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# Bevel Consumable Reference

True Bevel Chart Used in Pronest

<table>
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<th>80AMP</th>
<th>130AMP</th>
<th>200AMP</th>
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<th>400AMP</th>
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<td>5/16”</td>
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<td>3/4”</td>
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**Bevel Consumables**

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<th>Inner Retaining Cap</th>
<th>Nozzle</th>
<th>Swirl Ring</th>
<th>Electrode</th>
<th>Water Tube</th>
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Loading Parts into Pronest

Once you have ProNest opened, select the edit part list icon. Arrows point to icons to click on.
This will open up the parts list window. From this screen you can either select the VSP parts which are shown in the picture.
If you click on a part it will be highlighted and show a figure of it in the preview window on the right side of the screen.
If you double click on the part it will open up this window where you alter the dimensions, change the part name, and the desired quantity. Once you are satisfied click ok.
Once you click ok it will move the part down to the part list shown below. You now have the option to select a specific material and class. This would have to be done for each individual part. There is a way to select the material and class prior to loading parts so it will auto fill this information when you add it to the part list that is shown on the next page.

If you select material it will give you options for material type including aluminum, mild steel, and stainless steel. The class option is going to be the plasma process selection. Your different amperages 80, 130, 200, 260, 400. It will also have options for true hole, and for true bevel. The options listed in the class section will be determined by the material that has been selected. As an example if you have .125 mild steel selected for your material, you won't have an option to select a 400Amp class.
When you select a specific material it will prompt you to reapply leads. It is recommended to select reapply leads. This will automatically adjust the lead in and lead out length for the specific material for the best results.
If you are going to load multiple parts to be cut on the same material thickness and the same class you can preset this information to auto fill on the parts added to the part list. Before double clicking on the part, just single click so it is highlighted. On the right side of the screen it will have an option for material and class. If you change the fields to the desired material and the desired class, it will apply that to all the parts you add to the part list.

If you set this information it will retain the material setting even when you shut down ProNest. Be aware that if you set the information on this part of the screen you will have to change it back to none, or to another material and class selection.
You can also load parts that were made in a CAD software program, or other parts you might have in a separate folder on the computer. To import these parts select the CAD tab.
You can select the drop down box to locate the file you wish to add parts from.
If you do not see the file and you know you are in the correct folder. Select the drop down box for files of type, scroll down to the bottom and select all files.

These parts will be added to the part list the same way as the shown previously in this document. You will also have to select the material and class as shown before.
How to Add Bevels to Your Part

Once you have the part added to the part list and you selected the material and process. Click on the Advanced Edit button.

This is the advanced edit screen. We will be adding a single pass bevel which would be either a positive or a negative angle. First you need to click on the line you want the bevel to be on, when selected the line will turn blue in color. This will also display information in the properties window on the right side of the screen. Select the drop down box for cut type and select the bevel angle you would like. For this I chose a "V" or positive bevel.

*Note that if you want to put bevels on the selected part you have to select a true bevel option under the class drop down box.
This is the advanced edit screen. We will be adding a single pass bevel which would be either a positive or a negative angle. First you need to click on the line you want the bevel to be on, when selected the line will turn blue in color. This will also display information in the properties window on the right side of the screen. Select the drop down box for cut type and select the bevel angle you would like. For this I chose a “V” or positive bevel.
You can change the type of corner loop and the size of it by clicking on the one you want to change then using the information on the right side of the screen adjust as needed. The loop style drop down box will allow you to change the loop type, while the size will allow you to change the size.
When you select the bevel type you will get an option called angle. You will enter the desired angle for the bevel in this field.
Once you have entered a bevel angle click apply. If there are other bevel angles you need to add do so at this time by following the same procedure. After all the angles have been applied to the part the last thing to do is click the make pass profiles icon.
It is important to remember when you click the make pass profiles you will no longer be able to add bevel information to this part unless it is reloaded. Once you select make pass profile it will add all the bevel parameters to the image. This includes the corner loops, and bevel path.

