

BN2-20

Intro/Red Tool Class



LAST REVISED 06/16/26

BN2-20 Training Outline

- BN2-20 Overview
- Policies, Safety & Materials
- Loading and Setting up Material the BN2-20
- Cutting Types and Pressures
- Setting up A Sticker File in Versaworks



BN2-20 Introduction

- The BN2-20 is an eco solvent ink printer that can print on up to 20” wide material.
- It can automatically cut your printed items out (or not) as needed.
- It can print in white ink on matte and gloss paper, adhesive vinyl, metallic and holographic media, static cling material, heat transfer materials, and others. Not all inks and materials are covered in this introduction class.





Policies, Safety & Materials

Guidelines and Policies

- **Sign the Makersmiths Waiver Form** - This can be done at the iPad in the Leesburg classroom or the Purcellville Green Room
- **The BN2-20 is a Red Tool** – Red tools require safety training on a specific machine to operate unsupervised for safety and to prevent damage to the machine.
- **Schedule Your Time on the Printer** – Login to Makersmith.org. Go to [Reservations > UV Printer and BN2-20 Reservations](#) and fill out the reservation form
 - Limits: 2 hours per day/10 hours per week
 - The UV printer and the BN2-20 can both be printed to simultaneously but please confirm with the other person if there is interest in sharing the computer between the machines because it's not easy to have two using it at once.



Guidelines and Policies

- **Machine Cost Sharing**

- The costs for the machine are based on the cost of ink and media. You can pay for these items using the Square terminal to the right of the machine.
- There is no hourly/time charge to use the printer, just cost sharing for printing.

Material/Media Cost Sharing	Measurement	Price
BN2-20: Print+MS Media+MS Laminate	Per Foot	\$5.00
BN2-20: Print+BYO Media Fee+MS Laminate	Per Foot	\$3.00
BN2-20: Print+BYO Media+ BYO Laminate	Per Foot	\$2.00
BN2-20: MS Laminate Fee	Per Foot	\$1.00
BN2-20: Print+MS Media	Per Foot	\$4.00



BN2-20 Safety Review

- You are more likely to hurt the machine than the machine to hurt you.
- The only sharp part is the blade that cuts the paper and unless you have been specifically trained to do so, you won't need to change this.
- The printer carriage may move from side to side when the light on the power button is not solid blue.
- The machine will not operate if the acrylic window on the front of the machine is not in the down position/covering the print area.



BN2-20 Material Types

- 3651M or 3651G Oracal (or Oraguard) Brand - Standard vinyl we use in Red Tool classes. 'M' stands for Matte and 'G' stands for Gloss.
- Laminate is used over top of printed materials to make your project more scratch and UV resistant.
- Other materials such as clear, static cling, holographic, heat transfer, banner, and other materials are taught in the Advanced Class.





Getting to Know the BN2-20

Parts of the BN2-20

Only open the door if you are trained to clean the machine.

Acrylic protection cover. Machine won't print unless this is closed.

Status Light
Blue=Ready
Yellow =
Processing
Red = Error

Only open the door if you are trained to clean the machine.

Media roller. Removable to change the media or when you're running an already cut sheet through.

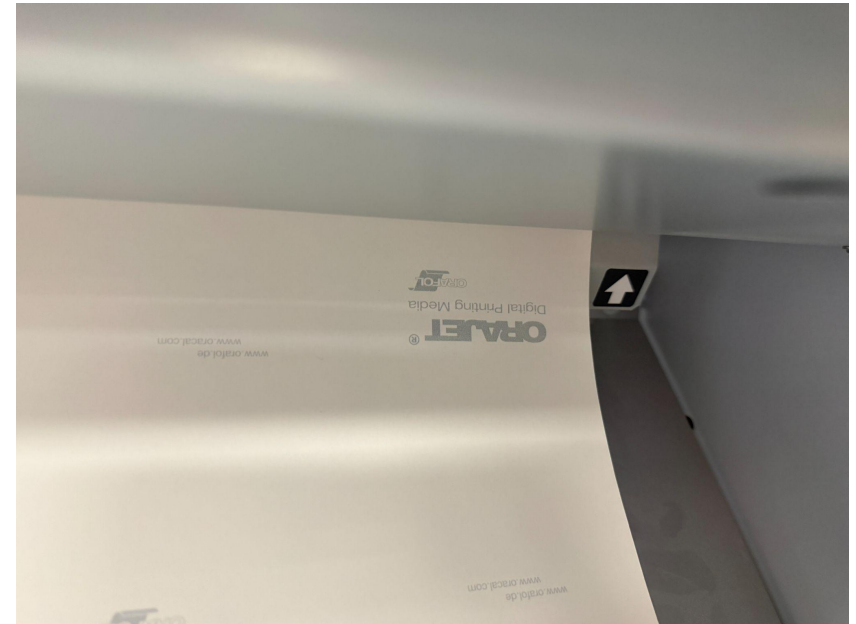
Blade and print head are inside the flap. Do not touch unless trained

Lever to secure and release media.



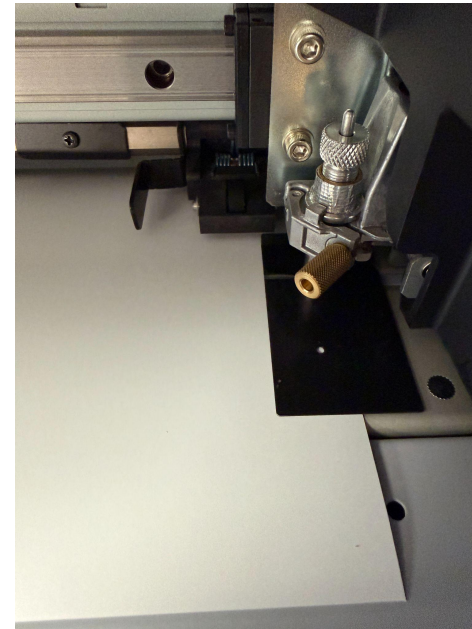
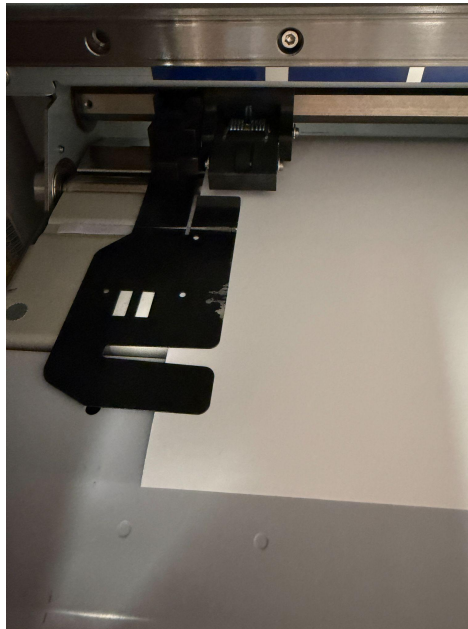
Loading Material into the BN2-20

- Lift the feed lever handle on the front of the machine to open the feed mechanism.
- The metal flap with a black arrow on each side will pop down.
- Lift the acrylic screen so that it is up and out of the way.
- Put your media on the roll, removing other media if necessary. The media should be coming out the underside of the roller.
- If you loaded the media on the roller correctly, you will be able to see the printed media brand and type information on the backside of the roll as you feed it into the machine.



Loading Material into the BN2-20

- Push the media up into the machine, following the arrows, making sure the media is underneath the foot clips on both sides.
- Feed the media up and through the area where the printheads are.
- Feed the media under the black feet/media clamps on the left and right sides. There is a slit in both feet that hold down the media. Be sure you see the media through each of those slits.
- Keeping the media as straight as possible by aligning it to the first ridge on the machine, the one with the small black rectangle on the right side. The sensor will beep when the media has been loaded far enough in.
- When lined up and under the rollers, pull down on the feed lever handle to lock the media in place.



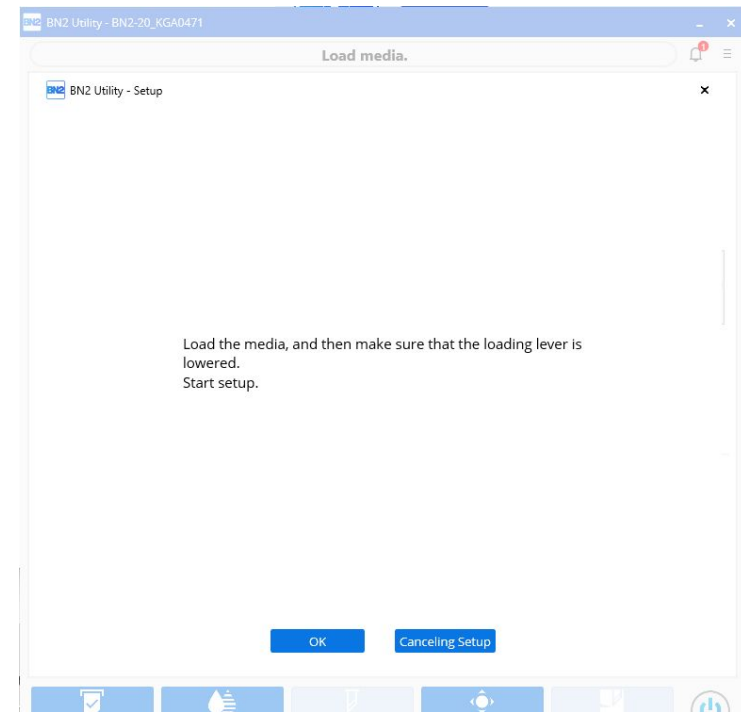
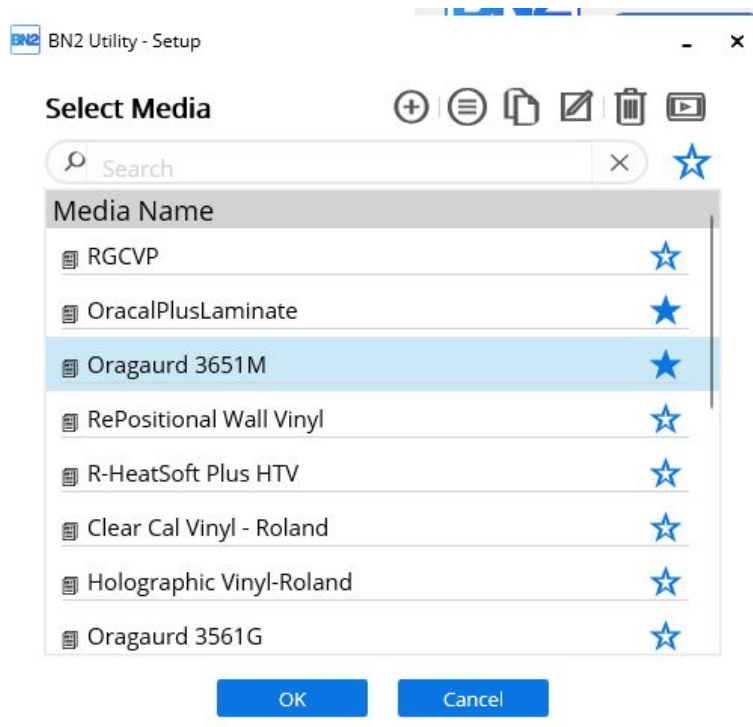
Setting Up the Media

- Open the Roland DG Connect Hub Application.
- Press the icon “BN2” in the lower left of the Connect Hub screen to open the BN2 Utility.
- If no media is setup, the BN2 Utility will say “Load media” at the top of the utility.
- In the BN2-20 utility panel, press “Setup” in the lower left corner.



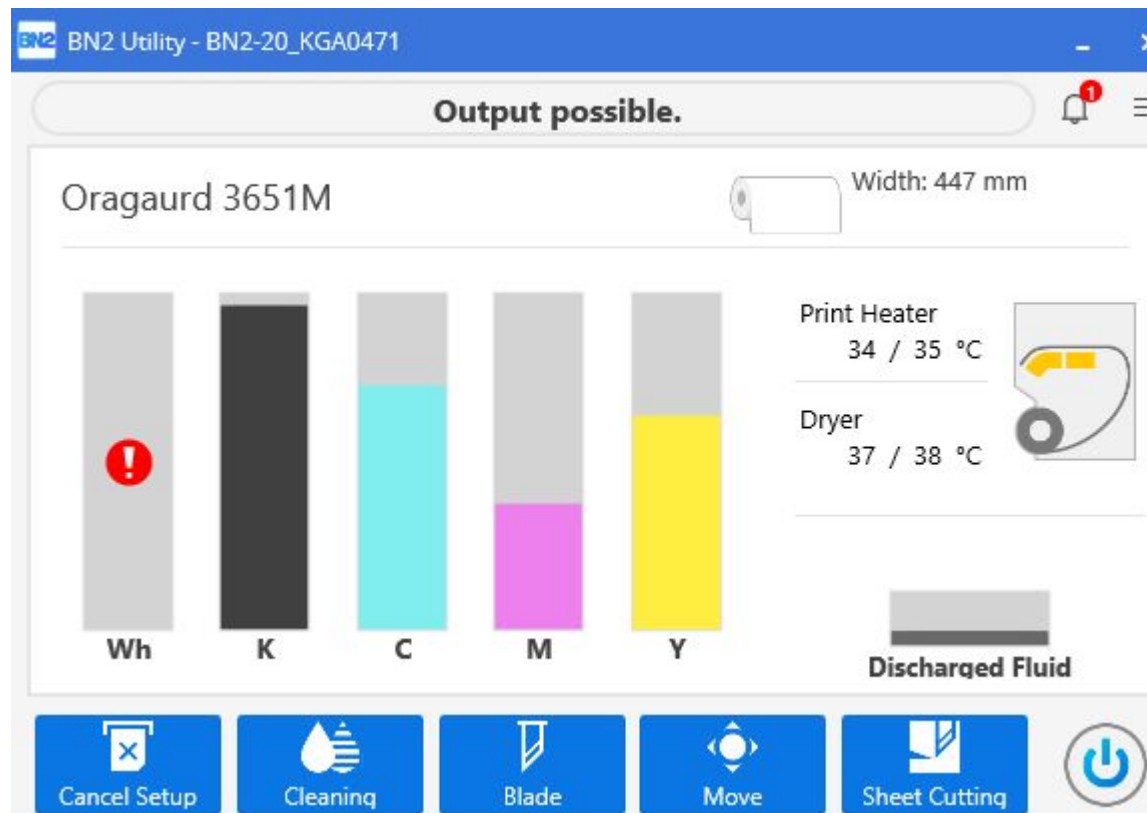
Setting Up the Media

- Select your media type.
- For the class, we will be selecting the Oraguard 3651M or 3651G for the first print. 'M' stands for matte, while 'G' stands for gloss. (We will later select OrcalPlusLaminate after we laminate the vinyl once printed.)
- Press OK
- Press OK on the next screen.



Setting Up the Media

- The machine will now try to finish loading the media by checking to make sure that the paper is loaded far enough in and lined up correctly. Once the material is loaded correctly, the message at the top of the BN2 utility will change from “Load Media” to “Output Possible”. If setup fails, lift the lever, move the material further forward towards you in the machine, and run the Setup process again.



Cut Types

- There are a few types of cuts to keep in mind when preparing your project:
 - **Die-cut:** A die-cut is usually done with a press and a sharp steel cutter, but the same concept can be done on the BN2-20. This type of cut follows the exact outer shape of your sticker and cuts all the way through giving you a clean, ready-to-use sticker with no extra material around it. You would use the “PerfCutContour” spot color to do a die cut on the BN2-20. This leaves small tabs so the material stays in place after being cut out. These can be regular or irregular shapes.
 - **Kiss cut:** A kiss-cut only cuts through the top sticker layer (or laminate and sticker layer) while the backing stays intact, so you get an easier to peel sticker with some extra backing paper space around it. You would use the “CutContour” spot color on the BN2-20 with the pressure set to only cut through the top material. These can be regular or irregular shapes.
 - **Through cuts:** As opposed to die cutting that only cuts around the outside of the sticker, this cuts all the way through the material, including inside parts of the design, which lets you remove sections and play with negative space. You would use the “PerfCutContour” spot color to do through cuts on the BN2-20 so that the sticker has small tabs and stays in place after being cut out. These can be regular or irregular shapes, but note that cutting out small inside parts from your sticker may or may not work well depending on the sharpness of the corners.



Cut Pressures

- The thickness of your material matters when printing and cutting out a sticker. This applies to both the sticker material and any laminate applied. Makersmiths has standardized on a set of materials and the class is taught with these in mind. If you want to use other materials, you need to work with the steward to set the machine up correctly.
- The Makersmiths provided cut pressure settings are provided on magnets on the side of the BN2-20.
- For the purposes of the class, the “CutContour” pressure settings are to do Kiss Cuts and the “PerfCutContour” settings are used to do Die/Through Cuts with tabs to hold the sticker in place after cutting.



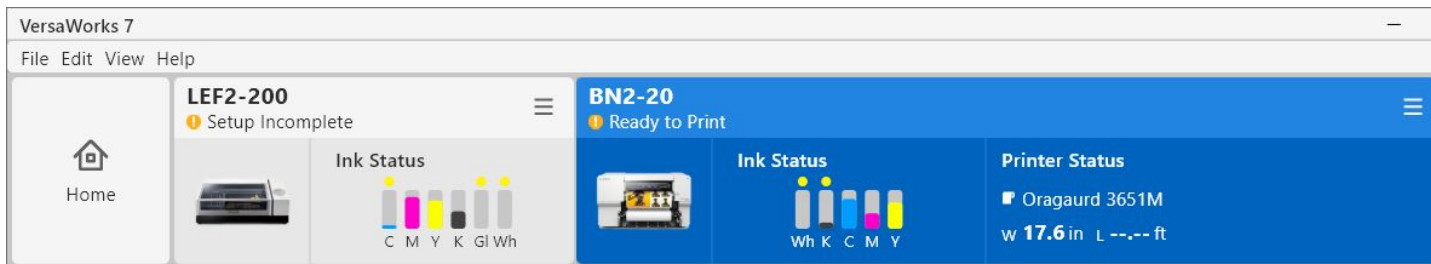
Class Project

- For this class, we will print a set of stickers.
- You will load and setup the Oraguard material in the machine using the BN2-20 application.
- You will load, setup and print a row of stickers through Versaworks.
- You will laminate the sticker.
- You will reload the Oraguard + Laminate into the machine.
- You will load, setup and cut the stickers through Versaworks.

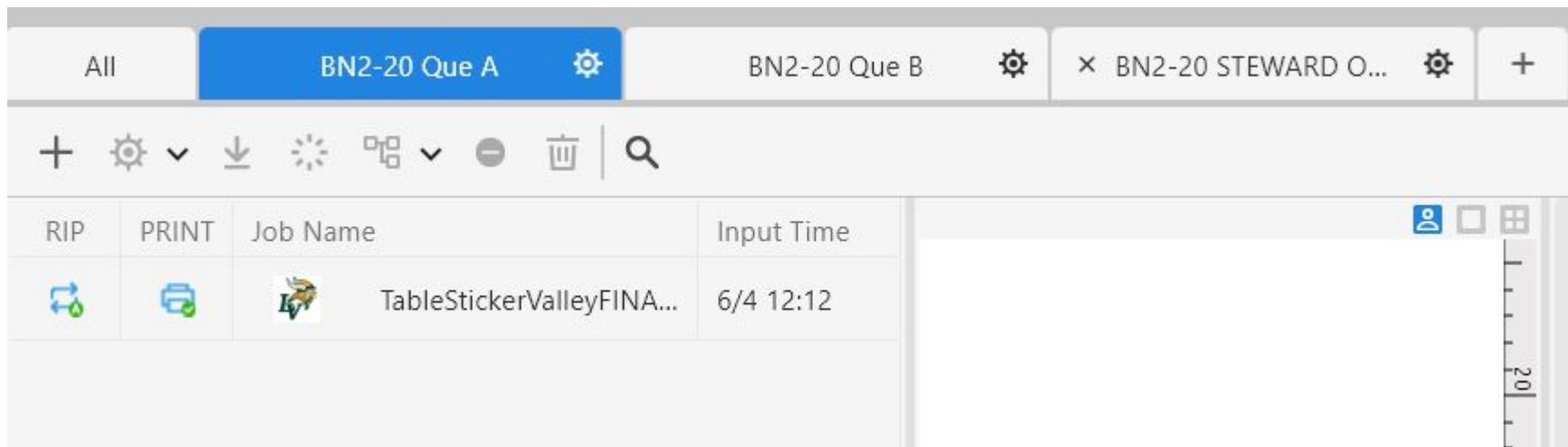


Setting Up the File in Versaworks

- Open Versaworks
- Click the BN2-20 printer at the top of the screen. It should say “Ready to Print” under “BN2-20”



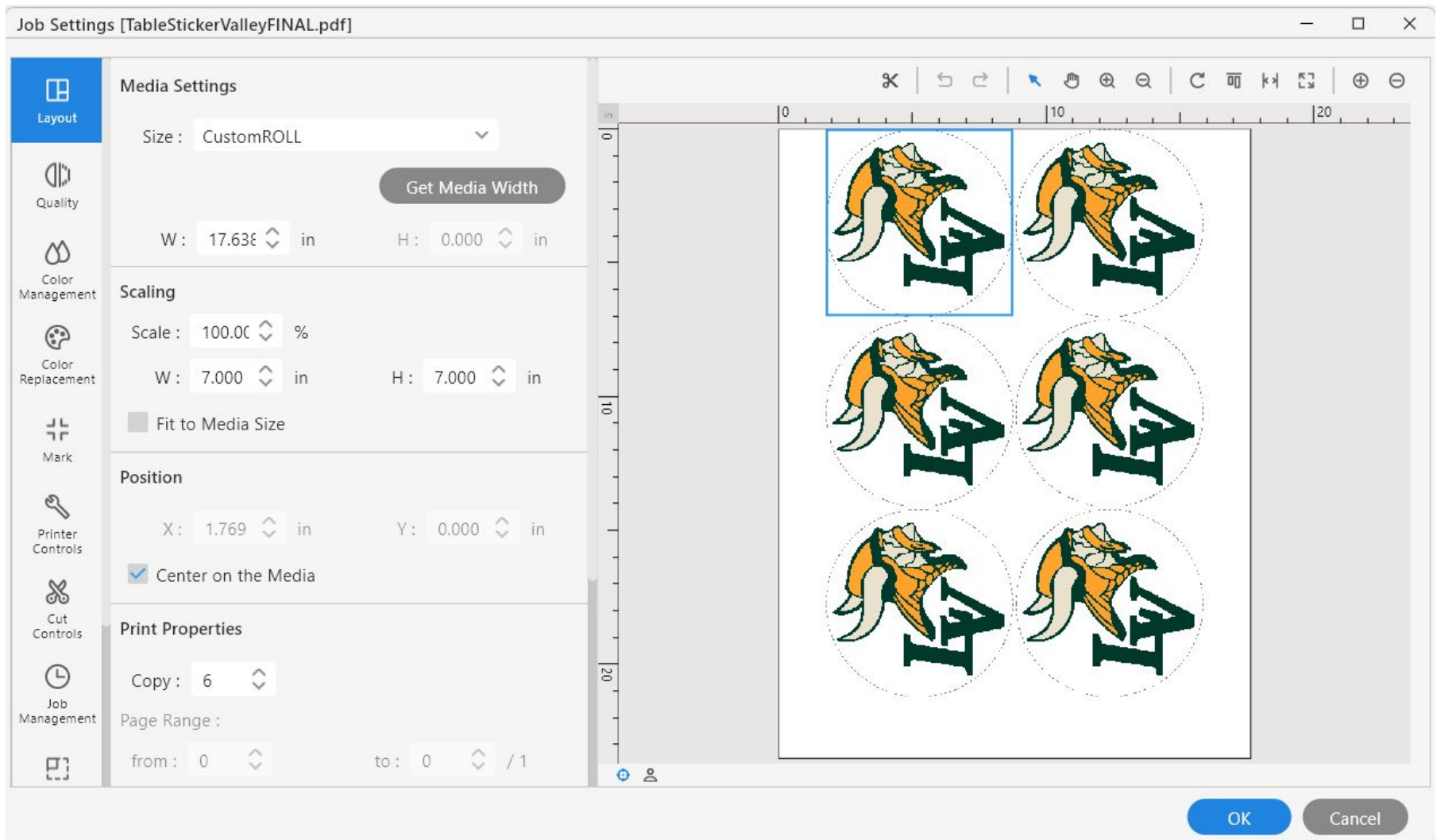
- Select Queue A then press the plus button or drag your file into the BN2-20 print queue A.



- Be sure to add it to the BN2-20 queue, NOT the LEF2-20 (UV Printer)

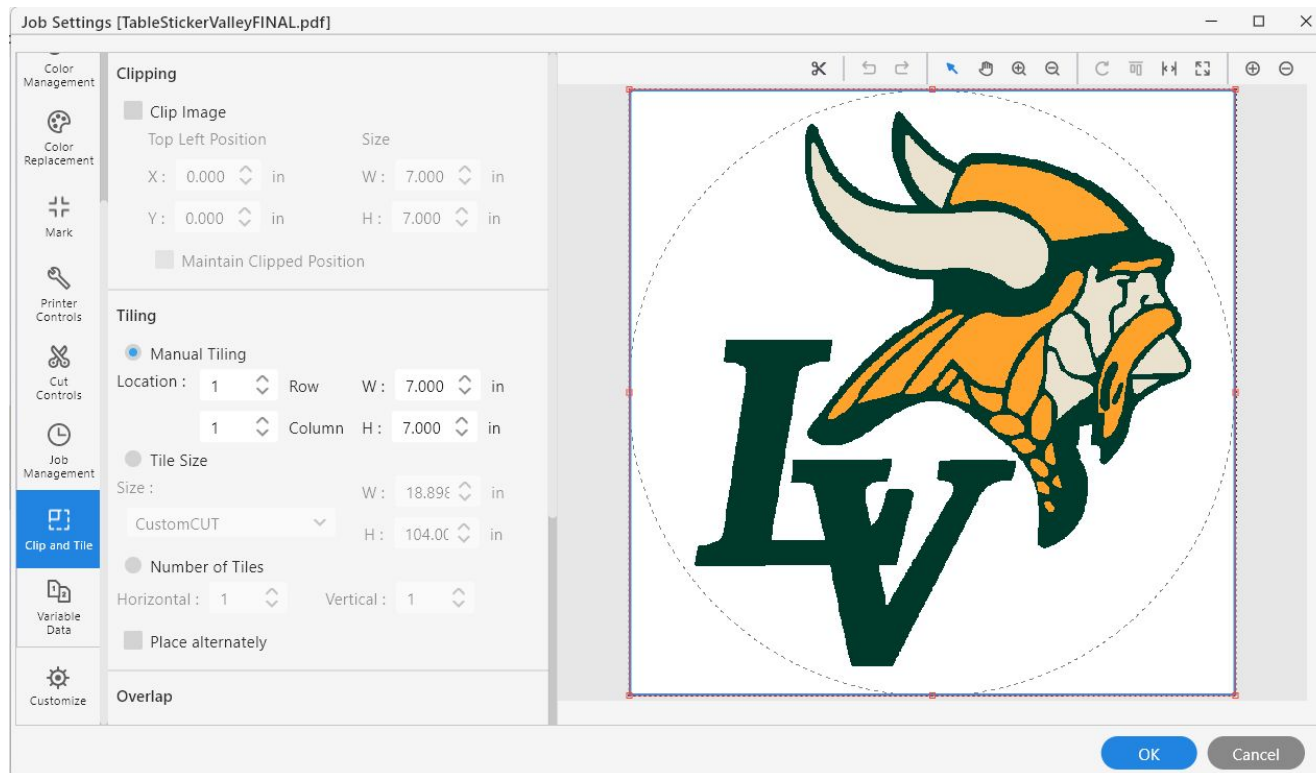
Setting Up the File in Versaworks

- Double click the file you loaded and you will see this screen to setup your file.



