

Product Development of a Plastics Processor

W. Siebel *

Injection moulding companies in the field of plastics technology also have to focus their activities on full-scale customer benefits. Neglecting this point of view endangers jobs and may lead to the development of exchangeable products that can also be produced (cheaper) abroad. The cooperative development and production of high-quality brand name products "Made in Germany" may otherwise drop out of the running.

The plastic parts for water filtration must fulfil the demanding European and German standards for parts coming into contact with foods and also have to have an appealing design. Possibly higher production costs may also result in order to ensure the necessary operational safety.

The Wegberg plastics processor FORMZEUG successfully completed a joint project for its customer, CARBONIT Filtertechnik. The ideas of the development department were realised with own tool construction. The experiences gained in the production of injections moulds from 1 to 4,000 grams were also incorporated into the project.

The newly developed plastic housing forms the outer coating for a sintered active charcoal block filter for water filtration. Suitability in accordance with the German Food Act was of central importance. The casing must withstand a permanent pressure of 10 bar. The compliance with this demand is tested with a much higher pressure (60 bar over a period of 5 minutes).

The product consists of a transparent filter bowl, a filter head with ring nut and a screw spanner as well as an air-release mechanism. FORMZEUG constructed the filter housing and managed to portray the proper material flow in the subsequent injection mould with the help of so-called mould flow analyses. For this task, the company closely cooperated with the material suppliers (EMS, filter bowl and Ticona, filter head and ring nut). The permanent knowledge exchange led to the development of parts for which Formzeug manufactured the tools. The advantage of this course of action was that one company constructed the parts and the tools and that the prerequisites for optimum production were already established during tool construction.

During the construction and manufacturing process of the tools, the company also made sure that it would be possible to incorporate changes later on without having to go to great efforts. This means that the design study was not implemented with the tool right from the start. Instead, there was enough leeway to approximate the data after production of the component sample. For example, the required values for the pressure test were achieved after slight changes. With the final design, destruction of the filter crucible starts as of a pressure around 73 bar. A longitudinal tear results but the casing does not splinter. The demands of the following tests were fulfilled in the end:

1. Dynamic pressure test in acc. with DIN 19632 with an internal pressure from 0.5 to 13 bar and 200,000 stress cycles in approx. 10 days (15 stress cycles per minute).
2. Permanent pressure temperature test in a warming box storage with 40 °C temperature and an internal pressure of 16 bar. Test duration 2,000 hours (approx. 12 weeks).
3. Bursting pressure test in acc. with DIN 19632, internal pressure 30 bar, test duration 10 minutes.

The filter housing fulfils the KTW-standards and the DVGW requirements according to work sheet W 270. It and is suitable for foods.

This example of a joint development shows that plastics processing should not only concentrate on production with apparently cheap parts. Constructing also plays a major role here. The customer can save money with a joint development with the plastics processor for optimising the tools.



Fig.: Active charcoal block filter for water filtration

* Dipl.-Ing Wolfgang Siebel
FORMZEUG GMBH & CO KG
In Berg 35-45, D-41844 Wegberg
E-mail: fzg@formzeug.de