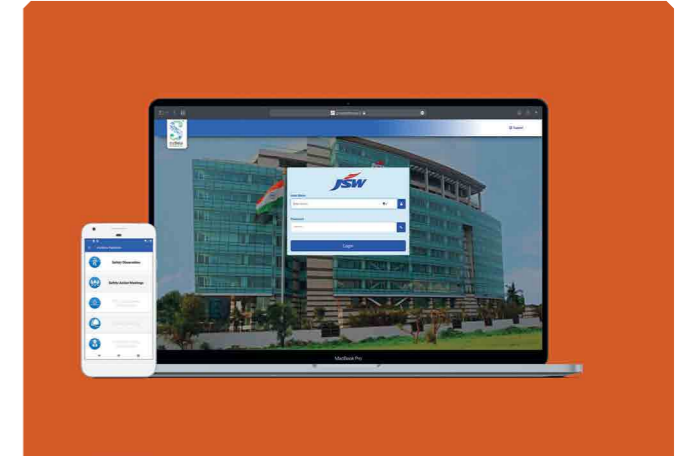
We follow BIS standards for marketing and labelling, providing the date of manufacture, location of manufacture, ISI Mark, safety handling procedure, constituents and type of cement. No complaints have been received related to marketing and labelling. We are advancing as a digitally enabled and data-intelligent business.



Digitalisation

Today, customers are digitally engaged and are more data conscious. They expect us to offer customised solutions that can be accessed on demand and can be seamlessly integrated into their lives.

Digitalisation is a crucial driver in the Company's steady evolution as a tech-driven organisation. Digitalisation is helping us create new platforms to drive better engagement with our customers and other stakeholders, enhance our agility and creating greater efficiencies in our operations. We are advancing as a digitally enabled and data-intelligent business.