Setting Up the File in Versaworks

- On the left side menu, press “Clip and Tile”.
- This will show your sticker with CutContour and PerfCutContour lines if you set them up correctly. If it is setup incorrectly, you will see solid filled areas around your sticker. If it is set up correctly, you will see dotted lines as in the image below. The example below does not have a Kiss Cut/CutContour, only a Through Cut/PerfCutContour circle around the image .



Setting Up the File in Versaworks

Go to the “Layout” tab on the left

- Press the “Get Media Width” button.
- Check “Tile Spacing” on the Layout tab. The default Tile Spacing is “Equal X and Y Spacing” and should be set to 0.16”. This is the distance around the outside rectangle of your artwork between each sticker. Use this setting if you do not have added spacing around the outside of your artwork in the original file.
- If you added white space around your original artwork, you can reduce the spacing value so as not to add more than needed.
- In the “Position” section, tick the box for “Center on Media”
- Change the quantity to however many you want to print. It’s suggested to always increase the quantity to print at least one full row, otherwise you’re just wasting vinyl material.
- You can change the Orientation if needed to get more stickers on a row.

The screenshot displays the Versaworks software interface with the following settings:

- Media Settings:** Size: CustomROLL, W: 17.638 in, H: 0.000 in. A "Get Media Width" button is visible.
- Scaling:** Scale: 100.00 %, W: 0.000 in, H: 0.000 in. A "Fit to Media Size" checkbox is present.
- Position:** X: 0.000 in, Y: 0.000 in. The "Center on the Media" checkbox is checked.
- Print Properties:** Copy: 1, Page Range: from: 1 to: 1, Tile Spacing: Equal X and Y Spacing, Spacing: 0.100 in. A "Mirror" checkbox is present.
- Orientation:** Four icons representing different orientations are shown.
- EPS:** Margin: 0.000 in.



Setting Up the File in Versaworks

Go to the “Quality” tab

- Change the Media Type to “Generic Vinyl” if you are using the standard Makersmiths provided Oraguard (or Orcal) vinyl.
- You will usually change the Print Quality to High Quality, but depending on your project you may not need to.

The screenshot shows the 'Quality Settings' panel in Versaworks. It is divided into several sections: 'Quality Settings', 'RIP Setting', 'Special Color Plate Generation', and 'Special Color Plate Correction'. The 'Quality Settings' section includes dropdowns for Media Type (Generic Vinyl), Resolution (1440 x 1080 dpi), and Mode (CMYK (v)). The Print Quality section has radio buttons for High Quality (selected), Standard, and High Speed. The RIP Setting section has a dropdown for Bit Depth (8-bit). The Special Color Plate Generation section includes a dropdown for Special Color, a checkbox for Generate Special Color Plate, a dropdown for Generated Pattern, and a Density field. The Special Color Plate Correction section includes a dropdown for Special Color, Position Correction fields for Horizontal and Vertical, and Size Correction fields, each with a Test Print button.

Quality Settings

Media Type : Generic Vinyl

Print Quality : High Quality (17 min)
 Standard (8 min)
 High Speed (7 min)

Resolution : 1440 × 1080 dpi

Mode : CMYK (v)

Details

RIP Setting

Bit Depth : 8-bit

Special Color Plate Generation

Special Color :

Generate Special Color Plate

Generated Pattern :

Density : %

Special Color Plate Correction

Special Color :

Position Correction

Horizontal : in

Vertical : in

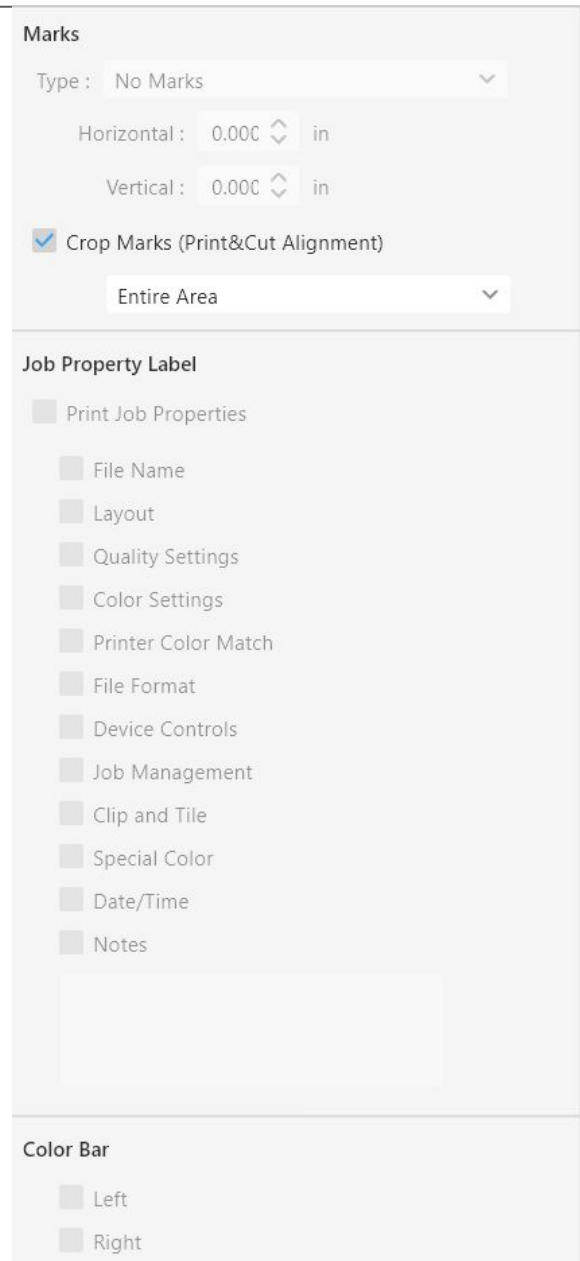
Size Correction

in

Setting Up the File in Versaworks

Go to the “Mark” tab.

- For the class, you are going to Print first, laminate, then cut so you MUST tick the box next to “Crop Marks (Print&Cut Alignment)”. This adds marks to your print so that the machine can perfectly realign the the paper after you’ve removed it and laminated it.
- If you are printing and cutting at the same time, or not cutting at all, you don’t need to add the crop marks and can skip this step.



The screenshot displays the 'Marks' and 'Job Property Label' sections of the Versaworks software interface. The 'Marks' section includes a 'Type' dropdown set to 'No Marks', 'Horizontal' and 'Vertical' dimension inputs both set to '0.000 in', a checked checkbox for 'Crop Marks (Print&Cut Alignment)', and a dropdown for 'Entire Area'. The 'Job Property Label' section features a list of checkboxes for various job properties, including 'Print Job Properties', 'File Name', 'Layout', 'Quality Settings', 'Color Settings', 'Printer Color Match', 'File Format', 'Device Controls', 'Job Management', 'Clip and Tile', 'Special Color', 'Date/Time', and 'Notes'. The 'Color Bar' section at the bottom has checkboxes for 'Left' and 'Right'.



Setting Up the File in Versaworks

Go to the “Cut Controls” menu on the left hand side

- For this class, you will first Print Only, because we are going to add laminate. Choose “Print Only” in the Operation Mode. This is because you will later run a “Cut Only” process.
- For future projects, if you are going to print and cut at the same time (no laminate) choose “Print & Cut” in the Operation Mode, then set the pressure settings according to the settings printed on magnets on the side of the BN2-20.

Press OK in the bottom right corner to exit the file setup dialog.

