

BUILDING ON EXPERIENCE

The first man-made plastic was invented in Britain by Alexander Parkes in 1861. Called Parkesine, it was a cellulose derivative that could be heated, moulded and, when cool, would retain that shape. It was not however commercially practicable. In 1868, John Wesley Hyatt in America developed Celluloid which was; with the help of his brother he then went on to patent the first injection moulding machine in 1872. For the next 70 years, the process changed very little and its use was restricted to manufacturing simple products such as buttons and hair combs.

The breakthrough came in 1946 when another American, James Watson Hendry, built the first screw injection machine. It now became possible to control the speed of injection more precisely which, in turn, allowed better quality products to be made. It also allowed material to be mixed prior to injection so that colouring agents or recycled plastic could be added to virgin material. Injection moulding is therefore clearly not a new technology. It is, however, one that has had an enormous impact on industry in general and the production of footwear with non-leather soles in particular.

While some producers of injection moulding machines for footwear specialise in a particular material or group of materials, others try to cover a broader field. Very few cater for all the synthetic soling compounds used in the footwear

industry and, of these, Main Group Technologies from Italy is at the forefront. The brand has been in existence for 80 years and during that time has accumulated an immense wealth of practical experience in designing and building injection moulding machines. It has recently taken another step forward with new headquarters with all the facilities needed to design, manufacture and warehouse its extensive range of machines in one place.

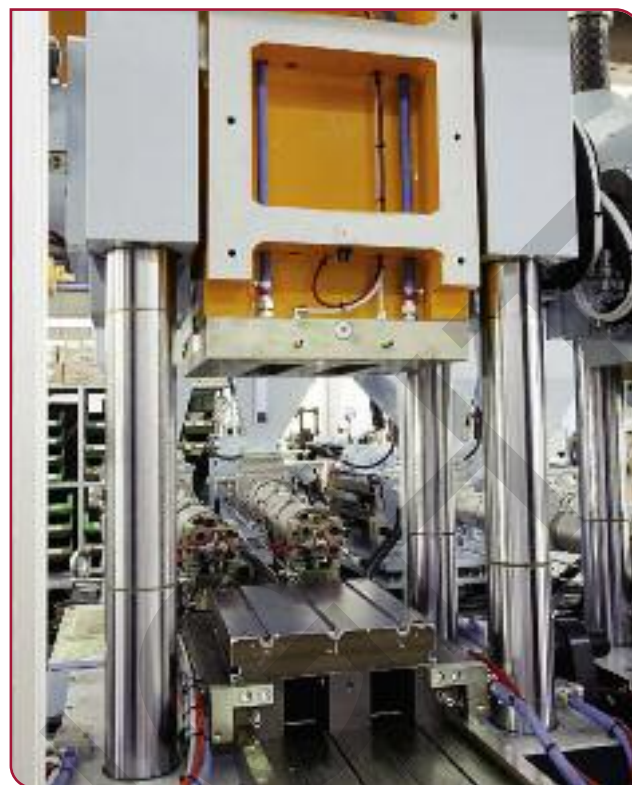
The scope of this range is quite extraordinary as it comprises no less than 14 designs capable of injecting rubber, EVA, PU and the entire range of thermoplastics, as well as combinations of different materials. The spread of technology needed to do this is made possible only by the company's many years of experience and innovation. It also means the company is able to take advantage of any new trend that may appear in the soling market. It is a perfect example of strength in depth. The latest offerings shown at the most recent SIMAC are a testament to this.

ALL IMAGES:
MAIN GROUP TECHNOLOGIES





The compact twin station Ross 260T.



The Ross 260T has 100mm columns.