Highlights FY 2021-22

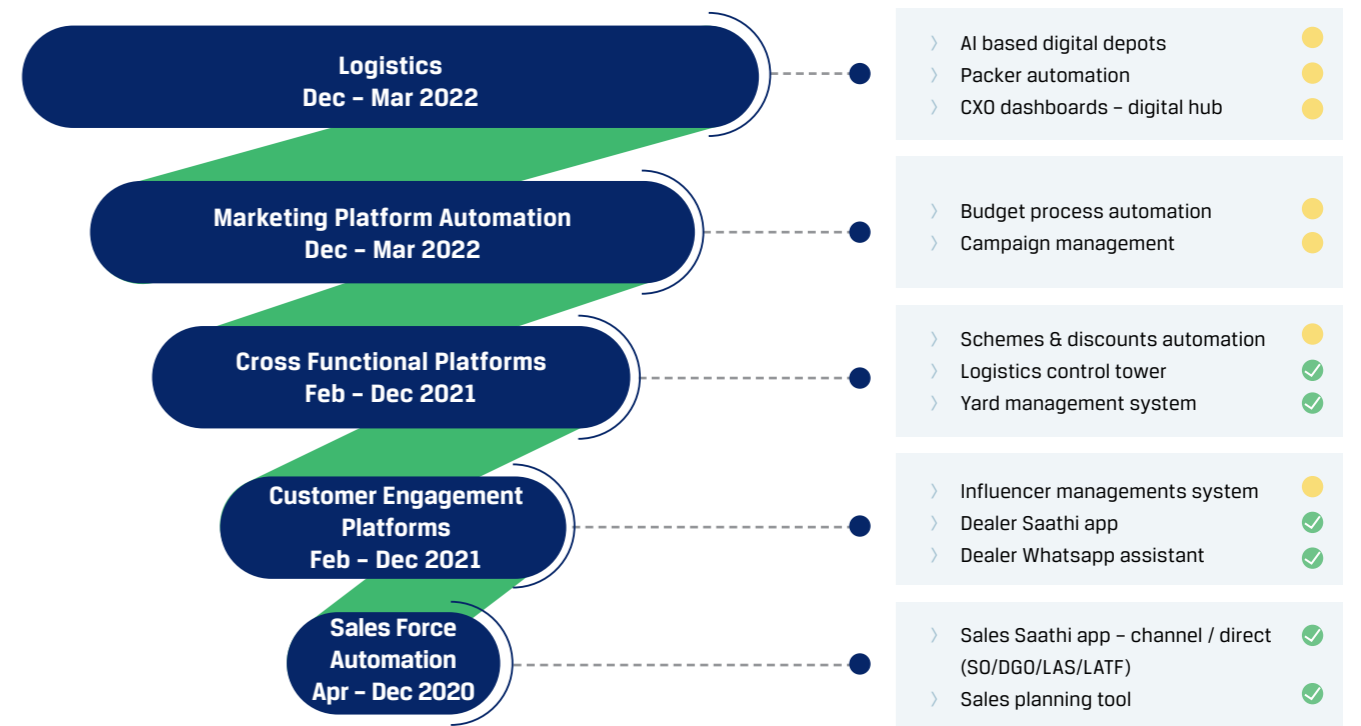
12+ Apps

Digital initiatives carried out during the year

20+

Business process re-engineering carried out in FY 2021-22

Digitalisation projects - Sales & Marketing Incl. Logistics



INTELLECTUAL CAPITAL

Scaling growth through connected apps

At JSW, we have leveraged SFDC (salesforce.com) as our CRM platform in the following ways:

- › Considering the limited offline capabilities with the SF platform, we have developed an android/iOS mobile application, which can be used both online and offline in remote areas and thus serve the needs of our field force working in both urban and rural locations
- › Implemented a solution that enables our frontline sales team to access intelligent field information anywhere, anytime to improve overall performance, operation visibility and management. It also creates better opportunities for customer conversion and has thus witnessed significant adoption rates since its pan-India rollout
- › Developed a workflow in the app, utilising the task module of SFDC seamlessly to integrate salesforce with back-end support functions such as finance, logistics, technical services and branding among others
- › Introduced a scientific approach for planning and executing dealer visits using an integrated planning tool (Velocity) with SFDC to push automated dealer visits to the SAATHI app
- › Integrated the GPS tracking software with SFDC for Sales teams/dealers to have access to real-time tracking of their shipments
- › Integrated the payment gateway with SAATHI app to SAP for making payments and updating the dealer ledger in real-time, enabling dealers to place orders and make payments in case of a shortfall of credits at any point in time
- › Integrated Mill test certificates/invoices/view ledger/ discounts among others to flow from SAP to SFDC into Sales SAATHI and Dealer SAATHI, available for downloads at their fingertip

A glance at the pre- and post-deployment of these connected apps and their benefits

Pre-deployment

Offline and online app with limited functions

Post-deployment benefits

SAATHI App – One-stop shop for SO/DGOs; single app with 360 views of dealers which enables sales officers to have more constructive discussions with their dealers and hence increases sales volume/value.

Pre-deployment

Heuristic visit planning

Post-deployment benefits

Automated visit planning: Utilising the 'Velocity' tool (LP model-based) for optimised visit planning for dealers based on their potential, share of wallet and loyalty.

Pre-deployment

No dealer performance information

Post-deployment benefits

Enhanced customer engagement and customer experience using real-time dealer performance dashboard.

Pre-deployment

No financial information; dependent on SO/ASM who, in turn, called support functions to seek information

Post-deployment benefits

High accountability and transparency using real time financial information including ledger-related details such as SD/SSD, discounts, open/close balance, credit notes among others.



Pre-deployment

No order information; dependent on SO/ASM who, in turn, called support functions to seek information

Post-deployment benefits

The tracking of orders with driver details and ready call features. Real-time order status information with dispatch data for every order with a GPS link to track the delivery in real time.

Pre-deployment

Only way to collaborate with JSW support functions was to call the SO/ASM and raise their concerns/requests

Post-deployment benefits

SO/Dealers can raise their requests through the app which, in turn, notifies respective support functions in finance, logistics, technical services, branding and closure with remarks updated in the app. This has enabled seamless interactions between the SO/ASM and also dealers through their respective platforms with the central/back-end support functions of JSW. It provides transparency to their issues/ concerns raised and resolutions updated for ready reference.

