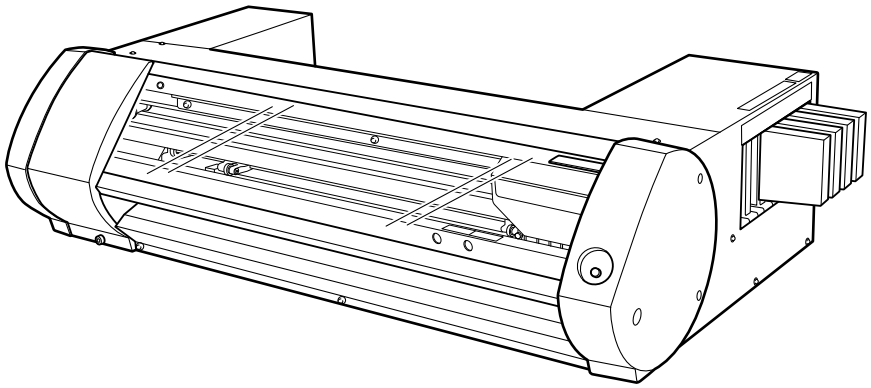
Roland

VersaSTUDIO

SIGN MAKER BN-20A

User's Manual



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The Basics

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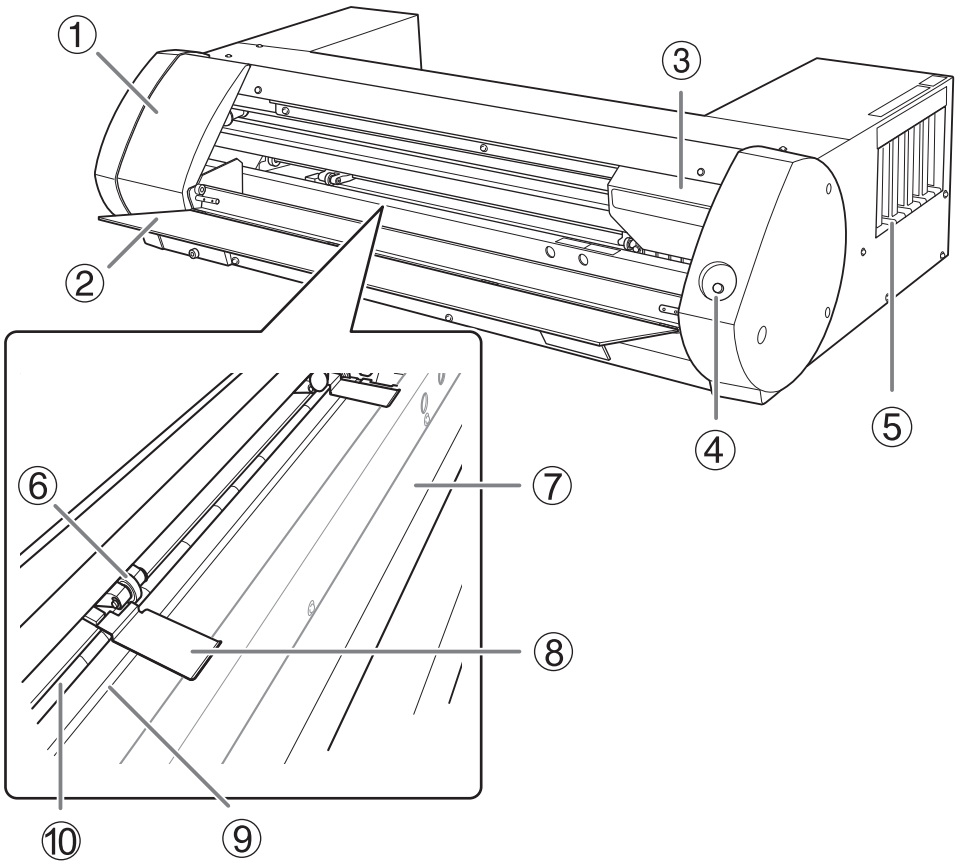
Introduction

