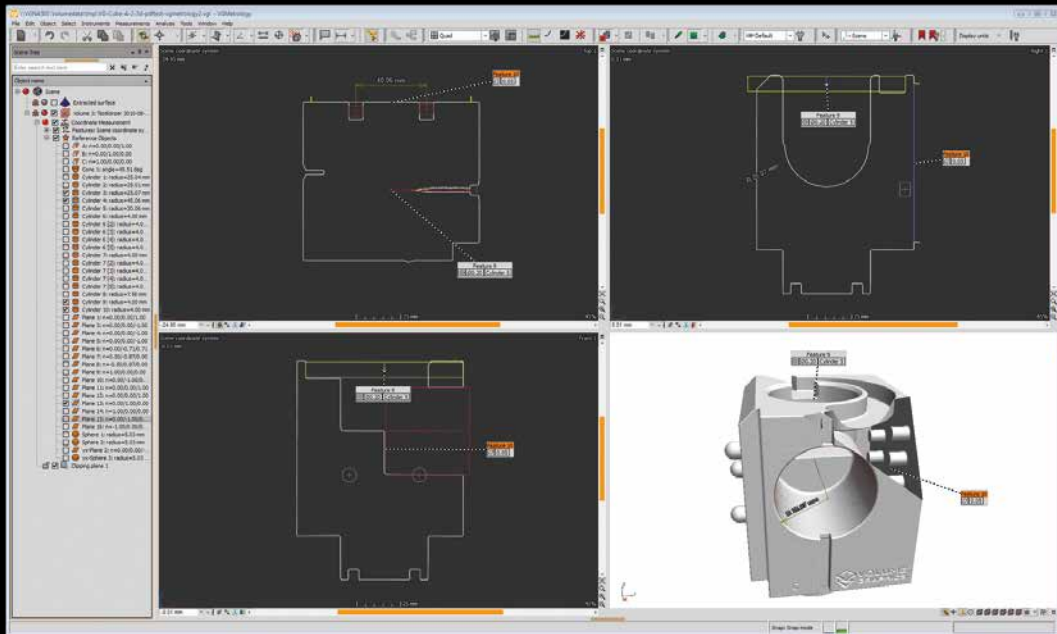




VGMETROLOGY

Maximum Precision, Minimal CT Data Set Sizes



Full-featured but nonetheless easy-to-use—VGMETROLOGY is made for metrologists.

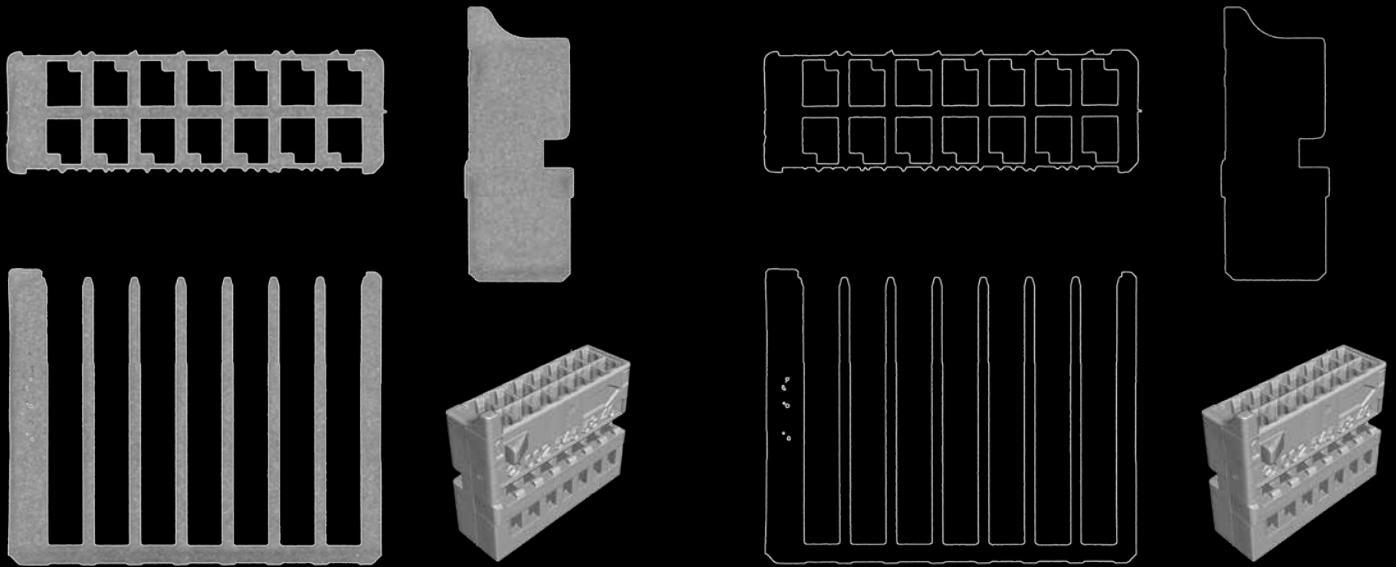
The Universal Metrology Solution

VGMETROLOGY is made for metrologists. Our universal metrology solution turns your computed tomography (CT) scanner into a comprehensive and precise metrology device.

