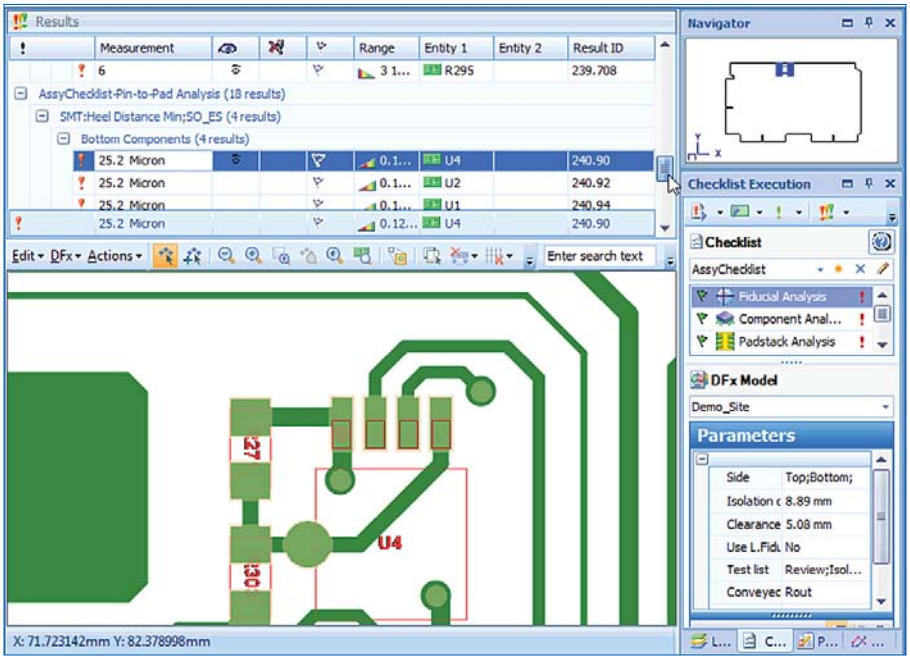
Valor MSS Process Preparation

Manufacturing

D A T A S H E E T



Process Preparation module is a complete engineering solution for PCB assembly and test including upfront critical DFA analysis, BOM validation, including work flows for stencil design, SMT programming and line balancing, test and inspection engineering, documentation and work instructions, and box build or hand assembly operations.

MAJOR BENEFITS:

- Right-First-Time new product preparation
- Faster preparation time for SMT, electrical test and inspection
- Reduced ICT fixture cost
- High machine productivity
- Balanced lines, balanced factory
- Higher machine utilization — no waste, no time lost to clear first articles
- Good internal/external customer communication
- Accelerated set-up and planning
- Increased inventory turns — reduced WIP
- Higher overall equipment efficiency (OEE)
- No time lost creating machine libraries

Overview

The Valor MSS Process Preparation module provides a complete engineering solution for DFx, process development, and test engineering that will drive your PCB assembly operations to higher profitability. This is achieved with new breakthroughs in process automation and workflows that improve both efficiency and quality. The Process Preparation module's unique approach creates a single, central database of all Manufacturing Process Definitions (MPD) and engineering data, based on ODB++ and simple Bill of Materials files. The true client-server application reduces Work in Process (WIP) , increases Overall Equipment Effectiveness (OEE) and ensures you can achieve a streamlined flow in your produc–tion process, including SMT, THT, stencil design, hand work, box build, electrical test, and both optical and x-ray inspections. It is easily configured for user type and workflow, including data preparation, DFA analysis, documentation, SMT programming, test and inspection engineering and stencil design — all in one seamless, cohesive solution.