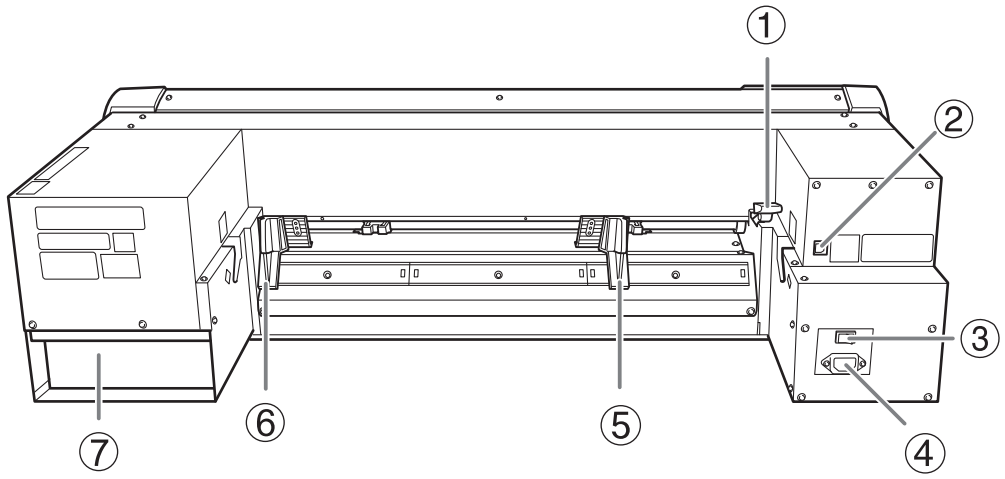
Part Names

Front



No.	Name	Function overview
①	Maintenance cover	Remove when performing manual cleaning. P. 75Manual Cleaning
②	Front cover	Keep this cover closed except when necessary, such as when loading media.
③	Print-head carriage	The print heads and blade are inside this carriage.
④	[POWER]Key	Switches the printer on and off.
⑤	Cartridge slots	The location where ink cartridges are installed.
⑥	Pinch roller	These clamp the media when the loading lever is moved to the front of the machine. The right pinch roller is fixed in place.
⑦	Platen	This is the path over which the media passes. A suction fan that keeps the media from coming loose and a print heater that helps fix the ink are built in.
⑧	Media clamp	These keep the media from coming loose and prevent fuzz on the cut edge of the media from touching the print heads.
⑨	Blade protector	This protects the tip of the blade during cutting.
⑩	Grit roller	These rollers feed out media toward the front of the machine.

Rear



No.	Name	Function overview
①	Loading lever	Operate this when you load media.
②	USB connector	-
③	Main power switch	-
④	Power-cord connector	-
⑤	Left media guide	Use this guide when loading media. This guide is on the "Left" when viewing the printer from the front.
⑥	Right media guide	Use this guide when loading media. This guide is on the "Right" when viewing the printer from the front.
⑦	Waste cartridge	-

System Configuration of This Machine

"VersaWorks 6" is written as "VersaWorks" in this manual.

