Dr.-Ing. Heinz Gross

Kunststoff Verfahrenstechnik

Development of improved technologies, planing and design of production lines

GWDS TECHNOLOGY THE SIMPLE SOLUTION TO FURTHER IMPROVE THE THICKNESS DISTRIBUTION OF BLOW MOLDED PARTS

Heinz Gross

Goal

A technical solution was to be developed to change the thickness of the parison at every necessary location over the length and also over the circumference in order to be able to match the different draw ratios in the part which has to be produced. The final goal was to achieve better part qualities while in the same time to reduce the production costs.

Actual situation

Conventional dies have a conical flow channel at the exit. For such dies no solution exists to establish a dynamic radial wall thickness programming over the circumference of the parison for all possible die diameters. The PWDS and the Flex Ring technology could only be applied to a certain range of die diameters. Furthermore these technologies suffered from the fact that only small thickness gradients could be achieved. Additionally those solutions often cause trouble during operation, Furthermore they afford a regular maintenance.

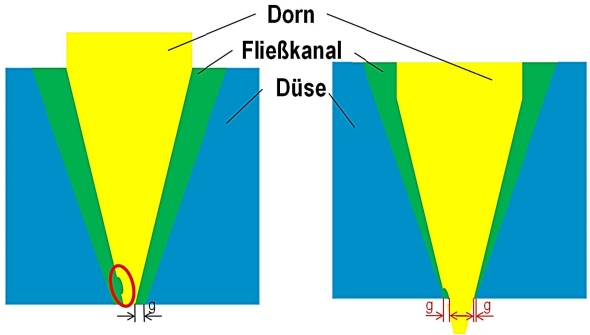

Fig.1 Conventional conical die

GWDS the new solution to optimize the thickness of the parison

The GWDS technology simply uses a cylindrical flow channel at the exit of the die.

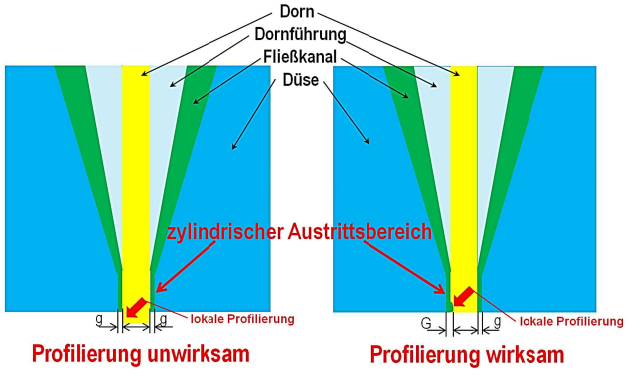

Fig. 2 GWDS die with cylindrical flow channel

The most important advantage is that the thickness of the parison can be much be better shaped over the length and over the circumference according to the needs of the product which has to be produced. Further advantages are:

- Every existing head can be easily retrofitted
- Much greater thickness gradients in the parison can be reached
- The GWDS technology can be used for every die diameter
- No danger to damage the die by setting a wrong stroke for the pin
- The pin can be moved with small forces
- A greater pin velocity is possible
- No parison velocity change when moving the pin
- The effectiveness of a profiling can be changed without being forced to change the die gap as well
- No danger of break downs during operation
- Easy to maintain no maintenance is necessary

As a consequence every part which is blow molded world-wide can be produced with a better wall thickness distribution. When implementing the GWDS-technology into a head the part quality can further be improved while in the same time the material consumption can be reduced. Additionally also the cycle time can be reduced by avoiding regions in the blown part where the wall is thicker than necessary.

Fig. 3 GWDS die with profiled pin

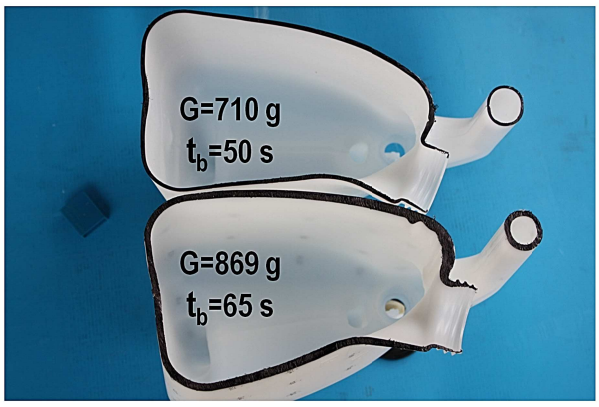

Fig. 4 Part produced conventionally (bottom), Part produced with GWDS (top)

Conclusion

The GWDS-technology opens up totally new processing possibilities in extrusion blow molding. The thickness distribution of every part that is actually blow molded world-wide can be produced with an improved thickness distribution. This helps to reduce material consumption in production and to speed up cycle times so that also the capacity of the machine is enlarged. This all is achieved with a very simple modification of the flow channel at the exit of the die. So the manufacturing costs for a GWDS die is identical to a conventional die of the same size as no additional technical equipment is needed compared to conventional conical dies.