Operation Mode
Operation Mode : Print Only

Cutting Options

Cut All Paths

Cut Image Boundaries :
None

Return to Origin After Print

Cut Passes 1 Times

Execute PREFEED Operation

Cutting Conditions Settings

Cutting Speed : 100 cm/sec

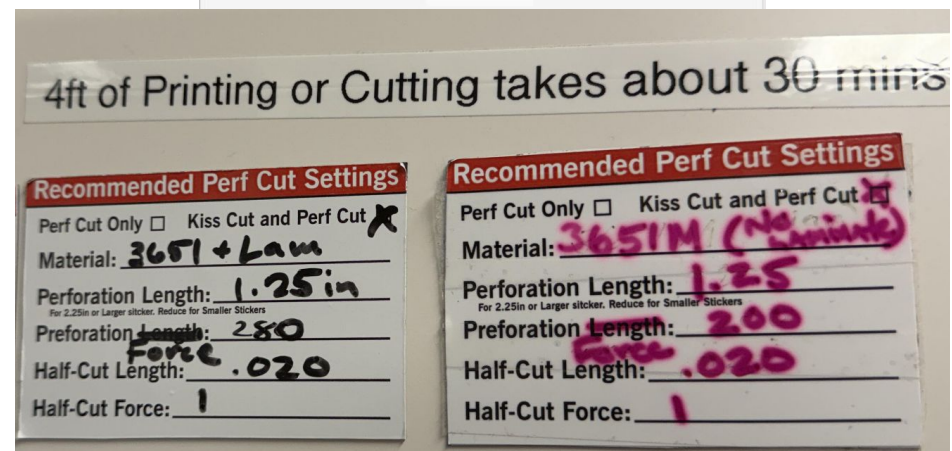
Cutting Force : 100 gf

Blade Offset : 0 mm

Conditions for Cutting Perforated Lines

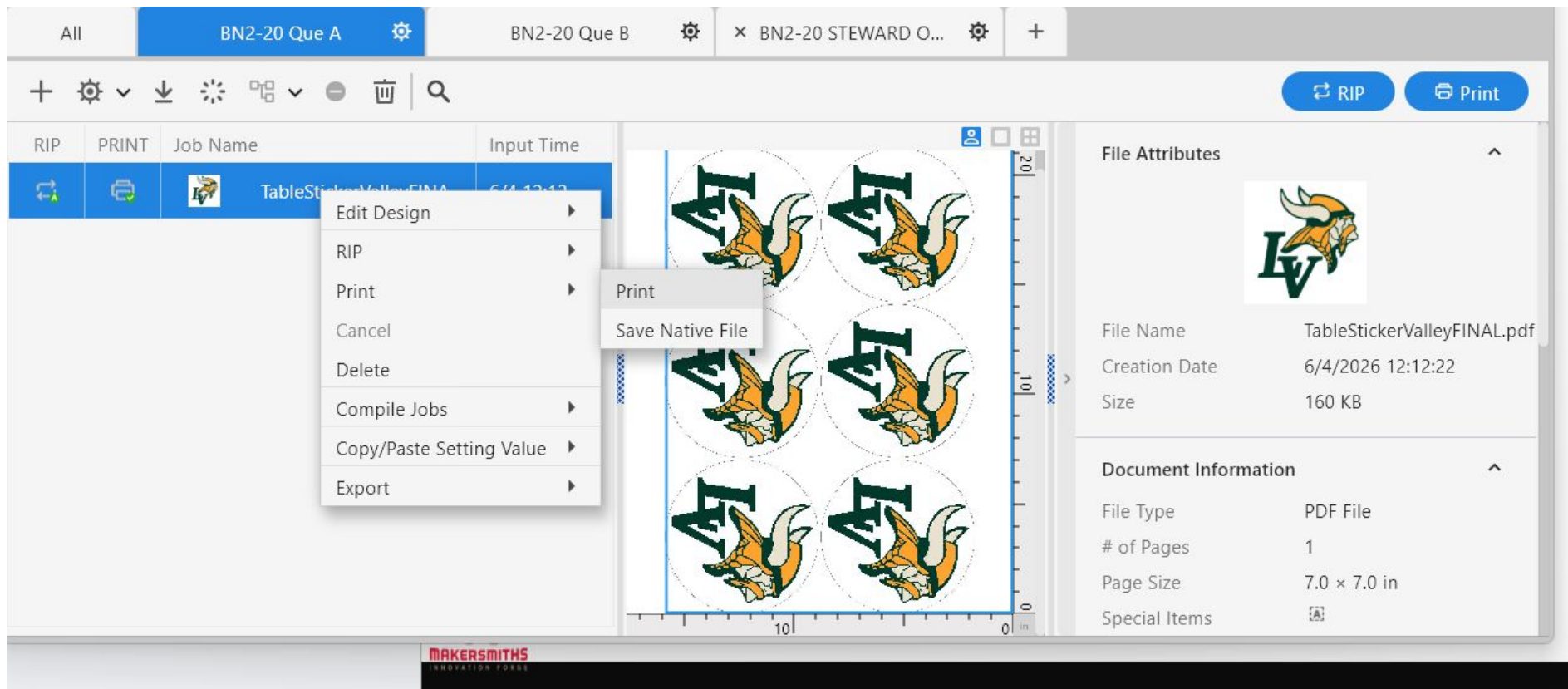
Perforation Length : 0.787 in

Perforation Force : 150 gf



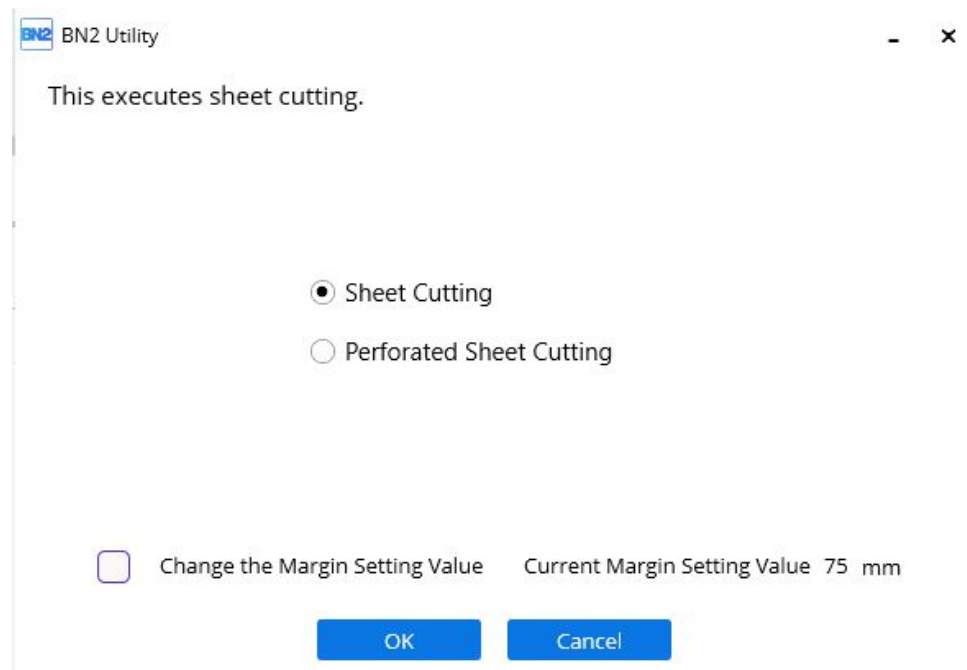
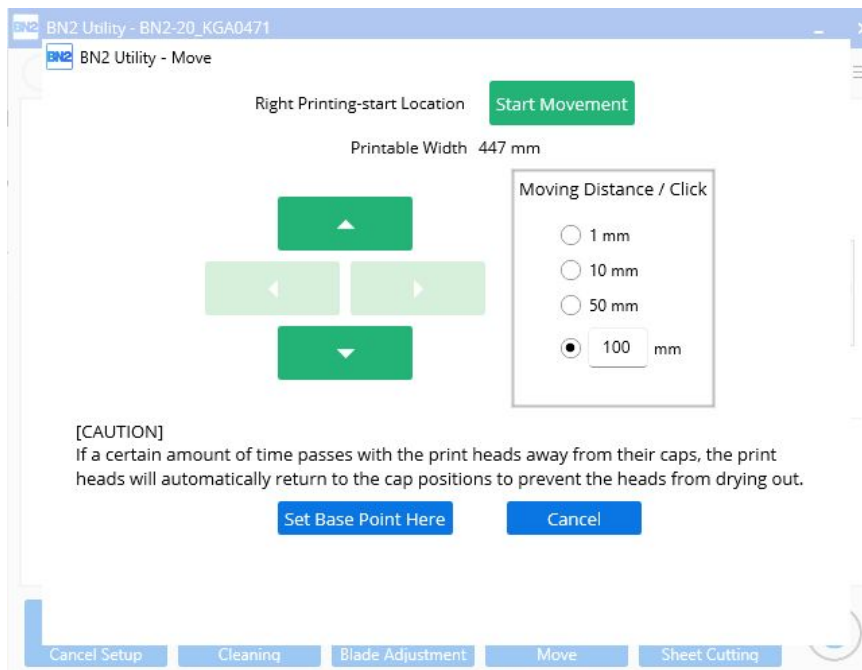
Setting Up the File in Versaworks

- Right click your project in Versaworks, got to Print, and press Print. This will print the crop marks and your stickers.



