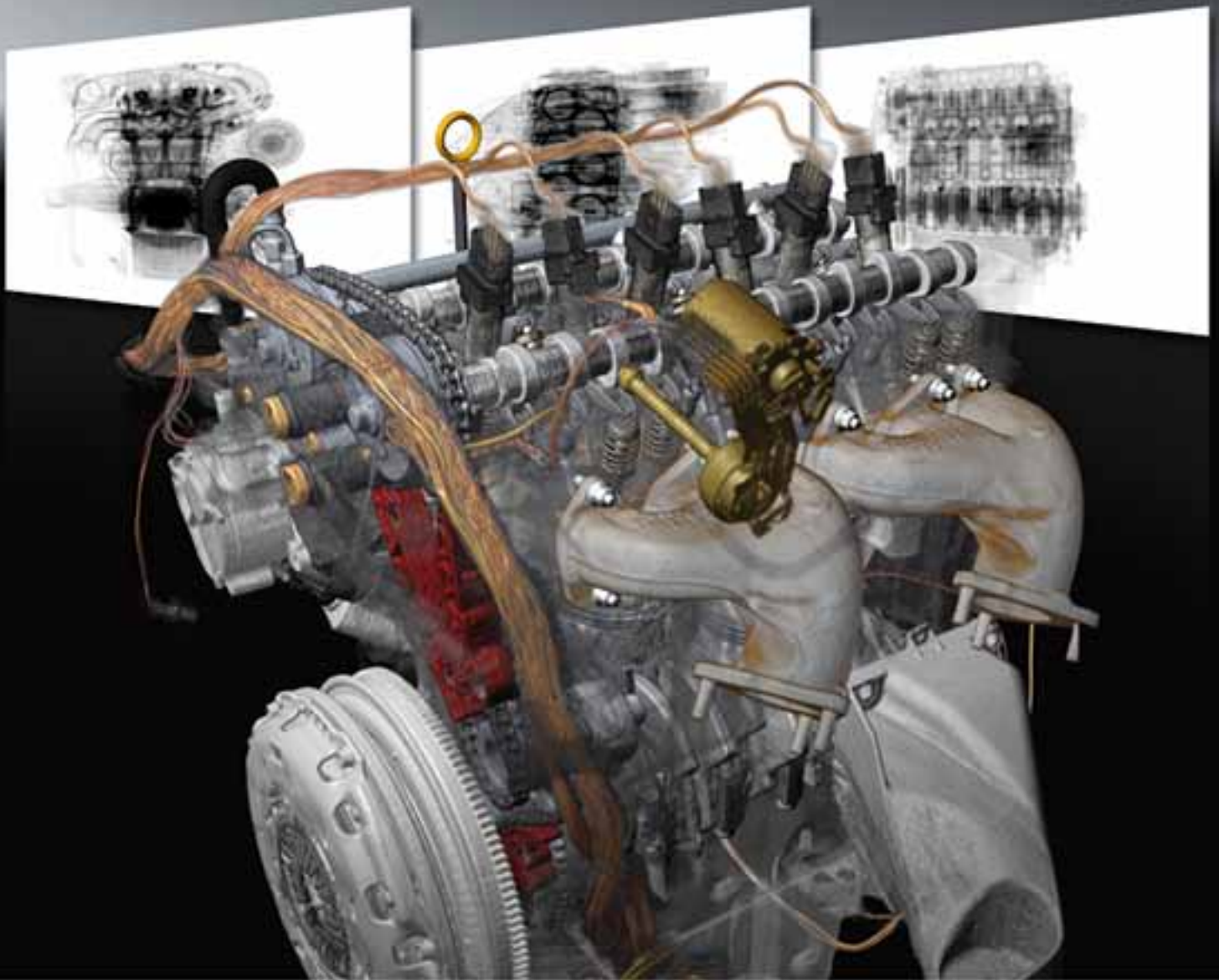


VGStudio MAX 2.1



**THE MARKET'S LEADING APPLICATION SOFTWARE FOR THE ANALYSIS
AND VISUALIZATION OF INDUSTRIAL COMPUTER TOMOGRAPHY/VOXEL
DATA**



WHY VGSTUDIO MAX EXCELS

VGStudio MAX has revolutionized the way industrial computer tomography (CT)/voxel data is utilized: Very large data sets can now be handled quickly and interactively. With its unique features and module options, *VGStudio MAX* allows large CT data sets to be processed within very few minutes – with no limit on data quantity. Data sets of 80 GB can today be processed on off-the-shelf PC hardware. This is why *VGStudio MAX* provides ideal tools for quality control, rapid prototyping and reverse engineering.

