#### **KVALCAM Reference Guide**



Innovation, Quality & Honesty

# KvalCAM<sup>®</sup> Reference Guide



#### **Proprietary Notice**

This manual is confidential and contains proprietary information and intellectual property of **Kval** Inc., and is to be used solely by Customer as an operating manual for **Kval Inc**. machines. Neither this manual nor any of the information contained herein may be reproduced or disclosed under any circumstances without the express written permission of **Kval Inc**. For authorization to copy this information, please call **Kval Technical Support** at (800) 553-5825 or fax (707) 762-0485.

Manual Name: KvalCAM Reference Guide

Manual Revision: Rev 2

KvalCAM<sup>®</sup> is a registered trademark of Kval Incorporated.

Copyright 2023 Kval Incorporated. All rights reserved.

 $\mathsf{Beckhoff}^{\mathbb{R}},\mathsf{TwinCAT}^{\mathbb{R}},\mathsf{and}\;\mathsf{EtherCat}^{\mathbb{R}}$  are registered trademarks and are licensed by  $\mathsf{Beckhoff}$  Automation GmbH

All other products are trademarks or registered trademarks of their respective holders, all rights reserved. Reference to these products is not intended to imply affiliation with or sponsorship of **Kval Incorporated**.

#### **Contacting Kval**

For further information about this manual or other Kval Incorporated products, please contact us.

#### Mailing address:

Kval Incorporated 825 Petaluma Boulevard South Petaluma, CA 94952

#### Phone and Fax:

call: (800) 553-5825 fax: (707) 762-0485

#### **General Office Business Hours**

Mon-Thu:6:00 AM - 4:00 PM PST Fri: 6:00 AM - 3:30 PM PST

#### Parts

Contact us for all parts related needs, from orders to inquiries. Call, email, contact us on our website at the "Contact Us" page.

email: parts@kvalinc.com

#### **Technical Support**

For machinery support and troubleshooting. Call, email, contact us on our website at the "Contact Us" page.

Mon-Fri:4:00 AM - 4:00 PM PST email: support@kvalinc.com

#### **Field Service Support**

For any other inquiries or to schedule on-site service. Call, email, contact us on our website at the "Contact Us" page.

email: service@kvalinc.com

#### **Sales Support**

For machinery information, specifications, and quotes. Call, email, contact us on our website at the "Contact Us" page.

email: sales@kvalinc.com

#### **Kval Website**

Learn about **Kval**, order parts, get information on our array of machines (including new machine releases), learn about our machine software solutions, download machine documentation, view videos of our machines in action, contact all the departments.

http://www.kvalinc.com



# NOTICE OF OWNERSHIP OF KVALCAM SOFTWARE AND LIMITED LICENSE TO USE

READ THIS NOTICE CAREFULLY BEFORE USING THE KVALCAM SOFTWARE WHICH OPERATES KVAL MACHINERY. THIS DOCUMENT CONSTITUTES NOTICE TO YOU THAT YOU HAVE A LIMITED LICENSE TO USE THE KVALCAM SOFTWARE ON THE TERMS AND CONDITIONS APPEARING BELOW.

BY USING THE KVALCAM SOFTWARE YOU ARE CONSENTING TO BE BOUND BY THIS LIMITED LICENSE. IF YOU DO NOT AGREE TO ALL OF THE TERMS OF THIS LICENSE, THEN DO NOT USE THE KVALCAM SOFTWARE.

KVAL, Inc., is the owner of all rights in respect of the software and documentation (referred to as "Licensor"). You are the purchaser of KVAL Machinery operated by the KVALCAM Software are the "Licensee".

The computer program(s) and related documentation and materials (herein collectively referred to as "the KvalCAM Software" and further defined herein) which are used in the operation of the KVAL Machinery are licensed, not sold, to you for use only upon the limited terms of this license, and Licensor reserves any rights not expressly granted to you. Licensor retains all ownership of the KvalCAM Software.

Title, ownership rights, and intellectual property rights in the KvalCAM Software shall remain with KVAL, Inc. The KVALCAM Software is protected by copyright laws and treaties. Title and related rights in the content generated through the KVALCAM Software are also the property of the Licensor and are protected by applicable law.

#### 1. **Definitions**.

**a**."KVALCAM Software" means the KVALCAM computer application installed in the KVAL Machinery and written documentation and materials provided to you, as well as any res or updates of such computer application and documentation.

**b**."Install" means storing of the KVALCAM Software in the computer component of the KVAL Machinery.

**c**."Use" means executing the KVALCAM Software for purpose of operating the KVAL Machinery and use of the documentation for properly operating KVALCAM Software.

#### 2. Grant of License.

**a**.Licensor hereby grants Licensee a non-exclusive, non-transferable license to Use the KVAL-CAM Software upon payment of all amounts due for the purchase of the related KVAL Machinery.

**b**.Licensee will make no copies of the KVALCAM Software or alter the KVALCAM Software in any way. Title to the KVALCAM Software will remain vested in Licensor, and nothing in this License will give or convey any right, title or interest therein to Licensee except as a licensee.

**c**.Licensee agrees that it will use the KVALCAM Software or related documentation directly or indirectly for the benefit of Licensee, and only pursuant to the scope of the grant of the License set forth herein.

**d**.Licensee will not decode, alter, decompile, reverse engineer, perform reverse analysis on or disassemble the KVALCAM Software.

**e**. This License will terminate automatically if Licensee fails to comply with the limitations described above.



# Chapter 1 KvalCAM Reference

About KvalCAM	1-2
Summary of the KvalCAM Interface	1-3
Machine Line	1-3
Libraries	1-3
Machine Control	1-4
About the Libraries	1-5
Distinguish Between the Library Types	1-5
About the Door Job Library Screen	
About the Door Data Library Screen	
About the Feature Group Library Screen	
Controls at the Library Screen	
Using the Door File Table	
Using the Display Deleted Check Box (Recover a Door File)	
Using the File Control Buttons	
Using the Create Button Using the Edit/View Button	
Using the Clone Button	
Using the Delete/Restore Button	
Using the Diff Button	
About the Database Icon	
About Revisions	1-14
Principle and Diff	1-14
Revisions at the Door Job Library	1-14
Revisions at the Door Data Library	
Revisions at the Door Feature Group Library	
About Door Job Creation	1-16
About the Door Job Name Menu	1-17
About the Door and Jamb Data Menus	1-18
Door Data and Jamb Data Highlights	1-18
Description of the Door Data Table Selections	1-19
Description of the Jamb Data Table Selections	
Jamb Data Properties	
Jamb Data Property Tables	
Select From Library Save Data	
One Click Expression Copy	
Summary of a Feature Group and Features	
About the Feature Tree Menu	1-26

About the Selected Feature Details Menu	1-27
About the Selected Feature Details Menu (Child Level)	1-28
About the Control Buttons	
About the Control Buttons	1-29
About the Job Preview Screen	1-30
Using the Cube Icon to Navigate	
Color Coding in the Preview Screen	
About the Bottom Buttons	
About the On Machine Button	
About the Show Mode Buttons	1-34
About the Standard View Buttons	1-35
View Buttons	1-36
Lock View	1-36
Hinge View	
Тор View	
Bottom View	
Push and Pull View: Right Hand Door	
Push and Pull View: Left Hand Door	
Push and Pull View: Left Hand Reverse Door	
Push and Pull View: Right Hand Reverse Door	
Mouse Operation	
Keyboard Shortcuts	
Comparing the FaceProfile and LiteCutout Feature Types	
KvalCAM Level	
Editing Screen Comparison	
About the Machine Line Screen	1-46
Machine Line Screen	1-46
About Backing up Data and Checking the Revision Status	s <b> 1-50</b>

# Chapter 2 KvalCAM Examples

Door Data Process Steps	
About the Door Data Process Steps	2-2
Jamb Data Process Steps	
About the Jamb Data Process Steps	2-3
About Jamb Data Properties Table	2-4
About Feature Types	2-5
About Edge Feature Types	
About Edge Feature Types	2-6
About the Door Edge Sides	2-6



About Face Feature Types	2-7
About Face Feature Types	
Face Features Overview	2-7
An Example of a Lock Feature Group	2-8
About Feature Group Parent and Children	2-8
Example of the Lock Feature Group	
About the Lock Feature Group Properties	
About the Lock Edge Rectangle Feature Type	
About the Lock Edge Plate Feature Details Descriptions	
About Radius 1-4 Properties	
About the Lock Edge Circle Feature Types	
About the Lock Edge Plunge Circle Feature Detail Table	
About the Lock Predrill Hole Locations and Dimensions	
About Lock FaceCircle Feature	
About the Lock Face Circle Feature Details Description	
About the Face Circle Through Hole 1	
About the Face Circle Through Holes 2 and 3	
An Example of a Tee-Shape Feature	
About the TeeRelativeLocation	
About the TeeLength and TeeWidth	
About the MainLength and MainWidth	
About the Radius1 through Radius4	
About the EntryRadius1 and EntryRadius2	
An Example of 3.5" Hinges with Predrills	
About Feature Group Parent and Children	
About the Hinge Feature Group	
About the Hinge Feature Details	
About the Hinge Properties	
About the Hinge Locations About the Predrill Holes	
About the Predrill Locations on the Hinge	
About the Jamb Hinge Properties	
An Example of a Face Rectangle with Round Top	
About Feature Group Parent and Children	
About Face Rectangle Coordinate References	
About the FaceRectangle Details	
About Shape Location Information	
About Shape Parameter Information	
Process to Create a FaceProfile Feature Type	
Process	
FaceProfile Process Summary	2-33

Process to Create LiteCutout Feature Type	2-34
Process	2-34
LiteCutout Process Summary	2-34
About the FaceProfile and LiteCutout Editing Screen	2-35
About the Editing Screen	
About the Status Panel	
About the View Settings Panel	2-36
About the Parameters Panel	
About the Work Area	2-38
About the Work Area Coordinates	2-38
About the Task Bar	2-39
The Import DXF Button	2-39
The OK Button	2-39
The Cancel Button	2-39
The Insert Vertex Button	2-39
The Delete Selected Button	2-39
The Offset Profile Button	2-39
The Weed Vertexes Button	2-40

# Chapter 3 KvalCAM Common Terms

Ad Hoc	.3-2
Axis	.3-2
Cube Icon	.3-4
Dado	.3-5
Diff	.3-6
Door Data	.3-6
Door Data Library	.3-7
Door Job	.3-8
Door Job Library	.3-8
Expressions	.3-9
Common Door Expressions	.3-9
Feature	3-10
Feature Group	3-10
Feature Group Library	3-11
Handing	3-12
Left Hand Door	3-13
Right Hand Door	3-13
Jamb Data Table	3-14
Jamb Data Table Content	3-15
The properties available in the Jamb Data table are listed below	3-15
Library Principle Variant	3-16



Rabbet	3-18
Right Hand Doors and Right Hand Reverse Doors	
Validation	
Validation Report	3-20
Variant	
Table of Symbols and Keywords	3-23
Common Door and Jamb Properties	3-24
Door Properties	3-24
Jamb Properties	3-24
Supported Math Constants	3-26



NAL

# CHAPTER 1 KvalCAM Reference

This chapter describes the **KvalCAM** interface.

# Chapter 1 at a Glance

Section Name	Summary	Page
About KvalCAM	KvalCAM overview.	page 1-2
Summary of the KvalCAM Interface	Description of the Machine Line, Libraries, and Machine Control interfaces	page 1-3
About KvalCAM Libraries	Describes the KvalCAM library selections and differences associated with them.	page 1-5
Controls at the Library Screen	Describes the various controls to operate the controls at the library interface.	page 1-8
About Revisions	Describes the available revision options.	page 1-14
About Door Job Creation	Describes the interface selections at the Door Job screen. Including: Door Job Name Table page 1-17 Door and Jamb Data Tables page 1-18 Feature Groups page 1-25 Control Buttons page 1-29 Job Preview Screen page 1-30	page 1-16
Comparing the FaceProfile and LiteCutout Feature Types	Describes the Lite Cutout machine options to create a face cutout.	page 1-44
About the Machine Line Screen	Describes the controls to machine a door with the properties of the selected Door Job.	page 1-46
About Backing up Data and Checking the Revision Status	Describes the options to backup data and check revision status of KvalCAM.	page 1-50



## About KvalCAM

**KvalCAM** allows you to easily define the shapes, sizes, and locations to machine a door. The **Kval-CAM** 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.

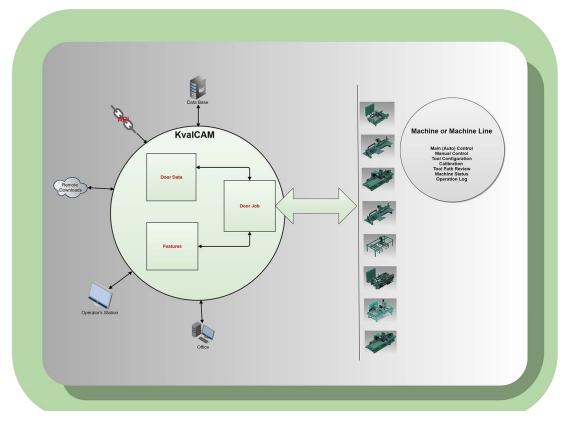


FIGURE 1-1. Input Block Diagram



### 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.

Libraries			Door Job Library	Door Data Library	Feature Group Library		
Machine Line			Door Job Library	Door Data Library	Feature Group Library		
Vision-FS	Name Contains:	Description Contains:					Display De
Aachine not connected.	Name	Description				Created	Last Modified
	# DD Extra Props	contains "Adamantium" enum for	DoorCoreMaterial			11/22/2019 12:22:34 AM	11/22/2019 12:22:34 AM
Face-SS	# DD Extra Props	contains "LaterVersionProp"				11/22/2019 12:22:33 AM	11/22/2019 12:22:33 AM
	3/0 x 7/0 Wood					2/2/2018 5:48:43 PM	2/2/2018 5:48:43 PM
Machine not connected.	3/0 x 8/0 Wood					2/2/2018 5:48:43 PM	2/2/2018 5:48:43 PM
	3/0 x 9/0 Wood					2/2/2018 5:48:43 PM	2/2/2018 5:48:43 PM
Edge-SS	3/0 x 9/0 Wood Inactive					2/2/2018 5:48:43 PM	2/2/2018 5:48:43 PM
,	Cut Out Calibrations	Calibrations				2/2/2018 5:48:43 PM	2/2/2018 5:48:43 PM
Machine not connected.	Empty Door					2/2/2018 5:48:43 PM	2/2/2018 5:48:43 PM
	LH: W23.8125 L96 T1.73					2/13/2018 12:42:03 AM	9/11/2018 7:13:24 PM
DL-NCX	LH: W27.75 L83.125 T1.75					2/2/2018 5:48:43 PM	2/2/2018 5:48:43 PM
	LH: W29.625 L84 T1.735					3/6/2018 7:59:52 PM	3/6/2018 7:59:52 PM
Machine not connected.	LH: W29.625 L84 T1.75					3/6/2018 7:59:52 PM	3/6/2018 7:59:52 PM
	LH: W30 L84 T1.75					10/3/2018 6:04:15 PM	10/4/2018 6:21:41 AM
	LH: W30.375 L81.8125 T1.75					2/2/2018 5:48:43 PM	2/2/2018 5:48:43 PM
	LH: W35.5 L96 T1.75					2/2/2018 5:48:43 PM	2/2/2018 5:48:43 PM
	LH: W35.75 L82.375 T1.75					2/22/2018 7:44:32 PM	2/22/2018 7:50:26 PM
	LH: W35.812 L83.25 T1.75					2/13/2018 12:42:02 AM	2/13/2018 12:42:02 AM
	LH: W35.812 L93.5 T1.75					2/14/2018 7:37:04 PM	2/14/2018 7:37:04 PM
	LH: W35.812 L96 T1.75					2/2/2018 5:48:43 PM	2/2/2018 5:48:43 PM
	LH: W35.925 L80 T1.75					4/26/2018 1:42:30 AM	4/26/2018 1:42:30 AM
	LH: W36 L80 T1.75					4/26/2018 1:42:30 AM	4/26/2018 1:42:30 AM
	LH: W36 L80 T1.75					2/2/2018 5:48:44 PM	2/2/2018 5:48:44 PM
	LH: W36 L80 T1.75					4/26/2018 1:42:30 AM	4/26/2018 1:42:30 AM
	LH: W36 L80 T1.75					4/26/2018 1:42:30 AM	4/26/2018 1:42:30 AM
	LH: W36 L80 T2					4/26/2018 1:42:30 AM	4/26/2018 1:42:30 AM
	Door Data Count: 48						
	Door Data Count: 48						

**KvalCAM Reference Guide** 

#### **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.

Libraries	Calibration		Tool Path	Preview Test	Status	Log
Machine Line	Main Contro	ol	Manual Control		Tool Usage	Tool Config
Face-SS					-	_
Machine not connected.		Main Control			Width Adjust And Feed Cor	ntrol
					Manual Feed	Feed Mode
Edge-SS	Home Machine	Reset Machine	Setup Mode Off	Reverse	Forward Feed Fast	
Machine not connected.					Manual Width Adjust	
• DL-NCX	Park Current Tool	Abort Job		Open	Close	Auto Feed OFF 🔻
Machine not connected.	Cu	rrent Servo Post	ion			
• EFX	X	Y Z	Width	Toggle Clamp	Toggle Stop	
Machine not connected.		Routine Speed				
	Speed Per 0 25		75 100	Door Length Probe Disabled	Lock Edge Depth Probe Disabled	



## 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.

KvalCAM	0.0.1-RC5 (commit SHA: 68b7(
	Libraries
Ν	/lachine Line

#### **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

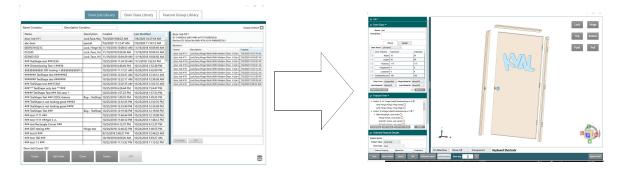
Detail	Door Job	Door Data	Feature Group
Saves Cut Information	Yes	No	Yes
Saves Door Parameters	Yes	Yes	No
Number of Feature Groups Allowed	Many	0	1
Load Work onto Machines (Cut Doors)	Yes	No	<sup>1</sup> Yes

1. For Testing Purposes Only



Below is a list of highlights about this screen.

