

Aquamould®

AQUAMOULD



SMS Plastics Technology

Battenfeld 
Injection Molding Technology

Aquamould® – The water injection process

Water injection technology was developed by the German institute for plastics processing IKV which is situated in Aachen. The research results of the IKV were further developed by

Battenfeld and adapted for series production. This was the launch of the Aquamould® process. The technique involves the direct injection of water into the

mold which offers the following advantages:

- Short cycle times due to direct cooling of the melt
- Weight reduction due to hollow sections

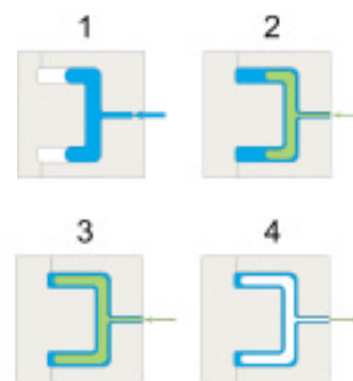
- Reduced shrinkage of the molded articles
- Good wall-thickness distribution even for thick-walled parts
- Smooth surfaces inside the molding
- Suitable for long flow paths
- Lower costs using water



Aquamould® - Water injection technology

Aquamould® is similar to Battenfeld's internal gas pressure technology Airmould®. The main difference between the two processes is the fact that Aquamould® uses water instead of nitrogen. After injection of the melt, water is injected into the cavity. The water ensures that the mold cavity is completely filled and also exerts the required follow-up pressure. Before mold opening the water

pressure is reduced and the water is drained from the cavity. The most suitable process depends on the geometry of the molded part, the required properties and the raw material.



- Water
- Plastics
- Mold

The Aquamould®- Modular System

With the Aquamould® modular system machines can be perfectly adapted for a multitude of applications. It consists of the following components:

- Water compressors
- Pressure control
- Water injection modules



Pressure generating units for water

Pressure generating units for water are compact mobile units. All elements which come into contact with the water are made from copper (low-pressure areas) or stainless steel (high-pressure areas). The mobile pressure generating unit is linked to the injection molding machine with stainless steel pipes, high-pressure hoses and screw couplings. WE series pressure generating units are equipped with the following standard features:

- Water heating to a maximum of 70° C
- Effective working pressures of up to 300 bar
- High injection capacities due to hydro accumulator systems
- Parallel supply of several injection molding machines
- Particularly low-noise emission



Standard pressure generating units for water are available with an output of 60 l/h and 100 l/h. Other sizes are available on request.

Pressure Control

Pressure control

The electric control unit is either integrated into the control system of a Battenfeld injection molding machine or a mobile unit which is linked to the injection molding machine via an Aquamould® interface (per as the tried and tested Air mould® interface).



Mobile control unit

The mobile control unit is linked to the injection molding machine via an Aquamould® interface. The mobile control unit can be used for Battenfeld or non-Battenfeld injection molding machines.

Benefits

The mobile control unit UNILOG B4 AC with touch-screen operation offers the following benefits:

- High-resolution, large graphics screen (VGA Color)
- Menu-guided, user-friendly input system
- Pressure profile input with reference curve and up to nine freely programmable positions
- All time settings with a precision of 1/100 s
- Graphical display of the actual values for pressure curves in the shape of profiles for parallel operation of up to four pressure control modules
- Up to four pressure control modules can be controlled
- Control system identical to Battenfeld machine control unit UNILOG B4
- Up to 99 data sets can be stored
- External data storage on disc
- Data storage for UNILOG B4 machine control unit and Aquamould® control unit on the same disc
- All letters can be displayed (e.g. Japanese, Chinese, Arabic etc.)
- Standard version in German/English can be switched to up to ten other optional languages
- Monitoring programme
- Program for actuation of the core pullers (stroke valves); standard software, optional hardware equipment
- Standard program for actuation of the retractable injection modules
- Diagnostic function (signal exchange check)
- Pulsed program
- Pressure control program
- Manual operation

Water pressure control

The water pressure is controlled with pressure control modules. The compact design of these modules allows them to be positioned close to the mold. This ensures very precise control as well as further reduction of water consumption. Leakage-free valves are used for precise control of the water pressure. They



are suitable for low and high water volumes. The valves are actuated electrically which dispenses with the need for a supply of

hydraulic oil or compressed air.

