

SUCCESS THROUGH SYNERGY SUMITOMO (SHI) DEMAG SUPPORT PACKAGE HELPS ITALIAN DC MOTOR MANUFACTURER MOVE INTO INJECTION MOULDING

Value takes many forms. But for one Italian company specialising in automotive and industrial DC motor production, Sumitomo (SHI) Demag is much more than a machinery supplier. The affinity, consultancy support and practical guidance supplied by Sumitomo (SHI) Demag consistently over the last two decades has proved invaluable to Electro-Parts S.p.A who embarked on launching a dedicated in-house moulding facility in 2002. From utilising its deep experience in purchasing and sourcing plastic components for its motors to its current in-house production of 30 million precision components annually, the Italian firm is now on an ambitious mission to penetrate new markets.

For 20 years, Electro-Parts S.p.A located in Bossolasco, Northern Italy, had carved out a solid reputation as a quality manufacturer of DC motors and gears used predominantly by the automotive sector. Yet, its reliance on one external supplier could have thwarted future strategic ambitions at the turn of the century. To safeguard the company's future, CEO Marco Falcone tentatively approached current Sumitomo (SHI) Demag's Italy Managing Director Paolo Zirondoli to explore the feasibility of establishing an in-house mould shop.

Paolo's advice proved invaluable. With the support of Sumitomo (SHI) Demag, Electro-Parts developed a roadmap to bring the moulding of its precision components in house. Starting with a hydraulic driven machines, today the company's fleet comprises 14 Sumitomo (SHI) Demag injection moulding machines, including nine precision all-electric operating three shifts daily, including an overnight ghost shift.

CEO Marco Falcone recalls the pivotal moment Electro-Parts switched from sub-contracting its production of components to bringing moulding in-house and commends the ongoing consultancy support and 'total solution' approach. *"Sumitomo (SHI) Demag's support getting this project off the ground has been invaluable. The relationship formed at the start was mutually beneficial. They have been an exceptional partner, sharing the same affinity to our business strategy and providing the assurance that the equipment was 100 percent reliable and appropriate for the strategy we were proposing. They supported us in the switch in applying the indirect moulding experience we had gained purchasing parts to developing our own direct moulding process. Electro-Parts launched a facility that enabled us from day one of this new approach to maintain control over production capacity, costs and quality. The synergy between our two companies has been constant. Through this mutual trust, the Sumitomo (SHI) Demag Italy team helped us to fast track our ambitions."*

Since 2002, the Electro-Parts plant has expanded five times, adding equipment, gaining ISO 16949:2002 certification and establishing dedicated assembly and electronic R&D centres.

Masters of precision moulding

With today's workforce of approximately 280 people, 180 in Italy and 100 in Romania, Electro-Parts manufactures and assembles a wide range of motion parts, DC and brushless motors used in vehicle roof tops, electric windows, as well as parking brakes, seat adjustments, automated trunk opening and closure mechanisms and cooling fans. Every mass moulded component is assembled and EOL tested on one of 30 automatic lines on-site.

As production line assembly robots are not tolerant to variables, moulding repeatability and precision on every single component is critical, notes Paolo. It's one of the key rationales why Electro-Parts installed the first IntElect Smart all-electric machine in 2009, introduced thanks to the dedication and engagement of the local agent Mr. Roberto Sallemi, that since years together the Sumitomo Demag Italian Team takes care of the Customer. Since this date, the company has exclusively extended its machine fleet with all-electric injection moulding machines, initially with the IntElect Smart series, followed by the IntElect2. Two of the latest IntElect2 series were installed in July 2021.

With automotive applications requiring greater dimensional stability, Electro-Parts predominantly uses polyamide, materials and other safety and fibre reinforced components. Controlling the injection pressure and process optimisation is essential for mouldability.

Paolo explains: *"For industries where precision is paramount, the combination of electric drives and digital control can turn injection moulding into a predictable and precise operation. As a result of the parallel movements, Electro-Parts reported a 15% increase in productivity on their new IntElect machines compared to their hydraulic machines."* Fewer defects and subsequently less material waste was also a decisive driver for moving entirely to all-electric machines. Due to the highly technical demands and properties of the components, Electro-Parts cannot reuse and recycle scrap material.

Given the current material expense and supply challenges, every plastic pellet must be transformed into a part rather than wasted. Processing 200 tons of material every year, the IntElect machines address this critical challenge, as well as other sustainability agendas including energy consumption, water use and noise emissions to safeguard workforce welfare.

"The IntElect machines enable moulders to run much closer to low weight limits, with greater precision and consequently fewer defects and lower scrap rates. In practical terms, it means no additional quality control

or associated costs are required. Simply put, each IntElect machine generates first class quality parts, time and again,” adds Paolo.