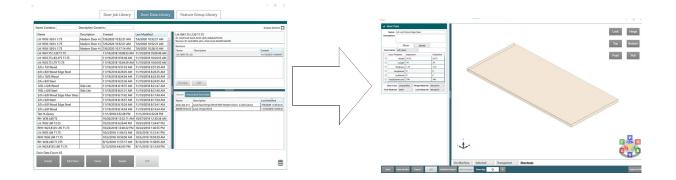
- Select a file from the table to open the **Door Job Creation** screen.
- The **Door Job Library** contains all the files in the selected database.
- The **Door Job Files** contain all the information to create a door.
- Files support revisions.



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.

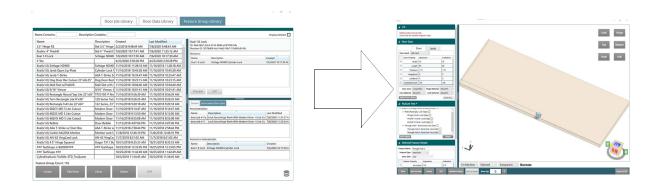




#### About the Feature Group Library Screen

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.

lame Contains: Description Co		Dibrary Door	Data Library Fea	ture Group Library
Name door Job #11 abc door	Description	Created 7/6/2020 9:08:22 AM 7/6/2020 11:12:47 AM	Last Modified 7/8/2020 10:27:54 AM 7/6/2020 11:14:12 AM	door Job #11 1D: 311405e2-ae83-4485-ae7f-7d1ef82fe226 Revision ID: 0e2ee14a-8d8c-47fe-b314-f4d8668129c1
08595741621C 012345 0254631521 ### TeeShape test ###1234	Lock, Face, Hir	11/19/2018 9:59:38 AM	11/19/2018 10:09:49 AM 11/19/2018 10:04:55 AM 11/19/2018 10:04:50 AM 11/1/2018 1:52:53 PM	Revisions:         Created           Name         Description         Created           door Job #11         Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/8/2020 10:27:54           door Job #10 a         Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/6/2020 10:53:23           door Job #10 a         Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/6/2020 10:53:23
### Dimensioning Test 1 ###34 @@@@@@@@ DXF testing 1 @@@@@@@@02 ####### TeeShape test ####### ### TeeShape test ########		10/05/0010 10 00 11 114	10/31/2018 1:52:38 PM 10/29/2018 3:42:09 PM 10/27/2018 12:34:31 AM 10/27/2018 12:30:38 AM 0/26/2018 12:02 <b>*5</b> AM	door Job #10         Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/6/2020 10.52:21           door Job #10         Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/6/2020 10.27:12           door Job #10         Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/6/2020 10.23:12           door Job #10         Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/6/2020 10.23:12           door Job #10         Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/6/2020 10.23:12           door Job #10         Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/6/2020 10.53:12           door Job #10         Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/6/2020 10.53:12           door Job #10         Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/6/2020 10.53:12           door Job #10         Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/6/2020 10.53:12
###*** TeeShape only test ***### ##### TeeShape Test ### Fail case 1 ### TeeShape Test ### COOL feature ### TeeShape is not looking good ####2		10/25/2018 1:49:35 PM 10/25/2018 12:52:35 PM	0/25/2018 7:24: PM 0/25/2018 1:57:23 PM 10/25/2018 1:49:35 PM 10/25/2018 1:2:52:35 PM	Right Click the border and dra to display the Revision Pane.
### TeeShape is not looking good #### ### TeeShape Test ### ### test 1111 ### ### test 1111 ###gm k .n,	Bug - TeeShap	10/25/2018 12:19:38 PM 10/23/2018 11:40:44 PM	10/25/2018 12:33:49 PM 10/25/2018 12:19:38 PM 10/25/2018 12:10:08 PM 10/24/2018 11:48:12 PM	Revision Display Pane
### test Rectangle Corner ### ### DXF testing ### ### test 6 ### ### test 100 ###	Hinge test	10/24/2018 6:12:37 PM 10/24/2018 12:40:22 PM 9/12/2018 2:46:21 PM 10/18/2018 8:00:26 AM	10/24/2018 6:12:37 PM 10/24/2018 1:40:55 PM 10/24/2018 12:46:25 AM 10/23/2018 5:03:27 AM	
### test 1.1 ### Door Job Count: 107			10/22/2018 11:13:52 PM 🗸	Principle Diff

#### 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.

lame Contains: Descr	iption Contains:	Sear	ch Boxes			Check Bo	X Display Deleted:
Name	Description	Created	Last Modified		door Job #11		
door Job #11	Lock,Face,Hing	7/6/2020 9:08:22 AM	7/8/2020 10:27:54 AM	^		83-4485-ae7f-7d1ef82fe226 ee14a-8d8c-47fe-b314-f4d8668129c1	
abc door	special	7/6/2020 11:12:47 AM	7/6/2020 11:14:12 AM		Revisions:	ee 14a-0000-471e-b5 14-14000012501	
08595741621C	Lock, Hinge W	11/19/2018 10:08:53 AM	11/19/2018 10:09:49 AM		Name	Description	Created
012345	Lock, Face, Hir	11/19/2018 9:59:38 AM	11/19/2018 10:04:55 AM		door Job #11	Lock,Face,Hinge Work With Modern Door 4 Lite (	
0254631521	Lock, Face, Hir	11/19/2018 10:04:39 AM	11/19/2018 10:04:50 AM			Lock,Face,Hinge Work With Modern Door 4 Lite (	
### TeeShape test ###1234		10/25/2018 11:34:19 AM	11/1/2018 1:52:53 PM		door Job #10 a	Lock,Face,Hinge Work With Modern Door 4 Lite (	7/6/2020 10:53:23 A

#### 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.

Name Contains: Description Cont	ains:		Display Deleted
Name	Description	Created	Last Modified
## Hinge test ###		9/1/2020 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	
### TeeShape Test ### COOL feature		10/25/2018 1:49:35 PM	9/17/2020 11:58:50 AM
### TaaShana tact ###1234		10/25/2019 11-24-10 AM	11/1/2018 1-52-52 DM

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

ob Count: 11	0			
Create	Edit/View	Clone	Restore	Diff



#### **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.

Door Job Count: 1	06			
Create	Edit/View	Clone	Delete	Diff

#### Using the Edit/View Button

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

Door Job Count: 10			
Create	Edit/View	lone Delete	Diff

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.

Door Job Count: 10	6					
Create	Edit/View	Clone	Delete	Diff		9

#### 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.

KvalCAM Reference Guide



### test 6 ###			
### test 7 ###			
### test Re Clone Selected	×		
#### Func Name: rename			
##### TeeS			Clana Dan Un Saraan
####### Te Description: add new or adjust the origin	al description		Clone Pop-Up Screen
###### Те			
###*** TeeS			
(test) time 1 Sav	e Cancel		
Door Job Count: 110			
Create Edit/View Clone	Restore	Diff	

#### Using the Delete/Restore Button

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

Door Job Count: 10	106			
Create	Edit/View	Clone	Delete	Diff

**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.

## test Rectangle	fgm k .n, e Corner ###				10/24/2018 11:48:12 PM 10/24/2018 11:48:12 10/24/2018 6:12:37 PM 10/24/2018 6:12:37 FM	_
## DXF testing #	e#	Hinge te	st		10/24/2018 12:40:22 PM 10/24/2018 1:40:55 F	PM 👃
oor Job Count: 10	06					
Create	Edit/View	Clone	Delete	Diff		

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.

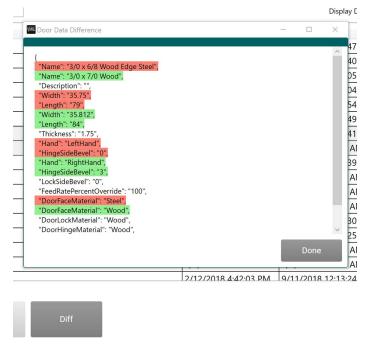


FIGURE 1-3. Comparing Two Files

#### About the Database Icon

In some instances, multiple databases may be available. Follow the procedure below to connect to different database

l	Diff	

#### 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.

Duta Source PostgreSQL: host=db.kvaline	local;username = kvai;password = ;database = kvaicam;port = 5432;	Connect
Status Connection state: Connectee Server: db.kvalinc.Jocal Database: kvalcam User: kval	Server version: 12.3 (Ubuntu 12.3-1.pgdg18.04+1) Database version: 2.7.3	
		Go to Libraries

#### 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.

Name Contains: Description Co	ntains:			Display Deleted:
Name	Description	Created	Last Modified	door Job #11
door Job #11	Lock,Face,Hing	7/6/2020 9:08:22 AM	7/8/2020 10:27:54 AM	ID: 31b405e2-ae83-4485-ae7f-7d1ef82fe226 Revision ID: 0e2ee14a-8d8c-47fe-b314-f4d8668129c1
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	Revisions:
012345	Lock, Face, Hir	11/19/2018 9:59:38 AM	11/19/2018 10:04:55 AM	Name Description Created door Job #11 Lock Face, Hinge Work With Modern Door 4 Lite ( 7/8/2020 10:27:54 A
0254631521	Lock Face, Hir	11/19/2018 10:04:39 AM	11/19/2018 10:04:50 AM	door Job #11 Lock Face, Hinge Work With Modern Door 4 Lite C 7/6/2020 10:27:54 A
### TeeShape test ###1234				door Job #10 a Lock Face Hinge Work With Modern Door 4 Lite C 7/6/2020 10:53:23 A
### Dimensioning Test 1 ###34		10/30/2018 6:40:44 PM	10/31/2018 1:52:38 PM	door Job #10 a Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/6/2020 10:52:21 A
@@@@@@@ DXF testing 1 @@@@@@@@12				door Job #10 Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/6/2020 10:27:14 A
####### TeeShape test #######2				door Job #10 Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/6/2020 10:23:22 A
####### TeeShape test #######				door Job #10 Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/6/2020 10:12:09 A door Job #10 Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/6/2020 10:05:56 A
### TeeShape test ###12342			10/26/2018 12:02:35 AM	door Job #10 Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/6/2020 1005:56 A door Job #10 Lock,Face,Hinge Work With Modern Door 4 Lite ( 7/6/2020 908:22 AM
###*** TeeShape only test ***###		10/25/2018 6:26:44 PM	10/25/2018 7:24:47 PM	
##### TeeShape Test ### Fail case 1	-	10/25/2018 1:57:23 PM	10/25/2018 1:57:23 PM	
### TeeShape Test ### COOL feature	Bug - TeeShap		10/25/2018 1:49:35 PM	
### TeeShape is not looking good ####2	ing interior		and the second se	
### TeeShape is not looking good ####			10/25/2018 12:33:49 PM	
### TeeShape Test ###	Bug - TeeShan	10/25/2018 12:19:38 PM	10/25/2018 12:19:38 PM	
### test 1111 ###	oug recomp	10/23/2018 11:40:44 PM	10/25/2018 12:10:08 PM	
### test 1111 ###am k.n.			10/24/2018 11:48:12 PM	
### test Rectangle Corner ###		10/24/2018 6:12:37 PM	10/24/2018 6:12:37 PM	
### DXF testing ###	Hinge test			
### test 6 ###	,	9/12/2018 2:46:21 PM	10/24/2018 12:46:25 AM	
### test 100 ###		10/18/2018 8:00:26 AM	10/23/2018 5:03:27 AM	
### test 1.1 ###		10/22/2018 11-13-52 PM	10/22/2018 11:13:52 PM	Principle Diff



#### **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.

		Door Job Library	Door Data Library		e Group Library	
Name Contains:	Description Conta	ins:				Display Deleted
Name	Description	Created	Last Modified	LH: W41.75 L1		
LH: W36   8/0 t 1.75	Modern Door 4 L	7/6/2020 10:52:21 AM	7/6/2020 10:52:21 AM		24-4239-a52b-0e82bd7f337b 2883-e41e-47eb-bcef-b9e007a9e280	
LH: W36   8/0 t 1.75	Modern Door 4 L	7/6/2020 10:52:21 AM	7/6/2020 10:52:21 AM		2003-6416-4760-0061-036007836200	
LH: W36   8/0 t 1.75	Modern Door 4 L	7/6/2020 10:17:14 AM	7/6/2020 10:28:10 AM	Revisions: Name	Description	Created
LH: W41.75 L120 T1.75		11/19/2018 10:08:53 AM	11/19/2018 10:09:49 AM	Name LH: W41.75 L12		11/19/2018 10:0
LH: W35.75 L83.375 T1.75		11/19/2018 9:59:38 AM	11/19/2018 10:04:55 AM	U. HULFJELD		11/13/2010 10:0
LH: W35.75 L79 T1.75		11/19/2018 10:04:39 AM	11/19/2018 10:04:50 AM			
3/0 x 7/0 Wood		11/19/2018 9:57:24 AM	11/19/2018 9:57:39 AM			
4/0 x 8/0 Wood Edge Steel		11/19/2018 8:26:05 AM	11/19/2018 8:26:25 AM			
3/6 x 10/0 Wood		11/19/2018 8:24:54 AM	11/19/2018 8:25:30 AM			
2/6 x 8/0 Steel		11/19/2018 8:23:36 AM	11/19/2018 8:24:05 AM	- Partecharter	Diff	
12SL x 6/8 Wood	Side Lite	11/19/2018 8:19:37 AM	11/19/2018 8:21:47 AM	Principle	Diff	
14SL x 6/8 Steel	Side Lite	11/19/2018 8:21:21 AM	11/19/2018 8:21:40 AM	-		
3/0 x 6/8 Wood Edge Fiber Glass		11/19/2018 8:17:42 AM	11/19/2018 8:17:49 AM	Details Assoc	iated Door Jobs	
3/0 x 6/8 Steel		11/19/2018 8:16:57 AM	11/19/2018 8:17:04 AM	Name	Description	Last Modified
3/0 x 6/8 Wood Edge Steel		11/19/2018 8:15:24 AM	11/19/2018 8:15:41 AM		Lock,Face,Hinge Work With Modern Door 4 Lite Cutout	7/8/2020 11:2
3/0 x 6/8 Wood		11/19/2018 8:14:54 AM	11/19/2018 8:14:54 AM		Lock, Hinge Work	11/19/2018 10
fest % Query		11/1/2018 6:32:28 PM	11/1/2018 6:32:28 PM			2
RH: W36 L80 T2		10/26/2018 12:22:11 AM	10/27/2018 12:30:38 AM			
LH: W36 L80 T2.25		10/25/2018 6:26:44 PM	10/25/2018 7:24:47 PM			
RHR: W23.8125 L96 T1.73		10/24/2018 12:40:22 PM	10/24/2018 1:40:55 PM			
LH: W30 L84 T1.75		10/3/2018 11:04:15 AM	10/3/2018 11:21:41 PM			
RHR: W36 L84 T1.75		10/3/2018 10:59:50 AM	10/3/2018 10:59:50 AM			
RH: W36 L80 T1.375	-	9/12/2018 11:57:17 AM	9/12/2018 11:58:05 AM			
LH: W23.8125 L96 T1.73		2/12/2018 4:42:03 PM	9/11/2018 12:13:24 PM			
LH: W23.8125 L96 T1.73 Door Data Count: 62 Create Edit/View	Clone	2/12/2018 4:42:03 PM Delete	9/11/2018 12:13:24 PM			

