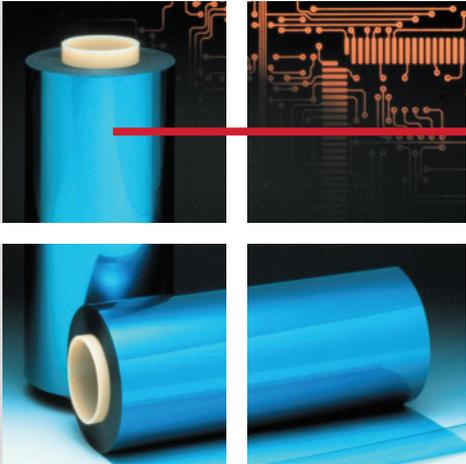


# Totalimage

Dry Film Primary Photo-Imaging Systems



## System Compatibility. Reliability. Highest Yields.

**Totalimage** is comprised of high reliability, PHOTEC dry film photoresists and ENPREP chemistry that has been specially formulated for primary photo-imaging. Used as an integrated system, Totalimage is production-proven to increase yields and productivity, while reducing rejects and rework. Due to this combination of highly compatible process chemistry and dry film technologies, Totalimage enables full control of all process steps, while maintaining high loading process capabilities and fast operation.

Especially formulated for fine line circuitry and high density PCB manufacturing, Totalimage reduces total cost of ownership and is backed by MacDermid Enthone expertise.

### KEY FEATURES

- Reduced cost of ownership
- High resolution for fine line circuitry
- Superior adhesion and film strength
- Supported by MacDermid Enthone technical expertise



**MacDermid Enthone**  
ELECTRONICS SOLUTIONS

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## PHOTEC: Dry Film Photoresist

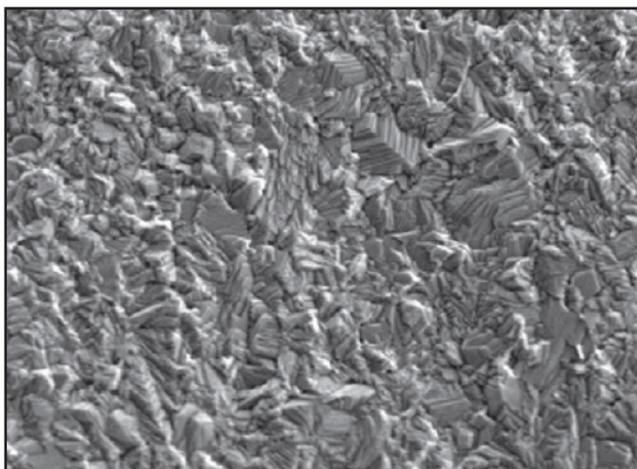
PHOTEC photoresists provide high reliability in a diverse range of process conditions. The PHOTEC Series offers superb conformity on all commonly used substrates, ensuring the highest PCB yields at the lowest possible cost. PHOTEC dry film photoresists are manufactured by Hitachi Chemical Company Ltd., Japan and exclusively marketed and distributed by MacDermid Enthone throughout Europe. Backed by unmatched technical support, PHOTEC dry film rolls are custom slit at MacDermid Performance Solutions' certified facility in the United Kingdom.

PHOTEC series dry film photoresists provide highest first pass yields due to high resolution enabling fine line structures, good adhesion and tenting properties and excellent substrate conformance. PHOTEC series dry film resists are easy to strip with controlled particle sizes. This reduces the potential of clogged equipment nozzles of sludge formation. PHOTEC series have extremely strong tenting capabilities which overcome obstacles encountered by fine line work, while maintaining excellent tolerance to off-contact exposure.

## Surface Preparation

Chemical cleaning is the preferred method of cleaning the copper surface prior to resist application. Compared to mechanical cleaning, chemical cleaning eliminates the possibility of leaving particulate matter on the surface that may become entrapped under the laminated resist.

The ENPREP Ti-1000 surface preparation is a two stage pretreatment. Both achieve excellent clean, micro-roughened surfaces. ENPREP Ti-1000 processes provide the optimum surface technology for the best adhesion of PHOTEC dry film.