- > **Full-featured.** VGMETROLOGY offers you the full metrology-related functionality of VGSTUDIO MAX including GD&T functionality.
- > **Uncompromisingly accurate.** VGMETROLOGY gives you the complete picture of all object surfaces—and saves it in the very compact .mvgf format.
- > **Universal.** VGMETROLOGY works natively on voxel, point cloud, mesh, and CAD data.
- > **Easy-to-use.** The focused range of functionality makes VGMETROLOGY easily accessible for new users.
- > **Efficient.** Powerful automation functions speed up your work when dealing with repetitive tasks and analyzing periodic structures.
- > **Seamless.** You can exchange files between VGMETROLOGY and other Volume Graphics products.

The Volume Graphics Metrology Kernel in VGMETROLOGY has been tested by the national institutes PTB (Physikalisch-Technische Bundesanstalt) and NIST (National Institute of Standards and Technology).*

* PTB and NIST verified: This software contains the Volume Graphics Metrology Kernel VGMK 3.2.0 140356 which passed the PTB test for "Evaluation software based on minimum-zone method for coordinate measuring machines" and the PTB test for "Evaluation software based on least-squares method for coordinate measuring machines" and which was verified by the NIST "Algorithm Testing and Evaluation Program for Coordinate Measuring Systems". The test results were obtained under Windows (64 bit).



Left: conventional CT data, right: VGMETROLOGY data

CT Gives You the Full Picture— Conventional Methods Can't

In contrast to tactile and optical methods, industrial CT holistically scans all surfaces of an object, even if they are inside your part or difficult to capture.

CT is the ideal basis for metrology applications. While tactile coordinate measurement methods are also non-destructive, CT is also non-intrusive. This means measuring on CT doesn't deform the part. And unlike optical methods, CT still works accurately even if the part reflects or is translucent.

It's Time to Retire Those Meshes

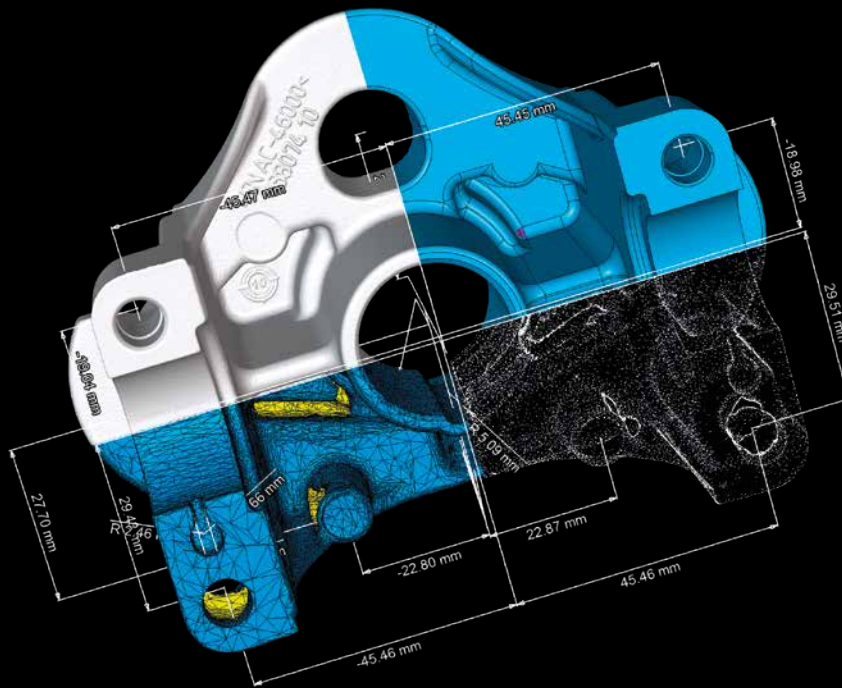
A .mvgl file contains the best possible object surface without any loss in quality.

At the same time, a .mvgl file is smaller than a .stl file with comparable precision. But unlike the .stl format, a .mvgl file is small because it contains only the surface of the object. In a .stl file, a polygon mesh approximately describes the surface of the object. The smaller the .stl file, the less accurate the mesh.

