

EPOXY STRIPPERS

An important aspect of the casting procedure is being able to remove the **epoxy** encapsulant to effect repairs or recovery of

electronic components. A number of proprietary materials called "strippers" are capable of this. The resins are not actually dissolved by the strippers but swell and disintegrate into small particles.

Removal of epoxy encapsulating materials can be accomplished by a variety of inorganic and organic materials, including nitric and sulfuric acids, sodium hydroxide, formic and acetic acids, phenol, methylene chloride, and other chlorinated solvents, esters, and blends. In addition a growing number of proprietary compounds based on combinations of these materials and others perform the task more effectively. Some of the commercial formulations are listed in Table 40.

Strippers are either in the liquid form for immersion or in gel form for brushing onto surfaces. They are selective in their attack of encapsulated components, and care must be exercised in their use. Contact with the skin and breathing of fumes are also dangerous, and proper precautions should be taken.

The last two proprietary blends shown in Table 40 are a blend of oxygenated solvents and a blend of reactive components in glycol ethers, respectively. These have been found to be quite effective in attacking transfer-molded and anhydride-cured epoxy systems, respectively. The stripper based on the

oxygenated solvent blend must be used at elevated temperatures to be effective. The other **stripper** is unique in that it selectively attacks anhydride-cured **epoxy** resins but will not attack amine-cured epoxies, vinyls, or metals.

Stripping cured **epoxy** casting resins may take as long as several hundred hours, depending on the resin, curing agent, and cure conditions. This is illustrated by the data in Table 41. Although these are proprietary products, the results demonstrate the point that the more tightly crosslinked systems are more difficult to remove. If the **stripper** contains inorganic acids or bases, the chemical bonds of the cured system are also attacked.

Aside from attack by chemicals and solvents, mechanical stripping is also used. This is, of course, limited to sturdy components where the parts will not be easily damaged. Cutting, chipping, sanding, or blasting may be used to remove the plastic

Table 40. Some Commercially Available Epoxy Strippers

<i>Stripper</i>	<i>Supplier or manufacturer</i>
Eposolve 299	H.V. Hardman Co., Belleville, N.J.
De-Solv 8090, 292	Ram Chemicals, Gardena, Calif.
Isochemstrip 701, 708	Isochem Resins Co., Lincoln, R.I.
Metastrip 702	Mereco Products Division, Metachem Resins Corp., Cranston, R.I.

Resin-Out	Relto Products, Chicago, Ill.
Epoxy Dissolver 4079	Hysol Corp., Olean, N.Y.
Epoxy Strip NC-194	Beck Equipment Co., Cleveland, Ohio
Monastrip EP	Mona Industries, Inc., Paterson, N.J.
Stripper S-16	Enthone, Inc., New Haven, Conn.
Epoxy Stripper 600	See Zak, Los Angeles, Calif.
Stripping Agents MS-110, MS-111	Miller-Stephenson Chemical Co., Los Angeles, Calif.
CT-325	Starnetics Co., North Hollywood, Calif.
Eccostrips	Emerson & Cumings, Inc., Canton, Mass.
Octastrips	Stripper Octagon Process, Inc., Staten Island, N.Y.
Armstrong Stripper	Armstrong Products Co., Warsaw, Ind.
Decap	Dynaloy, Inc., Hanover, N.J.
Uresolve	Amicon Corp., Lexington, Mass.