

T Series - Two Pack Thermally Curing Solder Resists

From the T Series family of Solder masks

1. Description

Two pack solder resists are screen printed thermally curable products that give a highly resistant film on both tin/lead and copper PCB's.

This Technical Information Leaflet (TIL) and the relevant Material Safety Data Sheet (MSDS) should be read carefully prior to using this product.

2. Product features

- RoHS & WEEE Directive Compliant
- A selection of products is available to suit a wide range of process conditions
- The required colour and finish may be obtained by mixing the resist with the appropriate hardener



3. Product Range

CBSN2009	XZ15T	Two Pack Thermal Solder Resist Semi Gloss Green	2.00 kg.
CBSN2011	XZ16T	Two Pack Thermal Solder Resist Gloss Green	2.00 kg.
CCSN3009	XZ17B	Two Pack Thermal Solder Resist Catalyst	0.67 kg.
CDSN4004	XZ42	Slow Thinner	5.00 L.
CDSN4008	XZ46	Cleaner	5.00 L.

4. General Handling

4.1 Storage and Shipping

When stored in a cool place, T Series resists have an almost indefinite shelf life (in excess of 5 years). Under the same conditions, catalyst XZ17B has a shelf-life in excess of three years.

4.2 Waste disposal

Care should be exercised in the disposal of printing ink waste. This should be carried out in accordance with good industrial practice, observing all the appropriate regulations and guidelines.

For more specific handling advice refer to the detailed Safety Data Sheet (SDS), supplied by your local Sun Chemical Circuits representative.

5. Application / Processing Conditions

5.1 Mixing

Solder resist and catalyst must be mixed thoroughly before use. The following table gives recommended mixing ratios (resist:catalyst) and approximate mixed pot life.

Catalyst	Mixing Ratio (w/w)	Pot Life
XZ17B	3:1	3 days

It is recommended that attention be paid to ensuring that any resist at the sides of the container and on the bottom is completely mixed into the main body of the resist.

Returning of resist to the original container after use is not recommended as this can lead to dust particles or dried resist being introduced into the product which could affect future performance.

5.2 Thinning

Once mixed, solder resists are ready for use and should be printed unthinned where possible to ensure maximum film weight is deposited. This is particularly important when printing on tin-lead, when high film weights are essential.

If it is necessary to reduce the two-pack solder resist to obtain a more suitable printing viscosity, Slow Thinner XZ42 may be added at a maximum level of 3% to give a balance of drying speed and screen stability to meet most print requirements.

N.B. The resist should be stirred well before use.

5.3 Pre-Clean

Tin-lead plated boards should be completely free from oil, grease and chemical contaminants before printing. Thorough rinsing with hot water plus a proprietary cleaner is usually sufficient. In some cases, light mechanical abrasion may be necessary to achieve satisfactory adhesion.

Over copper, normal pre-cleaning methods should give excellent results. Copper should be cleaned mechanically before application of the solder resist. Brushing with silicon carbide or scrubbing with pumice is recommended. For heavy contamination, the copper should be micro-etched and brushed or pumice treated to ensure thorough cleaning.



5.4 Application

Polyester screens are recommended. When printing over tin/lead, 43 - 60T/cm (110 - 155T/inch) are recommended to give the necessary film weight and to provide complete encapsulation of plated tracks.

For printing on copper or other non-reflow surfaces, 49 - 70T/cm. (125 - 180T/inch) polyester meshes are recommended. Most photographic stencils are suitable for use with this resist.

For best results a capillary film should be used. Sharp edged polyurethane squeegees of 60-65 Shore A hardness should be used. Squeegees can be backed with a thin metal strip to improve track encapsulation by the applied coating.

All screens must be cleaned and thoroughly dried before use and free from residues of screen cleaner and solder mask residues.

5.5 Washing Up

Screen Cleaner XZ46 is recommended for washing up.

Alternative cleaners and screenwashes are available to suit customers' particular requirements. Your local Sun Chemical Circuits representative will be pleased to advise on product selection.

T Series resists are curing systems and are extremely difficult to remove after stoving. It is therefore advisable to check boards carefully for misprints etc. before stoving, at which stage the inks can be removed with XZ46

5.6 Curing

Initial drying of two-pack solder resists is by evaporation of volatile solvents, followed by chemical cross-linking. It is important that all solvent is removed from the resist film before cross-linking otherwise solvent will become trapped. This will affect resistance properties and adhesion and could cause out-gassing between tracks.

