



# KvalCAM<sup>®</sup> Reference Guide

Published: July 19, 2021

Innovation, Quality & Honesty

## KvalCAM<sup>®</sup> Reference Guide

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The screenshot displays the KvalCAM software interface. On the left, a 'Libraries' panel lists machine lines: 965X, EFX, DL-NCX, and MLX, each with a 'Machine not connected.' status. The main workspace shows a 3D model of a door assembly with 'KVAL' branding. The 'Feature Tree' on the right lists components like 'Hinge PreDrill', 'Jamb Hinge', and 'Schlage ND400'. Below the tree, 'Selected Feature Details' for 'Kval(y1.1) 3.5" Hinge PreDrill' shows coordinate references and a table of locations.

L Location	W Location	T Location
7	0	0
36.25	0	0
65.5	0	0
65.5	0	0

Buttons for 'Lock', 'Hinge', 'Top', 'Bottom', 'Push', and 'Pull' are visible on the right. A 'Keyboard Shortcuts' panel is at the bottom right. The bottom status bar includes 'On Machine', 'Show All', 'Shaded', 'Door Qty: 0', and 'Export to DXF'.

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Manual Part Number: DOC-KvalCAM-1

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# CHAPTER 1 KvalCAM Reference

This chapter describes the **KvalCAM** interface.

## Chapter 1 at a Glance

Section Name	Summary	Page
<b>About KvalCAM</b>	KvalCAM overview.	<a href="#">page 1-2</a>
<b>About KvalCAM Libraries</b>	Describes the KvalCAM library selections and differences associated with them.	<a href="#">page 1-3</a>
<b>Controls at the Library Screen</b>	Describes the various controls to operate the controls at the library interface.	<a href="#">page 1-8</a>
<b>About Revisions</b>	Describes the available revision options.	<a href="#">page 1-14</a>
<b>About Door Job Creation</b>	Describes the interface selections at the Door Job screen.	<a href="#">page 1-16</a>
<b>Comparing the FaceProfile and LiteCutout Feature Types</b>	Describes the Lite Cutout machine options to create a face cutout.	<a href="#">page 1-42</a>
<b>About the Machine Line Screen</b>	Describes the controls to machine a door with the properties of the selected Door Job.	<a href="#">page 1-44</a>
<b>About Backing up Data and Checking the Revision Status</b>	Describes the options to backup data and check revision status of KvalCAM.	<a href="#">page 1-48</a>

## About KvalCAM

**KvalCAM** allows you to easily define the shapes, sizes, and locations to machine a door. The **KvalCAM** software includes a single **User Interface** to control a single machine or an entire machine line. Each machine can also be controlled separately or as a collective. **Door Jobs** and **Features** from a library can be downloaded remotely and created at the station. The **KvalCAM** interface uses tabbed navigation to jump to desired screens.



For more information about **KvalCAM** and to view a video about **KvalCAM**, go to <https://kvalinc.com/>. Select the **KvalCAM** feature tab.

## Input Block Diagram

**KvalCAM** has the versatility to connect with many types of inputs. A **Door Job** is built from **Door Data** and **Features**. The **Door Job** communicates with the Machine or Machine Line to process the door.

Figure 1- 1 illustrates the multiple inputs that can be used by **KvalCAM** to create a door.

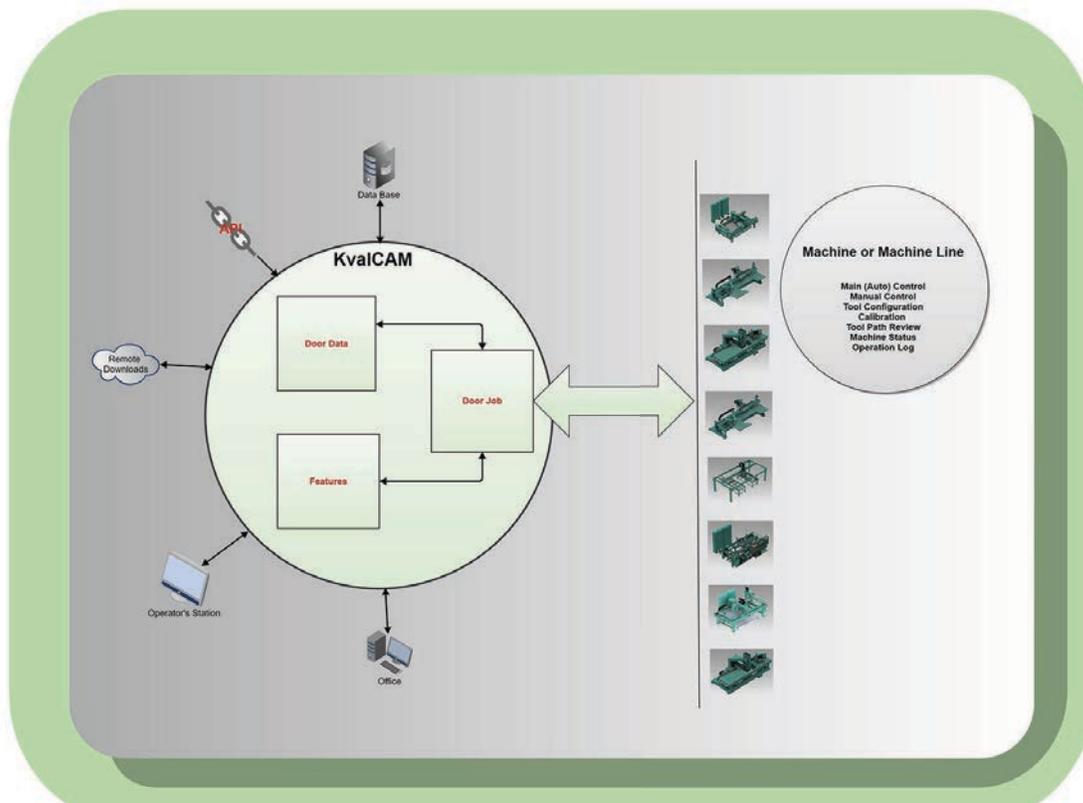


FIGURE 1- 1. Input Block Diagram

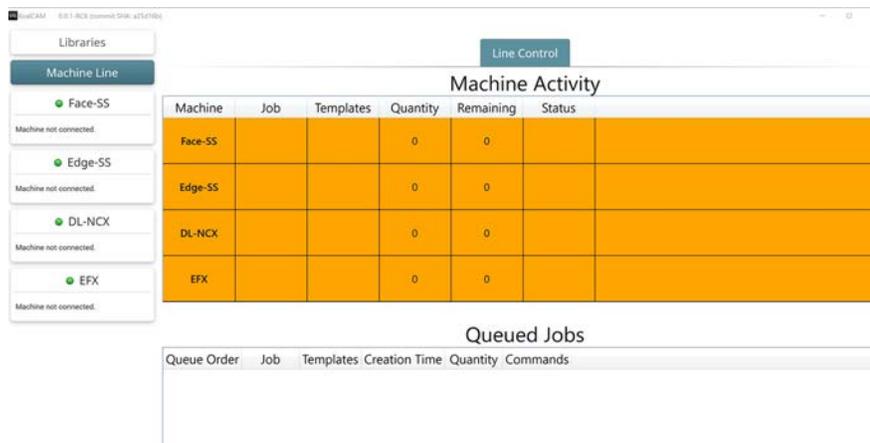
## Summary of the KvalCAM Interface

KvalCAM contains three main interfaces.

- Machine Line
- Libraries (**Door Job**, **Door Data**, and **Feature Group**)
- Machine Control

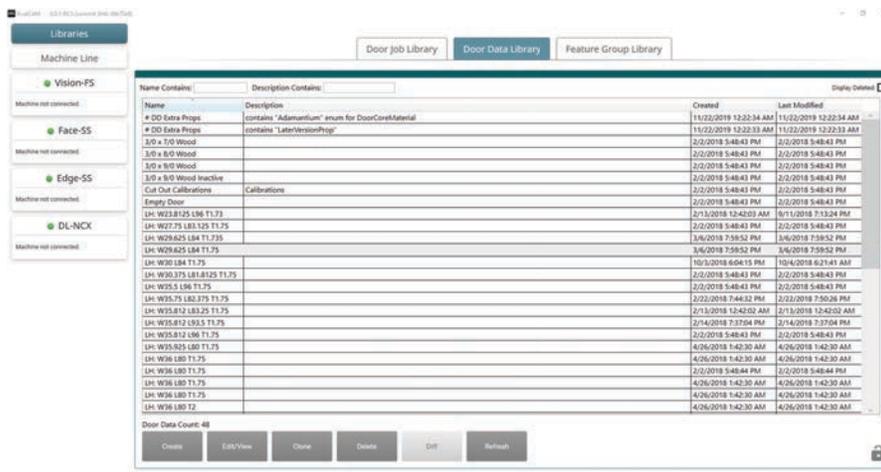
### Machine Line

This screen is the boot-up screen for **KvalCAM**. View the entire process of the machine line, queued jobs, quantity and remaining doors, and status of each machine. Some line control is available.



### Libraries

The Libraries include three tabs, the **Door Job Library**, the **Feature Group Library**, and the **Door Data Library**. At each library screen, files can be created, edited, cloned, deleted, and downloaded. Each Library contains a version section.

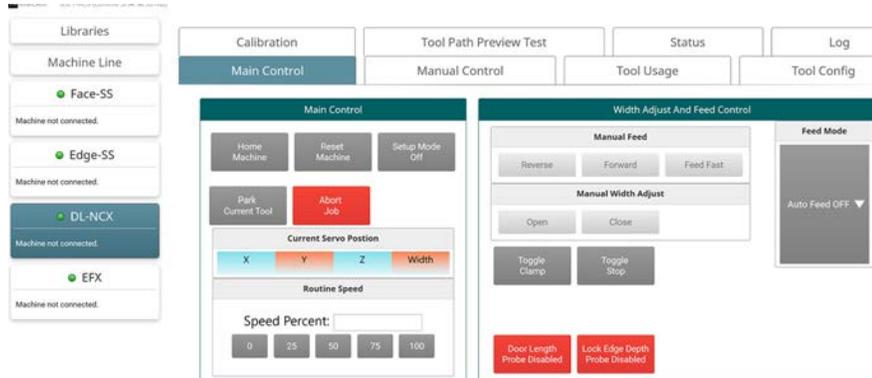




## Machine Control

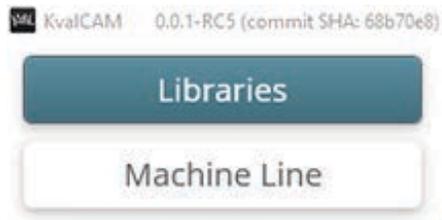
Each machine has a distinct control screen. **KvalCAM** is purpose-built to allow all compatible machinery to communicate with one another. Select the desired machine button to take control of that machine.

**Note:** Information about the Machine Controls is located in the **Machine Operation Manual**.



## About the Libraries

This section describes the Library Screens. Select the Libraries tab at the upper left of the screen and then select the desired library. Use the buttons at the bottom of the screen to Create, Clone, Edit, Compare, or Delete files. Lock editing capabilities and refresh tabs are also available.



### Distinguish Between the Library Types

The table below shows the details of the **KvalCAM** Libraries.

The Library Screens include:

- The **Door Job Library**
- The **Door Data Library**
- The **Feature Group Library**

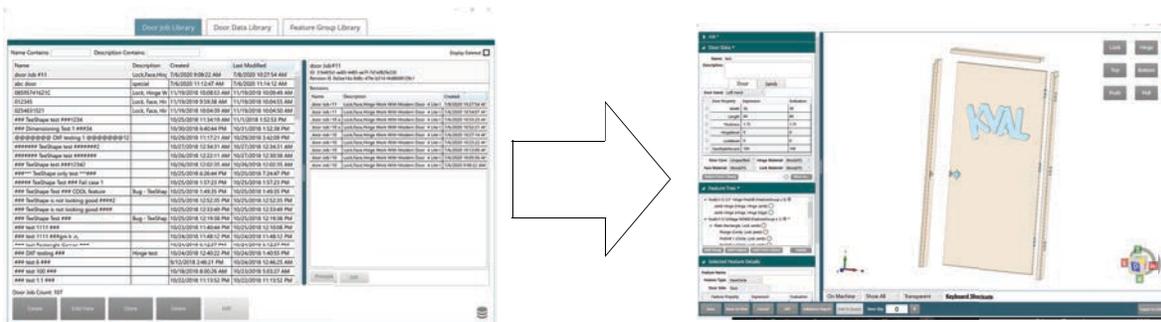
Detail	Door Job	Door Data	Feature Group
Saves Cut Information	Yes	No	Yes
Saves Door Parameters	Yes	Yes	No
Number of Feature Groups Allowed	Many	0	1
Load Work onto Machines (Cut Doors)	Yes	No	<sup>1</sup> Yes

1. For Testing Purposes Only

## About the Door Job Library Screen

Below is a list of highlights about this screen.

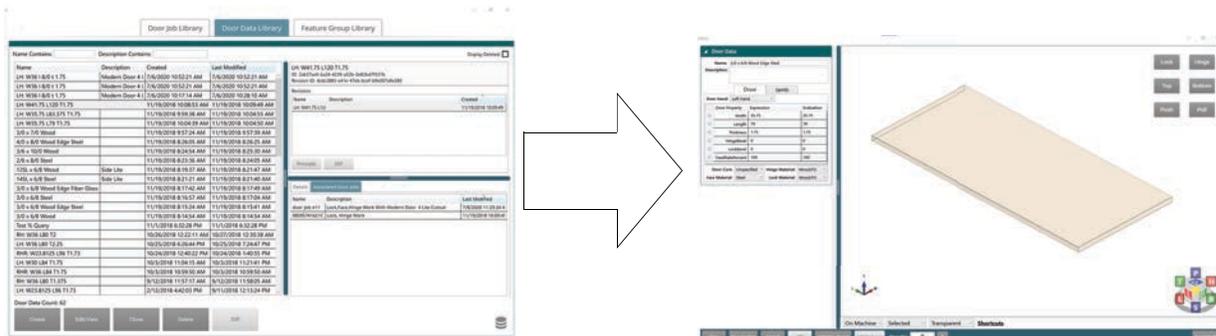
- Select a file from the table to open the **Door Job Creation** screen.
- The **Door Job Library** contains all the files in the selected database.
- The **Door Job Files** contain all the information to create a door.
- Files support revisions.



## About the Door Data Library Screen

Below is a list of highlights about this screen.

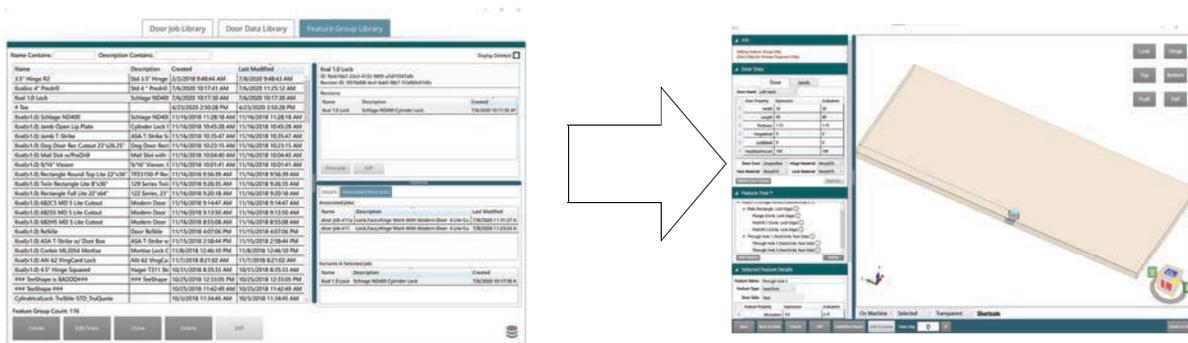
- Select a file from the table to open the **Door Data Creation** screen.
- The **Door Data Library** contains the specifications about an unprocessed door.
- No shape-cutting information is at this screen.
- Files can be saved and be attached to the many **Door Job** files.
- Files support revisions.



## About the Feature Group Library Screen

Below is a list of highlights about this screen.

- Select a file from the table to open the **Door Feature Creation** screen.
- The **Door Feature Library** contains shape information.
- There is one shape information per file.
- Files can be saved and be attached to the many **Door Job** files.
- Files support revisions.
- Tracks variants.



## Controls at the Library Screen

This section describes operations located at each **Library Screen**. Select the **Libraries Tab** located at the upper left and then select the desired library.

**Note:** The operations described here are common to all screens.

**Note:** The **Revision Display Pane** is hidden. To open the panel, hover the mouse over the right side border to display a pointer. Right click and drag the border over to display the pane.

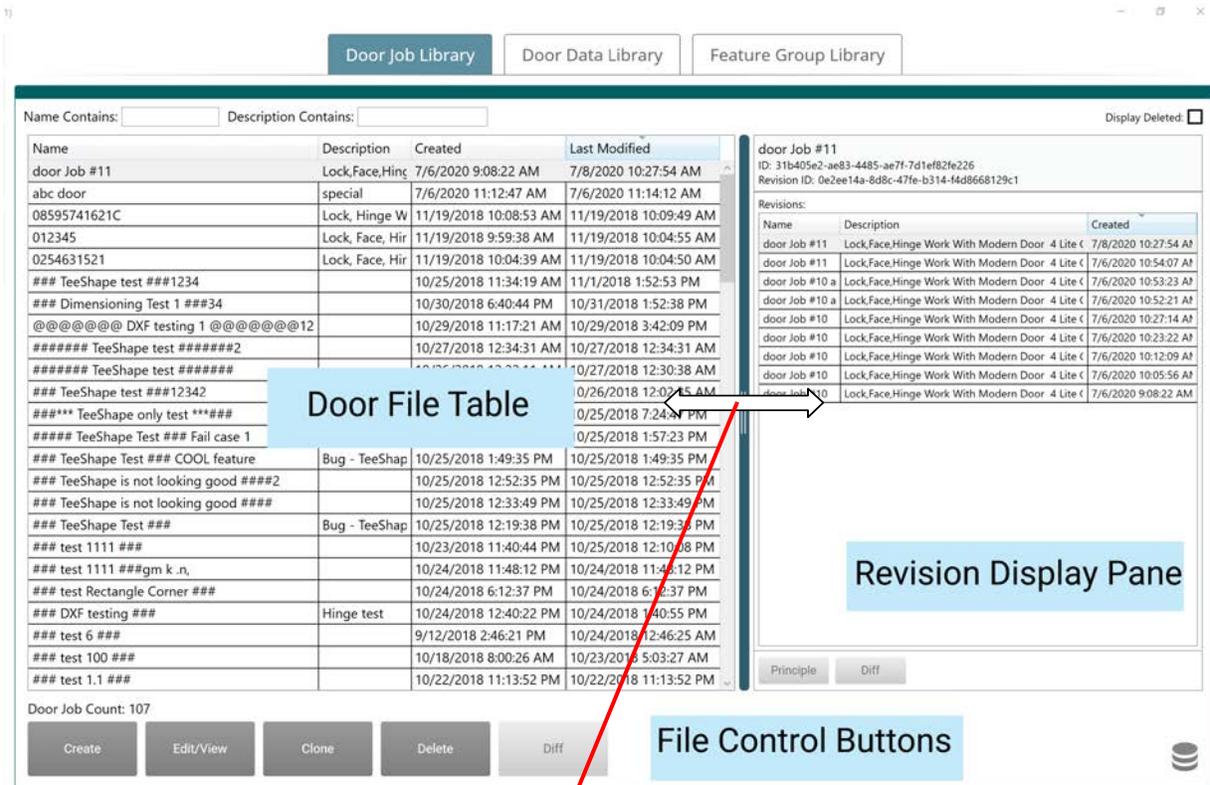


FIGURE 1-2. Library Screen

## Using the Door File Table

The list below shows information about general use of the tables. See the figure below.

- Each library table shows the files in the selected database.
- Click the desired table heading to sort by Name, Description, Date Created or Date Modified.
- At the top enter key words to search by name or description.
- Select the **Display Deleted Check Box** to view or recover deleted door files.

**Tip:** Change the column widths by selecting the column border and dragging to the desired width.

The screenshot shows a software interface with search boxes and a table of door files. The table has columns for Name, Description, Created, and Last Modified. The details pane on the right shows information for 'door Job #11' and a list of revisions.

Name	Description	Created	Last Modified
door Job #11	Lock,Face,Hing	7/6/2020 9:08:22 AM	7/8/2020 10:27:54 AM
abc door	special	7/6/2020 11:12:47 AM	7/6/2020 11:14:12 AM
08595741621C	Lock, Hinge W	11/19/2018 10:08:53 AM	11/19/2018 10:09:49 AM
012345	Lock, Face, Hir	11/19/2018 9:59:38 AM	11/19/2018 10:04:55 AM
0254631521	Lock, Face, Hir	11/19/2018 10:04:39 AM	11/19/2018 10:04:50 AM
### TeeShape test ###1234		10/25/2018 11:34:19 AM	11/1/2018 1:52:53 PM

## Using the Display Deleted Check Box (Recover a Door File)

Follow this procedure to recover a door file.

1. Select the **Display Deleted Check Box**, located in the upper right hand corner.
2. Deleted files are highlighted in red.

The screenshot shows the software interface with the 'Display Deleted' checkbox checked. The table below shows several rows highlighted in red, indicating they are deleted files.

Name	Description	Created	Last Modified
## Hinge test ##		9/17/2020 4:09:19 PM	9/17/2020 10:55:35 AM
### Dimensioning Test 1 ###34		10/30/2018 6:40:44 PM	10/31/2018 1:52:38 PM
### DXF testing ###	Hinge test	10/24/2018 12:40:22 PM	10/24/2018 1:40:55 PM
### TeeShape is not looking good ###		10/25/2018 12:33:49 PM	10/25/2018 12:33:49 PM
### TeeShape is not looking good ###2		10/25/2018 12:52:35 PM	10/25/2018 12:52:35 PM
### TeeShape Test ###		10/25/2018 12:19:38 PM	9/16/2020 3:41:53 PM
### TeeShape Test ### COOL feature		10/25/2018 1:49:35 PM	9/17/2020 11:58:50 AM
### TeeShape test ###1234		10/25/2018 11:34:19 AM	11/1/2018 1:52:53 PM

3. Select the file to be recovered.
4. At the bottom of the page, select the **Restore Button** to recover the file.



## Using the File Control Buttons

Use the buttons at the bottom of the screen to create, clone, edit/view, or delete/recover files. Database selection is also available.

### Using the Create Button

Use this button to create a new file in the desired library.



### Using the Edit/View Button

Use this button to open an existing file to view or edit.



Edit or view a **Door Job**, **Door Feature**, or **Door Data** file.

1. Select a file from the **File Table**.
2. Select the **Edit/View** button to go the file screen.

**Tip:** Double-click the desired file in the table to go straight to the screen.

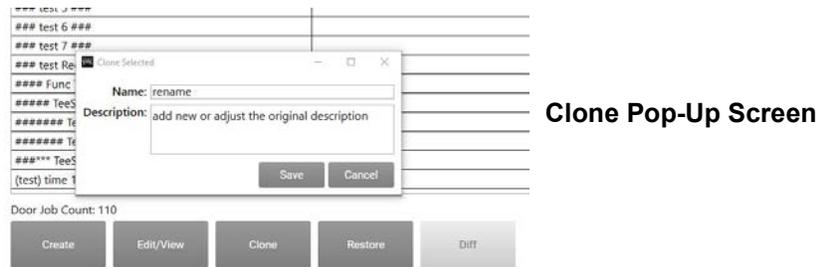
### Using the Clone Button

Use the **Clone Button** to create a copy of a door file.



#### To Clone a File

1. Select the file to be cloned from the table.
2. Select the **Clone** button.
3. At the Pop-Up window, rename the file and, if needed, update the description.
4. Select the **Save** button to complete the process.



## Using the Delete/Restore Button

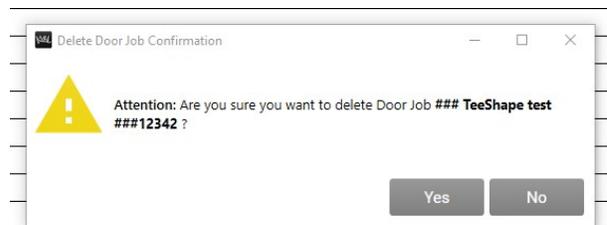
Use this button to delete a file or restore a file.



**Note:** The Delete Button turns into the Restore Button when the Display Deleted Check Box is selected.

### To Delete a File

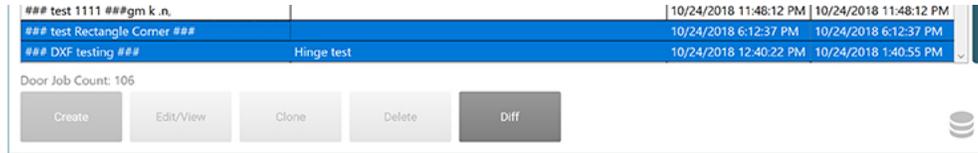
1. Select the file to be deleted from the table.
2. Select the **Delete** button.
3. At the Pop-Up window select **Yes** to delete the file.



**Note:** To restore a file, see [“Using the Display Deleted Check Box \(Recover a Door File\)”](#) on page 1-9.

## Using the Diff Button

This button compares two files. The figure below shows two highlighted files to be compared.



### Use the Diff Button to Compare Two Files.

1. Select two files to compare. Press and hold The **CTRL** or **SHIFT** key, then select the two files to highlight in blue.
2. Select the **Diff** button.
3. In the Pop-Up window, the differences are highlighted.

The top selected file is highlighted in red while the second file selected is highlighted in green.

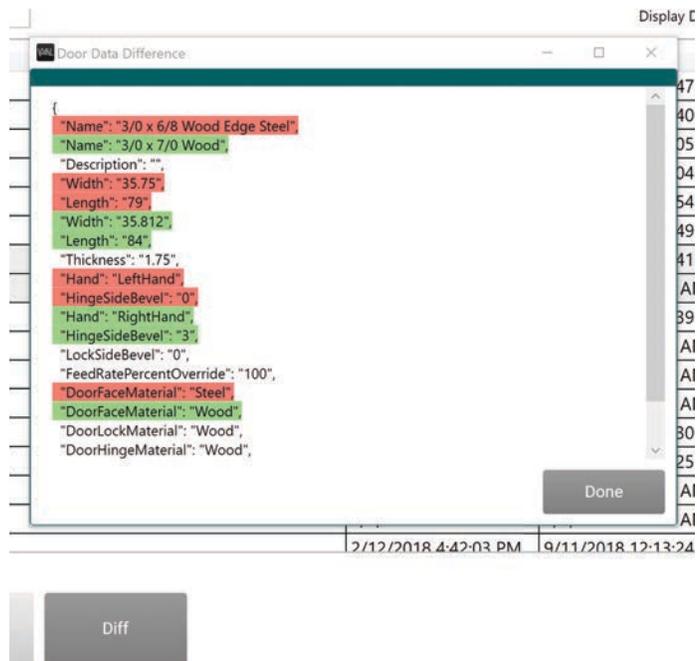


FIGURE 1-3. Comparing Two Files

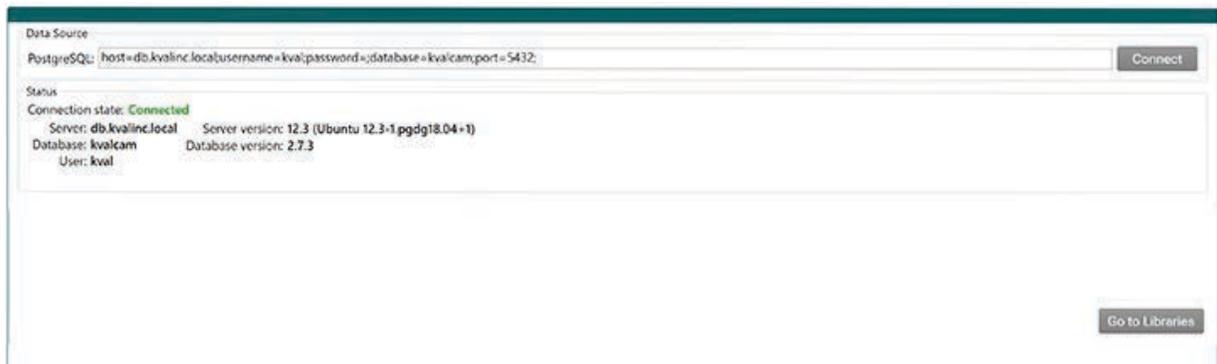
## About the Database Icon

In some instances, a choice of multiple database may be accessed.



### To Select a Different Database:

1. Select the **Database** icon.
2. At the Database screen, enter the desired database path into the **PostgreSQL Text Box**.
3. Select the **Connect** button.
4. Select the **Go to Libraries** button that is located at the bottom of the screen.



### About the Database Screen Contents

The database screen contains the following:

- Data Source path (PostgreSQL)
- Status Information
  - Connection State (**Tip:** If not connected, verify path)
  - Server (Multiple servers may be created)
  - Database (This is the name assigned to the database)
  - User (Assigned User)
  - Server version (OEM server version)
  - Database (Kval database version)



## About Revisions

Revisions are created after editing an existing **Door Job**, **Door Data** or **Feature Group** file in the KvalCAM library.

Revisions represent a save point in the history of editing, the **Principle** revision is the current save point in the case of a **Door Data** or **Feature Group**.

See “Controls at the Library Screen” on page 1-8, for instructions to open the Revision screen.

### Principle and Diff

Each Revision Panel contains a **Principle** and **Diff** button. The **Diff Button** compares two files.

For information about using the **Diff Button**, see “Using the Diff Button” on page 1-12.

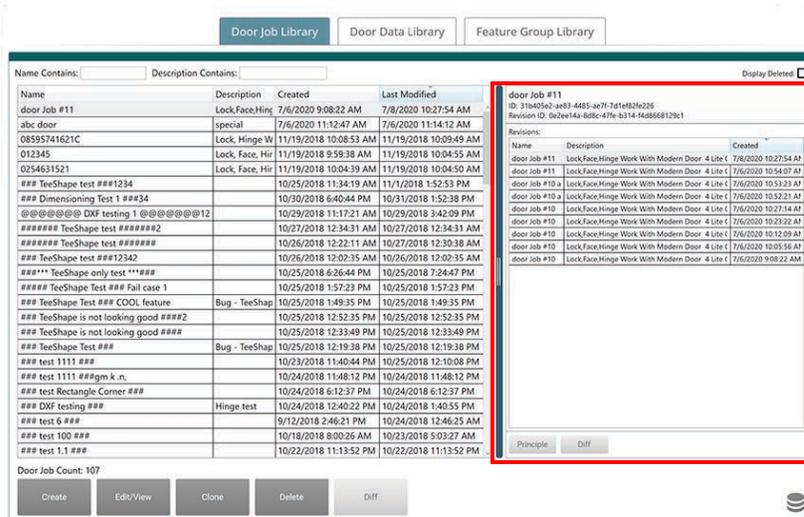
#### Using the Principle Button

Normally the top file in the table is the principle. However, any revised file can be assigned as the principle using the **Principle** button.

1. From the revision table, select to highlight the desired revision file.
2. Select the **Principle** button.
3. The selected file will be highlighted in green and will be assigned as the principle file.

### Revisions at the Door Job Library

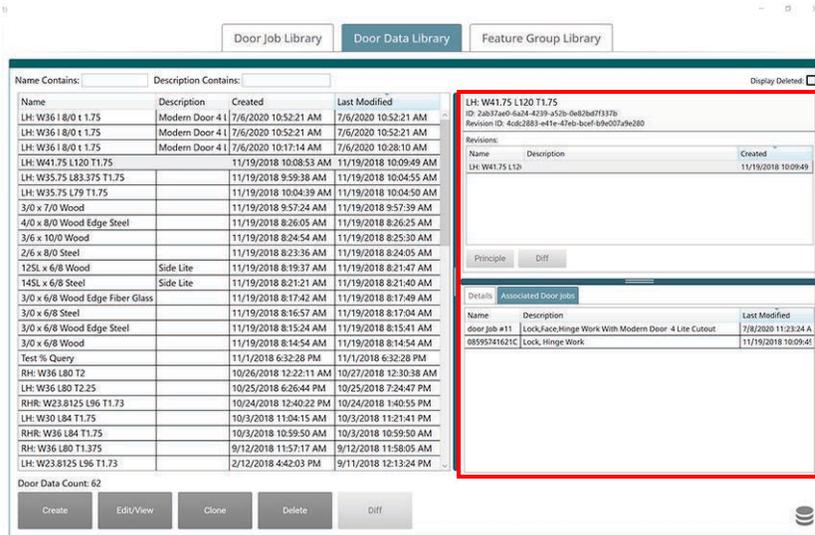
The **Door Job** file revisions be compared and any file can be assigned as the principle.



