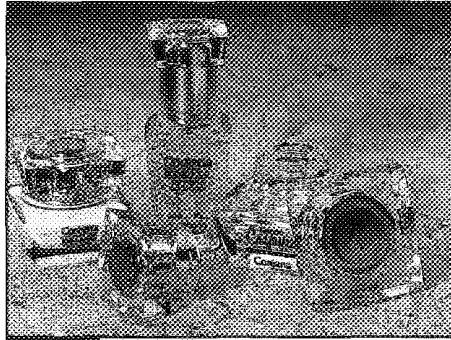


Crystal-clear resin makes metallized caps sparkle

Bottles and jars for skin-care products are now topped with two-piece enclosures made from gold metallized-polypropylene screw caps inside chicly styled over-caps. The resin used to make the overcap is called Surlyn.



Molded caps made from Surlyn resin give a gemlike brilliance to the tops of cosmetic bottles.

When molded it provides a tight fit over the metallized polypropylene. And although the material looks like glass, there's no risk of the caps shattering if they're dropped. In addition, unlike many clear plastics, Surlyn has good resistance to chemicals and oils and is said to mold easier than acrylic. Yeosong Industrial Co. Ltd., Chungnam, Korea, maker of the bottle caps, is able to mold thick-walled parts that are free of sink marks, weld lines, and bubbles.

Surlyn, from DuPont P&IP, Wilmington, Del., is a thermoplastic polymer that is "ionically cross-linked" in what is referred to as an ionomer resin. The 25 commercial grades of Surlyn are derived from ethylene-methacrylic acid copolymers. The grades have individualized molecular weights and acid contents. They also incorporate different ions into their structures, crystallize distinctly, and vary in the amount of cross-links formed. These variations affect the physical properties and processing qualities of each grade.

Surlyn resins are suitable for standard molding and extrusion equipment because ionic cross-linking is thermally reversible at normal processing temperatures of 175 to 290°C (350 to 475°F). When Surlyn resin is injection molded, its processing qualities are said to resemble those of low-density polyethylene or ethylene copolymers. The resins have a range of hardnesses from 25 to 73 Shore D, flex moduli between 3 and 75 kpsi, and tensile strengths on the order of 2.1 to 5.4 kpsi.

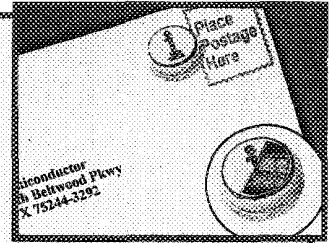
— Jean M. Hoffman
Circle 413

PCs to print postage stamps

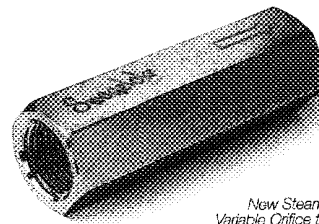
After five years of testing, the U.S. Postal Service has approved the cryptographic iButton from Dallas Semiconductor as a Postal Security Device.

The microchip, armored in a 16-mm stainless steel case, will act as a physically secure coprocessor for PCs and provide safe, long-term storage of 1,024-bit private keys, a tamper-resistant real-time clock, a random number generator, and the computing power to handle the math required by public key cryptography. All that will let PCs print postage for envelopes and packages.

Post Office specs for the device called for validation testing under the direction of NIST. The iButton passed the Federal Information Processing Systems certification for FIPS140-1 levels 1, 2, and 3, as well as the physical security of level 4. The device has also passed muster against side channel attacks, sometimes referred to as differential power analysis, a weakness of some smart cards. The iButton has a 134-kbyte memory and performs 1,024-bit RDA encryption in less than one second. It should be available for delivery by the end of this year. ■



What makes this steam trap a Plant Engineering Product of the Year?

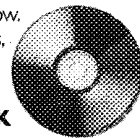


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