Application Areas

Supplier Data Validation

CompareVidia can be used to validate supplier data (using different CAD systems) against the original design. Shape and model quality differences are detected automatically given a user defined tolerance. Undocumented design changes and model changes resulting from using different CAD environments or CAD data formats will be automatically detected. The validation procedures are simple to implement at different stages of an engineering process both on the manufacturing and the supplier side. All processes become transparent and traceable.

Manufacturing Validation

CompareVidia automatically validates that a model prepared for manufacturing complies with the original CAD model before the manufacturing process begins. The smallest deviations are detected to prevent possible manufacturing faults and inconsistencies. Only validated CAD models are passed onto manufacturing. Physical model inspection points can also be compared with the original CAD model to validate the final quality of the manufactured detail.

CAD Legacy Migration

Translation of CAD data from a legacy system into your current CAD design system can introduce shape and quality changes. Whatever methodology you use (BREP, feature-based or manual re-mastering) and data formats (native, neutral) CompareVidia can validate the results and help you to define the optimal migration strategy.
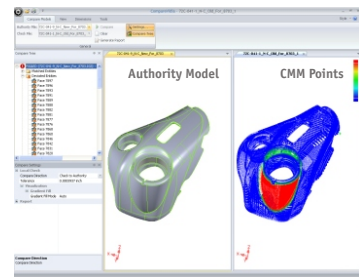
Comparing physical measurements with Authority Model

Collected CMM points are projected on the Authority Model to validate the correctness of physical model.
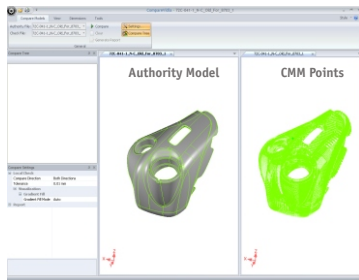
Comparing Authority model with CMM points
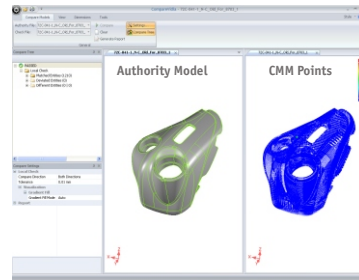
All CMM points within tolerance

Detected differences (red colored points)

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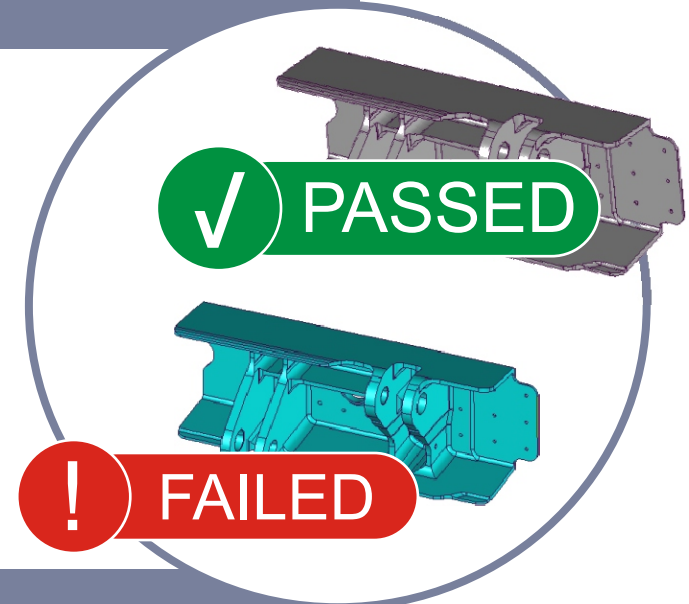E-mail: info@capvidia.be
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COMPAREVIDIA

Quality Assurance Standard for Digital Product Definition including Boeing D6-51991

IGES
STEP
CATIA V5
CATIA V4
PRO/E
UGS
INVENTOR
ACIS

✓ PASSED

! FAILED

CAD Model Validation

CompareVidia is a specialized application to validate and compare CAD models.
A simple workflow enables you to load two CAD models and compare them with each other against user defined criteria. Shape differences are analyzed and models are classified as either PASSED or FAILED. A report is automatically generated to digitally certify compliance with a set criteria including Boeing's D6-51991 "Quality Assurance Standard for Digital Product Definition". CompareVidia delivers a new solution to companies looking for efficient and automatic way to validate CAD model integrity at different stages of the digital product life cycle management.

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CompareVidia - What is it?

CompareVidia allows you to compare two CAD models with each other. You define the Authority Model (reference model) and the Check Model (model to validate). The validation process is controlled with user defined (Compare Settings) parameters. You can perform a Global Check to verify (Volume, Area, and Centre of Mass). A Local Check is used to verify the model shape. Parameters such as Volume and Area are defined as a percentage of maximum acceptable deviation. Tolerance is defined in either inches or millimeters or automatically driven by the units of the Authority Model.

The validation results are presented in the Compare Tree and graphically on the Check Model. You get a global indication Passed/Failed (✅ / ⛔) icon further detailed by the information classified into folders of the project tree. The Global Check folder provides information about Volume, Area and Centre of Mass. The Local Check folder has three sub-folders: Matched Entities, Deviated Entities, and Different Entities.