#### **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 3-22.

Name Contains: Description	Contains:					
Name 3.5" Hinge R2 Kvalinc 4" Predrill		Created 2/2/2018 9:48:44 AM 7/6/2020 10:17:41 AM	Last Modified 7/8/2020 9:48:43 AM 7/6/2020 11:25:12 AM		: 2e3-4132-9890-a7df11347afb 76d08-4ccf-4ab3-98c7-57a960c6145c	
Kval 1.0 Lock # Tee		7/6/2020 10:17:30 AM 4/23/2020 2:50:28 PM	7/6/2020 10:17:30 AM 4/23/2020 2:50:28 PM	Name Kval 1.0 Lock	Description Schlage ND400 Cylinder Lock	Created 7/6/2020 10:17:30 A
Kval(v1.0) Schlage ND400 Kval(v1.0) Jamb Open Lip Plate Kval(v1.0) Jamb T-Strike Kval(v1.0) Dog Door Rec Cutout 23"x26.25"	Cylinder Lock F ASA T-Strike Se	11/16/2018 10:45:28 AM 11/16/2018 10:35:47 AM	11/16/2018 10:45:28 AM 11/16/2018 10:35:47 AM			
Kval(v1.0) Dog Door Rec Cutout 23 x26.23 Kval(v1.0) Mail Slot w/PreDrill Kval(v1.0) 9/16" Viewer Kval(v1.0) Rectangle Round Top Lite 22"x36"	Mail Slot with I 9/16" Viewer, E	11/16/2018 10:04:40 AM 11/16/2018 10:04:40 AM 11/16/2018 10:01:41 AM 11/16/2018 9:56:39 AM	11/16/2018 10:04:40 AM	Principle	Diff	
Kval(v1.0) Twin Rectangle Lite 8"x36" Kval(v1.0) Rectangle Full Lite 22"x64" Kval(v1.0) 682C5 MD 5 Lite Cutout	129 Series Twir 122 Series, 23"	11/16/2018 9:26:35 AM 11/16/2018 9:20:18 AM 11/16/2018 9:14:47 AM	11/16/2018 9:26:35 AM 11/16/2018 9:20:18 AM 11/16/2018 9:14:47 AM	Details Asso Associated Job	kiated Door Jobs	
Kval(v1.0) 68255 MD 5 Lite Cutout Kval(v1.0) 68255 MD 5 Lite Cutout Kval(v1.0) 682H5 MD 5 Lite Cutout Kval(v1.0) ReStile	Modern Door :	11/16/2018 9:13:50 AM 11/16/2018 8:55:08 AM 11/15/2018 4:07:06 PM	11/16/2018 9:13:50 AM 11/16/2018 8:55:08 AM 11/15/2018 4:07:06 PM	Name door job #11a	Description Lock,Face,Hinge Work With Modern Door 4 Lite C Lock,Face,Hinge Work With Modern Door 4 Lite C	
Kval(v1.0) ASA T-Strike w/ Dust Box Kval(v1.0) Corbin ML2054 Mortise Kval(v1.0) AN-62 VingCard Lock	Mortise Lock C AN-62 VingCa	11/15/2018 2:58:44 PM 11/8/2018 12:46:10 PM 11/7/2018 8:21:02 AM	11/15/2018 2:58:44 PM 11/8/2018 12:46:10 PM 11/7/2018 8:21:02 AM	Variants in Sele	sted job:	
Kval(v1.0) 4.5" Hinge Squared ### TeeShape is BADDD### ### TeeShape ###	Hager T311 Ste ### TeeShape				Description Schlage ND400 Cylinder Lock	Created 7/6/2020 10:17:30
CylindricalLock-TruStile-STD_TruQuote Feature Group Count: 116		10/3/2018 11:34:45 AM	10/3/2018 11:34:45 AM			



## **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 3-20.



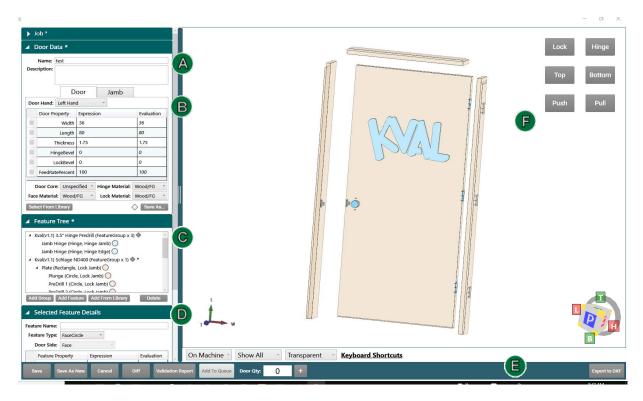


FIGURE 1-4. Door Job Screen



## About the Door Job Name Menu

At the top of the screen to the left, enter the desired name of the door job int the **Job Name** text box. To identify the **Door Job** fully, enter a description in the **Job Description** text box.

	Job	Jo
Job Name:	12874985	in
Job Description:	6-8' Oak Wood	<b>Jo</b> l tior
		Job Name: 12874985 Job Description: 6-8' Oak Wood

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

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

FIGURE 1-5. Door Job Name Section

The name and description are be displayed in **Door Job Library** along with the creation date and date of any modifications. See Figure 1- 6 below.

	Door Job Library Door Da	ita Lib	rary Feature Group	o Library
me Contains: De	scription Contains:	××		
lame	Description	<b>9</b> 1	eated	Last Modified
2874985	6- Oak Wood	-0-	19/2023 2:35:13 PM	1/19/2023 2:35:13 PM
pex_8-0 Door, i Sync, i async	8-0 doo, i sync group, i async feature, i clamp group	-0-	20/2022 11.24.07 AIVI	4/20/2022 11.24.07 AW
pex_8-0 Door, 2 Sync, 1 clamp	8-0 door, 2 sync groups, 1 clamp group		20/2022 11:24:01 AM	4/20/2022 11:24:01 AM
Apex_8-0 Door, 2 Sync, 2 clamp	8-0 door, 2 sync groups, 2 clamps groups	*	20/2022 11:24:24 AM	4/20/2022 11:24:24 AM
Apex_Common 6-8	Common 6-8 door, wiht three hinges	Т.	20/2022 11:24:40 AM	4/20/2022 11:24:40 AM
Apex_Common 6-8	Common 6-8 door, wiht three hinges	- 4	/20/2022 11:18:22 AM	4/20/2022 11:18:22 AM
Apex_Common 6-8 (2 hinge)	Common 6-8 door with 2 hinges. Center hinge must sync, but not run.	4	/20/2022 11:24:32 AM	4/20/2022 11:24:32 AM
Apex_Common 6-8 40	Common 6-8 door, wiht three hinges	7	/19/2022 1:09:32 PM	7/19/2022 1:09:32 PM
Apex_Common 6-8 barry	Common 6-8 door, wiht three hinges	5	/19/2022 4:12:45 PM	5/19/2022 4:31:43 PM
Apex_Common 6-8 barry jamb	Common 6-8 door, wiht three hinges	7	/14/2022 1:26:00 PM	7/14/2022 1:26:00 PM
Apex Common 6-8 barry bb jamb	Common 6-8 door, wiht three hinges	7	/19/2022 10:57:41 AM	7/19/2022 10:57:41 AM

FIGURE 1-6. Door Library



## About the Door and Jamb Data Menus

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.

В	Name: Test
	Description: KvalCAM vers 2.0
	Door Jamb
	Door Hand: Left Hand Y
	Door Property Expression Evaluat

#### **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 D	ata *			Name and Description: Add a file
Name:	Test			name and description.
Description:	KvalCAM	vers 2.0		<b>Door Hand:</b> Select the Hand Orientation of the Door. From the drip down menu,
	D	oor Jamb		• Left Hand
Door Hand:	Left Han	d ~		• Right Hand
Door Pr	operty	Expression	Evaluation	Left Hand Reversed
1	Width	36	36	<ul> <li>Right Hand Reversed</li> </ul>
1	Length	82	82	<b>Door Parameters:</b> Displays the basic
ii i	Thickness	1.75	1.75	parameters of the door being processed.
н	ingeBevel	0	0	FeedRate% Override: Manually adjust the
i I	ockBevel	0	0	servo speed of the drill / routers. For example
FeedRa	tePercent	100	100	for a harder material may call for a lower per centage.
Door Cor Face Materia Select From	al: Wood	5	I: Wood/FG ¥ I: Wood/ <del>EG ¥</del> Save As	<b>Door Core:</b> Clamping pressure will adjust to the selection. (Unspecified, Hollow, or Foam)
				<b>Door Material:</b> Select type of material of the Face, Hinge side, and Lock side of the door. (Wood, Fiber -Glass, or Steel)

FIGURE 1-8. 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.

#### **Jamb Data Properties**

Each properties table lists the following parameters:

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



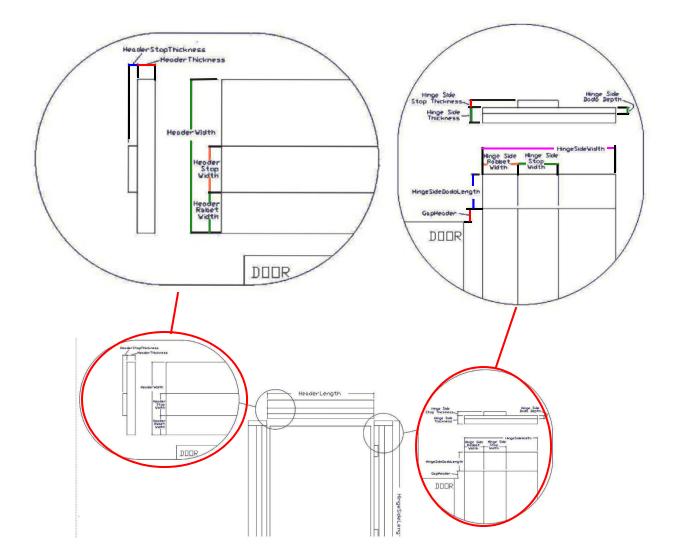


FIGURE 1-9. Jamb Properties

#### **Jamb Data Property Tables**

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. Figure 1- 10 below shows the **KvalCAM** tables.

Ν	ame: test		
criț	otion: test		
		Door Jamb	
	Ena	able Jamb Parameters: 🔀	
ŀ	linge Side		
			/
	Jamb Property	Expression	Evaluation
	Length	\$Door.Length + \$Jamb.GapHe	81.375
1	Width	6.5	6.5
1	Thickness	1.25	1.25
1	DadoLength	1.25	1.25
1	DadoDepth	0	0
1	RabbetWidth	\$Door.Thickness	1.75
1	StopWidth	\$Jamb.HingeSideWidth - \$Jan	4.75
1	StopThickness	0.5	0.5
ι	ock Side		
	Jamb Property	Expression	Evaluation
1	Length	\$Door.Length + \$Jamb.GapHe	81.375
1	Width	6.5	6.5
1	Thickness	1.25	1.25
	DadoLength	\$Jamb.LockSideThickness	1.25
	DadoDepth	0	0
	RabbetWidth	\$Door.Thickness	1.75
	StopWidth	\$Jamb.LockSideWidth - \$Jaml	

	Jamb Property	Expression	Evaluation
I	Length	\$Door.Width + \$Jamb.G	36.25
I	Width	6.5	6.5
	Thickness	1.25	1.25
	RabbetWidth	\$Door.Thickness	1.75
	StopWidth	\$Jamb.HeaderWidth - \$	4.75
	StopThickness	0.5	0.5
	HingeSideOffset	\$Jamb.GapHingeSide +	0.125
(	Бар		
	Jamb Property	Expression	Evaluation
	HingeSide	0.125	0.125
	LockSide	0.125	0.125
	Header	0.125	0.125

FIGURE 1-10. Jamb Data Tables

Properties available in the Jamb Properties tables are listed below.

Hinge /Jamb Sides	Header	Gap <sup>1</sup>
Length Width Thickness DadoLength <sup>2</sup> DadoDepth RabbetWidth <sup>3</sup> Stop Width	Length Width Thickness RabbetWidth Stop Width Stop Thickness HingeSideOffse <b>t</b>	HingeSideOffset LockSide Header

1. Gap is the space between a closed door and the header, hinge jamb., and lock jamb.

2. A dado is a slot or trench cut into the surface of a jamb. See "Dado" on page 3-4

3. A rabbet is a slot at or near the end of a jamb. See "Rabbet" on page 3-17



#### 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 1-11.

Name: Description:		vers 2.0		
Door Hand: Door P	Left Han	oor Jamb d ~ Expression	Evaluation	
L.	Width	36	36	
	Length	82	82	
<b>*</b> ].	Thickness	1.75	1.75	
й н	ingeBevel	0	0	Select the Select From Library button to
il i	LockBevel	0	0	jump to the Door Data Library.
FeedRa	tePercent	100	100	
Door Co Face Materi			rial: Wood/FG ~ rial: Wood/FG ~	<b>Note:</b> Includes Jamb Data.
Select From	Library			
Select From		-		
Select From			Select Doc	r Data To Add To Job
Select From		scription Contains:	Select Doc	r Data To Add To Job

FIGURE 1-11. 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.

Thick:	ness 1.75	1.75	WK Save	Door Data			- 🗆	×
HingeB	evel 0	0						_
LockB	evel 0	0	Name C	ontains:	Description Contains:			
FeedRatePer	100	100	Name		Description	Created	Last Modified	
reedkatepen	cent 100	100				5/7/2021 10:08:19	5/7/2021 10:08:19	^
Door Core: U	nspecified Y Hinge Materia	al: Wood/FG ~	12SL x	6/8 Wood	Side Lite	11/11/2020 5:00:4	11/11/2020 5:00:4	
		-	14SL x	6/8 Steel	Side Lite	11/11/2020 5:00:4	11/11/2020 5:00:4	
Face Material: W	/ood/FG Y Lock Materia	al: Wood/FG ~	2/6 x 8	I/O Steel		11/11/2020 5:00:4	11/11/2020 5:00:4	$\sim$
Select From Libra	гу	Save As	Na	ame: test				
			Descript	tion:				
Feature Tre	e							
					Save As Ad Hoc Save As Revision	n Save As Ne	ew Cancel	
▲ Kval(v1.1) 3.5"	Hinge Predrill (FeatureGroup	x 3) 🗇 🦳						
Jamb Hinge	(Hinge, Hinge Jamb) 🔵							

FIGURE 1-12. 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.

DL-NCX	Door H	Hand:	Left Han	d ~		
DL-NCX	D	oor Pr	operty	Expression		Evaluation
connected.	1		Width	36		36
	1 T		Length	80		80
Copy DoorData	Ctrl+C	Т	hickness	1.75		1.75
Paste DoorData	Ctrl+V	Hir	ngeBevel	0		0
Save DoorData As		L	ockBevel	0		0
Diff DoorData Edit Diff DoorData Principle		edRat	ePercent	100		100
Diff DoorData Revision		Core	e: Unspe	cified ¥ Hinge Materia	I: Woo	od/FG ×
	Face N	<b>Nateria</b>	I: Wood	/FG Y Lock Materia	I: Woo	od/FG ~

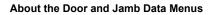
FIGURE 1-13. Pop-Up Window to Save Door Data

#### **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 3-9.

N	ame:	Test			
escri	ption:	KvalCAM	vers 2.0		
		D	oor	Jamb	]
Door	Hand:	Left Han	d	~	
0	oor P	roperty	Expressi	on	Evaluation
-		Width	36		36
-		Length	82		82
-		Thickness	1.75		1.75
1	н	ingeBevel	0		0
1		ockBevel	0		0
F	eedRa	tePercent	100		100
Do	or Cor	e: Unspe	cified ~	Hinge Material:	Wood/FG
ace M	Aateria	al: Wood	/FG ×	Lock Material:	Wood/FG

FIGURE 1-14. 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.

DL-NCX	[	Door Property	Expression	Evaluation
nnected.	Ľ.	Width	36	36
	Ľ.	Length	80	80
Copy DoorData	Ctrl+C	Thickness	1.75	. 1.75
Paste DoorData	Ctrl+V	HingeBevel	0	0
Save DoorData As		LockBevel	0	0
Diff DoorData Edit Diff DoorData Principle		edRatePercent	100	100
Diff DoorData Revision		Core: Unspe	cified 🐣 Hinge Material: Wo	ood/FG ~
	Face	Material: Wood	/FG Y Lock Material: Wo	ood/FG ~

FIGURE 1-15. Pop Up Window to Copy Data





## Summary of a Feature Group and Features

Feature Groups and Features resemble an outline.