Pre-deployment

SO/Dealer would send emails to request for Mill certificates

Post-deployment benefits

One-click, ready to download and share MTC for dealers to their customers through the app.

Pre-deployment

Payments through cheque/RTGS

Post-deployment benefits

Dealer SAATHI App: Online payments through the app (UPI/Net banking) and settlements have led to real time settlements, and thus reduced outstanding aging of invoices.

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Pre-deployment

No loyalty program and points redemption and communication

Post-deployment benefits

SAATHI is also integrated with the loyalty platform and thus provides real time visibility of loyalty points, registering a purchase, viewing passbook and redemption, among other facilities.

Leveraging analytics

We are revamping our marketing and logistics practices through partnerships with the world's leading digital innovators and using extensive data models and algorithms to build new capabilities. Our objective is to empower our teams to make smarter, quicker decisions by transforming data into an accessible, reusable asset.

A key focus of these efforts is to understand the return on each marketing and commercial investment. To deliver on this, we are upgrading our end-to-end analytics capabilities to measure the value of each dealer's touchpoint and the impact of every campaign. These efforts help us in:

- › Understanding the effectiveness of our brand interaction
- › Generating efficiencies by improving resource allocation
- › Capturing insights to optimise channel strategies in real time
- › Identifying opportunities for innovation and the scaling up of new launches