Cutting the Sheet

- When your print is done, go back to the BN2 Utility.
- If you are adding laminate, press the Move button and move the sheet down 100mm. This is the “down” direction.
- Press Cancel to go back to the main screen, then press the Sheet Cutting button. This will move the print a further 75mm and then cut the paper.
- If you are not laminating your project, there are no further steps.



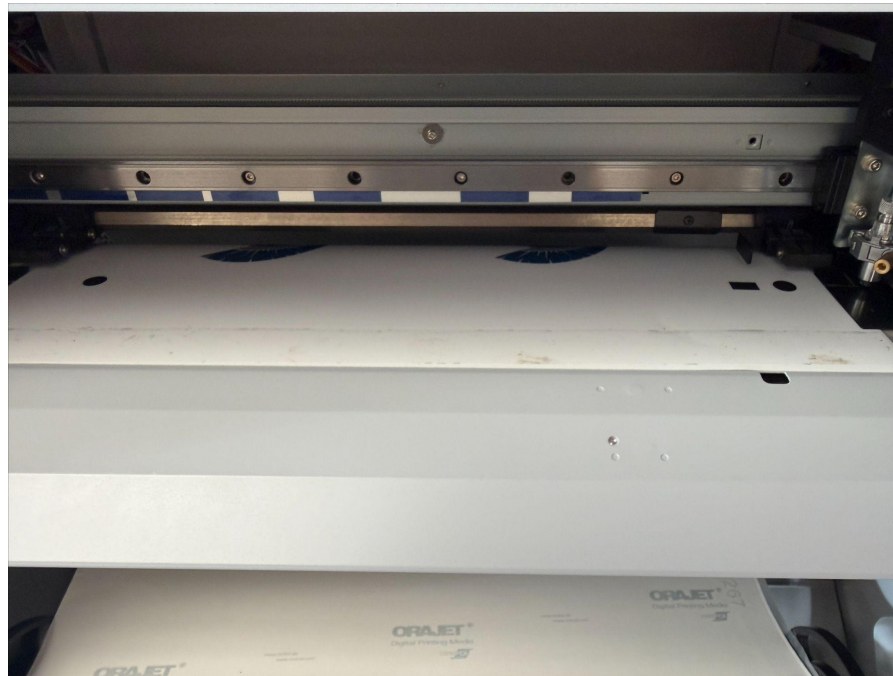
Laminating

- Let the ink dry a minute or two before putting the laminate on it.
- Cut enough length of laminate to cover both sets of registration marks.
- Fold down a 1-2 in section of the backing to expose 1-2in of laminate.
- Be aware that any dirt or fuzz that may grab onto the front of your stickers before laminating will end up on your sticker.
- Line up the top of the laminate with the top of the printed sticker sheet.
- Start by applying the laminate on the top center of the sticker paper. Press a small section of laminate onto the sticker material. Slowly move from the center out to the sides with a plastic squeegee, ensuring that the 1-2 in of laminate is straight with the top of the sticker paper.
- Insert the top 1-2in section of the laminate and sticker paper into the cold roller. As you turn the handle to feed both into the roller, slowly pull back the laminate backing. Be careful and consistent, go slow so you don't crease the laminate.
- Run through the laminator a few times after application
- Trim excess laminate on the side of your sticker sheet if larger than 1/8in



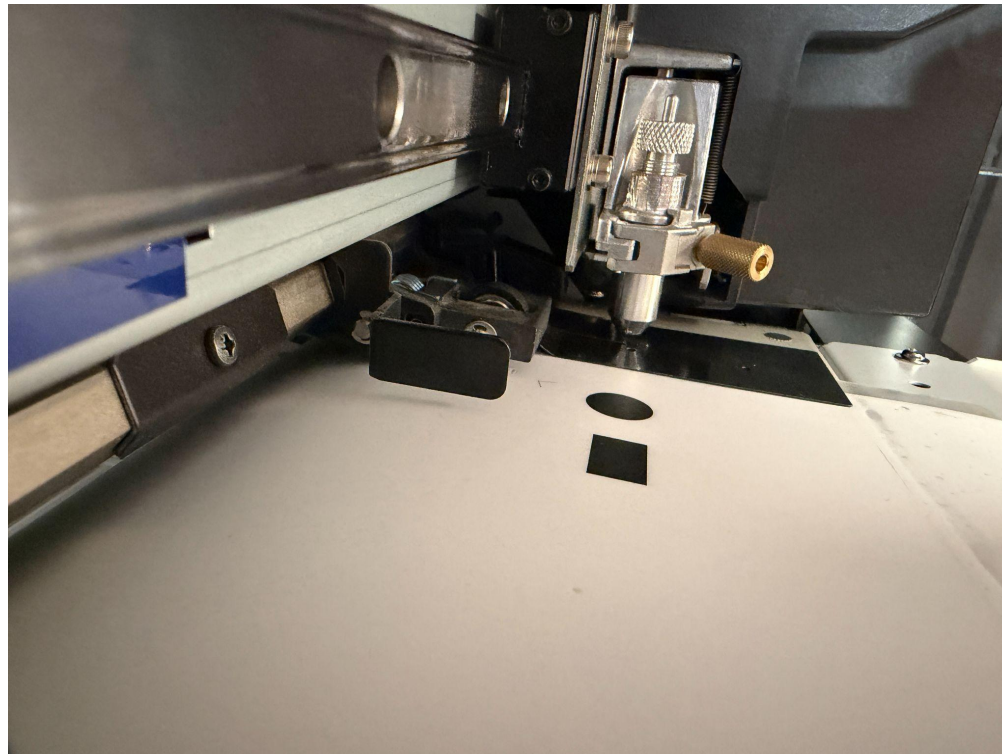
Load Laminated Material

- After your project is laminated, you have to reload the printed material, setup the material in the BN2-20 Utility, then setup to cut in Versaworks.
- It is important that you **DO NOT** change any size, quantity or spacing options in Versaworks. You will **ONLY** change the Operation Mode and cut pressure settings.
- Lift the feed lever handle on the front of the machine to open the feed mechanism.
- Lift the acrylic screen so that it is up and out of the way.
- Remove the roll media.
- Load your printed and laminated material as you did for the roll.



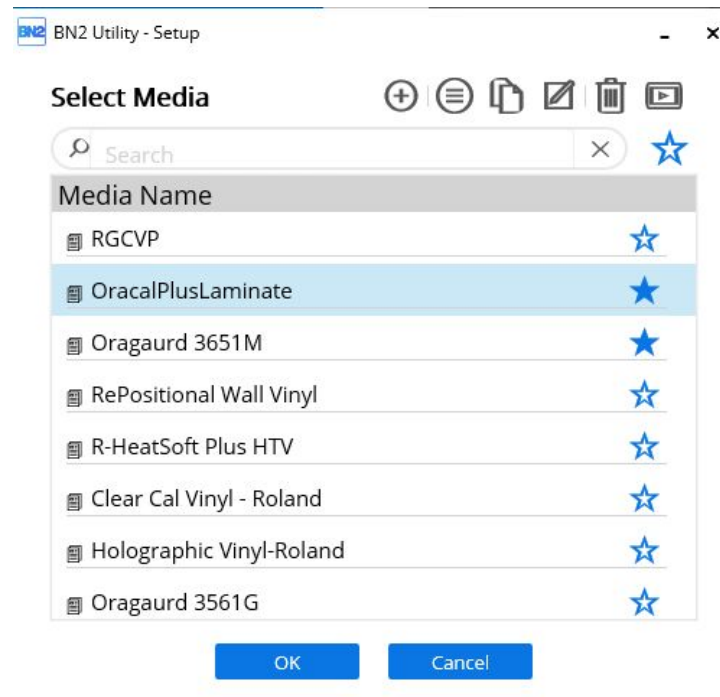
Load Laminated Material

- The registration mark with the rectangle is the top left and will be the first sensor area checked. If you see two circles instead of 2 circles and one rectangle, it's upside down.
- Line up the registration marks with the blade carriage.
- When lined up and under the black feet/media clamps, with the registration marks in line with the blade carriage, pull down on the feed lever handle to lock the media in place.