С		(Feature Group - Number of Locations)
ature Group Name Istomer Assigned N	▲ Feature Tree *	
	<ul> <li>Kval(v1.0) 4" Hinge Predrill (F</li> <li>Kval(v1.0) Schlage ND400 (Fe</li> </ul>	eatureGroup x 1)
	Lock Plate (Rectangle, Loc Through Hole 1 (FaceCirc)	
ature Name Istomer Assigned N		
istomer Assigned N	Jame) Kval(v1.0) 682H5 MD 5 Lite C Lite Cutout 7 (FaceRectan e shape from the drop-down menu.Rectan	gle, Face Sige)
istomer Assigned N	Lite Cutout (FaceRectan	gle, Face Sige)
istomer Assigned N Shape: Choose	Lite Cutout (FaceRectan e shape from the drop-down menu Rectan pe: Rectangle Add Child Add	gle, Face Sixe)
Shape: Choose Feature Tyj Door Sid	Lite Cutout (FaceRectan e shape from the drop-down menu Rectan pe: Rectangle Add Child Add de: Circle	gle, Face Six
Istomer Assigned N Shape: Choose Feature Tyj Door Sid Property	Lite Cutout (FaceRectan e shape from the drop-down menu Rectan pe: Rectangle Add Child Add de: Circle FaceCircle Exp FaceRectangle	gle, Face Six () le <b>Location of Cut</b> : Choose location from drop-down men <b>From Lib</b> eature Type: Rectangle Door Side: Lock Edge roperty Ext location SD End
Shape: Choose Feature Ty Door Sid Property TLocation	Lite Cutout (FaceRectan e shape from the drop-down menu.Rectan pe: Rectangle Add Child Add de: Circle Exp FaceCircle Exp FaceRectangle SD Hinge	gle, Face Six () le <b>Location of Cut</b> : Choose location from drop-down men <b>Erom Lib</b> eature Type: Rectangle Door Side: Lock Edge Bottom End Top End Location SD Hinge Edge
Istomer Assigned N Shape: Choose Feature Tyj Door Sid Property	Lite Cutout (FaceRectan e shape from the drop-down menu.Rectan e shape from the drop-down menu.Rectan e Rectangle Add Child Add de: FaceCircle Ext FaceRectangle 5D Hinge 0.0 Rectangle TeeShape	gle, Face Six () le <b>Location of Cut</b> : Choose location from drop-down men <b>From Lib</b> eature Type: Rectangle Door Side: Lock Edge roperty Ext location SD End

FIGURE 1-16. Feature Group Summary

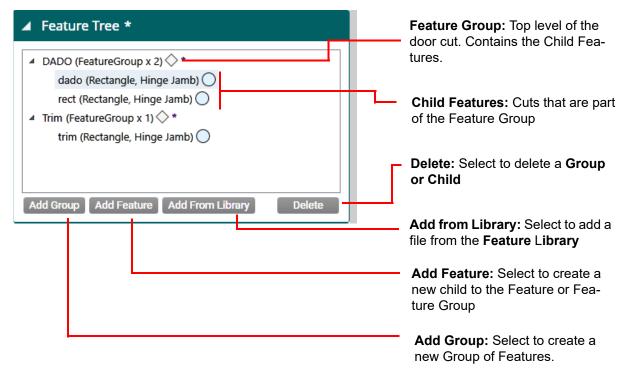


### About the Feature Tree Menu

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 3-20
- **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 1-17. Feature Tree Definitions



## 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- 18 shows a **Hinge Cut** example.

Door Hinge (	- inge Predrill (FeatureGrou Hinge, Hinge Edge) O Feature Add From Libra	~	<b>Feature Group:</b> The selected group is detailed below.
	ture Details e: Kval(v1.1) 3.5" Hinge Pu 1: Std 3.5" Hinge Predrill	redrill	Feature Group Name: This field is required when saving a new tem- plate.
Coordinate Referer			<b>Description:</b> Description of the Feature Group
L Reference: Top W Reference: Lock T Reference: Hing	~ < ~		Coordinate References: Set the reference in relation with the cut. The reference option will be dis- played in Job Preview.
Locations	W Location	T Location	T (Thick) Reference:
7 7	1	0 0	Hinge Pivot Face     Key Face
36.25 <i>36.25</i> 65.5	0	0 0	Opposite Key Face     Opposite Hinge Pivot Face
65.5	0	0	L (Length) Reference:
Add Location Defined Properties Property Name	Remove Location	Evaluation	• Bottom • Top W (Width) Reference:
			• Lock • Hinge
			<b>Locations:</b> Add, Remove, Edit location information.
ned Proper	Remove Property ties: Create a cu Feature Group.		

for the selected Feature Group. In most cases, a Defin 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 1-18. Feature Detail Section Definitions



## 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 form the previous page. The example below details the parameters of the hinge cut. Predrill locations are also included in the example.

4	Kval(v1.1) 3.5" Hind	ge Predrill (FeatureGroup x 3)	◇*	Feature Group Child: The selected group is detailed below.
	Door Hinge (Hi	nge, Hinge Edge) 🔵	~	g
_		ature Add From Library	Delete	<b>Feature Name:</b> Name of The Fea- ture Under the Group.
	Selected Featu			Feature Type: Select type of cut:
	ature Type: Hinge	5		Circle
	Door Side: Hinge			FaceCircle
	Feature Property		Evaluation	FaceRectangle
1.	TLocation	Width / 2.0	0.75	• Hinge
111	LLocation	Length/2	8.75	Rectangle
1.1	Depth		0.134	TeeShape
171	Bevel	0.0	0	FaceProfile
111	Backset	0.25	0.25	LiteCutout
11	Width	\$Door.Thickness - Backset	1.5	(See "About Face Feature Types" on page 2-7.)
11	Length	3.5	3.5	
11	PredrillDepth	Depth+0.5	0.634	
11	PredrillDiameter	0.157	0.157	<b>Door Side:</b> Select Door Side:
11	Radius1	0.25	0.25	Bottom End
11	Radius2	0.25	0.25	• Top End
				Hinge Edge
	drill On: 🗙			Lock Edge
re	drill Locations:	Add Hole Remove Hole		• Hinge Jamb
	X Position	Y Position		• Lock Jamb
	1.395	0.687		Header Jamb
	0	0.36		(See "About Edge Feature Types" on
	-1.395	0.687		page 2-6.)
Att	ached Augmer	ntations: Manage Augme	ntations	Properties Table: Parameters of the cut. Includes Hinge Predrill locations.
-	<b>y Expressi</b> o at row	ons: Click to copy	expression	Manage Augmentations: Add augmentations to the created Feature. Augmentations are cre- ated at the factory to aid common cuts.

FIGURE 1-19. Feature Details Child Section Definitions



## **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.

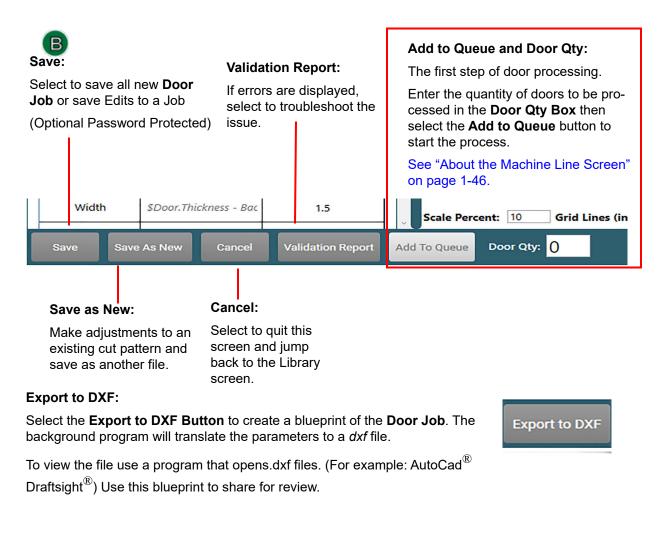


FIGURE 1-20. Control Button Definitions



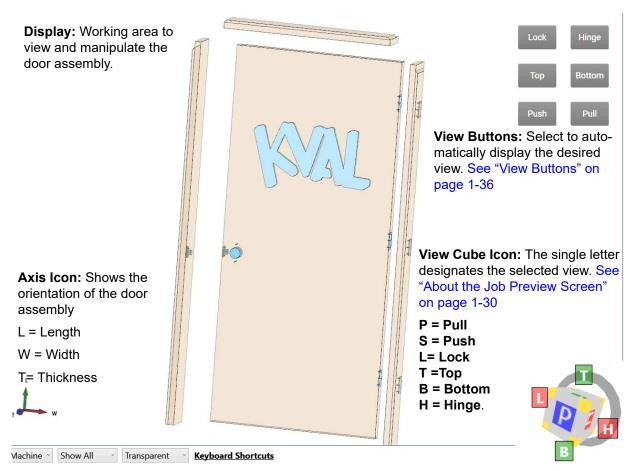
## About the Job Preview Screen

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 1-33

FIGURE 1-21. 3-D Display



## Using the Cube Icon to Navigate

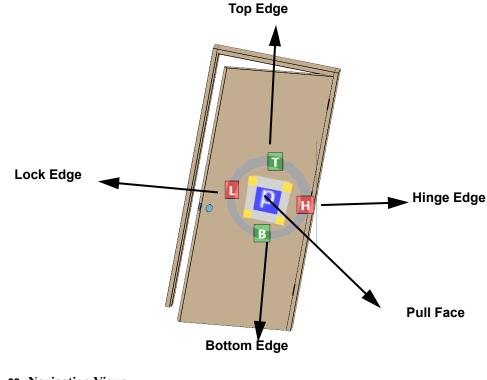
Any of the faces can be clicked on to orient the camera to that standard view. In addition to this, any edge or corner of the view cube can be clicked on to get a corresponding camera position. The view cube has a ring and adjacent articles around one face. This ring is designed as a visual indicator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

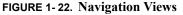
The view cube is located in the lower-right corner of the screen. This cube has 6 sides, and the corresponding edges and borders or a normal cube. On every face of the cube, there is a single letter that corresponds to the standard view in which that view is oriented. Letters to the side identify adjacent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

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



Figure 1- 22 shows the relationship of the cube icon to a Left Hand Door with the view from the pull side.







### **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 1-23 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**.

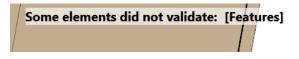


FIGURE 1-23. Sample validation Error Message

Jamb Lock Plate Validation Error

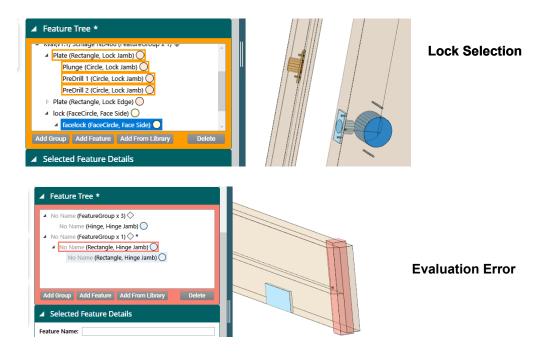


FIGURE 1-24. Color Code Examples



## About the Bottom Buttons

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

On Machine *	Show All °	Shaded ~	Keyboard Shortcuts

FIGURE 1-25. 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- 26 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.

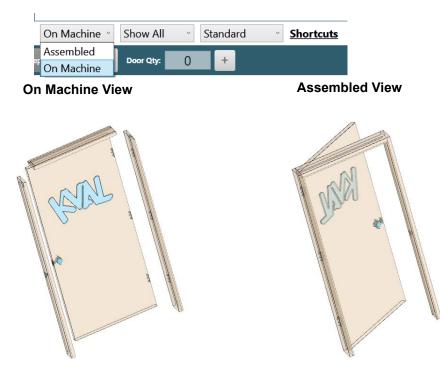


FIGURE 1-26. The On Button Drop Down Menu



## About the Show Mode Buttons

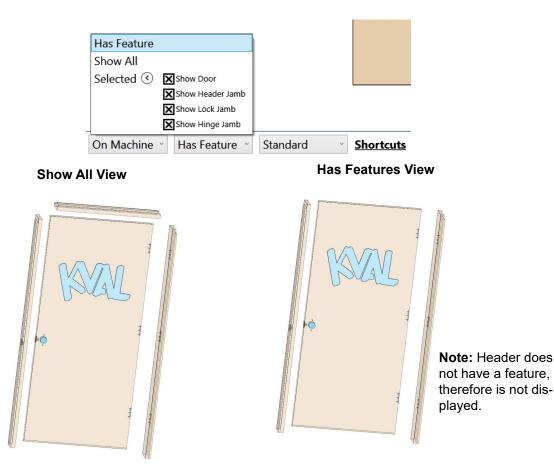
From the drop down menu, select Has Feature or Show All.

- 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- 27 shows the door in the **On Machine** view to accentuate the change in views.



#### FIGURE 1-27. The Show Button Drop Down Menu

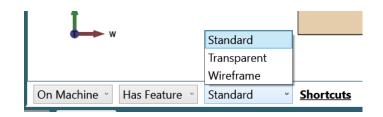
## About the Standard View Buttons

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 1-28 shows each door renderings.

Note: The Standard view is the default mode.



 Standard View
 Transparent View
 Wireframe View

 Image: Comparent View
 Image: Comparent View
 Image: Comparent View

FIGURE 1-28. The Standard View Buttons



Hinge

Bottom

Pull

Lock

Тор

Push

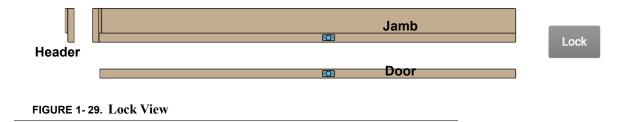
## **View Buttons**

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 1-21 on page 1-30 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

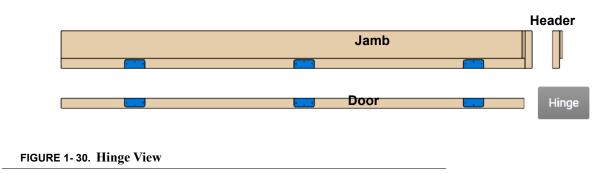
After selecting the Lock button, Figure 1- 29 shows the view of a door assembly in the Shaded view and On Machine mode.





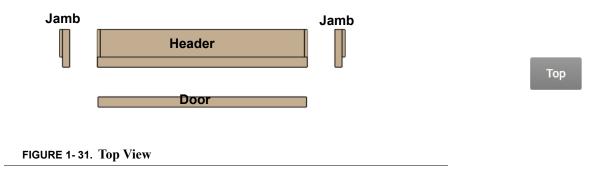
#### **Hinge View**

After selecting the Hinge button, Figure 1- 30 shows the view of a door assembly in the Shaded view and On Machine mode.



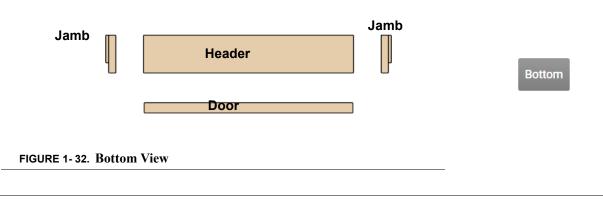
## **Top View**

After selecting the Top button, Figure 1- 31 shows the view of a door assembly in the Shaded view and On Machine mode.



#### **Bottom View**

After selecting the Bottom button, Figure 1- 32 shows the view of a door assembly in the Shaded view and On Machine mode.



## Push and Pull View: Right Hand Door

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

nd Door	7	
Pull	, o g	

P (Keyboard shortcut)

**Hinge Pivot Side** 

**Opposite Key Side** 

Wide Side Pull Side

Inside

Door Hand Indepedent Names

Door Hand Dependent (RH)

Door

36

Width

Expression

Door Hand: Right Hand

Door Property

Ľ

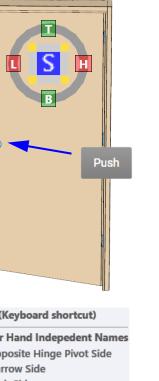
Jamb

×

**Right Hand Door** 



FIGURE 1-33. Right Hand Door View





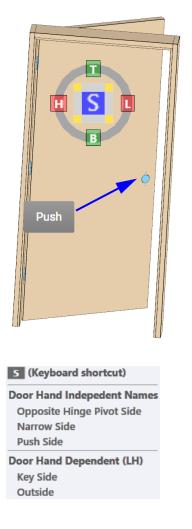
Evaluation 36



### Push and Pull View: Left Hand Door

Figure 1- 34 shows a left hand door in the push and pull mode.

		D	oor	Jamb	
Doc	or Hand: Le	eft Han	d	~	
	Door Prop	erty	Expressio	n	Evaluation
		Width	36		36



## Left Hand Door

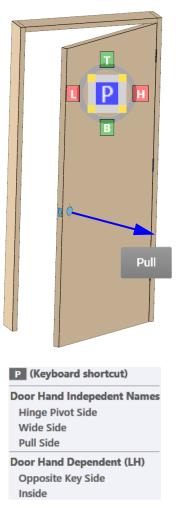
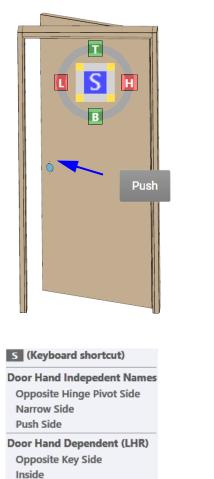


FIGURE 1-34. Left Hand Door View

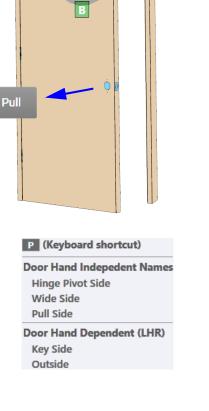
## Push and Pull View: Left Hand Reverse Door

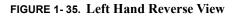
Figure 1- 35 shows a left hand reverse door in the push and pull mode.