The most common types of corner loops recommended to use are the OffOn and the LinearLoop3. These will result in the best quality with the bevel application.
Changing Lead in Location and Style

This can be done to any non-bevel or bevel part. The best time to do this is in the advanced edit screen. To change Lead in location, click the “Modify Leads” icon. This will change the mouse icon to a wand. Now just click anywhere on the part and it will position the lead in and lead on there. Once the location has been changed right click the mouse and it will return to select mode.
To change the style of the lead in and lead out click on the lead in. This will bring up option in the properties menu on the right side of the screen. These options will allow you to change the style, size, and angle of the lead in and lead out.

For straight cutting the most common styles are Linear and Arc. When bevel cutting the leads have been preset from the spreadsheet and usually do not require changes. Typically when bevel cutting, the only adjustments needed are the location of the lead in.
Multiple Pass Beveling

Multiple pass bevels would be any bevel that has more than one cut sequence on the same profile side of a part. This would include “X”, “Y”, and “K” bevels. Once the part has been set up and you are in the advanced editor screen, you need to split the profile on the profiles that have multiple pass bevels on them. To do this click on each line, if there are multiple lines hold down the “Ctrl” key on the keyboard to select them all. Once the lines are selected, click on the “Split Profiles” icon. Notice the lines will turn blue when selected.
Once you select the “Make Pass Profiles” icon it will add the bevel geometry to the part. On the top tool bar you can click view, and then select “Cut Sequence” this will display a number by each pierce location. This is how the part will be cut. By default it will cut all parts in a clockwise direction. It is beneficial to change the cut sequence when there are multiple pass bevels or, if the majority of the part has bevels on it. To change the cut sequence, click on the “Cut Sequence” icon. A box will open with three options. To clear the existing cut sequence click on the red x.

Once the profiles have been split you can now add all required bevels to the part.
When you click the red X it will clear the numbers.
Next you need to select the lines one at a time for the new cut order. The best way to select the cut order is to do any bevel cutting first. When doing multiple passes on the same side you always want to select the bottom bevel pass then the land pass then the top bevel pass, in that order when applicable. This will result in the best quality for that cut. It is also beneficial to make sure any bevel side passes are cut before passes that are just an “I” or straight cut. This will ensure that when you are beveling the part is still attached to the plate so it will not drop.
Once you have finished selecting the cut sequence you can click on the close button and then output the part.
Alterning Data in the Bevel Spreadsheet

The spreadsheet is used to compensate for the bevel angle and the size of the cut part. We will cover how to adjust both parameters in this document.

First we need to open the spreadsheet, to do that click on the settings icon.
This is the settings window.

Select the Bevel properties and click on pencil icon to open up Bevel .XLS (Spreadsheet).
This will open the bevel spread sheet.
The spreadsheet is set up with columns of various names and rows with different colors. The main columns we will focus on displayed in this picture will be material, thickness, class, land dimension, and kerf.

Material – represents Mild Steel (MS) and Stainless Steel (SS)
Thickness – Shows the thickness of the material
Class – This is the amperage process used for cutting the material and thickness.
Land Dimension – This is the measured value for the flat cut on a “Y” or “K” style bevel cut.
Kerf – This is used to adjust any straight cut measured part size, directly proportional to the size. If the part is too small increase the kerf value. If the part is to big decrease the kerf value.
If you scroll to the right in the spreadsheet there are a few more rows we will need to possibly adjust. They are manual angle adjustment, angle adjustment, manual process compensation, and process compensation.

Manual Angle Adjustment – This is used to adjust the measured angle. This column is only used with data that was not copied and pasted into the spreadsheet.

Angle Adjustment – This is used to adjust the measured angle only in rows that were copied in the spreadsheet.

Manual Process Compensation – This is used to adjust the measured bevel part size only on preexisting rows in the spreadsheet.