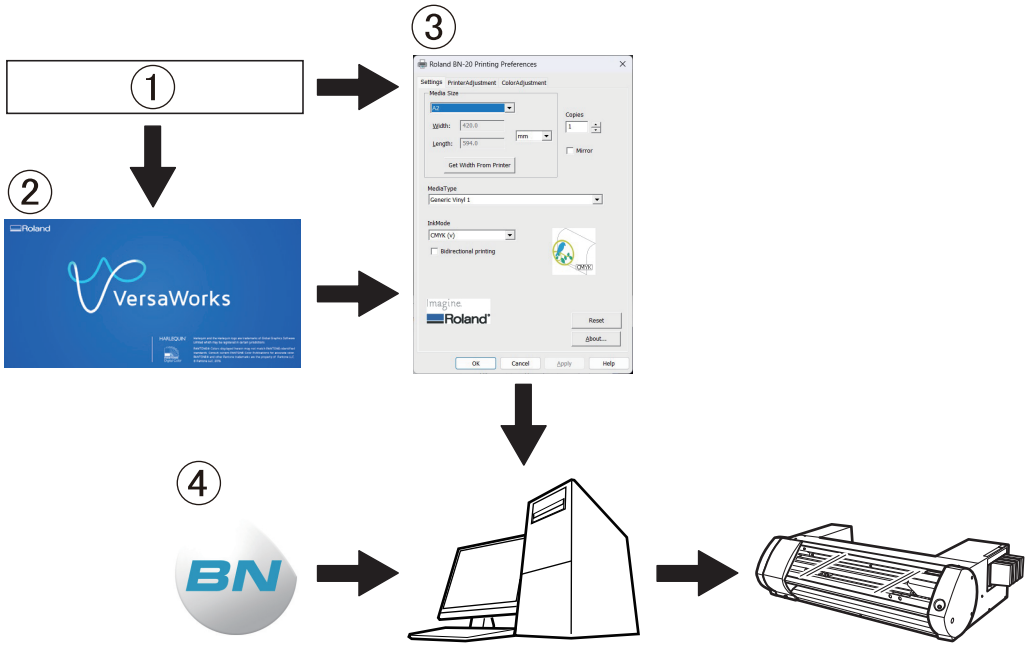
System configuration

The following combination of devices and software can be used to generate output.

- Commercial application software + BN-20 driver
- Commercial application software + VersaWorks + BN-20 driver

MEMO

When you use VersaWorks, the BN-20 driver's printing preferences become invalid.



①	**Commercially available application software**	Verified application software • Adobe Illustrator CS6 or later • CorelDraw X3 or later
②	**VersaWorks**	Software RIP (Raster Image Processor). For more information, see "VersaWorks Installation Guide."
③	**BN-20 driver**	Driver software that is needed to output printing data from a computer to the machine. It is also used to set the printing preferences in the case that you use commercial application software.
④	**Utility**	Software that is needed to operate the machine. The major functions are shown below. • Display of messages and error messages • Adjustment function • Management of ink remaining amount • Maintenance function

RELATED LINKS

- P. 11Displaying the BN-20 Driver's Printing Preferences Dialog Box
- P. 14How to Open the BN-20 Driver / VersaWorks Help
- P. 12Starting/Exiting Utility

- VersaWorks Installation Guide

Displaying the BN-20 Driver's Printing Preferences Dialog Box

Procedure

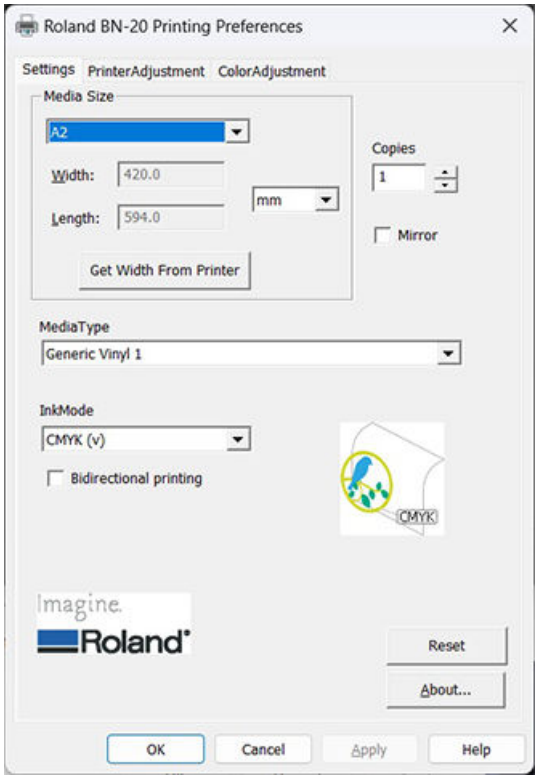
1. **Open the [Devices and printers] window.**
   - Windows 11

     From the Start menu, click **[All apps]**>**[Windows Tool]**>**[Control Panel]**>**[View devices and printers]**.
   - Windows 10

     From the Start menu, click **[Windows System]**>**[Control Panel]**>**[View devices and printers]**.