		D	oor		Jamb	
Doc	or Hand:	Left Hand	d Reverse	~		
	Door Pro	operty	Expressio	n		Evaluation
Ľ.		Width	36			36
474						



## Left Hand Reverse Door





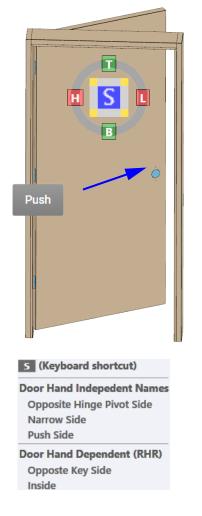




## Push and Pull View: Right Hand Reverse Door

Figure 1- 36 shows a right hand reverse door in the push and pull mode.

		D	oor	Jai	nb	
Doo	or Hand: R	ight Ha	nd Revers	e ~		
	Door Prop	erty	Expressio	n		Evaluation
Ū.		Width	36			36
1.74						



## **Right Hand Reverse Door**

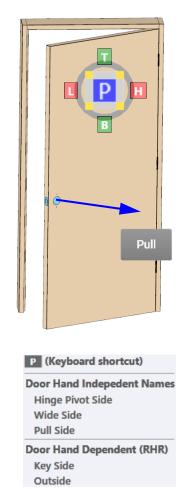


FIGURE 1-36. Right Hand Reverse View



## **Mouse Operation**

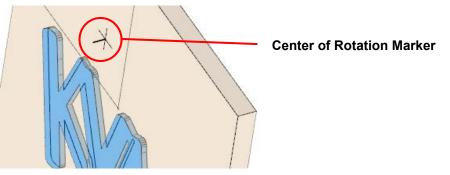
This section describes mouse operation.

**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 ink 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

On Machine 🕤 Has Feature 🗳	Standard ~	<b>Shortcuts</b>
----------------------------	------------	------------------

FIGURE 1-37. Keyboard Short Cut Link

Standard	Views
L Lock	Edge View
H Hing	e Edge View
T Top I	dge View
B Botte	om Edge View
P Pull I	Face View
5 Push	Face View
I Isom	etric Perspective View
View Ma	nipulations
View Ma	
F Zoor	
F Zoor Z Zoor	n to Fit
F Zoor Z Zoor SHIFT	n to Fit n Out (from center)
F Zoor Z Zoor SHIFT	n to Fit n Out (from center) Z Zoom In (toward center)
F Zoor Z Zoor SHIFT R Rota	n to Fit n Out (from center) Z Zoom In (toward center) te In-Plane CW
F Zoor Z Zoor SHIFT R Rota SHIFT	n to Fit n Out (from center) Z Zoom In (toward center) te In-Plane CW R Rotate In-Plane CCW

FIGURE 1-38. Shortcut Pop-Up



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

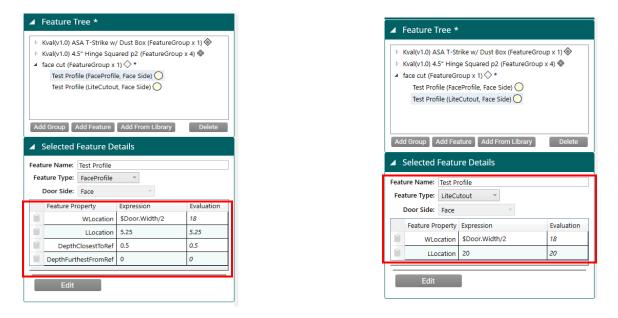


FIGURE 1-39. KvalCAM FaceProfile Feature and LiteCutout Feature

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.

#### FaceProfile Parameters

FaceProfile Param	neters
General MaxToolDiameter:	1.05

nt

FIGURE 1-40. 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

#### **LiteCutout Parameters**



## 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.

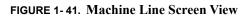
	Menu	Description
Α	Machine Activity	For each machine, a table shows job name, quantity of remain- ing doors, doors being processed, and status of the machine.
В	Queued Jobs:	Shows a list of the upcoming jobs.
С	Line Controls:	Common operations to control the machine line

## Machine Line Screen

						0	÷
	A	Line Control					
		Machine Acti	ivity				
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)		

#### Queued Jobs

Queue Order	Job	Templates	Creation Time	Quantity	Commands	
1	B 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	
	Top stores		9,20,2027 2010710 710	-		
	C					







## 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.

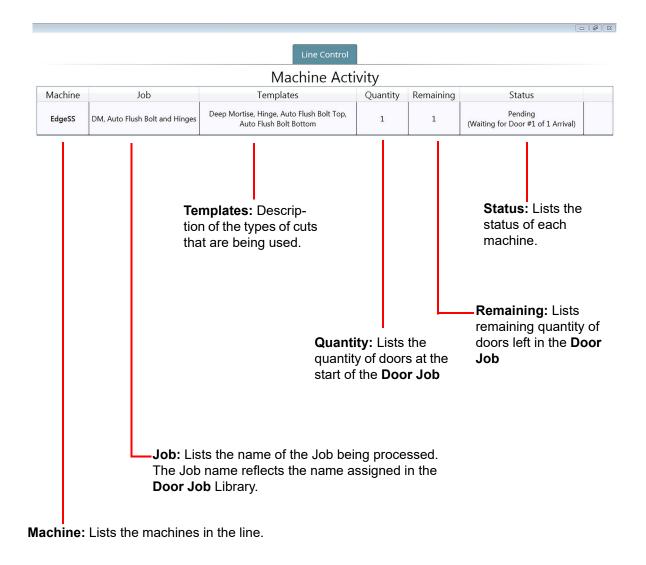


FIGURE 1-42. Machine Activity Definitions





## About the Queued Jobs Section

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

					<u> </u>			
Queue Order	Job	٦	[emplates	Creat	ion Time	Quantity	Commands	Sortable
1	DM and Hinges	Deep	) Mortise, Hinge	6/18/2017	7 10:04:53 AM	5	Remove	
2	Top Closer		Top Closer	6/18/2017	10:05:47 AM	2	Remove	
		Commands: Select the Remove Button to clear the Job from the list Quantity: Lists the quantity of doors at the start of the Door Job. Creation Time: List the time when the job is put in queue. Template: List the File name of the Template.						
	Job: List the file name of the Job.							
	Queue Order: Lists the jobs that are going to be processed							

# Queued Jobs

FIGURE 1-43. About Queued Jobs



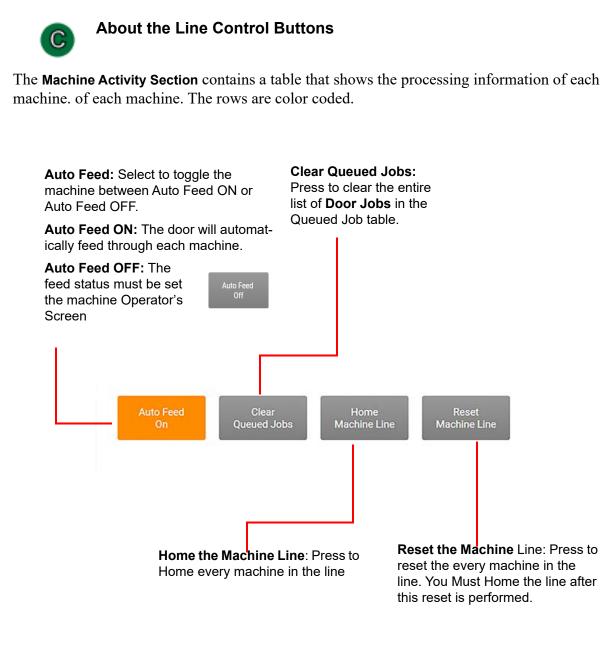
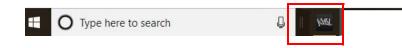


FIGURE 1-44. Line Control Buttons



## 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.

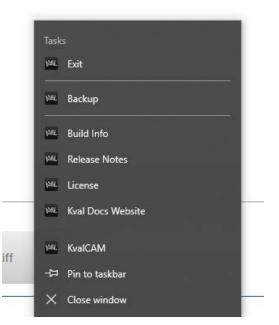


FIGURE 1-45. Taskbar Pop Up



## CHAPTER 2 KvalCAM Examples

This chapter provides examples of common Feature Groups in the KvalCAM software.

## Chapter 2 at a Glance

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



## **Door Data Process Steps**

The **Door Data** module contains all the properties of the raw door. Door properties can be inputted manually or transfered 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 "KvalCAM Common Terms" section in this manual.

Door Hand Drop Down Menu	✓ Door Data *				
	Name: Test Description: KvalCAM vers 2.0				
Properties Table					
	Dcor Jamb				
	Door Hand: Left Hand Y				
<b>.</b>	Door Property Expression	Evaluation			
Select the folder icon to copy	Width 36	36			
the expression	Length 82	82			
	Thickness 1.75	1.75			
	HingeBevel 0	0			
Door Materials	LockBevel 0	0			
	FeedRatePercent 100	100			
	Dana Cana Hannarifant y Hinna Matariak I				
Select Door Data from the Library	Door Core:         Unspecified         Hinge Material:           Face Material:         Wood/FG         Lock Material:         1	Wood/FG × Wood/FG ×			
	Select From Library	Save As			
	<u>&gt;</u>				

## 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.

KvalCAM Reference Guide

FIGURE 2-1. Door Data Module



## 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 "KvalCAM Common Terms" section in this manual.

	▲ Door Data
Jamb Enable Check Box: Select to apply the jamb	Name:         Test           Description:         KvalCAM vers 2.0
properties to the Door Job.	Door Jamb
	Enable Jamb Parameters: 🔀
Properties Table:	▶ Hinge Side
See "About Jamb Data Properties Table" on	▶ Lock Side
page 2-4	▶ Header
	▶ Gap
Select Jamb Data from the Library	Select From Library Save As

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.



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.

_		
Door Data *		
Name: test		
ription: test		
	$\frown$	
	Door Jamb	
En	able 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
RabbetWidth	\$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	<b>6</b> .5
Thickness	1.25	1.25
DadoLength	\$Jamb.LockSideThickness	1.25
DadoDepth	0	0
RabbetWidth	\$Door.Thickness	1.75
StopWidth	\$Jamb.LockSideWidth - \$Jaml	4.75
StopThickness	0.5	0.5

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.

					1
Feature Name:	Plunge				
Feature Type:	FaceRe	ctangle 🛛 🕹			
Door Side:	Circle				
Feature Propert	Hinge Rectan	gle		Evaluation	
WL	TeeSha	pe		2.75	
LL	FaceCir			44	
DepthClose	FaceRe FacePro	2		0.5	
DepthFurthestF	LiteCut	out		0	
	Length 5			5	
	Width	4		4	
F	Radius1	1/4		0.25	
F	Radius2 Radius1			0.25	
F	Radius3 Radius1			0.25	
F	Radius4 Radius1			0.25	
Attached Augmentations:					

#### Feature Type Menu

#### Selected Feature Details Feature Name: dado Feature Type: Rectangle Door Side: Header Jamb Feature Pro Bottom End valuation Top End TLocati Hinge Edge Ū WLocati Lock Edge Der Hinge Jamb Ĩ. ).25 Lock Jamb Ū. Be Header Jamb Ū. Length 1.75 1.75 Ū. Width \$Jamb.HingeSideW 4 Ű Radius1 .25 0.25 Ū Radius2 Radius1 0.25 Ū Radius3 Radius1 0.25 Ē Radius4 Radius1 0.25 Attached Augmentations: Man iage Augmenta

**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

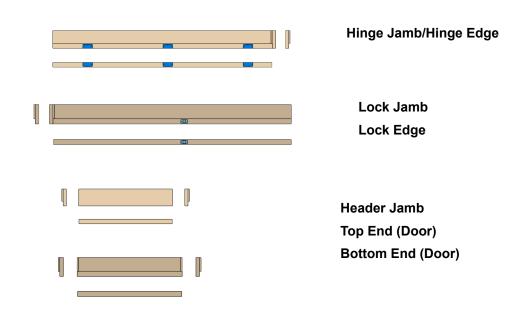
## About Edge Feature Types

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.



**KvalCAM Reference Guide** 



## 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	Face (Only Selection)
FaceRectangle	
FaceProfile	
LiteCutout	

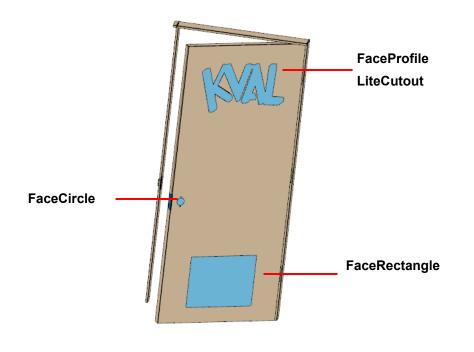
## About Face Feature Types

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.

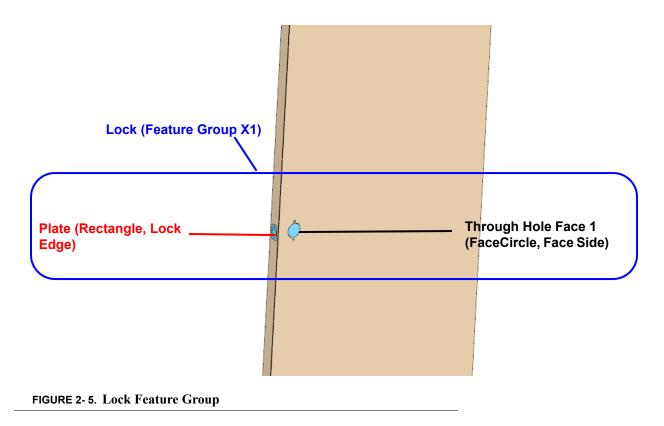
Below are the parent and child relationships.

## 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

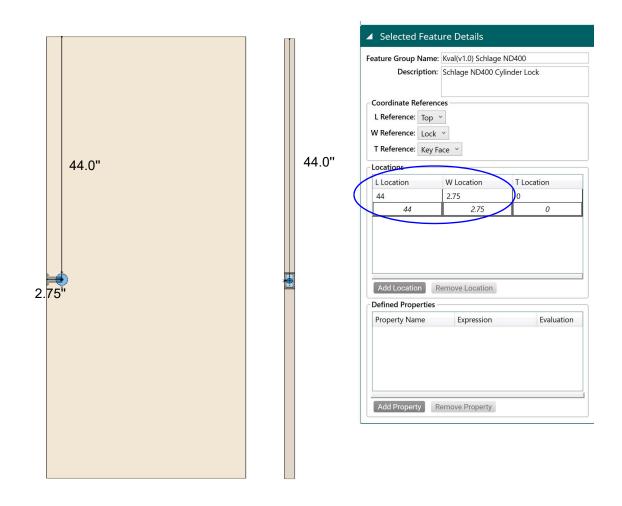
Figure 2-5 shows a example of a completed Feature Group and Features on a door.



## 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.







## 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)

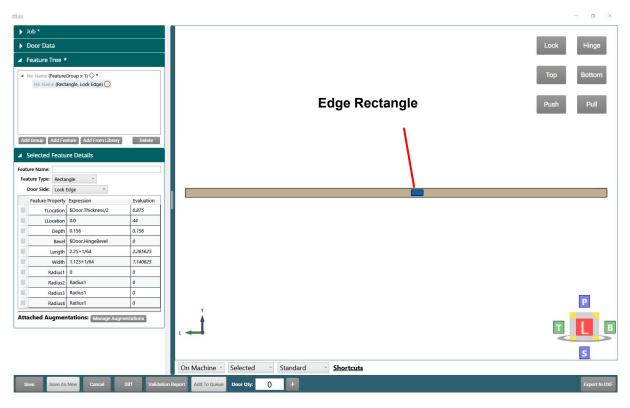
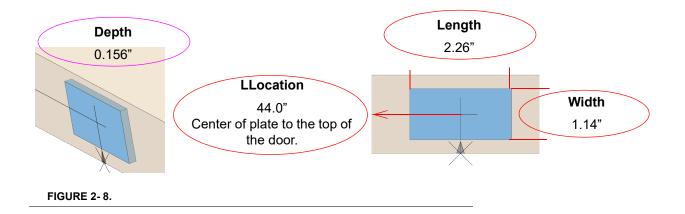


FIGURE 2-7. Rectangle Feature Type

## About the Lock Edge Plate Feature Details Descriptions

Lock edge plate properties are described below.