Examples of the extensive functionality of *VGStudio MAX*:

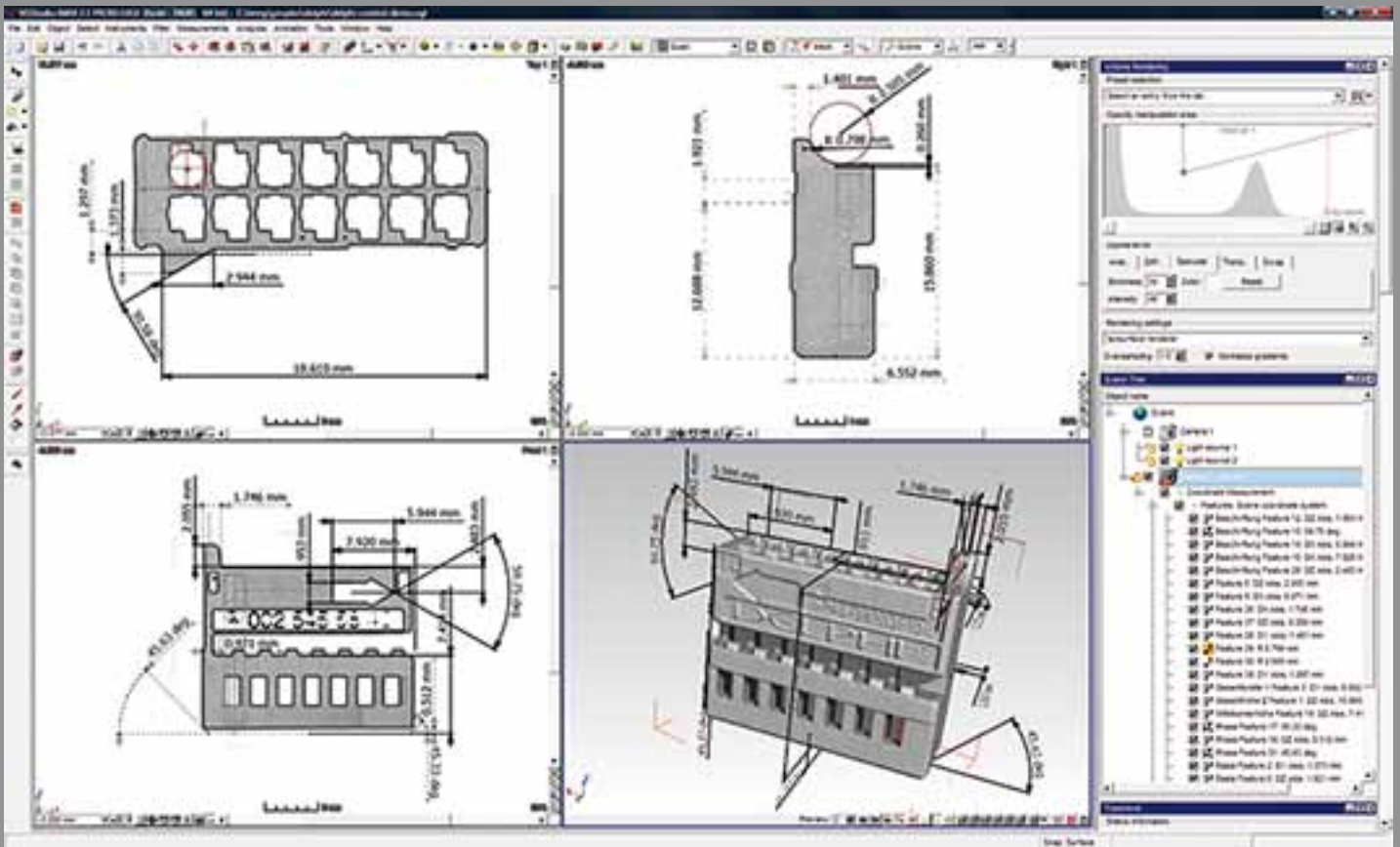
- Coordinate Measurement for 2D and 3D dimensioning (optional module)
- Nominal/Actual Comparison for comparison with CAD data (optional module)
- automatic discontinuity analysis for Porosity/Inclusion detection (optional module)
- Wall Thickness Analysis (optional module)
- unsurpassed segmentation tools for the separation of materials and geometries within a data set
- macro/batch processing
- powerful reporting tool for the generation of detailed reports containing user-defined information on every measured feature
- high performance CT Reconstruction (optional module)

