# CAM350™

*Streamlining the transition of engineering data into physical PCBs*

DownStream Technologies

The challenge for today's electronic product manufacturers is clear – send better products to market faster and more cost-effectively, before the competition.

In order to meet that challenge, the entire product development process must be optimized. Specifically for PCB Designers and Fabricators, this means careful transitioning of engineering design data into the PCB fabrication process.

## Introducing CAM350™ – a Complete PCB Fabrication Flow for Both PCB Designers and PCB Fabricators.

Built to meet the needs of both PCB Designers and PCB Fabricators, CAM350 is a complete PCB Fabrication Flow that streamlines the transition of engineering design data into physical PCBs. This powerful solution provides superior price/performance value in an easy-to-use product suite, delivering fast and accurate results.

*CAM350 for Engineering* can detect and correct PCB fabrication errors early in the design process with robust Design, for Fabrication (DFF) verification to drastically reduce costly design re-spins and increase PCB manufacturability.

*CAM350 for Fabrication* is a powerful solution that integrates the entire CAM process to accurately prepare, optimize, and process design data. The result: increased productivity, faster turnarounds, and higher quality.

*CAM350 — providing a complete fabrication flow to support both sides of the PCB design and manufacturing process.*

# CAM350 for Engineering

## Data Input and Output

CAM350 is a flexible, open system offering a wide variety of data input and output capabilities, including ODB++, Gerber, DirectCAM, IPC D-356 and many others. CAM350 is also equipped with the option of inputting complex CAD databases including PowerPCB and Boardstation, just to name a few. And, through the integration of intelligent data formats, CAM350 has expanded the number of intrinsic aperture shapes it supports to include rounded, rectangle, square thermal, ellipse, and bullet.

Other data input and output functionality includes:

- Reverse Engineering
- Draw-to-Raster Polygon Conversion
- Composite-to-Layer

## Automation and Scripting

CAM350 allows for Batch Mode processing for increased throughput, consistency, and accuracy of both the front-end sales analysis and back-end tooling analysis of PCB datasets.

Process Agents are user-configurable scripts and can be stored for repetitive jobs. CAM350 includes two Process Agents — Quote Agent and MRC Agent.

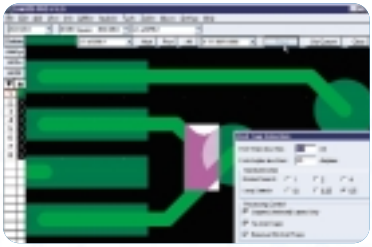
*With the right scripts, all labor-intensive, error-prone tasks can easily be managed*

The Quote Agent scans your entire design searching for critical pieces of information for quotation purposes while the MRC Agent groups together up to 80 different checks to be performed at any time on the job.

## Design for Fabrication

DFF Analyzer performs over 80 essential bare-board analysis checks, including fabrication, silk screen, power and ground, signal layers, drill, and soldermask to ensure designs do not contain manufacturing rules violations.

Locate, identify and automatically repair all manufacturing rules violations up-front, before any investment in hard tooling is made. Run DFF Analyzer to detect and adjust acid traps, soldermask slivers, copper slivers, starved thermals, and more.



*DFF analysis is critical to the success of today's complex electronic products*

## Design Rule Checking

CAM350 is also equipped with functionality tests for numerous types of spacing violations like track-to-track, track-to-pad and pad-to-pad, as well as drill hits without pads and pads without drill hits. In addition, DRC can compare drills-to-masks, masks-to-pads, and drills-to-pads to check for annular ring problems. In addition, the user can pre-define multiple passes to check different layers with unique rule sets, then run them in Batch Mode.

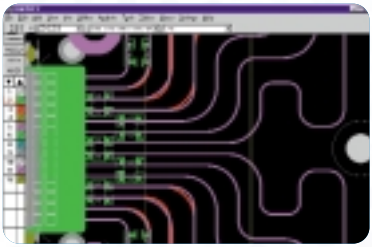
# CAM350 for Fabrication

## Data Exchange

CAM350 is equipped with a comprehensive set of data exchange options to automate the data entry process, reducing preparation time while optimizing the data for manufacturing. Robust editing features include draw-to-flash, vector-to-raster, polygon conversion, silkscreen clipping, and isolated pad removal.

