this month's topic Materials

Toughened Two-Component Epoxy Resists Thermal Cycling

Master Bond EP38CL was developed for bonding, sealing, coating, and encapsulation applications that require toughness and durability. With a Shore D hardness that exceeds 75, it is resistant to rigorous thermal cycling, impact, and mechanical shock. EP38CL cures at room temperature, or more quickly at elevated temperatures, with little shrinkage upon curing. The low-viscosity, two-part epoxy has a 100:60 mix ratio by weight and a working life of 40–50 min. It bonds well to a variety of substrates, including metals, ceramics, glass, composites, many rubbers, and plastics. It has a tensile lap shear strength of 2,500 psi, a compressive strength of 8,000 psi, a tensile strength of 7,500 psi at room temperature, and a service temperature range of –60°F to 250°F. Standard packaging options range from 1-pint to 5-gal kits, as well as premixed and frozen syringes.

Master Bond, Inc.
www.masterbond.com

Powder Steps Up the Performance of Structural Ceramics

A new high-performance ceramic powder, 3 mol% yttria-stabilised zirconia (3YSZ), is formulated for the production of high-strength structural ceramics. It provides the beneficial properties associated with small grain sizes, including high chemical homogeneity and density, as well as superb electrical and thermal insulation. Valves and other process equipment constructed of ceramics that are made with the powder have exceptional bending strength and fracture resistance, and withstand the strain and friction placed on moving parts to ensure long-term performance. 3YSZ is produced via the patented emulsion detonation synthesis (EDS) manufacturing technology, which ensures an even distribution of yttria throughout the zirconia lattice. This high chemical homogeneity overcomes brittleness and imparts a constant coefficient of thermal expansion. The product can be supplied in application-specific forms — a spray-dried granulated powder (with or without binder), suspension, or slurry.

Innovnano
www.innovnano-materials.com

Silicone Film Functions as a Gas-Permeable Membrane

Silpuran film is an ultrathin, pure silicone product that is suitable for applications in the healthcare and medical technology sectors. It can serve as a flexible wound dressing, a breathable membrane, or a dielectric elastomer in sensors and artificial muscles. The film is constructed of ultrapure silicone rubber and is produced in thicknesses down to 20 µm. The thickness across the entire width and length of the film is uniform to within ±5% of specification. Silpuran film is free of organic plasticizers and stabilizers and is manufactured under cleanroom conditions to avoid the risk of contamination. The silicone rubber used in these films has passed tests for biocompatibility according to ISO 10993 and U.S. Pharmacopeia Class VI.

Wacker Chemie AG
www.wacker.com

www.aiche.org/cep or Circle No.119