A .mvgl file contains subvoxel-accurately determined surfaces. To achieve subvoxel accuracy, VGMETROLOGY processes the gray values of individual voxels in such a way that even those details which are smaller than a voxel become visible.*

Our .mvgl format packs everything metrologists need into one compact, easy-to-handle file. This comes in handy especially when you exchange metrology data sets over the internet.

* VGMETROLOGY ES and VGMETROLOGY VIEWER can work with subvoxel-precise surfaces, but don't offer surface determination.



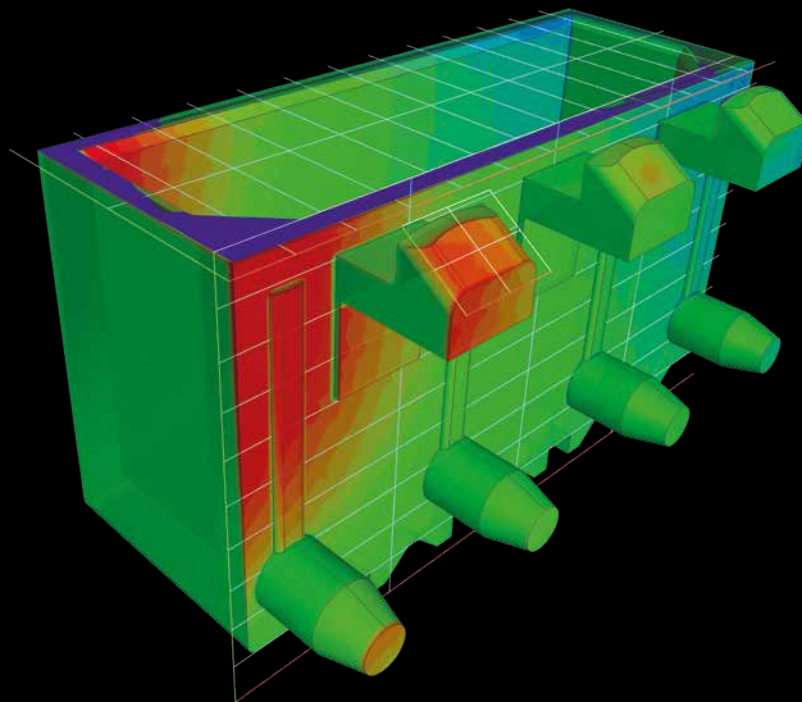
No matter the format, VGMETROLOGY can handle it. From top left to bottom right: voxel, CAD, mesh, and point cloud data.

Equipped for All Common Measurement Methods

- > **Works natively with point clouds and meshes created by tactile and optical scanners in addition to voxel data**
- > Loads CAD models in formats such as CATIA V5, Creo, Pro/ENGINEER—in addition to the import of STEP and IGES formats *
- > Automatically translates and intelligently evaluates additional part information that is stored in Product and Manufacturing Information (PMI), e.g., dimensioning, GD&T, layers, annotations, or captions **
- > Imports point clouds in ASCII files, .csv files, and plain text files
- > Supports mesh files in the .stl format, both ASCII-coded as well as binary-coded
- > Reduces measurement uncertainty because geometry object fitting is optimized for each supported data type (voxel, CAD, mesh, and point cloud data)
- > Imports textured meshes and colored point clouds for a more meaningful documentation and visual analysis of objects

Full Metrology-Related Functionality Combined with Features to Increase Efficiency

- > **GD&T functionality (based on DIN EN ISO 1101)**
- > Object registration by Best-fit, 3-2-1, RPS, sequential, or feature-based method
- > Storage of different registrations of an object to easily switch between them; measurements are updating accordingly
- > Intuitive sequential alignment to register two objects against each other based on corresponding pairs of geometry elements
- > Automatic selection of the type of geometry element to be fitted
- > Automated generation of datum systems
- > Creation of common datums
- > Nominal/actual comparisons on CAD, mesh (.stl), and voxel data, including on Regions of Interest (ROIs)
- > Wall thickness analyses both for near parallel surfaces (using the ray method) and for curved or branching surfaces (using the sphere method)
- > Extensive reporting functions
- > Automated analysis of single data sets or a group of data sets with macros and templates
- > Automated replication of measurement plans across periodic structures



The optional Manufacturing Geometry Correction Module creates a color-coded visualization that shows you at a glance any deviations of the manufactured part from the target model.

