

OPTEK

OPERATIONS TECHNOLOGY INC

DPL-24A

DIFFERENTIAL PRESSURE LAMINATOR



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INTRODUCTION

Vacuum Lamination of high-tech products has seen explosive growth in recent years. Technological advances coupled with our years of experience with the DPL-24A has resulted in the creation of the DPL-24A. No system offers the level of vacuum and positive pressure that this system provides.

No pressure is applied to the lamination sandwich during the Vacuum Dwell therefore maximum evacuation is assured.

During the Pressure Dwell, a flexible diaphragm compresses and encapsulates the product and true Isostatic lamination is achieved.

These features open the door for many new and exciting applications and clearly position the DPL-24A as the most technologically advanced device of its kind...with a cost/benefit ratio sure to please the most demanding purchaser.

APPLICATIONS

Initially conceived for laminating films onto printed circuit boards, new applications are being developed at a steady rate. Among them are:

1. **Lamination of Film Mask to BGA and micro BGA products.**
2. **Lamination of Primary Imaging Film onto 3-Dimensional Surfaces.**
3. **Evacuation of Liquid Photo-Imageable Solder Mask.**
4. **Lamination of Dielectric Coating in Preparation for the Screening of Additional Circuitry.**
5. **Application of tape-supported strippable encapsulant for chip-scale interconnect processing.**
6. **Lamination of pressure-sensitive adhesives to glass and other substrates for flat panel displays.**
7. **Application of Coatings for Flexible Circuits.**

In addition, tests are being conducted which will permit the use of the DPL as the first high vacuum, single cavity, isostatic, multi-layer press on the market.

The latest technological developments in the industry, coupled with a massively constructed vacuum vessel, assure the purchaser of many years of trouble-free operation.

THEORY OF OPERATION

The DPL-24A Differential Pressure Laminator has been designed to give the operator a flexible method for laminating sheet supported emulsions onto a variety of substrates.

These substrates, pre-laminated either manually or with the assistance of currently available dispensing equipment, are placed on the slide mounted platen and positioned in the chamber. Substrates varying in thickness and geometry may be intermixed to increase throughput.

The fully automated cycle is activated from the Touch-Screen computer on the front panel which also displays the vacuum and pressure dwell times, the top and bottom heater functions, and vacuum level (in Torr). This is also where programs can be stored with different process parameters.

Utilizing a high vacuum rotary vane pump, a vacuum end point below 2 Torr is achieved.

The substrate is exposed to this Vacuum Dwell for a time determined by the integral precision digital timer.

Following this period, a preheated silicone rubber diaphragm descends onto the workpiece. This action closes the small gap below the spring-mounted platen assembly and provides direct thermal contact with the lower heat platen.

The temperatures of both the upper and lower Heated Platens are controlled independently by integral Temperature Controllers.

Unlike conventional Vacuum Laminators, the DPL-24A permits the addition of positive pressure above the diaphragm, increasing the effective lamination pressure dramatically.

The Pressure Dwell period is adjusted with a timer identical to that employed in the Vacuum Dwell.

Upon completion of a cycle, the drawer mechanism is retracted and the products removed for further processing.

SPECIFICATIONS

Model	DPL-24A
Substrate Size	Up to 24" X 24" on a standard machine. Smaller sizes can be processed in multiples to increase throughput and can be intermixed with substrates of differing geometries.
Substrate Thickness	Thicknesses from .001" to .375" can be accommodated though standard tooling is designed for a maximum height of .150".
Shipping Weight	2200 Lbs.
Dimensions	44" Wide X 44" Deep X 60" High
Utilities	220 VAC, 40 Amps/phase, 3 Phase 50/60Hz Dry air at 5.5 Bar (80 PSI), 142 L/m (5 CFM)
Vacuum	An end point in excess of 2 Torr.
Temperature	Independent upper and lower controllers with on-screen readouts.
Timers	Independent Vacuum and Pressure countdown timers with on-screen readouts.
Productivity	Cycle time is adjustable from 5 seconds to infinity and is determined by application parameters such as product complexity, topography, exit temperature, etc. A typical time for a film application is less than one minute (30 seconds/Vacuum Dwell and 20 seconds/Pressure Dwell).
OPTEK is committed to continuous improvement. Specifications are subject to change. Consult factory for custom configurations.	

Operations Technology Inc. has been providing innovative equipment to industry since 1978. For more information about this and other OTI equipment, please contact us at the address below.