## DirectCAD Technology

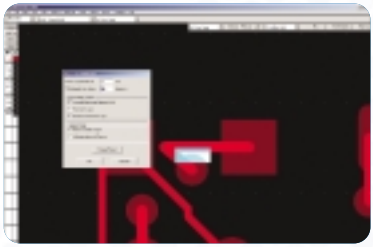
CAM350's DirectCAD technology reads and writes the intelligent CAD database, automatically capturing the attributes of the design and other manufacturing data, eliminating the need to work with Gerber files. This results in less drawn data, a good netlist and minimal cleanup. All CAD data, including testpoints, holes, netlists, and component footprints are saved for comprehensive review of manufacturability and board analysis.



*The DXF interface will simplify even the most complex data sets*

## DXF Data

The DXF interface inputs and outputs DXF data, allowing accurate artwork to be produced. The DXF methodology maintains fully intelligent text, including AutoCAD fonts, raster-filled polygons, tapered lines or arcs, line styles, and more.



*Analysis is critical to the success of today's complex electronic products*

## Design for Fabrication Analysis

DFF Analyzer locates, identifies and automatically repairs all manufacturing violations up-front, before committing the design to the shop floor. DFF Audit detects and repairs over 80 manufacturing issues, including solder bridges and acid traps, increasing productivity and reducing scrap.

DFF Analyzer allows for Batch Mode analysis, increasing productivity while at the same time ensuring the manufacturability of the designs before they are built.

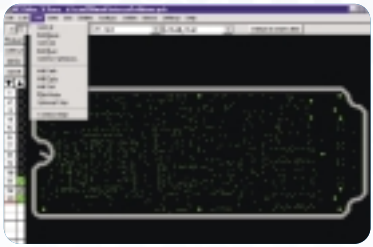
The AutoFix feature will instantly repair all problems found during analysis.

## Rule Checking

CAM350 includes a Manufacture Rules Check (MRC) feature to test for numerous types of spacing violations, including track-to-track, track-to-pad, and pad-to-pad, as well as drill hits without pads and pads without drill hits. In addition, MRC can compare your drills-to-masks, masks-to-pads, and drills-to-pads to check for annular ring problems. Multiple passes can be predefined, allowing different layers with unique rule sets to be checked and then run in Batch Mode. This eliminates the need to repeatedly run MRC, but allows for different spacing rules on inner and outer layers.

## NC Data Preparation

CAM350 includes an NC Editor, eliminating the need for additional tools and investment. The NC Editor operates in a 2-dimensional mode, maintaining true NC data and capabilities. This allows for accurate preparation of drill and/or mill tooling for either a one-up board or a complete panel. This feature optimizes the drill and mill machine's functionality to ensure manufacturability and efficiency.



*The NC Editor reduces drill wear, eliminates shorts, and improves overall board performance*

## Symbol Editor

CAM350 allows for Panel Symbols to be stored in a central library, allowing them to be used across multiple templates or designs. Symbols are intelligent and can be tailored to react to your stackup upon placement within a given design structure.

## Bare-board Test

CAM350 includes bare-board Test Editors that extract the essential data to drive the Flying Probe and Bed-of-Nails test equipment. This important feature will optimize test equipment performance, generate an accurate netlist, and identify collisions, breakouts and un-probed locations.

## Panel Editor

The Panel Editor in CAM350 streamlines and optimizes the process of tooling a printed circuit board for bare-board fabrication by allowing the operator to create templates for a variety of different panel sizes. Each template can include pinning holes, test coupons, nomenclature title blocks, and fiducials. Other parameters can be set, such as step and repeat spacing and panel border spacing, eliminating manual set up on each job.

The Panel Editor also allows for "Spreadsheet" mode, allowing multiple rotations of odd-shaped boards to be nested in order to achieve maximum copies on a panel.

*Optimize board real estate and machine performance with panelization functionality*

## Scripting and Process Agents

Several scripts, called Process Agents, which are designed to automate particular tasks such as quoting and rule checking, are included in CAM350.

An experienced programmer can take advantage of CAM350's macro scripting capabilities by using BASIC programming language and get additional performance and productivity by automating additional processes.

Point. Click. Build.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