2. **Right-click the [Roland BN-20] icon, and then click Printing Preferences.**

   The BN-20 driver's Printing Preferences dialog box opens.



Starting/Exiting Utility

Opening the Utility Window

Click (the Utility icon) in the notification area. (Or, right-click the icon, and then click [**View/Hide**].)

The Utility window is displayed.

MEMO

Utility is resident software.

Utility is "resident software" that is always running. To hide the window, click ✕ in the upper-right corner of the window or click [**Close**]; Utility will not terminate.

If is not displayed in the notification area, start Utility from the Windows Start menu.

Starting from the Windows [Start] Menu

Windows 11

From the Start menu, click [**All apps**]>[**BN-20 Utility for Windows**]>[**BN-20 Utility for Windows**].

Windows 10

From the Start menu, click [**BN-20 Utility for Windows**]>[**BN-20 Utility for Windows**].

Exiting Utility

Right-click (the Utility icon) in the notification area, and then click [**End**]. This exits the utility.

Starting VersaWorks

Windows 11

From the Start menu, click **[All apps]**>**[VersaWorks]**>**[VersaWorks]**.

Windows 10

From the Start menu, click **[VersaWorks]**>**[VersaWorks]**.

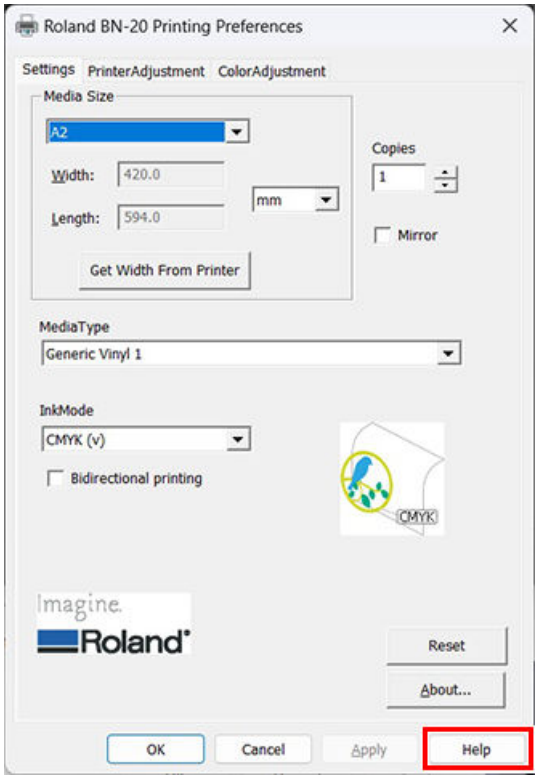
RELATED LINKS

- https://downloadcenter.rolanddg.com/VersaWorks6

How to Open the BN-20 Driver / VersaWorks Help

BN-20 Driver

Display the BN-20 driver's Printing Preferences dialog box, and then click [**Help**].

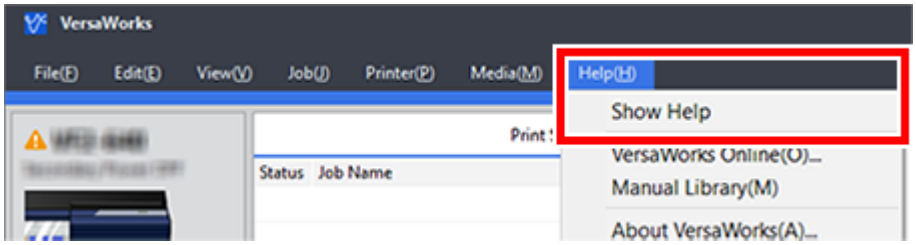


RELATED LINKS

- P. 11Displaying the BN-20 Driver's Printing Preferences Dialog Box

VersaWorks

Start VersaWorks, and then click [**Help**]>[**Show Help**] from the menu.



Windows 11

From the Start menu, click [**All apps**]>[**VersaWorks**]>[**VersaWorks Help**].

Windows 10

From the Start menu, click [**VersaWorks**]>[**VersaWorks Help**].

RELATED LINKS

- P. 13Starting VersaWorks

About the Media Used

Types of Media

This Master Guide uses the word “media” to mean sheets used for output. Media used with this machine are broadly classified into two types:

- Roll media: Media wound onto a paper tube
- Sheet media: Any media that is not wound on to a paper tube, e.g. standard size paper sheets

For both roll and sheet media, different types of paper can be selected according to the purpose. For details contact your media supplier. Media can also be purchased from the Roland DG Corp. website.

RELATED LINKS

- https://www.rolanddg.com/

Usable Media

This machine cannot print on every kind of media. Before selecting media, be sure to perform trial printing to check whether satisfactory output quality is obtained.

Size

	Usable Media
Width *1	• 150 to 170 mm (5.9 to 6.7 in.) • 200 to 235 mm (7.9 to 9.3 in.) • 287 to 322 mm (11.3 to 12.7 in.) • 348 to 383 mm (13.7 to 15.1 in.) • 393 to 429 mm (15.5 to 16.9 in.) • 439 to 474 mm (17.3 to 18.7 in.) • 487 to 515 mm (19.2 to 20.3 in.)
Cuttable media thickness*1	Max. 0.22 mm (8.66 mil; depending on the media composition)
Maximum media thickness (including backing paper)*1	When only printing: 1.0 mm (39.4 mil) When performing cutting: 0.4 mm (15 mil)
Maximum roll outer diameter	150 mm (5.9 in.)
Paper tube (core) inner diameter	76.2 mm (3 in.) or 50.8 mm (2 in.)

*1 Applies to both roll and sheet media

Maximum Roll Weight

6 kg (13.23 lb.)

Other Conditions

Media such as the following cannot be used.

- Media whose end is attached to the paper tube (core)
- Media that is severely warped or that has a strong tendency to reroll
- Media that cannot withstand the heat of the media heating system
- Media whose paper tube (core) is bent or crushed
- Media that bends under its own weight when loaded
- Media on a sagging roll
- Media that is rolled unevenly

Four Different Output Methods

The following four output methods are available for this machine.

Printing (Only)	Printing using ink. It is also called "Printing Only" to distinguish from "Printing and Cutting."
Cutting (Only)	Cutting using a blade such as for seal die cutting. It is also called "Cutting Only" to distinguish from "Printing and Cutting."
Printing and Cutting	Printing method in which printing is followed by cutting. If output data that contains both printing and cutting information is sent to the printer, the cutting operation starts after printing finishes.
Crop-Cut	Output method using "Crop Marks" to align the printing and cutting results. If you are printing on the media, removing it so it can be laminated, and then reloading the media in the machine to cut it, use the crop marks to align the media.

Important Points During Use

Use the machine periodically

We recommend using the machine at least once a week. If left unused for a long period of time, the ink may settle, resulting in unstable discharge (and nozzle clogging). Any dry ink will need to be discharged.

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Switching Power On and Off

Precautions When Operating the Power Supply

IMPORTANT

Make sure that the main power is on at all times

Never switch the main power off. Continuous power on allows the automatic maintenance function to work periodically. Failure to ensure automatic maintenance will result in a malfunction of the machine, such as damaged print heads.

During operation, never unplug or switch the main power off.

During operation, if the main power is switched off, or unplugged, the print heads may be damaged. The sub power switch must always be turned off before the main power is switched off. To turn off the sub power switch, press and hold down the [POWER] key. If accidentally the main power is switched off, immediately switch the main power and sub power ([POWER] key) back on again.