## Revisions at the Door Data Library

In the upper panel, the **Door Data** file revisions may be compared and any file can be assigned as the principle. The lower panel displays:

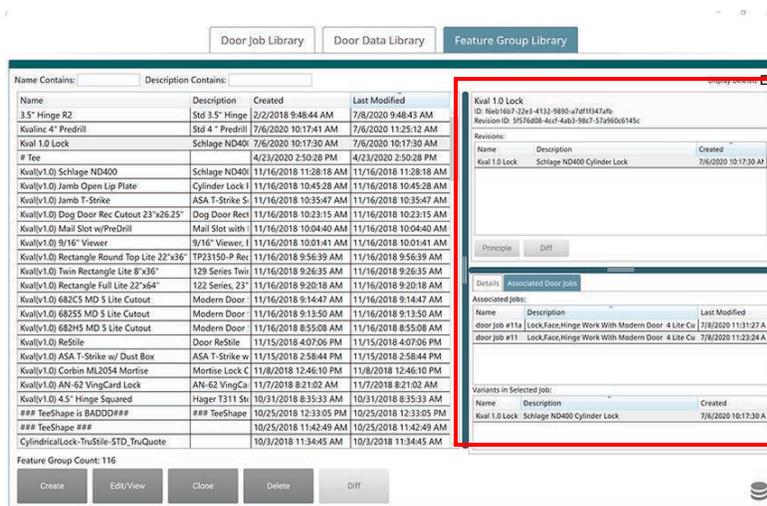
- The **Door Jobs** that contain the selected **Door Data File**.
- The Revision ID.



## Revisions at the Door Feature Group Library

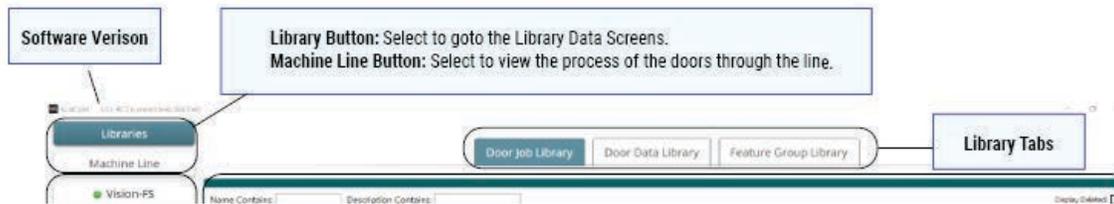
In the upper panel, the **Door Feature** file revisions may be compared and any file can be assigned as the principle. The lower panel displays:

- **Door Jobs** that contain the selected **Feature Group File**.
- The Revision ID.
- Any Variant in the files. For a **Variant** definition, see “Variant” on page 3-15.



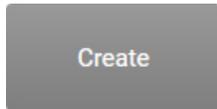
## About Door Job Creation

This section describes the functions available at the **Door Job Creation** screen. Select the **Libraries** Tab and then make sure you are at the **Door Job Library Tab**.

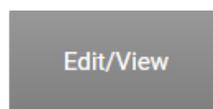


**Note:** Sample of face, lock, and hinge job creations are located in this manual.

**Note:** For a definition of validation errors, see [“Validation” on page 3-13](#).



To create a new **Door Job**, select the **Create** button at the bottom of the screen.



To edit or view a created **Door Job**, select the item from the table, then select the **Edit / View** button on the bottom of the screen.

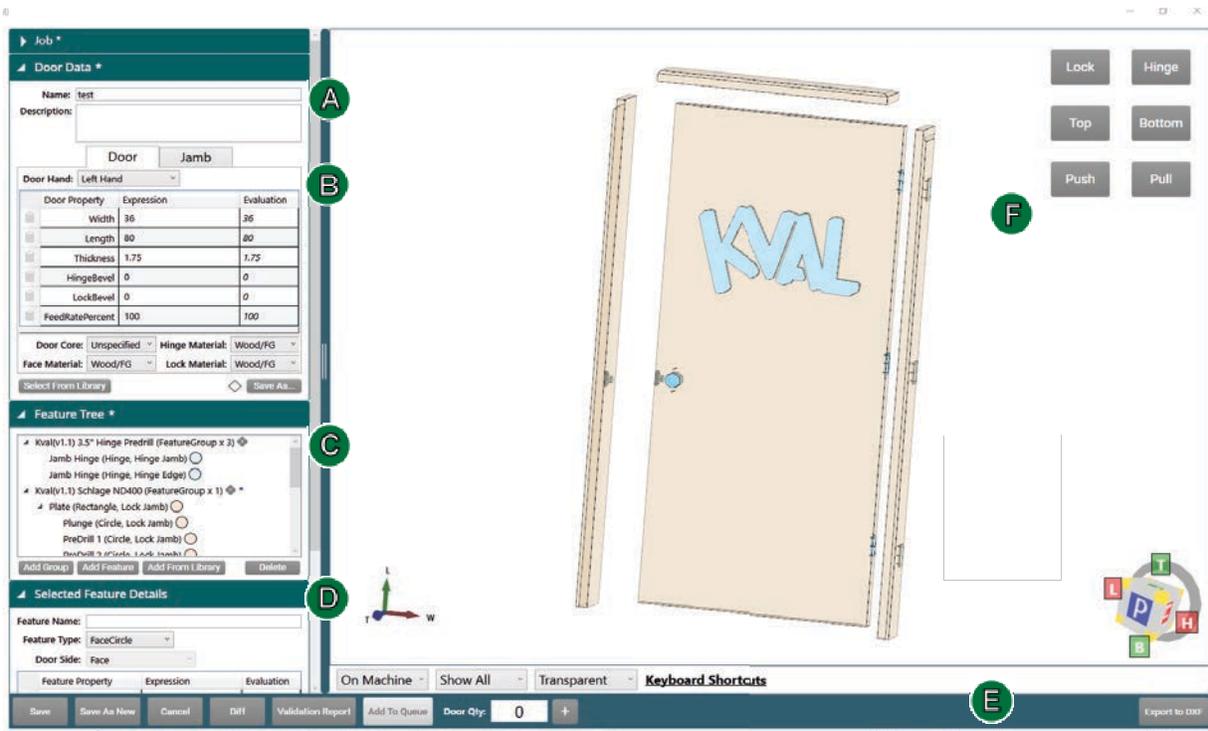


FIGURE 1-4. Door Job Screen

A

## About the Job Name Menu



The screenshot shows a form titled "Job" with two input fields. The first field is labeled "Job Name:" and contains the value "12874985". The second field is labeled "Job Description:" and contains the value "6-8' Oak Wood".

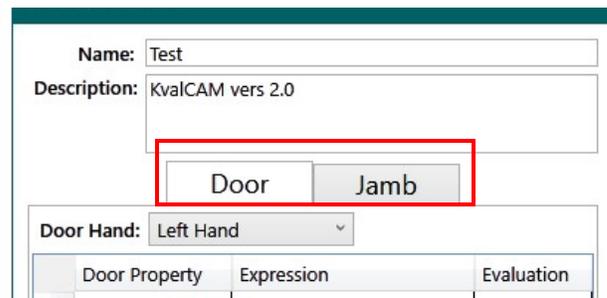
**Job Name:** Job Name is displayed in the Library page.

**Job Description:** Add an description of the **Door Job**.

B

## About the Door Data Menu

The **Door Data** menu contains raw door data and raw jamb data to create a **Door Job**. **Door Data** and **Jamb Data** are located under separate tabs.



The screenshot shows a form with several fields and buttons. The "Name:" field contains "Test" and the "Description:" field contains "KvalCAM vers 2.0". Below these fields are two buttons, "Door" and "Jamb", which are highlighted with a red box. Below the buttons is a "Door Hand:" dropdown menu set to "Left Hand". At the bottom, there are three tabs: "Door Property", "Expression", and "Evaluation".

FIGURE 1-5. Door Data Menu

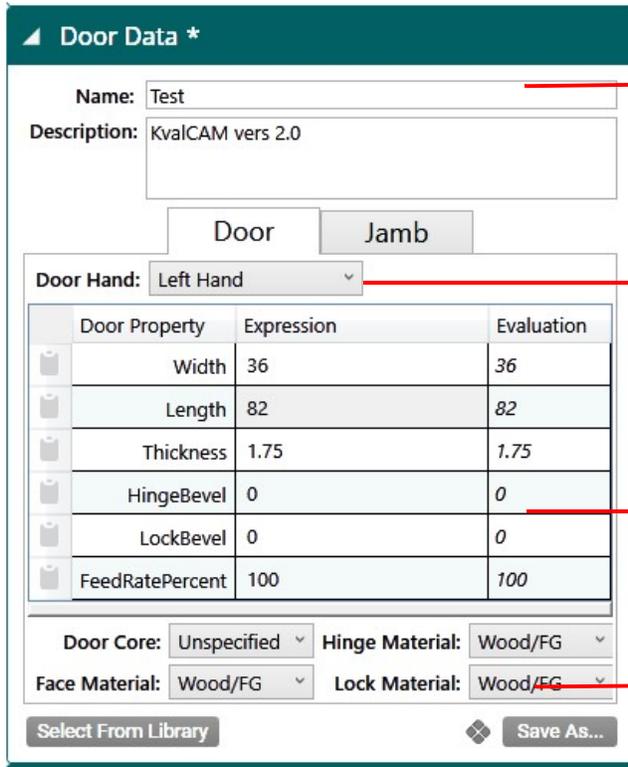
## Door Data and Jamb Data Highlights

**Note:** Definitions of ad hoc, expressions, and revised files can be found in the Common Terms Chapter of this Reference Guide.

- **Door Data** and **Jamb Data** can imported into the **Door Job** from the **Door Data Library**. (Most common)
- Data can be saved to the **Door Data Library** as an ad hoc file, a revised file or as a new file.
- By way of the **Door Data Library**, door and jamb data can be shared with many **Door Job** files.
- Expressions are available.
- One click expression copy is available.
- If needed, data can be entered and changed manually.

## Description of the Door Data Table Selections

Select the **Door** tab to view, edit, or save the door data properties. The figure below describes the available **Door Data** properties. For an example of using the **Door Data** section, See “[Door Data Process Steps](#)” on page 2-2.



Door Property	Expression	Evaluation
Width	36	36
Length	82	82
Thickness	1.75	1.75
HingeBevel	0	0
LockBevel	0	0
FeedRatePercent	100	100

**Name and Description:** Add a file name and description.

**Door Hand:** Select the Hand Orientation of the Door. From the drip down menu, select:

- Left Hand.
- Right Hand
- Left Hand Reversed
- Right Hand Reversed

**Door Parameters:** Displays the basic parameters of the door being processed.

**FeedRate% Override:** Manually adjust the servo speed of the drill / routers. For example, for a harder material may call for a lower percentage.

**Door Core:** Clamping pressure will adjust to the selection. (Unspecified, Hollow, or Foam)

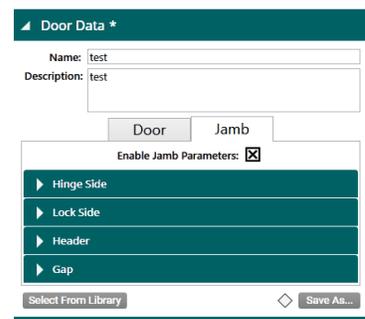
**Door Material:** Select type of material of the Face, Hinge side, and Lock side of the door. (Wood, Fiber -Glass, or Steel)

FIGURE 1- 6. Door Data Table

## Description of the Jamb Data Table Selections

Select the **Jamb** tab to view, edit, or save the jamb data properties. The figure below describes the available **Jamb Data** properties. Each properties table lists the parameters for:

- Hinge Side
- Lock Side
- Header
- Header, Hinge Side, and Lock Side Gaps



## Jamb Data Properties

Jamb Properties include all the parameters to create a door frame. The data is normally created remotely and saved into the database. The properties are shown in the figure below. For an example of using the Jamb Data section, see “[Jamb Data Process Steps](#)” on page 2-3.

**Note:** To activate jamb data, the **Enable Jamb Properties** check box must be selected.

The figure shows two screenshots of the Door Data software interface. The left screenshot shows the 'Door Data' window with the 'Jamb' tab selected and the 'Enable Jamb Parameters' checkbox checked. Below this, two tables are shown: 'Hinge Side' and 'Lock Side'. The right screenshot shows the 'Header' and 'Gap' Jamb Data tables.

Jamb Property	Expression	Evaluation
Length	$\$Door.Length + \$Jamb.GapH$	81.375
Width	6.5	6.5
Thickness	1.25	1.25
DadoLength	1.25	1.25
DadoDepth	0	0
RabbitWidth	$\$Door.Thickness$	1.75
StopWidth	$\$Jamb.HingeSideWidth - \$Jan$	4.75
StopThickness	0.5	0.5

Jamb Property	Expression	Evaluation
Length	$\$Door.Length + \$Jamb.GapH$	81.375
Width	6.5	6.5
Thickness	1.25	1.25
DadoLength	$\$Jamb.LockSideThickness$	1.25
DadoDepth	0	0
RabbitWidth	$\$Door.Thickness$	1.75
StopWidth	$\$Jamb.LockSideWidth - \$Jami$	4.75
StopThickness	0.5	0.5

Jamb Property	Expression	Evaluation
Length	$\$Door.Width + \$Jamb.G$	36.25
Width	6.5	6.5
Thickness	1.25	1.25
RabbitWidth	$\$Door.Thickness$	1.75
StopWidth	$\$Jamb.HeaderWidth - \$$	4.75
StopThickness	0.5	0.5
HingeSideOffset	$\$Jamb.GapHingeSide +$	0.125

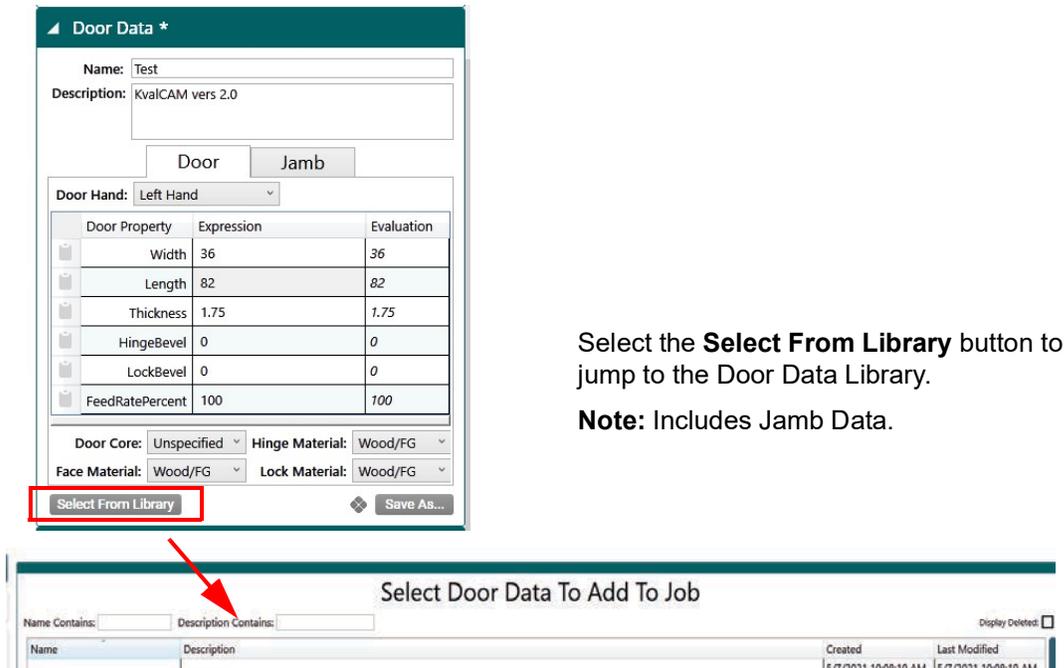
  

Jamb Property	Expression	Evaluation
HingeSide	0.125	0.125
LockSide	0.125	0.125
Header	0.125	0.125

FIGURE 1- 7. Jamb Data Tables

## Select From Library

This button is available in both the Door Data and Jamb Data screens. Select it to jump to the **Select Door Data** Screen to select files to bring into **Door Job**. See [Figure 1- 8](#).



Select the **Select From Library** button to jump to the Door Data Library.

**Note:** Includes Jamb Data.

FIGURE 1- 8. Select From Library Button Action

## Save Data

This button is available in both the Door Data and Jamb Data screens. Choose the **Save As** button to store the data file. At the Pop-Up screen, choose the desired action to save the file.

- **Save as New:** Complete the Name Field and Description.
- **Save as Revision:** Select a file and save as a revision.
- **Save as Ad Hoc:** Save changes as Ad Hoc.
- **Or Cancel the save.**

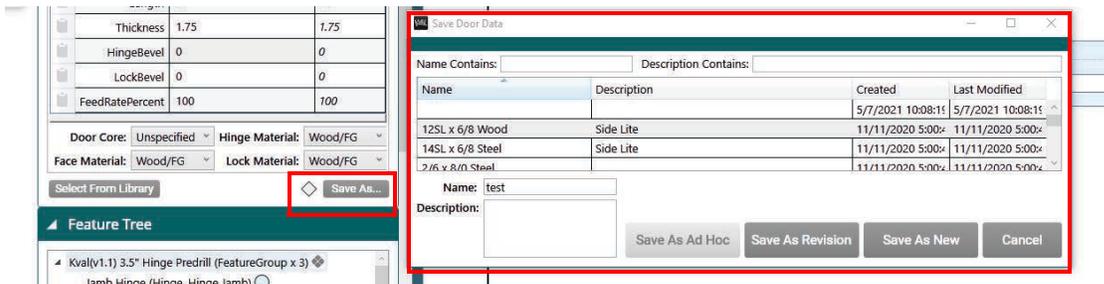


FIGURE 1- 9. Save Data Button Action

**Tip:** Another way to save data is to right click the mouse and select **Save Door Data As...** from the Pop-Up window. See Figure below.

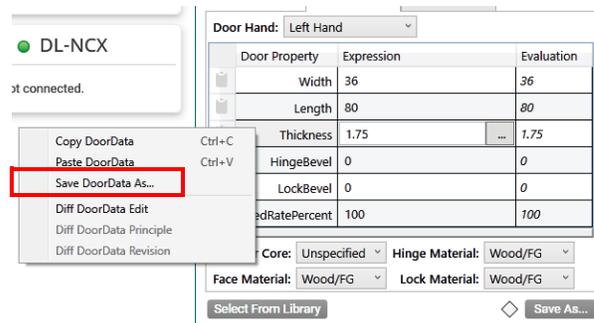


FIGURE 1-10. Pop-Up Window to Save Door Data

### One Click Expression Copy

This button is available in both the Door Data and Jamb Data screens. To copy an expression click the folder icon in the far left of the **Data Properties** table. Paste the expression to the desired location. For a definition of the term expressions, see [“Expressions” on page 3-6](#).

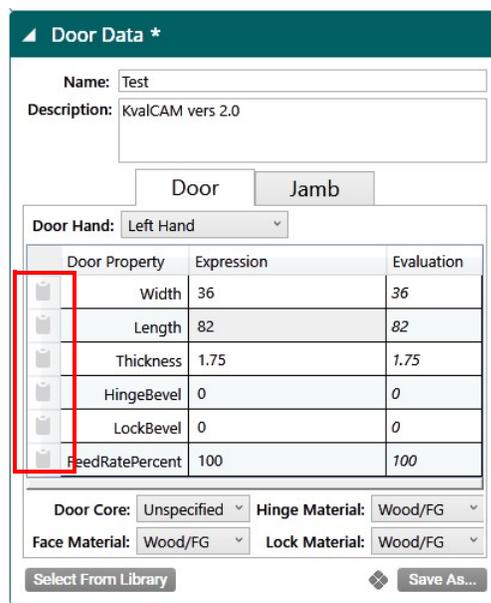
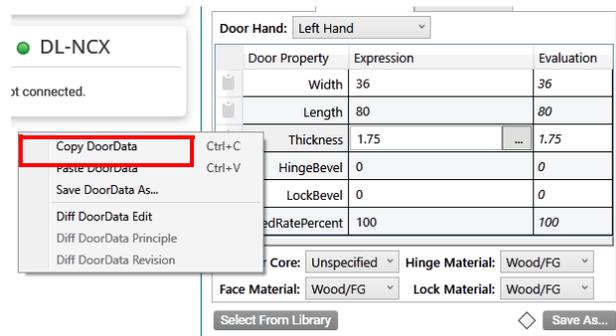


FIGURE 1-11. Using One Click Copy

**Tip:** Another way to copy data is to right click the mouse and select **Copy Door-Data** from the Pop-Up window. See Figure below.



**FIGURE 1-12. Pop Up Window to Copy Data**

## About the Feature Tree Menu

### Summary of a Feature Group and Features

Feature Groups and Features resemble an outline.

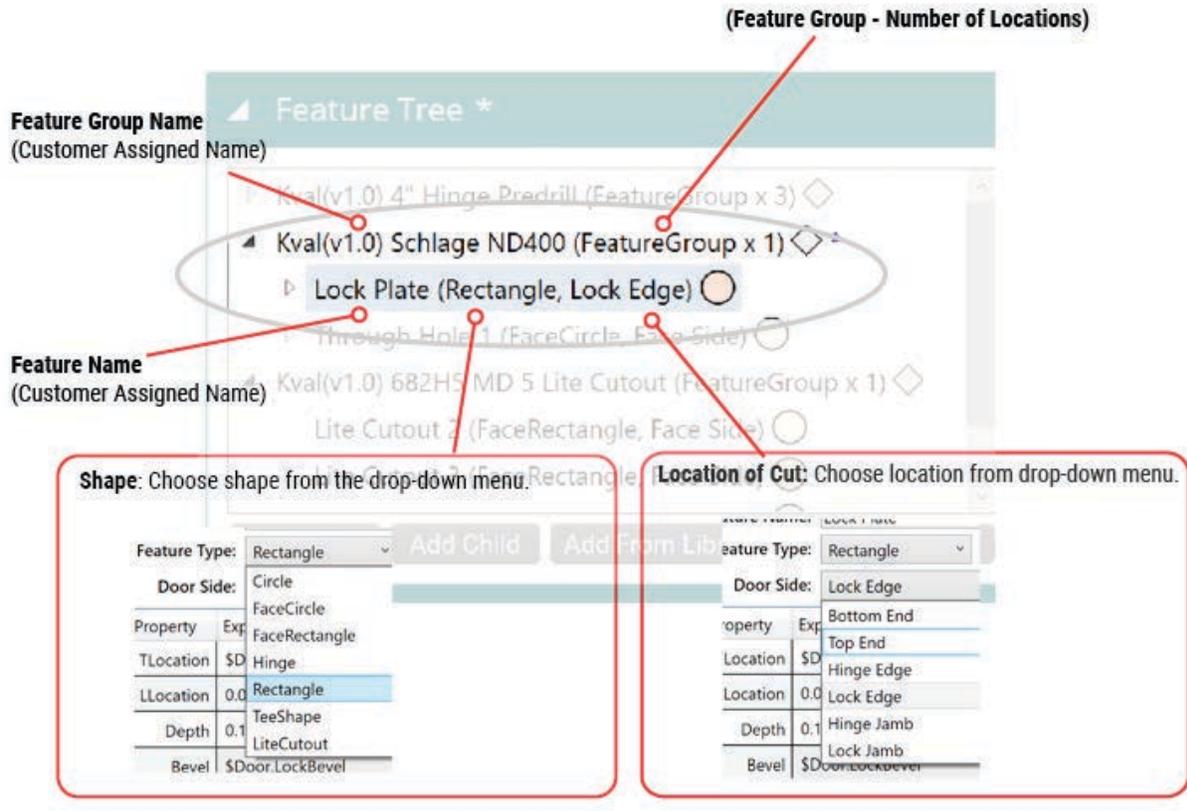


FIGURE 1-13. Feature Group Summary

## C About the Feature Tree Menu

View, edit, or create features of the door. Also known as “Group” or “Template”, a Feature Group is a container in which individual or multiple features can be loaded to process a door. Feature Groups operate at the top level of the feature tree, from which **child** features branch out.

### Notes/Tips:

- **Color Coded:** Indicators next to the **Features** are color coded to reflect the location on the door. (Hinge Edge, Lock Edge, Hinge Pivot Face, Opposite Hinge Pivot Face, Top End, Bottom End).
- **Validation:** If a cut is not correct, the offender will be highlighted by an orange rectangle in the Feature Tree Menu. Use the **Validation Report** to find the error. [See “Validation Report” on page 3-14](#)
- **Cut/Copy and Paste:** Select a Group or Child. Right click the mouse button. Choose Cut or Copy from the list. Position mouse at the desired location in the tree. Right click and choose Paste.

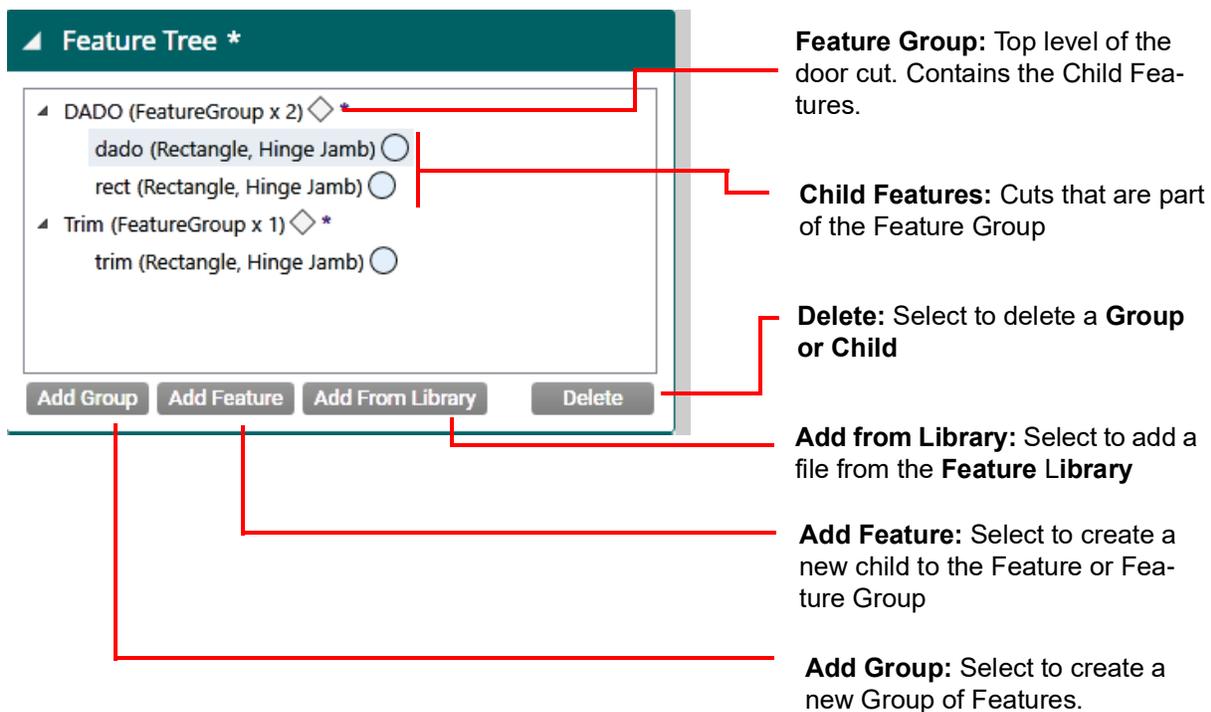


FIGURE 1- 14. Feature Tree Definitions

## D About the Selected Feature Details Menu

All **Feature Groups** have their own L (Length), T (Thickness), and W (Width) location that is separate from the features contained inside. [Figure 1- 15](#) shows a **Hinge Cut** example.

**Feature Group:** The selected group is detailed below.

**Feature Group Name:** This field is required when saving a new template.

**Description:** Description of the Feature Group

**Coordinate References:** Set the reference in relation with the cut. The reference option will be displayed in **Job Preview**.

**T (Thick) Reference:**

- Hinge Pivot Face
- Key Face
- Opposite Key Face
- Opposite Hinge Pivot Face

**L (Length) Reference:**

- Bottom
- Top

**W (Width) Reference:**

- Lock
- Hinge

**Locations:** Add, Remove, Edit location information.

In this example, the hinge locations are located 7.0",36.25" and 65.5" with a reference from the top of the door.

L Location	W Location	T Location
7	0	0
7	0	0
36.25	0	0
36.25	0	0
65.5	0	0
65.5	0	0

**Defined Properties:** Create a custom property to be used for the selected Feature Group. In most cases, a Defined Property is created to simplify changes in a commonly used parameter in a Door Job.

Select **Add Property**. Add a Name and Expression. Error checking will help in adding the correct data.

In the Children Feature Detail Screen, add a hashtag (#) in front of the created property name.

**FIGURE 1- 15. Feature Detail Section Definitions**

## D About the Selected Feature Details Menu (Child Level)

The Feature Details of children of the feature groups are defined and displayed at this level.

The example below is the parameter of the Hinge Cut from the previous page. The example below details the parameters of the hinge cut. Predrill locations are also included in the example.

**Feature Group Child:** The selected group is detailed below.

**Feature Name:** Name of The Feature Under the Group.

**Feature Type:** Select type of cut:

- Circle
- FaceCircle
- FaceRectangle
- Hinge
- Rectangle
- TeeShape
- FaceProfile
- LiteCutout

(See “About Feature Types” on page 2-5.)

**Door Side:** Select Door Side:

- Bottom End
- Top End
- Hinge Edge
- Lock Edge
- Hinge Jamb
- Lock Jamb
- Header Jamb

(See “About Feature Types” on page 2-5.)

**Properties Table:** Parameters of the cut. Includes Hinge Predrill locations.

Feature Property	Expression	Evaluation
TLocation	$Width / 2.0$	0.75
LLocation	$Length/2$	8.75
Depth	0.134	0.134
Bevel	0.0	0
Backset	0.25	0.25
Width	$\$Door.Thickness - Backset$	1.5
Length	3.5	3.5
PredrillDepth	$Depth+0.5$	0.634
PredrillDiameter	0.157	0.157
Radius1	0.25	0.25
Radius2	0.25	0.25

**Copy Expressions:** Click to copy expression in that row

**Manage Augmentations:** Add augmentations to the created Feature. Augmentations are created at the factory to aid common cuts.

FIGURE 1- 16. Feature Details Child Section Definitions

## **E** About the Control Buttons

The Control Buttons are located at the bottom of the screen. The first 4 buttons are related to saving or editing the file. The last button (Add to Queue) relates to running doors through the process.

**Save:**  
Select to save all new **Door Job** or save Edits to a Job (Optional Password Protected)

**Validation Report:**  
If errors are displayed, select to troubleshoot the issue.

**Add to Queue and Door Qty:**  
The first step of door processing. Enter the quantity of doors to be processed in the **Door Qty Box** then select the **Add to Queue** button to start the process.  
[See "About the Machine Line Screen" on page 1-44.](#)

**Save as New:**  
Make adjustments to an existing cut pattern and save as another file.

**Cancel:**  
Select to quit this screen and jump back to the Library screen.

**Export to DXF:**  
Select the **Export to DXF Button** to create a blueprint of the **Door Job**. The background program will translate the parameters to a *dxf* file.

To view the file use a program that opens.dxf files. (For example: AutoCad<sup>®</sup> Draftsight<sup>®</sup>) Use this blueprint to share for review.

**FIGURE 1-17. Control Button Definitions**

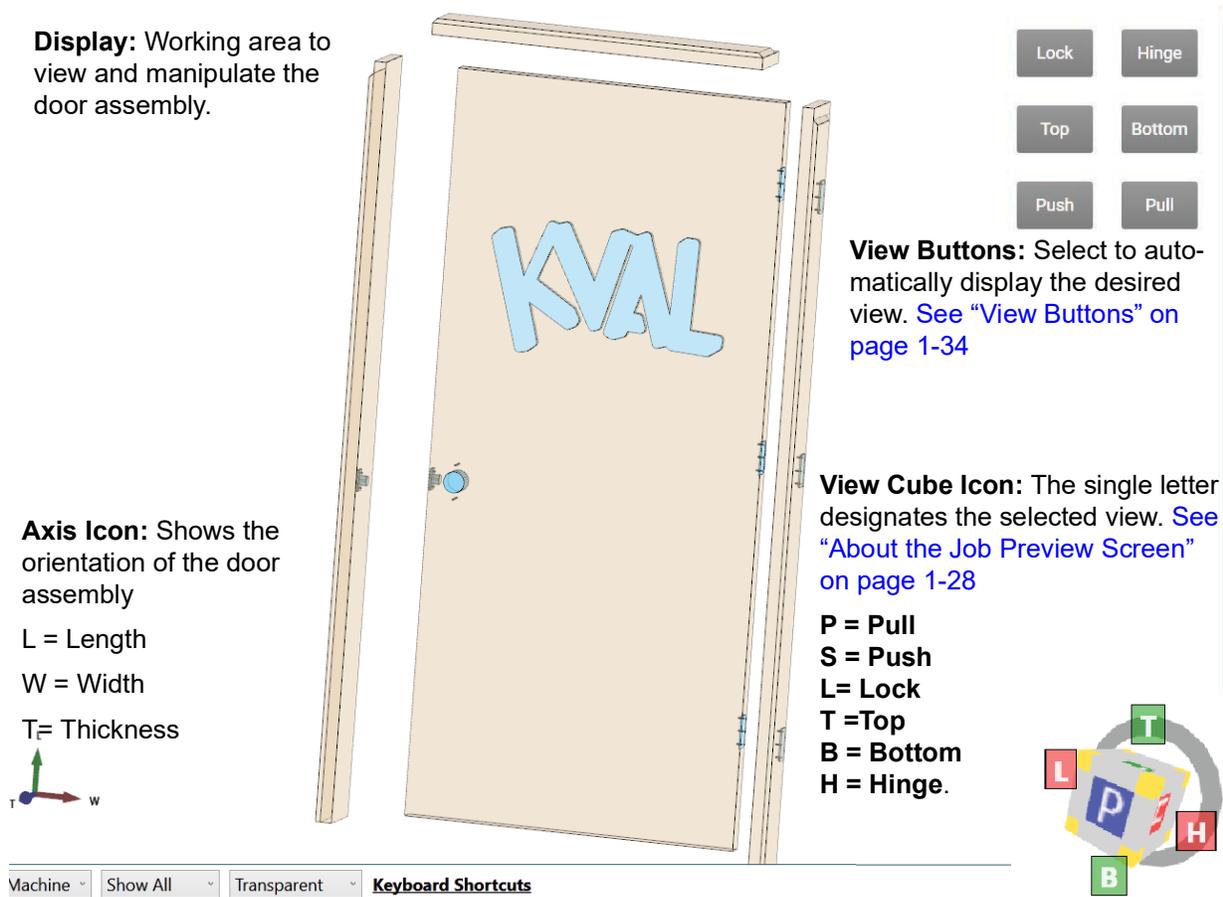
## F About the Job Preview Screen

This display supports viewing the door graphically before cutting, offering powerful opportunities to edit or verify the door parameters.

