

# Engineering the future of offshore wind in Japan

## A strategic breakthrough in monopile production.

While the origins of creation remain an enigma, the genesis of Japan's very first XXXL Monopile plant is a clear testament to vision, engineering excellence and determination. The initiative, driven by JFE Engineering Corporation, is not just a new chapter in industrial manufacturing, it's a bold milestone in Japan's commitment to offshore wind energy.

Located in Kasaoka, the newly inaugurated factory began its journey in July 2021, when the necessary permits and approvals were secured. It marks the first completely new facility built by JFE Engineering Corporation in nearly half a century, underlining the scale and ambition of the project. Built from the ground up, the plant has been equipped with next-generation systems, selected from global leaders in monopile manufacturing technology, to establish a world class production line.

### Innovation at the core

At the heart of the new facility is a strategy centered around sustainability and efficiency. Wider and heavier steel plates, including J-TerraPlate™, were selected to streamline the welding process, reduce emissions and minimize fabrication costs. These premium-grade plates, tailored for monopile production, offer enhanced performance and durability.

### Technology chosen to match ambition

In selecting equipment partners, JFE Engineering Corporation emphasized proven performance, scalability and technical precision. Among the key innovations integrated into the plant is a complete plate-bending solution, resulting from the strategic partnership between Faccin and Okaya.

This advanced technology comes with dedicated customer assistance, specialized training programs and responsive maintenance services to ensure maximum operational efficiency. The solution's scalable design adapts effortlessly to evolving production demands, while precise engineering and advanced control systems guarantee accuracy and consistency in the plate bending process.

With this strategic partnership, JFE Engineering Corporation gains not only state-of-the-art machinery but also reliable support and ongoing innovation, effectively aligning technological choice with its ambitious growth objectives.

The contract awarded to this joint partnership emerged as the top choice from a global pool of suppliers due to its clear advantages in productivity, safety, technical precision and customization. The technical proposal outlined a uniquely tailored solution specifically designed to meet JFE Engineering Corporation's stringent design and production requirements, distinguishing it significantly from standard offerings provided by competitors.

Central to this distinctive solution are two identical heavy-duty bending lines, each comprising an integrated handling and conveying system, combined with a GIGAROLL 4R 4200x150 four-roll plate





bending machine. These GIGAROLL systems offer significant advantages, including higher productivity, enhanced safety features and superior roundness tolerances. They can efficiently form large cones and cylinders up to 12,000 mm in diameter, expandable to 15,000 mm, and accommodate substantial plate thicknesses up to 130 mm.

This extensive capability provides JFE Engineering Corporation unmatched flexibility and accuracy in their manufacturing processes, enabling safer operations and consistent production quality. As a result, the company achieves improved efficiency, superior product quality and a distinctive competitive advantage in the global market.

#### Designed for scale, built for precision

Each plate bending line includes a sophisticated system for handling steel plates over 40 meters in length and 4.2 meters in width. Plates are continuously supported on rollers along both longitudinal and transverse axes, significantly reducing friction and mechanical stress. This approach not only preserves the surface quality of the plates but also supports advanced welding preparation, even when side bevels are applied.

Operators benefit from a high-tech control panel that displays live positioning data and enables automatic subroutines for precise cone rolling. The system can be reconfigured directly from the operator station, whether producing cylinders or cones, with no manual intervention required. Cameras positioned throughout the setup provide full visibility of the operations.

Importantly, handling operations can run parallel to or independently from the plate bending, significantly reducing cycle times and improving throughput.

#### Measurement, automation and quality control

To ensure absolute control and consistency, each GIGAROLL line is equipped with EYE BEND, a laser-based real-time measurement system. This advanced system delivers continuous feedback on the bending radius,



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enhancing automation, reducing errors and significantly speeding up inspection processes. Such precise, real-time monitoring meets the stringent accuracy and efficiency requirements particularly critical in sectors like wind energy, where component precision directly affects performance and longevity.

The hydraulic systems, built with a modular approach, feature a custom epicyclic reduction gearbox and central drive unit with four satellite hydro motors. This four-motor configuration ensures continuous operability even during maintenance, significantly reducing downtime. All hydraulic axes are proportionally controlled via Load Sensing on a compensated manifold, providing fine-tuned responsiveness and excellent energy efficiency.

With over five decades of experience in heavy-duty applications, Faccin specifically designed these robust, high-performance systems to handle the extreme demands of high-volume production environments, particularly addressing challenges faced by the wind sector, such as the requirement for

consistent quality, durability and efficiency in manufacturing large scale turbine components.