Property	Expression Description	
TLocation	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.	
LLocation	Value was set at the Feature Group level (44 " from top of the door).	
Depth	Set depth of lock cut.	
Bevel	Expression value is set at the Door Data Section.	
Length	The length of the lock plate (Length+1/64).	
Width	The Width of the lock plate (Length+1/64).	
Radius1-4	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

**FIGURE 2-9.** Rectangle Properties

Selected Feature Details			
Feature Name: Plate			
Feature Type: Re	tangle ~		
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	
Attached Augmentations: Manage Augmentations			



## **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.

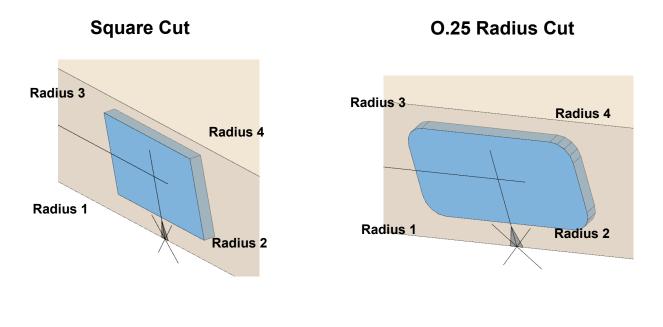


FIGURE 2-10. Radius Locations



#### 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

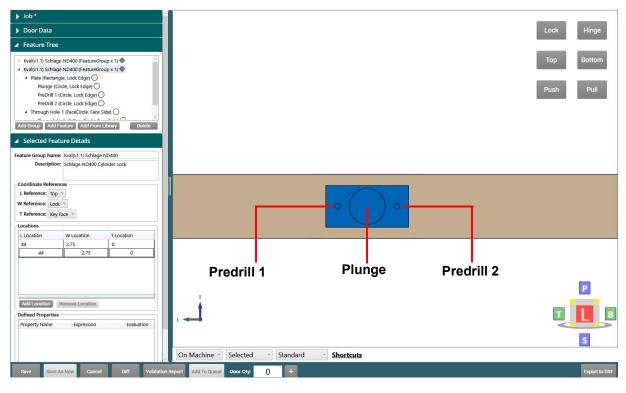
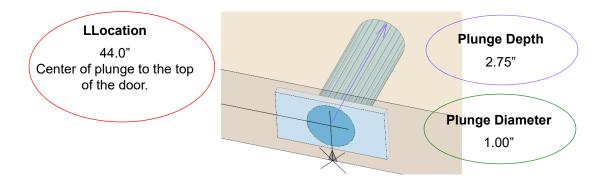


FIGURE 2-11. Circle Type Feature



#### About the Lock Edge Plunge Circle Feature Detail Table

The properties of the plunge circle are described below.



Property	Expression	⊿ Selee	ted Featu	re Details	
	Description	Feature N	ame: Plunge		
TLocation	Enter 0 to use the reference	Feature	Type: Circle	~	
	value. Value was set at the	Door	Side: Lock E	dge ×	
	Plate level (Parent).	Feature P	roperty	Expression	Evaluation
LLocation	Enter 0 to use the reference	-	TLocation	0	0.875
ELOCATION	value		LLocation	0.0	44
			Depth	WLocation	2.75
Depth <sup>1</sup>	WLocation value is set at the		Bevel	0.0	0
	Lock Feature Group (Parent		Diameter	1	1
	of Parent).	Diam	eterMinimum	Diameter	1
Bevel	0 degree Bevel.	Diam	eter Maximum		1
Diameter	Enter Value (1.0 ").		epthMinimum		2.75
DiameterMin. <sup>2</sup>	Auto filled with the set		pthMaximum	Depth	2.75
Diameter with.	Diameter value.	Attache	d Augmen	tations: Manage Augm	entations
DiameterMax.	Auto filled with the Diameter value.				
DepthMin. <sup>3</sup>	Auto filled with the Depth value.				
DepthMax.	Auto filled with the Depth value.				

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.

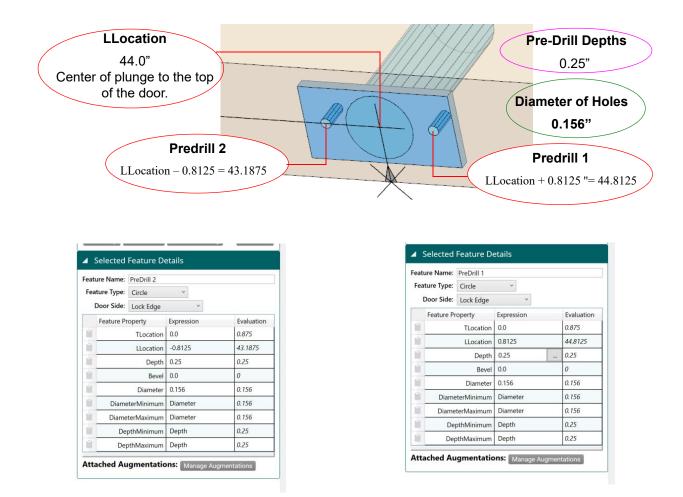
3. DepthMaximum and DepthMinimum are used to allow for a wider range of tools to be selected.

#### 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.



#### Predrill 2

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

1. LLocation(44.0') - 0.8125 = 43.1875

#### Predrill 1

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

1. 0.8125 " + LLocation(44.0") = 44.8125

2. Diameter of the predrill.

#### FIGURE 2-13. Predrill Holes



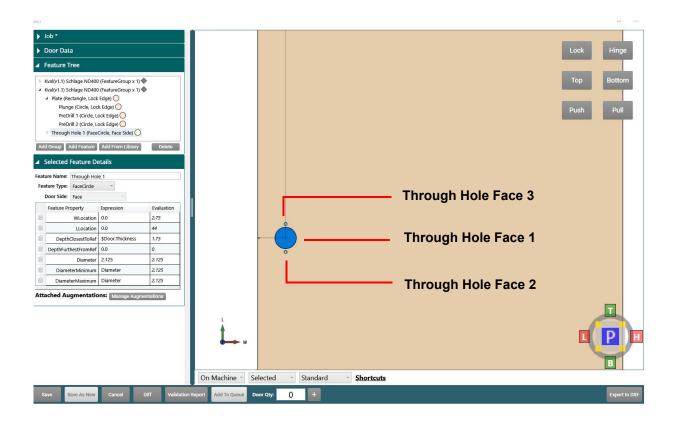
#### About Lock FaceCircle Feature

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.

eature Name	Through Hol	le 1		
Feature Type	FaceCircle	FaceCircle ~		
Door Side	E Face			
Feature	Property	Expression	Evaluation	
11	WLocation	0.0	2.75	
ii i	LLocation	0.0	44	
🗎 Dep	thClosestToRef	\$Door.Thickness	1.75	
DepthFu	rthestFromRef	0.0	0	
til.	Diameter	2.125	2.125	
Diar	neterMinimum	Diameter	2.125	
Diar	neterMaximum	Diameter	2.125	

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

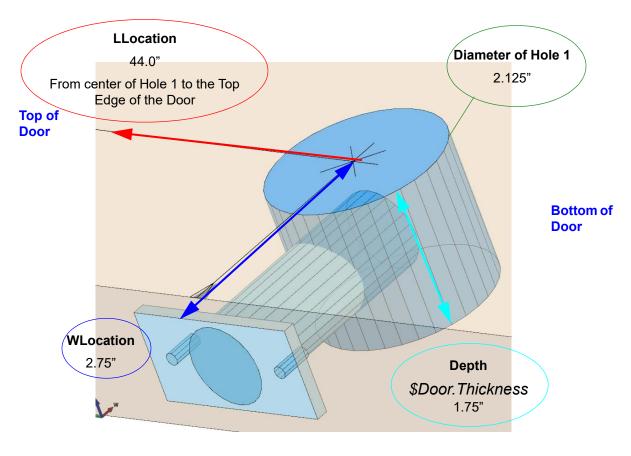
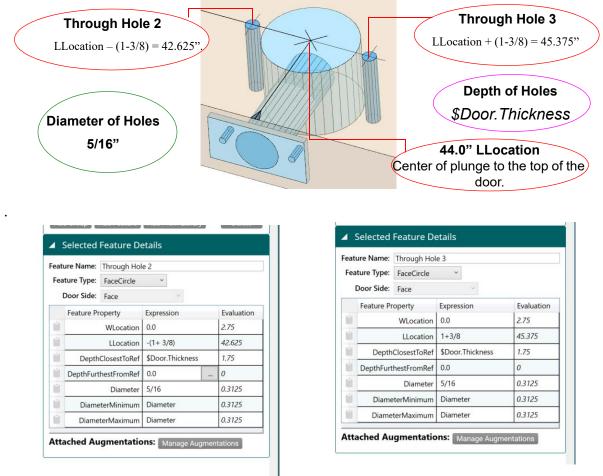


FIGURE 2-16. Through Hole 1 Diameter



#### 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.



#### Through Hole 3

Property	Expression	Property	Expression
LLocation <sup>1</sup>	-(1+3/8)	LLocation <sup>1</sup>	1+3/8
DepthClosetToRef <sup>2</sup>	\$Door.Thickness	DepthClosetToRef <sup>2</sup>	\$Door.Thickness
Diameter	5/16"	Diameter	5/16"
1 44.0 (1.2/9) 42 (25.11		1 - 44.0 + (1 - 2/8) = 45.275 II.	. 1 1

1. 44.0 - (1-3/8) = 42.625. LLocation value set at the Feature Group level.

2. Depth equals the door thickness.

#### FIGURE 2-17. Face (Predrill holes)

**Through Hole 2** 

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



## 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.

4	Selected Feature	Details		TeeRelativeLocation
Feat	ure Name: Plate			TeeLength
Fea	ture Type: TeeShape	· ·		TeeWidth
I	Door Side: Lock Edg	e Ý		EntryRadius1
	Feature Property	Expression	Evaluation	EntryRadius2
1	TLocation	\$Door.Thickness/2	0.875	
	LLocation	0	44	
	Depth	0.171875	0.171875	
	Bevel	\$Door.LockBevel	0	
1	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	
Ľ.	Radius1	0	0	MainLength
	Radius2	0	0	MainWidth
	Radius3	0	0	Radius 1-4
	Radius4	0	0	raulus 1-4
Ĩ.	EntryRadius1	0.0	0	
Ľ	EntryRadius2	0.0	0	

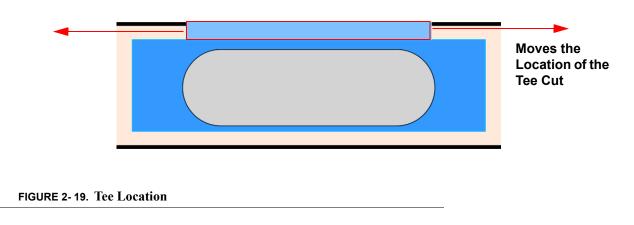
FIGURE 2-18. Tee shape feature



#### About the TeeRelativeLocation

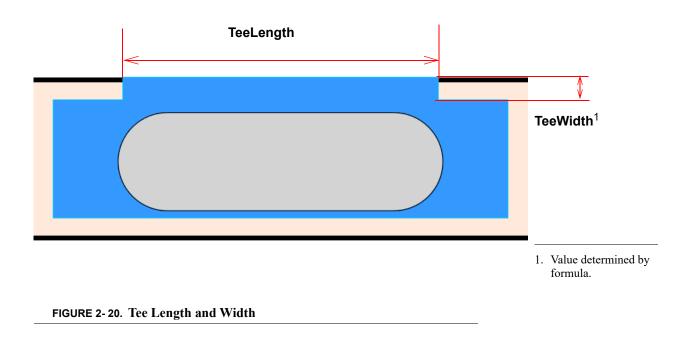
.

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.



#### About the TeeLength and TeeWidth

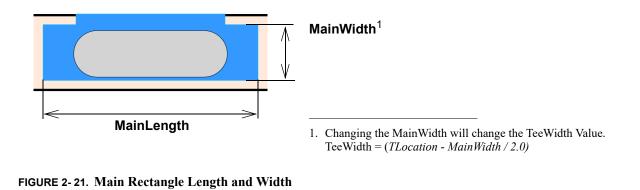
The length and width of the Tee cut are determined by these properties. The width is hard-coded to use this formula: TLocation - MainWidth / 2.0.





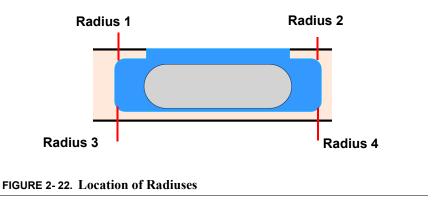
#### About the MainLength and MainWidth

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



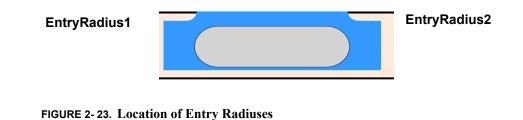
#### About the Radius1 through Radius4

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".



#### 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".



KvalCAM Reference Guide



## 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

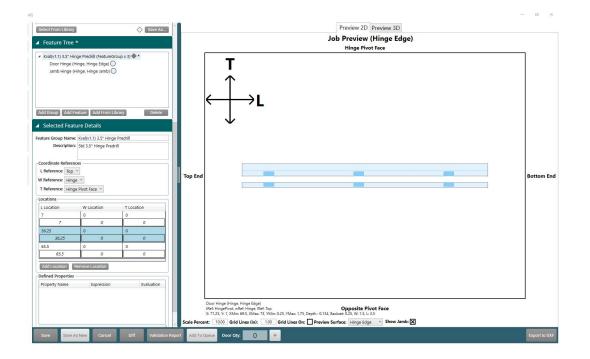


FIGURE 2-1. Hinges



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.

		Тор	End	Selected Feature	re Details	
,	36.25"	7.0"	B	Feature Group Name:	Kval(v1.1) 3.5" Hinge F Std 3.5" Hinge Predril	
				T Reference: Hinge		
				L Location	W Location	T Location
				7	0	0
				7	0	0
	,	,		36.25	0	0
		,		36.25	0	0
65.5 "		-		65.5	0	0
				65.5	0	0
				Add Location Re Defined Properties	move Location	
				Property Name	Expression	Evaluation
<u></u>	v					

• Locations: Hinge cut will be repeated at the locations listed in this table.

FIGURE 2-2. Hinge Feature Group

## About the Hinge Feature Details

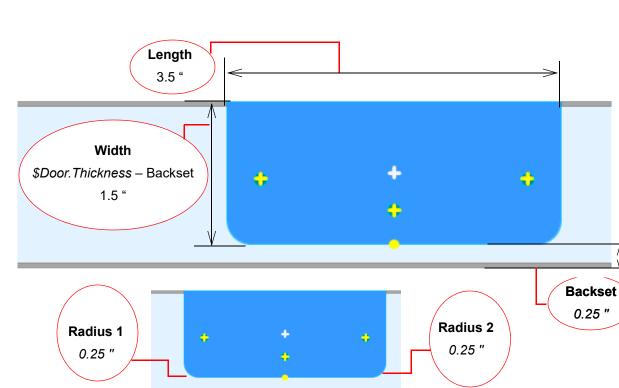
The properties of a circle are described below.

Property	Description	<b>A</b> 9	Selected Featu	re Deta	ils	
TLocation	Auto calculated. Puts hinge in the middle of the edge of the door. <sup>1</sup>	Fea	ure Name: Door H ture Type: Hinge Door Side: Hinge	2	~	
LLocation	Start center location of the first Hinge. <sup>2</sup>		Feature Property TLocation LLocation	Width / I	2.0	Evaluation 0.75 8.75
Depth	Depth of the hinge cut	-	Depth		-	0.134
Bevel	Set at the Door Data level	Ľ.	Bevel	\$Door.H	ingeBevel	0
Backset	Backset of hinge from edge	Backset of hinge from edge				0.25
	of door		Width		hickness - Backset	1.5
Width	Auto calculated	-	Length PredrillDepth			3.5 0.634
Length	Length of the hinge cut.	-	PredrillDiameter			0.156
PredrillDepth	Depth of the predrill holes	Ľ.	Radius1	0.25		0.25
PredrillDia.	Diameter of the predrill	Ĩ	Radius2	0.25		0.25
	holes.	Predrill On: 🗙				
Radius1 and 2	The radius of each corner of	Prec	Irill Locations:	Add Hole	Remove Hole	
	the hinge cut		X Position		Y Position	
	h/2.0 (1.75"/2' = 0.75"). Width = Door		1.395		0.687	
Thickness - Backs Backset set in the	et (1.5"). Door Thickness set at Door Data.		0 0.36			
2. LLocation = Leng	gth / 2. (7.0"+ (3.5" / 2) = 8.75") f hinge.(3.5"). Top edge of hinge (7.0")	Se	e "About the	Predrill		age 2-27.
		Atta	iched Augmer	ntations	Manage Augm	entations

FIGURE 2-3. Hinge Feature Details



#### **About the Hinge Properties**



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

FIGURE 2-4. Hinge Dimensions

#### About the Hinge Locations

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

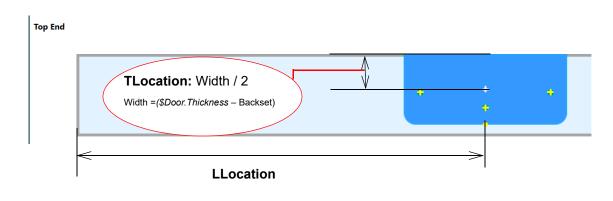


FIGURE 2-5. Hinge Locations



#### **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.

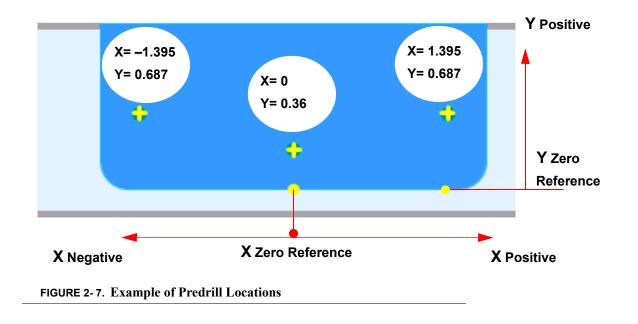
Predrill I	Locations: Add Hole	Remove Hole
х	Position	Y Position
1.	.395	0.687
0		0.36
-1	1.395	0.687

FIGURE 2-6. 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.