Water injection modules

Water is injected via injection modules inside the mold. The small design of these injection modules is perfectly suitable for the special requirements of water injection technology. Prior to de-molding, all water is removed from the molded part. This can be achieved in different ways such as:

- By gravity through the water injection points
- The use of gas pressure applied to a second inlet of the injection molded component

Main benefits:

There are many good reasons for using Aquamould®:

- All components are perfectly tuned, compact and modular in their application
- Powerful pressure generating units for water a parallel supply several to injection molding machines
- Mobile control modules are easy to operate and connected to the injection molding machine via an Aquamould® interface
- Mobile control units can be used for Battenfeld and non-Battenfeld machines
- Pressure control modules with high-precision, leakage-free valves

Additional benefits:

- Competent manufacturer of injection molding machines
- Experienced in all main innovative injection molding processes

Areas of application for Aquamould® Technology

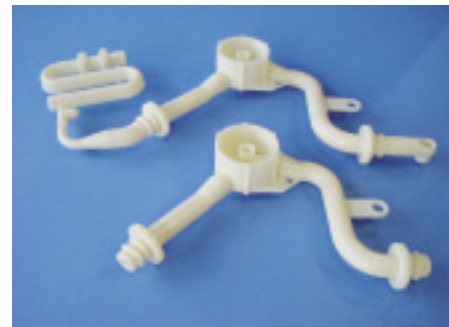
Aquamould® Technology is suitable for all thick-walled components as well as for components with large cross sections or long flow paths:

Potential applications are components such as:

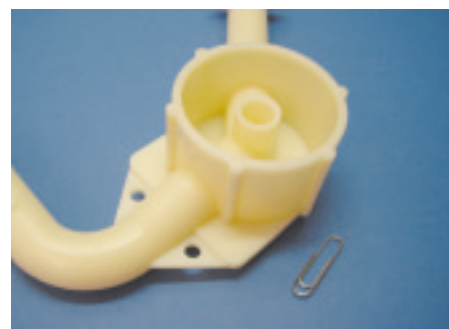
- Thick-walled handles, pipes, armrests etc.
- Thick-walled components with thin-walled sections such as pipelines, pipes with fastening lugs etc.
- Cars: handles of all kinds
- Pipelines for air or water
- Door modules with reinforcement channels
- Decoration panels, roof racks etc.
- Office equipment: Handles, transport rolls, fixtures etc.
- Armrests: turnstiles for chairs etc.
- Domestic appliances: pipelines for water heaters, washing machines or dishwashers, knobs for cookers and others
- Sports and leisure applications: carrier handles
- Toys with thick-walled sections
- Shafts for rackets (e.g. ball games) etc.
- Medical engineering: pipelines, knobs, canulas etc.



Source IKV, Aachen



Source IKV, Aachen



Source IKV, Aachen

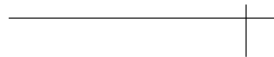
Aquamould® services

Battenfeld offers customers a whole range of services which include the following:

- Technical support throughout the entire process from the initial idea to series production
- Design optimization for the process
- Determination of melt and water injection
- Selection of the injection molding machine, mold, Aquamould® modular system, automation
- Training in-house or at Battenfeld training centres
- Design of the molded article and design guidelines
- Test-runs at one of Battenfeld's technical centres
- Consultancy and support after delivery of the system



Your local contact



Battenfeld 
Injection Molding Technology

Battenfeld GmbH
Scherl 10 · D-58540 Meinerzhagen
Tel. ++49 (+) 23 54/72-0 · Fax ++49 (+) 23 54/72-528

Battenfeld Kunststoffmaschinen Ges.m.b.H.
Wiener Neustädter Straße 81 · A-2542 Kottingbrunn
Tel. ++43 (+) 22 52/404-0 · Fax ++43 (+) 22 52/404-702

www.sms-k.com

SMS Plastics Technology