CopyMate - 3D Made Easy

Whether you need to create a prototype or have an existing part, the task of converting a real part into a digital model has been a formidable one. CopyMate is a new approach that makes the complex task of copying a 3D part simple. Scanning 3D parts is handled quickly and efficiently.

The scanned data is automatically converted into a computerized model. CopyMate provides an easy way to edit the model and customize it for production. Machining is handled by a user-friendly wizard that guides the user through the process of creating toolpaths and sending them to the machine. CopyMate makes copying of 3D parts as simple as using a Xerox.

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Product Description

Laser Probe

See specification in Appendix 1

Point Cloud Data Collection

CopyMate provides an elegant method of fitting CNC machines with a digitizing probe that enables the collection of points from any given part. The user is guided through a simple setup procedure, so that point collection can be achieved on any machine. The setup procedure controls also features such as automatic calibration and optimized performance.

Data Filtering & Processing

Years of experience of GraphiTech's engineers have been compiled into a state of the art algorithm that processes the incoming data. Examining the probe points and filtering bad points on the fly, enables CopyMate to provide high quality surfaces ready for machining.

Surface Generation

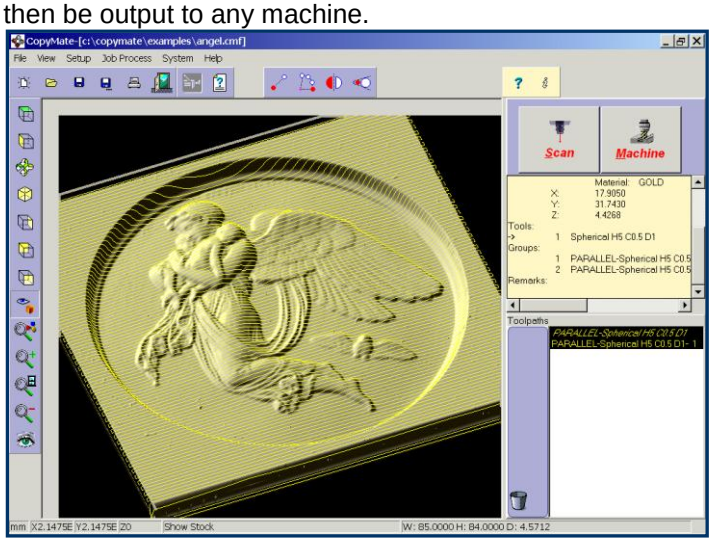
GraphiTech 's unique surface structure, developed for the purpose of handling very complex and detailed surfaces, has been integrated into CopyMate. This surface has been optimized for memory size and quality. Typical cloud of points, tend to be extremely large and put a heavy demand on the computer. CopyMate will automatically convert the data into a surface, which is machine ready.

Surface Manipulation

CopyMate provides the tools to position, mirror and scale the surface. The setup tools are designed so that machine setup time is reduced to the bare minimum saving time and hassle.

Toolpath Creation

A simple, but smart wizard guides the user through the steps required to generate a toolpath. From stock and material definition, selecting and defining tools, setting technology parameters. Full gouge check is performed to create the optimal toolpath, which can then be output to any machine.



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Feature	Description
Constant Z scanning	Scanning of a part without surface tracking. This method increased dramatically the speed of scanning.
Transformation	Position, Flip, Rotate, Mirror, Scale.
Trim Plane	Limit the surface to a given height, removing all noise and irrelevant data bellow this plane.
Hatch Wizard machining	Create finish and rough tool-paths to machine the scanned part.
Slice Scanning	Optimized scanning method, builds the model from slices. The user may export the slices or the model surface.
Repair/Cut tool	Surface editing and retouch tools
Slice viewer	Cross-section builder and viewer.
Z level machining	Enhanced roughing and finishing milling strategies.
Script	Milling automation tools
CDI (Data interface) **IGES(output)** **VDA (output)** **Rhino (output)**	Output format for CAD/CAM

Appendix 1 –Laser Probe Performance Specifications

Lens assembly focal length	16 mm	25 mm	50 mm	50mm Extended	75 mm	100 mm	125 mm Extended	150 mm
Z (vertical) axis specifications								
Absolute accuracy (1)	2µm	3µm	6µm	6µm	10µm	15µm	20µm	25µm
Repeatability 1σ (2)	0.1µm	0.4µm	1µm	2µm	2µm	4µm	8µm	10µm
Maximum working range	0.5mm	1.8mm	8mm	8mm	18mm	35mm	45mm	70mm
Linearity over working range	0.5%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Stand off (3)	9mm	15mm	35mm	80mm	60mm	70mm	240mm	110mm
Angular measurement range	0 - 85 degrees							
Data handling								
Data rate	Up to 1000 points per second							
Maximum readings/scan	No Limit							
General								
Working temperature (4)	18 to 35°C (6)							

(1) As measured on diffused metallic step, average over 5mm scan in X direction. Measured over 50% of working range. Reflective fine-machined surfaces (N6) will yield approximately 2X less absolute accuracy.
(2) Measured as above over repeat scans on similar objects without changing setup.
(3) From tip of objective to center of working range.
(4) Unit is calibrated at 23°C. The probe has a calibration temperature dependence of 0.02%/°C and a dependence of 0.15% from lowest to highest laser power.

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Appendix 2 – Packing List

System includes:

1. Laser Probe with two lenses **
   (Select 2 from: 50mm, 75mm, 100mm, 150mm, 250mm)
2. Electronic unit for Laser probe.
3. CopyMate software CD, including:
   - Point Cloud Data Collection
   - Data Filtering & Processing
   - Surface Generation
   - Surface Manipulation
   - Toolpath Creation*

* Not included in Compact level.
**Other specialty lenses – 16mm, 25mm, extended & High-Definition lenses quoted upon request.