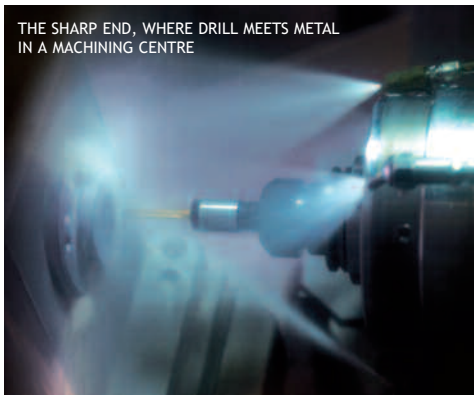
Adding Swedish steel to glass

ANDREW FRASER AND BJÖRN HÄGGLUND TAKE US ON A TOUR OF EMHART GLASS'S ÖREBRO PLANT IN SWEDEN


THE SHARP END, WHERE DRILL MEETS METAL IN A MACHINING CENTRE


CHECKING THE SET-UP OF A MACHINING OPERATION

Emhart Glass supplies glass container manufacturing and inspection equipment around the world. The company invented the first IS machine in 1924, and today's products include the 12 section quad-gob servo-electric NIS machine. The Emhart Inex division offers a range of inspection systems, from basic mechanical devices to sophisticated, powerful high-speed vision inspection systems.

The three US plants in New York, Florida and Missouri produce cold end equipment and refractory items, whilst production of hot end machinery is centred in Sweden. There, the northern Sundsvall plant concentrates on the assembly of IS machines of all types, together with gob-forming and ware-handling equipment. Sundsvall is also the location of a large store of IS parts and accessories, from where glass plants across the world are supplied through the Emhart Glass distribution system. Further south in Sweden, the Örebro factory specialises in high precision metal-working.


THE PLANT'S IONITRIDING CELLS USE GLOW DISCHARGE TECHNOLOGY TO ENSURE EXTRA-HARD METAL SURFACES

HISTORY OF THE ÖREBRO PLANT

Örebro is a medium-sized town situated approximately midway between the centres of Stockholm and Gothenburg. The current Emhart Glass factory was built in 1917 by the company Örebro Motorfabrik to manufacture boat engines.

In 1953 the company started supplying a variety of machine parts to Sundsvalls Verkstäder, which was already established as the main machine-building centre for Emhart Glass. Over the years, this relationship developed to the point where in 1959 the Örebro factory was bought by the Swedish subsidiary of Emhart Glass to become a dedicated supplier of IS machine parts.

PEOPLE

The Emhart Glass factory in Örebro currently employs 160 people in three production shifts. Many employees have a long history of service in the plant, which ensures a deep level of understanding of the special requirements of the glass industry. Over the years, the skill requirements have changed significantly, from classical metal-working expertise to the ability to handle largely automated production equipment. This task demands more IT-related programming and scheduling skills, without losing contact with the basic manufacturing processes.

In the surrounding area there is also a long-established local culture of metal-working expertise. Companies such as Volvo, Atlas-Copco and Scania operate manufacturing facilities in the area, which results in a pool of highly-trained and experienced personnel. An additional benefit is the proximity to specialist sub-contractors, who can provide incremental capacity to cope with the large demand fluctuations which are typical of the glassmaking machinery business.

EQUIPMENT

The plant covers an area of 10,000m^2, the majority of which is occupied by a machine base of 40 CNC milling/grinding machines that can be operated around the clock with minimum operator control. This equipment has also been designed to offer high flexibility in order to handle the large and unpredictable range of items being produced.

Automated production also demands automated materials handling; the plant's central automated crane is a computer-controlled material transportation system capable of ensuring that the raw work-pieces arrive at the machining centre exactly when required. In common with the machining centres, this material handling system also runs day and night without the presence of operating personnel.

