

36 station Pragma rotary machine.

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Proportional injection

Main Group from Italy is well known for its wide range of injection moulding machines that, between them, are able to process rubber, EVA, PU and the entire range of thermoplastics as well as combinations of different materials. The spread of technology needed to do this has been made possible by many years of experience and innovation. A good example is its Pragma rotary machine which has been around for a number of years now with either 18, 24 or 30 stations and has proved both flexible and efficient in operation. It has now become available in an extra large 36 station high output version.

All Pragma machines have 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. They can work with any type of polyurethane-based polymer and are also extremely flexible in that they can inject soles directly onto the lasted upper in one, two or even three colours if inserts are again used. They have always had excellent electronic hardware and software systems, and it is here that the latest development has taken place with the introduction of what the company calls 'proportional injection'.

One of the problems with injecting PU soles has often been surface definition which depends on the precise measuring and even distribution of the mixed components within the mould cavity. Various systems have been tried, with some more successful than others and often involving a completely new machine. Main Group claims to have found an easier solution by making major changes to the software and injection control rather than any mechanical

alterations to the actual machine itself. The company says the results are extremely positive in terms of overall visual appearance and general quality. Laboratory tests are cited that have shown polymer distribution within the mould is indeed very good as the overall material density throughout the sole is more even.

The isocyanate / polyol / colour ratio mix is said to remain constant no matter what the injection speed used and, as a result, there is a zero margin of error where with traditional systems it might be anything up to 3% in some instances. The new proportional system has been extensively trialled and refined over the past two years and is now entering bulk production with a number of major footwear producers of casual and safety footwear. Main Group says that it will now start fitting the new proportional system to all its PU machines. 🌀



A PU sole made with a traditional injection system shows evidence of bubbles, flaws and has a less than perfect definition.



A PU sole made using the new improved system shows a distinct improvement in terms of both definition and overall surface quality.



A PU sole made with a traditional injection also reveals variations in density viz: Forepart 0.481. Waist 0.623. Heel 0.532.



A PU sole made using the new improved system shows minimal variations of density viz: Forepart 0.623. Waist 0.612. Heel 0.615.



90% of current output is casual footwear.



10% is safety boots and shoes.