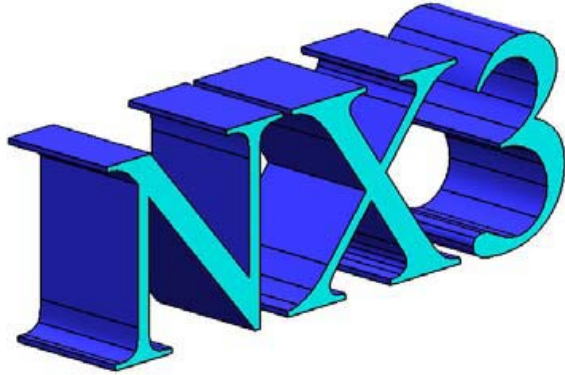


A u r o r a e n g i n e e r i n g



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White Paper

Analyzing Free Form Features

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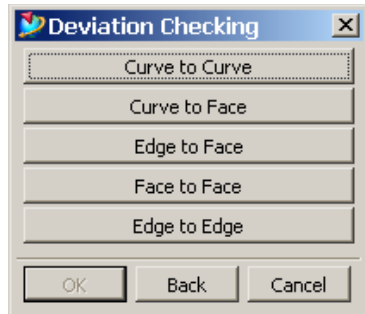
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Analyzing Free Form Features:

Deviation: Select **Analysis—Deviation—Checking**.



Curve to Curve measures the distance between two curves and the angle between their tangent vectors at a series of points along the curves.

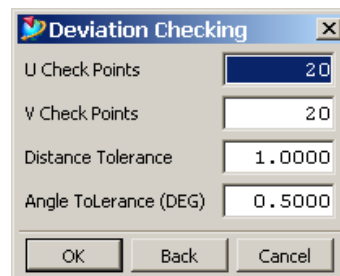
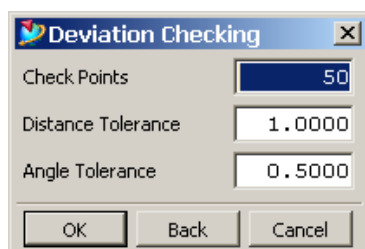
Curve to Face checks of deviation between a curve and a face or surface.

Edge to Face checks the deviation between the edge of two faces.

Face to Face checks an entire face over another face for point/normal deviation. It is the only deviation method with different criteria. Points are specified along the U and V direction of the faces.

Edge to Edge checks the deviation between the edges of two sheet or solid bodies.

Four of the **Five Deviation Options** activate the same **Deviation Checking** dialog. **Face to Face** has its own **Deviation Checking** dialog.



Face to Face

Terminology:

U Check Points

Check points along the U direction of the face.

V Check Points

Check points along the V direction of the face.

Distance

The value between checkpoint on the first object and the closest point on the second object.

Angle difference

Angular deviation between curve tangents and/or face normals at checkpoints.

Number of deviations

Deviations displayed in the report.

Check Points

This is the number of points to check along the selected geometry.

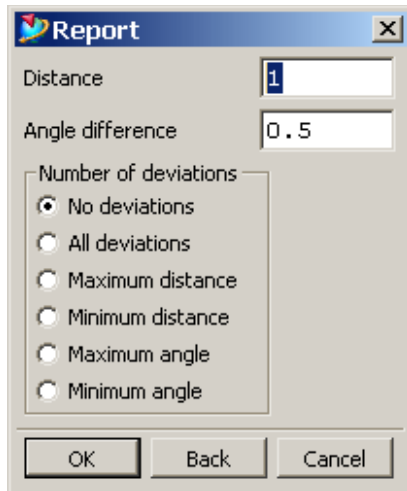
Distance Tolerance

The maximum allowable distance between corresponding points.

Angle Tolerance

The maximum allowable angle between the surface normals and the maximum allowable angle between curve tangent vectors at corresponding points.

Report Dialog.



No deviations

A short list showing only maximum and minimum deviations displays in the Information window.

All deviations

A full list of deviations display in the Information window.

Maximum distance

A list with the maximum deviation displays in the Information Window. The points at that occurrence displays on each curve or face analyzed.

Minimum distance

A list displays with the minimum deviation in the Information Window. The points from each curve or face analyzed highlight.

Maximum angle

A list with the maximum angle deviation displays in the Information window.

Minimum Angle

A list with the minimum angle deviation displays in the Information Window.

Minimum Radius: Select Analysis—Minimum Radius.

- A point is created at the location of **Minimum Radius** on a face/sheet. The information concerning the **Minimum Radius** is displayed in an Information Window.
- A Minimum Radius is reported for each side of a sheet body.
- No radius is reported on planar faces.
- When multiple faces/sheets are selected, a Minimum Radius vector displays on all points having the radius value.

B-Surface Analysis: Select Information—B-Surface.

Show Patch Boundaries

Displays the Patches NX generated in creating the selected sheets.

Show Poles

Displays the Poles assigned to the sheet in the Graphics window in both the U and V directions.

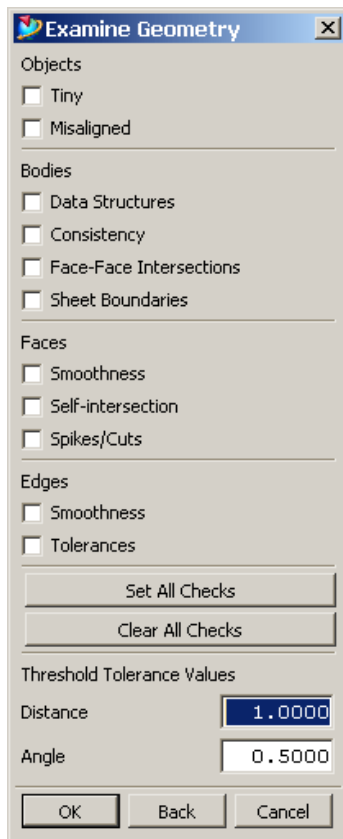
Output to Listing Window

This lists the B-Surface information in an Information Window: the Degree in U and V, the number of C0, C1 and C2 seams in the U and V.

Reading the Display

The control polygon displays in the system color with a solid font and points mark the poles. The surface patches display in different fonts: dotted for C0, dashed for C1 and solid for C2. The color is the same as the B-surface selected.

Examine Geometry: Select Analysis—Examine Geometry.



Objects

Tiny checks for objects for which the diagonal length of a box enclosing the object is less than the specified design tolerance.

Misaligned checks for objects that misalign with respect to the WCS by a value greater than the angular tolerance

Bodies

Data Structures checks for corruption.

Consistency checks faces and edges to verify they are continuous, Vertices lie on their respective edges and faces, and Edges lie on their respective faces.

Face-Face Intersections checks for faces that intersect within a single body.

Sheet Boundaries checks for all boundaries or gaps.

Faces

Smoothness checks faces that are B-surfaces for a minimum of G1 continuity along patch boundaries.

Self-intersection checks for faces that intersect.

Spikes/Cuts checks the angle between adjoining edges.

Edges

Smoothness checks the edges of adjacent faces within a body for a minimum of G1 continuity.

Tolerances checks to ensure the edges are within the specified tolerance.

Automatic Modeling Checking

By changing some customer defaults in the **ug_metric.def** or **ug_english.def** files, NX can perform Automatic Checks whenever a blend, face blend or Boolean feature is created or modified.

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