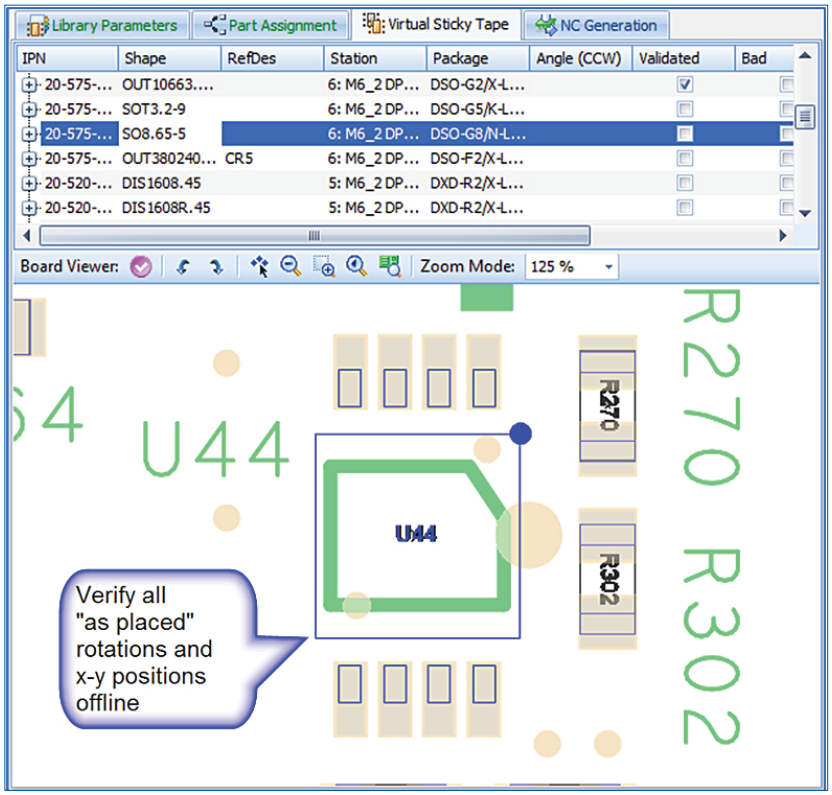
Mentor Graphics®

The Perfect MPD

The Valor MSS Process Preparation module delivers a complete, comprehensive, and synchronized MPD to your production floor, which includes:

- Manufacturing Process Steps
- Balanced lines
- Common set-ups
- Optimized feeders
- Optimized SMT programs
- Virtual sticky tape
- Integrated stencil design
- Test and inspection programs
- Optimized ICT test fixtures
- Manual assembly planning
- Documentation and work instructions

The net result of the perfect MPD is a streamlined process flow with higher yields, greater throughput and improved ability to respond to the changing needs of your customers.



Eliminate line downtime from program errors with Virtual Sticky Tape. This simulation feature allows for "as built" component rotations and offsets to be verified offline in a virtual simulated environment for right first time production.

Four-Step Approach

The Valor MSS Process Preparation module's unique approach to process engineering comprises four steps, all accomplished with centralized data:

1. Define the Product: Create a virtual PCA, neutralized and validated, in a BOM-centric standardized format. The lean data model allows quick change management.
2. Define the Resources: Create virtual assembly line and simulation models for auto-generating exact machine data on demand.
3. Define the Process: Generate optimized output and documents for assembly, test, and inspection machines, plus manual work cells perfectly matched to available resources and to the product model.
4. Define the Production Plan: Use in conjunction with the Valor MSS Production Planning module to optimize distribution of work orders across multiple lines for efficient factory load balancing and better on time delivery for high mix and ultra-high mix production environment.

Data Preparation

Quickly import your CAD data, Gerber data, and BOM files. Built in error checking, learning library and profiles for each design center make short work to accurately create a complete data model of the PCB assembly, fully optimized for manufacturing. All part numbers and attributes are place in a central Master Part Library (MPL) which supports all manufacturing processes, test and inspection. One common data model is used for all processes, created from a single data preparation source. The work flow is highly streamlined and repeatable, making it ideal for new product introductions. Accurate, validated data is the first step toward right-first-time production.

KEY FEATURE — All qualified parts from the Approved Vendor List (AVL) for any given Internal Part Number (IPN) are automatically compared by geometric attributes for body size component height and pin contact area. IPNs with geometries outside the tolerance are quickly flagged.

Design for Assembly (DFA)

Complete and accurate DFM analysis for assembly and bare board fabrication is essential for right first time production. The DFA process is highly repeatable, extensive and will ensure that the PCBA can be assembled according to your process limitations with high quality. DFA analysis is highly automated and quickly provides accurate information that is suitable for quoting purposes. DFA will provide excellent objective feedback to the PCB design team to ensure a more manufacturable design. If the design is frozen, DFA gives the process engineer a clear warning of what issues to expect in production. The goal is always to eliminate manufacturing risk as far in advance as possible.