The **Job Preview** screen is a interactive graphical representation of the **Door Job**. The door can be viewed from different perspectives and configured to be in various assembly situations.

The door can be viewed in terms of components as they exist on the machine, or it can be viewed as components in their final, assembled position in a structure.

This section describes the options available at this screen



**Bottom Buttons:** These buttons manipulate how the door assembly is viewed. See “About the Bottom Buttons” on page 1-31

FIGURE 1- 18. 3-D Display

## Using the Cube Icon to Navigate

Any of the faces can be clicked on to orient the camera to that standard view. In addition to this, any edge or corner of the view cube can be clicked on to get a corresponding camera position. The view cube has a ring and adjacent articles around one face. This ring is designed as a visual indicator of the "bottom" of the cube, or what would be considered the lower side of the "T" dimension.

The view cube is located in the lower-right corner of the screen. This cube has 6 sides, and the corresponding edges and borders or a normal cube. On every face of the cube, there is a single letter that corresponds to the standard view in which that view is oriented. Letters to the side identify adjacent views.

- **H** - Hinge edge
- **L** - Lock edge
- **T** - Top edge
- **B** - Bottom edge
- **P** - Pull face
- **S** - Push face



Figure 1- 19 shows the relationship of the cube icon to a Left Hand Door with the view from the pull side.

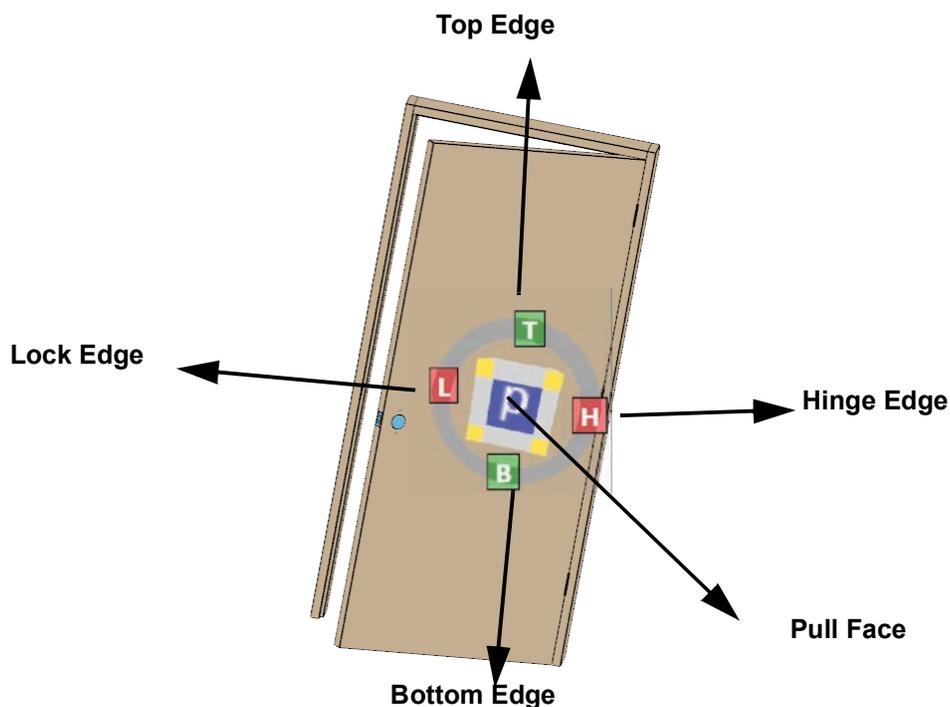


FIGURE 1- 19. Navigation Views

## Color Coding in the Preview Screen

Colors define the type of selection or the status of the item in the screen. Error colors are paralleled from the Feature Tree to the graphical display.

- **Dark Blue:** Feature is selected
- **Light Blue:** Features added to the Door Job
- **Orange:** Validation Error
- **Red:** Evaluation Error

Figure 1-20 shows an example of a feature selection and a validation error.

**Note:** Along with color coded errors, error messages also appear on the **Preview Screen**.

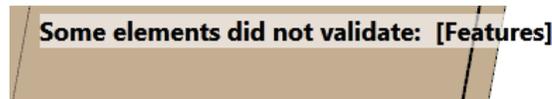


FIGURE 1-20. Sample validation Error Message

### Jamb Lock Plate Validation Error

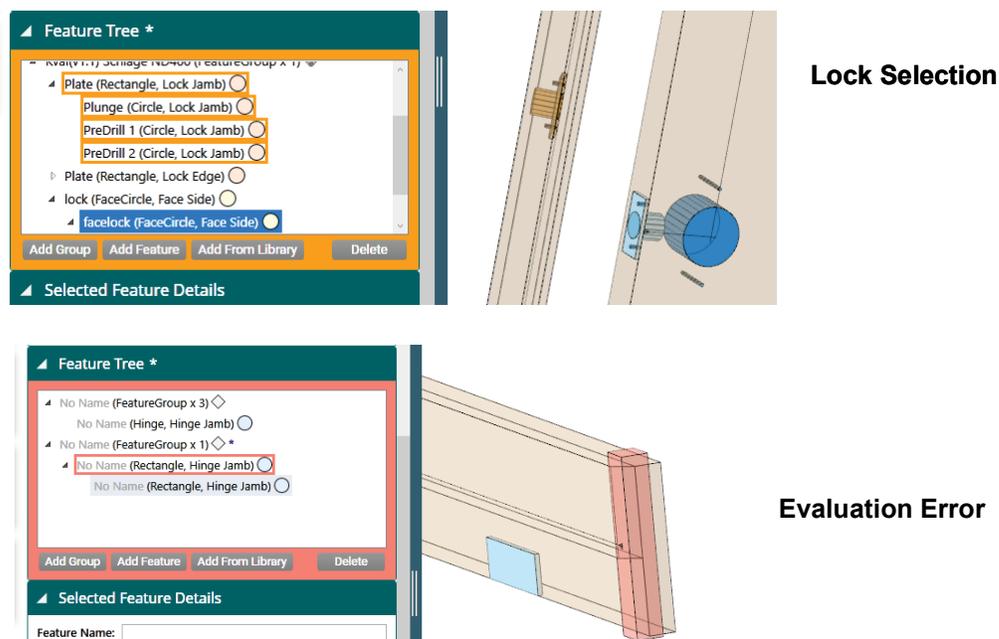


FIGURE 1-21. Color Code Examples

## About the Bottom Buttons

The bottom buttons offers different ways to view the door assembly.



FIGURE 1-22. Bottom Buttons of the 3-D Preview Screen

## About the On Machine Button

From the drop down menu, select **On Machine** or **Assembled**.

- **On Machine:** Shows the door as separated component articles of manufacture.
- **Assembled:** Shows the door as it would appear attached to a building.

Figure 1-23 shows the display in an **Assembled** view and **On Machine** view. The door mode is shown in **Transparent** view to accentuate illustration.

**Note:** The default display is the **On Machine** view.

**Note:** The **Assembled** view always shows the wide-side up (the Pull side). Any door hand will result in the pull side being in the positive "T" direction.

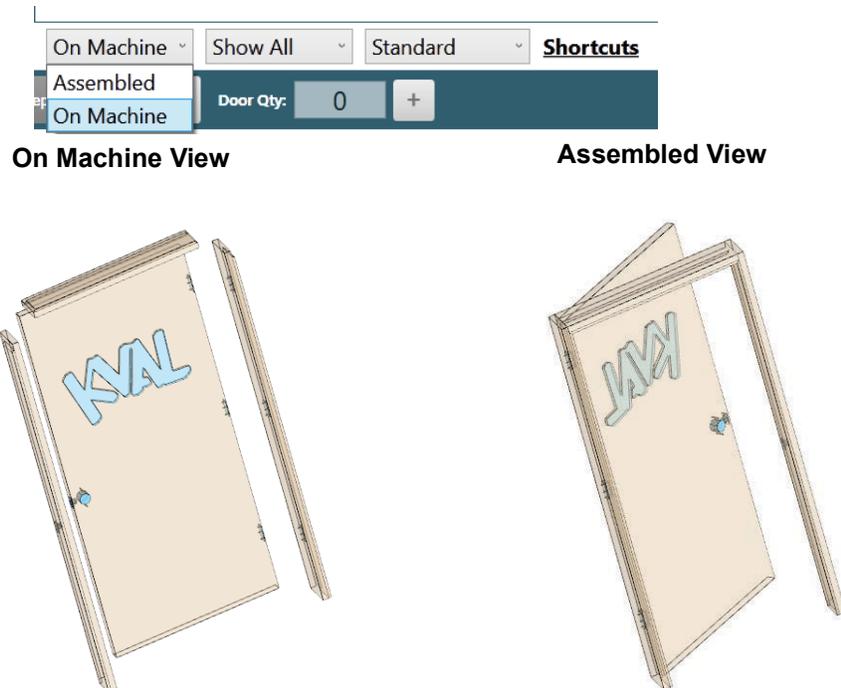


FIGURE 1-23. The On Button Drop Down Menu

## About the Show Mode Buttons

From the drop down menu, select **Has Feature** or **Show All**.

- **Has Feature:** Shows the articles that have one or more features assigned to them.
- **Show All:** Shows all of the articles regardless of whether they have assigned features.
- **Selected:** Shows selected articles from the drop down check box regardless of whether they have assigned features. Select the check box to show or hide the desired articles.

**Note:** Select the arrow next the Selected title to collapse or expand the article list.

**Note:** The **Has Feature** is the default mode.

**Note:** [Figure 1- 24](#) shows the door in the **On Machine** view to accentuate the change in views.

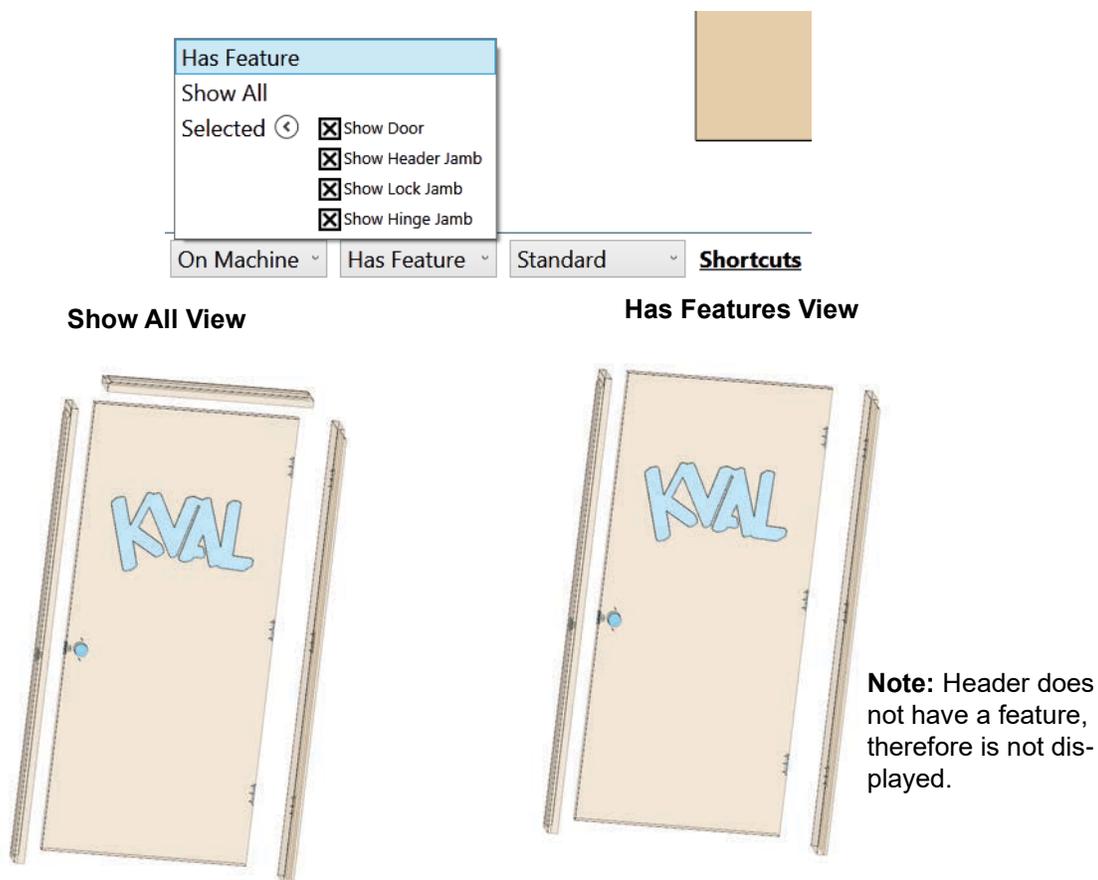


FIGURE 1- 24. The Show Button Drop Down Menu

## About the Standard View Buttons

From the drop down menu, select **Standard**, **Transparent**, or **Wireframe**.

- **Standard:** Shows the door assemblies in an opaque rendering with assigned features visible.
- **Transparent:** Shows all the assigned features with the door assemblies in a transparent rendering. This allows the viewing of features through the door without obstruction.
- **Wireframe:** Shows the door assemblies as a line drawing.

Figure 1- 25 shows each door renderings.

**Note:** The **Standard** view is the default mode.

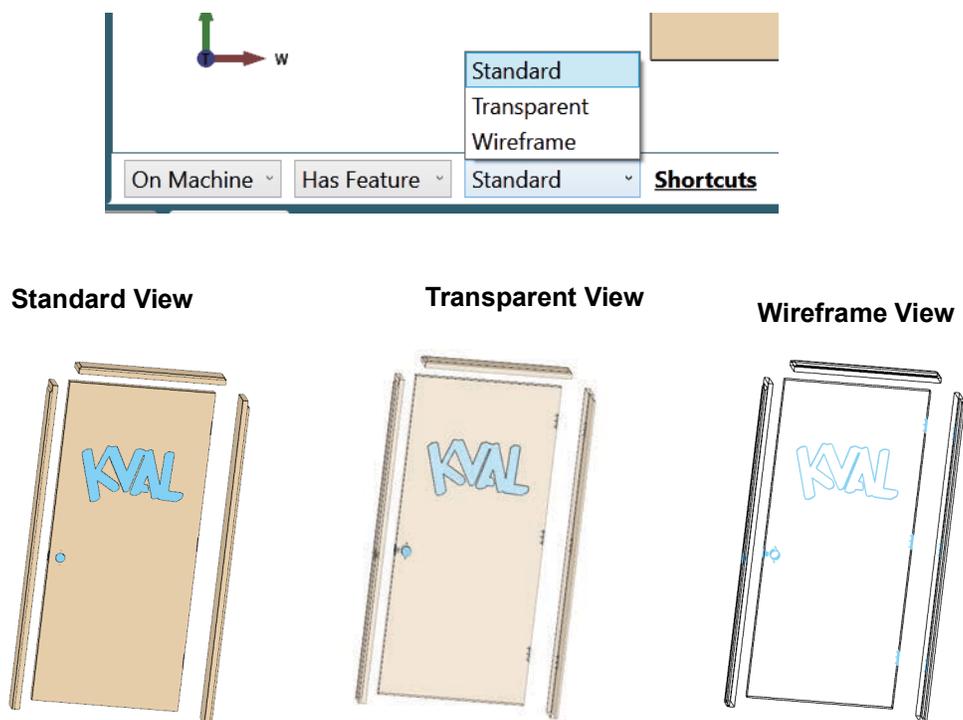
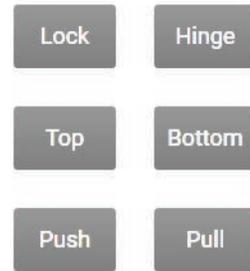


FIGURE 1- 25. The Standard View Buttons

## View Buttons

With the view buttons, quickly orientate the display to the desired view. The **Push** and **Pull** views are affected by the door hand selected in the **Door Data** section. With each change in view, the Axis Icon and the View Cube will change to reflect the orientation. See [Figure 1- 18 on page 1-28](#) for information on the Axis Icon and View Cube.



**Tip:** A mouse rollover over each button will display information about the View buttons. See the display examples in the list below.

- **Lock:** Select to view the door assembly from the lock edge side.
- **Hinge:** Select to view the door assembly from the hinge edge side.
- **Top:** Select to view the door assembly from the top edge side.
- **Bottom:** Select to view the door assembly from the bottom edge side.
- **Push:** Select to view the door assembly from the face side of the door assembly from the push view.
- **Pull:** Select to view the door assembly from the face side of the door assembly from the pull view.

## Lock View

After selecting the Lock button, [Figure 1- 26](#) shows the view of a door assembly in the Shaded view and On Machine mode.

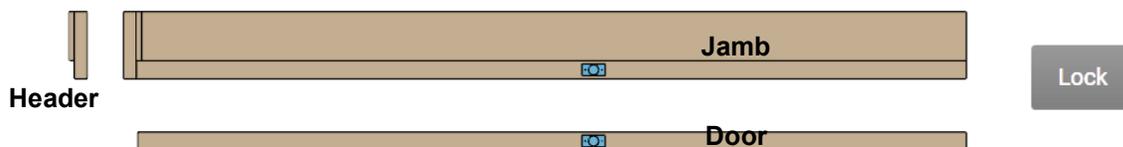


FIGURE 1- 26. Lock View

### Hinge View

After selecting the Hinge button, [Figure 1- 27](#) shows the view of a door assembly in the Shaded view and On Machine mode.

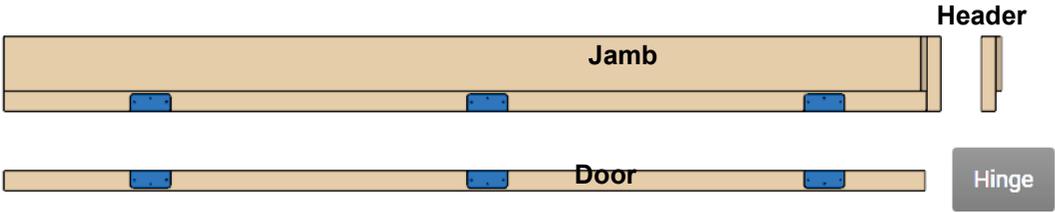


FIGURE 1- 27. Hinge View

### Top View

After selecting the Top button, [Figure 1- 28](#) shows the view of a door assembly in the Shaded view and On Machine mode.

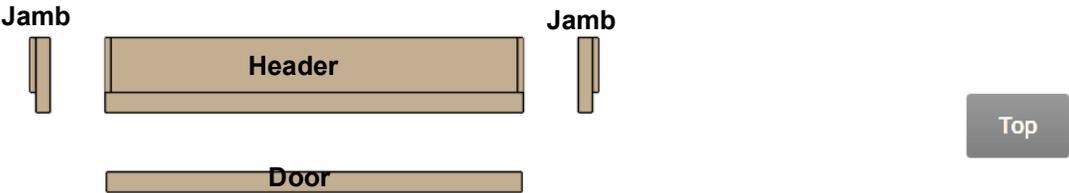


FIGURE 1- 28. Top View

### Bottom View

After selecting the Bottom button, [Figure 1- 29](#) shows the view of a door assembly in the Shaded view and On Machine mode.

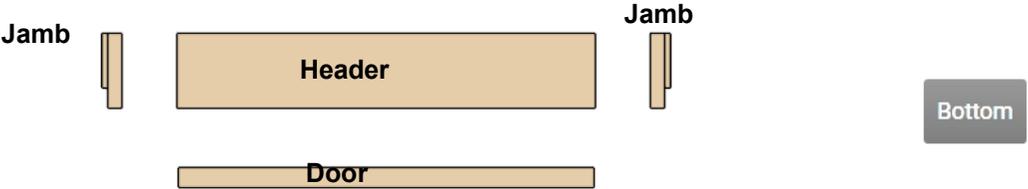


FIGURE 1- 29. Bottom View

## Push and Pull View: Right Hand Door

Figure 1- 30 shows a right hand door in the push and pull mode.

Door			Jamb		
Door Hand: Right Hand					
Door Property	Expression	Evaluation			
Width	36	36			

### Right Hand Door

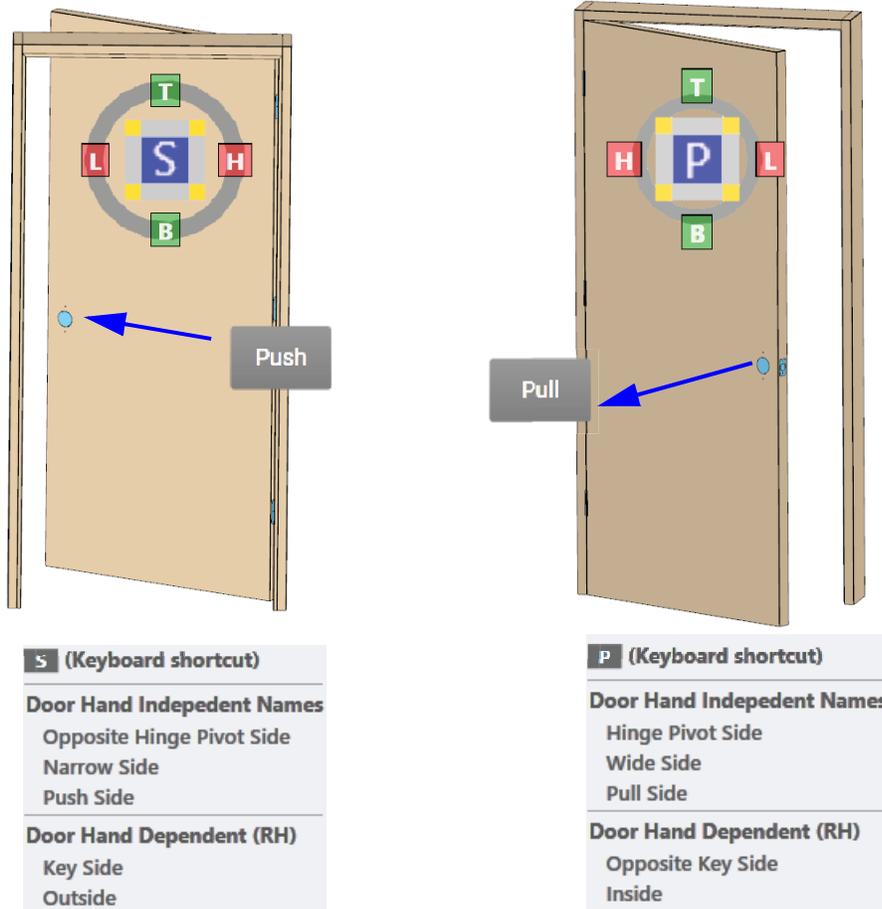


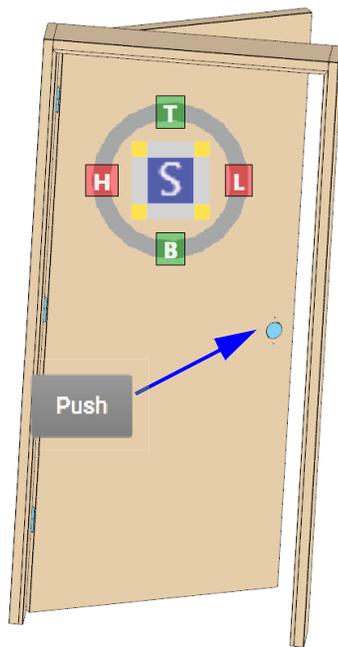
FIGURE 1- 30. Right Hand Door View

## Push and Pull View: Left Hand Door

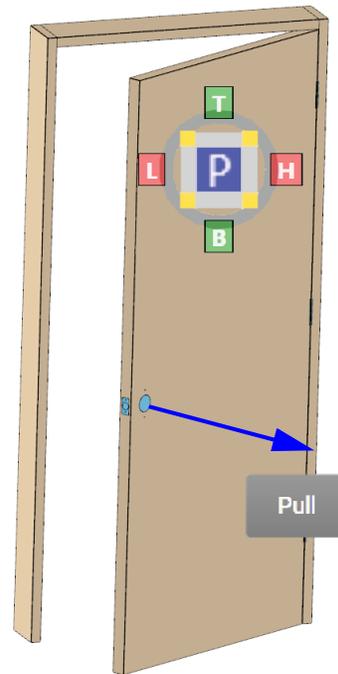
Figure 1- 31 shows a left hand door in the push and pull mode.

Door		Jamb
Door Hand: Left Hand		
Door Property	Expression	Evaluation
Width	36	36

### Left Hand Door



<b>S</b> (Keyboard shortcut)
<b>Door Hand Independent Names</b>
Opposite Hinge Pivot Side
Narrow Side
Push Side
<b>Door Hand Dependent (LH)</b>
Key Side
Outside



<b>P</b> (Keyboard shortcut)
<b>Door Hand Independent Names</b>
Hinge Pivot Side
Wide Side
Pull Side
<b>Door Hand Dependent (LH)</b>
Opposite Key Side
Inside

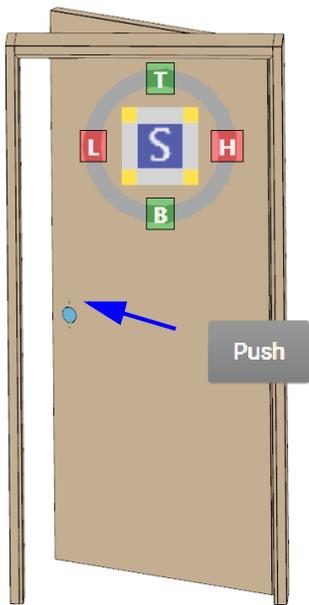
FIGURE 1- 31. Left Hand Door View

## Push and Pull View: Left Hand Reverse Door

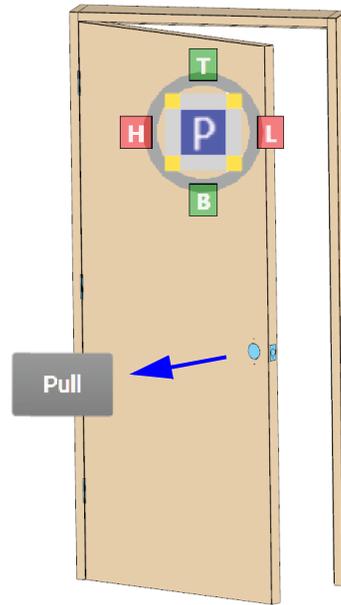
Figure 1- 32 shows a left hand reverse door in the push and pull mode.

Door		
Jamb		
Door Hand: Left Hand Reverse		
Door Property	Expression	Evaluation
Width	36	36

### Left Hand Reverse Door



<b>S</b> (Keyboard shortcut)
<b>Door Hand Independent Names</b>
Opposite Hinge Pivot Side
Narrow Side
Push Side
<b>Door Hand Dependent (LHR)</b>
Opposite Key Side
Inside



<b>P</b> (Keyboard shortcut)
<b>Door Hand Independent Names</b>
Hinge Pivot Side
Wide Side
Pull Side
<b>Door Hand Dependent (LHR)</b>
Key Side
Outside

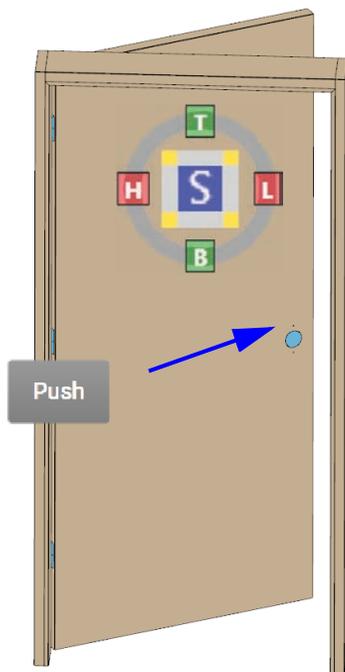
FIGURE 1- 32. Left Hand Reverse View

## Push and Pull View: Right Hand Reverse Door

Figure 1- 33 shows a right hand reverse door in the push and pull mode.

Door		Jamb
Door Hand: Right Hand Reverse		
Door Property	Expression	Evaluation
Width	36	36

### Right Hand Reverse Door



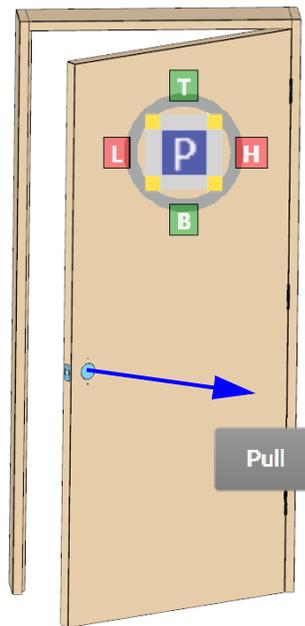
**S** (Keyboard shortcut)

**Door Hand Independent Names**

- Opposite Hinge Pivot Side
- Narrow Side
- Push Side

**Door Hand Dependent (RHR)**

- Opposite Key Side
- Inside



**P** (Keyboard shortcut)

**Door Hand Independent Names**

- Hinge Pivot Side
- Wide Side
- Pull Side

**Door Hand Dependent (RHR)**

- Key Side
- Outside

FIGURE 1- 33. Right Hand Reverse View

## Mouse Operation

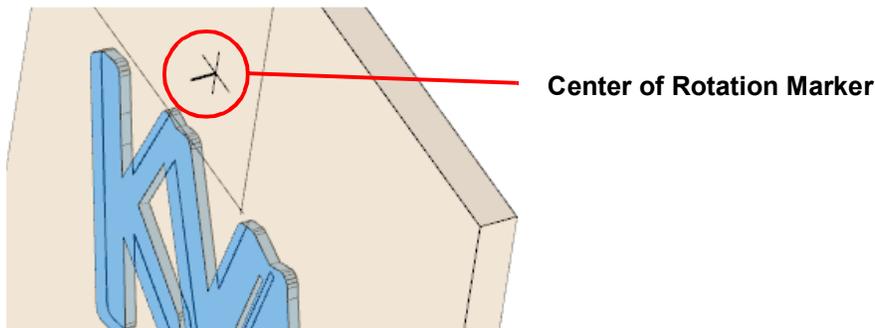
This section describes mouse operation.

**Left-click and release:** selects geometry and highlights it in the graphics area as well as highlights it in the feature tree.

**Middle-click and drag:** pans the model. Dragging in any direction will "pull" the model in that direction.

**Mouse scroll-wheel roll:** zooms in or out on the model. An upward scroll zooms in on the model and the center of zoom is on the cursor. A downward scroll zooms out on the model and the center of the zoom is on the cursor.

**Right-click and drag:** rotates the model. When right clicking in the target geometry or very close to the target, the closest point will become the center of rotation for the rotation. The center point will be identified by an axis marker.



If right clicking in the "whitespace" of the screen (not on the model), the system default will put the center of rotation at the center of the model.

**Note:** When 2D Lock mode is active, this gesture performs the same action and the middle-click and drag button.

**Hold CTRL while left click and drag:** creates a Zoom-to-Rectangle action, which lets the user zoom to a particular region very quickly.

## Keyboard Shortcuts

This section describes shortcuts to use to navigate the 3d display.

- Hover over the shortcuts link to open a Pop-Up. Move off shortcuts link to close the Pop-Up.
- Select the Shortcut link to open a Pop-Up window. Select the shortcut link again to close the Pop-Up



FIGURE 1-34. Keyboard Short Cut Link

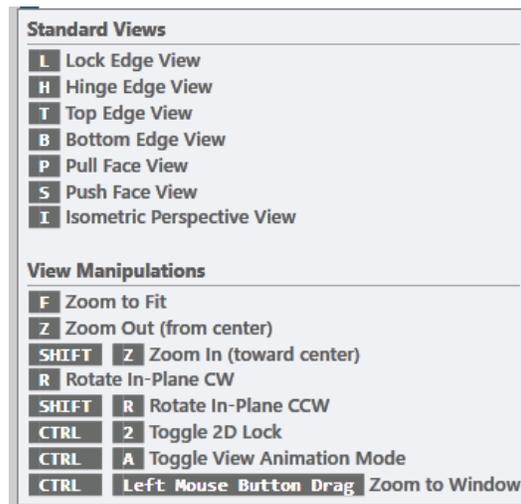


FIGURE 1-35. Shortcut Pop-Up



## Comparing the FaceProfile and LiteCutout Feature Types

The **FaceProfile Feature Type** and the **LiteCutout Feature Type** are similar in that **DXF** (Drawing Exchange Format) files can be uploaded, adjusted, and pulled into **KvalCAM** for processing.

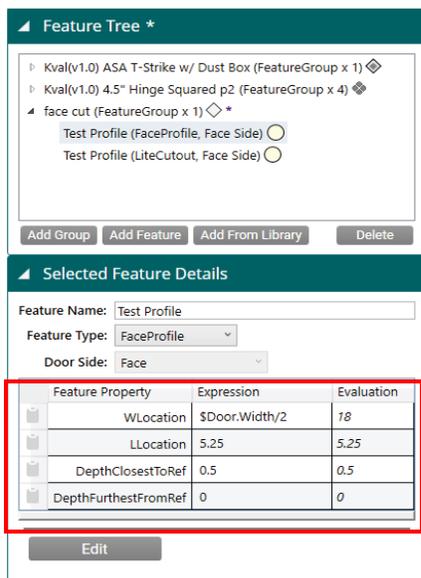
### KvalCAM Level

The figure and table below list the properties **FaceProfile** and **LiteCutout** details at KvalCAM level.

**Note:** The **LiteCutout** Feature is used to create Door Lite Cutouts. The **FaceProfile** Feature adds depth control to allow the ability to engrave the shape on the face of the door.

#### FaceProfile Feature Details

Width, Length Location and Depth



#### LiteCutout Feature Details

Width and Length Location

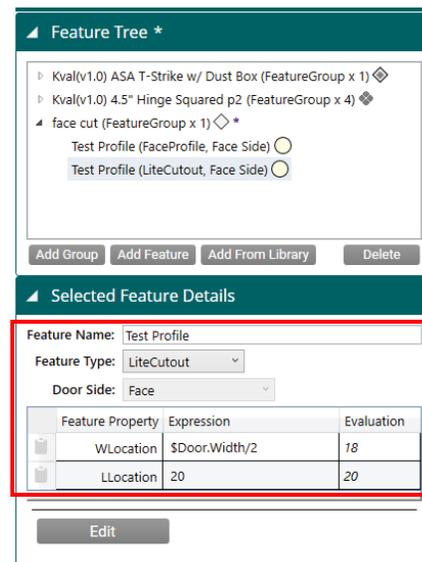


FIGURE 1- 36. KvalCAM FaceProfile Feature and LiteCutout Feature

Property (KvalCam)	FaceProfile	LiteCutout
Length Location	Yes	Yes
Width Location	Yes	Yes
Depth	Yes	No

## Editing Screen Comparison

The figure and table below list the **FaceProfile** and **LiteCutout** parameters at the editing screen level.

**Note:** The **FaceProfile** and the **LiteCutout** screen are similar except the **LiteCutout** screen includes control over through-cuts. **FaceProfile** is designed for engraving the face of the door, therefore through-cut controls are not needed.

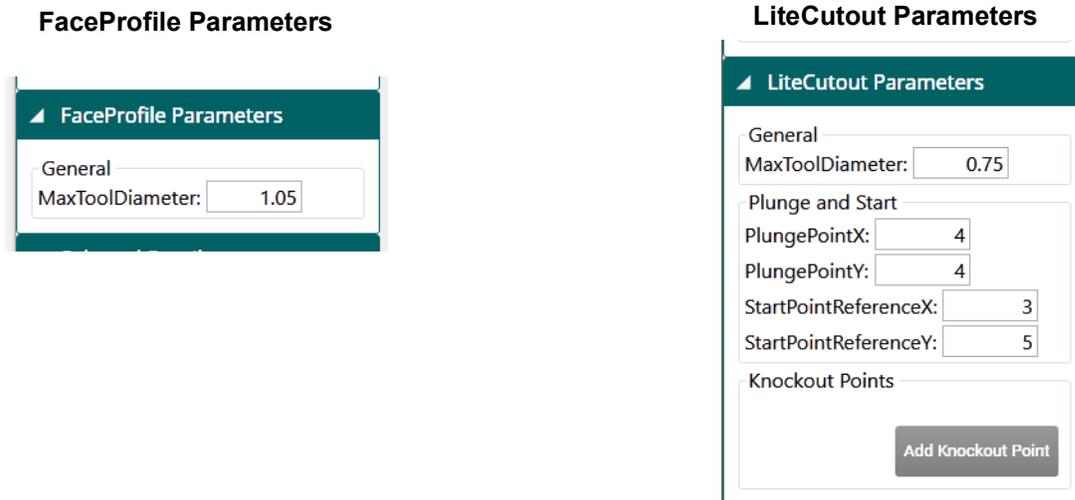


FIGURE 1- 37. Editing Screen FaceProfile and LiteCutout

Editing Screen	FaceProfile	LiteCutout
Error Checking	Yes	Yes
View and Adjust the Display Settings	Yes	Yes
Maximum Tool Diameter Adjustment	Yes	Yes
Plunge Point Adjustment	No	Yes
Start Point of Cut Adjustment	No	Yes
Add Knockout Points	No	Yes
View Plunge Point Parameters	Yes	Yes
Offset Profile	Yes	Yes
Weed out Vertex Points	Yes	Yes



## About the Machine Line Screen

The **Machine Line Screen** displays a snapshot of the operation of the entire machine line. Select the **Machine Line Tab** on the left side of the screen to jump to this screen.

	Menu	Description
<b>A</b>	Machine Activity	For each machine, a table shows job name, quantity of remaining doors, doors being processed, and status of the machine.
<b>B</b>	Queued Jobs:	Shows a list of the upcoming jobs.
<b>C</b>	Line Controls:	Common operations to control the machine line

### Machine Line Screen

The screenshot shows the Machine Line Screen interface. At the top, there is a 'Line Control' tab. Below it, the 'Machine Activity' section contains a table with the following data:

Machine	Job	Templates	Quantity	Remaining	Status
EdgeSS	DM, Auto Flush Bolt and Hinges	Deep Mortise, Hinge, Auto Flush Bolt Top, Auto Flush Bolt Bottom	1	1	Pending (Waiting for Door #1 of 1 Arrival)

Below the Machine Activity table is the 'Queued Jobs' section, which contains a table with the following data:

Queue Order	Job	Templates	Creation Time	Quantity	Commands
1	nd Hinges	Deep Mortise, Hinge	6/18/2017 10:04:53 AM	5	Remove
2	Top Closer	Top Closer	6/18/2017 10:05:47 AM	2	Remove

At the bottom of the screen, there are three control buttons: 'Clear Queued Jobs', 'Home Machine Line', and 'Reset Machine Line'. The interface also includes a 'Line Control' tab and a 'Machine Activity' section header.

FIGURE 1-38. Machine Line Screen View



### About the Machine Activity Section

The **Machine Activity Section** shows the processing information of each machine. The rows are color coded.

- **Green:** Actively working on processing the door.
- **White:** Machine is idle.
- **Orange:** Machine is paused.

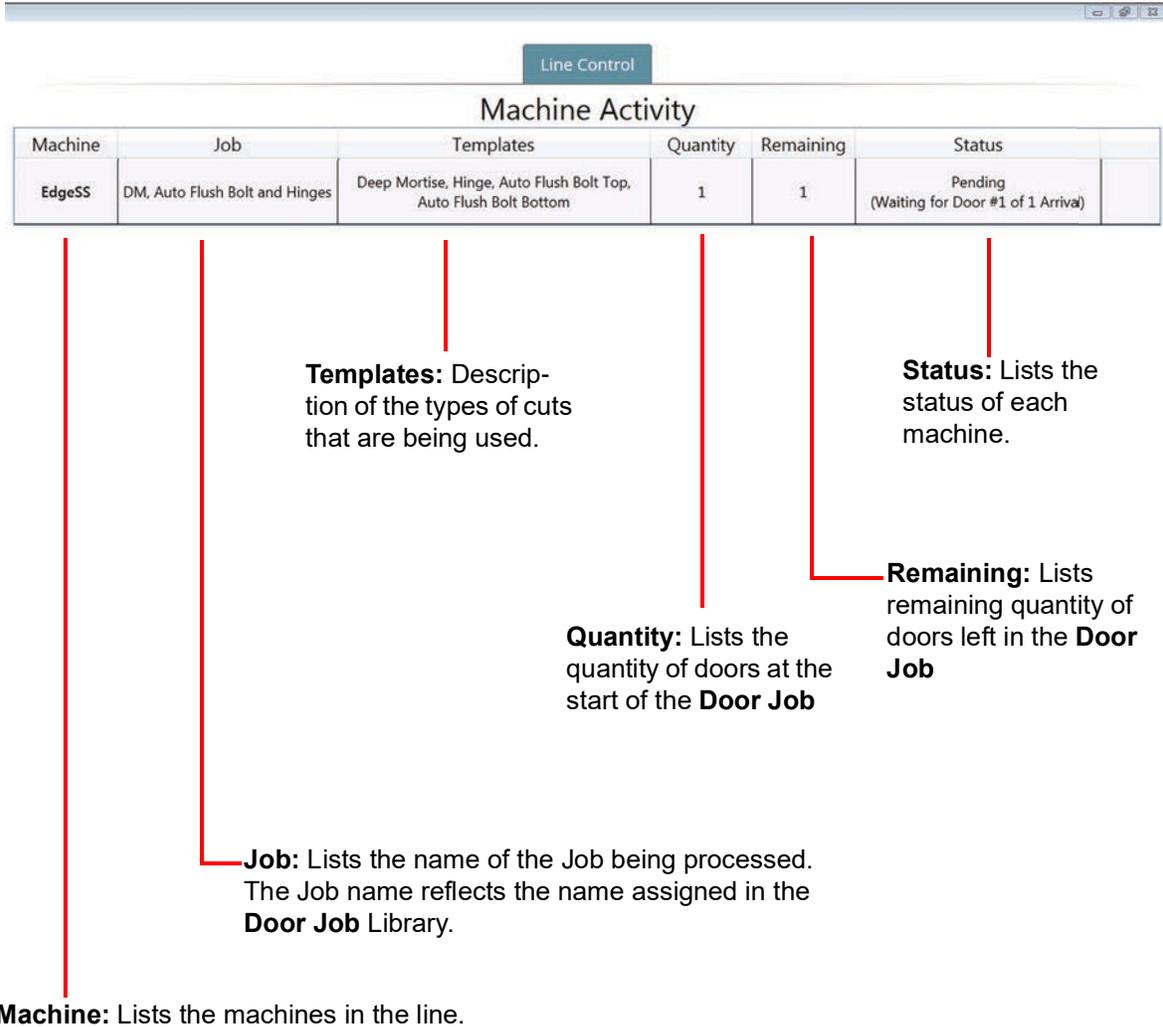


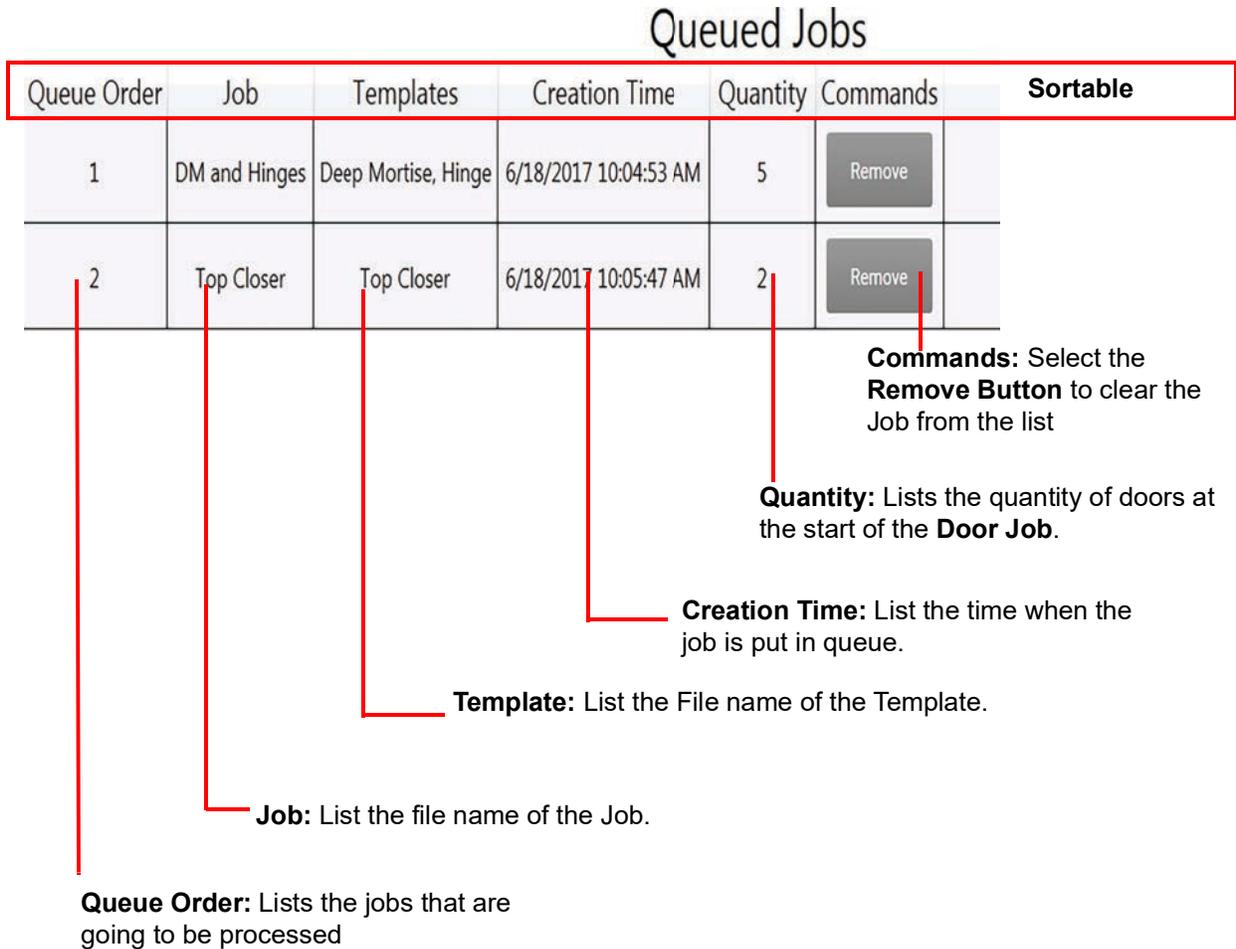
FIGURE 1- 39. Machine Activity Definitions



**B**

**About the Queued Jobs Section**

The **Queued Jobs Section** shows the door processing order. This table can be sorted by selecting the desired title.



**FIGURE 1- 40. About Queued Jobs**



## About the Line Control Buttons

The **Machine Activity Section** contains a table that shows the processing information of each machine. of each machine. The rows are color coded.

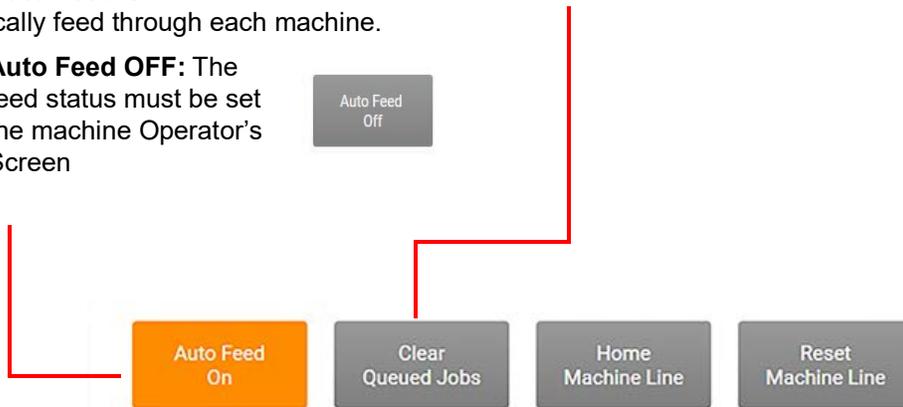
**Auto Feed:** Select to toggle the machine between Auto Feed ON or Auto Feed OFF.

**Auto Feed ON:** The door will automatically feed through each machine.

**Auto Feed OFF:** The feed status must be set the machine Operator's Screen



**Clear Queued Jobs:** Press to clear the entire list of **Door Jobs** in the Queued Job table.



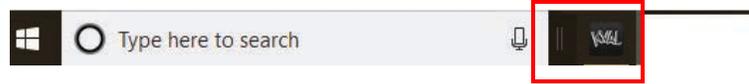
**Home the Machine Line:** Press to Home every machine in the line

**Reset the Machine Line:** Press to reset the every machine in the line. You Must Home the line after this reset is performed.

FIGURE 1-41. Line Control Buttons

## About Backing up Data and Checking the Revision Status

Right Click the Kval Icon at the Taskbar of the screen to display this Pop-Up.



**Note:** If icon is not in the Taskbar, select icon from the windows screen and drag to the favorites bar.

**Exit:** Select to close the running KvalCAM program.

**Backup:** Select to save to store all data from the machine operation. Notes may be added to describe the saved file.

**Build Info:** Select to view upper level notes about the current build.

**Release Notes:** Select to open a PDF of the history of release notes on this version of software.

**Licenses:** Select to see all third party licenses.

**Kval Docs Website:** Select to go to a see KvalCAM documentation. (Must have Internet connections)

**KvalCAM:** Select to open a closed **KvalCAM** window.

**Close window:** Select to close an open **KvalCAM** window. **KvalCAM** is still active.

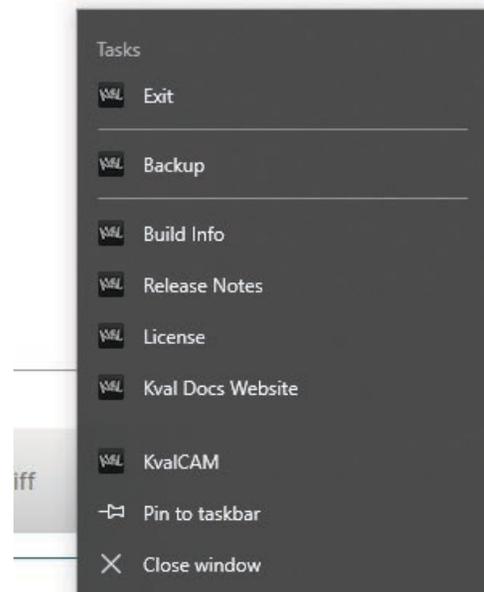


FIGURE 1- 42. Taskbar Pop Up



## CHAPTER 2 KvalCAM Examples

This chapter describes the **KvalCAM** software.

### Chapter 2 at a Glance

Section Name	Summary	Page
<b>Door Data Process Steps</b>	Process to use the Door Data Section.	<a href="#">page 2-2</a>
<b>Jamb Data Process Steps</b>	Process to use the Jamb Data Section.	<a href="#">page 2-3</a>
<b>About Feature Types</b>	A summary of Feature types available.	<a href="#">page 2-6</a>
<b>An Example of a Lock Feature Group</b>	Steps to create a Lock Feature Group.	<a href="#">page 2-8</a>
<b>An Example of a Tee-Shape</b>	Steps to Create a Tee-Shape.	<a href="#">page 2-20</a>
<b>An Example of 3.5" Hinges with Predrill</b>	Steps to Create a 3.5" Hinge Feature Group.	<a href="#">page 2-23</a>
<b>An Example of a Face Rectangle with Round Top</b>	Steps to Create a face Rectangle with a Round Top.	<a href="#">page 2-29</a>
<b>Process to Create a FaceProfile Feature Type</b>	Steps to Create a shape using the FaceProfile Feature type.	<a href="#">page 2-33</a>
<b>Process to Create LiteCutout Feature Type</b>	Steps to Create a shape using the LiteCutout Feature type.	<a href="#">page 2-34</a>
<b>About the FaceProfile and LiteCutout Editing Screen</b>	A summary of using the FaceProfile and the LiteCutout editing screens	<a href="#">page 2-35</a>

## Door Data Process Steps

The **Door Data** module contains all the properties of the raw door. Door properties can be inputted manually or transferred in by way of the **Door Data Library** to the **Door Job**. Expressions can be copied and pasted into the **Features** and **Feature Groups**.

For more in-depth descriptions, see the “[Common Terms](#)” section in this manual.

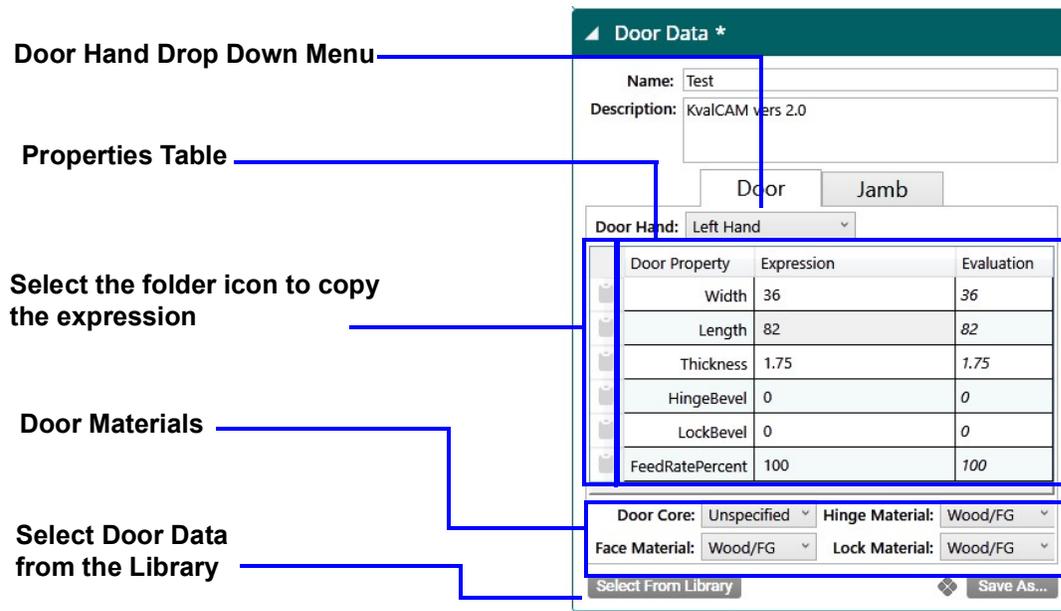


FIGURE 2- 1. Door Data Module

## About the Door Data Process Steps

Have KvalCAM open.

1. Select the **Libraries Tab** at the **KvalCAM** screen.
2. Select the **Door Job Tab**.
3. From the **Door Job Table**, select the desired **Door Job**.
4. Within the **Door Job**, select the **Door Data Tab**.
5. At the **Door Job** section, the following is an example of processes that can be done:
  - Load door data from the **Door Data Library**.
  - Enter data in to the **Expression** column.
  - Choose material make up for the door core, hinge, face and lock.
  - Choose the door hand.
  - If needed, select the folder icon in the table to copy the expression.

## Jamb Data Process Steps

The **Jamb Data** module contains all the properties to process a jamb. The **Jamb Data Tab** is located in the **Door Data** section of the **Door Job**.

For more in-depth descriptions, see the [“Common Terms”](#) section in this manual.

**Jamb Enable Check Box:**  
Select to apply the jamb properties to the Door Job.

**Properties Table:**  
See [“About Jamb Data Properties Table”](#) on page 2-4

**Select Jamb Data from the Library**

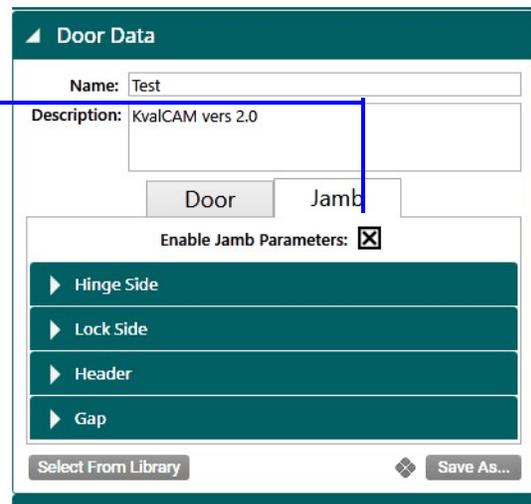


FIGURE 2-2. Jamb Data Module

## About the Jamb Data Process Steps

Have **KvalCAM** open.

1. Select the **Libraries Tab** at the **KvalCAM** screen.
2. Select the **Door Job Tab**.
3. From the **Door Job Table**, select the desired **Door Job**.
4. Within the **Door Job**, select the **Door Data Tab**.
5. At the **Door Job** section, select the **Jamb Tab**.
6. To enable the jamb properties to be used in the job, select the **Enable Jamb Parameters** check box.

## About Jamb Data Properties Table

Properties of the jambs and headers are calculated in **KvalCAM** to create a precise cut. Jamb Properties include all the parameters to create a door frame. The data is normally created remotely and saved into the database. The properties are shown in the figure below.

**Important:** The jamb parameters must be as accurate as possible for cut quality to be maximized.

**Note:** To activate jamb data, the **Enable Jamb Properties** check box must be selected.

The screenshot displays the 'Door Data \*' window in KvalCAM. It includes fields for Name (test) and Description (test), buttons for 'Door' and 'Jamb', and a checked 'Enable Jamb Parameters' checkbox. Below are three tables for 'Hinge Side', 'Lock Side', and 'Header', each listing Jamb Properties, their mathematical expressions, and their evaluated values. A 'Gap' table is also shown at the bottom.

**Enable Jamb Parameters:**

**Hinge Side**

Jamb Property	Expression	Evaluation
Length	$\$Door.Length + \$Jamb.GapHe$	81.375
Width	6.5	6.5
Thickness	1.25	1.25
DadoLength	1.25	1.25
DadoDepth	0	0
RabbitWidth	$\$Door.Thickness$	1.75
StopWidth	$\$Jamb.HingeSideWidth - \$Jan$	4.75
StopThickness	0.5	0.5

**Lock Side**

Jamb Property	Expression	Evaluation
Length	$\$Door.Length + \$Jamb.GapHe$	81.375
Width	6.5	6.5
Thickness	1.25	1.25
DadoLength	$\$Jamb.LockSideThickness$	1.25
DadoDepth	0	0
RabbitWidth	$\$Door.Thickness$	1.75
StopWidth	$\$Jamb.LockSideWidth - \$Jam$	4.75
StopThickness	0.5	0.5

**Header**

Jamb Property	Expression	Evaluation
Length	$\$Door.Width + \$Jamb.G$	36.25
Width	6.5	6.5
Thickness	1.25	1.25
RabbitWidth	$\$Door.Thickness$	1.75
StopWidth	$\$Jamb.HeaderWidth - \$$	4.75
StopThickness	0.5	0.5
HingeSideOffset	$\$Jamb.GapHingeSide +$	0.125

**Gap**

Jamb Property	Expression	Evaluation
HingeSide	0.125	0.125
LockSide	0.125	0.125
Header	0.125	0.125

Buttons: Select From Library, Save As...

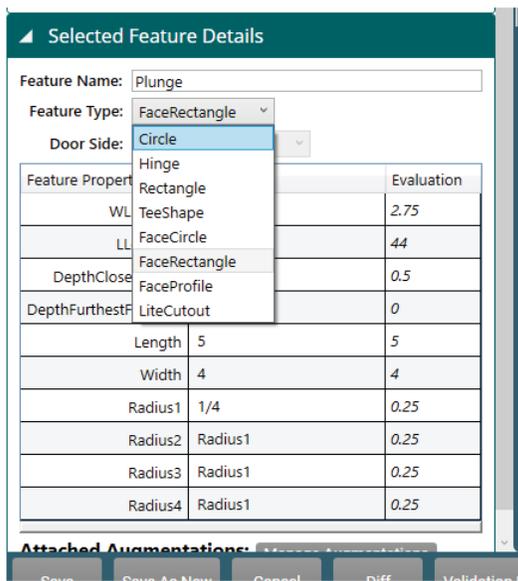
FIGURE 2- 3. Jamb Properties

## About Feature Types

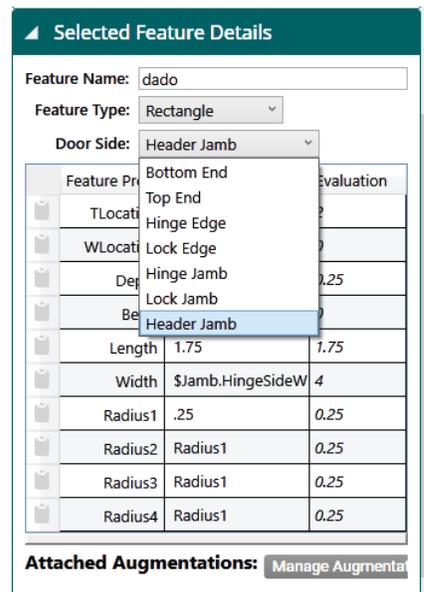
In this manual, examples of the **Feature Types** are depicted. **Feature Types** are predefined shapes located at the **Selected Feature Detail** section. The **Feature Type** selection will determine the types of **shapes** to apply to the door.

**Feature Types** are separated into shapes that can be applied to the edge, jamb, or the face of a door. The **Door Side** selections will determine the position of the shape on the door.

**Feature Type Menu**



**Door Side Menu**



**FIGURE 2-4. Feature Types**

## About Edge Feature Types

The compatible **Edge Feature Types** and compatible **Door Side** locations are listed in the table.

Edge Feature Types	Door Side Drop Down Menu
Circle	Bottom End
Hinge	Top End
Rectangle	Hinge Edge
TeeShape	Lock Edge
	Hinge Jamb
	Lock Jamb
	Header Jamb

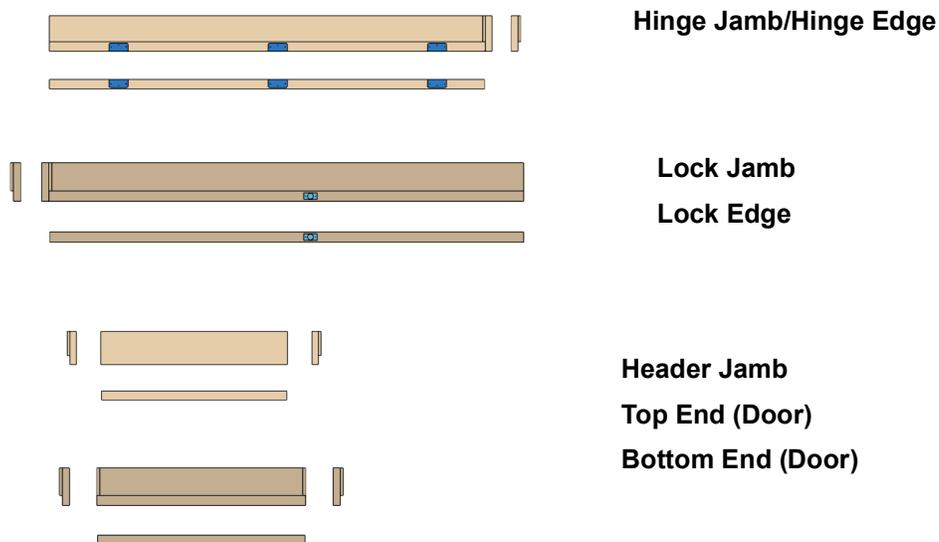
### About Edge Feature Types

The **Edge Feature Types** include common edge shapes.

- See [page 2-8](#) for an example using the circle and rectangle.
- See [page 2-20](#) for an example of using the Tee Shape.
- See [page 2-24](#) for an example using the hinge

### About the Door Edge Sides

Apply the Feature Types to the door edges and jamb edges locations displayed in the Figure below.



## About Face Feature Types

The compatible **Face Feature Types** and compatible **Door Side** locations are listed in the table below.

Face Feature Types	Door Side Drop Down Menu
FaceCircle FaceRectangle FaceProfile LiteCutout	Face (Only Selection)

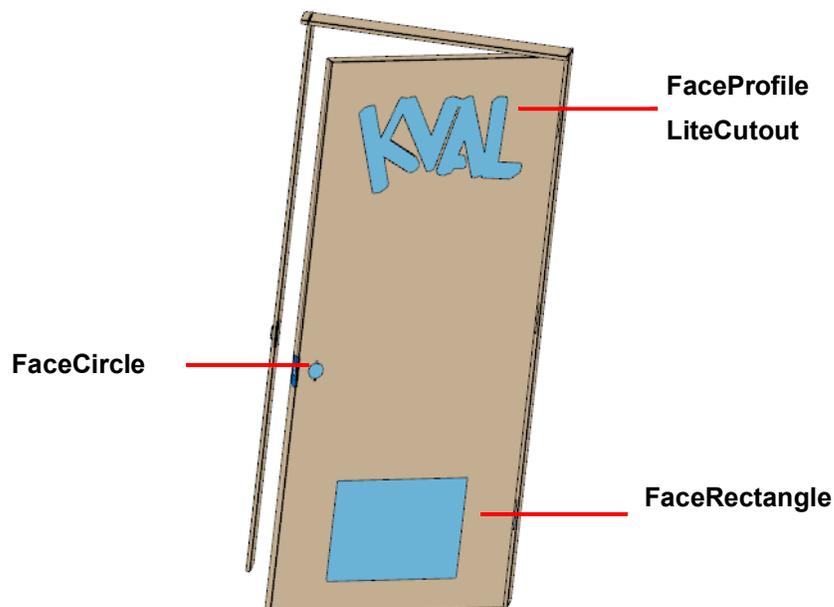
## About Face Feature Types

The **Face Feature Types** include common edge shapes.

- See [page 2-16](#) for an example using the FaceCircle.
- See [page 2-29](#) for an example of using the FaceRectangle.
- See [page 2-33](#) for an example of using the FaceProfile.
- See [page 2-35](#) for an example of using the LiteCutout.

## Face Features Overview

Apply the Feature Types to the door face locations displayed in the Figure below.



## An Example of a Lock Feature Group

This section describes the **Feature Details** of a common **Lock Feature Group**. Feature details of the group are separated into sections. Each section includes feature detail descriptions of the edge lock and the face lock.

### About Feature Group Parent and Children

Each shape is detailed in this section.

Below are the parent and child relationships.

#### Lock (FeatureGroup x1) Parent

Plate (Rectangle, Lock Edge) **Child and Parent**

Plunge (Circle, Lock Edge) **Child of Plate**

Predrill 1(Circle, Lock Edge) **Child of Plate**

Predrill 2(Circle, Lock Edge) **Child of Plate**

Through Hole Face 1 (FaceCircle, Face Side) **Child and Parent**

Through Hole Face 2 (FaceCircle, Face Side) **Child of Through Hole**

Through Hole Face 3 (FaceCircle, Face Side) **Child of Through Hole**

### Example of the Lock Feature Group

Figure 2- 5 shows a example of a completed Feature Group and Features on a door.

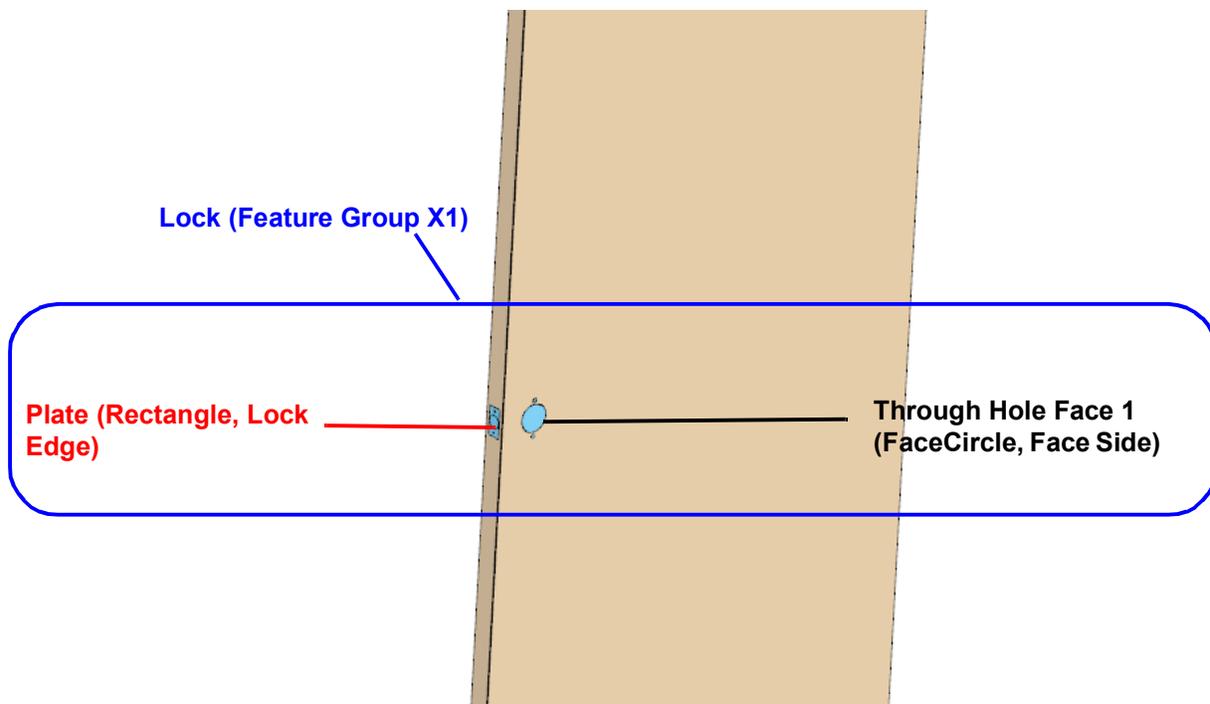


FIGURE 2- 5. Lock Feature Group

## About the Lock Feature Group Properties

At the **Feature Group** level door coordinates and locations of the cut are defined. All features in this group will follow the references and locations determined at the group level.

- **Feature Group Name and Description:** Enter a descriptive name and description that represents the **Feature Group**.
- **Coordinate Preferences:** In this example, the L (length) is referenced from the **Top**, W (Width) from the **Lock** side, and the T (Thickness) from the **Key Face** side.
- **Locations:** The **Lock** is located 44.0 inches from the **Top**, and 2.75 inches from the **Lock** edge. The T Locations are set at Feature levels. **Note:** The center of the cut is the reference.

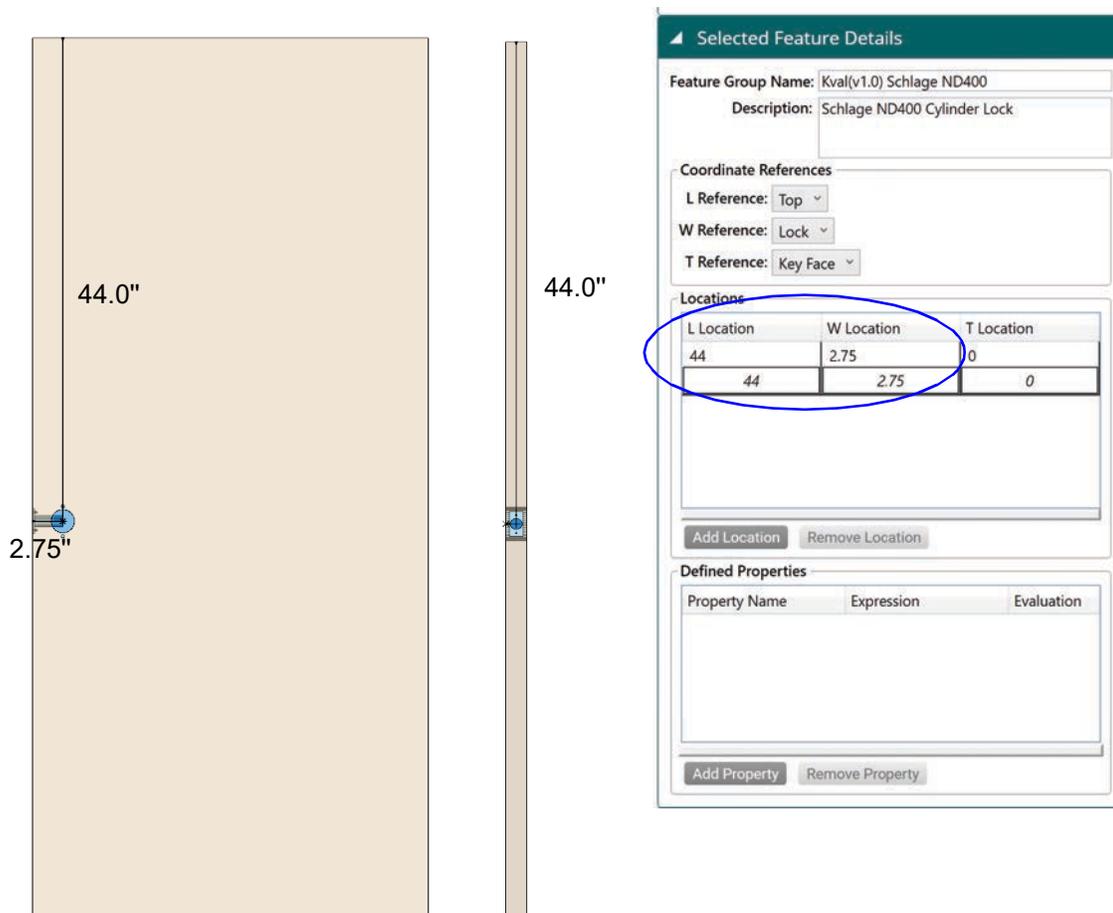


FIGURE 2- 6. Lock Group Properties

## About the Lock Edge Rectangle Feature Type

The **Rectangle Feature** represents the **Lock Plate** on the edge of the door. For the location on the door, see [Figure 2- 6 on page 2-9](#).

**Lock (FeatureGroup x1) Parent**

**Plate (Rectangle, Lock Edge) Child**

Plunge (Circle, Lock Edge)

Predrill 1(Circle, Lock Edge)

Predrill 2(Circle, Lock Edge)

Through Hole Face (FaceCircle, Face Side)

Through Hole Face 1 (FaceCircle, Face Side)

Through Hole Face 1 (FaceCircle, Face Side)

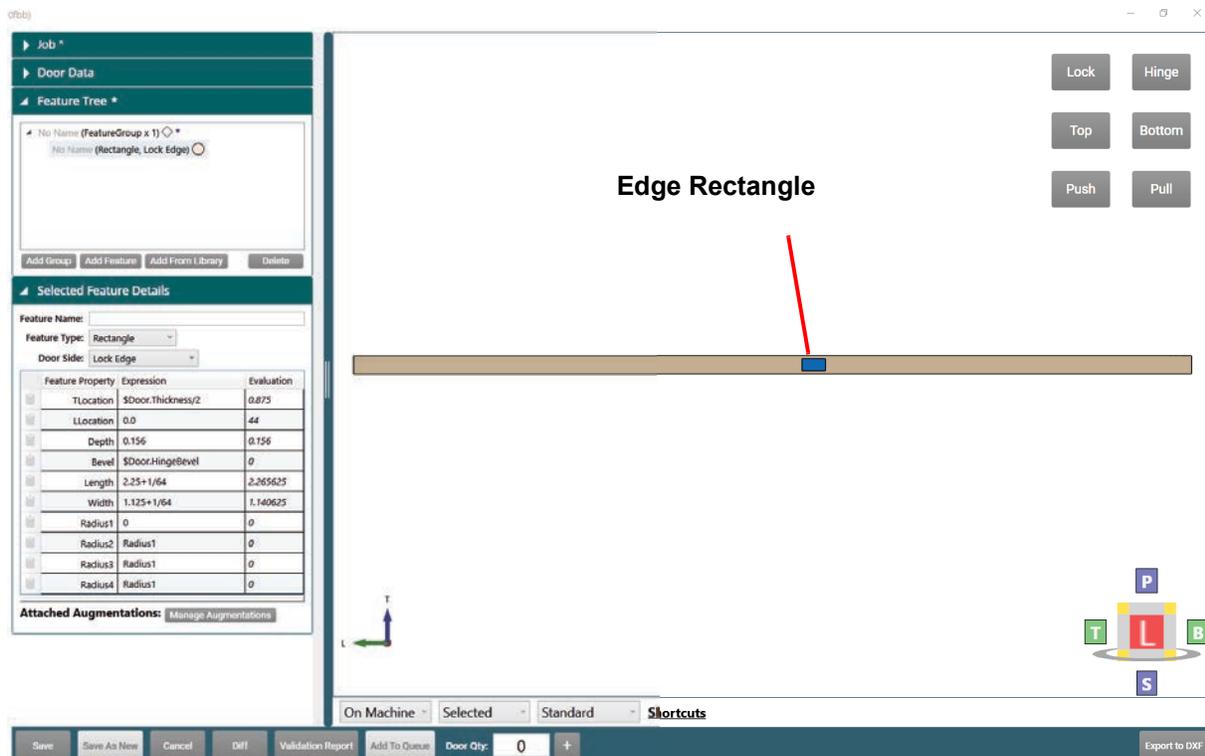


FIGURE 2- 7. Rectangle Feature Type

## About the Lock Edge Plate Feature Details Descriptions

Lock edge plate properties are described below.

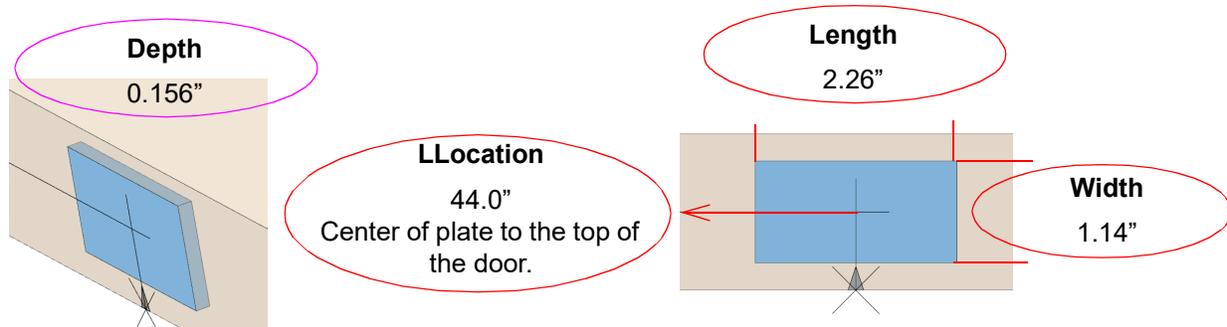


FIGURE 2- 8.

Property	Expression Description
<b>TLocation</b>	Expression loaded from pop-up menu. <sup>1</sup> Thickness set at the Door Data level. Thickness /2 centers the plate on the door edge.
<b>LLocation</b>	Value was set at the Feature Group level (44 " from top of the door).
<b>Depth</b>	Set depth of lock cut.
<b>Bevel</b>	Expression value is set at the Door Data Section.
<b>Length</b>	The length of the lock plate (Length+1/64).
<b>Width</b>	The Width of the lock plate (Length+1/64).
<b>Radius1-4</b>	The radius of each corner of the rectangle shape. <sup>2</sup>

1. To open the expression pop-up menu, left click within the table cell, choose the ellipsis (...), choose the expression from the menu. Modify as required.
2. See "About Radius 1-4 Properties" on page 2-8

Selected Feature Details		
Feature Name:	Plate	
Feature Type:	Rectangle	
Door Side:	Lock Edge	
Feature Property	Expression	Evaluation
TLocation	$\$Door.Thickness/2$	0.875
LLocation	0.0	44
Depth	0.156	0.156
Bevel	$\$Door.LockBevel$	0
Length	$2.25 + 1/64$	2.265625
Width	$1.125 + 1/64$	1.140625
Radius1	0.0	0
Radius2	0.0	0
Radius3	0.0	0
Radius4	0.0	0
<b>Attached Augmentations:</b> <a href="#">Manage Augmentations</a>		

FIGURE 2- 9. Rectangle Properties

## About Radius 1-4 Properties

The radius cuts are located at each corner of the rectangle shape. A null (0) value indicates a squared cut which is available on machines with chisels. The figure below shows the radius corner designators.

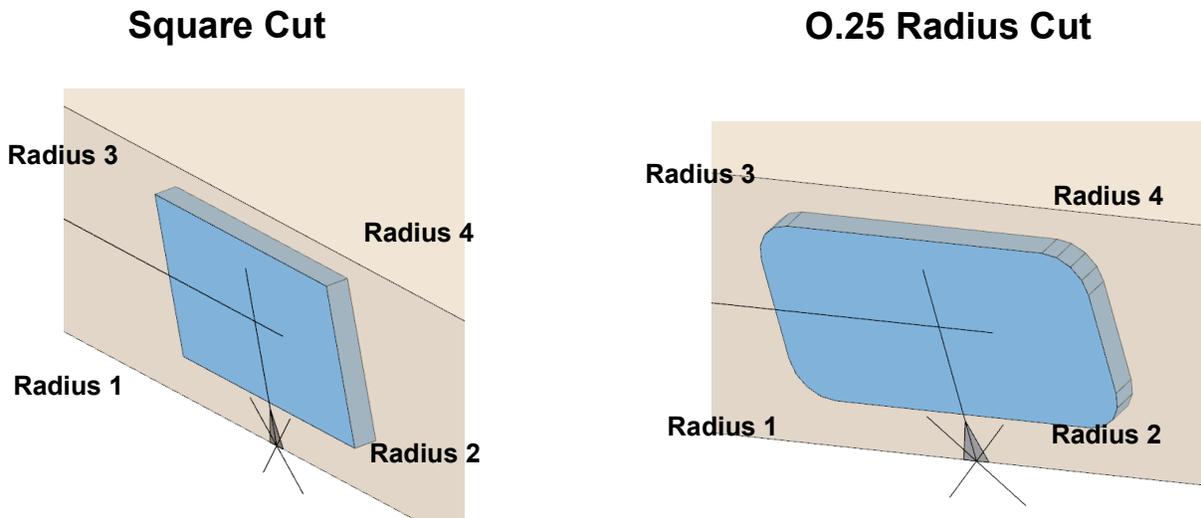


FIGURE 2- 10. Radius Locations

## About the Lock Edge Circle Feature Types

The **Circle Features** include an edge plunge and lock predrill holes. The plunge and the predrills are children of the **Lock Plate Feature**. For the location on the door, see [Figure 2- 6 on page 2-9](#).

### Lock (FeatureGroup x1) **Parent**

Plate (Rectangle, Lock Edge)

Plunge (Circle, Lock Edge) **Child**

Predrill 1(Circle, Lock Edge) **Child**

Predrill 2(Circle, Lock Edge) **Child**

Through Hole 1 Face (FaceCircle, Face Side)

Through Hole Face 2 (FaceCircle, Face Side)

Through Hole Face 3 (FaceCircle, Face Side)

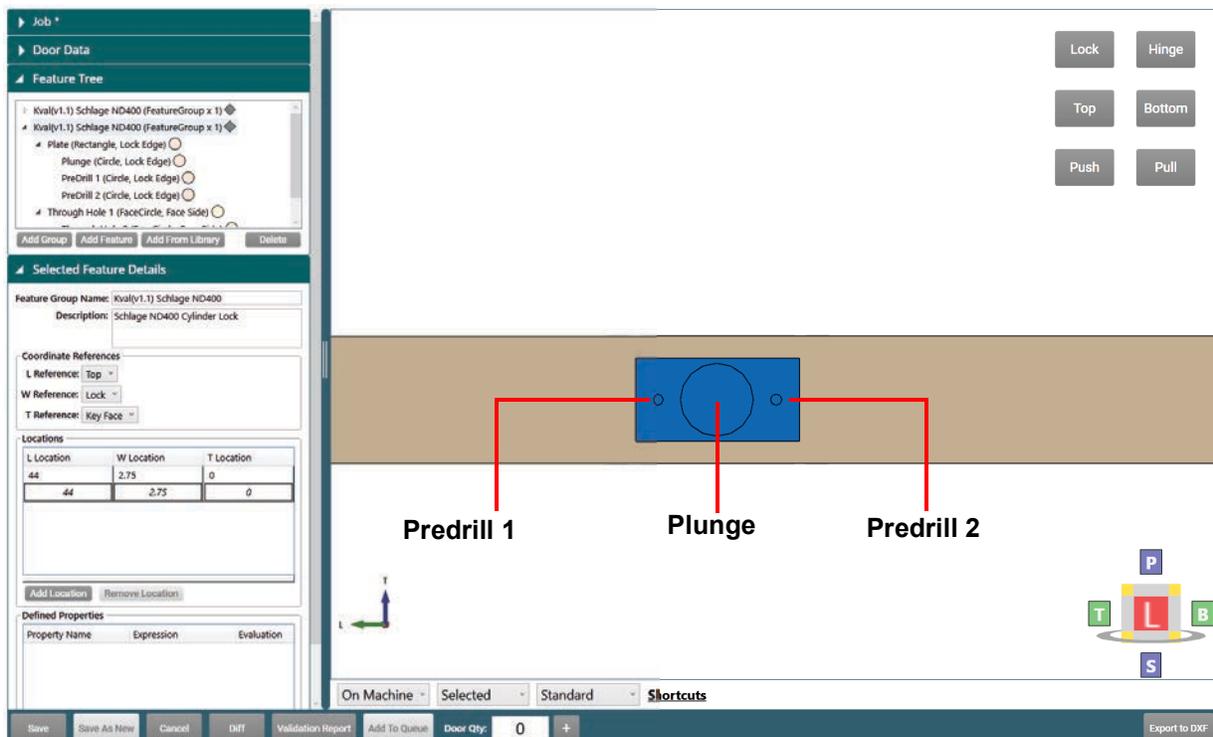
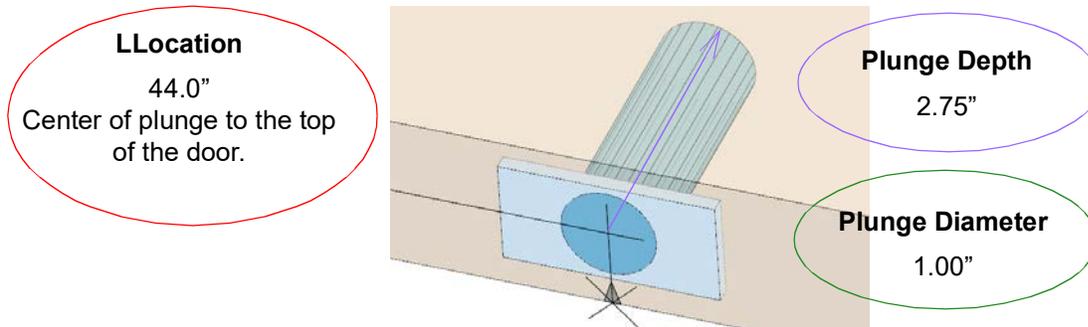


FIGURE 2- 11. Circle Type Feature

## About the Lock Edge Plunge Circle Feature Detail Table

The properties of the plunge circle are described below.



Property	Expression Description
<b>TLocation</b>	Enter 0 to use the reference value. Value was set at the Plate level (Parent).
<b>LLocation</b>	Enter 0 to use the reference value.
<b>Depth<sup>1</sup></b>	WLocation value is set at the Lock Feature Group (Parent of Parent).
<b>Bevel</b>	0 degree Bevel.
<b>Diameter</b>	Enter Value (1.0 ").
<b>DiameterMin.<sup>2</sup></b>	Auto filled with the set Diameter value.
<b>DiameterMax.</b>	Auto filled with the Diameter value.
<b>DepthMin.<sup>3</sup></b>	Auto filled with the Depth value.
<b>DepthMax.</b>	Auto filled with the Depth value.

**Selected Feature Details**

Feature Name:

Feature Type:

Door Side:

Feature Property	Expression	Evaluation
TLocation	0	0.875
LLocation	0.0	44
Depth	WLocation	2.75
Bevel	0.0	0
Diameter	1	1
DiameterMinimum	Diameter	1
DiameterMaximum	Diameter	1
DepthMinimum	Depth	2.75
DepthMaximum	Depth	2.75

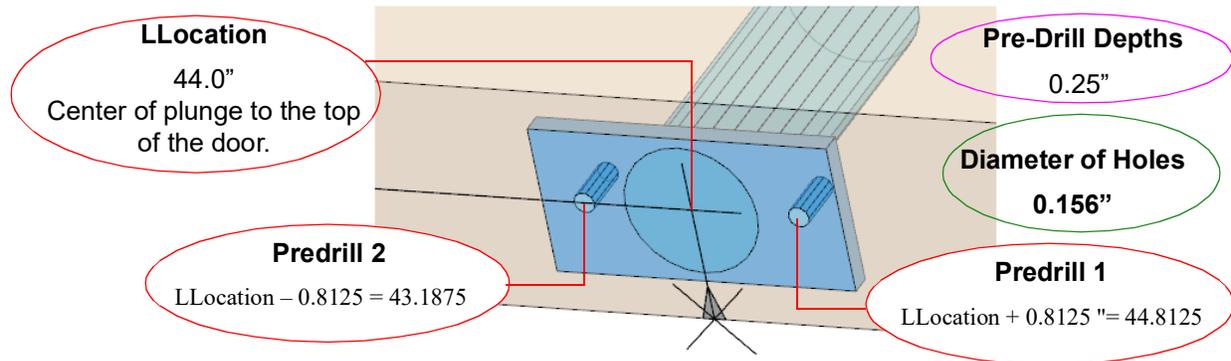
**Attached Augmentations:**

1. Using the WLocation, the depth of the cut will center to the Face Plunge cut.
2. DiameterMaximum and DiameterMinimum are used to allow for a wider range of tools to be selected.
3. DepthMaximum and DepthMinimum are used to allow for a wider range of tools to be selected.

**FIGURE 2-12. Circle Feature Type Details**

## About the Lock Predrill Hole Locations and Dimensions

The predrill holes are children of the Plunge cut. The **LLocation** of the **Predrill 1** and **Predrill 2** holes are referenced from the middle of the **Lock Plate**. For a list of properties, see **Features Details** table in [Figure 2- 13](#) below.



Selected Feature Details		
Feature Name: PreDrill 2		
Feature Type: Circle		
Door Side: Lock Edge		
Feature Property	Expression	Evaluation
TLocation	0.0	0.875
LLocation	-0.8125	43.1875
Depth	0.25	0.25
Bevel	0.0	0
Diameter	0.156	0.156
DiameterMinimum	Diameter	0.156
DiameterMaximum	Diameter	0.156
DepthMinimum	Depth	0.25
DepthMaximum	Depth	0.25
Attached Augmentations: <a href="#">Manage Augmentations</a>		

**Predrill 2**

Property	Expression
<b>LLocation<sup>1</sup></b>	-0.8125
<b>Depth</b>	0.25
<b>Diameter</b>	0.156

1.  $LLocation(44.0') - 0.8125 = 43.1875$

Selected Feature Details		
Feature Name: PreDrill 1		
Feature Type: Circle		
Door Side: Lock Edge		
Feature Property	Expression	Evaluation
TLocation	0.0	0.875
LLocation	0.8125	44.8125
Depth	0.25	0.25
Bevel	0.0	0
Diameter	0.156	0.156
DiameterMinimum	Diameter	0.156
DiameterMaximum	Diameter	0.156
DepthMinimum	Depth	0.25
DepthMaximum	Depth	0.25
Attached Augmentations: <a href="#">Manage Augmentations</a>		

**Predrill 1**

Property	Expression
<b>LLocation<sup>1</sup></b>	0.8125
<b>Depth</b>	0.25
<b>Diameter<sup>2</sup></b>	0.156

1.  $0.8125' + LLocation(44.0') = 44.8125$

2. Diameter of the predrill.

**FIGURE 2- 13. Predrill Holes**

## About Lock FaceCircle Feature

The **Circle Features** include an edge plunge and lock predrill holes. The plunge and the predrills are children of the **Lock Plate Feature**. For the location on the door, see [Figure 2- 6 on page 2-9](#).

### Lock (FeatureGroup x1) **Parent**

- Plate (Rectangle, Lock Edge)
- Plunge (Circle, Lock Edge)
- Predrill 1(Circle, Lock Edge)
- Predrill 2(Circle, Lock Edge)

### Through Hole Face 1 (FaceCircle, Face Side) **Child**

### Through Hole Face 2 (FaceCircle, Face Side) **Child**

### Through Hole Face 3 (FaceCircle, Face Side) **Child**

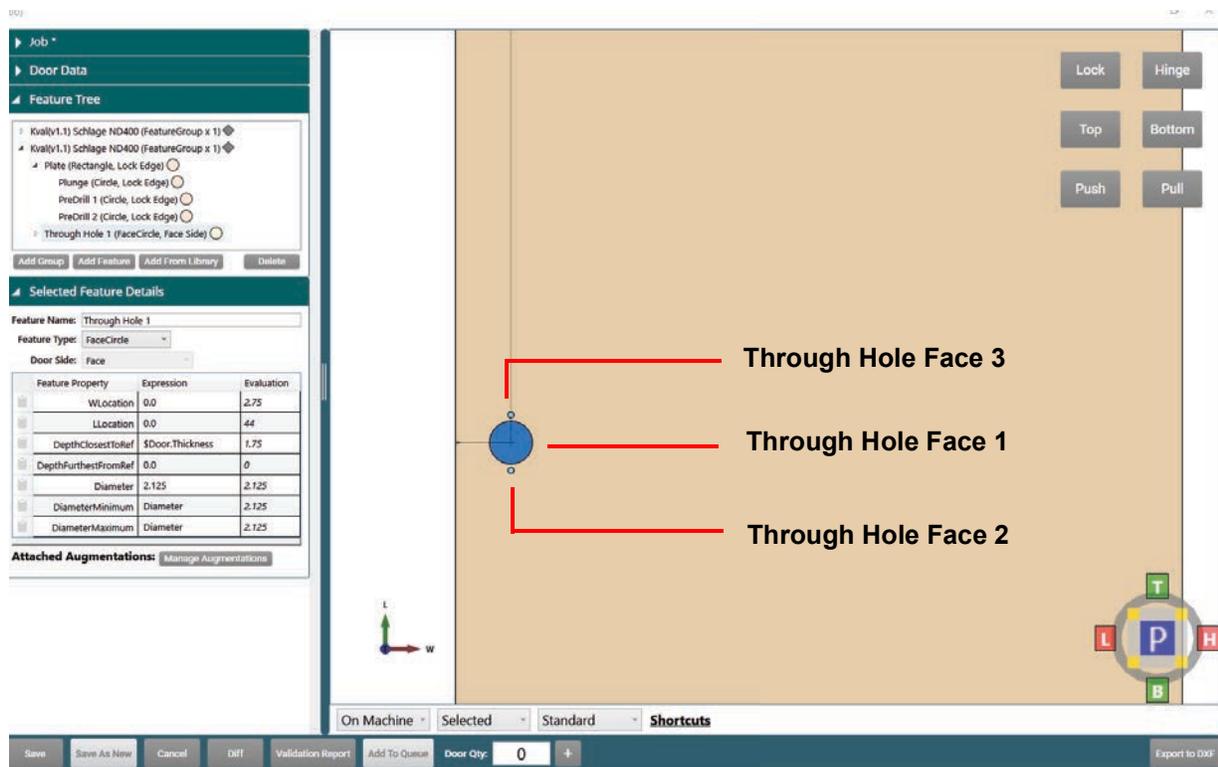
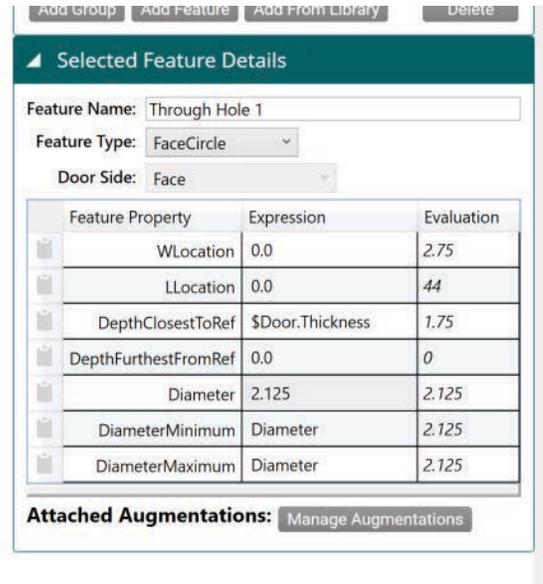


FIGURE 2- 14. Face Circle Feature Type

## About the Lock Face Circle Feature Details Description

Table properties are described below.



Property	Expression Description
<b>WLocation</b>	Value was set at the Feature Group level (2.75 " from the lock edge of the door).
<b>LLocation</b>	Value was set at the Feature Group level (44.0 " from top of the door).
<b>DepthClosestToRef</b> <sup>1</sup>	<i>\$Door.Thickness</i> . (Cut will go through the door.)
<b>DepthFurthestFromRef</b> <sup>2</sup>	0
<b>Diameter</b>	Enter Value (2.125 ")
<b>DiameterMin.</b> <sup>3</sup>	Auto filled with the Diameter value.
<b>DiameterMax.</b>	Auto filled with the Diameter value.

1. The door side (T Reference) that is selected at Feature Group Level.
2. Opposite Door side of the DepthClosestoRef
3. DiameterMaximum and DiameterMinimum are used to allow for a wider range of tools to be selected.

FIGURE 2- 15. Face Circle Feature Details

## About the Face Circle Through Hole 1

The figure below shows the diameter of Through Hole 1 of the Face Lock. The depth of the rout is set to thickness of the door by way of the expression (*\$Door.Thickness*). The door thickness value is set at the **Door Data** section at the **Door Job**. This ensures the rout will be cut through the door.

For a list of properties, see **Features Details** table in [Figure 2- 15 on page 2-17](#).

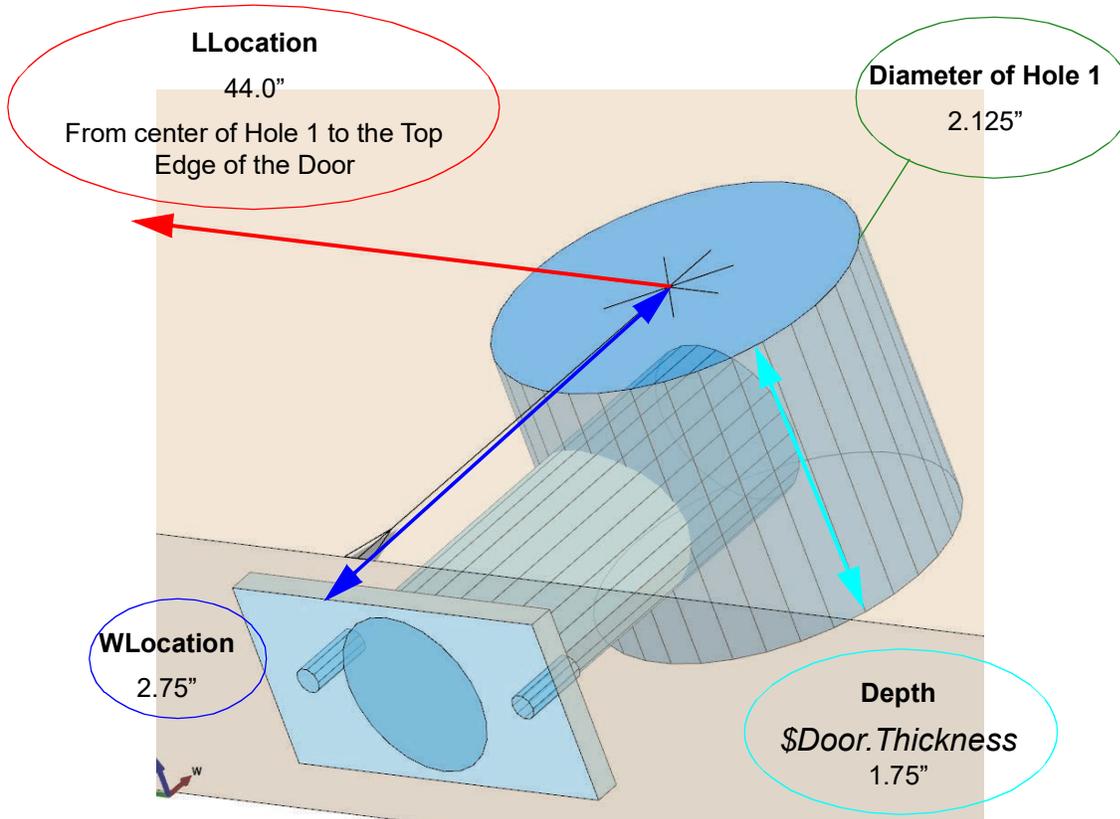
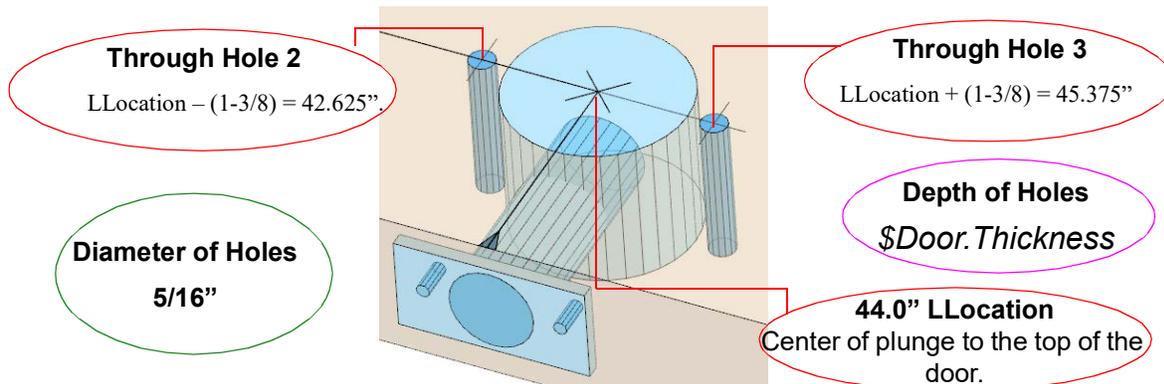


FIGURE 2- 16. Through Hole 1 Diameter

## About the Face Circle Through Holes 2 and 3

Through Holes 2 and 3 are children of the Through Hole 1 cut. The LLocations of Through Hole 2 and Through Hole 3 are referenced off the center of Through Hole 1. The figure below shows the diameters, locations, and depths of Through Holes 2 and 3 of the Face Lock. For a list of properties, see Features Details table in Figure 2- 17 on page 2-19.



Selected Feature Details		
Feature Name: Through Hole 2		
Feature Type: FaceCircle		
Door Side: Face		
Feature Property	Expression	Evaluation
WLocation	0.0	2.75
LLocation	-(1+ 3/8)	42.625
DepthClosestToRef	\$Door.Thickness	1.75
DepthFurthestFromRef	0.0	0
Diameter	5/16	0.3125
DiameterMinimum	Diameter	0.3125
DiameterMaximum	Diameter	0.3125

Attached Augmentations: [Manage Augmentations](#)

Through Hole 2

Selected Feature Details		
Feature Name: Through Hole 3		
Feature Type: FaceCircle		
Door Side: Face		
Feature Property	Expression	Evaluation
WLocation	0.0	2.75
LLocation	1+3/8	45.375
DepthClosestToRef	\$Door.Thickness	1.75
DepthFurthestFromRef	0.0	0
Diameter	5/16	0.3125
DiameterMinimum	Diameter	0.3125
DiameterMaximum	Diameter	0.3125

Attached Augmentations: [Manage Augmentations](#)

Through Hole 3

Property	Expression
LLocation <sup>1</sup>	-(1+3/8)
DepthClosestToRef <sup>2</sup>	\$Door.Thickness
Diameter	5/16"

1.  $44.0 - (1-3/8) = 42.625$ . LLocation value set at the Feature Group level.
2. Depth equals the door thickness.

Property	Expression
LLocation <sup>1</sup>	1+3/8
DepthClosestToRef <sup>2</sup>	\$Door.Thickness
Diameter	5/16"

1.  $44.0 + (1-3/8) = 45.375$ . LLocation value set at the Feature Group level.
2. Depth equals the door thickness.

FIGURE 2- 17. Face (Predrill holes)

## An Example of a Tee-Shape Feature

The **Tee-Shape** cut is represented by its own **Feature Group**. The **Tee-Shape** combines two rectangle shapes to form the **Tee** and the **Main** body. The figure below shows a Tee-Shape Lock.

Selected Feature Details

Feature Name:

Feature Type:

Door Side:

Feature Property	Expression	Evaluation
TLocation	$\$Door.Thickness/2$	0.875
LLocation	0	44
Depth	0.171875	0.171875
Bevel	$\$Door.LockBevel$	0
TeeRelativeLocation	0	0
TeeLength	$3.375+1/64$	3.390625
TeeWidth	$TLocation - MainWidth / 2$	0.242188
MainLength	$4.875+1/64$	4.890625
MainWidth	$1.25+1/64$	1.265625
Radius1	0	0
Radius2	0	0
Radius3	0	0
Radius4	0	0
EntryRadius1	0.0	0
EntryRadius2	0.0	0

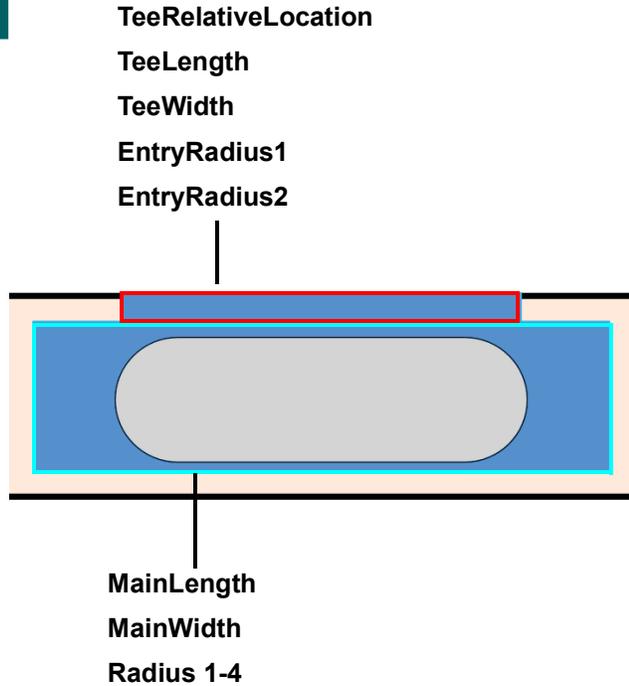


FIGURE 2- 18. Tee shape feature

### About the TeeRelativeLocation

The **TeeRelativeLocation** is referenced to the center of the **MainLength** property. A value entered here will move the Tee cut location toward the Top End or Bottom End. This may be used in an Olive Hinge Feature.

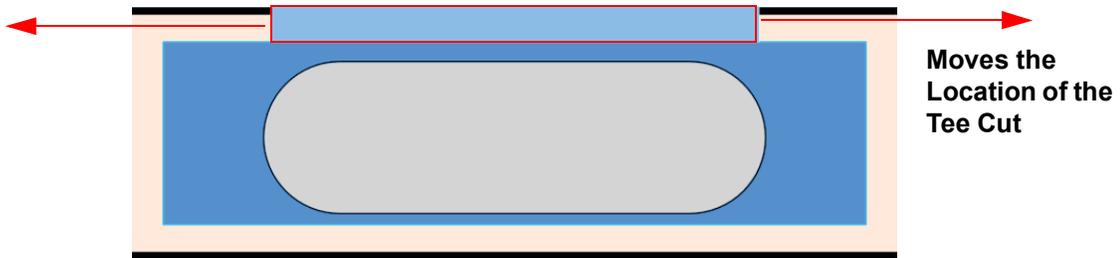
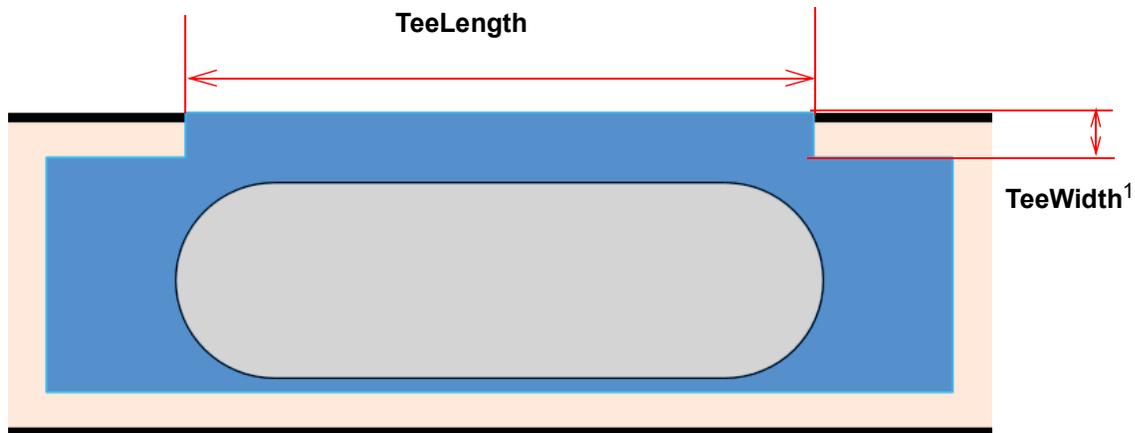


FIGURE 2- 19. Tee Location

### About the TeeLength and TeeWidth

The length and width of the Tee cut are determined by these properties. The width is hard-coded to use this formula:  $TLocation - MainWidth / 2.0$ .

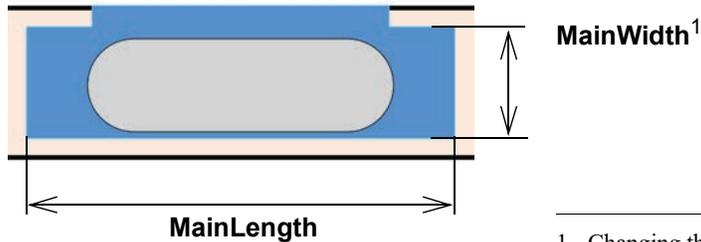


1. Value determined by formula.

FIGURE 2- 20. Tee Length and Width

## About the MainLength and MainWidth

Changing these values will alter the length and the width of the lower (Main) cut of the feature.



1. Changing the MainWidth will change the TeeWidth Value.  
 $TeeWidth = (TLocation - MainWidth / 2.0)$

FIGURE 2-21. Main Rectangle Length and Width

## About the Radius1 through Radius4

These radius cuts are applied to the main portion cut only. The figure below illustrates the main cut with each radius cut to 0.25".

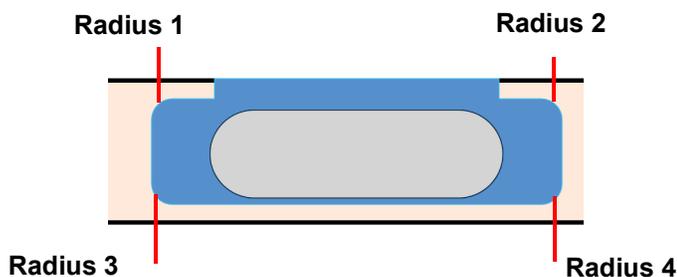


FIGURE 2-22. Location of Radiuses

## About the EntryRadius1 and EntryRadius2

These radius cuts are applied to the Tee portion of the cut only. The figure below illustrates a Tee cut with each radius cut to 0.25".



FIGURE 2-23. Location of Entry Radiuses

## An Example of 3.5" Hinges with Predrills

This section describes the **Feature Details** of a common **Hinge Feature Group**. Feature details of the group are separated into sections. Each section includes feature detail descriptions of hinge cuts.

### About Feature Group Parent and Children

**3.5" Hinge with Predrill (FeatureGroup x 3) Parent**

**Door Hinge (Hinge, Hinge Edge) Child**

**Jamb Hinge (Hinge, Hinge Jamb) Child**

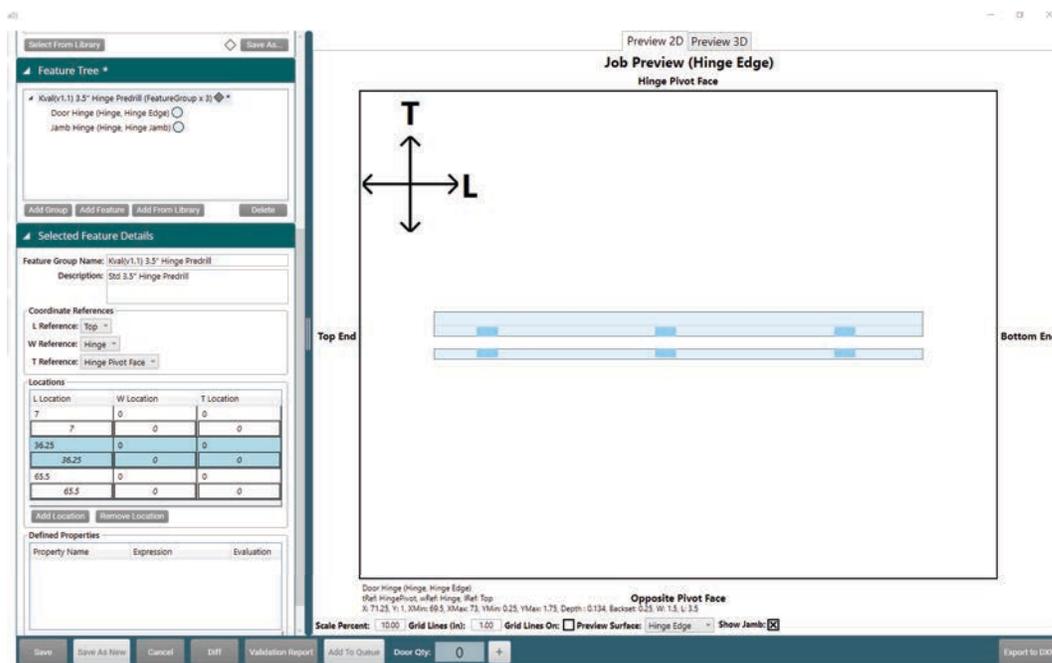


FIGURE 2-24. Hinges

## About the Hinge Feature Group

At the **Feature Group** level door coordinates and locations of the cut are defined. All features in this group follow the references and locations determined at this top level. For more information about the **Group Feature Details**, in the “KvalCAM Reference Guide”.

- **Feature Group Name and Description:** Enter a descriptive name and description that represents the Feature Group.
- **Coordinate Preferences:** In this example, the L (length) is referenced from the **Top**, W (Width) from the **Hinge** side, and the T (Thickness) from the **Hinge Pivot Face** side.
- **Locations:** Hinge cut will be repeated at the locations listed in this table.

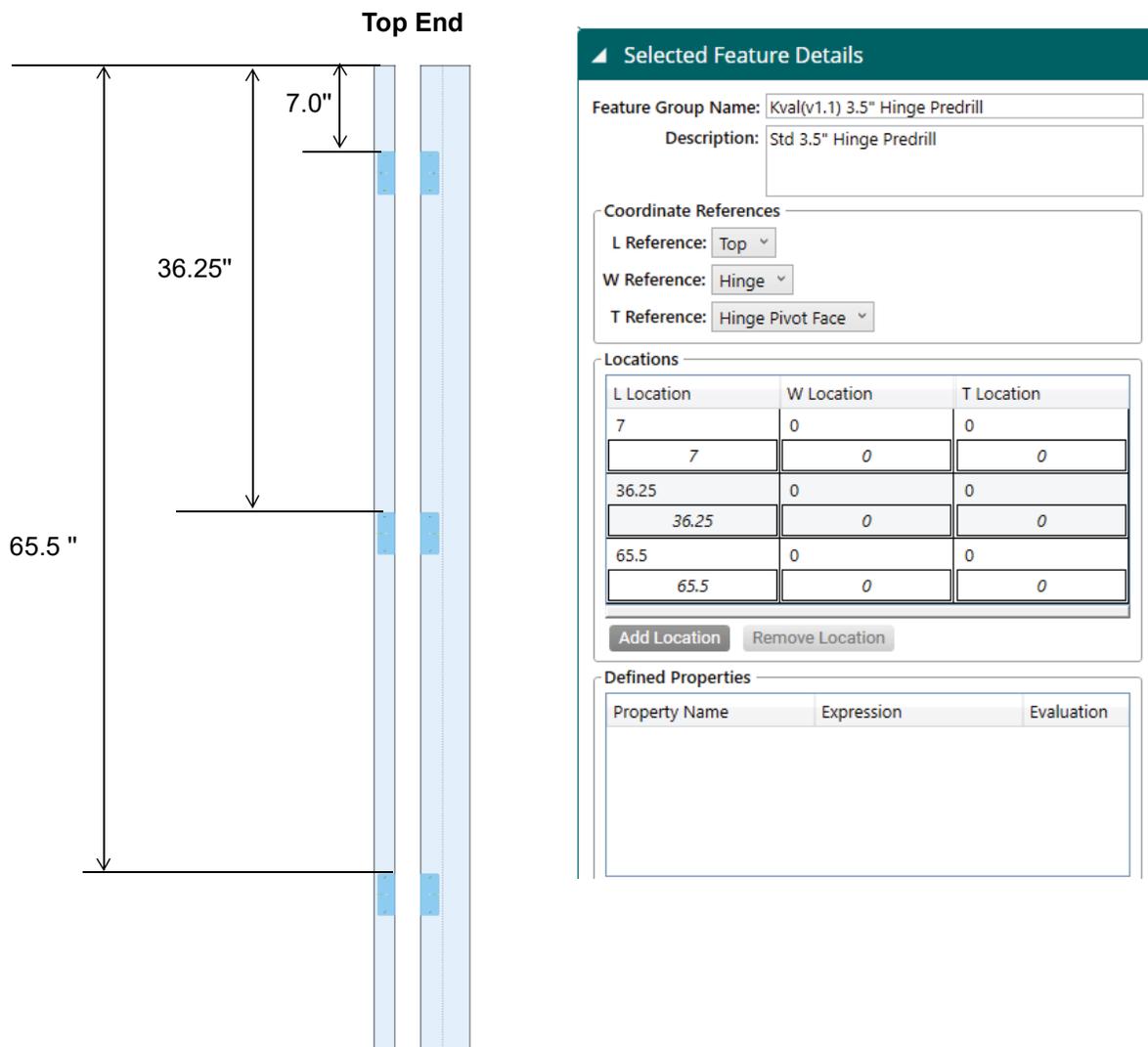


FIGURE 2-25. Hinge Feature Group

## About the Hinge Feature Details

The properties of a circle are described below.

Property	Description
<b>TLocation</b>	Auto calculated. Puts hinge in the middle of the edge of the door. <sup>1</sup>
<b>LLocation</b>	Start center location of the first Hinge. <sup>2</sup>
<b>Depth</b>	Depth of the hinge cut
<b>Bevel</b>	Set at the Door Data level
<b>Backset</b>	Backset of hinge from edge of door
<b>Width</b>	Auto calculated
<b>Length</b>	Length of the hinge cut.
<b>PredrillDepth</b>	Depth of the predrill holes
<b>PredrillDia.</b>	Diameter of the predrill holes.
<b>Radius1 and 2</b>	The radius of each corner of the hinge cut

1.  $TLocation = Width / 2.0$  (1.75" / 2" = 0.75 "). Width = Door Thickness - Backset (1.5"). Door Thickness set at Door Data. Backset set in the properties table.
2.  $LLocation = Length / 2$ . (7.0" + (3.5" / 2) = 8.75")  
Length = length of hinge.(3.5"). Top edge of hinge (7.0")

**Selected Feature Details**

Feature Name:

Feature Type:

Door Side:

Feature Property	Expression	Evaluation
TLocation	$Width / 2.0$	0.75
LLocation	$Length/2$	8.75
Depth	0.134	0.134
Bevel	$\$Door.HingeBevel$	0
Backset	0.25	0.25
Width	$\$Door.Thickness - Backset$	1.5
Length	3.5	3.5
PredrillDepth	$Depth+0.5$	0.634
PredrillDiameter	0.156	0.156
Radius1	0.25	0.25
Radius2	0.25	0.25

Predrill On:

Predrill Locations:

X Position	Y Position
1.395	0.687
0	0.36
-1.395	0.687

See "About the Predrill Holes" on page 2-27.

Attached Augmentations:

FIGURE 2- 26. Hinge Feature Details

## About the Hinge Properties

The figure below illustrates the parameters set in the **Features Details** table.

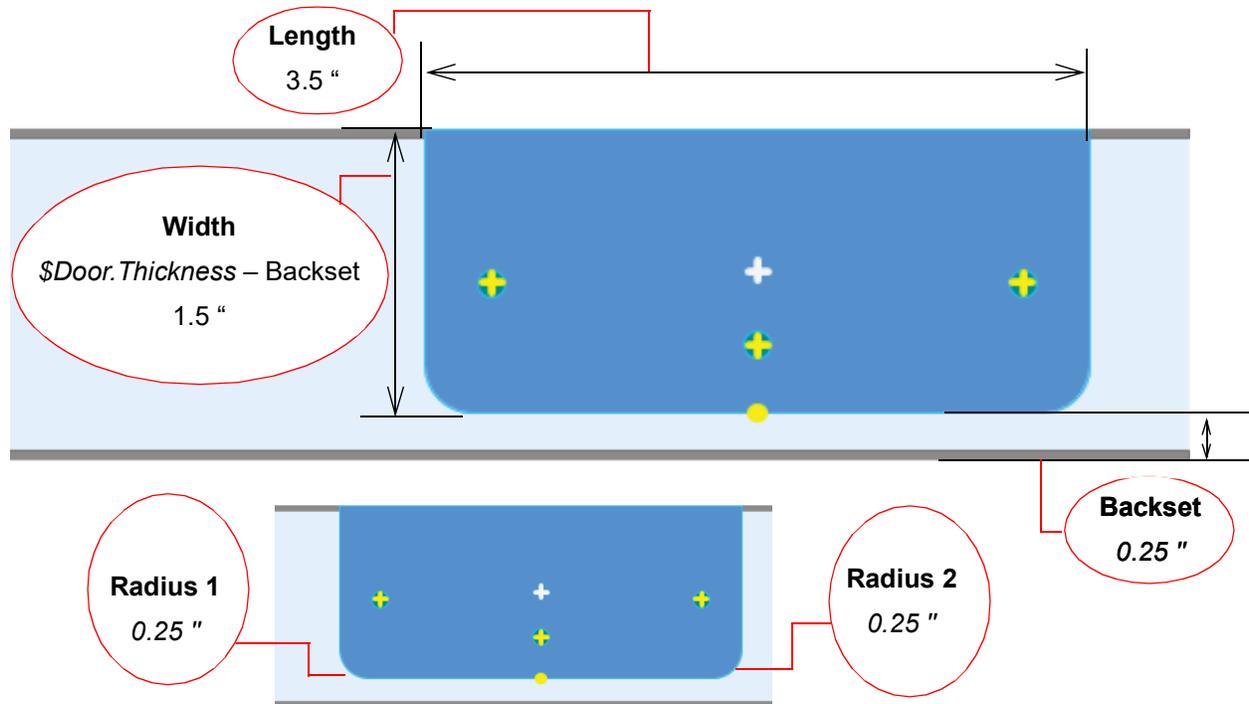


FIGURE 2-27. Hinge Dimensions

## About the Hinge Locations

The figure below shows the locations of the hinges set in the **Features Details** table.

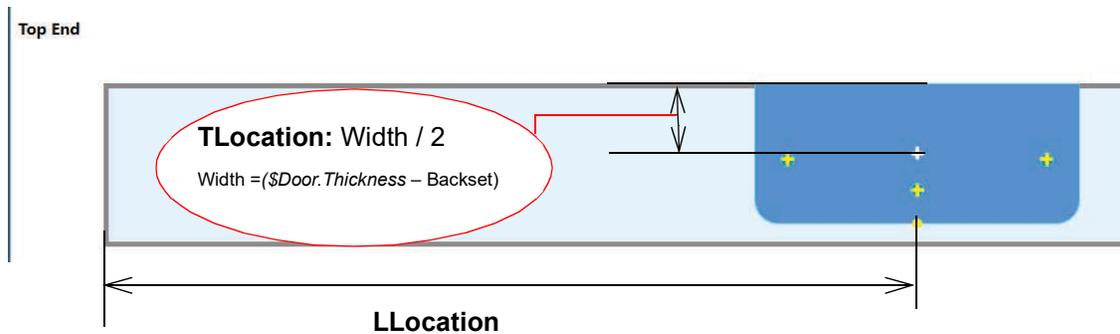


FIGURE 2-28. Hinge Locations

## About the Predrill Holes

Select the **Predrill On** check box to turn on the predrill.

**Note:** The jamb pre-drill holes are equal to the mirror image of the parameters entered.

Predrill On:

Predrill Locations:

X Position	Y Position
1.395	0.687
0	0.36
-1.395	0.687

FIGURE 2- 29. Hinge Predrill Holes

## About the Predrill Locations on the Hinge

The figure below shows the predrill locations that are listed in the **Predrill Locations** table above. The X and Y position values are referenced off the bottom of the hinge. The yellow cross-hairs represent the predrill location.

The **X** zero reference is located at the bottom middle of the hinge and can have positive or negative values. The **Y** zero reference is located at the bottom of the hinge and can **only** have a positive value.

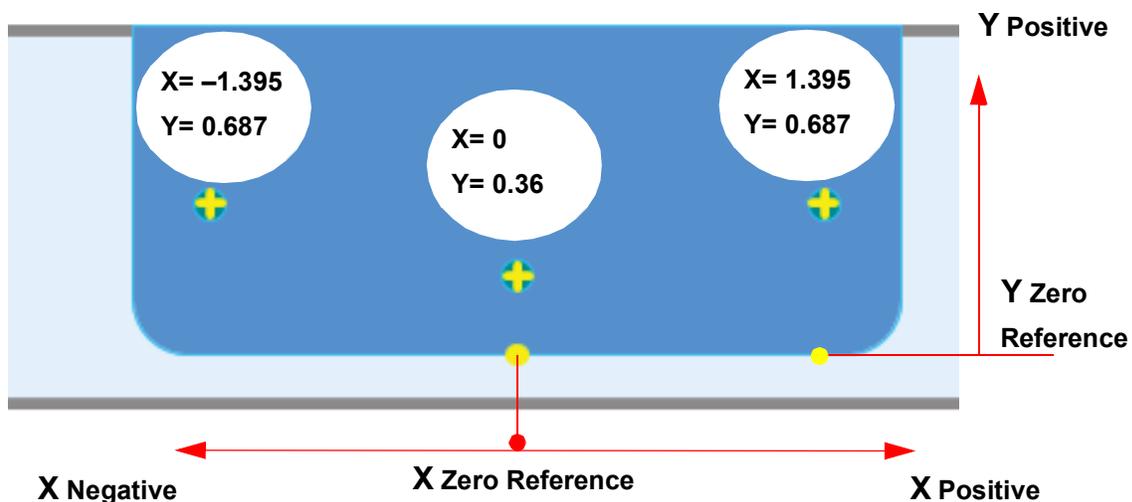


FIGURE 2- 30. Example of Predrill Locations



## About the Jamb Hinge Properties

To create a jamb with hinge properties:

1. Right click to highlight the **Door Hinge** feature.
2. From the Pop-Up window, select **Copy Selected**.
3. Right click to highlight the **Hinge Feature Group**.
4. At Feature Details, change **Feature Type Name** to **Door Hinge Jamb**.
5. The **Feature Details** auto fills to represent the jamb.

## An Example of a Face Rectangle with Round Top

This section describes a common method to use a **FaceRectangle** Feature.

### About Feature Group Parent and Children

**Rectangle Round Top Lite (FeatureGroup X1) Parent**  
**Lite Cutout (FaceRectangle, Face Side) Child**

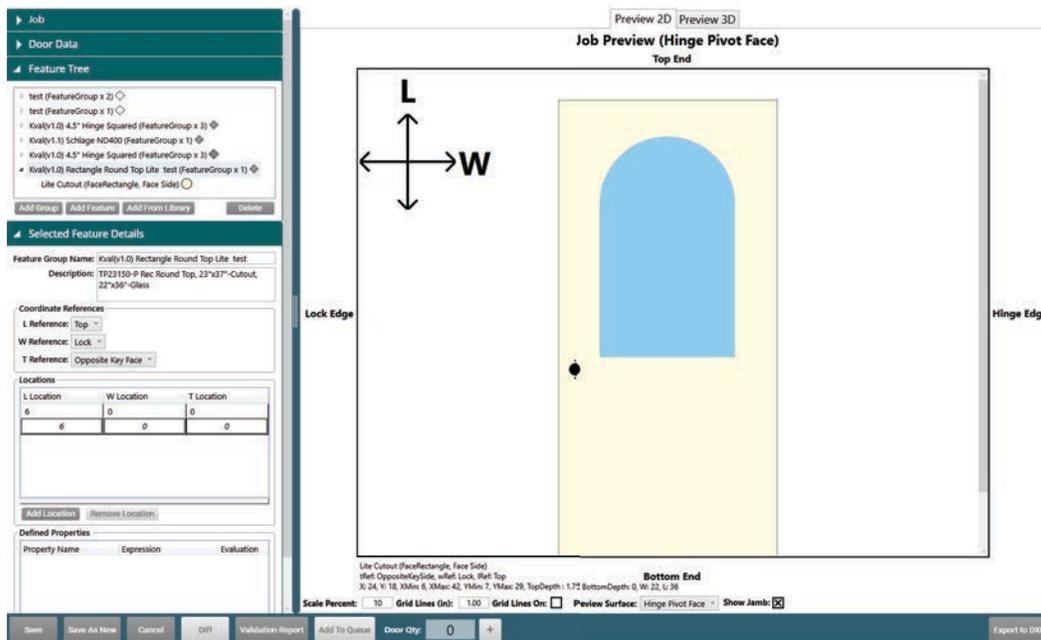


FIGURE 2- 31. Face Rectangle Cut

## About Face Rectangle Coordinate References

At the **Feature Group** level door coordinates and locations of the cut are defined. All features in this group follow the references and locations determined at this top level. For more information about the **Group Feature Details**, in the “KvalCAM Reference Guide”.

- **Feature Group Name and Description:** Enter a descriptive name and description that represents Feature Group.
- **Coordinate Preferences:** In this example, the L (length) is referenced from the **Top**, W (Width) from the **Lock** side, and the T (Thickness) from the **Hinge Pivot Face** side.
- **Locations:** The start of the cut will be 6.0" from the top of the door.

