

WORLD'S FIRST SUSTAINABLE METAL RECYCLING PLANT

Mitsubishi Electric supplies 3,000 hp frequency inverter for large shredder plant at S. Norton Group in Manchester

Ratingen, Germany 26th February 2025

The S. Norton Group has invested £20 million in a brand-new/world-class metal shredding facility in Manchester, UK. The Company group collects, processes and exports 1,5 million tons per year. In Manchester the ZZ Power Zerdicator is the world's first shredder equipped with a state-of-the-art drive solution. It achieves an annual throughput of 130 tph.

The recycling business is highly energy intensive. Shredders, conveyor belts and exhaust air treatment are massive consumers of electricity. With the ZZ Power Zerdicator, LINDEMANN Metal Recycling Solutions and Mitsubishi Electric have developed a system for the S. Norton Group that will provide significant reductions in energy consumption. The frequency inverters from Mitsubishi Electric are key to what makes this energy-saving and highly efficient operation possible!

"This installation is the best in its class for shredders worldwide," said Nikolas Sachinopoulos, General Manager of LINDEMANN in the UK. "It is a great example of the significant benefits offered by the motor load monitoring and speed control systems of the frequency inverter."

The ZZ Power Zerdicator – 3,000 hp for high-quality recycling

The centerpiece of the new metals processing line at S. Norton is the 3,000 hp Lindemann ZZ Power shredder. It is one of the largest and most

powerful shredder in the LINDEMANN range, but also one of the most efficient in the world. ZZ series shredders are known for their high throughput capacity with low specific energy requirements. S. Norton's installation is equipped with a three-phase asynchronous motor, which is driven via the energy-efficient TMDrive medium-voltage inverters, powered by Mitsubishi Electric. These inverters enable reliable and precise control of the shredder's main motor to enable the material quality and desired plant throughput. An incredible 130 tons of recycled metal can be processed per hour by the plant.

Intelligent load management

Thanks to load management, the modern medium and low-voltage frequency inverters from Mitsubishi Electric are able to reduce load peaks, lower energy consumption and at the same time ensure the grid stability of the energy supplier. The flexible control provided by the TMdrive or the FR-A800/FR-F800 series enables higher motor utilization in the system areas without overload, and operation of the system in the optimum range. This increases the service life of the system components.

Optimized feed

The system also includes a EtaRip Pre-shredder, which further increases the capacity and efficiency of the shredder line. As a modern drive solution, the ZZ Power Zerdinator enables a high level of consistency in the shredder drive and optimizes the feeding process and utilization of the shredder capacity thanks to the Shredder Drive Assistant (SDA).

Due to the constantly changing composition of the material fed into the machine, the rotor of a shredder must fulfil constantly changing performance requirements.

When the shredder rotor is loaded with scrap metal to be processed, it slows down briefly. To compensate for this and bring the motor back up to

speed, it draws as much power as possible from the grid, which leads to peak loads, grid asymmetries and high energy costs. When a frequency inverter is used however, the amount of electricity drawn from the grid at the same time is controlled, and the rotor speed is reduced, without noticeable loss during operation.

Recycling without borders

This shredder knows almost no limits, it recycles everything – from individual pieces of scrap metal to complete end-of-life vehicles, as well as waste electrical and electronic equipment (WEEE), producing higher quality ferrous and non-ferrous metal grades.

Sustainability and efficiency

Mitsubishi Electric makes a positive contribution to the sustainability of the plant by providing energy-efficient drive solutions. The performance spectrum of Mitsubishi Electric drive and automation solutions ranges up to outputs of 7,350 kVA. They are characterized by ease of operation, quality through high vertical integration and high reliability. Software solutions such as the Recycling Asset Portal offer options for optimizing the systems. For example, the Asset Portal can be used to visualize, analyze and optimize operating data. This increases the availability of the system through predictive maintenance functions.

The RD55 data logger enables simple connection to existing systems in order to record current energy consumption and derive energy efficiency measures. "In this way, Mitsubishi Electric is also supporting its customers with digitalization," explains T. Droth, Business Development at Mitsubishi Electric Germany.

