Dispensing of adhesives containing microcapsules

Description

We are delighted to see a full page from us in the latest FAST magazine – a mini-article about the dispensing of adhesives containing microcapsules using the **preeflow** postive displacement pump. Please download and have a read!

Dispensing of adhesives containing microcapsules

Dispensing of adhesives containing microcapsules

LIQUID ADHESIVES

Microcapsules in adhesive dispensing technology

These days, we can find microcapsules in almost every industrial sector, where they take numerous roles. However, dispensing these fragile materials can be a problem since clearly it is important that the microcapsules be undamaged by the dispensing process. In adhesive technology, microcapsules can fulfil several functions. For example, microcapsules may be an integral part of the control of reaction and curing processes. Some anaerobic threadlocking adhesives contain microcapsules. After applying the adhesive to a screw, the action of screwing it into a thread bursts the capsules, releasing active materials which initiate the cure. Microcapsules can also act as spacers; including them in an adhesive will result in a predetermined minimum bondline thickness between two substrates. Some adhesives have very high levels of fillers to give thermal conductivity or other desirable properties.

The handling, application and dosing of these materials can present some big challenges. The material feed and dispensing onto the substrate must occur without any shear stress to prevent damage to the microcapsules. Consequently, piston pumps may not be appropriate if they induce high pressure (perhaps over 100 psi) or pulsation which can harm the microcapsules. Gear pumps might not work either, because of the geometry involving physical interaction with the gears and high shear forces. Systems based on pinch valves, hose pumps or diaphragm pumps may be suitable to test, although the pulsating action and the level of accuracy are potential problems.

The technology is suited to the pumping, feeding and dosing of fluids which contain microcapsules

An ideal dosing system must impart no shear stress on the material, and be highly precise. Intertronics has within its portfolio the endless-piston technology from ViscoTec GmbH which offers these features. Known as preeflow, the technology offers positive displacement, volumetric dispensing pumps that will dispense or dose independent of input pressure, material viscosity and ambient temperature. The special geometry of the stator and rotor configuration works as a progressive cavity pump. The rotor seals against the stator, forming a series of spaces or pockets, which translate along as the rotor rotates, keeping their form and volume. The pumped material is moved inside the pockets. In addition, the pockets are shaped such that they taper and overlap; the output is continuous, even and pulse free. Therefore it is possible to dose very shear sensitive and delicate materials without damaging them.

Due to the seal between rotor and stator, input pressure has no effect on the pump, so it achieves true positive displacement. It is also able to pump at very low rates, and low levels of shear are applied to the pumped fluid. Dispensing or dosing units based on this technology are available for precision applications.

The pumps feature a motor drive unit, in a pen-like configuration. A separate controller allows programing of the motor speed and number of rotations to effect dots or deposits of specific volumes, or continuous beads. When the dispensing operation is complete, the motor can be reversed briefly to prevent stringing or dripping. A dispensing needle is fitted to the end of the pen using a standard luer fitting. Crucially, once a material has been characterised, a desired volume can be selected on the controller, which is dispensed regardless of material viscosity changes and independent of ambient temperature.

Due to the seal between rotor and stator, input pressure has no effect on the pump

For further information please see www.intertronics.co.uk/preeflow or visit their blog at www.adhere.uk.com – also see www.youtube.com/intertronicsadhere.

Dispensing of adhesives containing microcapsules

Supplied by:

INTERTRONICS
12a Station Field Industrial Estate, Banbury Road, Kidlington
Oxfordshire England OX5 1JD
t 01865 842842 e info@intertronics.co.uk

Last updated: February 2020 Version: