

Generating and Saving 2D Sections/3D Slices



This procedure describes generate 2D sections of selected fasteners. You can choose to see the sections with or without a weld gun. Once you have generated a stack of these sections, you may choose save 3D slices of the commands.

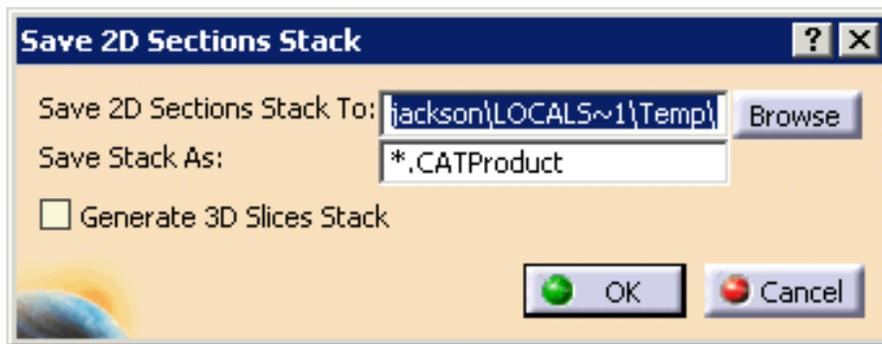
2D section for a fastener means the section of the contour of the products and resources when the section plane is passing through the z-x plane of the fastener. 2D sections for all the selected fasteners are stacked together as if the selected fasteners were coinciding.

For more information on activating/deactivating the command settings, see [Customizing](#).



If a DMU Optimizer license is not available, then the command is available with exception of "Generate 3D Slice functionality", that in this case is removed from 2D sectional command.

To summarize, if the DMU Optimizer license is not available, in "Save 2D Section Stack" dialog, we do not display the check box for "Generate 3D Slice functionality".



Other than that the command supports all other functionality.



1. Select **Generate stack of 2D Sections/3D Slices** at the selected welds .

The **Generate Stack of 2D Sections** dialog box appears.



2. On the PPR tree, select one or more fasteners.

You can select fasteners by selecting an activity; all the fasteners assigned to the activity will be selected as a result.



You can remove any fasteners with the **Remove** button.

3. If you have **Tools > Options > DPM Fastener Process Planner > Commands** tab set so that you must pick a gun in context of an activity, you must select an activity.

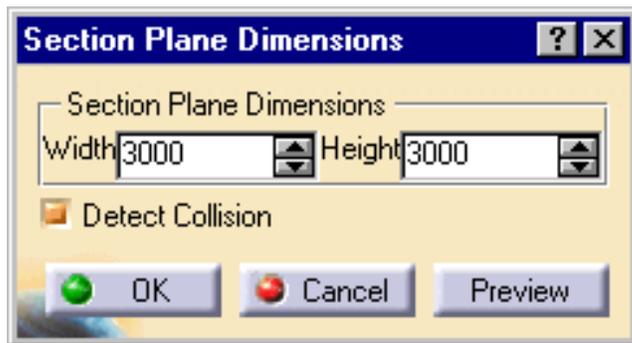
The activity selection can be changed at any time. The **Selected Activity** editor in the dialog box show the name of the last activity selected. The collision queue and the part positioning are done as per the context of this activity.

4. **(Optional)** Select a weld gun.

- Once you select a weldgun, if at least one fastener is already selected, then the selected weld gun snaps to the last selected fastener.
- If the selected weld gun is mounted on a robot, the robot is listed in the **Generate 2D Stack** dialog box. All its configurations are listed in the pulldown menu. By default, the first configuration is initially listed.
 - If the current weld is reachable with the gun-robot combination, then the robot is jogged so that the mounted weld gun is snapped to the last selected weld.
 - As the weld gun is manipulated around the fastener point, if the fastener is reachable for the robot-gun combination, then the robot jogs accordingly. As soon as the fastener goes out of reach of the robot, the robot stops jogging and only the gun rotates (about the z-axis of the manufacturing position of weld) around the fastener until the gun reaches a position where the fastener is again reachable for the robot.
 - During the gun search, the collision detection (which highlights the colliding objects in 3D inventory viewer) is enabled. The collision detected are those between the selected weld gun (along with the mounting robot, if the gun is mounted) and the rest of the objects in the world (all products plus resources). At a given position of the gun, if no collision is detected between the objects as mentioned above, the collision between the weld gun and mounting robot (excluding the robot mount plate) is also checked.
- If you select a weld gun, it will appear in the sections, and you can manipulate the gun relative to the weld in the sectional view. The weld gun will be seen in the sectional view, but manipulation is possible only in the main window. The manipulator is attached to the weldgun in the main window. Grab the manipulator with the left mouse button and rotate the gun. This will also be reflected in the section window.
- Robot Configurations can be changed using Robot Configuration Combo box in the dialog. As soon as a different Robot Configuration is selected in the combo box you will see the Robot configuration change in the 3D viewer