Process Compensation – This is used to adjust any measured bevel part size that were copied within the spreadsheet.
Adjusting Straight cut kerf values:
The first three rows of every class are designated for straight cuts only. The first row is just for a standard straight or “I” cut, which is displayed with a * symbol for bevel type. The second row is for the straight or Land pass of a “Y” bevel, displayed as y for bevel type. The third row is for the straight or land pass of a “K” bevel displayed as a k for bevel type. For the straight cuts the most common adjustment would need to be made in the kerf column.
To adjust the kerf value click on the cell you need to change. This will display the value in the text field above. There are two ways to change this value. The first is to take the existing value and then either add or subtract whatever the adjustment is then type in the new value. The second way is to use a basic formula which is shown in the picture. Click in the text field and then type an equal sign at the beginning then either a plus or minus sign after the existing value then enter the adjustment that is needed. This will automatically calculate the new value and enter it into the cell.

When measuring for kerf adjustment it needs to be done from a standard straight cut to a standard straight cut. And then you will adjust the value by half. For example if you are trying to cut a 5” by 5” square and it comes out .25 too small. You would increase the kerf by half of that, which would be .125.
Adjusting bevel parameters:

When you cut a part with a bevel for the first time it is recommended to do a test piece on a square shape. This will go through how to adjust the measured bevel and the measured part size on bevel information that is preexisting in the spreadsheet. These adjustments will be done in the Manual Angle Adjustment column and the Manual Process Compensation column.

It is best to have a standard straight cut on the opposite side of the bevel cut. This will help in getting an accurate measurement for the part size.

First you need to get the correct measured angle on the cut piece. Using a protractor measure the angle. The picture shows an angle adjustment of plus 2 degrees on a positive 45 degree angle. Insert the adjustment value into the measured bevel angle row under the Manual Angle Adjustment column. This adjustment would be made if a measured 45 degree angle when cut came out at 43 degrees.
Once the cut angle is correct the next adjustment will be the measured part size. Using a tape measure verify the size of the cut part compared to the desired size. You will insert the adjustment needed into the Manual Process Compensation Column in the correct row for the angle cut. This picture shows an adjustment of .0625 for a negative 35 degree angle.
Angle Adjustment and Process Compensation for rows that have been copied and pasted into the spreadsheet:
For any rows that have been copied and then pasted into the spreadsheet the adjustments are done in the Angle Adjustment column and the Process Compensation column. To adjust the angle click on the cell that needs to be adjusted. In the text field insert an equal sign in front of the existing value. After the existing value, enter the adjustment needed using a plus or minus sign then the value. Listed below is an example of how this would look:

\[= -1.65828775 + 1\]

This same process is done for adjusting the measured part size. Just select the row for the bevel angle that needs to be adjusted. Click the cell in the Process Compensation column and reference the formula example above to adjust the part size.
Adding New Bevels to the Spreadsheet

The type of bevel angle that you are adding will determine how many new rows are needed. For a “Y” bevel one row would be needed. For “X” and “K” you will need 2 new rows.

You need to first create a blank row between the process data by right clicking the row number under where you want to create the new row. This picture shows the row between the .75 MS and the .875 MS process.

The next step is to right click then select insert.
This will insert a blank row directly above the thin row.

Repeat this step to add a second new row.
After the rows have been inserted you need to select the positive and negative angles for the cut type. I selected the positive 45 and negative 45 angles. You will need to select the row number on the left of the screen to highlight the entire row. Once you have highlighted one row hold down the “Ctrl” key on the keyboard and then highlight the second row.
Next do a right click and then select copy. This will put a scrolling dotted line around the two selected rows.
Now you want to click on the top inserted row.
Right click and select paste special. This is the most critical step of this process.
When you click on paste special this screen will show up. You must select values. Once the values option is selected you can click ok.
This will paste just the values into the inserted rows. You will need to change bevel type from “A” and “V” to “K” for both of the copied rows.
Once the bevel type has been changed to “K” and the spreadsheet has been saved this will give you the option in the advanced editor screen in Pronest to select “K” as a bevel option.
This is just to show the "K" bevel option in the advanced editor screen.