Circuit boards should not be subjected to an initial rapid increase in temperature which could cause trapping of the solvent, and ovens should have a constant airflow in the region of 1 - 2m./second.

Boards should be stoved as soon as possible after printing to eliminate excessive flow.

The following table lists suggested curing times and temperatures. Please note, however, that individual ovens can vary in efficiency, and therefore optimum drying cycles may vary.

Catalyst	Convection Oven
XZ17B	60 mins. at 140 - 150°C (284 - 302°F)

Please note that XZ17B is unsuitable for use with IR ovens, and should only be used in batch ovens.



5.7 Notation/ Legend Printing

T Series resists are compatible with a wide range of UV curing, thermal curing and photoimageable notation inks. Your local Sun Chemical Circuits representative will be pleased to advise on product selection.

6. Health and safety

Detailed material safety data sheets will be supplied by your local Sun Chemical Circuits representative.

The products detailed hereon have been tested in accordance with, and meet the requirements of, the RoHS Directive 2002/96/EC and 2011/65/EU, and the European Directive 2003/11/EC, regarding the presence of the metals - Pb (Lead / Lead compounds), Hexavalent Chromium, Cd (Cadmium), Hg (Mercury), and Poly Brominated Flame Retardants.

Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II – Europe.

As the world's foremost producer of inks, pigments and colour technology, Sun Chemical is leading our industry in developing and producing products which minimise our impact – and our customers' impact – on the environment and striving to maximise the use of renewable resources. We consider it our responsibility to be involved in the communities in which we live and work and to offer direction in meeting today's needs without compromising the ability of future generations to meet theirs.

7. Film Performance/ Technical Specification

7.1 Physical Properties of Resists and Hardeners

Sales Code	Pack Code	Viscosity	S.G.	Flash point	Non volatile content
XZ15T	CBSN2009	11 – 14 Pa.s	1.34	83°C (181°F)	87%
XZ16T	CBSN2011	11 – 14 Pa.s	1.62	86°C (187°F)	83%
XZ17B	CCSN3009	15 – 20 Pa.s	1.15	72°C (162°F)	54%



7.2 Properties of Cured Film

Solder Resistance		30 secs @ 288°C (550°F)
Thermal Shock	IPC SM840E Class H MIL-PRF-55110F MIL-STD-202G	Pass Pass Pass
Chemical Resistance	IPA 1,1,1 Trichloroethane MEK Methylene Chloride Alkaline Detergent Fluxes	>1 hour >1 hour >1 hour >1 hour >1 hour >1 hour
Abrasion Resistance	IPC SM840E Class H	Pass
Adhesion (Copper) (Tin / lead)	IPC SM840E Class H IPC SM840E Class H	Pass Pass
Pencil Hardness		6H
Dielectric Strength		90kV/mm.
Moisture & Insulation Resistance	IPC SM840E Class H	Pass
Electromigration	IPC SM840E Class H	Pass
Insulation Resistance		6 x 10 ¹² Ohm
C.T.I. (IEC112)	200	

8. Disclaimers

This information has been carefully compiled from experience gained in field conditions and extensive laboratory testing. However the products' performance and its' suitability for the customers' purpose depend on the particular conditions of use and the material being printed. We recommend that customers satisfy themselves that each product meets their requirements in all respects before commencing a production run. Since we cannot anticipate or control the conditions under which our products are used, it is impossible to guarantee their performance. All sales are also subject to our standard terms and conditions.

9. Technical Assistance / Contacts

Sun Chemical Circuits are an international company, and as such can offer technical, engineering and sales support to our customers worldwide. If you require more information regarding this product, or any of our extensive range of materials for PCB fabrication, please contact our local sales offices.

Our Products are intended for sale to professional users. The information herein is general information designed to assist customers in determining the suitability of our products for their applications. All recommendations are made without guarantee, since the application and conditions of use are beyond our control. We recommend that customers satisfy themselves that each product meets their requirements in all respects before commencing a print run. There is no implied warranty of merchantability or fitness for purpose of the product or products described herein. In no event shall Sun Chemical be liable for damages of any nature arising out of the use or reliance upon this information. Modifications of the product for reasons of improvements might be made without further notice

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