ROSS 260T

The latest trends for sole units demand thinner and thinner substance soles, increasingly rigid materials coupled to ever more complex designs and higher standards of finish. Needless to say, in the tough conditions of the current global footwear market these all have to be provided at the lowest possible production cost. The best material for this type of sole is thermoplastic polyurethane (TPU) for a number of reasons. It has a good range of density from 0.50 to 1.25g/ml and Shore A hardness from 45 to 95. It can also be blown at densities below 0.60g/ml, retains good properties at lower densities and, at the same time, is able to combine both good matt and gloss finishes in the one unit. Its only drawback is that it is unfortunately the most expensive of the standard sole moulding compounds.

The 260T (T standing for 260 ton mould clamping pressure) is the latest in a long and very successful line of ROSS machines. Earlier examples initially had a clamping pressure of 130 tons, which was then raised to 200 tons. This latest increase to 260 tons is designed to meet the high in-mould pressures created when injection moulding these thin sole units in relatively high viscosity TPU and, at the same time, allow larger size moulds to be used to produce complete sandals or shoes. It remains a twin station machine and can handle either one or two colour mouldings.

The squared head mould holder version facilitates the production of highly complex sole units and the addition of inserts either before or during the injection phase. The massive 100mm diameter columns reflect the 260 ton clamping pressure used and the 260T is the only machine currently on the market to have them (60-70mm is the

norm). This mould-holder also offers fast mould changes on each station without stopping the machine and automatic adjustment for different mould heights. In a further move to keep production costs down, the machine can be operated in a fully automatic cycle by the addition of front and rear sprue extraction robots without any loss in quality.

The machine's performance is continually monitored by its own in-built management software which cannot be overridden by an operator. It records every machine stoppage that loses output and the reason why it occurred. This data is collated in a file which is then sent by LAN net directly to management, enabling problems to be quickly rectified.

PRAGMA ROTARY

The latest version of the Pragma is available in 18, 24 or 30 station versions and has been designed to process two-part sole units in either single density PU, dual density PU and PU or TPU and PU at a high rate of productivity, with faster colour changing plus the ability to add inserts if required. It can in fact work with any type of polyurethane-based polymer to produce footwear complying with EN 344-345 at faster cycle times and with superior resistance to humidity ageing. It is also extremely flexible in that it can inject soles direct to the lasted upper in one, two or even three colours if inserts are used.

Furthermore, it also has a very large mould-holder both in terms of ring opening stroke, sole plate and last-holder movement, able to house larger moulds than other standard machines and up to size 52 continental (16 UK) if necessary. It also features the latest in electronic hardware and software systems, together with precise and sturdy mechanics to ensure good reliability and straightforward maintenance.



The squared head mould holder on the 260T accepts large size moulds.



Supplying spares for a wide variety of machines to over 16,000 customers worldwide is a major logistical undertaking.

Someone has also thought carefully about the ergonomics of using the machine. The operator now has easier access to all functions both during actual production or at any other time. In a particularly sensible move, the work surface of the rotary table itself has been lowered so that a footboard is no longer needed. The control panel display unit has been completely redesigned and can either stand alone or fitted to the machine if preferred for the operator to use without any interruptions in checking machine operations. All in all, some useful improvements to an already excellent machine.

CUSTOMER SERVICE

All this has of course not happened overnight, and has actually taken many years of continually improving what has gone before. Furthermore, the longevity of these machines is such that, with over 16,000 existing customers worldwide, it raises the inevitable problem of spares and servicing. The new warehouse facility contains spares for

every model of Main Group machine that is known to still be in use by a customer somewhere in the world. Naturally as the number of older machines dies away, the number of spares for them is also gradually reduced. Despite the sheer variety of machines involved, the company prides itself on the fast shipment of spare parts to anywhere in the world. Also travelling all over the world are the skilled technical and service engineers who offer customer support on the spot.

As remarked on earlier, it is primarily the way the company has been able to turn its hand to any form of injection moulding machine to meet whatever material and customer demand arises that marks it out. The fact that they are also always well thought out and soundly engineered for a long and productive life is a further testament to a very successful business model. With products like this and an extensive global customer base, the Main Group brand should have many more years to look forward to. 🇮🇹



The multi-station Pragma rotary machine.