

EXJECTION® News

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Exhibition Highlight K2007: EXJECTION® ready to go into production

The production of thin-walled profiles with a length of 1,000 mm or more has not been possible by using an injection moulding machine with a clamping force of 500 kN. The polymers used in production of profiles in automotive and in aircraft industries have melts with a very high viscosity. Their processing demands moulds with cascade gating and cost intensive production units. Extrusion does not provide the flexibility customers need to produce profiles with functional elements like fastening elements, cross ribs or caps, and textured, high quality surfaces.

The new technology EXJECTION® makes it possible to produce profiled plastic parts with a specified great length on an injection moulding machine. At the same time the disadvantages of the conventional injection moulding and extrusion processes will be avoided. Profiles with integrated functional elements, with a high surface quality and with a length of several meters can be moulded only with a single gate. An economic analysis of specific parts has shown improvements concerning investment cost of up to 50 %. The production costs of the plastic parts are reduced by up to 70 % due to lower machine hour costs and due to avoiding any aftertreatment processes.

During the EXJECTION® process, a mould insert is shifted transversely with respect to the machine's longitudinal axis while the melt is being injected into the mould. The moulding flow only needs to be high enough in order to fill the cross section of the profile. Like this it is possible to use polymer grades with a higher molecular weight that show improved mechanical properties. As the plastic profile will be moulded inside a nearly totally closed cavity, its surface quality is as good as that of an injection moulded part. The extension of the surface with extrusion like quality is reduced to a small strip with the width of the gate.

The low level of pressure inside the cavity predestines the EXJECTION® technology for back moulding of sensitive inserts like films, textiles, fleeces and wood veneers. Inserts made of glass, metal, solid wood and high-tech composites can also be used. The internal stress level of the plastic parts is reduced to a minimum due to the low shear rate of the melt during filling the cavity. The effectiveness of the back pressure is granted along the full length of the cavity.

The EXJECTION® technology has been invented by Mr Gottfried Steiner, innovation office (in short IB STEINER) at Spielberg/Austria. He also is the owner of the patents.



The development has been supported by FFG and SFG. The stage of serial production has been reached in collaboration with HYBRID COMPOSITE PRODUCTS GmbH at the pilot plant of ENGEL AUSTRIA at Schwertberg/Austria in May 2007. Mr. Thomas Krivec, project manager and inventor comments.” In the last few months, we have optimized the functionality of the pilot mould and carried out several test runs under serial conditions. As a result of these tests, EXJECTION® parts have already been made from different polymers, e.g. ABS, SAN, PMMA, IONOMER, PC, TPU, PBT, PA and PP. The distribution of effect pigments and fillers could be analysed. Also the quality of ledges with back moulded decorated films is excellent.”

Due to the high innovation level of the new technology and the expected market potential, well-known companies like the steel specialist BOEHLER-UDDEHOLM and the coating company OERLIKON BALZERS COATING, both situated at Kapfenberg/Austria, decided to become active partners during the manufacturing of the pilot mould. HASCO, Guntramsdorf/Austria, delivered standard parts of the mould, KISTLER INSTRUMENTE AG, Winterthur/Switzerland, delivered sensors to measure the cavity pressure. For the calculations of the rheological behaviour, the software Moldflow Plastics Insight (MPI)® has been used.

At the exhibition stand of ENGEL AUSTRIA at the K2007 at Duesseldorf the EXJECTION® technology will be presented to the visitors. Production runs will be carried out on the injection moulding machine ENGEL e-motion 200/55 (clamping force 550 kN). During the exhibition, profiles with a length of 930 mm and a wall thickness of 1.2 mm will be produced. “A first feedback from the market shows an enormous interest of manufacturers of moulds, injection moulding machines, material suppliers and plastics processing companies in the new technology”, says Mr. Gottfried Steiner. “The primary goal of the new technology is not the substitution of established technologies. There are a lot of ambitious parts that could not be produced until now due to technical or economical restrictions. Specific examples are cable binders with a great length, lamp covers with uniform scattered light and special profiles for building and furniture industry. Any expert who has seen the EXJECTION® technology until now could name new, additional parts that will profit from the new technology.”

The exploitation of EXJECTION® requires to acquire a licence, based on granted patent rights concerning the technology itself but also mould design und parts moulded by using the EXJECTION® technology. Companies that acquire a basic licence for the production of parts before the start of K2007 will benefit of additional implementation services to an amount of about half of the licence fees. They can use it for example in order to check the feasibility of the technology for their specific part. This aspect will become of enormous interest to those companies that like to achieve a leading market position by using the new technology for the production of their products.