Rework and Removal of UV Light-Curable Conformal Coatings

Dymax conformal coatings are UV/Visible light-curable resins that contain no added solvents and that are applied as thin coating layers on electronic devices for protection against a variety of environmental, mechanical, electrical, and chemical stresses including:

- moisture and humidity
- dust and dirt
- mechanical and thermal shock
- PCB processing solvents
- fungus and mildew
- corrosion (salt spray, sulfur flower)
- vibration
- chemicals, fuels, automotive fluids

Removal of Uncured Conformal Coatings

Uncured Dymax light cure only or light + heat cure conformal coatings may be removed from dispensing components and parts with organic solvents such as 99% isopropyl alcohol (IPA).

Uncured Dymax dual-cure, light + moisture cure conformal coatings may be removed from dispensing components and parts with non-alcoholic solvents. Alcoholic solvents (such as IPA or ethanol) that contain moisture will activate the curing process. Therefore, it is recommended that non-alcohols such as Butyl Acetate, acetone, or MEK be used to clean up uncured material and purge wetted dispensing lines.

Conformal Coating Rework Process

An effective rework process must balance the end-use performance requirements of the coating with its ease of removal. Because Dymax conformal coatings are formulated to offer enhanced environmental and chemical resistance, cured material will be impervious to many solvents and can be more challenging to remove.

The most common techniques to remove cured conformal coatings are **chemical**, **heat**, and **mechanical** removal.

Chemical Removal

Removing cured conformal coatings with chemicals requires immersion of the entire coated board or treating localized areas with the chemical stripping solution on a cotton swab or other applicator. In some cases, aggressive solvents like methylene chloride, MEK (methyl ethyl ketone) or acetone may sufficiently remove coatings. Removal times will depend on the specific coating, the thickness applied, and chemical being used.

Several companies manufacture materials which dissolve or attack conformal coatings. Below are two chemicals that Dymax has successfully used during in-house testing.

Manufacturer	Product	Where to Find
Savogran	Strypeeze Paint/Varnish Remover	https://savogran.com/removers.html Online and through local paint and hardware stores
Dynaloy, Inc	Dynasolve 185	Online through several authorized distributors

Heat Removal

Depending on the size of the area to be reworked and the temperature sensitivity of the components involved, cured conformal coating can be removed by heat in two ways:

- Heat the entire board to 150°C or above the glass transition temperature (T_g) to soften the coating and mechanically remove while the coating is still hot. Exercise care with heat-sensitive components.
- Use a heat gun or HADT (Hot Air Desoldering Tool) to target specific areas and remove coating as it softens. This method is useful when the surrounding area contains heat-sensitive components since it directs the hot air to one spot.

Mechanical Removal

Mechanical methods include scraping, cutting, or soldering through. The use of abrasive media in a grit blast or MicroBlasting system is very effective at removing conformal coatings. Dymax recommends:

Manufacturer	Where to Find
Crystal Mark, Inc	https://www.crystalmarkinc.com/
Comco, Inc	https://www.comcoinc.com/

Caution

Always consult your company's health and safety department to determine a safe removal process. Always follow the safety precautions of the manufacturer when using any of the chemical products referenced in this guide. As every application and all parts are different, Dymax does not guarantee the effectiveness of any of the suggested removal methods mentioned in this bulletin. Thorough and complete evaluation of all methods mentioned in this guide on the individual part and processes must be made to assess hazard level to both the part and personnel and the facility, and to establish the appropriate precautions.

Further Technical Assistance

Dymax Application Engineers are available to assist customers in evaluating individual rework methods. Please contact us at applicationengineering@dymax.com for assistance with your specific rework process.

© 2005-2023 Dymax Corporation. **All rights reserved.** All trademarks in this guide, except where noted, are the property of, or used under license by Dymax Corporation, U.S.A.

The data contained in this bulletin is of a general nature and is based on laboratory test conditions. Dymax does not warrant the data contained in this bulletin. Any warranty applicable to the product, its application and use is strictly limited to that contained in Dymax's standard Conditions of Sale. Dymax does not assume responsibility for test or performance results obtained by users. It is the user's responsibility to determine the suitability for the product application and purposes and the suitability for use in the user's intended manufacturing apparatus and methods. The user should adopt such precautions and use guidelines as may be reasonably advisable or necessary for the protection of property and persons. Nothing in this bulletin shall act as a representation that the product use or application will not infringe a patent owned by someone other than Dymax or act as a grant of license under any Dymax Corporation Patent. Dymax recommends that each user adequately test its proposed use and application before actual repetitive use, using the data contained in this bulletin as a general guide.