Case Study

The Saathi revolution

Inspiring dealers to digitalise and expand their business through Saathi app

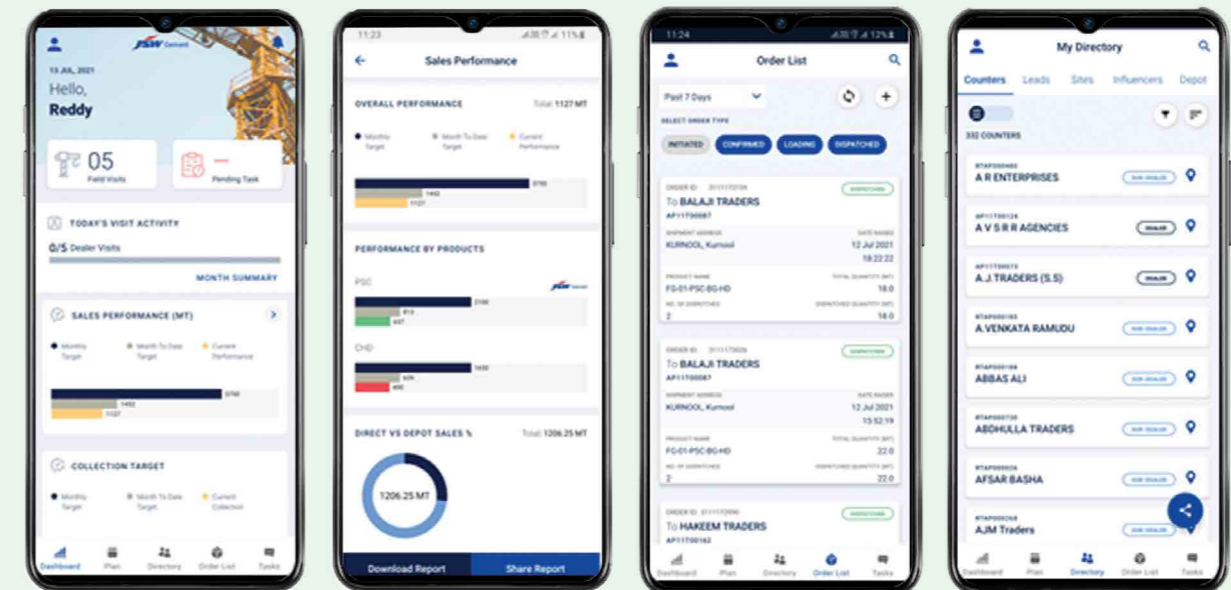
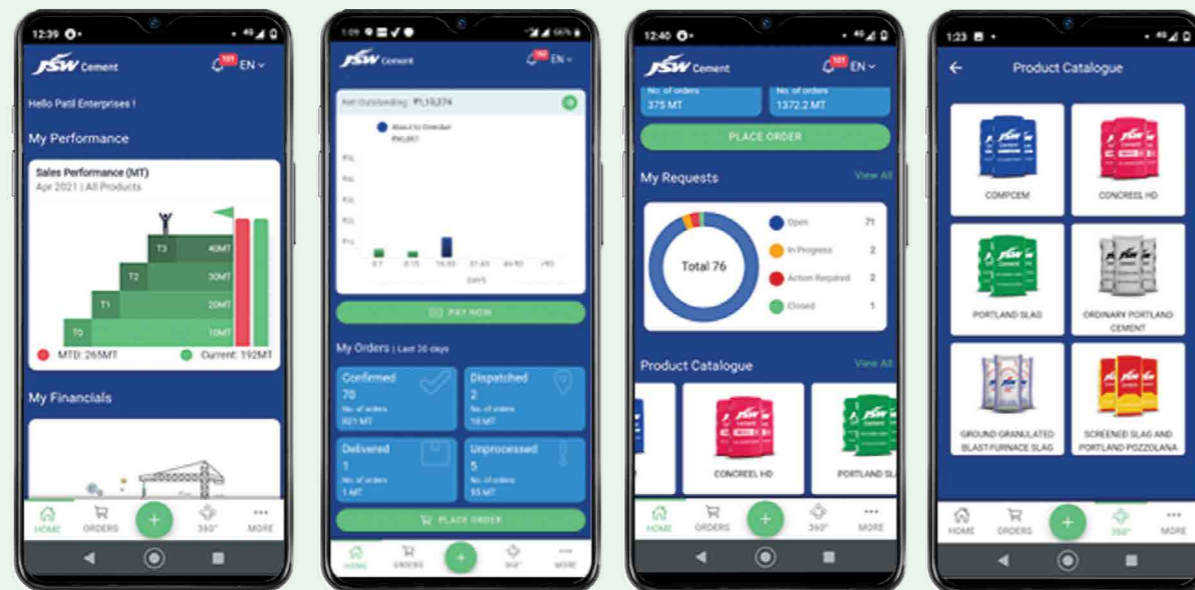
The Smart JSW Saathi app has already proven to be a powerful catalyst for JSW Sales promoter's preferences and for deepening engagement. The platform helps sales promoters with placing orders, view order status, real-time tracking of their dispatches, online payment, real-time settlement

and update of their outstanding, checking their financial books, collaborating with JSW departments through service requests, and downloading documents required in their day-to-day operations.

Accelerating sales team efficiency through Saathi App

We have introduced SAATHI platforms for our field force to accelerate their speed of execution and work more efficiently through the use of the app. Sales SAATHI is their go-to app for all customer account-related interactions. Such tools, help

raise awareness around best practices by creating visibility on dealer history, orders, financial health and issues/concerns/complaints. This platform also helps in taking up cases for closure for enhanced business outcomes and customer satisfaction.



INTELLECTUAL CAPITAL

Digitalisation of logistics and supply chain

Yard management system and 'Track n Trace' system

We have digitalised the logistics across all our manufacturing units, obtaining an end-to-end view of the entire supply chain process for ease of operations.

Utilising RFID technology, we have complete visibility of the trucks in our yard. This enables us to properly schedule the loading and unloading, keeping the turnaround time at targeted levels. With controlled trips to transporters, we are assuring quality service for our customers. Other than optimising costs, the RFID system also helps us better navigate traffic as we can plan the truck routes inside the plants. Once the trucks leave our plants, we track them throughout the journey, monitoring the driving patterns to ensure driver safety. This information is shared with the transporters regularly. With digitalisation, we have redefined our logistics operations throughout our distribution channels, attaining greater efficiency.