5. Select the **Generate 2D Sections**.

The **Section Plane Dimensions** dialog box appears.



If you select the **Preview** button, the section plane appears on the geometry. You can view the section plane's size as you use the spinners to set the dimensions.

Users can choose to detect collisions as the sections are generated (the default) or not with the **Detect Collision** check box.

6. Once you have the section plane's size correct, **OK**.

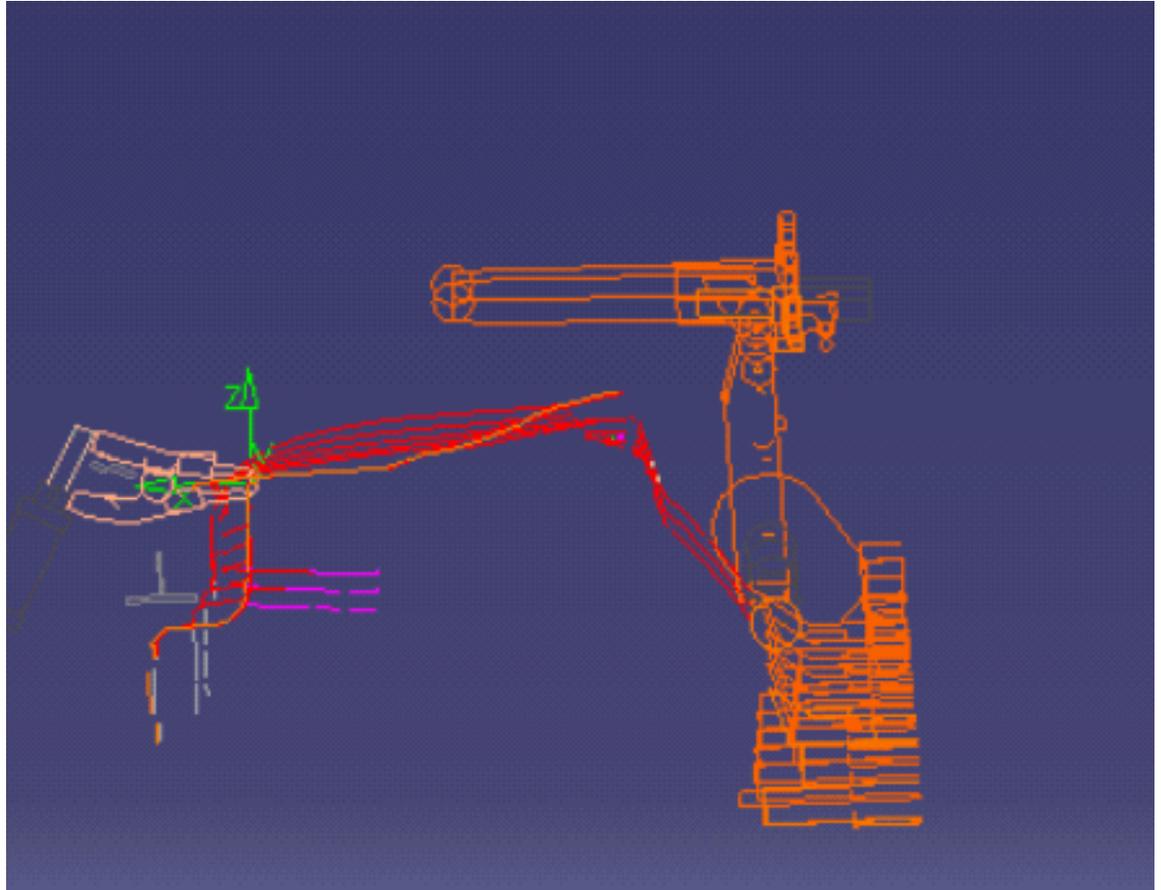
A **Sectional View** window opens with the section view of the last selected fastener. The sectional view will contain the sectional view of all the selected welds with the last selected fastener as the current and active section. The sections of all the other fasteners will still be visible but will be frozen. They will not be updated as weld gun rotates.

