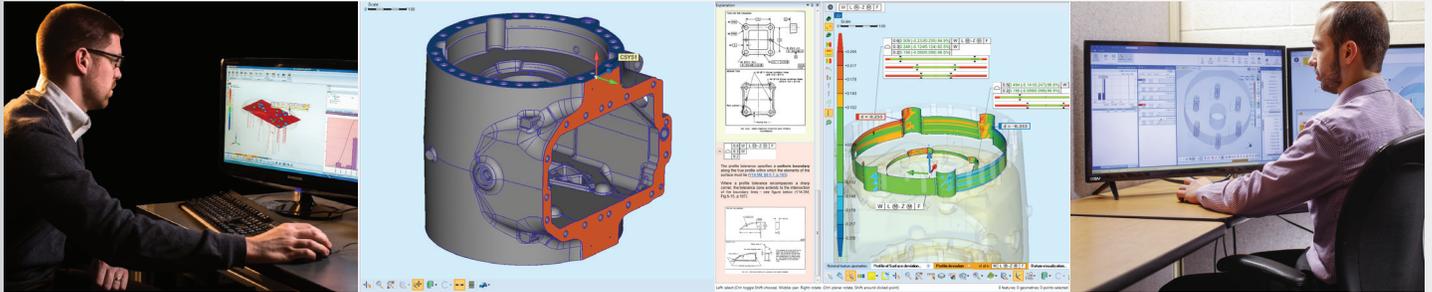


KOTEM

SmartFit 3D | Interactive Software Environment



SmartFit 3D

SmartFit® 3D is a fast, accurate, and reliable standalone 2D/3D best-fitting and analysis software package that compares CAD/nominal models to data from most measurement systems. SmartFit 3D is an interactive software environment where measured data is analyzed, optimized, and compared to CAD and theoretical data.

What Problems Can It Solve?

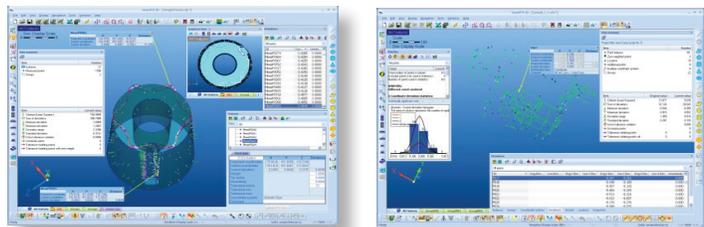
- Best-fit a part to its tolerance zones
- Assess profile tolerances on complex surfaces
- Find the best coordinate systems for machining
- Determine the best achievable tolerance
- Find set-up problems and determine new, better datum targets
- Troubleshoot the manufacturing process using intelligent “what if” analysis
- Analyze assemblies and provide advice on correction

Two Distinct Working Modes

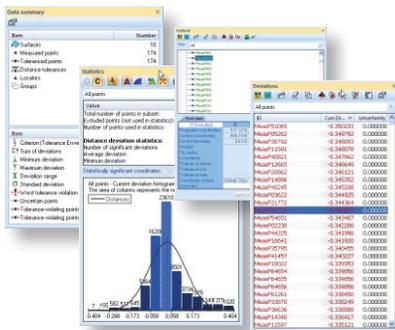
Data imported into SmartFit 3D can be optimized in “**Point to Point**” or “**Point to Surface**” mode.

In “**Point to Point**” mode, the nominal coordinates of each measured point are explicitly defined, and remain unchanged during the entire optimization process.

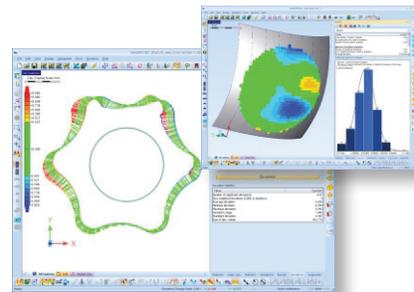
“**Point to Surface**” mode represents the nominal part with a CAD model, while the nominal points are represented by the projected coordinates, which usually vary at each optimization step.



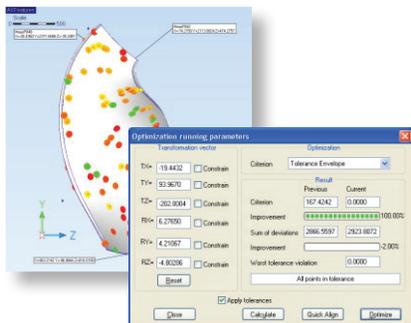
High Performance 2D/3D Fitting & Analysis Software



SmartFit 3D displays **tabular data** and **graphs** of that data to provide a thorough understanding.



Color whisker plots in distance or coordinate mode, and deviation color scaling clearly show part position and tolerance conditions.



SmartFit 3D calculates the best position of a part for machining in its **Tolerance Envelope Mini-Max optimization**.

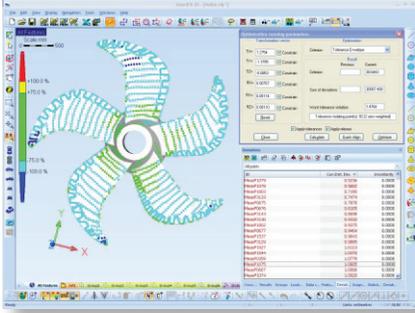


Select SmartFit 3D results to **output to Excel**.

