From Tool Correction to 3D Printing Geometries

The new Manufacturing Geometry Correction Module for VGMETROLOGY and VGMETROLOGY ES combines the manufacturing, testing, and correction of tools and components into a seamless digital workflow. It is a cost effective, easy to use, and versatile method for tool correction, surface reconstruction of a manually reconstructed tool, and part correction of 3D printing geometries.

Correcting Injection Molding Nests

In VGMETROLOGY, you can use the Manufacturing Geometry Correction Module in combination with our new “golden” surface function to correct an injection molding tool with multiple identical nests. The golden surface function lets you create an average surface of the parts coming from the different nests which is the best basis for correcting the geometry of the nests—whereas variances between the nests are more likely an outcome of inhomogeneous process parameters.
Define a Measurement Plan Even If No CAD Model Is Available

The average surface—created with the new golden surface feature in VGMETROLOGY—can also be used as a basis for the definition of a measurement plan if no CAD model is available. This lowers the number of errors when applying the measurement plan to multiple scans, especially in automated inspection, scopes.

Align Two Objects Intuitively

Sequential alignment is a completely new method to register two objects against each other based on corresponding pairs of geometry elements, without first having to register each object to a coordinate system. This intuitive step-by-step process is similar to what you would do with physical objects. The result of each alignment step is immediately visible. If not all degrees of freedom are important, the alignment can remain incomplete. Or set the remaining degrees of freedom by using the best fit method.

Use Organic Shapes as a Datum

With the support of complex datums, we’ve added the option to use freeform surfaces and combination of surfaces as datum objects for registration and geometric tolerancing. This is useful in cases where organic shapes, e.g., a car dashboard or cavities of connectors, should be used as a datum.
Recognize the Tolerance Status Immediately

You can now see at a glance if a dimension is within tolerance in all views—without looking at the Scene Tree or numerical values. In VGMETROLOGY and VGMETROLOGY ES, the tolerance state of dimensioning features is now optionally shown in all views by evaluation indicators.

Generate “Watertight” .stl Meshes

A new “grid-based” algorithm in VGMETROLOGY and VGMETROLOGY ES extracts surface meshes not only much faster. They are now also "watertight", meaning that the meshes fully enclose a volume with no gaps or holes. This makes them perfect for most types of 3D printing.

Improved Automation

VGMETROLOGY 3.2 and VGMETROLOGY ES 3.2 come with a completely reworked and extended automation tool. It now supports the so-called “jobs” known from VGinLINE. Drawing from the full scope of available analyses, jobs combine macros, template, and all referenced data into one automation workflow.

If-then statements in jobs allow for even more complex automated inspections. For example, you can determine that further analyses are skipped if the part is already out of tolerance.

Also, input and output paths of macros can now be edited, saving you the time to re-record a macro.

Quickly Assess Geometric Deviations across Multiple Regions

Version 3.2 makes analyzing repetitive structures such as cylinder heads or Ball Grid Arrays a breeze. You can now quickly copy one region of interest (ROI) multiple times into a periodic pattern; all nominal/actual comparisons within this ROI will be copied automatically.

NIST Tested

The Volume Graphics Metrology Kernel VGMK 3.2.0 140356 (Windows 64 bit) is now tested by the NIST’s "Algorithm Testing and Evaluation Program for Coordinate Measuring Systems".

Separate Color Bars

You can now define separate color lookup tables for each instance of a nominal/actual comparison. In this way, the color coding can reflect tolerancing criteria which vary between different regions (ROIs) of the object.
Direct Access to Color Bar Settings
Accessing the color bar settings directly from the 2D/3D views makes adapting them to your nominal/actual comparison even easier.

Tolerance Indicators within Annotations
By including the tolerance indicators in the annotations, you can now localize geometric deviations that are out of tolerance in all views much more quickly.

One-click Update of Analyses
With just one click, you can now update even a high number of nominal/actual comparisons (e.g., for multiple ROIs) for an object, which is enormously time-saving.

File I/O
- More robust and faster import of JPEG2000 files on PCs equipped with SSD disks
- Increased compatibility due to updated formats for the import of native CAD files
- Added option to export CAD and mesh objects

Global Floating License: Use Software Flexibly Worldwide
Global companies can now use one license at different locations in different time zones throughout the world. With this new Global Floating license type, you require fewer licenses compared to other license models.

Each of these Global Floating licenses can contain a different add-on module configuration. A user can start multiple instances of the software on the same computer without each one counting as a separate license. And soon, you’ll be able to “borrow” a license from your Global Floating license pool for a limited time, e.g., for a business trip or a conference.

Global Floating is an additional license model to the existing floating license. It’s available for VGSTUDIO MAX packages and packages with additional add-on modules.

Navigation
- Preference setting to choose between mousewheel in 2D views either slicing through the object or zooming
- Added the possibility to center and focus a view with double middle mouse click in the spherical navigation mode
- Improved performance of the spherical navigation mode

Visualization
- Improved performance of switching the workspace views
Geometry elements II
> Added a handy new option for including or excluding holes when creating an ROI from certain geometry elements, e.g., for creating a cylindrical ROI with “lids” on the top and bottom
> Added an option to include or exclude holes when creating a mesh from certain geometry element types
> Improved freeform surface fitting logic to achieve better results with fewer clicks

Datum systems
> The option to “Project T.” for datum elements specified in the geometric tolerancing dialog is now enabled by default.

Object conversion
> New options to convert CAD or mesh objects to surface-only volume objects

Registration
> Added an option to store multiple registrations on one object and to switch between them to see which out of several possible registrations minimizes the deviations to a reference object; measurements are updating accordingly.

Dimensional tolerancing
> Added a preferences option to hide the CM group name for datum elements in GD&T annotations
> Added an option to automatically set the nominal position values of a position tolerance, which is less error-prone and faster than manually entering them.

Macros
> Macros recorded on a single object can now be automatically applied to a whole set of similar objects for “in-scene batch processing”.
> Multi-applying a single macro can now be aborted
> “Save movie/image stack” is now macro recordable and thus available in batch processing mode and VGinLINE.
> Create mesh from geometry elements can now be recorded in a macro.
Reporting and traceability

> It is now possible to export and import a volume’s meta information in .csv format (e.g., from a barcode scanner), both manually and via macros, saving time and reducing errors.

Manufacturing Geometry Correction

> Improved the usage of nominal/actual comparison for the Manufacturing Geometry Correction Module
> Improved the 3D navigation for CAD geometry correction objects that do not yet have any components

Annotations

> Added the time-saving option to create analysis annotations by pasting previously copied coordinates from the clipboard