KEY FEATURE — DFA analysis is based on accurate part geometries supplied through the Valor Part Library based on the BOM and AVL for the work order. Each of the exhaustive checks in DFA are controlled by an easy-to-use matrix of rules according to categories based on degree of error. This analysis provides far greater predictive information that simple one dimensional go/no-go checking.

Assembly Documentation

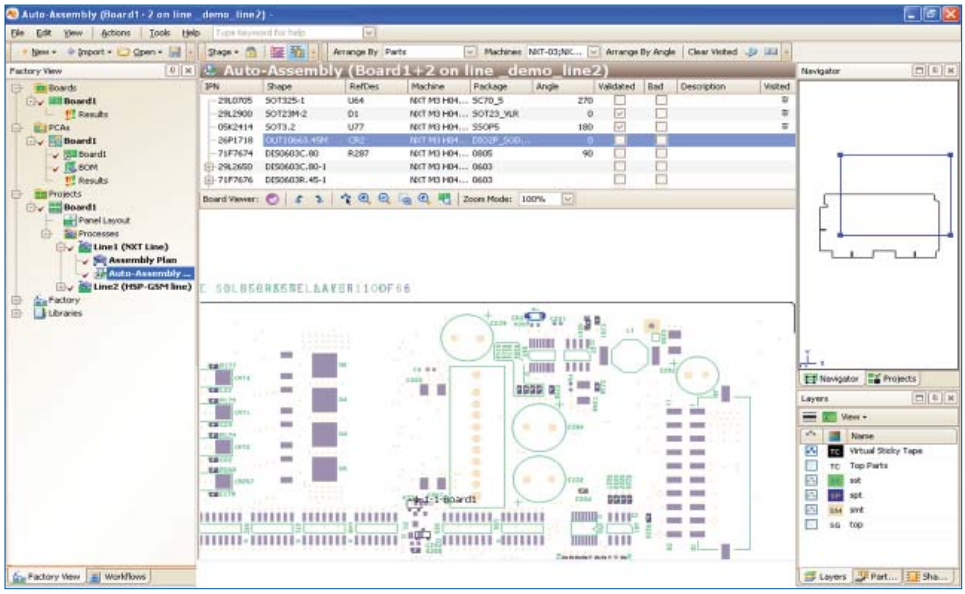
The template driven documentation editor makes work instruction creation fast and accurate. Since each SMT, THT and hand assembly process is synchronized to its corresponding work instruction, errors in the production process are eliminated. Each document is automatically updated after revision to the BOM. The document output can be a read-only PDF set, or interactive data based on the CAD attributes, when used with the Valor Document Viewer.

KEY FEATURE — Use your own templates based on the type of process, so that any product using that process flow can have high quality, highly detailed work instructions created with far less manual effort.

SMT Programming

With the Process Preparation module, there is just one centralized programming resource and one centralized part library for all SMT gear in your factory. This avoids the use of machine specific libraries or multiple programming tools, and therefore creates maximum flexibility when planning which product will run on which lines. Jobs are easily portable using the Intelligent programming system that creates machine-specific Shape and Supply Form data as needed though the Auto-Generation option, whenever new part data is required. Individual SMT machines are configured for accurate simulation and optimized performance. Programming can occur for one product at a time or for strategically created product families to reduce the change-over times. Both high volume production or high mix environments are support. Fixed feeder set-ups are fully supported

KEY FEATURE — Use Virtual Sticky Tape to find and fix all component rotation or X-Y position programming errors offline, before you run the first board. Virtual Sticky Tape is based on the actual machine data and library information "as built". Offline process simulation prevents loss of production time to trouble shoot and tweak programming data.



With Valor MSS Process Preparation, you don't need multiple programming tools or machine-specific libraries; a single programming resource and library serve your entier factory.