VGStudio MAX implements the new, unique 'Region of Interest' concept, i.e. a region to be analyzed can be defined using powerful segmentation tools. These 'Regions of Interest' allow complex assemblies to be split into separate components. Data analysis tasks such as Nominal/Actual Comparisons, Wall Thickness or Porosity/Inclusion Analyses can then be performed on specific user-defined areas. Overall processing times can thus be dramatically reduced.

Furthermore, 'Regions of Interest' can be stored as templates containing inspection plans defined for these regions, for example to perform a discontinuity analysis. Such templates are ideally suited for use in macros: They guarantee comparable analysis results in serial analyses for improved quality surveillance and control.

VGStudio MAX supports the importation of volume and projection data of all kinds and provides a sophisticated import wizard guiding the user through the import process. Data sets are immediately displayed in a 3D view as well as in three orthogonal slice image views. With its ultra-fast volume visualization (real-time ray-tracing), *VGStudio MAX* allows CT data to be visualized interactively from any point of view. Data volumes can be sliced in any required orientation to provide a detailed insight. An intuitive keyframer tool allows different types of animations to be created for the presentation of analysis results in a most impressive format.





FACTS ABOUT VGSTUDIO MAX

VGStudio MAX is the world's most advanced software platform for industrial CT data analysis and visualization. It incorporates Volume Graphics' latest VGL® kernel technology, knowledge and experience gathered from more than 1500 installations worldwide.

VGStudio MAX:

- allows users to perform material- and geometry-related analyses of their CT/voxel data sets within one single software environment
- supports the combined processing of CT and CAD data
- offers software tools for direct processing of voxel data sets – there is no need to convert voxel data into other data formats such as point clouds or surface meshes. This direct processing reduces measurement uncertainty and improves overall processing time, which is especially important in serial inspection or in-line CT data analysis.
- supports macros, inspection templates and 'Regions of Interest' for efficient processing of serial inspection tasks

VGStudio MAX is today's leading tool for the visualization and analysis of CT data and is used by nearly all industries and research institutes world-wide using 3D image-based systems such as CT systems, for example:

- automotive companies
- well-known aerospace companies
- consumer electronics companies
- supplier industries like aluminium foundries, injection molding companies, electronics manufacturers
- producers of medical equipment
- research institutes, universities, museums and many others

COORDINATE MEASUREMENT MODULE

VGStudio MAX turns any industrial CT scanner into a high-performance Coordinate Measurement System (CMS) allowing inspection tasks to be performed which cannot be accomplished efficiently or non-destructively using conventional methods. The software was developed especially for use on CT data and thus provides a highly efficient and intuitive user interface. In order to achieve the highest possible level of precision when measuring CT data, the optional Coordinate Measurement (CM) module includes a unique algorithm for precise surface determination with sub-voxel accuracy.