7. Use **Windows > Tile Vertically** to see both the sectional and 3D view simultaneously.

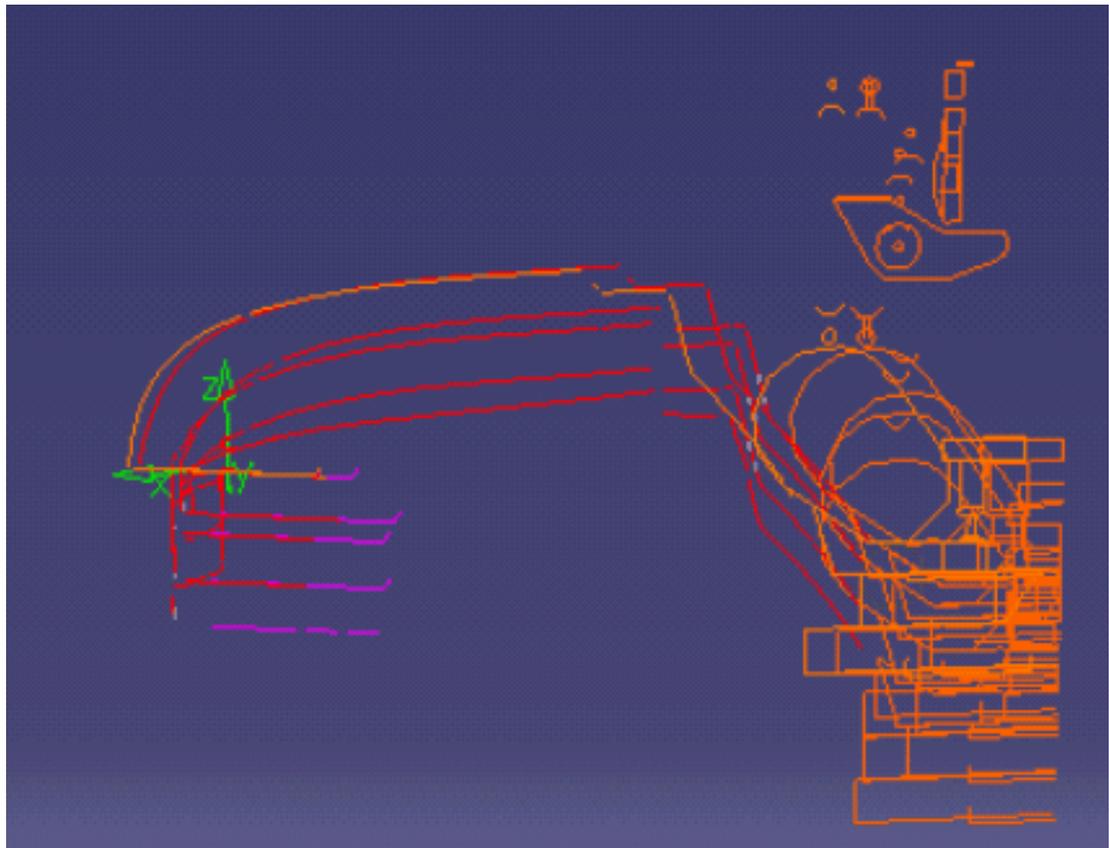


If you have selected a weld gun, a section of weld gun is also displayed in the dynamic window (see [below](#)). Also, by default, the gun is snapped to the last selected fastener and the corresponding section among the stack of sections is highlighted in the dynamic window.

- o As the user manipulates the gun in the main window, the section contour updates in the dynamic window.
- o The user may select any curve in the dynamic window and the weld gun snaps to the corresponding fastener in the main window. Now, as the user rotates the gun in the 3D inventory viewer (main window), the selected section in the dynamic window gets modified.



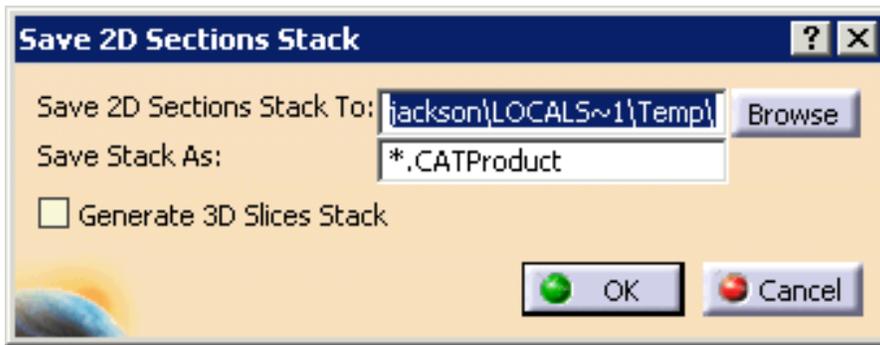
If you have not selected a weld gun, the stack of 2D sections corresponding to the selected fasteners is displayed in the dynamic window with the 3D compass snapped to the last of the selected fasteners in the 3D inventory viewer (as shown [below](#)). The sectional contour corresponding to the current weld is highlighted in the sections stack. As the user reorients/repositions the 3D compass at the current fastener, the corresponding sectional contour gets updated accordingly. Also, the user may select any curve in the dynamic window and the compass snaps to the corresponding weld in the main window.



By selecting, adding, or removing different fasteners, the stack of 2D sections in the dynamic window gets updated (corresponding sections are added/removed).

8. **(Optional)** In the main window, edit the manufacturing position of the fastener. Then click the **Save Position** button on the **Generate Stack of 2D Sections** dialog box to align it with:
 - o the weld gun TCP (if a weld gun is selected)
 - o the compass.
9. **(Optional)** You may flip the weld gun (if selected) or 3D compass at the current fastener (i.e., the highlighted fastener in the dialog) by pressing the **Flip** button. Immediately, the section corresponding to the current fastener gets updated in the dynamic window.
10. **(Optional)** Use either the **Measure Item** or **Measure Between** commands to take measurements within in the Sectional View window.
11. To save the stack of 2D sections or the stack of 3D slices, click the **Save Sections** button. The position will be changed only if it falls within the Editing Constraints set in **Tools > Options (See Customizing > Fastener Attributes >Maximum offset to edit manufacturing position)**.

A **Save 2D Section Stack** dialog box appears:



- To save the 2D sections, use the **Browse** button to select the directory in which the file should be stored, enter a name for the CATProduct file, and select the **OK**.



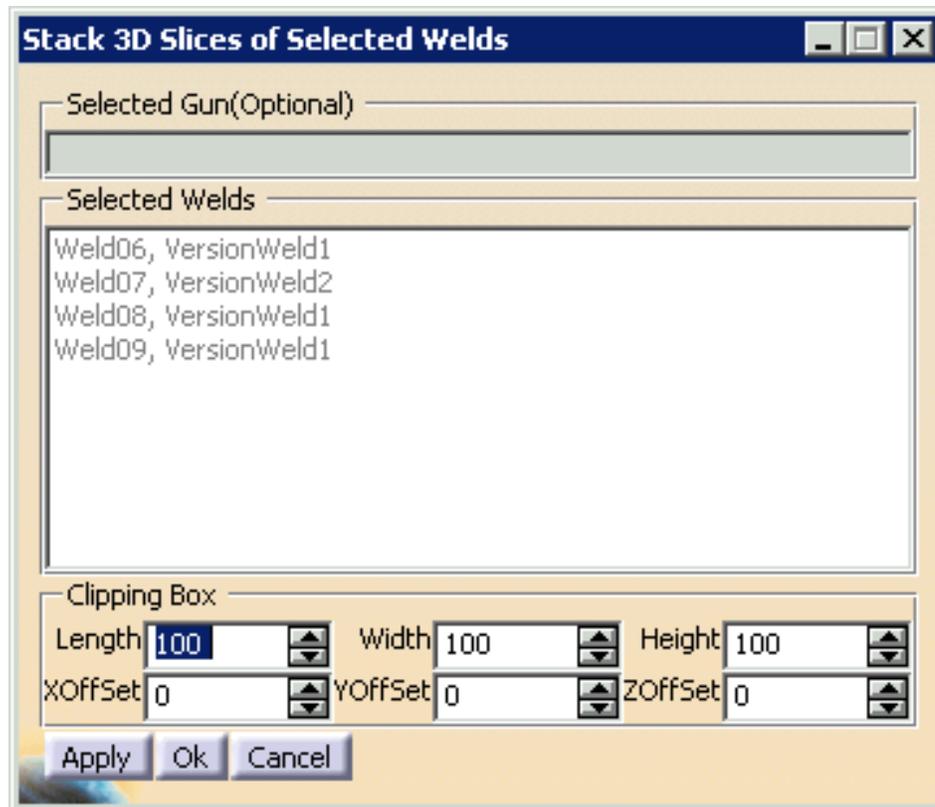
In this case, only the 2D sections in the dynamic view are saved as separate CATParts and inserted into the new product document.

The command remains active after the save is executed (i.e., the user may still manipulate the gun or compass and the sectional contours get updated). If you select **Generate 3D Slices Stack**, the command ends once the slices are saved.

- To save the 3D Slices Stack, use **Browse** to select the directory in which the file should be stored, enter a name for the CATProduct file, check the **Generate 3D Slices Stack**, and **OK**.

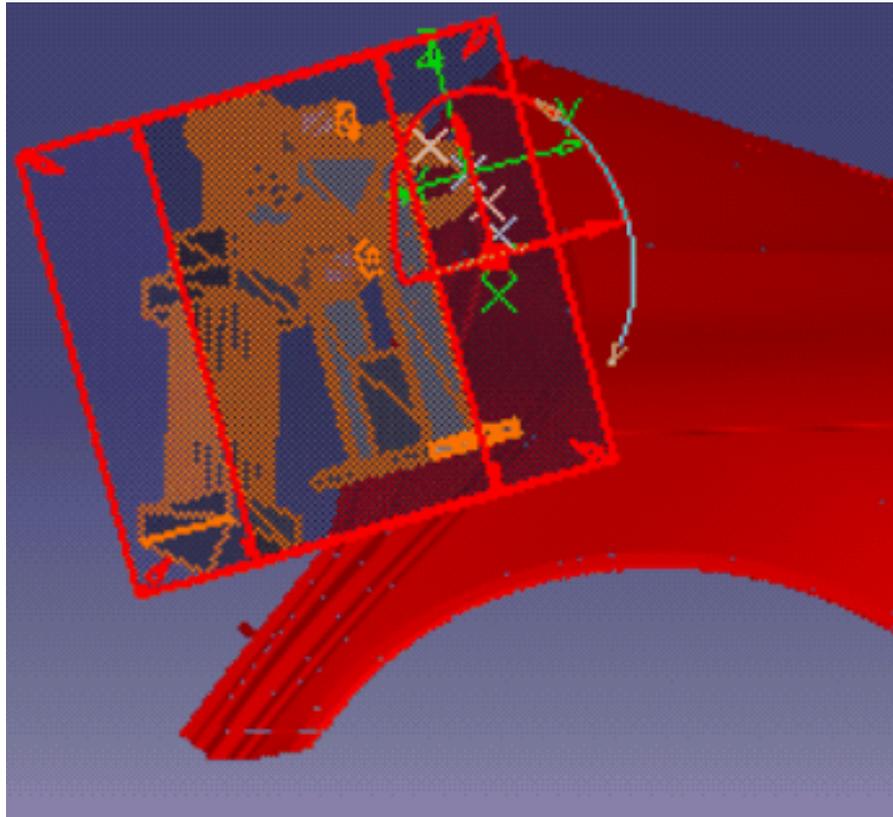
The **Stack 3D Slices of Selected Welds** dialog box appears.

The length, width, height represent the dimensions of the clipping box. The offsets (**XOffset**, **YOffset**, **ZOffset**) determine the relative position of the box center with respect to the fastener's manufacturing position.



- a. Select the **Apply** button.

A **Clipping Box** appears on the geometry. If you selected a weld gun earlier this clipping box will be the bounding box on the weld gun; otherwise, the dimensions shown above are the default dimensions.



- b. Alter the clipping box dimensions, position and orientation using the manipulators attached to the box. Altering the size of an existing weld gun's bounding box is useful if the user wants to redesign an existing weld gun; altering the size of the clipping box when no weld gun is selected is useful for creating a new weld gun.
- c. Select **OK**.

A product document containing the stack of 2D sections is saved in the specified location and then the stack of 3D slices is generated and saved.



Generate 2D Sections/3D Slices is no longer active after the save is executed.

12. (Optional) Lock Location.

You can lock the manufacturing location by using **Lock Location** check box. After manipulating the manufacturing location using compass manipulation and on checking **Lock Location** check box, the compass disappears and you can't modify the manufacturing location with out un-checking the **Lock location** check box.

13. (Optional) Show Active Section only.

At the time of studying the welds in the 2D section command, you may select multiple welds and generate the sections. These sections are useful for understanding the clashes. The section corresponding to the selected weld from the list is highlighted. Sometimes, when number of welds is too high, it is difficult to visualize and differentiate the highlighted section. In this situation it will be useful for you to hide all the section other than the selected weld, so that you can easily concentrate on the section of the selected weld.

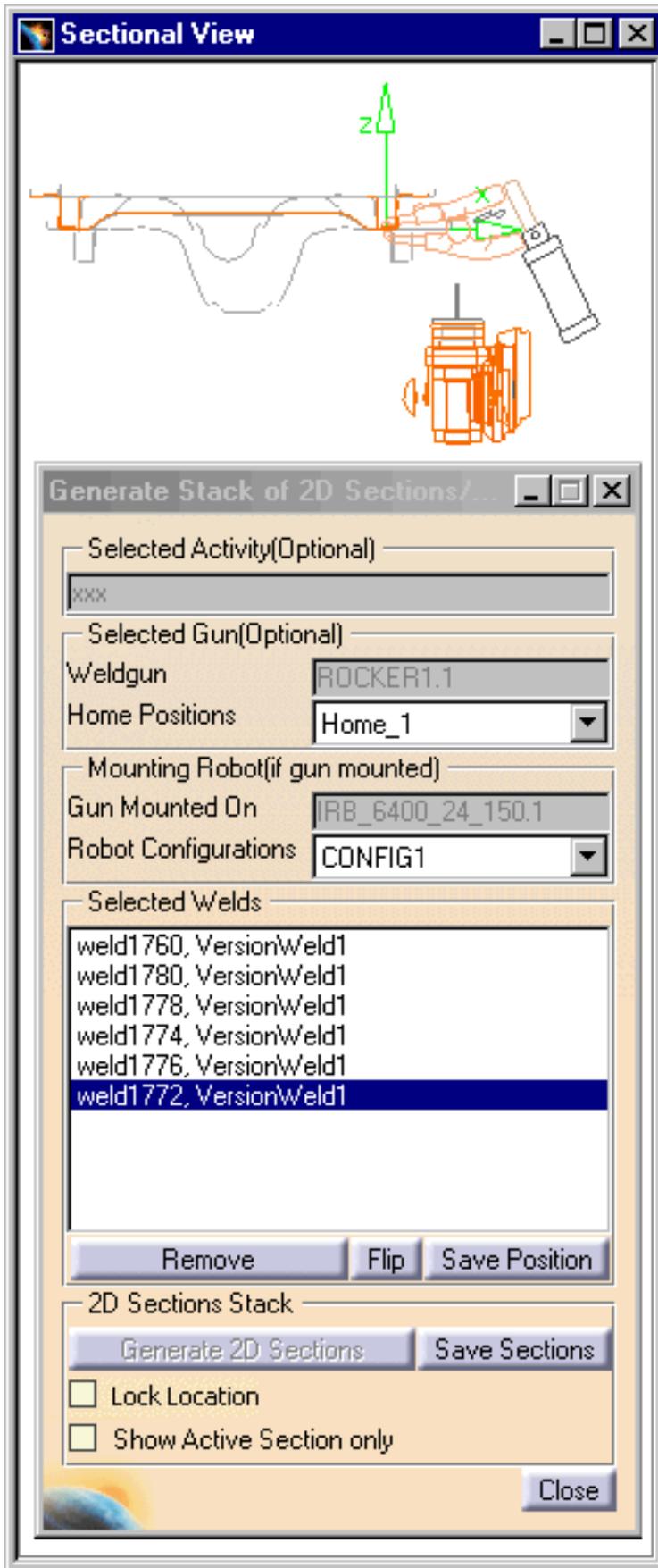
A check box **Show Active Section only** is in the dialog box of the command, which can be checked if you want to see only section of the selected weld's from the Selector List.

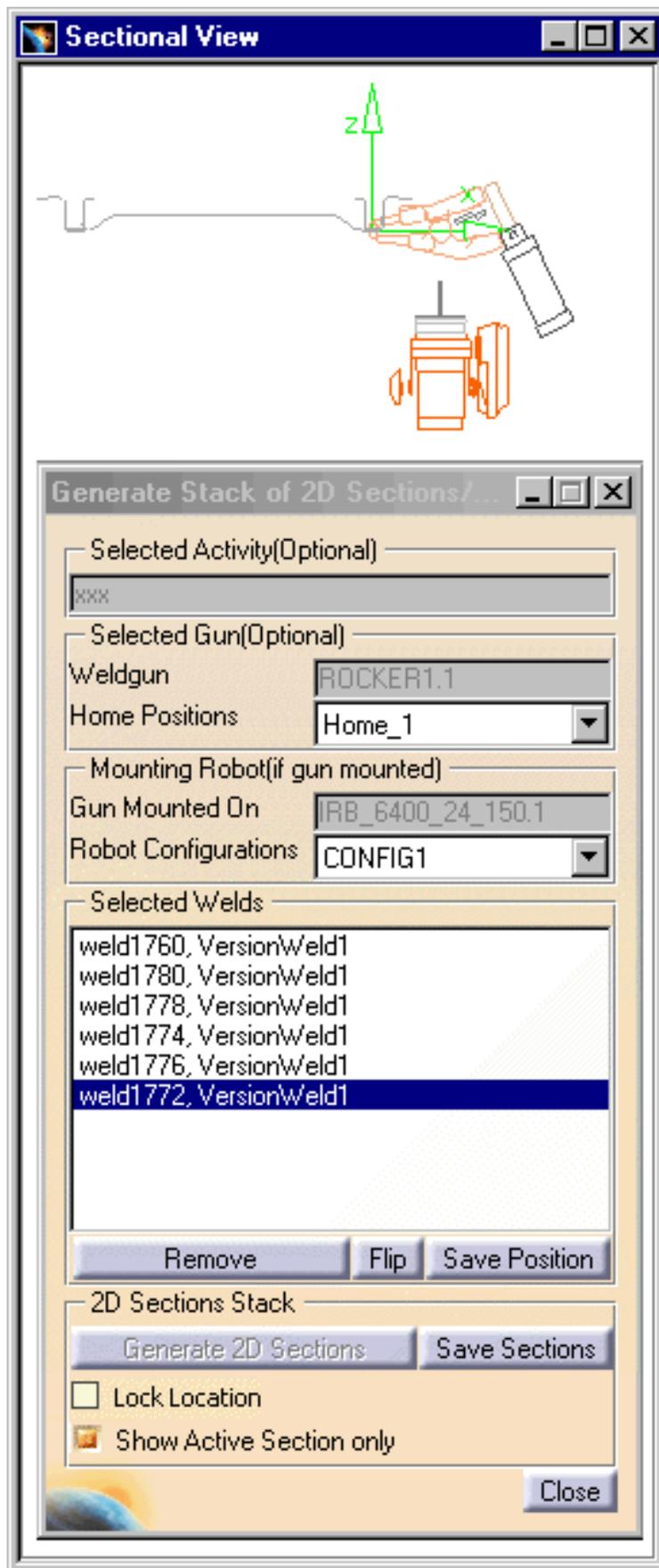
- The check box will be in the disabled state, when the sections are created, when the check box is enabled it can be used for the hiding all the section other than the selected weld.
- If you save 2D sections and generate 3D slices the 2D section, and the 3D slices corresponding to the selected welds are generated. Also in this case, the displayed section cannot be selected from the section window.
- If the check box is checked:

If a weld is selected, the section corresponding to that weld is displayed the section window.

If single or multiple welds are added, section corresponding to the default highlighted weld (which is the last weld) is displayed in the section window.

If single or multiple welds are removed from the list, section corresponding to the default weld (which is the next to the removed welds in the list) is displayed in the section window.