If a CAD model fails a warning icon ⚠️ is attached to all entities that do not comply with the validation criteria. You can select each problematic entity in the project tree and further analyze it in the graphical window. Two synchronized graphical windows simplify the investigation of all identified differences. More detailed information including entity count and images with the identified faulty places are also available in detailed report.
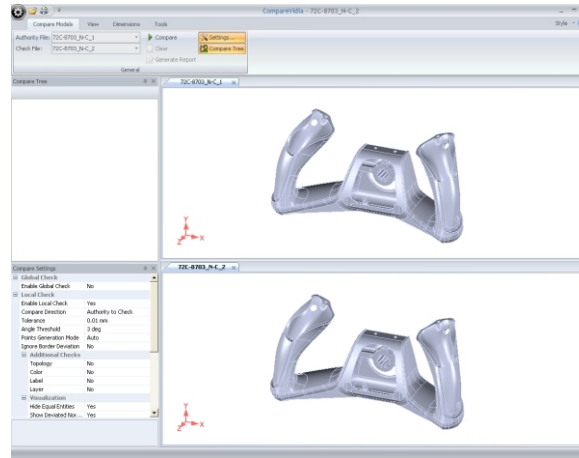
Authority Model and Check Model prepared for validation

*Compare Tree, Corresponding Entities*
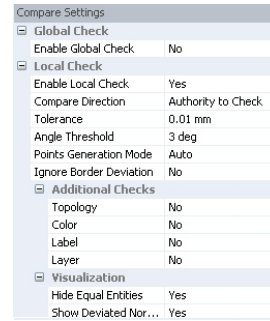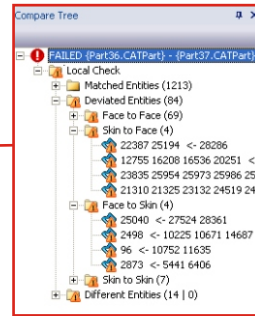

Compare Parameters

CompareVidia - How does it work?

Comparing CAD models is based on a distance calculation between corresponding model entities (faces, edges) and angle differences between surface normals in the corresponding points. Points are automatically generated based on the 3D model shape complexity. This ensures that the optimal number of points is used (a few points for planar faces and more for complex NURBS). Within the compare process all correspondences between model entities are established and visualized in the compare tree: face-to-face, face-to-skin, skin-to-face and skin-to-skin.
The validation process is controlled by the following parameters:

- *Tolerance* – defines allowed maximum deviation
- *Angle Threshold* – defines angle difference between normals in corresponding points
- *Compare Direction:*
  - **Both Directions:** projects validation points in both directions from Authority Model onto Check Model and from Check Model onto Authority Model, if distances between all corresponding points are within the tolerance - validation is passed (models are equal)

  - **Authority to Check:** projects validation points from Authority Model onto Check Model, if distances between all corresponding points are within the tolerance - validation is passed. Note: Check Model may contain extra entities not present in the Authority Model which does not influence the validation result (validation passes).

  - **Check to Authority:** projects validation points from Check Model onto Authority Model, if distances between all corresponding points are within the tolerance - validation is passed. Note: Authority Model can contain extra entities not present in the Check Model which does not influence the validation result (validation passes).

- *Ignore Border Deviation* - detects tangential deviations along face's borders and can be used as additional validation criteria. If set to YES it will allow models to PASS even if the border deviation is larger than the set tolerance.
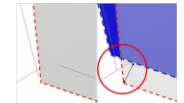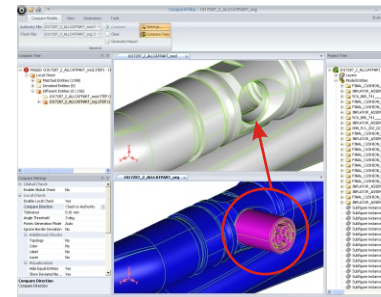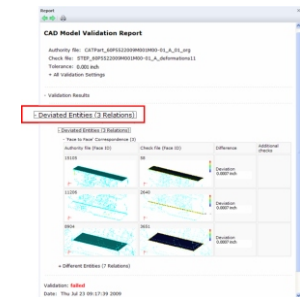

Tangential deviation on the surface

✅ PASSED

Validation passes

⛔ FAILED
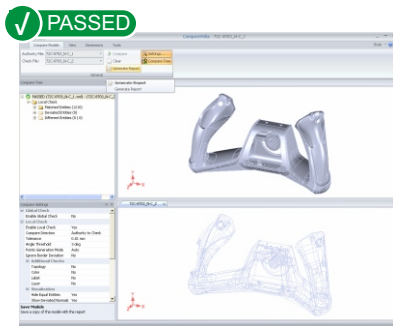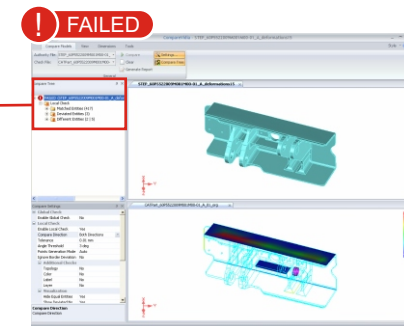
Deformation on the Check Model

Finds differences between two assemblies

Report