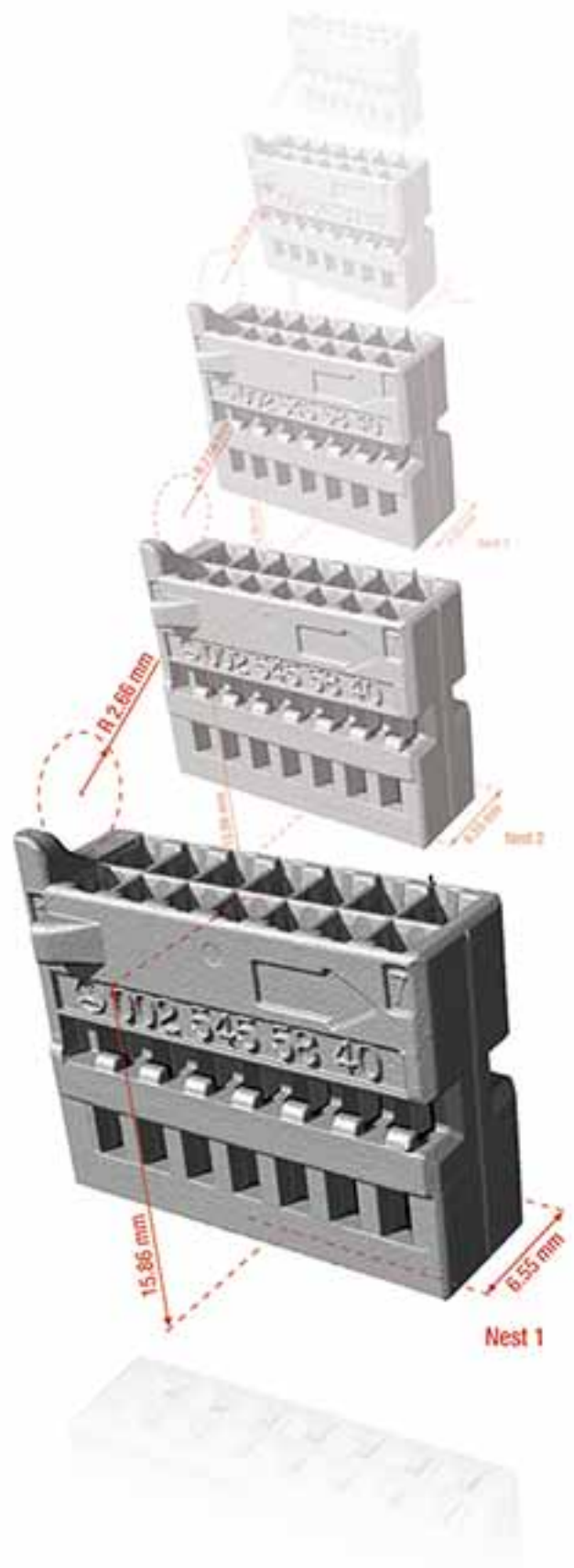
This new functionality allows measurement uncertainty to be drastically reduced for all geometry-based analyses, i. e. for Coordinate Measurement, Nominal/Actual Comparison and Wall Thickness Analysis. A variety of object registration tools like 'Best fit', '3-2-1', 'RPS' and ruled geometry-based methods are included in the module. The Coordinate Measurement option is the prerequisite for all analyses to be performed within predefined coordinate systems.