### Two-stage process:

- ENPREP TI - 1000 CL Cleaner
- ENPREP Ti - 1000 ME microetch

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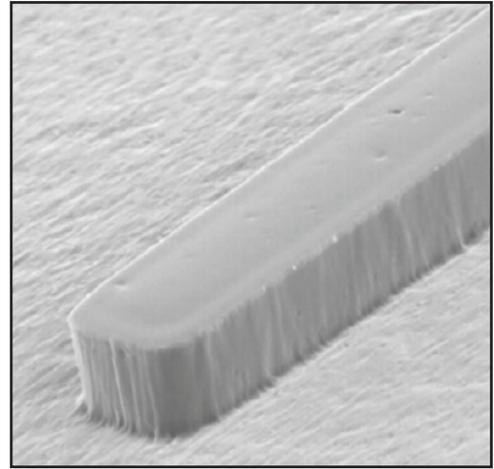
Dry Film Primary Photo-Imaging Systems



## Development

Development is the removal of unexposed portions of the negative working resist, a critical stage as it determines the quality of the resist remaining on the surface in terms of track profile, adhesion, etc. As circuit density increases, the track width becomes smaller and more closely packed.

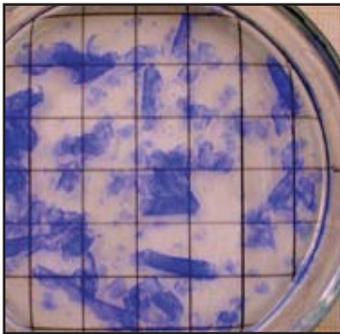
ENPREP Ti - 1300 DS is a liquid development process providing superior conditions for improved adhesion and straight side walls during the development stage for fine line circuitries. Depending on the type of PHOTEC resist used, in some cases a defoamer such as ENPREP Ti - Defoamer may be needed.



## Resist Stripping

The objective of resist stripping is to remove the resist from the copper panel (including fine lines and spaces), while ensuring a non-oxidised surface. The stripping mechanism depends not only on the cross-link density of the resist but also on the number of carboxylic acid groups in the polymer chain. Therefore, the type of stripping solution should be optimized for each resist.

ENPREP Ti - 1400 RS resist stripper allows the stripping solution to penetrate the resist and break the polymer chain before the resist-to-copper bond is broken. This is most important for removing resist between high density fine lines.

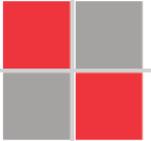


## Equipment Cleaner

ENPREP Ti-1500 EC is an acidic, solvent based, soluble (horizontal) equipment cleaner designed for use in dry film resist developers and dry film strippers. Effective on removal of dry film resists, antifoam residues and hard water scale carbonates residues, it also thoroughly cleans residues found inside of nozzles and pipes.

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Surface Preparation			
PRODUCT	TYPE	MAKE-UP	ADVANTAGES
ENPREP Ti-1000 CL <b>cleaner</b>	Sulfuric	12-14% @ 30-35°C	<ul style="list-style-type: none"><li>• Spray and dip applications</li><li>• Potentially versatile when with peroxide</li><li>• Prevents oxidation</li></ul>
ENPREP Ti-1000 ME <b>microetch</b>	Sulfuric / Caroate	75-140 g/l @ 25-35°C	<ul style="list-style-type: none"><li>• For spray and dip applications</li><li>• Consistent etch rates over bathlife</li><li>• Uniform surface topography</li><li>• Prevents oxidation</li></ul>
Dry Film Resist			
PHOTEC	Primary Image	Rolls	<ul style="list-style-type: none"><li>• High resolution enables fine line structures</li><li>• Good adhesion and tenting properties</li><li>• Excellent substrate performance</li></ul>
Development			
ENPREP Ti-1300	Carbonate	Variable (7-21 ml/l)	<ul style="list-style-type: none"><li>• Enables high-density structures</li><li>• Supports wide range of exposure settings</li><li>• Ease of replenishment (bleed/feed)</li><li>• Optimized for use with PHOTEC (straight side walls)</li></ul>
Stripping			
ENPREP Ti-1400 RS	Amine	7-15% @ 45-55°C	<ul style="list-style-type: none"><li>• Fast speed</li><li>• Suited for fine line structures</li><li>• Ease of replenishment (bleed/feed)</li><li>• Optimized for use with PHOTEC</li><li>• Particle size becomes optimum for filtration</li></ul>
Equipment Cleaner			
ENPREP Ti-1500 EC	Acidic / Soluble (Horizontal)	N/A	<ul style="list-style-type: none"><li>• Ready-to-use</li><li>• Use multiple times</li><li>• Improves yields</li><li>• 30-60 minute cleaning cycles</li></ul>



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