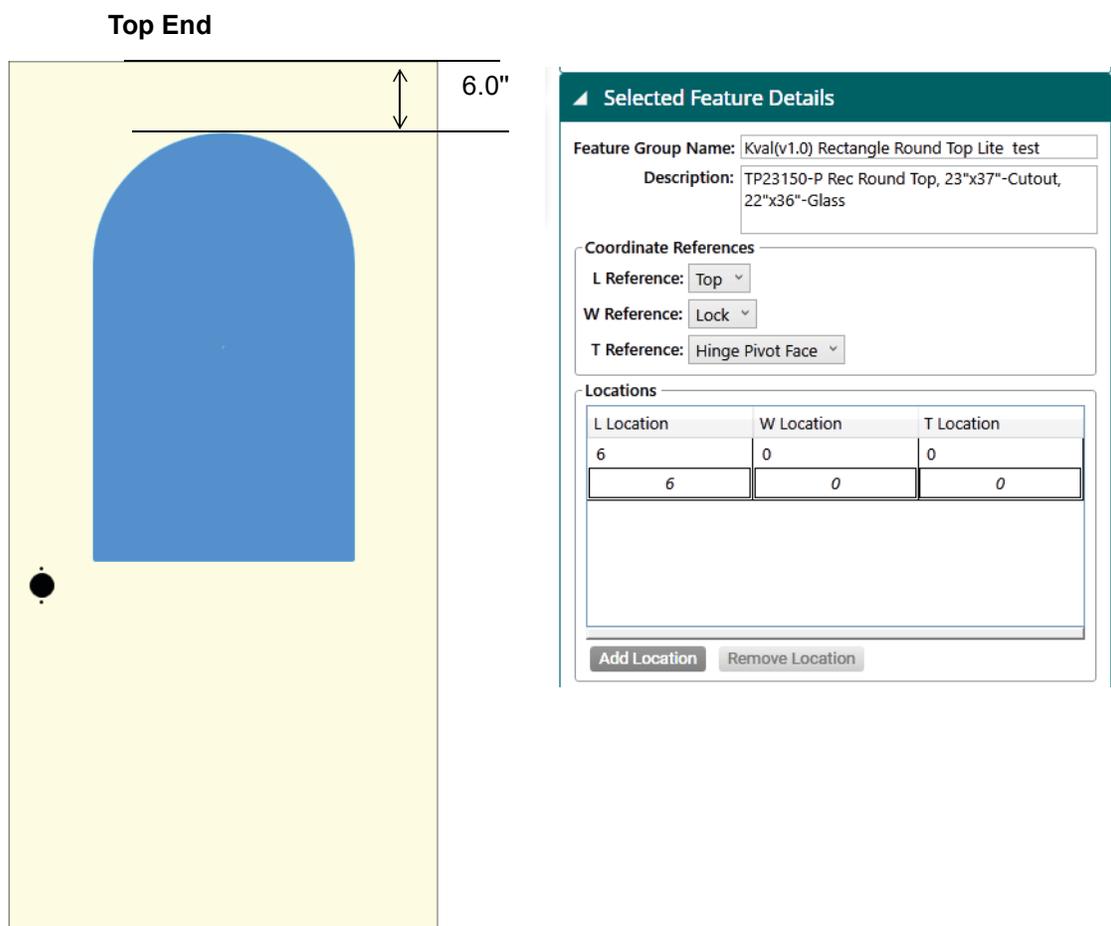
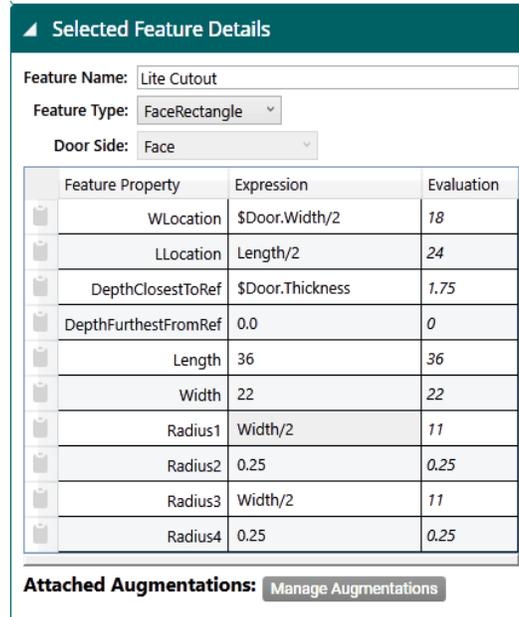


FIGURE 2- 32. Face Rectangle Dimensions

## About the FaceRectangle Details

The properties of a **FaceRectangle Feature** are described below.



Property	Expression Description
<b>WLocation</b>	$\$Door.Width/2$ , puts cut in the middle of the width of the door.
<b>LLocation</b>	$Length/2$ sets the location of the cut on the length of the door. <sup>1</sup>
<b>DepthClosestToRef</b>	$\$Door.Thickness$ . Cut will go through the door.
<b>DepthFurthestFromRef</b>	0
<b>Length</b>	Length of the rectangle cut. (36.0").
<b>Width</b>	Width of the rectangle cut. (22.0").
<b>Radius1</b>	$Width/2$ , Creates 1/2 of the round top.
<b>Radius2</b>	Radius of corner (0.25").
<b>Radius3</b>	$Width/2$ , Creates 1/2 of the round top.
<b>Radius4</b>	Radius of corner (0.25").

1.  $LLocation = 24.0"$  Where  $Length = 36.0" / 2 = 18.0"$ .  $LLocation = 18.0" + 6.0"$  (Location set at Feature Group Level) = 24.0"

FIGURE 2- 33. Face Rectangle Details

### About Shape Location Information

The figure below shows the shape location determined in Properties Table on [page 2-31](#).

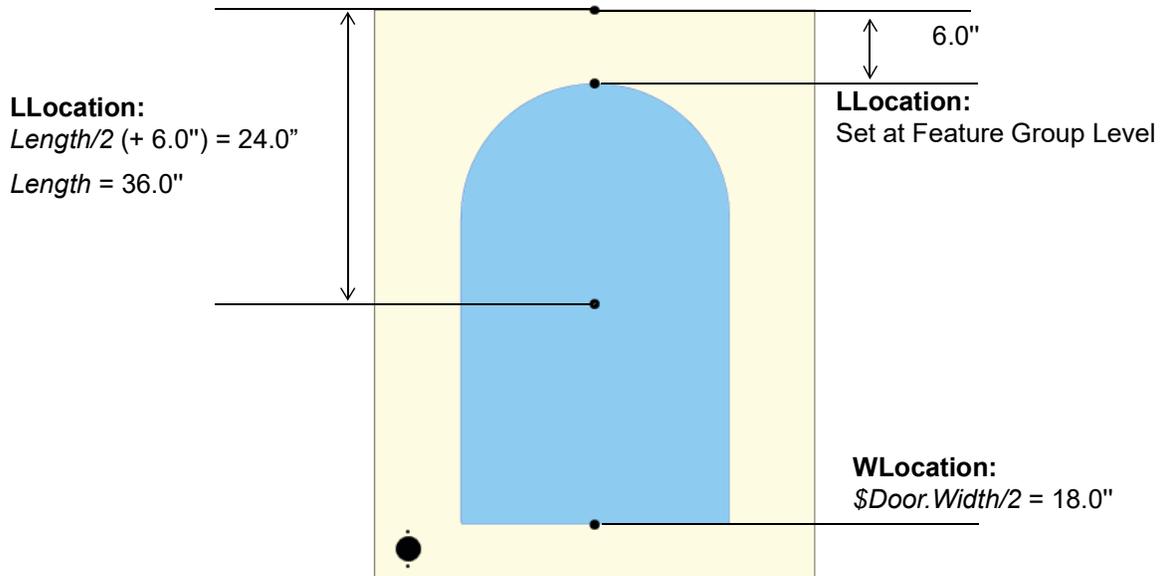


FIGURE 2- 34. Rectangle Shape Locations

### About Shape Parameter Information

The figure below shows the shape parameters determined in **Properties Table** on [page 2-31](#).

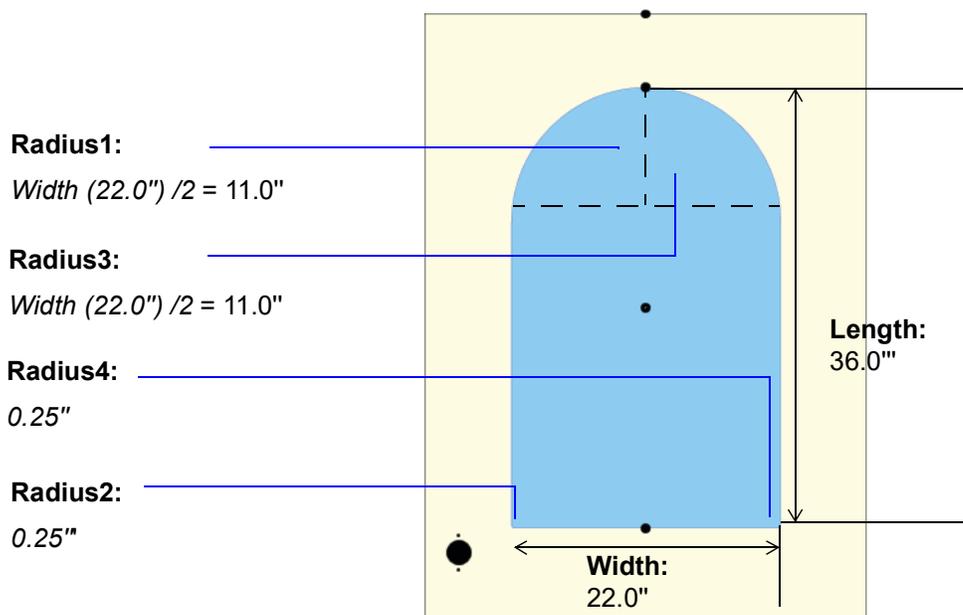


FIGURE 2- 35. Shape Dimensions

## Process to Create a FaceProfile Feature Type

**Note:** For descriptions and comparisons of the **FaceProfile Feature Type** and the **LiteCutout Feature Type**, see “[Comparing the FaceProfile and LiteCutout Feature Types](#)” on page 1-42.

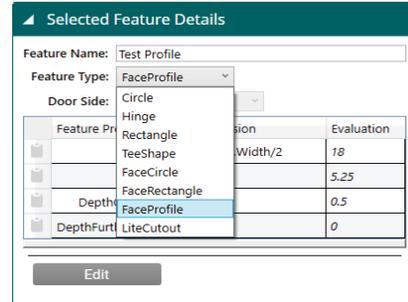
This procedure shows the steps to create a new **FaceProfile Feature**.

**Note:** The **FaceProfile Feature** uses a DWF file as a reference to engrave a shape on the face of the door.

### Process

To add a new **FaceProfile**:

1. If needed, add a **Feature Group**.
2. Add a **Child** to the **Feature Tree**.
3. Select **FaceProfile** from the **Feature Type** drop down menu and add a **Feature Name**.
4. Select the **Edit Button** to jump to the **FaceProfile** editing screen.
5. Select the **Import DXF Button** and select the desired file from your directory. If needed, edit the shape. Select **OK** to return to **KvalCAM** menu. See “[About the FaceProfile and LiteCutout Editing Screen](#)” on page 2-31.
6. At the **KvalCAM** screen make adjustments if necessary



### FaceProfile Process Summary

**1**  
Add Group

**2**  
Add Child

**3**  
Add Feature Name and Description  
Door Side: Auto selected.

**4**  
Select the Edit Button  
Jump to the Face Profile Screen.

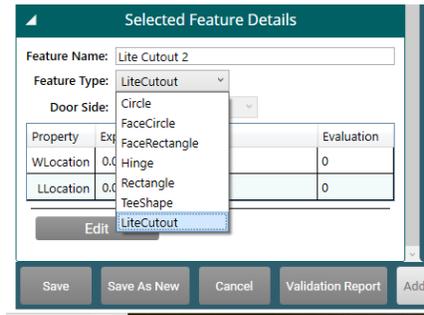
**5**  
At the editing screen, pull in the DXF file, adjust the shape, and send to KvalCAM.  
  
See “[About the FaceProfile and LiteCutout Editing Screen](#)” on page 2-35.

**6**  
Location Properties  
Adjust if necessary.  
**WLocation:** Location on the width of the door.  
**LLocation:** Location on the length of the door.  
**Depth:** Set depth of the cut.

## Process to Create LiteCutout Feature Type

This procedure details the steps to create a new **LiteCutout** Feature.

**Note:** The **LiteCutout Feature** is uses a DWF file as a reference to create a Door Lite Cutout.



### Process

To add a new **LiteCutout**:

1. If needed, add a **Feature Group**.
2. Add a **Child** to the **Feature Tree**.
3. Select **LiteCutout** from the **Feature Type** drop down menu and add a **Feature Name**.
4. Select the **Edit Button** to jump to the **LiteCutout** editing screen.
5. Select the **Import DXF Button** and select the desired file from your directory. If needed, edit the shape. Select **OK** to return to **KvalCAM** menu. See [“About the FaceProfile and LiteCutout Editing Screen”](#) on page 2-31.
6. At the **KvalCAM** screen may adjustments if necessary

### LiteCutout Process Summary

**1**  
Add Group

**2**  
Add Child

**3**  
Add Feature Name and Description  
Door Side: Auto selected.

**4**  
Select the Edit Button  
Jump to the Face Profile Screen.

**5**  
At the editing screen, pull in the DXF file, adjust the shape, and send to KvalCAM.  
See [“About the FaceProfile and LiteCutout Editing Screen”](#) on page 2-35.

**6**  
**Location Properties**  
Adjust if necessary.  
**WLocation:** Location on the width of the door.  
**LLocation:** Location on the length of the door.

## About the FaceProfile and LiteCutout Editing Screen

These screens are automatically opened when the **Edit** button is selected when the **FaceProfile** Feature or **LiteCutout** Feature selected.

**Note:** The **FaceProfile** and the **LiteCutout** screen are similar except the **LiteCutout** screen includes control over through-cuts. **FaceProfile** is designed for engraving the face of the door, therefore through-cut controls are not needed. To see a comparison of the two screens, see [“Comparing the FaceProfile and LiteCutout Feature Types”](#) on page 1-42.

### About the Editing Screen

The editing screen can be separated into three sections.

1. Located at the right side of the screen is a **Control Panel** to manage the cutting process, error check, and adjust view settings.
2. The **Work Area** dominates the screen. View, adjust shape, and adjust cutting process of the DXF file.
3. Located at the bottom of the screen is a **Tool Bar** to perform varied tasks on the **DXF** file.

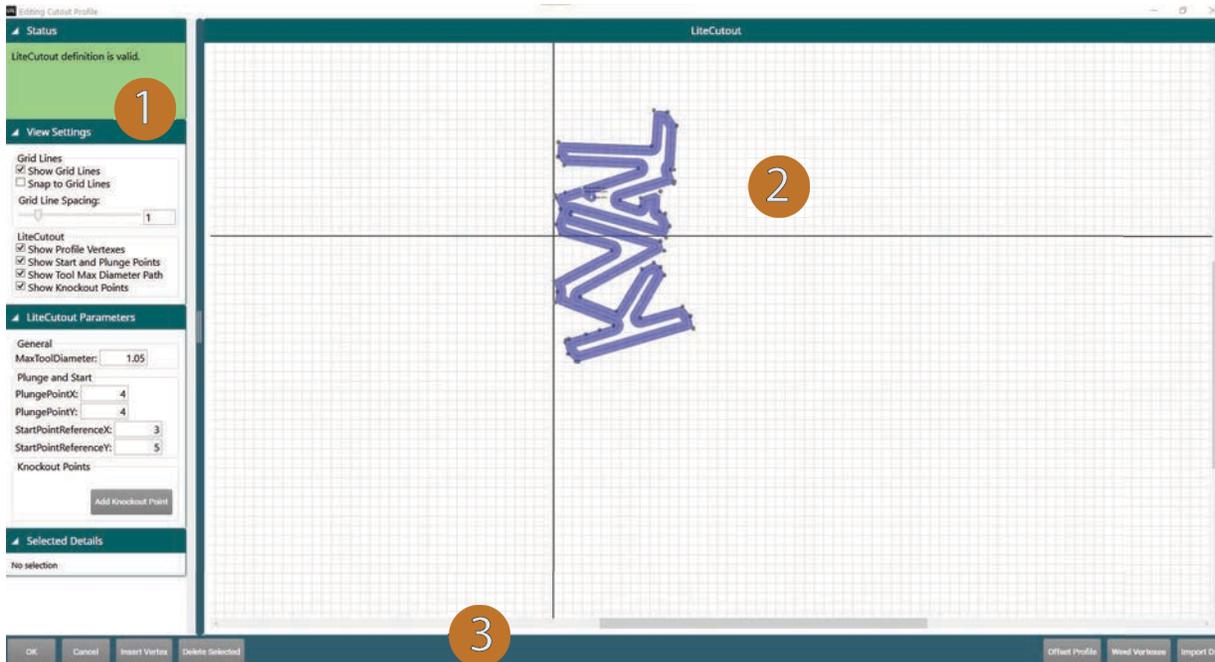
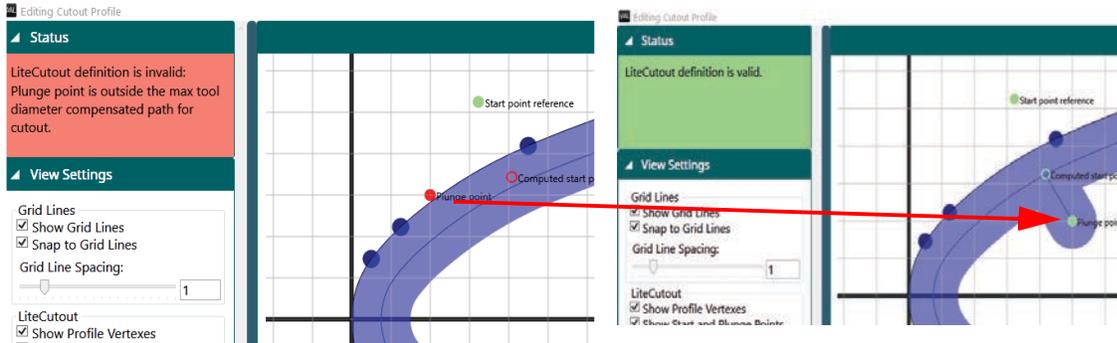


FIGURE 2-36. Opening Editing Screen (LiteCutout)

## About the Status Panel

The **Status** area shows errors in the displayed model. A green background indicates a valid model. A red background indicates an error.

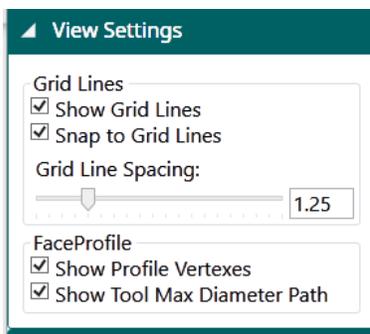
The example below shows an error with the placement of the **Plunge Point** and is corrected by moving it to within the boundaries of the cut.



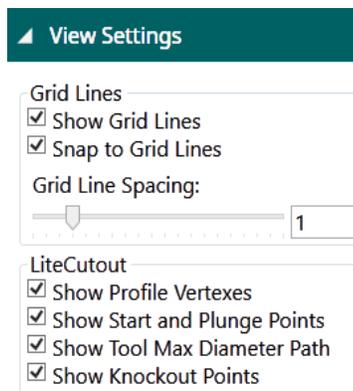
## About the View Settings Panel

At the **View Settings** panel, the work area can be visually altered to your desired viewing experience.

### FaceProfile Settings



### LiteCutout Settings



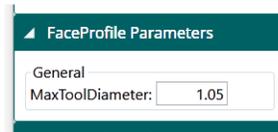
## About the Parameters Panel

At the **Parameters** panel, control the specifications and shape of the displayed model.

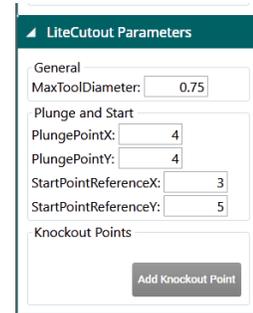
At the **FaceProfile** panel, maximum tool diameters can be entered and viewed.

At the **LiteCutout** panel, maximum tool diameters and more control of the machine cutting process is offered. See [Figure 2- 37](#) below.

### FaceProfile Parameters



### LiteCutout Parameters



The figure below shows the display of model from a **LiteCutout** editing screen. Parameter types that can be altered are identified.

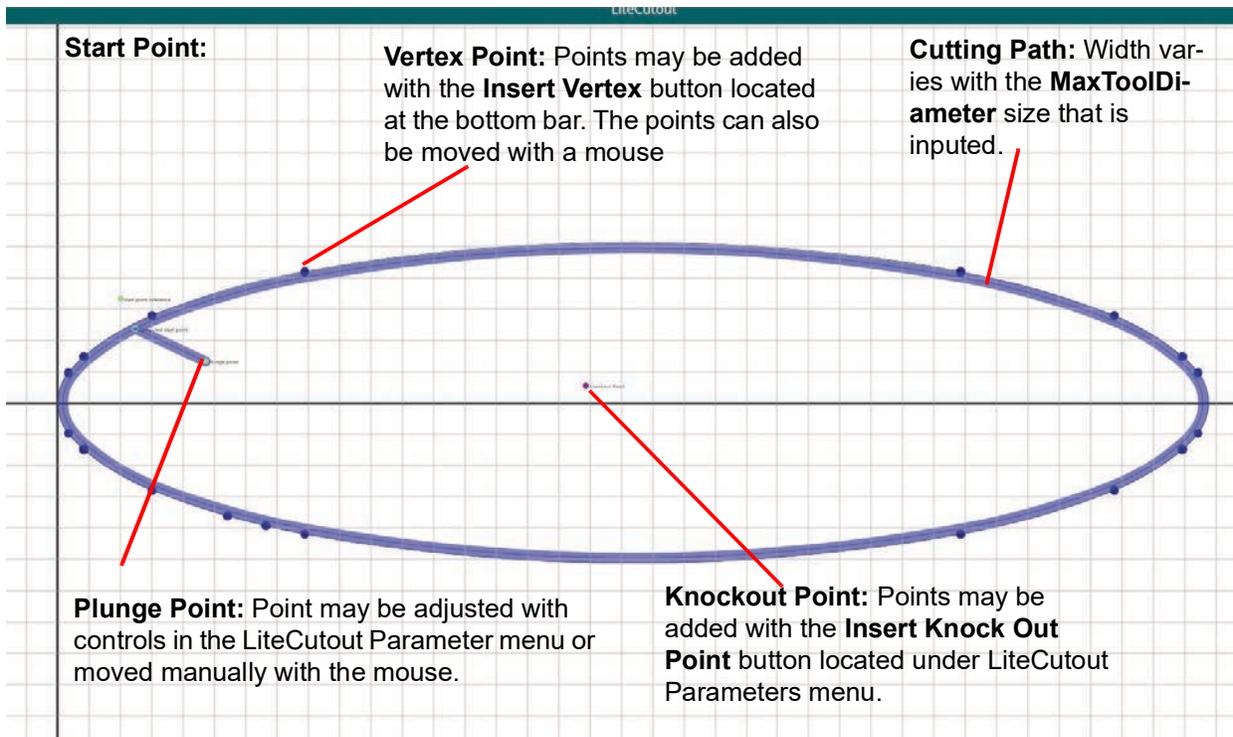
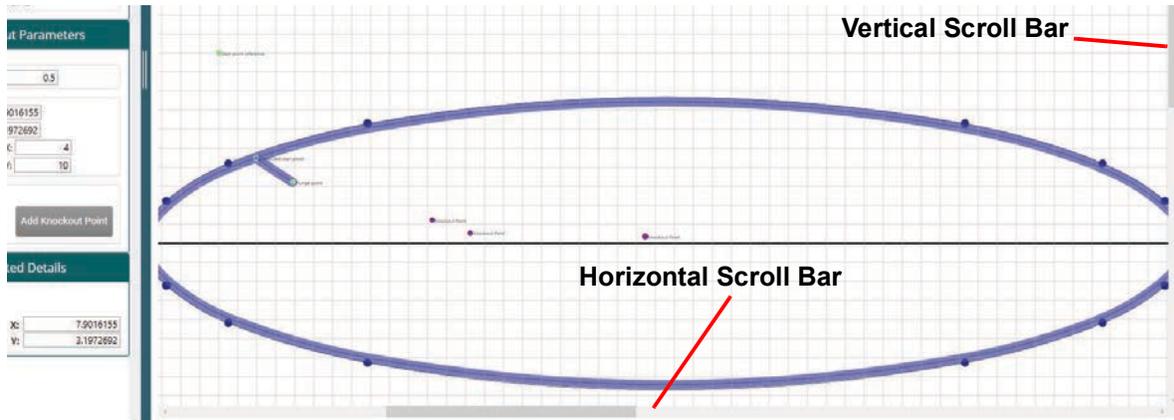


FIGURE 2- 37. Samples of Parameters

## About the Work Area

The **Work Area** displays the imported **DXF** file. Actions that can be done are:

- Zoom In and Out with Mouse.
- Move shape vertically and horizontally with scroll bars.
- Select a vertex (point on the cutting path) and manipulate the shape.



## About the Work Area Coordinates

The coordinates will adapt to all door types: LH (left-hand), RH (right-hand), LHR (left-hand reverse), RHR (right-hand reverse). This feature can be shared across all face cutting machines and doors.

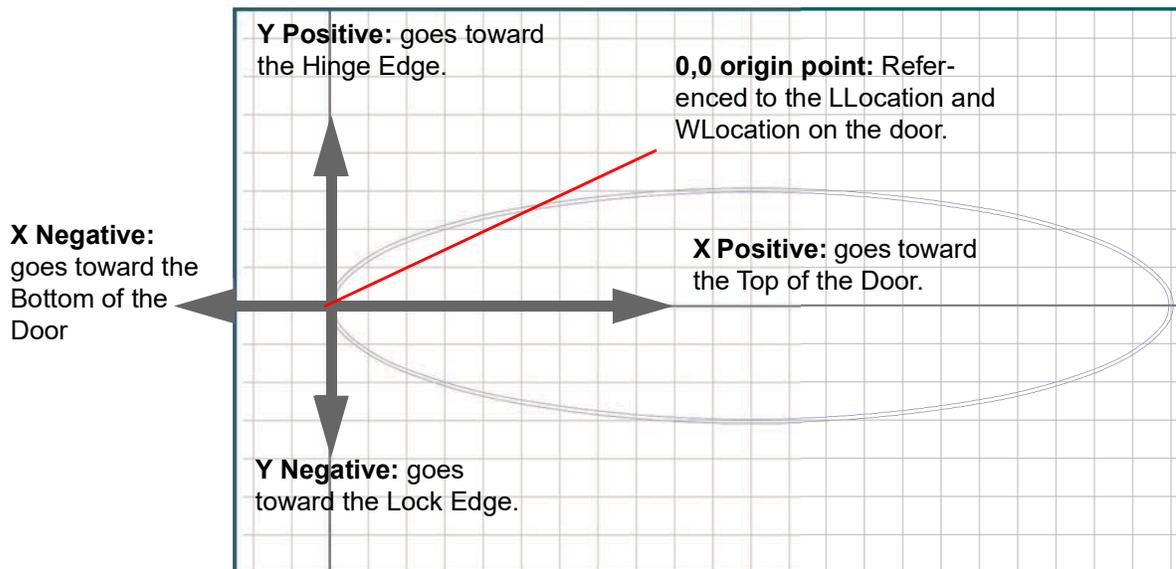


FIGURE 2-38. Coordinates as related to KvalCAM

## About the Task Bar

The Task Bar is located at the bottom of the editing screen. The section below describes the actions of each button.



### The Import DXF Button

The first action to take. Import a DXF file from a predetermined directory to edit.

### The OK Button

Select the **OK** button to complete the editing process. The editing screen closes and the DXF is displayed in the **KvalCAM Preview** screen.

### The Cancel Button

Stop work and go back to **KvalCAM**. The Editing screen closes, changes are not saved and the DXF is not transferred to **KvalCAM**.

### The Insert Vertex Button

Select any **Vertex Point** along the cutting path and then select **Insert Vertex** button to add a point next the selected point.

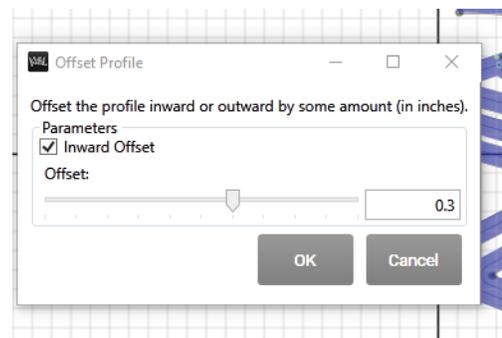
### The Delete Selected Button

Select any **Vertex Point** or **Knockout Point** along the cutting path to delete it from the shape.

### The Offset Profile Button

If an offset is needed for the cutting path, select the **Offset Profile** button. The offset can be in an inward direction or outward direction. The range that can be selected is 0.0 " to 0.5".

1. Select the **Offset** button
2. At the Pop-Up window, select the Inward **Offset** check box to have an inward offset. Deselect the box to have an outward offset.
3. Use the slide bar or enter the value in the text box to increase or decrease the size of the offset.
4. Select **OK** to finish the offset change.

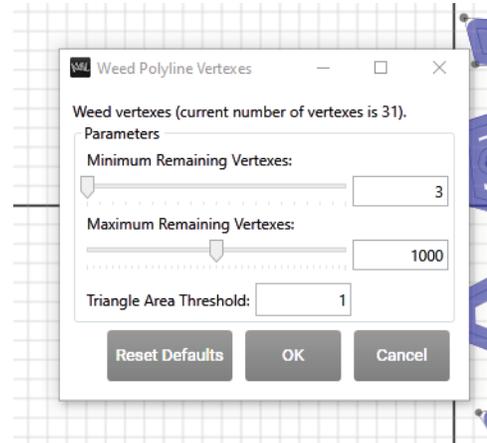


## The Weed Vertexes Button

Occasionally DXF files that are imported may have too many vertex points. This button deletes some of the vertex points.

1. Select the **Weed Vertexes** button.
2. Use the slide bar or text boxes to weed out the vertex points.
  - **Minimum Remaining Vertexes:** The lower boundary for the remaining vertexes, the vertex count does not go below this value.
  - **Maximum Remaining Vertexes:** The upper boundary for remaining vertexes. The vertex count will be less or equal to this value.
  - **Triangle Area Threshold:** The threshold for which a vertex is weeded, measured as the area of a triangle (inches) formed by the vertex to be weeded and its neighbors. Triangles formed with areas less than this value cause the vertex to be removed.
3. Select the **OK** button to confirm the weeding, the **Cancel** button to stop, or the **Reset Default** to go back original vertex count.

**Note:** The weeding process does not support shapes with polylines with arcs. An error pop-up will be displayed. Select the OK box to close the box.





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## CHAPTER 3 KvalCAM Common Terms

This chapter describes common **KvalCAM** terms.

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## Common Terms

This section contains descriptions of terms used in **KvalCAM**.

### A

#### Ad Hoc

**Ad Hoc** is **Door Data** or a **Feature Group** that is part of a **Door Job** that is not associated with any **KvalCAM Revision**. This allows a **Door Job** to be created or edited independently of the **Feature Groups** and/or **Door Data** in the **KvalCAM Library**. The figure below shows a **Feature Group** created **Ad Hoc**.

In this example, a test **Feature Group** was created from scratch within the **Door Job**. The light-colored diamond icon indicates that the **Feature Group** or **Door Data** is **Ad Hoc**. **Note:** The asterisk indicates that the **Door Job** has not been saved.

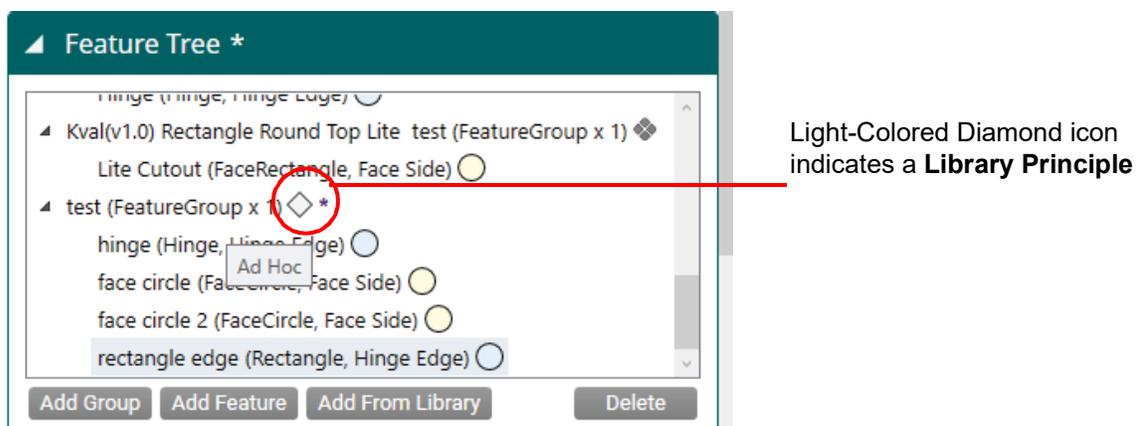


FIGURE 3-1. Ad Hoc Icon

#### Axis

An axis icon is located on the **Door Preview Screen** to visually represent the door reference. [Figure 3- 2 below](#) shows the axis icons. Note the icon relationship to the door graphic.