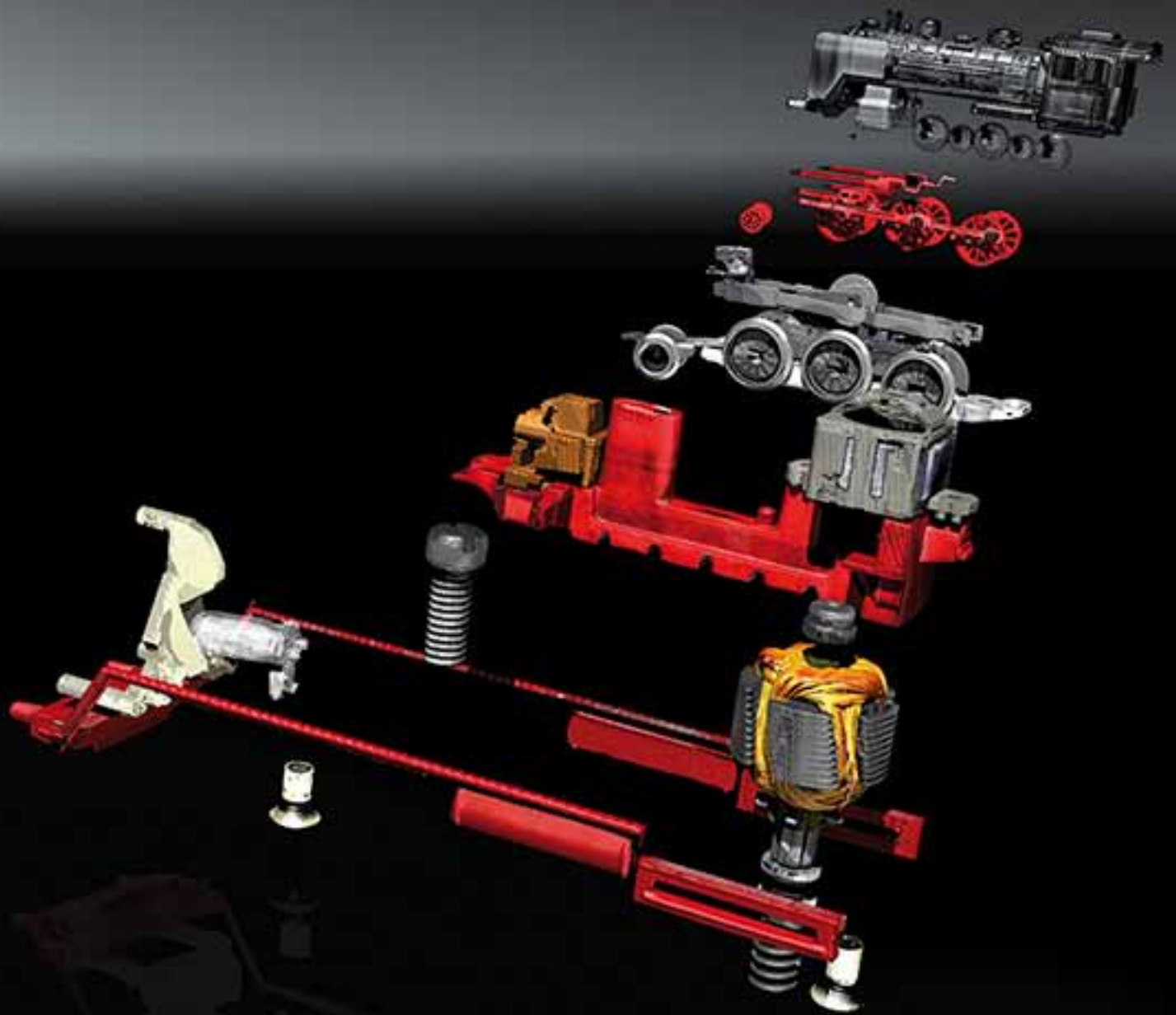
Features

- Version 2.1 includes a complete range of measuring functionality including geometric dimensioning and tolerancing (acc. to DIN EN ISO 1101).
- 2D and 3D dimensioning directly on CT/voxel data sets
- ruled geometry elements such as points, lines, circles, planes, cylinders, cones and spheres can be fitted directly to the CT/voxel data – no conversion of CT data into point clouds or STL data required
- minimization or reduction of measurement uncertainty by rapid fitting of thousands of measuring points
- recognized standard fitting methods (Chebyshev, Gauss) from conventional coordinate measurement technology
- preparatory inspection plans can alternatively be created on CAD data
- high performance reporting function with text and images for output in various formats (CSV, HTML, RTF etc.)

MACRO/BATCH PROCESSING

The macro and batch processing functionality of *VGStudio MAX* allows automated material- and geometry-related analyses to be performed for serial inspection processes. First article inspection of multiple cavity molding tools can therefore be done with unsurpassed efficiency.





SEGMENTATION

The *VGStudio MAX* segmentation functions allow volume data to be separated into different regions ('Regions of Interest'). A range of high-performance tools are available within *VGStudio MAX* for separation on the basis of gray values or geometry. Specific regions of a volume data set can be extracted into discrete objects, analyzed and exported as a new volume data set.



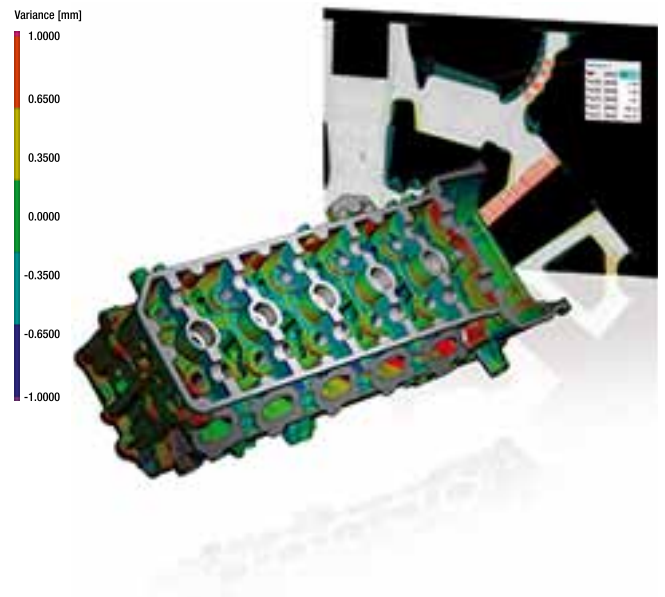
NOMINAL/ACTUAL COMPARISON MODULE

REQUIRES COORDINATE MEASUREMENT MODULE

The Nominal/Actual Comparison module option allows for a direct comparison of CT/voxel data with CAD or other CT/voxel data which is much more efficient than conventional methods.

