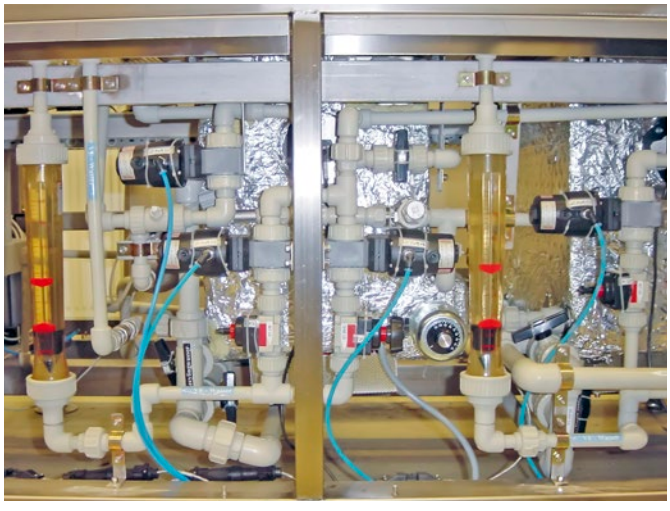
Product application for surface treatment Ultrasonic cleaning

Process description

High-grade cleaning plays an important role in the care and maintenance of tool moulds, which are typically used for rubber and plastic formed part production. A wide variety of different processes are available for cleaning the parts. Cleaning systems utilising only chemicals frequently do not have a thorough enough effect and require large volumes of cleaning agents. This increases the operating costs and harms the environment. Ultrasonic cleaning systems achieve significantly better cleaning results while using less chemicals. When cleaning with ultrasound, the electrical vibrations produced by a generator are transformed into mechanical vibrations by a sound transducer. This vibrator, whose construction can be adapted to the relevant application, transfers its energy to the parts to be cleaned via select cleaning fluids (alkaline or acidic). The resultant cavitation means that the dirt is cleaned off in a gentle and effective manner.

System design

The parts to be cleaned are first of all subjected to ultra-sound in an alkaline solution at a temperature between 60°C and 80°C. After this, the parts are rinsed with clean water (municipal water) at up to 60°C. At higher rinsing temperatures, which can be above 60°C depending on the parts to be cleaned, a pressurised rinsing is performed with fully demineralised water. The third rinsing process is always carried out at up to 60°C with fully demineralised water. The cleaned and rinsed parts are then dried in hot-air under vacuum. The system consists of corresponding tanks, cleaning and rinsing lines/circuits. The water required is provided from a separate water treatment plant. The pressure of the medium in the system is 1.5-2.5 bar at a temperature between 40°C and 80°C. The control pressure provided for the pneumatically operated valves is 6 bar at 20°C. The pipe system and system components are connected together with union ends.

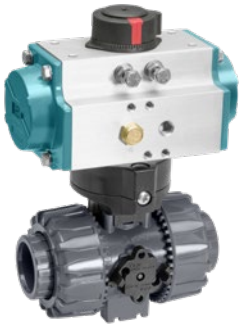


Solution

The control and dosing of the cleaning agent as well as the rinsing fluids is realised via GEMÜ 710 pneumatically operated 2/2- and 3/2-way ball valves, DN 25. The volumetric flow rate is set with manually operated diaphragm valves GEMÜ 617 DN 15 and GEMÜ R677, DN 25. The flow rate is detected and optically indicated by GEMÜ 800 and 850 variable area flowmeters. Polypropylene (PP) is used for the valve bodies so as to ensure chemical resistance to the cleaning agents. FPM is used as a sealing and diaphragm material. GEMÜ 0326 pilot valves, 24V DC, are installed in a control cabinet for actuation of the pneumatic actuators.

Pilot solenoid valve GEMÜ 0326

Diaphragm valve GEMÜ R677



Ball valve GEMÜ 710

Diaphragm valve GEMÜ 617

Flowmeter GEMÜ 800

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