### From vision to reality

Such a high-caliber installation demanded strict adherence to a tight construction schedule. Faccin's team successfully met all delivery and commissioning milestones. On March 19, 2024, the plant's official inauguration took place in the presence of Hajime Ooshita, President and CEO of JFE Engineering Corporation.

The event included the first live demonstration of plate rolling by the new GIGAROLL systems. Just weeks later, on April 1st, the facility officially commenced production of monopiles.

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### Faccin Group: powering precision engineering

With over 50 years of experience in precision metal forming, Faccin Group has become a trusted name in supplying high-performance machinery to the world's most demanding industries.

Headquartered in Visano, Italy, Faccin Group is comprised of three leading brands, Faccin, Boldrini and Roundo, each known for engineering excellence and innovation.

Together, they represent one of the largest manufacturers of metal forming machines globally, with more than 17,000 installations in over 150 countries.

The company operates a 60,000 square meter facility that includes a 15,000 square meter dedicated production area.

Every machine is designed, engineered and assembled in-house, ensuring complete control over quality and performance.

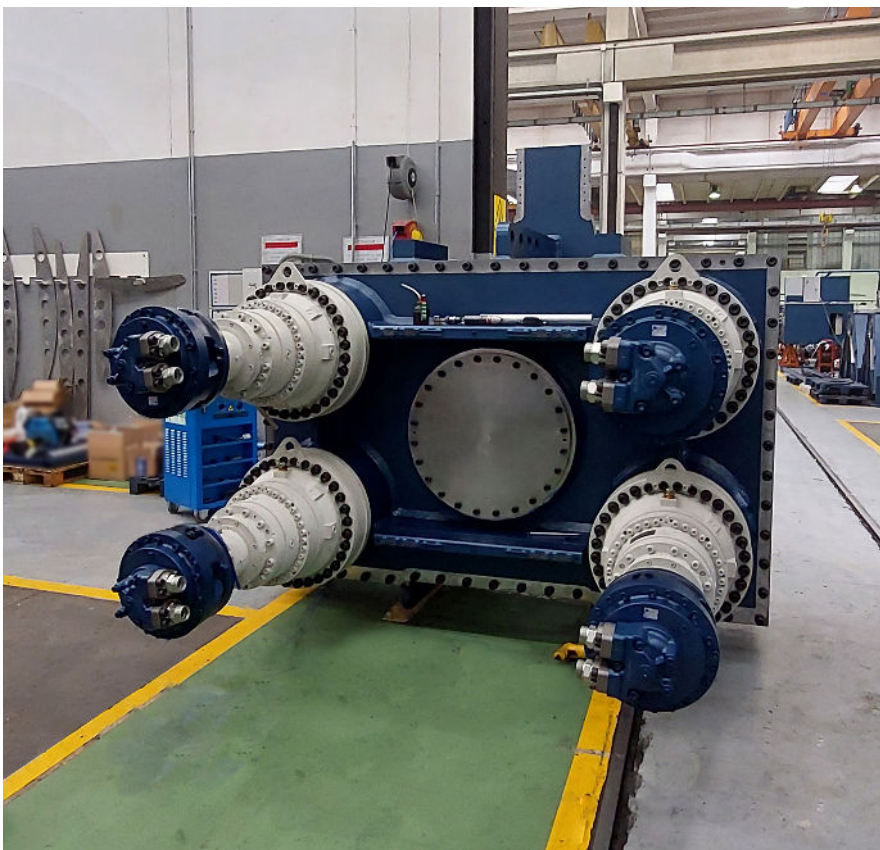
In 2009, Faccin Group earned ISO 9001 certification, reinforcing its commitment to excellence in manufacturing standards and customer satisfaction.

In the context of the offshore wind sector, Faccin Group has become a strategic enabler, especially in large-diameter rolling systems tailored for monopile and tower fabrication.

Its GIGAROLL series, designed specifically for extreme-duty applications, incorporates features like the proprietary EYE BEND system, a laser-based real-time feedback solution that increases precision and reduces inspection times.

This focus on customized, scalable solutions and responsive support has made Faccin Group an ideal partner for major infrastructure projects such as JFE Engineering Corporation's new monopile facility in Japan.

By delivering not just machinery but ongoing technical collaboration, Faccin helps shape the manufacturing backbone of the renewable energy transition, one precision roll at a time.



Faccin's main top roll drive