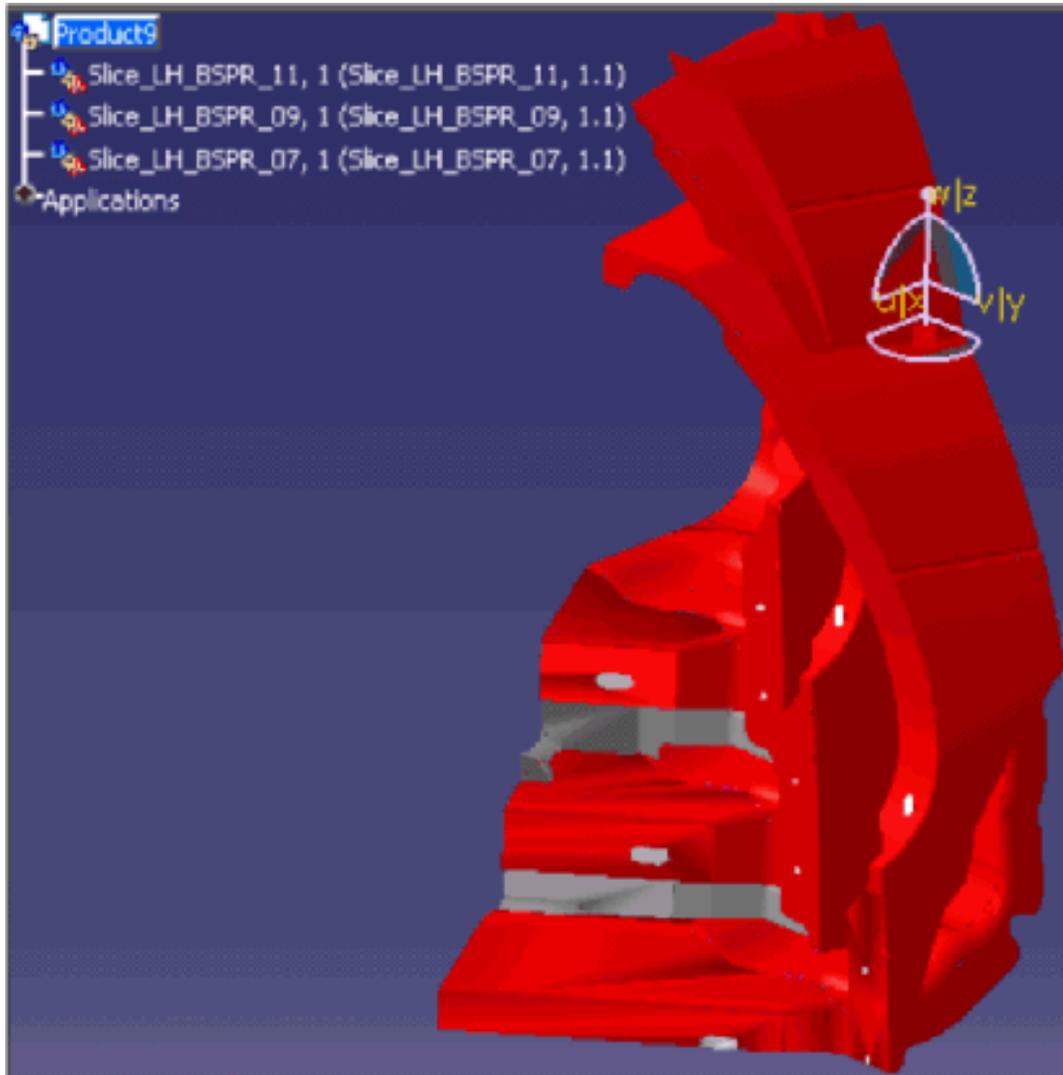


14. Select Close.



The generation and saving of stack of 3D slices is described below:

For each weld, the 3D clipping box is snapped to the appropriate position and orientation relative to the fastener and the volume of the associated product of the fastener enclosed within the 3D clipping box is clipped and saved in CGR format. The number of 3D slices (which equals the number of CGR files) generated is equal to the number of selected fasteners. All the generated 3D slices (i. e., CGRs) associated with the selected welds are inserted in a newly launched product document automatically. The 3D slices are positioned in the 3D viewer such that the fastener associated with each slice is positioned at the origin of the world co-ordinate system (3D compass location in the following picture).



The color(s) of a 2D sectional contour is determined by the color of the object(s) being cut by the section plane. Given a 2D sectional contour (usually multiple colors because the section plane simultaneously cuts several objects in the viewer), the color(s) of the contour may help identify the object being cut.