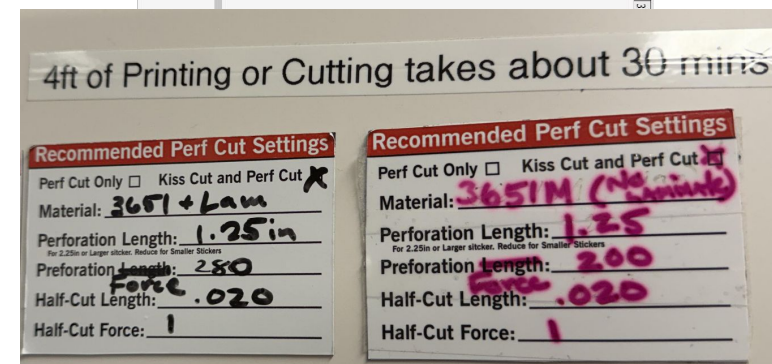
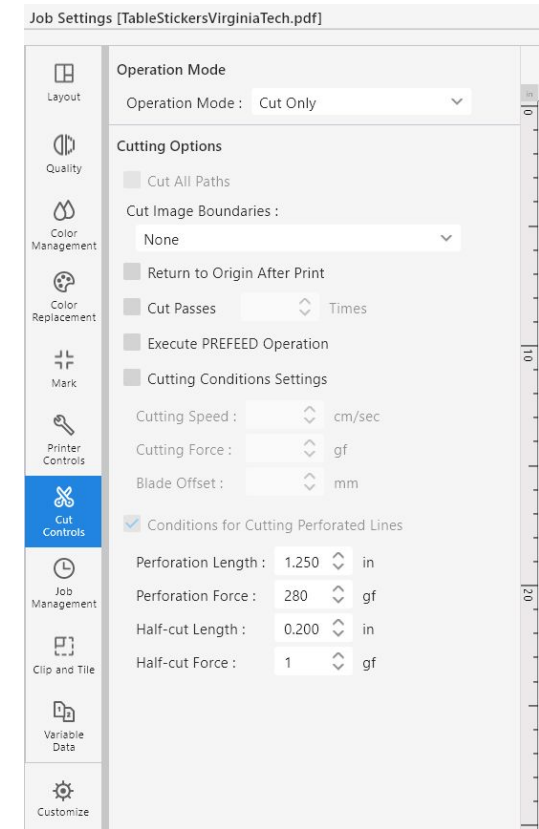
Setup the Material

- Open the BN2 Utility, press Setup, and select OracalPlusLaminate. If you have a different combination of paper and laminate for a project outside of this class, choose that combination.
- The machine will go through its setup process and “Load Media” at the top of the BN2-20 Utility will change to “Output Possible”.
- If setup fails, lift the lever, adjust the paper so that it is a square to the machine as possible and the blade carriage is lined up with the center of the crop marks, then go through Setup and select your material again.



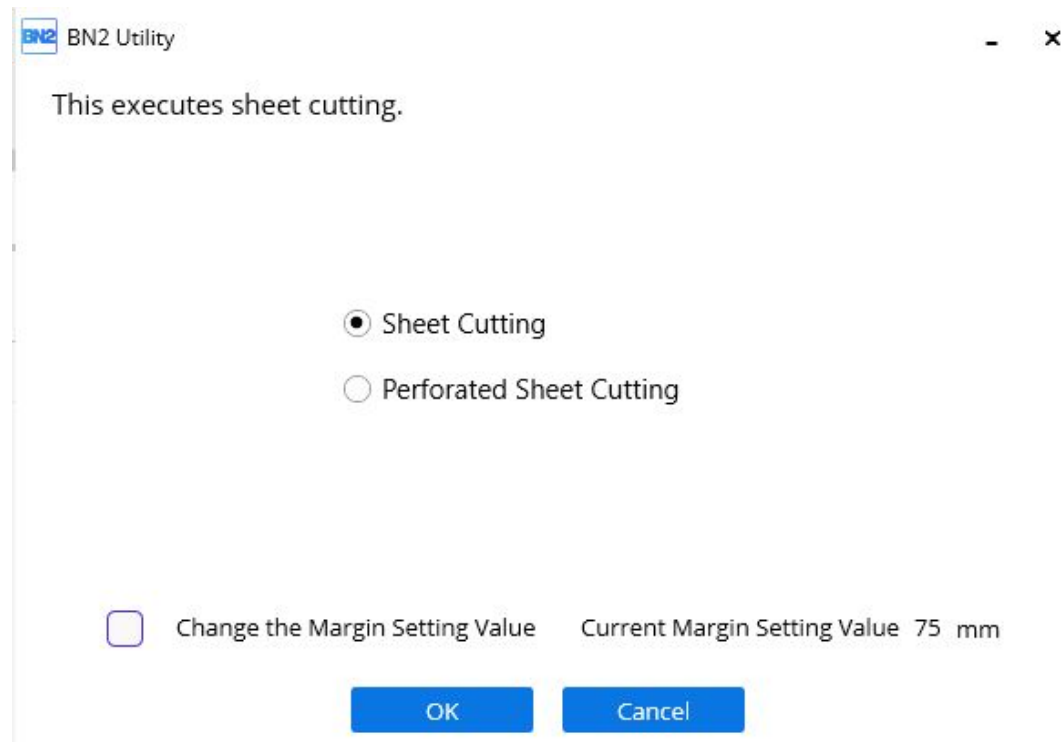
Setup to Cut in Versaworks

- Open Versaworks if not already open. Open your project.
- Go to the “Cut Controls” tab, change the Operation Mode to “Cut Only”
- Adjust the pressure settings in the “Conditions for Cutting Perforated Lines” section according to the settings printed on magnets on the side of the BN2-20. You need to use the settings that include laminate for the class project.
- Press OK in the bottom right corner to return to the main Versaworks screen.
- Right click your project in Versaworks and press Print. Even though you are pressing Print, it will only cut if you set the Operation Mode correctly above.
- The BN2-20 will first check the crop marks top AND bottom. It will move the paper very quickly, be sure it is able to move freely. Getting stuck can damage the rollers.
- If the crop mark check fails, it will cancel the output. Lift the lever, realign to make sure the paper is square to the machine and the crop marks are aligned with the blade.
- Lower the lever and press Print again.



Setup to Cut in Versaworks

- If you see a yield icon and nothing happening, You've forgotten to setup your Material in the BN2-20 Utility.
- For the class, your project will now cut through the laminate and sticker with a Kiss Cut and a Through Cut.
- When your print is done, go back to the BN2 Utility.
- Press the Sheet Cutting button. This will move the print a further 75mm and then cut the paper.



BN2-20 Pre-Start Checklist

WIP



Additional Notes

- Do not print more than about 100 2"x2" stickers at a time for each set of registration marks. The larger the number of stickers, the harder it is to line up the marks and the higher chance of print failure.
- You CAN print multiple different stickers together in one job. This will be covered in the Advanced Class. It's not recommended to laminate a sheet longer than 4 feet due to the difficulty in getting it all lined up.
- Different Kiss Cut settings can be added in the Setup Utility for materials other than those used in the basic class. Learning to do this is covered in the Advanced Class. Please do not change the standard settings for standard materials.
- If the blade seems like it's not cutting well, you can change out the whole blade carriage. DO NOT twist the blade as it changes the height and is difficult to set.
- Remember the blade is very SHARP
- If you need to stop the machine you can pause it from the Setup Utility software.
- If you need to "Emergency stop" the machine, lift the front acrylic panel. Follow the instructions in the Setup Utility from there. If the paper is getting crumpled, emergency stop or pause ASAP. This could break very expensive parts of the machine. **ASK FOR HELP** if you are running into issues.



Additional Notes

- Don't use any media types beyond those that you have been certified to use. Additional Media types are part of the Advanced Class.
- The Stewards for the BN2-20 can see all your print jobs and error history. If you run into issues, please own up and let the Steward know so we can check the machine.
- You may purchase and bring your own media and laminate to save money. Please ask the steward for help sourcing what you need to order and setting them up to be cut.
 - US Cutter is one source.
 - Substance is another (untested) potential source but this will require cut pressure setup and is reserved for the Advanced Class.
 - <https://substance.com/products/icon-pm-2750?variant=44614080790783>
- Every new type of media needs to be set up individually by the steward as the printer changes not just cut settings but also print settings.



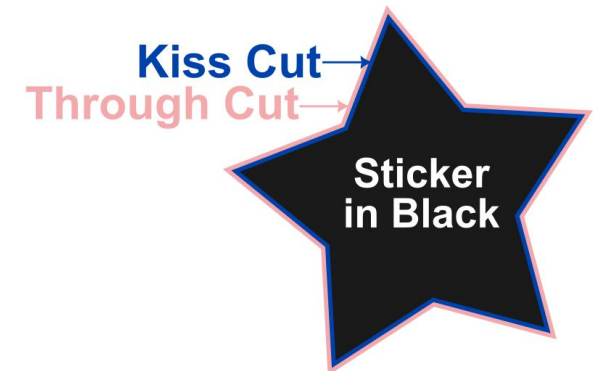
BN2-20

Artwork Setup for BN2-20



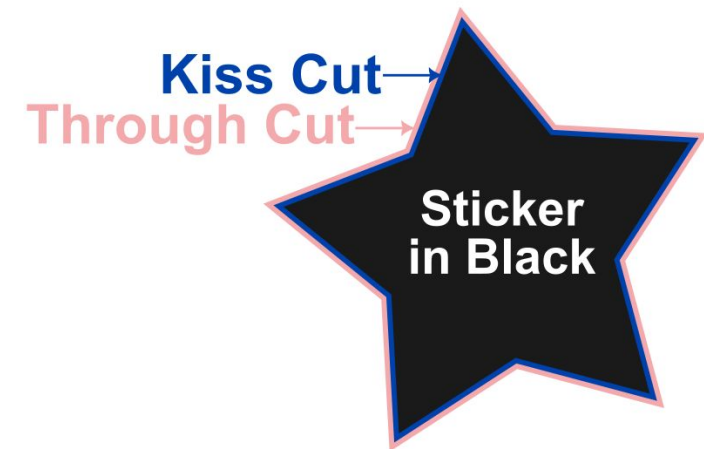
Setting Up Your Own Project Files

- Design/draw your sticker graphics in whatever program you want to work in. This may be an original drawing, photo, or other graphic done in Photoshop, GIMP, Illustrator, Corel Draw, Inkscape, or pretty much any other drawing program. The actual graphics on your sticker can be raster or vector images.
 - When designing your sticker, think about the tightness of curves and corners, both inside and outside. Any that are too tight can be difficult to cut out well.
- If you want to automatically cut out your stickers, either with a kiss cut and/or die/through cut, you will need to open your art in a vector drawing program (if you didn't already create your art in one) such as Illustrator, Inkscape or Corel Draw and add a Kiss Cut layer (spot color called "CutContour") and/or Through Cut layer (spot color called "PerfCutContour") to your sticker art.
- To add the Kiss Cut and Through Cut layers to your sticker, you create solid fill layers that are placed behind your art, and are larger than your graphic. This is done differently depending on the software you are using.