We are also collecting the geo-coordinates of all our customers, warehouses and delivery locations, to place

the warehouses closer to high consumption areas, with the intent of significantly improving our service. Further, we plan to introduce an efficient freight system, processes and utilise advanced tools like optimisers, among others, in the near future.

Logistics control tower

This is a 24x7 operating facility to improve customer service using cutting-edge technology involving RFID, GPS, ERP, ticketing and business intelligence tools. To deliver a seamless experience to the customer, LCT monitors all aspects of the operations right from the beginning of an order getting booked until it is delivered. All the operations are watched centrally from the control tower located in Mumbai.

LCT has played an important role in digitalising logistics operations. Digitalising all the customer and depot locations was the first step in the process. The trucks then got equipped for tracking through a variety of means.

Through in-plant monitoring processes, the system ensures loading at the optimum time for the trucks. The documentation required for the trip gets closely integrated for quick execution without the need for manual intervention.



LCT continuously tracks the bottlenecks in the dispatch process and takes corrective action to ensure an optimal delivery experience for the customer. It also tracks and controls the logistics spend and ensures timely deliveries to the correct locations. The data collected through the in-plant systems and the GPS tracking is stored carefully and used to create tailor-made solutions for our customers.

Digitalising our operations

We have deployed flexible and scalable digital solutions to enhance responsiveness across our operational network. These multi-year initiatives enable us to leverage technologies such as artificial intelligence, predictive analytics, and collaborative robotics to support factory automation and end-of-line customisation. In 2020, we initiated AI-based solutions for these areas:

We are also stepping up our capacity to capture and share data across all our value chains. We work with supply chain partners to pilot solutions that balance our efficiency and resiliency. Parallely we extended the scope of our AI-powered network optimisation tools to evaluate different product sourcing and delivery scenarios. This will enhance our ability to respond quickly to changes in demand while optimising production schedules. These tools enable us to better our operational efficacy and reduce our operational carbon footprint.

Improving the team's digital expertise

To enable our employees to extract maximum value from our digitalisation journey, we have accelerated our efforts to build up their competencies and make them more digital savvy.