Luca Avataneo, who has managed the Italian company’s entire moulding workshop since the very first day comments: *“We change moulds two or three times daily, processing very technically demanding polymers, including glass fibre reinforced polyamides, self-extinguishing materials, PBT, PPA and more. Consequently, every machine must be easy and fast to reset, reactive, flexible, reliable and high-performing.”*

Sustainable and smarter

Sumitomo (SHI) Demag’s direct drives – developed in house by its Japanese parent company – are another feature valued by Electro-Parts. Designed and built purely for the injection moulding process by experts truly dedicated to motion control, the high torque motor is reactive and reduces the risk of inertia. Paolo explains: *“Sumitomo (SHI) Demag is unique in that we don’t use conventional motors. The reason - injection moulding isn’t a simply standard process. It’s high speed with very fast acceleration and braking. Rather than incurring efficiency losses as a result of additional components used in conventional indirect technology, our motors are directly linked to the axis. Resulting in a higher injection power and a more dynamic response. As a result, in certain conditions moulders can achieve energy savings exceeding 70 percent and even faster cycle times in comparison to conventional moulding.”*

All of Electro-Parts IntElect machines are also equipped with Sumitomo (SHI) Demag’s patented activeFlowBalance. This unique technology ensures complete filling of the mould tool cavities, ranging from single to eight cavities at Electro-Parts. As the main person overseeing the machines, Luca explains: *“The activeFlowBalance feature uses the compression of the melt inside the barrel to stabilise the pressure, resulting in partially-filled cavities being filled by the expanding melt. It means equal pressure is applied to each cavity, avoiding flashes and incomplete filling. Doing this automatically saves me time by allowing complex injection profiles to be established in less than a minute, with minimal input from myself or other technical staff.”*

Paolo confirms: *“activeFlowBalance overcomes many of the problems which can cause malformed parts in the injection moulding process, undermining productivity and profit. Using this technology can reduce rejects by up to 40%.”*

Another unique IntElect feature – activeProtect, ensures falling components are safely ejected during the opening and closing sequence, protecting the mould tool from damage. Paolo clarifies: *“The additional sensor on the link of the toggle system controls and measures the forces on the clamping movement during*

the complete stroke. If the sensor picks up that the position or forces have deviated from the set parameters and related tolerances, it reacts instantly.”

For added mould protection, activeProtect also monitors the opening strokes. This helps to ensure mechanical mould elements, for example pins, are protected from damage.

The complete package

Providing all the equipment, including cooling systems and peripheral items, coupled with the consultancy support, training and process optimisation guidance from day one, has put Electro-Parts on a new strategic path which it is embracing with confidence. CEO Marco comments: *“Having previously relied on sub-contractors to supply components, we now have the moulding acumen and capacity to consider expanding production to supply assembled precision motors to new markets.”*

Excited about the future prospects, Marco concludes: *“The extensive experience gained by injection moulding precision components to exacting quality standards in our highly efficient moulding shop, all fully equipped with Sumitomo (SHI) Demag machines managed by Luca has opened our minds to new production scenarios. Including sub-contracting our services out to manufacture high demanding parts for other OEMs. Reaching this point was made all the more feasible thanks to the unwavering support of Sumitomo (SHI) Demag. It has been a technology and team effort.”*

Images/captions



Image 1: With the support of Sumitomo (SHI) Demag, Electro-Parts developed a roadmap to successfully mould its precision components in house



Image 2: Electro-Parts processes 200 tons of material annually, producing 30 million technical components for motors and gears

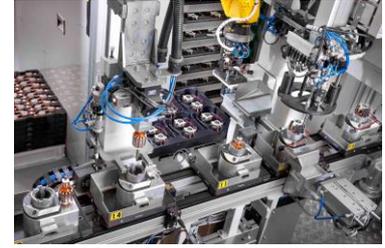


Image 3: The IntElect's unique mould safety system helps to ensure mechanical mould elements, for example pins, are protected from damage



Image 4: Moulding repeatability and precision on every single component is critical, as automated assembly lines are not tolerant to variables



Image 5: Since 2002, the Electro-Parts plant has expanded five times, adding equipment, gaining ISO 16949:2002 certification and establishing dedicated assembly and electronic R&D centres.

Notes to the editor

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Sumitomo (SHI) Demag Plastics Machinery GmbH

Sumitomo (SHI) Demag has had a strong influence on the development of the plastics industry from its very beginnings. As specialists in injection moulding machines for plastics processes, Sumitomo (SHI) Demag, together with its Japanese parent company, Sumitomo Heavy Industries, is one of the world's leading companies in the industry.

The global development and production network of Sumitomo Heavy Industries and Sumitomo (SHI) Demag consists of four facilities in Japan, Germany and China with more than 3,000 employees. The product portfolio includes all-electric, hydraulic and hybrid-driven injection moulding machines with clamping forces of between 180 and 15.000 kN. With over 154,000 installed machines, Sumitomo (SHI) Demag is present in important markets worldwide and is one of the largest manufacturers of injection moulding machines.

The parent company plant in Chiba, Japan, manufactures machines with small and medium clamping forces. Approximately 95 % of all delivered machines have an all-electric drive concept. The German Sumitomo (SHI) Demag's locations in Schwaig and Wiehe use hybrid drive concepts to manufacture the Systec Servo series, as well as the high-performance and high-speed EI-Exis SP and Systec SP machines. The IntElect series with all-electric drive technology is also manufactured in Germany for the international market.

Sumitomo (SHI) Demag has had a production facility in Ningbo, China, since 1998. The Systec C series with clamping forces of 500 to 10,000 kN has been manufactured for Asian markets in a new factory (13,000 m² floor space) of this subsidiary, Demag Plastics Machinery (Ningbo) Co., Ltd., since mid-2015.

In addition to injection moulding machines, Sumitomo (SHI) Demag provides standard and customized systems for parts handling automation, process engineering and solutions for special applications, and dedicated services, as well as machine financing options.

With its seamless sales and service network of subsidiaries and agencies, Sumitomo (SHI) Demag supports all major industrial markets.