Editorial

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Processors in the plastic injection molding industry are judged more on economic and cost criterias and, of course, product quality, than other industries. On the one hand, this is due to the very nature of plastic parts, which in most cases are lower cost and functional substitutions of parts made of other materials and thus, from the outset, prevails the cost factor. On the other hand, an injection molding operation would be relatively easily shifted to lower cost countries, since plastic parts could be stacked and shipped compactly.

Wittmann W843 pro robot

In order to remain competitive on the international market, relatively independently of the location, injection molding companies began early on to use linear robots for the rapid and secure automation of injection molding machines. Linear robots have the enormous advantage over articulated robots that they can be moved easily and quickly in the very limited work area of an injection molding machine. Typically, only a few and very fast axis movements are necessary in order to enter the mold area of the machine, to grip the injection molded parts and to leave the machine area in the shortest possible time. Likewise, more complex applications can be realized with the insertion of metal parts, textiles, foils, appliqués, labels, etc. as well as downstream automation.

In 1983 Wittmann entered the automation market for injection molding machines and succeeded to establish itself as the largest manufacturer of linear robots in Europe and North America. In a total of four production plants (2 in Europe, 1 in North America, 1 in

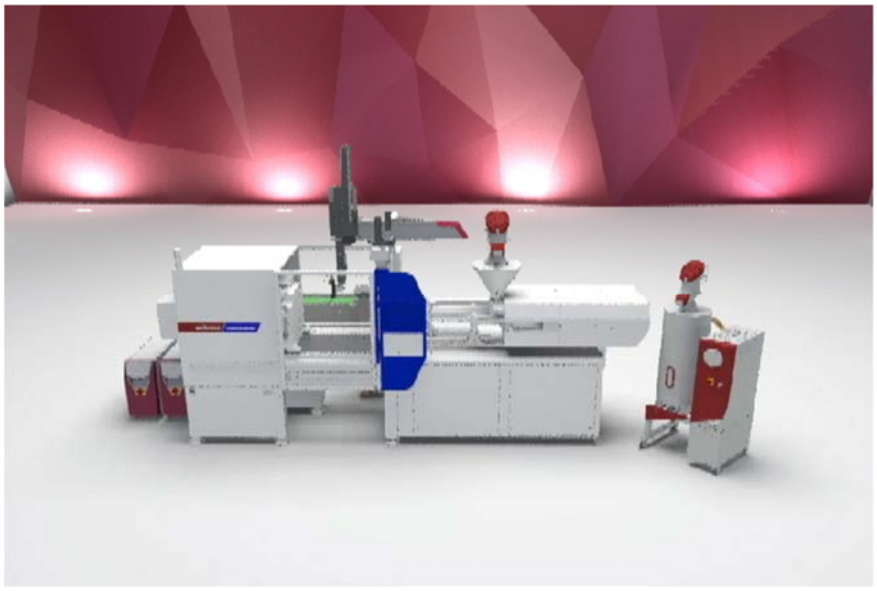
Asia), 4,500 units are currently produced on an annual basis. Of the robots installed over the years, more than 50,000 units are now in operation, with this number growing rapidly.

The payload of the Wittmann robot models range from 3kg (6.6 Lbs.), up to 125kg (275 Lbs.), which means that all market segments of the injection molding industry - automotive, electrical industry, medical technology, packaging, white goods, toys industry, etc. - can be covered. The robots are also available in special configurations for stack molds with two removal arms and 3-plate molds for the separate removal of sprue and finished parts from separate tool areas.

The Wittmann robots excel through their optimized mechanical design and in particular by a simple Teach-In programming. Typically, operators of injection molding machines do not receive separate training for robots and peripherals around the processing machine. The training is thus essentially limited to the briefing during the startup of the robot. This puts even more emphasis on the intuitive operation and the graphical support in the selection of functions.

With the current R8 robot control generation, Wittmann has introduced a "wizard" for the simple and animation-assisted programming of sequences. The next generation of control R9 from Wittmann, which has been introduced in October 2016, goes one step further and includes a digital twin of the physical robot. Thus, the program sequence can be simulated and tested simultaneously during the creation or Teach-In phase. At any time, the digital twin can be "separated" online from the physical Wittmann robot on the robot teach pendant and can be moved virtually independently for test purposes. This is a highly desired feature as molds in injection molding machines are frequently changed, thereby requiring adjusted robot sequences.

R9 Robot Control



Digital twin workcell online in the R9 control

Another important feature of Wittmann robots is the fastest possible removal of the injection molding parts from the mold. After all, this time determines the efficiency of the machine since the injection molding machine can only wait during the part removal time. Wittmann has developed the patented SmartRemoval function, which already uses the mold opening movement of the machine to accelerate the removal axis. In this case, the inertia of the rotor is used for acceleration in order to proceed at the highest possible speed upon reaching the mold open position. The saving is in the region of several tenths of a second, which in the plastics sector partly makes the difference between a profitable or non-profitable business.

Countless other intelligent functions such as SoftTorque, the switch-over of the axes into torque control for the simple take-over of the injection molded parts, the automatic collision detection, the automatic learning of the work areas of the robot, the autonomous calculation of the optimum speeds and the monitoring of the wear condition of the connected vacuum cups and lines offer injection molders the highest advantages in increasing production efficiency.