Features

- color-coded visualization of analysis results
- analysis of the entire object or user-defined 'Regions of Interest'
- geometric comparison directly on CT/voxel data sets – there is no conversion into point clouds or STL data required, which avoids additional measuring uncertainty and information loss
- Version 2.1 was extended by additional statistical evaluation features
- high performance reporting function with text and images for output in different formats (CSV, HTML, RTF etc.)

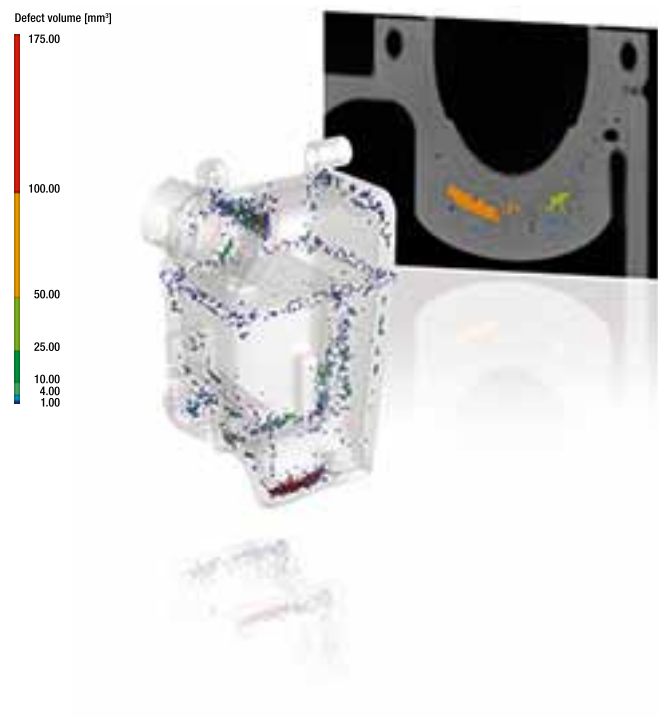


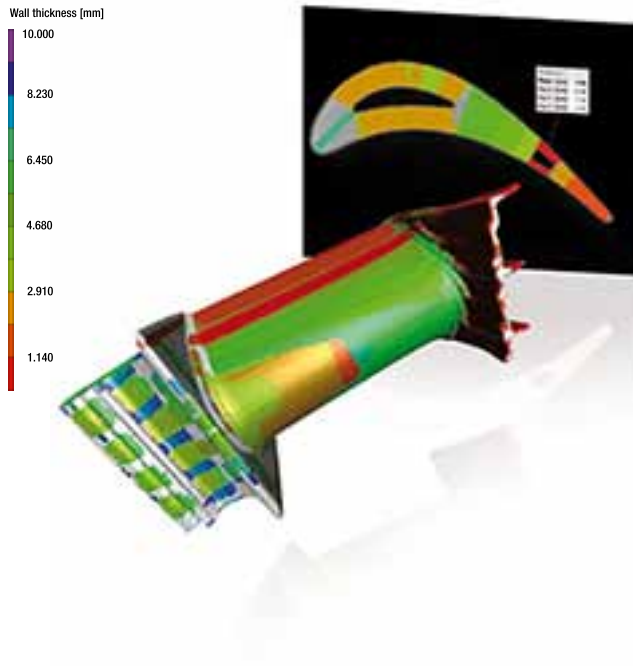
POROSITY/INCLUSION ANALYSIS MODULE

VGStudio MAX offers a unique tool for direct processing of CT/voxel data to detect discontinuities such as pores, holes and inclusions in the material, e. g. in plastic or light alloy parts.