#### 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

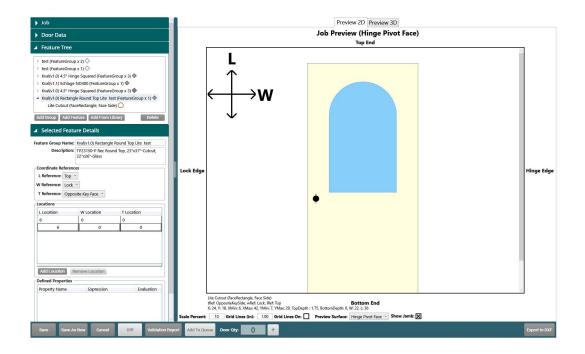


FIGURE 2-8. Face Rectangle Cut



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.

6.0"	Selected Featur	e Details	
	Feature Group Name: K	val(v1.0) Rectangle Ro	und Top Lite test
			Top, 23"x37"-Cutout,
	Coordinate References	;	
	L Reference: Top ~		
	W Reference: Lock ~	]	
	T Reference: Hinge P	ivot Face 🗡	
	Locations		
	L Location	W Location	T Location
	6	0	0
	6	0	0
	Add Location Rer	nove Location	
		Feature Group Name: Feature Group Name: Description: T Coordinate References: L Reference: Top × W Reference: Lock × T Reference: Hinge P Locations L Location 6 6	Feature Group Name:       Kval(v1.0) Rectangle Ro         Description:       TP23150-P Rec Round         22"x36"-Glass         Coordinate References         L Reference:       Top ×         W Reference:       Lock ×         T Reference:       Hinge Pivot Face ×         Locations       L         L Location       W Location         6       0

Top End

FIGURE 2-9. Face Rectangle Dimensions



#### About the FaceRectangle Details

The properties of a FaceRectangle Feature are described below.

Feat	ure Name:	Lite Cutout				
Fea	ture Type:	FaceRectang	le ~			
I	Door Side: Face					
	Feature Pr	operty	Expression	Evaluation		
Ľ.	WLocation		\$Door.Width/2	18		
Ľ.	LLocation		Length/2	24		
Ĩ.	DepthClosestToRef		\$Door.Thickness	1.75		
Ľ.	DepthFurt	hestFromRef	0.0	0		
Ľ.	Length		36	36		
Ĩ.		Width	22	22		
Ū.		Radius1	Width/2	11		
Ľ.		Radius2	0.25	0.25		
Ľ.		Radius3	Width/2	11		
1		Radius4	0.25	0.25		

Attached Augmentations: Manage Augmentations

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

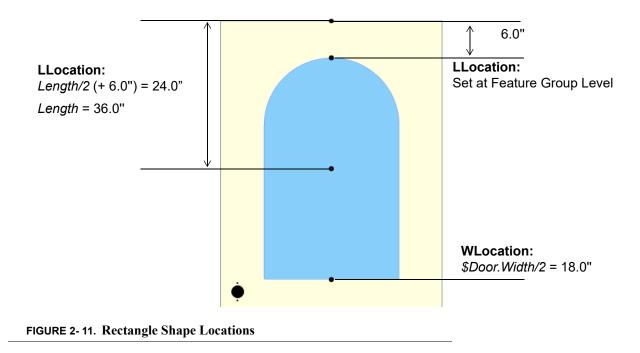
1. LLocation = 24.0" Where Length = 36.0" / 2 = 18.0". LLocation = 18.0" + 6.0" (Location set at Feature Group Level) = 24.0"

FIGURE 2-10. Face Rectangle Details



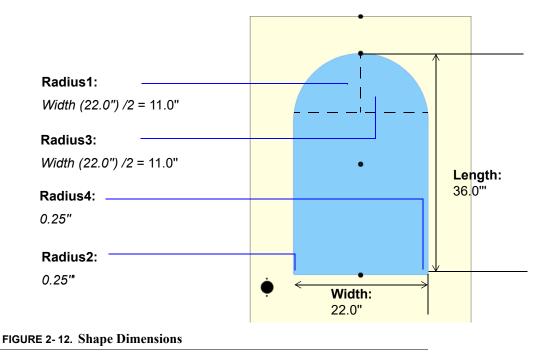
#### **About Shape Location Information**

The figure below shows the shape location determined in Properties Table on page 2-31.



#### **About Shape Parameter Information**

The figure below shows the shape parameters determined in **Properties Table** on page 2-31.





## Process to Create a FaceProfile Feature Type

**Note:** For descriptions and comparisons of the **FaceProfile Feature Type** and the Lite-Cutout Feature Type, see "Comparing the FaceProfile and LiteCutout Feature Types" on page 1-44.

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 Face-Profile and LiteCutout Editing Screen" on page 2-31.
- 6. At the KvalCAM screen make adjustments if necessary

#### **FaceProfile Process Summary**

1	▲ Feature Tree *			5
Add Group	Kval(v1.0) ASA T-Strike v     Kval(v1.0) 4.5" Hinge Squ     face cut (FeatureGroup )     Test Profile (FaceProf     Test Profile (LiteCuto)	ared p2 (FeatureGrou 1) ◇ * ile, Face Side) ○		At the editing screen, pull in the DXF file, adjust the shape, and send to KvalCAM.
Add Child	Add Group Add Feature	Add From Library	Delete	See "About the FaceProfile and LiteCutout Editing Screen" on page 2-35.
Add Feature Name and Description	<ul> <li>Selected Feature D</li> <li>Feature Name: Test Profile</li> <li>Feature Type: FaceProfile</li> </ul>	etails ~		6
Door Side: Auto	Door Side: Face	~		Location Properties
selected.	Feature Property	Expression	Evaluation	Adjust if necessary.
	WLocation		18	WLocation: Location on the
4	LLocation		5.25	width of the door.
4	DepthClosestToRef		0.5	
Select the Edit Button	DepthFurthestFromRef	0	0	<b>LLocation:</b> Location on the
Jump to the Face Pro- file Screen.	Edit			length of the door. <b>Depth:</b> Set depth of the cut.

Feature Name:	Test Profile		
Feature Type:	FaceProfile	~	
Door Side:	Circle Hinge	~	
Feature Pr		sion	Evaluation
	TeeShape	Width/2	18
1	FaceCircle		5.25
Depth	FaceRectangle FaceProfile		0.5
DepthFurt	LiteCutout		0



## 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.

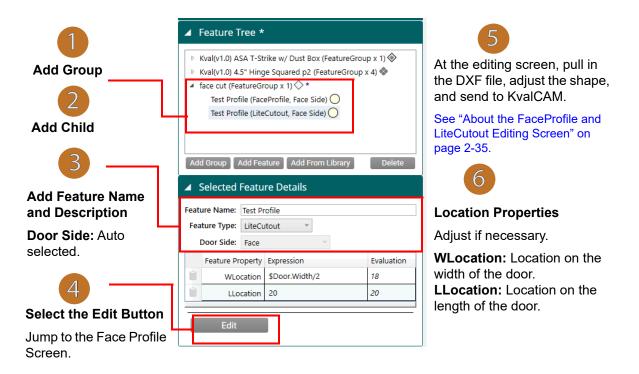
4		Selected Fe	atu	re Det	ails		
Feature Nam	ne:	Lite Cutout 2					
Feature Typ	oe:	LiteCutout	Ý				
Door Sid	le:	Circle FaceCircle		~			
Property	Exp	FaceRectangle				Evaluation	
WLocation		Hinge				0	
LLocation	0.0	Rectangle TeeShape				0	
E	dit	LiteCutout					~
Save	s	ave As New	Ca	ncel	Valida	ation Report	Ad

#### Process

To add a new LiteCutout:

- **1**. If needed, add a **Feature Group**.
- $\label{eq:add} \textbf{a} \ \textbf{Child} \ \textbf{to the Feature Tree}.$
- **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 Face-Profile and LiteCutout Editing Screen" on page 2-31.
- 6. At the KvalCAM screen may adjustments if necessary

#### LiteCutout Process Summary





## 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 1-43.

#### 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.

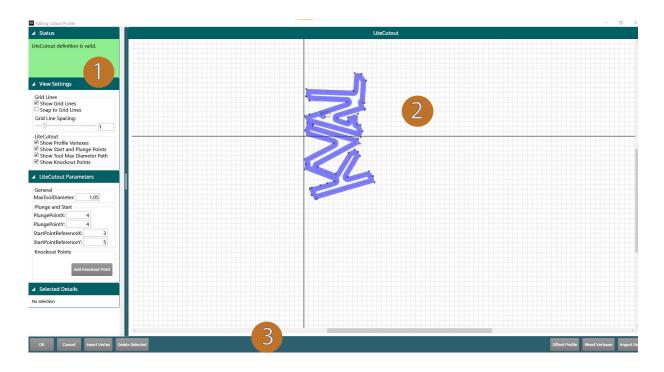


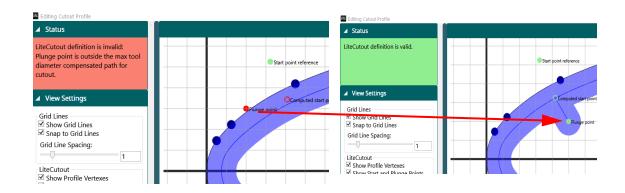
FIGURE 2-13. Opening Editing Screen (LiteCutout)



#### 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.



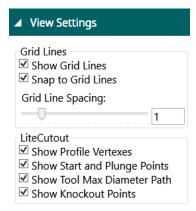
#### About the View Settings Panel

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

#### **FaceProfile Settings**

▲ View Settings
Grid Lines ✓ Show Grid Lines ✓ Snap to Grid Lines Grid Line Spacing: 1.25
FaceProfile ✓ Show Profile Vertexes ✓ Show Tool Max Diameter Path

#### LiteCutout Settings



KvalCAM Reference Guide



#### **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- 14 below.

FaceProfile Parame	ters
General	
MaxToolDiameter:	1.05

**FaceProfile Parameters** 

General			
MaxToolDiamete	er:	0.7	5
Plunge and Start			
PlungePointX:		4	
PlungePointY:		4	
StartPointReferer	nceX:		3
StartPointReferer	nceY:		5
Knockout Points			

LiteCutout Parameters

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

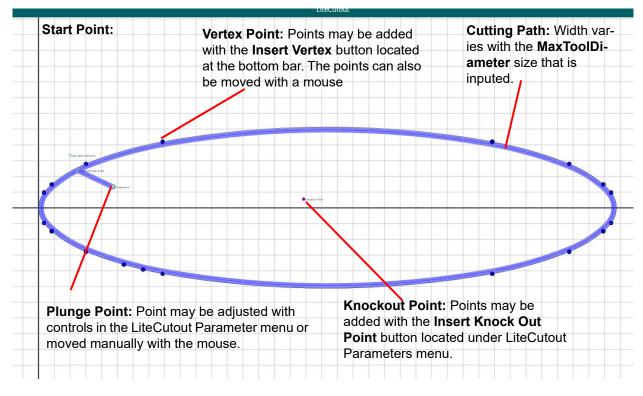


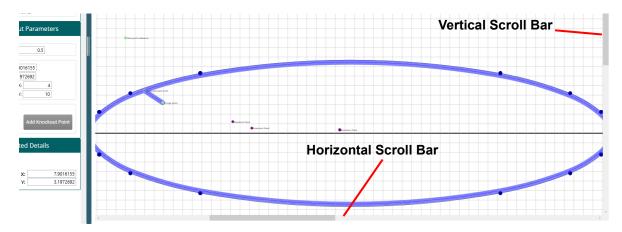
FIGURE 2-14. Samples of Parameters



#### 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.

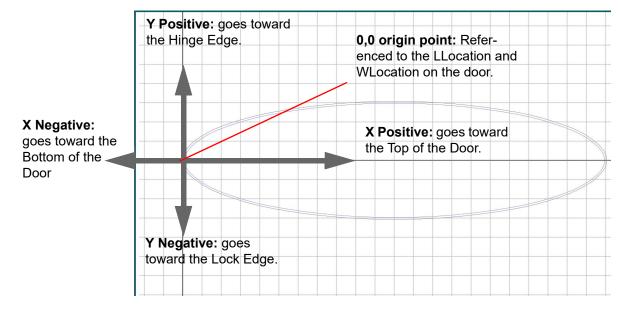


FIGURE 2-15. Coordinates as related to KvalCAM



#### 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
- 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.

set the profile inward or	automatic burgaria and	aunt (in inchas)
arameters	outward by some an	iouni (in inches)
Inward Offset //		
Jisec.		0.3
	Y 10 10 10 1	0.5
	ок	Cancel
	0.000	A STREET, STREET, ST



#### **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 that this value cause the vertex to be removed.
- 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.

Weed Polyline Vertexes —	
Weed vertexes (current number of verte	exes is 31).
Parameters	
Minimum Remaining Vertexes:	
0	3
Maximum Remaining Vertexes:	
	1000
Triangle Area Threshold:	1
Reset Defaults OK	Cancel
Nesel Defaults OK	Gancer

	Weeding Not Supporte	d ×	
A Po	lylines with arcs are not suppor	ted for weeding.	
			1
		ОК	

18VAL

# CHAPTER 3 KvalCAM Common Terms

This chapter describes common **KvalCAM** terms.

## Chapter 3 at a Glance

	Summary
Α	Ad Hoc page 3-2
^	Axis page 3-2
С	Cube Icon page 3-4
D	Dado page 3-5
D	Diff page 3-6
	Door Data page 3-6
	Door Data Library page 3-7
	Door Job page 3-8
	Door Job Library page 3-8
Е	Expressions page 3-9
-	Common Door Expressions page 3-9
F	Feature page 3-10
•	Feature Group page 3-10
	Feature Group Library page 3-11
н	Handing page 3-12
	Left Hand Door page 3-13
	Right Hand Door page 3-13
J	Jamb Data Table page 3-14
	Jamb Data Table Content page 3-15
L	Library Principle Variant 3-15
R	Rabbet page 3-18
, n	Right Hand Doors and Right Hand Reverse Doors page 3-19
v	Validation page 3-20
-	Validation Report page 3-20
	Variantpage 3-22
Table of S	Symbols and Keywords page 3-23
Common	Door and Jamb Properties page 3-24
Supporte	d Math Constants page 3-26

Α

#### 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.

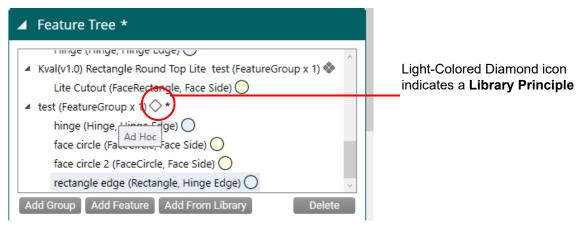


FIGURE 3-1. Ad Hoc Icon

#### 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.

L	Represents the Length axis
W	Represents the Width Axis
Т	Represents the Thickness Axis



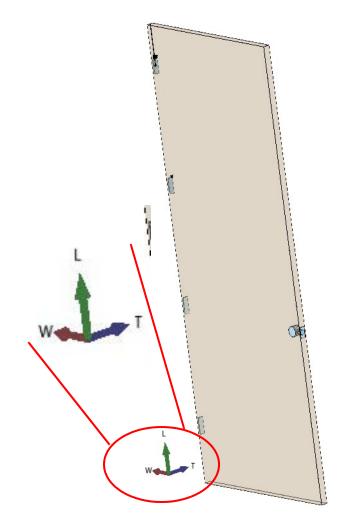


FIGURE 3-2. Axis Icons in Job Preview

С

## 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

#### Dado

A dado is a slot or trench cut into the surface of a jamb. A dado is cut across, or perpendicular to, the grain and is thus differentiated from a groove which is cut with, or parallel to the grain.

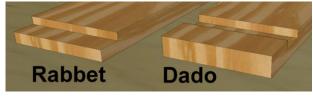


FIGURE 3-3. Dado Cut

In KvalCAM, the dado cut length and depth are used in the processing of a jamb. The dado parameters are Jamb Properties in both the Hinge Side and Lock Side data tables.

