PolyWorks®

Total Point Cloud Inspection and Reverse-Engineering Software Solution

From the Market Leader
TRUSTED. This word summarizes the worldwide success of PolyWorks in the manufacturing community.

Whether you are casting, milling, molding, or stamping, you can rely on PolyWorks to provide a complete solution for your process. PolyWorks includes the largest set of point cloud processing tools, including pre-processing, alignment, meshing (polygon generation), polygon editing, curve extraction & editing, NURBS surface creation, part-to-CAD & part-to-part comparison, dimensional measurements, and GD&T analysis.

Are accuracy and reliability important for you? At InnovMetric, they are the backbone of our business! PolyWorks delivers more tools for controlling and checking its processing algorithms than any other software. All over the world, high-end manufacturers trust the accuracy of PolyWorks’ inspection and reverse-engineering results.

Need more to be convinced? In today’s world, where processes must be constantly optimized for increased productivity, several world-class manufacturers have trained hundreds of users and designed new quality control and reverse-engineering processes based on PolyWorks.

Optimizing a Die Prototype

Process Description
From the first die CAD model to final dies certified for production, sheet metal panels and dies are scanned and inspected to analyze deviations and make corrections.

Markets
Automotive and Aerospace industries

Unique PolyWorks Benefits
• Constrainable feature-based and best-fit alignment
• Quick point-to-surface error measurement and customizable color maps
• Full support of surface and solid sheet metal models
• Intuitive sheet metal feature fitting
• Automatic fillet inspection
• Customizable flush & gap gauges

Key Advantage
Globally visualizing part deformation helps in analyzing specific stamping processes and in solving spring-back and assembly problems, resulting in dramatic reduction in die development time and cost.
Applications

Inspecting Turbine Blades

Process Description
Turbine blade castings are digitized and inspected along cross-sections.

Markets
Aerospace, Automotive, and Energy industries

Unique PolyWorks Benefits
• Super-thin object meshing
• Cross-sectional best-fit alignment
• Compensated cross-sectional comparison
• Full-scale GD&T analysis

Key Advantage
By using a point cloud digitizer and PolyWorks, a traditional CMM-based cross-sectional inspection process can be applied to turbine blades in a fraction of the time.

Quickly Surfacing a Legacy Part

Process Description
A part for which no CAD model is available is digitized, polygonized, and a network of NURBS surfaces is laid down over it and imported into a CAD system.

Markets
Automotive, Aerospace, and Consumer goods industries

Unique PolyWorks Benefits
• Automatic feature line extraction
• Automatic curve networks including T-junctions
• User-defined tolerance-based mesh curves
• Fully automatic surface fitting

Key Advantage
An accurate surface model is imported into your CAD system for design modifications, virtual assembly, or "as built" CAD archiving.
Creating a Golden Template from Several Prototypes

**Process Description**
Several prototypes are digitized and an average point cloud is computed from which a golden template is derived.

**Markets**
Automotive and Consumer Goods industries

**Unique PolyWorks Benefits**
- Fully-featured cross-sectional inspection
- Discrete averaging of multiple polygonal models
- Statistical selection of a golden template
- Direct link to Excel for additional processing

**Key Advantage**
This process is the fastest method for finding the median prototype and using it as a golden template for inspection purposes.

Copy Milling - Object Rescaling

**Process Description**
A clay model or finished model is digitized, accurately modeled by polygons, scaled up or down, and directly milled from polygons.

**Markets**
Automotive, Foundry, Jewelry, and Consumer Goods industries

**Unique PolyWorks Benefits**
- User-defined tolerance-based meshing
- Fully automatic curvature-based hole filling
- Powerful NURBS-based hole filling for reconstructing missing parts
- Feature line reconstruction
- Intelligent polygon subdivision

**Key Advantage**
Polygons more accurately describe a digitized model and can be directly milled without the need for CAD software.
### Simulating the Aerodynamic Properties of a Car

**Process Description**
A clay model, a car prototype, or an airplane is digitized and its polygonal representation is optimized for CFD software.

**Markets**
Automotive and Aerospace industries

**Unique PolyWorks Benefits**
- Automatic feature line extraction
- Accurate edge and corner fitting
- Automatic curve networks and quick remeshing
- Mesh optimization along curvature directions
- Feature-preserving triangle decimation

**Key Advantage**
Fluid dynamics information extracted from a more accurate model at an early stage of the creation process increases the efficiency of your design.

### Inspecting the Core of a Prototype Plastic Part

**Process Description**
To ensure perfect part assembly, every feature of the prototype plastic part is measured and compared with its design specifications.

**Markets**
Automotive and Consumer Goods industries

**Unique PolyWorks Benefits**
- Complete GD&T analysis
- Automatic nominal feature extraction
- Automatic feature fitting
- Comprehensive caliper gauges
- Wall thickness measurement

**Key Advantage**
Correcting deviations prior to production results in better assembly, increased product quality, and shorter time to market.
Users worldwide have chosen PolyWorks because it is...

"Using PolyWorks, we succeeded in reducing the time of a sculpture enlargement process by more than 83%. InnovMetric’s powerful software solution and knowledge of our business are a winning combination that ensures the success of every project".

Jon Lash, Director of Special Projects, Johnson Atelier, New Jersey USA

InnovMetric at a glance

Founded in 1994, InnovMetric Software pioneered the market for point cloud inspection and polygonal manufacturing software solutions. InnovMetric Software is a privately-owned company which has sustained an 86% average yearly growth. Today, PolyWorks licenses are at work daily in more than 30 countries, benefiting users such as BMW, Boeing, DaimlerChrysler, Ford, GM, Honda, Hyundai, Lockheed-Martin, Peugeot, Porsche, Rolls-Royce, Toyota, and Volkswagen with the most complete, accurate, and robust 3D point cloud processing software solution on the market.

For more information about PolyWorks, please contact InnovMetric or an authorized reseller.