Features

- automatic and fast detection, analysis and visualization of internal defects/porosity
- volume, position, size and surface area are determined for every individual defect
- color-coded visualization of defects according to their volume
- analysis of the entire object or user-defined 'Regions of Interest'
- statistical defect size analysis, overall percentage of porosity and pore volume histogram
- Version 2.1 was extended by a feature to detect extraneous materials/inclusions
- a data interface allows analysis results to be exported to and simulation results to be imported from MAGMASOFT®
- high performance reporting function with text and images for output in various formats (CSV, HTML, RTF etc.)
- if porosity and inclusion analyses are to be evaluated within a precisely defined coordinate system, this requires the use of the Coordinate Measurement module option





WALL THICKNESS ANALYSIS MODULE

With the Wall Thickness Analysis module option, areas with insufficient or excessive wall thickness or gap width can be localized automatically and directly within the CT/voxel data set.

Features

- color-coded visualization of analysis results
- analysis of the entire object or a user-defined 'Region of Interest'
- direct processing of CT/voxel data – no conversion into point clouds or STL data required
- no CAD model required
- Version 2.1 was extended by additional statistical evaluation features
- high performance reporting function with text and images for output in various formats (CSV, HTML, RTF etc.)
- if wall thickness analyses are to be evaluated within a precisely defined coordinate system, this requires the use of the Coordinate Measurement module option



CT RECONSTRUCTION MODULE

With the CT Reconstruction module option, Volume Graphics offers a direct link from the CT scanner to the unique visualization and analysis capabilities of *VGStudio MAX*.

Features

- fast GPU-accelerated CT Reconstruction for CT users and OEM customers
- reconstruction of the largest data sets (e. g. 6000 x 6000 x 2048), only limited by the PC hardware used
- automatic scan geometry corrections
- ROI reconstruction
- output directly to VG projects
- beam hardening correction with manual correction function editor or step wedge import
- real-time single slice preview

VGSTUDIO MAX IS AVAILABLE AS A NODE-LOCKED OR NETWORK LICENSE ON 32 BIT AND 64 BIT PLATFORMS

NODE-LOCKED LICENSES

Single user VGStudio MAX 2.1 node-locked license	for Windows 32 bit
Single user VGStudio MAX 2.1 node-locked license	for Windows 64 bit
Single user VGStudio MAX 2.1 node-locked license	for Linux 32 bit
Single user VGStudio MAX 2.1 node-locked license	for Linux 64 bit
Single user VGStudio MAX 2.1 node-locked license	for MAC OS X 32 bit

NETWORK LICENSES

VGStudio MAX 2.1 network license server	all operating systems
VGStudio MAX 2.1 per seat	all operating systems

VGSTUDIO MAX MODULE OPTIONS

Module 1: Wall Thickness Analysis	32 bit
	64 bit
Module 2: Porosity/Inclusion Analysis	32 bit
	64 bit
Module 3: Coordinate Measurement	32 bit
	64 bit
Module 4: Nominal/Actual Comparison (requires Module 3)	32 bit
	64 bit
Module 5: Cone beam CT Reconstruction	32 bit/64 bit
Bundle prices available on request	

VOLUME GRAPHICS OFFERS:

- network licenses
- update/service agreements giving access to regular product updates and priority support
- software training
- custom software development services and consulting
- free evaluation licenses with full functionality can be requested via our web site:
www.volumegraphics.com/en/download-center/product-evaluation.html

Please contact us for further details.

VGSTUDIO MAX IS DESIGNED TO MAKE OPTIMUM USE OF MODERN PCs AND WORKSTATIONS

HARDWARE REQUIREMENTS:

The multi-threaded implementation of nearly all *VGStudio MAX* features achieves a significant performance increase on multi-processor/multi-core PCs, e. g. rendering performance will scale with the number of CPU cores. We therefore recommend multi-processor/multi-core PCs for optimum performance. The total system memory requirements depend strongly on the users' typical data set sizes. For professional users we recommend a 64 bit hard- and software environment and a RAM of at least twice the size of the largest data sets for optimum performance.

OPTIMUM PC HARDWARE:

- Windows 64 bit, Linux 64 bit or MAC OS X operating system
- about 500 MB + user data of disk space for software installation
- multi-processor/multi-core system with two or more of the latest Intel Xeon or AMD Opteron processors
- more than 4 GB of RAM, depending on the size of the data sets to be processed
- high-end NVIDIA or ATI OpenGL graphics board

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