This approach creates a strong link between the company's 2050 sustainability goals and the energy-intensive recycling market. Rising energy prices are not only a burden on companies, but also a challenge

for the profitability of the sector. With intelligent products and solutions for saving energy and costs, Mitsubishi Electric is contributing to the future viability of metal recycling, which in turn is a cornerstone of the sustainable circular economy. The global recycled metals market is enormous, 45.8% of the almost 37 million tons of crude steel produced in Germany in 2022 was made from recycled steel. ⁽¹⁾

Box:

Founded in Liverpool in 1962, S. Norton Group collects, processes and distributes around 1,5 million tons of recycled metals every year. It also recycles over 95% of all processed materials through shredding and aims to divert waste from landfill.

The company's philosophy of "doing the job once and doing it right" is reflected in the close collaboration with LINDEMANN that has grown over decades. This partnership and the excellent teamwork, also with Mitsubishi Electric in this project, contributed significantly to the success of the project.

¹ Source: https://www.bvse.de/dateien2020/2-PDF/02-Press/04-Schrott-ES-Kfz/2023/bvse-Schrottmarktrückblick_2022.pdf

Pictures:



Image 1: With 3,000 hp, the LINDEMANN ZZ Power shredder is one of

the most powerful shredders in the world

[Source: Mitsubishi Electric Europe B.V.]



Image 2: Existing systems can easily be retrofitted with Mitsubishi Electric's low-maintenance frequency inverters on three-phase asynchronous motors, which leads to savings in energy, wear and maintenance costs.

[Source: Mitsubishi Electric Europe B.V.]



Image 3: The flexible control provided by the Mitsubishi Electric's TMdrive or the frequency inverter FR-A800/FR-F800 series enables higher motor

utilization without overload in the system areas and operation of the system in the optimum range.

[Source: Mitsubishi Electric Europe B.V.]



Image 4 : Operating data is visualized in a user-friendly way via the GOT operator terminal from Mitsubishi Electric.

[Source: Mitsubishi Electric Europe B.V.]



Image 5: The drive units form the centerpiece and the power section of

the inverter. If necessary, they can be pulled out in a modular fashion and serviced.

[Source: Mitsubishi Electric Europe B.V.]



Image 6: The transformer ensures the power supply for the drive units.

[Source: Mitsubishi Electric Europe B.V.]



Image 7: The MELSEC I-QR series controller provides the operating data for the Asset Portal via the RD55 data logger.

[Source: Mitsubishi Electric Europe B.V.]



Image 8: With the help of modern drive technology from Mitsubishi Electric, an impressive return on investment (ROI) can be achieved through cost savings and increased productivity.

[Source: Mitsubishi Electric Europe B.V.]



Image 9: The EtaRip Pre-shredder is the preliminary stage of the Zerditor shredder, which effortlessly recycles 130 tons of metal per hour – from scrap metal to entire end of life vehicles.

[Source: Mitsubishi Electric Europe B.V.]

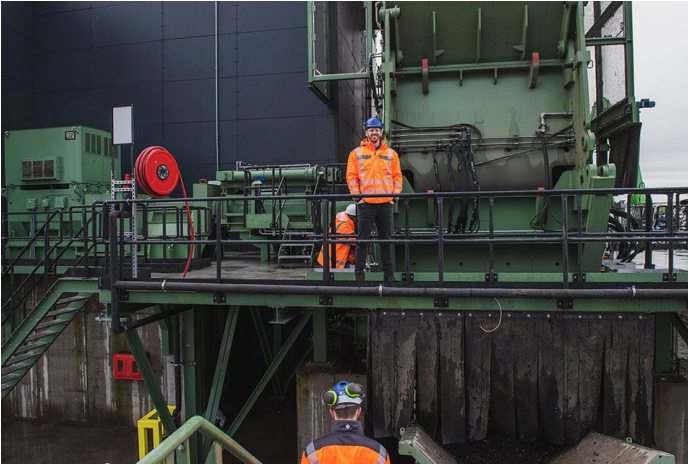


Image 10: "We always thought that we should do the job once - and do it properly. We have had a close relationship with LINDEMANN for decades. They supported us with this project."

