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Align Command

Tip 1: Choose whether the normal directions of the reference faces and change faces are in the same (Example 1) or opposite directions (Example 2). Note that you can only set the face normal direction once, for all selected faces, before starting the align modification.

Example 1 – Face normals in the same direction: The face normals of the **Ref Face** (gray) and the **Change Face** (blue) are in the same direction. The **Opposite** option is *not* needed.

Before   After
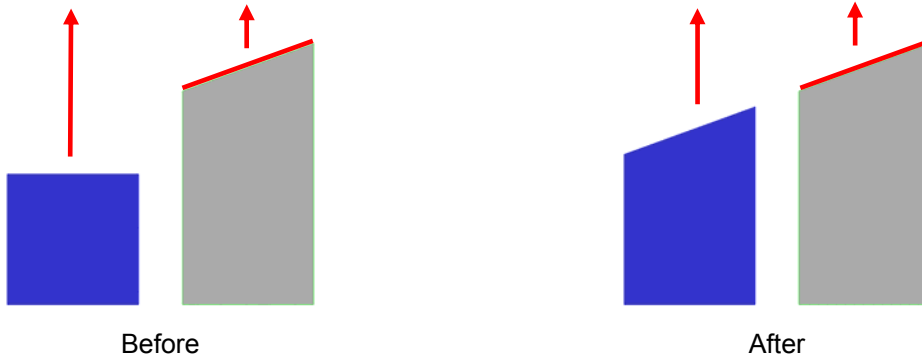
Example2 – Face normals in the "opposite" direction (Opposite option is needed): The face normals of the Ref Face (gray) and the Change Face are in opposite directions; therefore, check **Opposite** to perform the modification.

Before   After
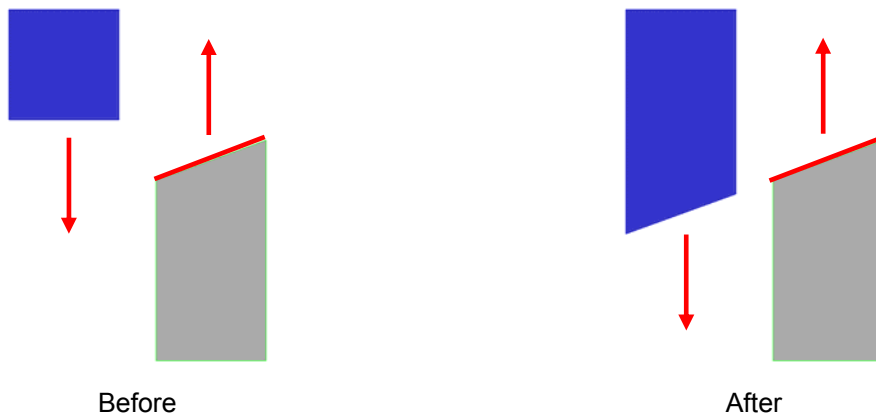
Overview: Use **Align** in the **Modify 3D** section to substitute the surface geometry of a face or faces so that it aligns with the geometry of a reference face or faces, or with a reference plane.

By aligning faces, the target faces move to a new position to meet the projection of the reference face geometry. The faces to be aligned need not be parallel to each other. Use this operation to modify freeform surfaces without creating a new surface from scratch.
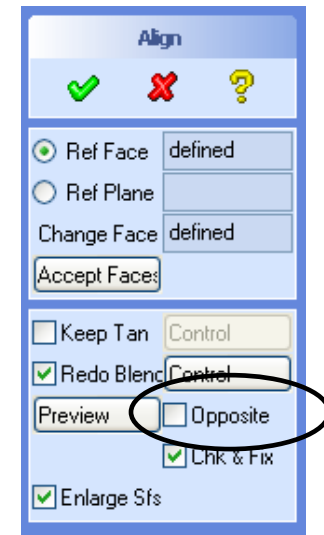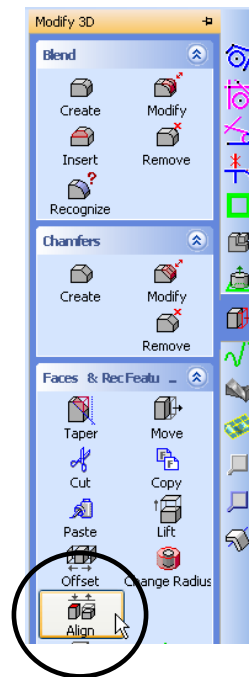
Tip 2: All reference faces must exist on one body, and all changed faces must be in one body. The reference and change faces, however, can be located in two different bodies (Example 3).