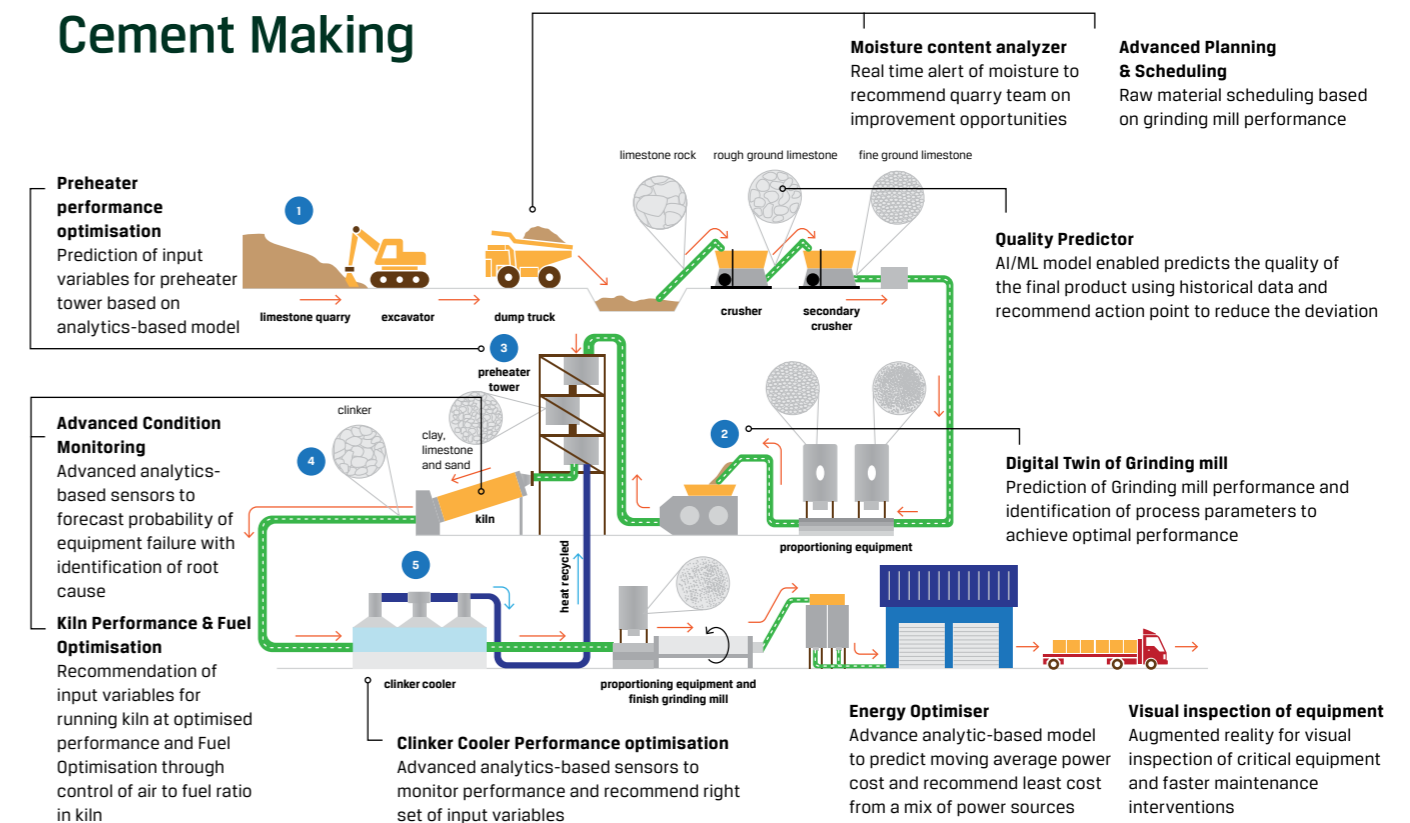
Our goal is to equip teams to

- > Be agile with digital technologies and techniques
- > Decide autonomously when, where, and how to deploy new capabilities

We intend to scale up our learning platforms and digital academies by integrating our learning platforms available at the Group level. We will also provide access to relevant, easy-to-consume learning materials on the sales apps, enabling employees to acquire applicable digital skills.

We believe that employees should have fun while learning, hence we intend to adopt a gaming-based format to implement these initiatives so that employees, trainees and apprentices can gain digital know-how relevant to their roles.

Cement Making



INTELLECTUAL CAPITAL

Research and development initiative

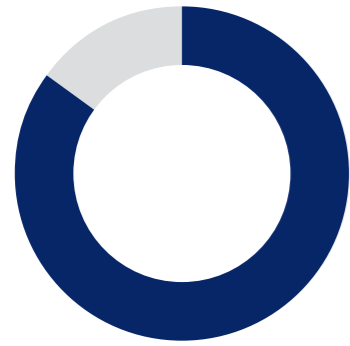
Development of Super Sulphated Cement (SSC)

Super sulphated cement (SSC) is produced with ground granulated blast furnace slag, calcined gypsum and portland cement clinker. This cement is resistant to sulphate attack and has excellent chemical resistance. Its specifications are mentioned in IS 6909. The JSW Cement R&D Centre has extensively researched and worked on developing this type of cement. We have a good synergy to produce this type of cement since a vast quantity of blast furnace slag

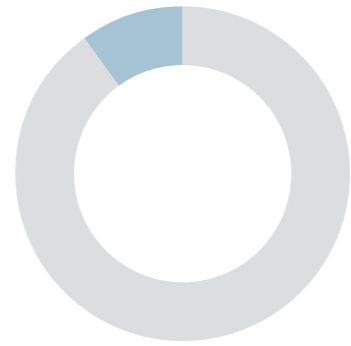
is available at various JSW steel plants which are near our grinding units. The major advantages are:

- › Lower heat of hydration and thus better stability
- › High resistance to sulphate and chloride attack. Most suitable for marine structures
- › Higher late strength compared to OPC cement
- › Higher slag usage and hence a lower clinker factor
- › CO₂ emissions are approximately 1/10th of OPC cement

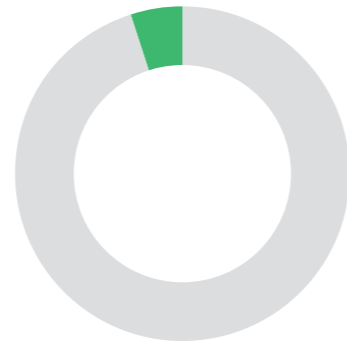
Mixing composition



GGBS



Anhydrous Gypsum (CaSO₄)



Portland Cement Clinker



Marine works



Concrete piling works



Underside of the bridges & piers etc



RCC pipes for use in underground where sulphate concentration is high



Foundations of chemically aggressive soils



Mass concreting



Transformation of AOD slag to a hydraulic/ cementitious material

Argon Oxygen Decarburization (AOD) slag is a by-product of the stainless-steel process and is available in abundance. Our R&D team in collaboration with Ecomaister has been working on transforming the AOD slag into a cementitious/hydraulic material. The AOD slag is transformed to a more stable merwinite phase through Slag Atomization Technology (SAT), which makes it more reactive in laboratory research work. We are scaling up this technology on a pilot level (500 Kg). The benefits of this research work include

- › Increased glass content in the slag transformed through SAT
- › The presence of stable phases such as merwinite resulted in improved physical properties
- › Improved reactivity of transformed AOD slag resulted in a higher blending ratio in slag cement
- › The slag cement improved the compressive strength and expansion stability

INTELLECTUAL CAPITAL

Energy optimising furnace (EOF) slag in cement blending

EOF slag is generated in our Salem unit during steel production. The generation is about 1,80,000 tonnes per annum. Our R&D investigated the utilisation potential of this slag for various applications such as its use in blended cement, clinker production and production of paver blocks. The exploratory studies revealed that the slag contained a good amount of glass content and was reactive when blended with OPC and blast furnace slag. The research work conducted through the design of experiments to evaluate the replacement ratio of BF slag in Portland slag cement indicated that 20% of BF slag in PSC, can be replaced with EOF slag.

- › The project will yield the following benefits:
- › Achieving circular economy and zero solid waste
- › Better value in use (VIU) for EOF slag
- › Improved properties of cement blended with EOF slag
- › Realisation of monetary benefits from lower slag dumping costs

Slag activity index

(%)

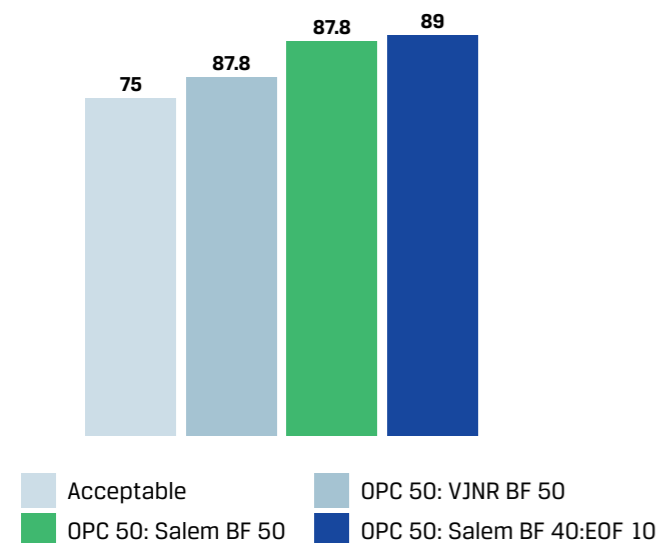


Figure 3: Slag activity index of EOF slag blended PSC

Transformation of steel slag (BOF and EAF slag) to a hydraulic material

Steel slag generated within the steel plant is utilised in low-value applications such as road making and filling low-lying areas. This slag contains a high proportion of valuable minerals like CaO(Calcium oxide) and about 20% FeO (Ferrous oxide). Our R&D has collaborated with FEHs, Germany to convert this solid waste generated, from steel industries into a high-value product. This is done by reducing iron oxide to metallic iron and converting the residual slag to a hydraulic and glassy material, which is like a granulated blast furnace slag having supplementary cementitious properties.