In its machining of complex metal parts, the Örebro plant produces the particularly hard surfaces that are required to deal with the mechanical, chemical and


CHECKING A BATCH OF TRIPLE GOB TAKEOUT TONG HEADS

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thermal stresses typically encountered in a glass plant. To achieve this, the factory operates two ionitriding cells which use glow discharge technology to generate streams of nitrogen ions to modify the metal surface, producing a layer of exceptional hardness (60-65 HRC or higher).

Highly specialised equipment is required as this process takes place in a vacuum, albeit without the need for extremely high temperatures. As well as outstanding hardness, this method also enables lowered friction coefficients, higher resistance to crack initiation, reduced susceptibility to corrosion in the finished article and good dimensional stability.The process is also pollution-free.

In common with all Emhart Glass manufacturing plants, Örebro is certified to ISO 9000-2000. This certifies that the company is producing high quality items in a systematic and structured way, assuring good conditions for consistent quality. An additional ISO 14 000 certification means that the production methods and practices are designed to reduce environmental impact.

PRODUCTS

Emhart Glass supplies every part required to build, operate, upgrade and maintain its IS machines. Whilst some of these items are sourced from specialist subcontractors, most of the critical, high tolerance, difficult-to-produce metal parts are manufactured in the company's Örebro plant.

Typical items include mould holder arms and inserts, baffle-, blow head-, funnel- and takeout-arms, plenum chambers, pistons and rods, lock rings, mechanism housings and section frames. The Örebro plant also assembles, tests and certifies neck ring mechanisms.

PRECISE SET-UP OF MILLING MACHINE TOOLS IS ESSENTIAL

CAREFUL PACKING BEFORE THE PARTS ARE SHIPPED AROUND THE WORLD

LOW COST MANUFACTURING

Components of a modern glass forming machine have to withstand aggressive operating conditions and at the same time meet exacting tolerances. Manufacturing these items requires extraordinary abilities and equipment. In the glass industry, volumes are relatively low and variety is high – factors which convinced Emhart Glass to expand its European manufacturing base rather than follow the trend to outsource production to 'low-cost' Asian countries.

Cost savings claimed for outsourcing projects to other mass-manufacturing industries have been found to be less applicable to machinery for the glass container industry. When all elements of production are considered (including consistent quality, ability to meet manufacturing deadlines, flexibility, logistics, knowledge transfer, efficiency improvements and remoteness from engineering), the lowest overall production costs result from centres of manufacturing excellence, such as Örebro, rather than from low-wage locations.

LINKED WITH ENGINEERING

Emhart Glass prides itself on its ability to meet all customer requirements, which frequently leads to customer-specific modifications, in addition to the introduction of new and improved equipment designs. The close integration of design and manufacturing at an early stage in product development helps to maintain a high level of flexibility and a shorter time to market.

WORK PIECES ARE AUTOMATICALLY FED TO THE MILLING/GRINDING CENTRE FOR ROUND-THE-CLOCK OPERATION

This level of intensive cooperation highlights the benefits of having in-house production facilities where the company can determine production priorities, rather than relying on the uncertainties of free capacity at an external supplier with its own interests.

THE FUTURE FOR ÖREBRO

Demand for production machinery continues to grow, which requires non-stop modernisation and updating of manufacturing and assembly facilities. For the Örebro plant this means a comprehensive investment programme in order to take advantage of the latest technology at a time when traditional tasks are becoming less labour-intensive.

For example, this year additional investments are being made in further automating the manufacture of section frames. However, investments in storage capacity are minimised because production is carried out 'just-in-time' so finished items are shipped daily to Sundsvall for assembly and to meet demand for spare parts.

Further into the future, Emhart Glass aims to directly link its supply logistics to the demands of its customers and to pass the resulting materials requirements directly to its internal and external suppliers through links with their production systems. In this way, time and administrative effort can be reduced, with a diminished need to maintain expensive stocks at each level. For Emhart Glass Örebro, this means increasingly close integration into materials requirement planning networks and increasing pressure to set and meet aggressive supply targets. ■

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