Tip 3: Material can be added or removed by the **Align** command, depending on the position of the

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reference faces relative to the changes faces (Example 3, 4).

Tip 4: The reference face does not have to be the same geometric resolution as the change face. This fact is very powerful - especially reference imported geometry.
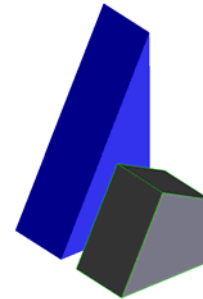
Example 3 – Multiple faces align to a single reference face: In a single operation, you can define a single reference face and modify the corresponding change faces, with the help of **Accept Faces**.
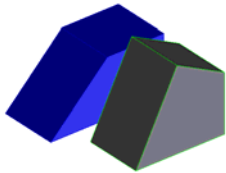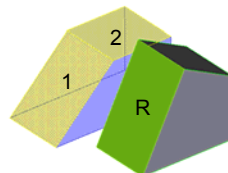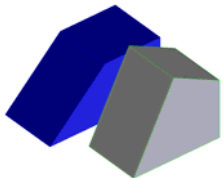
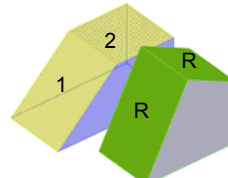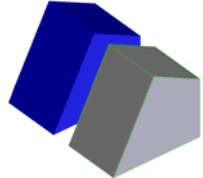|		
Before	Selection of faces	After

Example 4 – Multiple faces aligned with multiple reference faces: In a single operation, you can define multiple reference faces and modify the corresponding change faces, with the help of **Accept Faces**.
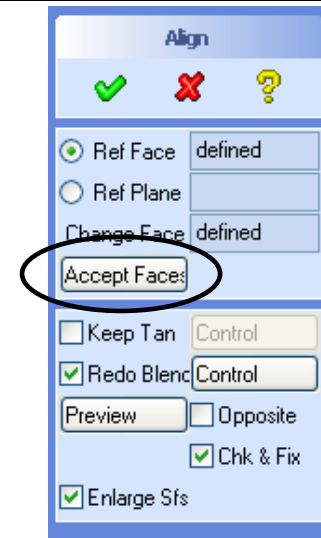
Before	Selection of faces	After

Align

✔ ✘ ?

● Ref Face   defined
○ Ref Plane
Change Face   defined
Accept Faces

☐ Keep Tan   Control
☑ Redo Blend Control
Preview   ☐ Opposite
              ☑ Chk & Fix
☑ Enlarge Sfs

Mulitple faces aligned to a single reference face – Example 4 steps:
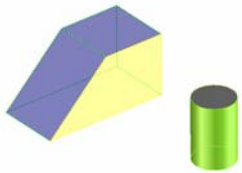
1. Select Change Face #1
2. Select **Ref Face** (green)
3. Click **Accept Faces**
4. Select Change Face #2
5. Select **Ref Face** (green)
6. Click **Preview**
7. Click **OK**

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Tip 5: If the reference faces are smaller than the change faces when aligning the surface of a body, the align operation will fail. The intersection curve of the reference faces must be long enough to act as the intersection curve of the change faces.

Tip 6: The alignment of the change faces is limited by the size of the surface geometry of the reference face. The reference face must be large enough to reach the change faces to be aligned. This is especially relevant for curved geometries like cylinders, tori, etc. (Examples 6, 7).
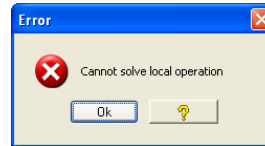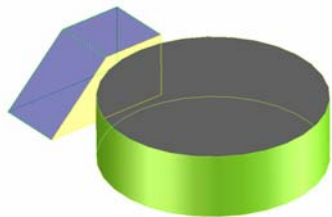
Example 5:

Iso view
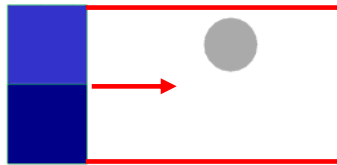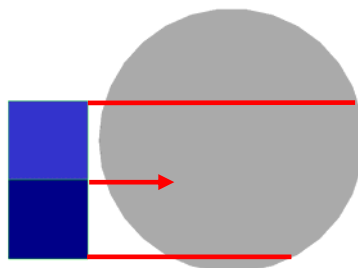
Ref. Face is *smaller* than the **Change Face**

Error — Cannot solve local operation — Ok

Align operation failed

Example 6:

Iso view

Ref. Face is larger than the **Change Face**
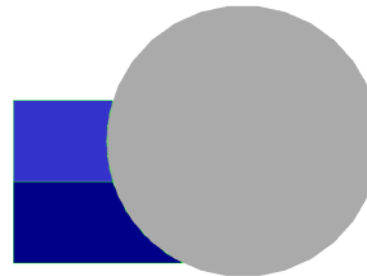
After

Note: Opposite option checked

Align

Ref Face | defined
Ref Plane
Change Face | defined
Accept Faces

☐ Keep Tan | Control
☑ Redo Blend | Control
Preview | ☐ Opposite
☑ Chk & Fix
☑ Enlarge Sfs
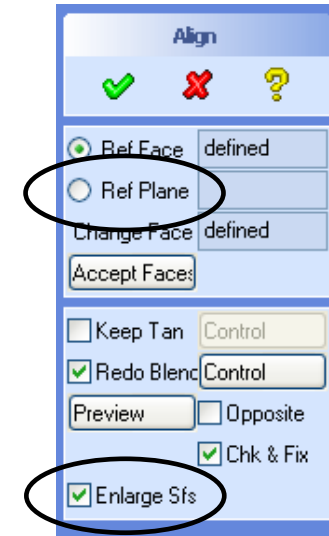
You can also choose to align selected faces with a single **Ref Plane** (reference plane). Define the reference plane using the **Direction 3D** tool to specify the direction and origin of the plane.
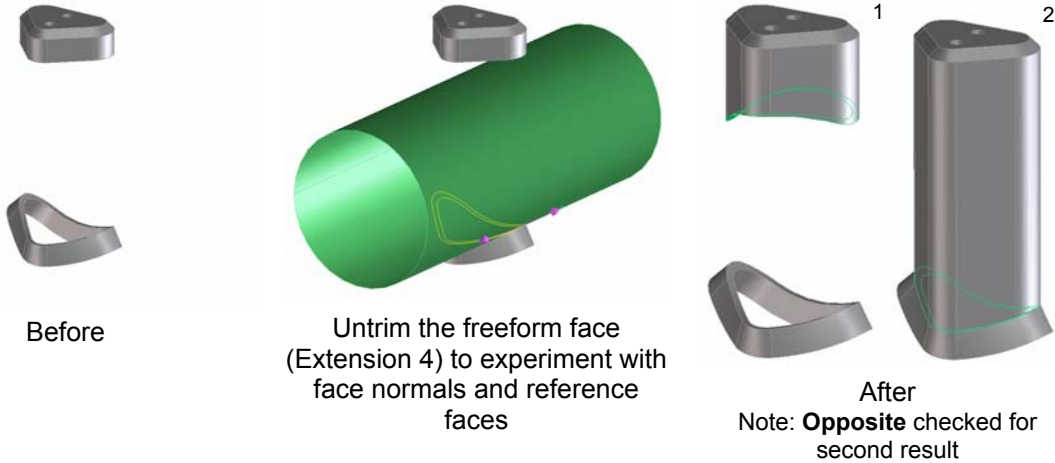
Select **Enlarge Sfs** if you want to enlarge surfaces that are adjacent to the change faces that you are aligning. In general, this is the default option.

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Tip 7: With freeform geometry, use the **Untrim** command in the **Surface** section to enlarge the reference face until it intersects with all neighbor faces.

Tip 8: Use the **Untrim** command to see how the **Align** operation will modify the geometry. For example, try using face normal directions and the **Opposite** option.

Example 7:

Before

Untrim the freeform face
(Extension 4) to experiment with
face normals and reference
faces

After
Note: **Opposite** checked for
second result

Example 8:

Before

Untrimming the face (Extension
4) let's you see the normal
direction of the cylindrical face

After
Note: **Opposite** option used for
second result