Setting Up Your Own Project Files

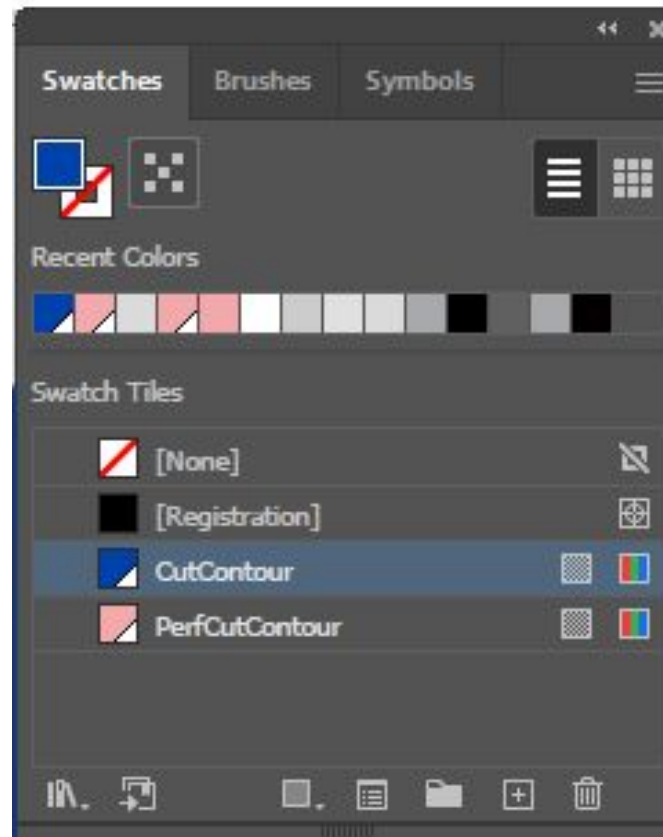
- Your cut lines do not have to be larger than your sticker. You can make them the same size as the artwork so they cut right on the line. If you do this, you may want to add some bleed to your artwork to ensure there is no white outline because of a slight misalignment.
- These are often 0.3" larger per layer but you can work with sizes that suit your project. So the pink Kiss Cut (CutContour) is 0.3" larger than the original art and the Through Cut layer (PerfCutContour) is 0.3" larger than the Kiss Cut.
- Spot Colors can be defined in Adobe Illustrator or Corel Draw. As of May 2026, Spot Colors are not supported by Inkscape and require additional programs to set correctly for the printer.



Setting Up Your Own Project Files

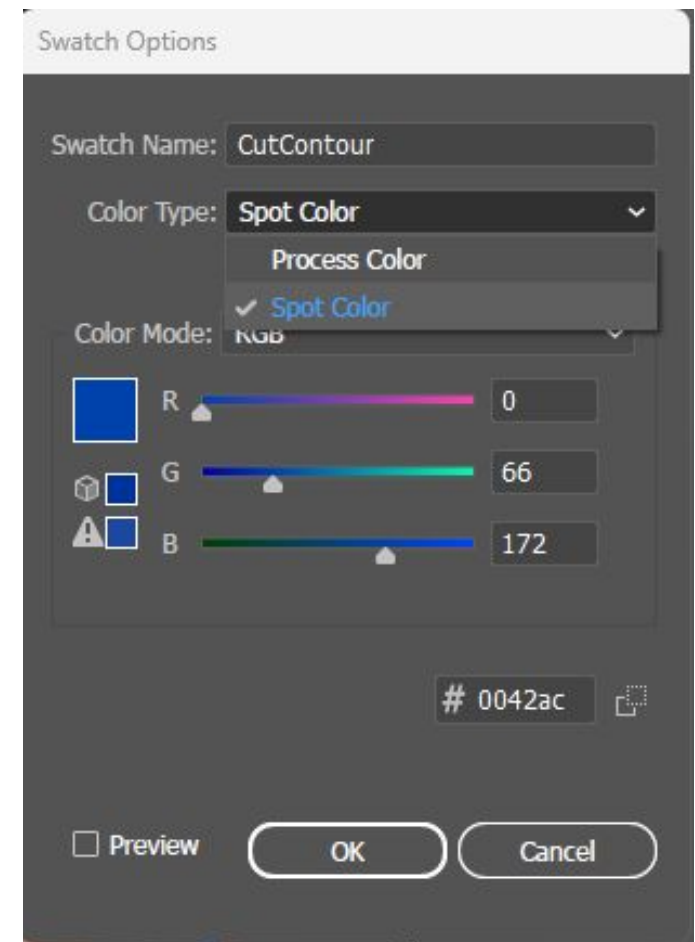
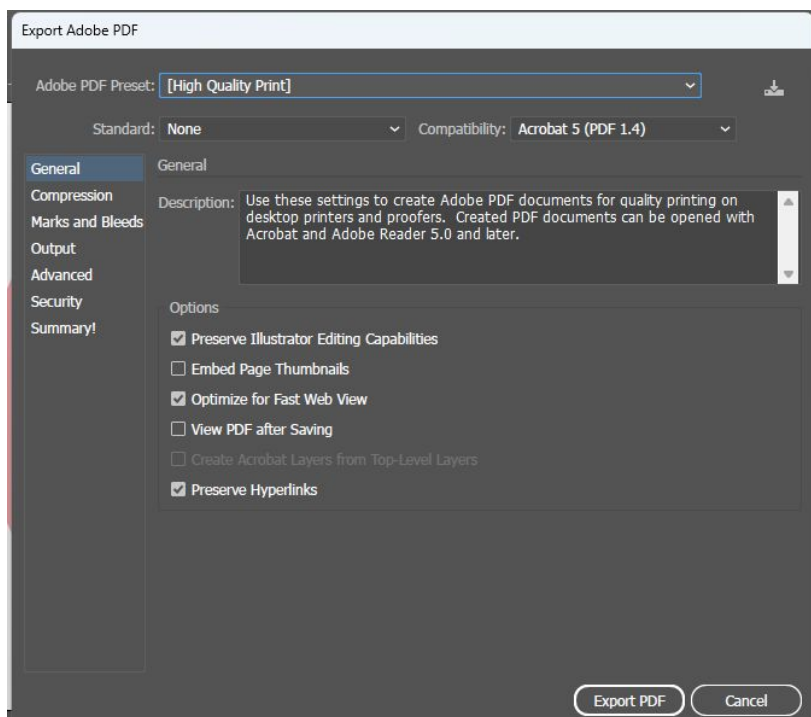
To define/name Spot Colors in Illustrator

- Go to the Windows menu at the top, open the Swatches window.
- You can use a recent color or pick something entirely new.
- Double click the name of the color to change it. Click the RGB icon on the right side of the name to change the color and/or the Spot Color name.



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- The actual color you use for the CutContour and PerfCutContour don't matter - only the Spot Color name matters. You **MUST** change the Color Type to **Spot Color** or they won't work.
- Make sure that the Spot Colors are applied to the Kiss Cut and Through Cut shapes/layers in your file.
- Remove the outer blank space on the Artboard in Illustrator by selecting Object -> Artboards -> Fit to Artwork Bounds.
- Export from Illustrator to PDF and select "High Quality Print"



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Notes:

- If you are creating inside Through Cuts, manually smooth the shape/corners to avoid tight inside corners that don't cut well.
- Before exporting to PDF, you might need to change any text to a Path by using Object to Path (Inkscape method).
- It is suggested to use separate layers for your art, Kiss Cut, and Through Cut.
- Might need to Path = Union for everything of similar colors before exporting.
- Suggestion is to setup your original art with one sticker at a time, not try to create a file with multiple stickers in one file. You will add the quantity in Versaworks. Saving different stickers on different artboards lets you do different stickers on same print run in Versaworks.
- Full image stickers really soak the material and are hard to keep flat after peeling (full color face sticker) so laminating may be necessary.