Test & Inspection Engineering

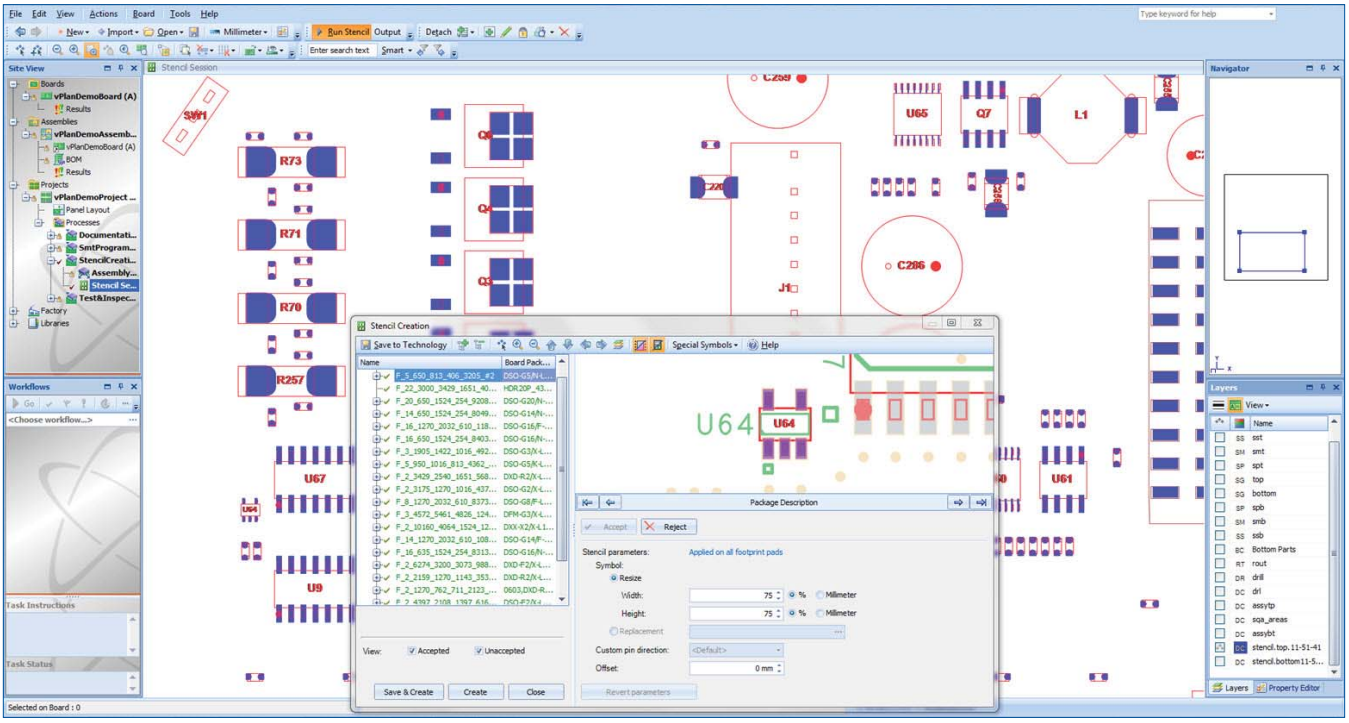
Create machine specific ICT, FPT, AOI and AXI output files for supported platforms. The product data mode and the MPL are optimized to support test and inspection programming and fixture design. Quickly optimize probe placement using probe reduction strategies. Leverage Boundary Scan analysis alongside ICT and flying probe capability. Automated DFT analysis avoids manual

intervention and the generated reports show testability as opposed to accessibility through predicted DPMO and Yield results. Quickly identify all components that are to be included in the AOI or AXI inspection programs.

KEY FEATURE — Use the Fixture Reuse analysis to determine if an ECN or new product revision requires changes to the test fixture. The analysis show exactly which test probes can be retained, moved, removed or changed.

Stencil Design

Technology rulesets based on the type of SMT process being used, will create optimal stencil designs in streamlined and repeatable manner. Creating stencil designs in-house reduces errors and shortens the review cycle between the manufacturer and the stencil supplier. The stencil design uses the same common data set as all other processes keeping the entire process preparation workflow streamlined and error free. Output is either ODB++ or 274X Gerber files.



With Valor MSS Process Preparation, you can design your own stencils, streamlining the process and reducing errors. Output can be either ODB++ or 274X Gerber files.

For the latest product information, call us or visit: www.mentor.com/valor

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