	In the Design of the	F	Contraction.
	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
ľ	RabbetWidth	\$Door.Thickness	1.75
	StopWidth	\$Jamb.HingeSideWidth - \$Jan	4.75
	StopThickness	0.5	0.5

FIGURE 3-4. Dado Parameter Data



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

		- 0	Displa
Door Data Difference		- L	
1			^
"Name": "3/0 x 6/8 Wood Edge Steel",			
"Name": "3/0 x 7/0 Wood",			
"Description": "",			
"Width": "35.75",			
"Length": "79",			
"Width": "35.812",			
"Length": "84",			
"Thickness": "1.75",			
"Hand": "LeftHand",			
"HingeSideBevel": "0",			
"Hand": "RightHand",			
"HingeSideBevel": "3",			
"LockSideBevel": "0",			
"FeedRatePercentOverride": "100",			
"DoorFaceMaterial": "Steel",			
"DoorFaceMaterial": "Wood",			
"DoorLockMaterial": "Wood",			
"DoorHingeMaterial": "Wood",			~
		Do	one
	-   · · ·	· · ·	
	2/12/2018 4·42·03 PM	9/11/20	118 12.13

FIGURE 3-5. 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 3-7 on page 3-7 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)

A Door Data \* Name: Test Description: KvalCAM vers 2.0 Jamb Door Door Hand: Left Hand Evaluation Door Property Expression Width 36 36 82 Length 82 Thickness 1.75 1.75 HingeBevel 0 0 LockBevel 0 0 FeedRatePercent 100 100 Door Core: Unspecified Y Hinge Material: Wood/FG Face Material: Wood/FG Y Lock Material: Wood/FG Select From Library Save As...

FIGURE 3-6. Door Data Properties

#### **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.

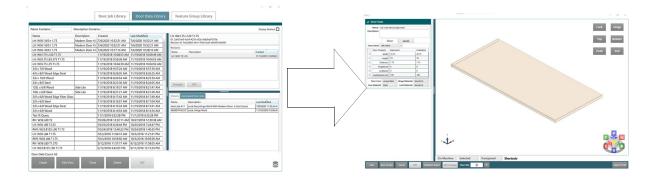


FIGURE 3-7. Door Data Library

#### 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- 8 on page 3-8 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.

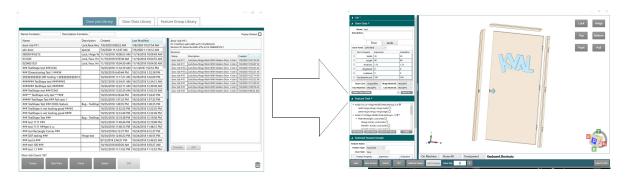
Libraries	▶ Job *
Machine Line	▶ Door Data
Machine Line	Feature Tree
EFX	Selected Feature Details
Machine not connected.	
DL-NCX	

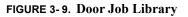
FIGURE 3-8. Door Job Parts

#### 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.







# Ε

## 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	
Length	Length of Door	\$Door.Length	
Width	Width of Door	\$Door.Width	
Thickness	Thickness of Door	\$Door.Thickness	
HingeBevel	Bevel defined for the hinge edge of the door in degrees	\$Door.HingeBevel	
LockBevel	Bevel defined for the lock edge of the door in degrees	\$Door.LockBevel	
FeedRatePercent	Feed rate percent defined for the door	\$Door.FeedRatePercent	

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- 10 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 1-24.

Libraries	▶ Job *	▶ Job *			
Machine Line	▶ Door Data	Door Data     Feature Tree			
Machine Line	▶ Feature Tree				
EFX	Selected Feature Details				
Machine not connected.		Feature Name: Lite Cutout 1 Feature Type: FaceRectangle Y			
DL-NCX	Door Side: Face	~			
	Property	Expression	Evaluation		
Machine not connected.	WLocation	\$Door.Width/2	15		
	LLocation	Length/2+4.6875	9.59375		
Commander 3	DepthClosestToRef	\$Door.Thickness	1.75		
Machine not connected.	DepthFurthestFromRef	0.0	0		
Machine not connected.	Length	9+13/16	9.8125		
	Width	9+13/16	9.8125		
	Radius1	0.25	0.25		
	Radius2	0.25	0.25		
	Radius3	0.25	0.25		
	Radius4	0.25	0.25		
	Attached Augment	ations: Manage Aug	mentations		

FIGURE 3-10. 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- 8 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 1-24.



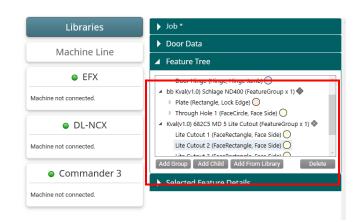
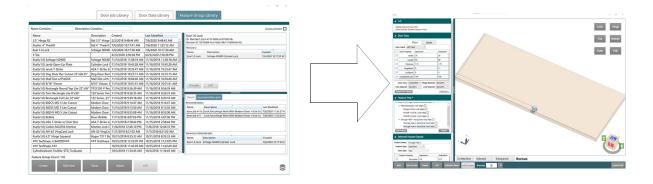


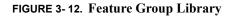
FIGURE 3-11. Feature Group Panel

#### **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.





# Η

# 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- 13 and Figure 3- 14.

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

The terms used are:

	Door	Jamb	
Door Hand:	Right Hand	~	<ul> <li>Right Hand</li> </ul>
Door Pr	Left Hand		• Left Hand
	Right Hand		
	Left Hand Reverse		Left Hand Reverse
i i i	Right 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

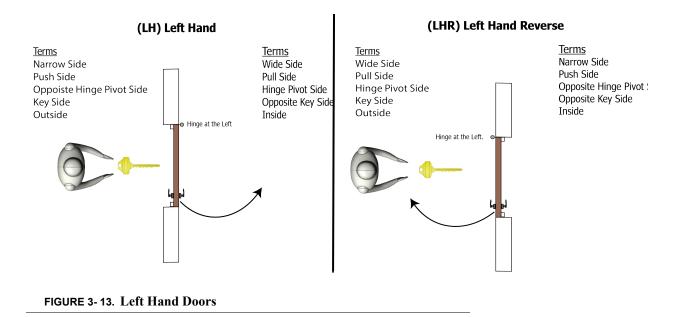
This section describes one method to determine a doors handing. For an illustrated view of determining door hand, see Figure 3- 13 and Figure 3- 14.

- 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.



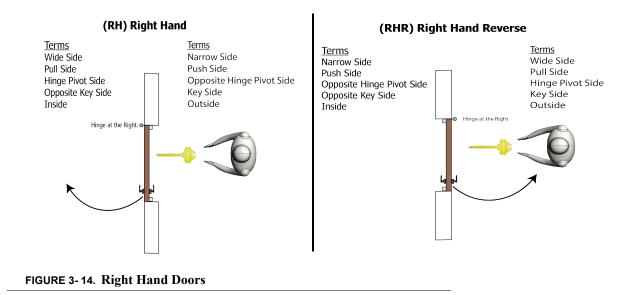
## Left Hand Door

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.



#### **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.



# J

#### Jamb Data Table

Select the **Jamb** tab to view, edit, or save the jamb data properties. The figure below describes the available **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.

	ame: test			<b>⊿</b> ⊦	leader		
escrip	tion: test				Jamb Property	Expression	Evaluatio
				1	Length	\$Door.Width + \$Jamb.G	36.25
		Door Jamb		1	Width	6.5	6.5
	Ena	ble Jamb Parameters: 🔀		1	Thickness	1.25	1.25
⊿ н	linge Side			1	RabbetWidth	\$Door.Thickness	1.75
	Jamb Property	Expression	Evaluation	1	StopWidth	\$Jamb.HeaderWidth - \$.	4.75
Ű	Length	\$Door.Length + \$Jamb.GapHe	81.375		StopThicknes	0.5	0.5
Ű	Width	6.5	6.5	-	HingeSideOffse		0.125
Ű	Thickness	1.25	1.25		HingesideOffse	samb.Gaphingeside +	0.125
Ŭ.	DadoLength	1.25	1.25				
Ē.	DadoDepth	0	0	4 9	iap		
Ū.	RabbetWidth	\$Door.Thickness	1.75				
Ľ.	StopWidth	\$Jamb.HingeSideWidth - \$Jan	4.75		Jamb Property	Expression	Evaluatio
Ū.	StopThickness	0.5	0.5		HingeSide	0.125	0.125
					LockSide	0.125	0.125
🔺 Lo	ock Side			Ľ.	Header	0.125	0.125
	Jamb Property	Expression	Evaluation				
Ē.	Length	\$Door.Length + \$Jamb.GapHe	81.375	Select	From Library	(	Save
Ŭ.	Width	6.5	6.5	Geneor	Library		
Ū.	Thickness	1.25	1.25				
Ľ.	DadoLength	\$Jamb.LockSideThickness	1.25				
Ľ.	DadoDepth	0	0				
Ŭ.	RabbetWidth	\$Door.Thickness	1.75				
Ū.	StopWidth	\$Jamb.LockSideWidth - \$Jaml	4.75				
1.0	StopThickness	0.5	0.5				

FIGURE 3-15. Jamb Data Tables



# Jamb Data Table Content

The properties available in the Jamb Data table are listed below.

# Hinge /Jamb Sides

# Header

Length
Width
Thickness
DadoLength
DadoDepth
RabbetWidth
Stop Width

Length Width Thickness RabbetWidth Stop Width Stop Thickness HingeSideOffset Gap

HingeSideOffset LockSide Header



# L

### Left Hand Door and Left Hand Reverse Doors

See "Left Hand Door" on page 3-13

#### 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**.

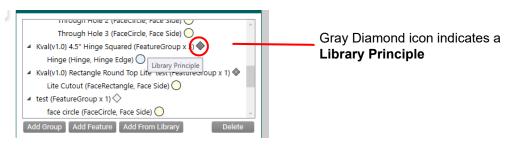


FIGURE 3-16. Library Principle Icon

## 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>2</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**.

<sup>1.</sup> Door Job Library and/or Feature Group Library

<sup>2.</sup> Door Job Library and/or Feature Group Library

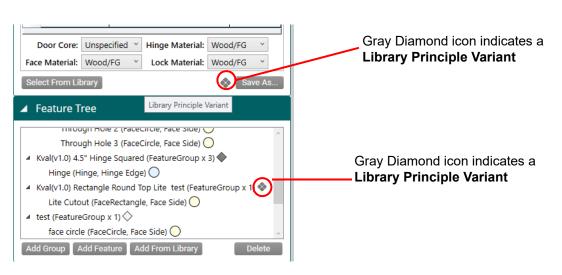


FIGURE 3-17. Library Principle Variant Icon



# R

## Rabbet

A rabbet is deep notch formed in or near the edge of a jamb.



In KvalCAM, the rabbet width is used in the processing of a jamb. The rabbet width is a Jamb Property both the Hinge Side and Lock Side data tables.

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

FIGURE 3-18. Rabbet Width Data

#### 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.



# Right Hand Doors and Right Hand Reverse Doors

See "Right Hand Door" on page 3-13

# -

# 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 3-19 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.

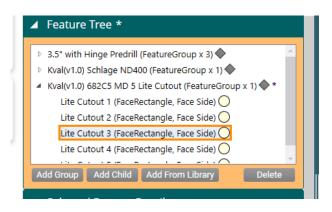


FIGURE 3-19. Example of a Validation Error Indication

## 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- 20 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.

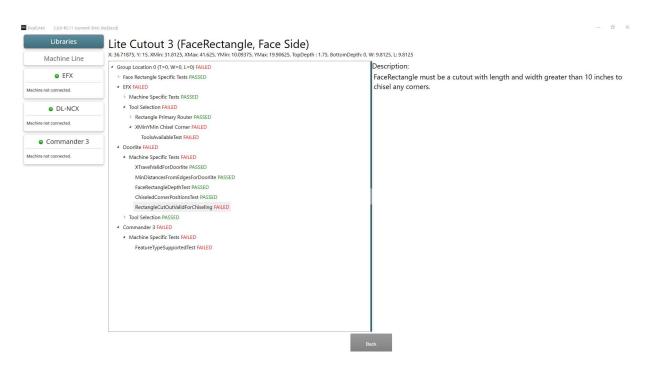


FIGURE 3-20. Example of a Validation Report



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

Last Modified	Kval(v1.0) 682C5 MD 5 Lite Cuto		
9/29/2020 2:04:04 PM	Revision ID: 1e3cb98e-6a6f-4ad2-a151-		
9/29/2020 2:04:04 PM	Revisions:		
9/29/2020 2:04:04 PM	Name	Description	Created
9/29/2020 2:03:25 PM	Kval(v1.0) 682C5 MD 5 Lite Cutout	Modern Door 5 S	11/16/2018 9:14:47
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	Principle Diff		
	Name Description test test		Last Modified
	Variants in Selected Job: Name	Description	Created
	Kval(v1.0) 682C5 MD 5 Lite Cutout 1a	Modern Door 5 Sc	10/2/2020 12:39:5

FIGURE 3-21. Example of a Variant



# Table of Symbols and Keywords

The table below describes keywords and symbols. that are available in **KvalCAM**.

**Note:** The "?" symbol is restricted and can not be used in an expression.

Symbol or Keyword	Description	Example Expression
#	Reference a defined property on the parent feature group	1+#MyProperty
\$Ancestor#	Reference ancestor (parent or higher) in the tree	Ancestor1.Length <sup>1</sup>
\$Door	Reference door data	\$Door.Thickness/2
\$Group	Reference group locations for the feature	\$Group.WLocation
\$Math	Access a math function or constant	\$Math.Max(Length,\$Math.PI)
\$Parent	Reference parent feature	\$Parent.Length+1
(and)	Parenthesis order of opera- tion	(2+2)*2=8
*	Multiplication	5*3=15
+	Addition	5+1=6
-	Subtraction	1-8=-7
1	Division	1/8=0.125

1. (Obasedindex, 0=parent, 1=grandparent, etc.)



# **Common Door and Jamb Properties**

The table below describes some of the door and jamb properties that are available in KvalCAM.

## **Door Properties**

Property	Description	Example Expression
Feed Rate Percent	Feed rate percent defined for the door.	\$Door.FeedRatePercent
HingeBevel	Bevel defined for the hinge edge of the door in degrees.	\$Door.HingeBevel
Length	Length of the door.	\$Door.Length
LockBevel	Bevel defined for the lock edge of the door in degrees.	\$Door.LockBevel
Thickness	Thickness of the door.	\$Door.Thickness
Width	Width of the door.	\$Door.Width

# **Jamb Properties**

Property	Description	Example Expression
	Hinge Jamb Dado Length	\$Jamb.HingeSideDadoLength
Hinge Jamb	Hinge Jamb Side Thickness	\$Jamb.HingeSideThickness
Side	Hinge Jamb Width	\$Jamb.HingeSideWidth
	Hinge Jamb Rabbet Width	\$Jamb.HingeSideRabbetWidth
	Lock Jamb Dado Length	\$Jamb.LockSideDadoLength
Lock Jamb	Lock Jamb Side Thickness	\$Jamb.LockSideThickness
Side	Lock Jamb Width	\$Jamb.LockSideWidth
	Lock Jamb Rabbet Width	\$Jamb.LockSideRabbetWidth
	Gap at the Header	\$Jamb.GapHeader
Gaps	Gap at the Hinge	\$Jamb.GapHingeSide
	Gap at the Lock	\$Jamb.GapLockSide



Property	Description	Example Expression
	Header Width	\$Jamb.HeaderWidth
Header	Header Rabbet Width	\$Jamb.HeaderRabbetWidth
	Head Hinge Side Dado Depth	\$Jamb.HingeSideDadoDepth

# **Supported Math Constants**

The table below describes math constants that are available in **KvalCAM**.

ldenti- fier	Description	Example Expression
abs	Absolute value function	\$Math.abs(3 - 5) = 2
sin	Sine trigonometric function accepting angle in radians	\$Math.sin(\$Math.PI / 2) = 1
sind	Sine trigonometric function accepting angle in degrees	\$Math.sind(90) = 1
cos	Cosine trigonometric function accepting angle in radians	\$Math.cos(0) = 1
cosd	Cosine trigonometric function accepting angle in degrees	\$Math.cosd(90) = 0
tan	Tangent trigonometric function accepting angle in radians	\$Math.tan(\$Math.PI / 4) = 1
tand	Tangent trigonometric function accepting angle in degrees	\$Math.tand(45) = 1
asin	Inverse sine (arcsin) trigonometric function	\$Math.asin(1) = PI / 2
acos	Inverse cosine (arccos) trigonometric function	\$Math.acos(-1) = PI
atan	Inverse tangent (arctan) trigonometric function	\$Math.atan(1) = PI / 4
atan2	<sup>1</sup> Quadrant based inverse tangent (arctan) function, first argument is y, second argument is x, uses the polarity of the arguments to determine quadrant	\$Math.atan2(-1, 0) = -PI / 2
max	Max value between two arguments	\$Math.max(2, 5) = 5



ldenti- fier	Description	Example Expression
min	Min value between two arguments.	\$Math.min(2, 5) = 2
E	Euler's number.	\$ <i>Math.e</i> = 2.71828
PI	Math constant Pi ( $\pi$ )	\$ <i>Math.PI</i> = 3.14159

1.see: https://msdn.microsoft.com/en- us/library/system.math.atan2(v=vs.110).aspx)











http://www.kvalinc.com



**Contacting KVAL** 

Phone and Fax:

In the U.S and Canada, call (800) 553-5825 or fax (707) 762-0485

Outside the U.S. and Canada, call (707) 762-7367 or fax (707) 762-0485

Email: service@kvalinc.com

http://www.kvalinc.com

#### **Customer Service**

Mailing address: Customer Support Department Kval Incorporated 825 Petaluma Boulevard South Petaluma, CA 94952