DAVID HOBSON, Group Capital Projects Manager at S. Norton

(Source: Lindemann)

Further information on this topic:

https://de.mitsubishielectric.com/fa/de_en/lp/loesungen-fuer-die-recyclingindustrie

[Mitsubishi Electric Asset Portal](#)

To the editors:

If you create a LinkedIn post, please link to our local company page!

<https://www.linkedin.com/showcase/mitsubishi-electric-europe-factory-automation-emea>

About LINDEMANN

LINDEMANN Metal Recycling Solutions designs, develops and produces first-class machines and systems as well as original spare parts in the premium segment. The company supplies customers from the scrap and metal processing industry, the scrap producing industry, the automotive

industry as well as foundries and steelworks. For 110 years, the company has been known in the industry for the outstanding quality of its machines and parts, and this has not changed to this day.

The company, which has 20 locations worldwide (branches and sales partners) and is headquartered in Düsseldorf, offers the entire metal recycling value chain, including separation, sorting and dust removal.

<https://lindemann-metalrecycling.com/de/>

About S. Norton & Co Ltd

S. Norton & Co Ltd is a leader in British metal recycling. The company began operations in the early 1960s and has continued to grow ever since. This is emphasized by winning two Queen's Awards for export in 2004 and 2009. The head office is based in Liverpool, with branches in Manchester, Glasgow, London and Southampton.

The strategic partnership and ongoing investment with Axion Recycling Ltd enables the company to recycle up to 95% of processed materials through shredding. Their commitment to the environment is epitomized by their aim to work towards a world where nothing goes to waste.

<https://www.s-norton.com/>

About Mitsubishi Electric Corporation

Mitsubishi Electric Corporation (TOKYO: 6503) has more than 100 years of experience in manufacturing reliable, high-quality products and is a recognized world leader in the production, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. Mitsubishi Electric enriches society with technology in the spirit of its "Changes for the Better". The company recorded sales of 5.257,9 billion yen (34,8 billion US dollars*) in the fiscal year ended 31

March 2024.

Further information can be found at www.MitsubishiElectric.com

**The amounts in US dollars are converted from yen at the rate of ¥151=US\$1, the approximate rate on the Tokyo foreign exchange market on 31 March 2024.*

About the Mitsubishi Electric Factory Automation Business Group

Mitsubishi Electric offers a wide range of automation and processing technologies, including control systems, drive products, power distribution and control products, electrical discharge machines, electron beam machines, laser processing machines, computerized numerical control systems and industrial robots, contributing to higher productivity - and quality - in factories. In addition, the extensive service networks around the globe provide direct communication and comprehensive support for customers. The global slogan "Automating the World" illustrates the company's approach of utilizing automation for the benefit of society by using advanced technologies, sharing know-how and supporting customers as a trusted partner.

You can find more information about the history of "Automating the World" here:

www.MitsubishiElectric.com/fa/about-us/automating-the-world

Factory Automation EMEA

Mitsubishi Electric Europe B.V., Factory Automation EMEA, has its European headquarters in Ratingen near Düsseldorf. It is part of Mitsubishi Electric Europe B.V., which has been represented in Germany since 1978 and is a wholly owned subsidiary of Mitsubishi Electric Corporation, Japan. The task of Factory Automation EMEA is to manage sales, service and support via the network of local subsidiaries and distributors throughout the EMEA region.

Further information can be found at:

emea.mitsubishielectric.com/fa

About e-F@ctory

e-F@ctory is Mitsubishi Electric's integrated approach to building reliable and flexible manufacturing systems that enable users to achieve many of their high-speed, information-driven manufacturing goals. Through its partner solutions, the e-F@ctory Alliance, and co-operation with open network associations such as the CC-Link Partners Association (CLPA), users can build comprehensive solutions based on a far-reaching "best-in-class" principle.

To summarise, e-F@ctory and the e-F@ctory Alliance enable customers to achieve integrated manufacturing while retaining the ability to choose the optimal suppliers and solutions.

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emea.mitsubishielectric.com

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