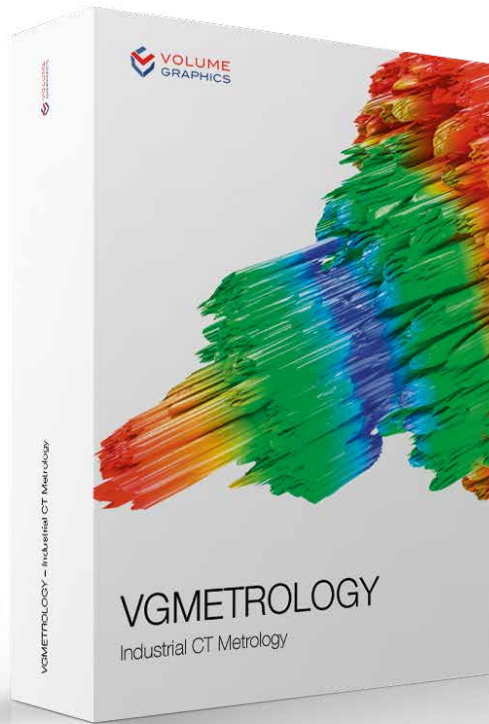
Optional Add-on Module: Manufacturing Geometry Correction

> Corrects tools for injection molding or casting and 3D printing geometries in a seamless digital workflow with a lower number of iterations—keeping the quality up and the time to market short.*

- > Processes voxel, .stl, and CAD data together in one software.
- > Calculates changes to injection molds, punching tools, or geometries of 3D printed parts based on scans of your sample part.
- > Provides a color-coded visualization that shows you at a glance any deviations of the manufactured part from the target model, including curvatures and undercuts.
- > Uses scan data of the part to quickly and easily generate correction areas in CAD format to adapt the part and the tool shape.
- > Exports information about the newly calculated surfaces directly as CAD faces.

* Optional add-on module for a fee. Supported CAD formats are: CATIA V5 (up to V5-6 R2018), Creo (up to 5.0 Beta). In beta status: CATIA V4 (up to 4.2.5), JT (up to 10.0), Pro/ENGINEER (up to 19.0), Unigraphics/NX (V11.0 to NX 12.0), Solid Edge (V19 – 20, ST – ST10), SolidWorks (97 up to 2018). CAD translation technology supplied by Tech Soft 3D.

** Optional add-on module for a fee. PMI import is supported for CATIA V5 and Creo. In beta status also for Pro/ENGINEER and Unigraphics/NX. CAD translation technology supplied by Tech Soft 3D.



Three Editions

VG METROLOGY comes in three editions:

A stand-alone edition with built-in surface determination, an essential edition VG METROLOGY ES, which can open .vgl and .mvgl with already determined surfaces, and a viewer edition VG METROLOGY VIEWER.

Features	VG METROLOGY	VG METROLOGY ES	VG METROLOGY VIEWER
Import voxel data directly from your CT scanner	✓		
Import point cloud, mesh, and CAD data	✓	✓	✓
Measure on voxel, CAD, mesh, and point cloud data	✓	✓	✓*
Automate with macros, templates, and batch processing	✓	✓	
Save projects as compact .mvgl files	✓	✓	
Open .mvgl files	✓	✓	✓
Price	Contact us for a quote!	Contact us for a quote!	Free

* Only alignments and basic measurements



Volume Graphics—Enabling better products

Volume Graphics customers all over the world in both industry and science know that Volume Graphics software gives them a decisive advantage: The ability to gain reliable insights and make better products. It's time you join them.

With the Volume Graphics product family, comprising of VGSTUDIO MAX, VGSTUDIO, VGMETROLOGY, VGiNLINE, and myVGL, you can carry out all kinds of analyses and visualizations directly on data from industrial computed tomography (CT).

Recognized Market Leadership

With a market share of around 80%, Volume Graphics holds a leading position in the industrial CT software industry, as recognized by the global business consulting firm Frost & Sullivan with the “2018 Global Industrial CT Software Market Leadership Award”.*



By choosing Volume Graphics, you can rely on more than 20 years of experience in the development of software for non-destructive testing. Today, global customers, e.g., from the automotive, aerospace, and electronics industries, use Volume Graphics software for quality assurance in product development and production.

Peace of Mind Included

When you choose Volume Graphics, you get the peace of mind that comes with knowing that you have a team of experts with a deep understanding of your tasks at your side. This begins when our sales experts help you configure your Volume Graphics software and continues long after the purchase: an optional update/service agreement keeps your software up to date, a competent team of specialists with short response times is there to support you, and training courses at VG Academy get you up to speed in using your software. In addition, our consultants are at your side, especially when it comes to automating complex analysis tasks.

* Source: Frost & Sullivan Award Write Up www.volumegraphics.com/en/frost



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Headquarters
Volume Graphics GmbH
Speyerer Straße 4-6
69115 Heidelberg, Germany

Phone: +49 6221 73920-60

Fax: +49 6221 73920-88

sales@volumegraphics.com

www.volumegraphics.com

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