<b>L</b>	Represents the Length axis
<b>W</b>	Represents the Width Axis
<b>T</b>	Represents the Thickness Axis

This illustration shows a Left Hand Door with the Pull Side orientation

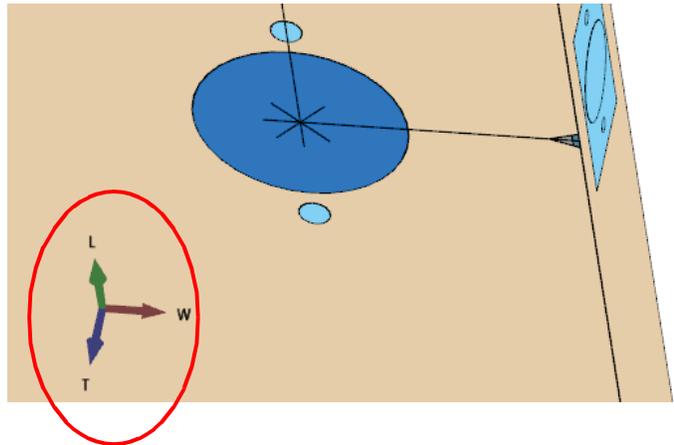


FIGURE 3-2. Axis Icons in Job Preview

## C

### Cube Icon

Any of the faces can be clicked on to orient the camera to that standard view. In addition to this, any edge or corner of the view cube can be clicked on to get a corresponding camera position. The view cube has a ring and adjacent articles around one face. This ring is designed as a visual indicator of the "bottom" of the cube, or what would be considered the lower side of the "T" dimension.

The view cube is located in the lower-right corner of the screen. This cube has 6 sides, and the corresponding edges and borders or a normal cube. On every face of the cube, there is a single letter that corresponds to the standard view in which that view is oriented. Letters to the side identify adjacent views.

- **H** - Hinge edge
- **L** - Lock edge
- **T** - Top edge
- **B** - Bottom edge
- **P** - Pull face
- **S** - Push face



**The Icon is Active:** Select the large center square, the smaller outer squares, or the yellow corners to jump to the corresponding position.

## D

### Diff

The **Diff** function compares two files and identifies differences between them. The **Diff Button** is located at the following **Screens**:

- **Door Data**
- **Door Job**
- **Feature Group**
- **Revision**

The process to use the **Diff** function can be found in the “KvalCAM Reference Manual.”

The figure below shows the display associated with a **Diff** function.

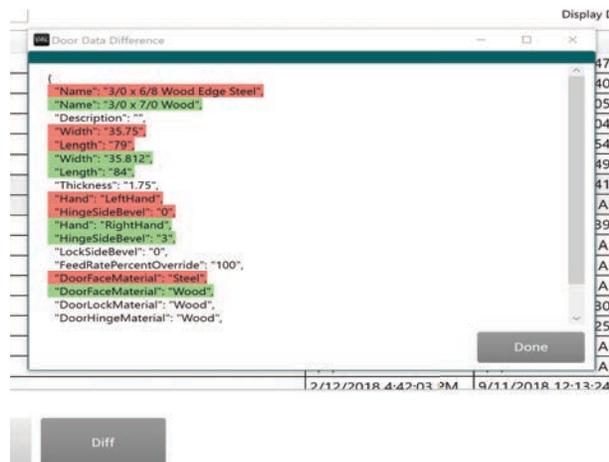
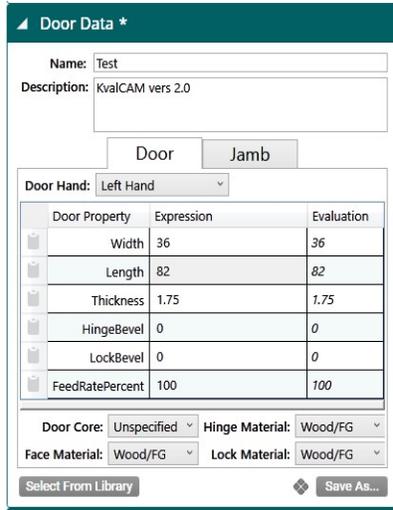


FIGURE 3-3. Diff Pop-Up Screen

### Door Data

**Door Data** represents all the information for a door slab and/or jamb. **Door Data** can be created and edited in the **KvalCAM Door Data Library** to later be added as part of a **Door Job**. [Figure 3-4 on page 3-5](#) shows an example of the information in **Door Data**.

More information about **Door Data** can be found in the “KvalCAM Reference Manual.”



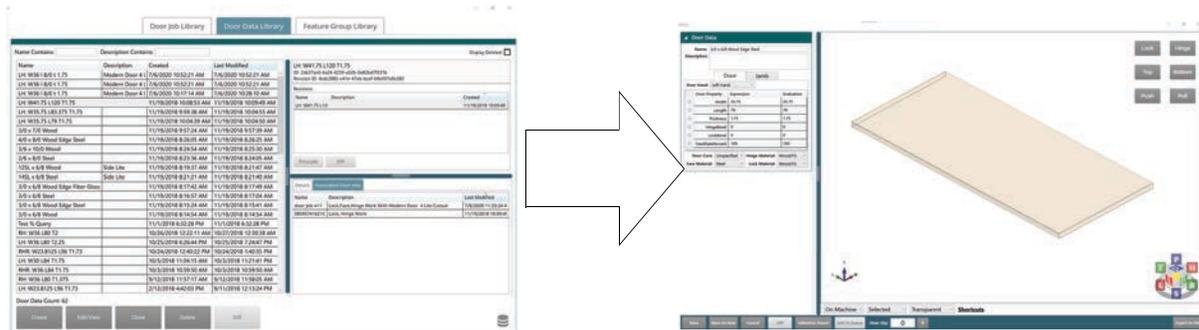
**Door Data Properties includes:**

- **Door Hand** (Left Hand, Right Hand, Left Hand Reverse, Right Hand Reverse)
- **Door Width**
- **Door Length**
- **Door Thickness**
- **Hinge Bevel**
- **Lock Bevel**
- **FeedRate Percent** (Adjust tool feed-rate 100% to 5%)
- **Door Core** (Unspecified, Hollow, Foam)
- **Face Material** (Wood, Fiberglass, Steel)
- **Hinge Material** (Wood, Fiberglass, Steel)
- **Lock Material** (Wood, Fiberglass, Steel)

**Door Data Library**

Below is a list of highlights about this screen.

- Selecting a file from the table leads into the **Door Data Creation** screen
- The **Door Data Library** contains the specifications about an unprocessed door.
- No shape-cutting information is at this screen.
- Files can be saved and be attached to the many **Door Job** files.
- Files support revisions.



**FIGURE 3-4. Door Data Library**

**Door Job**

A **Door Job** represents all the information required to process a door and/or jamb on a **KvalCAM** machine. **Door Jobs** can be created and edited within the **KvalCAM Door Job Library** and added to the **Door Job Queue**. Once in the queue, the door can be processed. A **Door Job** has one **Door Data** and a collection of **Feature Groups** within it that describe the work to be done. [Figure 3- 5 on page 3-6](#) shows the building blocks of a **Door Job**.

- **Job:** Door assigned file name.
- **Door Data:** Door slab specifications.
- **Feature Tree:** A collection of **Feature Groups**.
- **Selected Feature Details:** Shapes, locations, and cut information of the features that are part of the **Feature Group**.

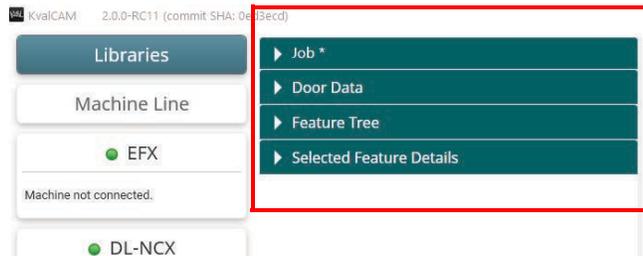


FIGURE 3-5. Door Job Parts

## Door Job Library

Below is a list of highlights about this screen.

- Selecting a file from the table leads to the **Door Job Creation** screen.
- The **Door Job Library** contains all the files in the selected database.
- The **Door Job Files** contain all the information to create a door.
- Files support revisions.

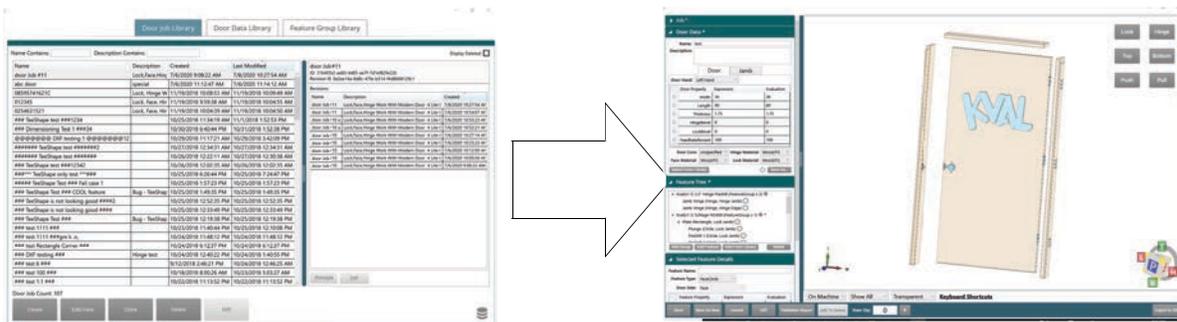


FIGURE 3-6. Door Job Library

## E

### Expressions

Every feature type has a set of properties that represent its milling shape. These properties are represented as expressions in the form of strings.

Example:  $5 + 3.5$  or  $4 + (1/8 * 2)$

The expressions are persistently saved and loaded for each property of a feature. At run time the user previews, validates, or runs a door job containing features. At this time the expressions are also evaluated to a final numeric form,

Example:  $5 + 3.5 = 8.5$ , or  $4 + (1/8 * 2) = 4.25$

The numeric form is shown and then used to preview, validate, and ultimately run a milling routine on the door. Expressions can reference other properties, the door parameters, or even other features in the tree.

Example:  $5 + Length / 2, 1 + \$Parent.Length / 2$ , or  $\$Door.Thickness/2 + Width$

### Common Door Expressions

Parameter	Description	Expression Description
<b>Length</b>	Length of Door	<i><math>\\$Door.Length</math></i>
<b>Width</b>	Width of Door	<i><math>\\$Door.Width</math></i>
<b>Thickness</b>	Thickness of Door	<i><math>\\$Door.Thickness</math></i>
<b>HingeBevel</b>	Bevel defined for the hinge edge of the door in degrees	<i><math>\\$Door.HingeBevel</math></i>
<b>LockBevel</b>	Bevel defined for the lock edge of the door in degrees	<i><math>\\$Door.LockBevel</math></i>
<b>FeedRatePercent</b>	Feed rate percent defined for the door	<i><math>\\$Door.FeedRatePercent</math></i>

## F

### Feature

A **Feature** represents a particular cut or operation to be performed on a door and/or a jamb, for example, cut a rectangular plate with a set of properties (width, length, depth, etc.) at a particular location on a door. There are many different feature types to perform different operations. Each **Feature** can have a collection of **Features** as children. The children inherit the parent feature's location on the door and/or jamb. [Figure 3- 7 below](#) shows the properties of a Feature in a Feature Group.

More information about **Feature**, see [“Summary of a Feature Group and Features” on page 1-23.](#)

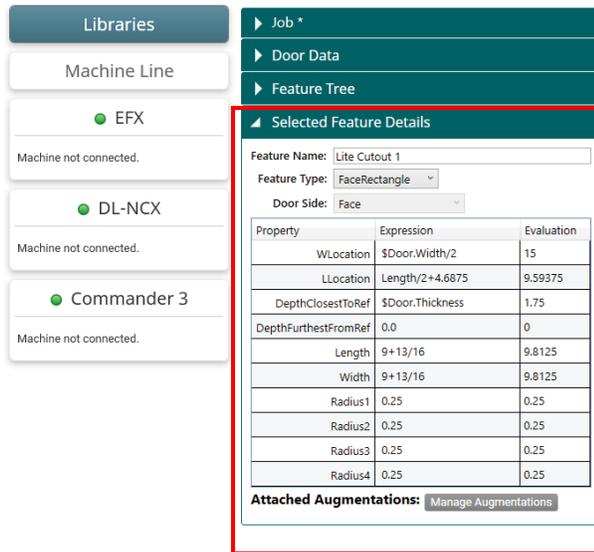


FIGURE 3-7. Feature Details Example

## Feature Group

A **Feature Group** represents a set of cuts or processes to be performed on a door and/or a jamb. Each **Feature Group** has a collection of **Features** that describe the operations to be done. **Feature Groups** can be created, edited, and saved in the **Feature Group Library**. **Feature Groups** and associated **Features** may be added to a **Door Job**. [Figure 3- 5 below](#) shows a collection of Feature Groups in a Door Job.

More information about **Feature Groups**, see “[Summary of a Feature Group and Features](#)” on [page 1-23](#).

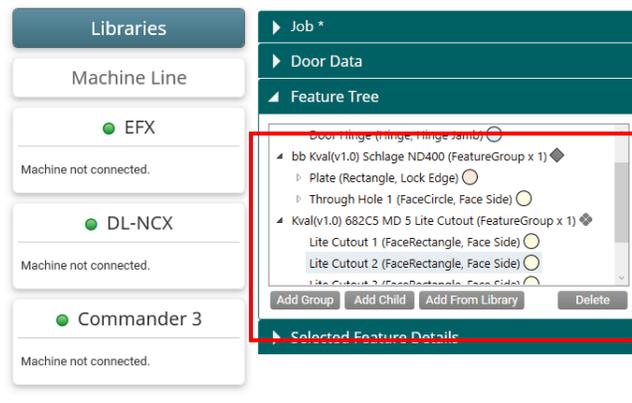


FIGURE 3-8. Feature Group Panel

## Feature Group Library

Below is a list of highlights about this screen.

- Selecting a file from the table leads into the **Door Feature Creation** screen
- The **Door Feature Library** contains shape information.
- There is one shape information per file.
- Files can be saved and be attached to the many **Door Job** files
- Files support revisions.
- Tracks variants.

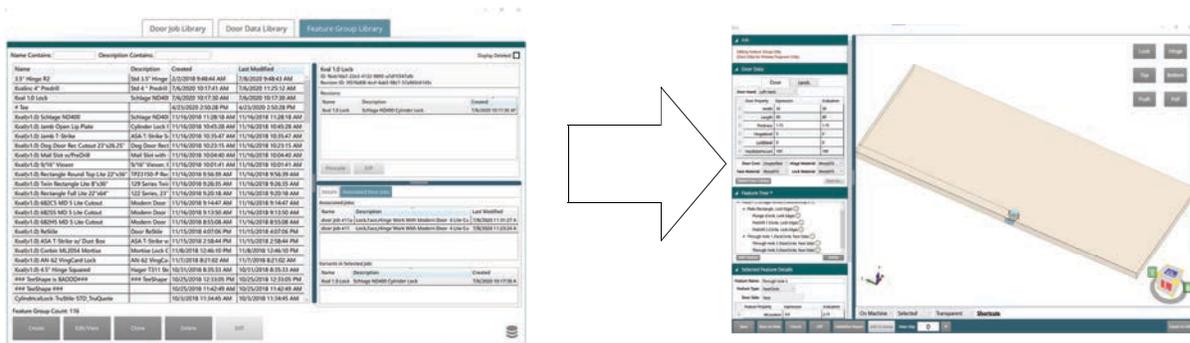


FIGURE 3-9. Feature Group Library

## H

### Handing

Door handing can be a confusing concept. There are a few different methods to determine the hand of a door. Each method depends upon the reference in relation to door and the door opener.

Handing is **Right Hand**, or **Left Hand** referenced. However, terms vary in the industry. See the list of terms in [Figure 3- 10](#) and [Figure 3- 11](#).

In **KvalCAM**, door hand is selected at the **Door Job Data** section.

The terms used are:



- Right Hand
- Left Hand
- Left Hand Reverse
- Right Hand Reverse

## About Door Hand Designation

**Left Hand and Right Hand** or **inswing** doors are the most popular choice on the residential market. With these doors, the hinges are installed on the inside opposite the key side of the door. This can be an excellent security benefit, as intruders can't tamper with the hinges. They can, however, knock the door back by force as it swings inward. These doors will offer you more space on the outside, however, that means that there will be more limited space inside.

**Reverse Right and Left Hand** or **outswing** doors are often used commercially. These doors have hinges that face the outside or key side. Security hinges are often used in reverse hand doors to stop the removing of the hinges. Because they open outwards, they are more difficult to kick in but they also limit space on the outside when open.

## How to Determine Door Handing

This section describes one method to determine a door's handing. For an illustrated view of determining door hand, see [Figure 3- 10](#) and [Figure 3- 11](#).

1. Stand on the outside (key side) of the door.
2. Facing the door, see what side the hinges are located.
3. The location of the outside or inside hinges determines the hand reference.
  - If the hinges are to the left, it is a left hand door.
  - If the hinges are to the right, it is a right hand door.

## Left Hand Door

In the figure below, note that the hinge is located on the left side of the door opener. A **Left Hand** door opens or swings in to the interior. A **Left Hand Reverse** door opens out or reverse of the **Left Hand** door.

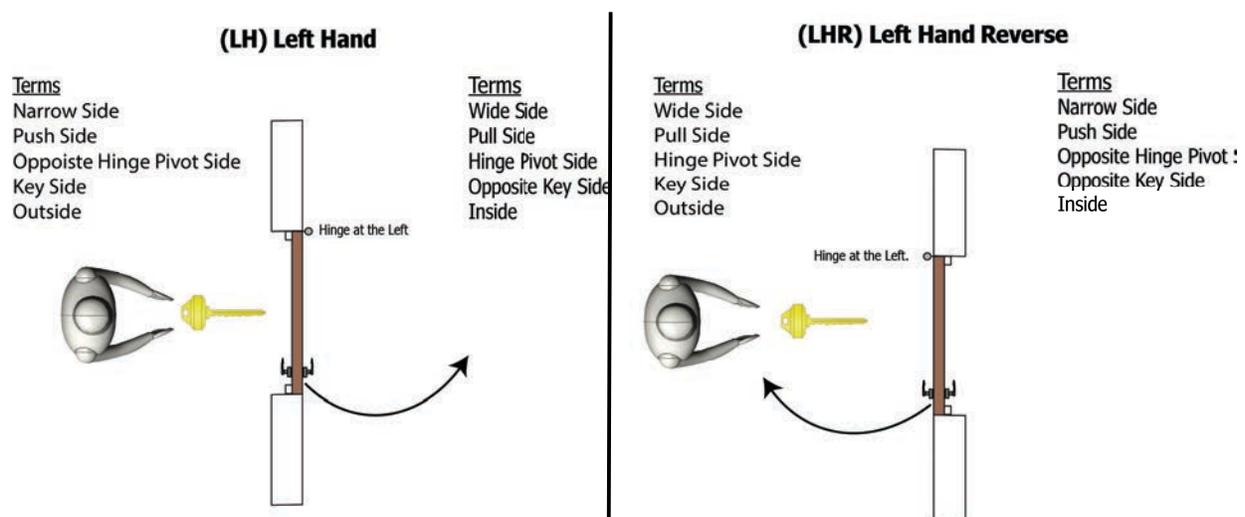


FIGURE 3- 10. Left Hand Doors

## Right Hand Door

In the figure below, note that the hinge is located on the right side of the door opener. A **Right Hand** door opens or swings in to the interior. A **Right Hand Reverse** door opens out or reverse of the **Right Hand** door.

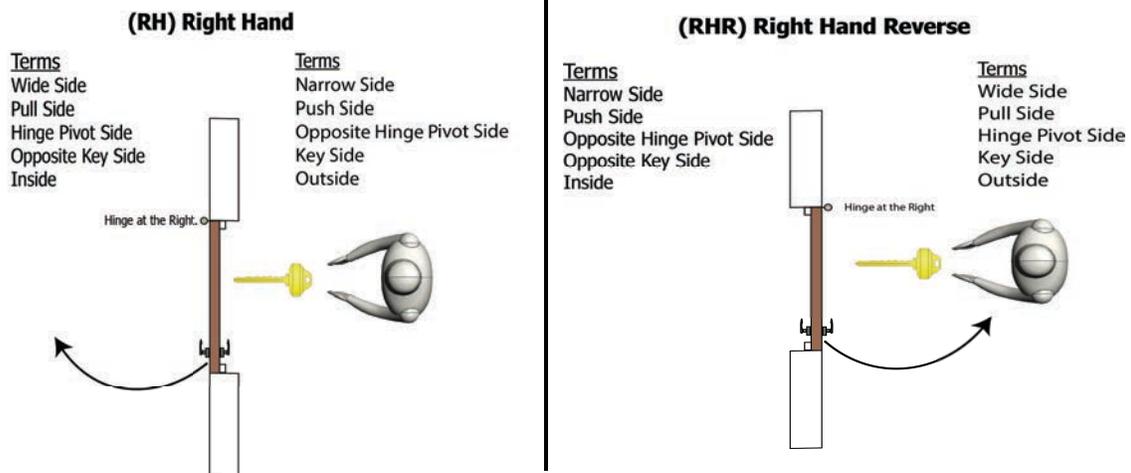


FIGURE 3- 11. Right Hand Doors

## L

### Left Hand Door and Left Hand Reverse Doors

See “Left Hand Door” on page 3-10

### Library Principle

A **Library Principle** is a **Door Data** file and/or a **Feature Group** is a file added from the library<sup>1</sup> to a **Door Job** with no changes made to it.

**Library Principles** can be associated with a **KvalCAM** revision. The figure below shows a **Feature Group** that is identified as a **Library Principle**.

In this example, a **Hinge Feature Group** was added to the **Door Job** from the **Feature Group Library**. The dark gray diamond icon indicates that the **Feature Group** or **Door Data** is a **Library Principle**.

1. Door Job Library and/or Feature Group Library

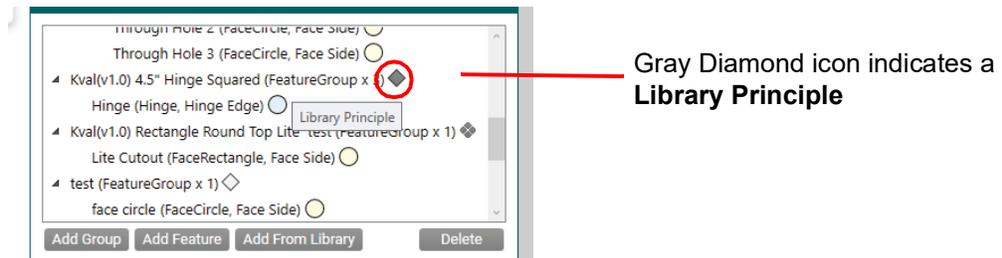


FIGURE 3-12. Library Principle Icon

## Library Principle Variant

A **Library Principle Variant** is a **Door Data** file and/or a **Feature Group** is a file added from the library<sup>1</sup> to a **Door Job** that has changes to it at the **Door Job** level. **Library Principle Variants** can be associated with a **KvalCAM** revision. The figure below shows a **Feature Group** and **Door Job** that is identified as a **Library Principle Variant**.

In this example, after **Door Job** file was added to the **Door Job**, the **Hinge Bevel** was changed from 3 to 0 causing the variant.

In this example, after **Feature Group** file was added to the **Door Job**, the radii of the hinge corners were changed from 0" to 0.25" causing the variant.

The spotted dark gray diamond icon indicates that the **Feature Group** or **Door Data** is a **Library Principle**.

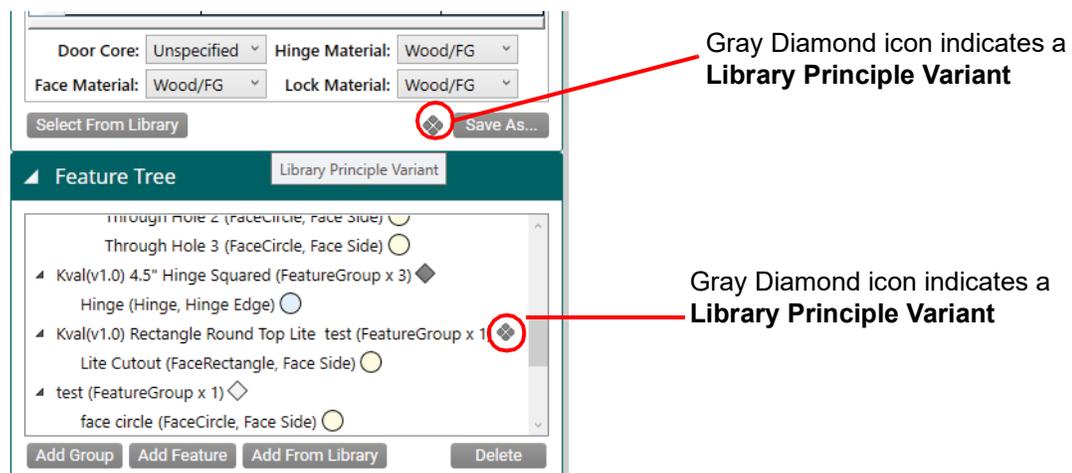


FIGURE 3-13. Library Principle Variant Icon

1. Door Job Library and/or Feature Group Library

## R

### Revision

After editing an existing **Door Job**, **Door Data**, or **Feature Group** in the KvalCAM library, a revision is created. Revisions represent a save point in the history of editing, the **Principle** revision is the current *save* point in the case of **Door Data** or **Feature Group**. In the case of a **Door Job**, the **Principle** is the *loaded* version into the editor. More information about **Revisions** can be found in the “KvalCAM Reference Manual”.

### Right Hand Doors and Right Hand Reverse Doors

See “Right Hand Door” on page 3-11

## V

### Validation

All feature groups are analyzed by a validation routine before the software permits the operator to download the programmed cut to the machines for processing.

The validation routine queries the capabilities of each machine and current tools loaded to determine if the programmed cuts can be performed by the line. If at least one machine in the line is capable of performing each cut/feature in the group, the group will be considered valid and the Add to Queue button will be enabled.

If any feature or cut fails validation, however, an Orange or Red box will be highlighted over the faulty cut/feature for review and the **Add to Queue** button will be disabled. [Figure 3-14](#) shows a feature that fails validation.

**Note:** Red only appears if the expression cannot be interpreted to a real number for validation, while orange appears if the line cannot perform the cut.

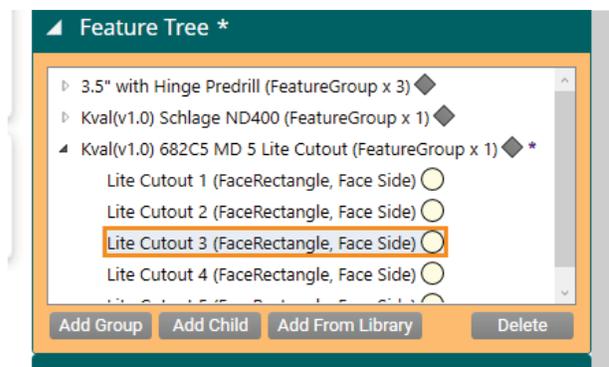


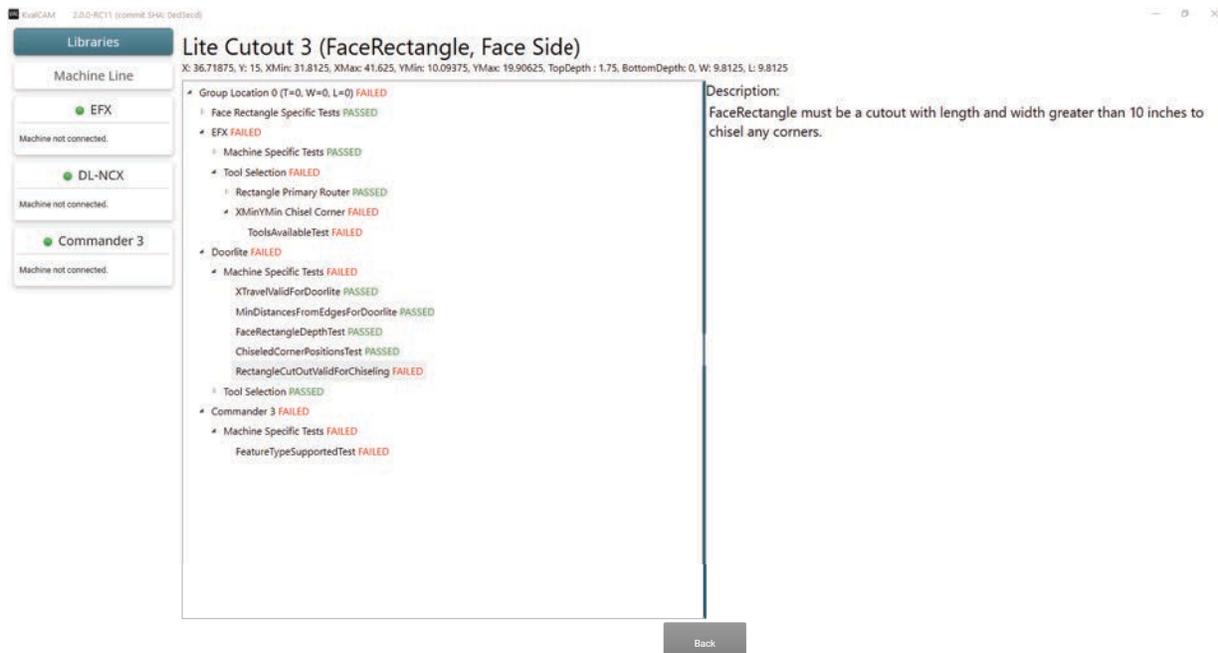
FIGURE 3-14. Example of a Validation Error Indication

## Validation Report

Validation Report identifies particular faults that would cause a feature to fail a process step. Each feature has its own validation tests and will fail if the tests for a valid feature are not satisfied. Clicking on a specific test will provide an explanation of the test being performed so that the user can correct the mistake. [Figure 3-15](#) shows an example of a Validation Report.

**Note:** Validation will only work if the information that is fed to the machine line is accurate. Inaccurate information that is downloaded from Tool Configurations, Calibrations, or Libraries (e.g. material types) will produce unexpected or potentially harmful results to the machine and/or operator.

**Note:** Some process cuts in fringe cases may pass validation that results in non-conforming cuts (cut does not match visual representation). If this incident occurs, it is recommended to contact the Kval Service Group. See the **Contacting Kval** information that is located on the back of the front cover of this manual.



**FIGURE 3-15. Example of a Validation Report**

## Variant

A variant refers to a **Revision** that has been modified **after** adding it to a **Door Job**. Modified **Variants** are only created by editing a **Revision** inside of a **Door Job**, and can never be directly added to a **Door Job**.

**Variants** track the use of a **Revision** while still allowing a change to the **Revision** to suit the purposes of the **Door Job**.

For example, there may be a **Feature Group** that represents cuts for a particular lock, but the location of the lock varies between **Door Jobs**. By adding the lock **Feature Group** to the **Door Job**, then changing its location, and saving the **Door Job** a modified **Variant** will be created.

When looking at the associated **Door Jobs** of that lock **Revision** all of the **Door Jobs** will be listed, even if the location varies between the jobs.

Figure 3- 16 Shows an example of a Door Lite Cutout **Feature Group** with a variant that is associated with a **Test Door Job**.

The screenshot displays the 'Feature Group Library' interface. On the left is a 'Last Modified' list with the following entries:

- 9/29/2020 2:04:04 PM
- 9/29/2020 2:04:04 PM
- 9/29/2020 2:04:04 PM
- 9/29/2020 2:03:25 PM
- 9/29/2020 2:03:25 PM
- 9/29/2020 2:03:25 PM
- 9/29/2020 2:02:09 PM
- 9/29/2020 2:02:08 PM
- 9/29/2020 2:02:08 PM
- 11/16/2018 9:14:47 AM
- 11/16/2018 9:13:50 AM
- 11/16/2018 8:55:08 AM

The main panel shows details for 'Kval(v1.0) 682C5 MD 5 Lite Cutout'. It includes the ID: 26b3477d-9ee3-4714-b9fe-b7e569a638b1 and Revision ID: 1e3cb98e-6a6f-4ad2-a151-c0eff439c130. Below this is a 'Revisions' table:

Name	Description	Created
Kval(v1.0) 682C5 MD 5 Lite Cutout	Modern Door 5 S	11/16/2018 9:14:47 A

Buttons for 'Principle' and 'Diff' are visible. The 'Associated Door Jobs' section shows a table with one entry:

Name	Description	Last Modified
test	test	10/2/2020 12:39:50

The 'Variants in Selected Job' section shows a table with one entry:

Name	Description	Created
Kval(v1.0) 682C5 MD 5 Lite Cutout 1a	Modern Door 5 S	10/2/2020 12:39:50

FIGURE 3- 16. Example of a Variant











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