Sample Applications: SmartFit 3D at Work

Smart Fit 3D is ideal for best-fitting and analysis in virtually any manufacturing process

Turbine Blades and Propellers

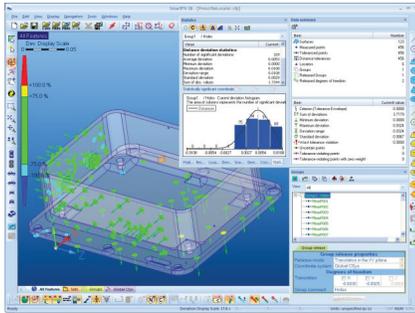


Analysis to aid propeller machining

Use SmartFit 3D to construct a profile tolerance for the blade that dictates its best position for machining. SmartFit 3D ensures there is material all around, and maximizes material in the places where it is most needed.

Next, let SmartFit 3D find the right position for machining the entire propeller, based on the blade tolerance profile, angular location of each blade in the assembly, and the pitch angle.

Die Casting and Assembly



Analysis of locator positions for machine die casting

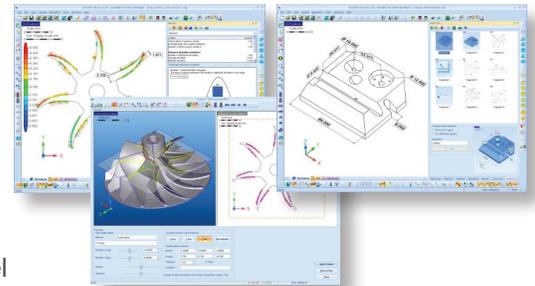
A dimensionally correct die may not always produce a dimensionally correct casting. A cast part may have areas outside the material or too much material in other places, causing rejection. SmartFit 3D can minimize guesswork and rework by optimizing the part against its CAD model.

Movements of die members, as well as other subassembly problems, are also easily solved by applying the “Group Release” function, which gives the values to be used in order to build the correct assembly.

SmartFit 3D offers your Quality Control and Manufacturing Specialists unprecedented access to process secrets.

SmartFit 3D Capabilities

- Assess profile tolerances of complex surfaces, determining the best achievable tolerance
- Simulate corrections for assemblies
- Achieve maximum material conditions for machining
- System identification of new, better datum targets (locators)
- Determine best coordinate system for machining
- “What if” analysis during optimization
- Create simple models — without a CAD system
- Compare two or more model surfaces
- Construct mesh surfaces
- Evaluate more than one imported point cloud against a nominal model
- Evaluate measured data against more than one imported or constructed model
- Associate measured points with specific geometric features
- Automatically process data with AutoRun



SmartFit 3D Import/Export Options

- Import measured points with or without probe tip radius
- Import CAD file — compatible with IGES, VDA, STL, DXF, STEP, SFM and QIF formats
- Import native CAD models (CATIA, Parasolid, Solidworks, ProE, ACIS, Ideas) via third-party API CAD importer
- Import measured point data including MeasureX, Measuremind, Metrolog, Calypso, Innovmetric, APT and PolyWorks Scan line formats.
- Export to SmartFit/SmartProfile Model (SFM) format
- Export to STL format
- Export whiskers to an IGES file
- Export screen captures
- Export results to an Excel file
- Export mesh points of a model
- Export cross section as a 2D SmartFit project
- Pre and Post point filtering options, including Reduce Noise, Point/Island/Scan line oriented outlier removal, Smart Scanned Point/QSP/Curvature based/Thinning point count reduction, Morphology, PAMS

SmartFit3D Features

- Eight mathematical criteria for best-fitting — Least Squares, Root Mean Square, Minimum Sum of Deviations, Mini-Max, Uniform Deviations, Minimum Standard Deviation, Tolerance Envelope, and Tolerance Envelope Mini-Max and Maximum Machining Allowance (Maximize the material for machining by direct optimization criterion)
- Calculation with uncertainty information — best fitting can take measurement uncertainties into account if provided. Optimization algorithms will achieve the best solution, with all uncertainty zones put into tolerance
- Tools for forcing a solution by weighting, excluding, or releasing points
- Calculation of basic geometric elements certified by PTB
- Cross sectioning capability — allows creation of cross sections from sophisticated freeform models, with analysis of errors in 2D.
Cross section can be included in reports or exported for further analysis.
- Multiple error display modes, including color mapping, statistics, graphics snapshots, and detailed point/error information
- “Point to Point” and “Point to Surface” working modes
- Built-in filters automatically invoked during measured data import
- Annotations and basic dimensioning capability
- Microsoft® Office™ 2007 color scheme
- Reverse engineering, with 2.5D and 3D triangle mesh and conventional geometries from point clouds
- Variable Tolerance Zone
- Custom operations - allows creation of automated functional groups for immediate execution

KOTEM

The leader in dimensional analysis software

KOTEM is the worldwide leader in dimensional analysis software. Our family of advanced GD&T and fitting software helps manufacturers integrate quality inspection data with their manufacturing and design work flows. KOTEM is a Quality Vision International company.

QVI® (Quality Vision International) is the world's largest vision metrology company. Founded in 1945, QVI is the world leader in optical, electronic and software technologies for vision and multisensor measuring systems.

To learn more about SmartFit go to www.kotem.com/smartfit

SmartFit is fully compliant with all internationally accepted GD&T Standards:



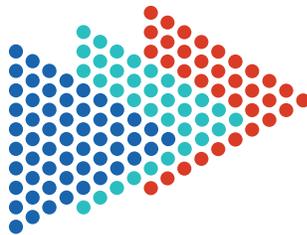
ASME Y14.5M-1994



ASME Y14.5-2009



ISO 1101



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