The benefits of this research work include

- › Valorisation of steel slag to a material suitable for producing blended cement
- › Achieving circular economy and zero solid waste
- › Conservation of virgin limestone resources and lower clinker factor
- › Lower CO₂ emissions/ton of cement and lower specific energy/ton of cement



Figure 4: Glassy steel slag produced after metal recovery and slag transformation

**Al killed LHF slag as a replacement of aluminum laterite in clinker production**

The raw material for clinker production requires sources of Al₂O₃ mineral to produce clinker of the required quality. Natural Al₂O₃-containing minerals are very scarce and available in a few geographic locations in India. The steel industry produces different types of slag, rich in different mineral constituents. Among the slags generated within the steel plant, is the alumina-rich ladle furnace slag that has very high proportions of Al₂O₃ and CaO constituents. Through sustained research efforts and plant trials, it was established by our R&D team that Al killed ladle furnace slag can replace the alumina minerals used in clinker production. The project is already getting implemented. In the first stage, about 120 tonnes per day of Al killed slag in raw mix sourced from JSW Steel Vijayanagar is utilised. In the second phase, about 100 tonnes per day of Al-killed slag from JSW Steel Dolvi will be further processed and supplied to our Nandyal plant.

The following benefits is incurred from this project

- › Lower specific consumption of limestone/ton of cement and lower specific energy
- › About 80% replacement of aluminium laterite by alumina killed steel slag
- › Monetary benefits of replacement of aluminium laterite equivalent to 200 tonnes per day
- › Approximately 22,000 tonnes per annum reduction in CO₂ emissions
- › Circularity in steel slag utilisation



Figure 5: Al killed LHF slag as substitute for aluminium laterite in clinker production

Water repellent cement - Preventing steel structures from corrosion

Our product portfolio includes innovative and sustainable products that perform under different climatic conditions. Water-repellent cement is one of the many differentiated products developed to reduce carbon footprint. This cement has all the qualities of conventional OPC cement. The lower specific fuel consumption emits about 33% less CO₂ compared to the conventional OPC cement. By developing these sustainable solutions, we aim to produce eco-friendly products to ensure a greener tomorrow for future generations. The slag cement-based water repellent cement absorbs about 50-60% less water than conventional cement when exposed to it for hours, which results in better protection of concrete and steel reinforced slabs and structures. This type of cement has excellent corrosion inhibition properties and which results in an increased life of buildings and structures.

Intellectual Property Rights (Patents)**Three patents filed in FY 2020-2021**

- › Patent 1 - A method to manufacture cementitious material from steel slag
- › Patent 2 - A method to manufacture belite-based cementitious material from steel slag
- › Patent 3 - A process to prepare dry powder polymer

Three patents filed in FY 2021- 2022

- › Patent 4 - Performance enhancer to extend the content of Ground Granulated Blast Furnace slag (GGBS) in Portland slag cement composition.
- › Patent 5 - Cement composition containing atomised Argon Oxygen Decarburisation slag and manufacturing method.
- › Patent 6 - A joined patent with IIT Roorkee: Development of calcite filled biodegradable ribbon made from a blend of polypropylene, PBAT and PLA for cement packing application.

Five more patent filing planned for in FY 2022-23 (under progress in our R & D lab and would be completed soon)

- › Manufacturing of Super Sulphated Cement using BF slag
- › Geo polymer concrete based on ground granulated BF slag
- › 3-D concrete
- › EOF slag as a substitute for Blast Furnace slag in cement manufacturing
- › Wall putty cementitious based material in powder form