Turning the Power On

⚠ WARNING

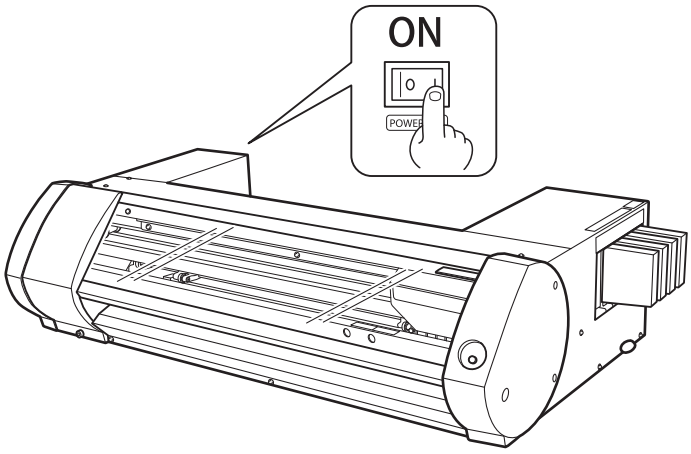
Remove any loaded media or switch off the sub power when printing is not being performed.

The continued application of heat at a single location may cause the release of toxic gases from the media or pose a fire hazard.

Procedure

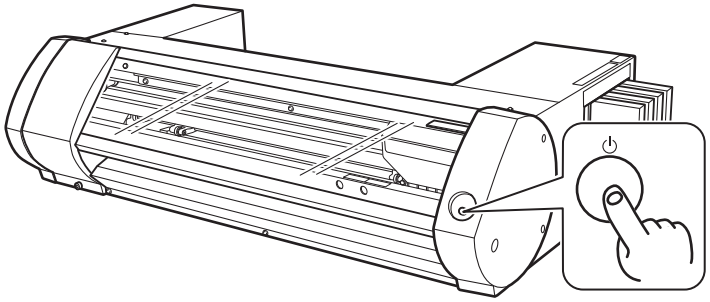
1. **Close the front cover.**

2. **Turn on the main power switch.**



3. **Press the [POWER] key.**

   When the [POWER] key indicator changes from flashing to steady, startup is finished.

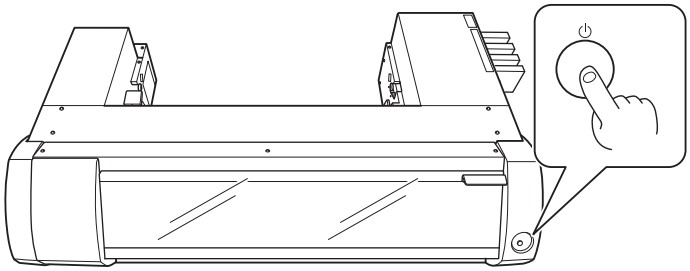


Switching the Power Off (Sub-power Off)

Procedure

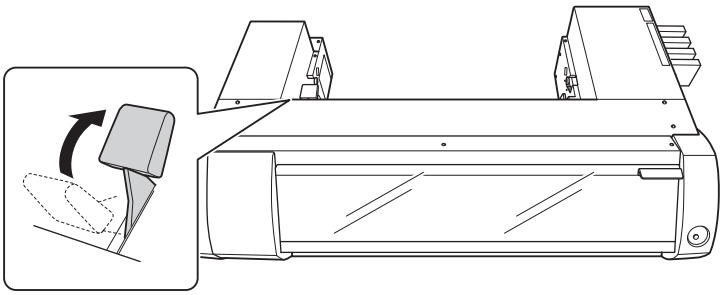
1. **When output is completed, press and hold down the [POWER] key for one second or more.**

   When the [POWER] key light is off, the power is off.



2. **Push the loading lever backward.**

   Even if you are not going to switch the power off when the machine is not in use, make sure the loading lever is moved to the rear.



About Sleep Mode (Power-Saving Mode)

The machine has a power-saving function; after about 30 minutes of non-use the machine automatically changes to the lower power consumption sleep mode. In the sleep mode, the [POWER] key slowly flashes on and off. When you next operate the [POWER] key or send print data from a computer to the machine with media loaded, the machine returns to the regular mode.

Printing

This section describes operations when printing only.

Refer to Cutting / Printing and Cutting(P. 40), Performing Printing and Cutting Separately(P. 49).

Step 1: Loading Media

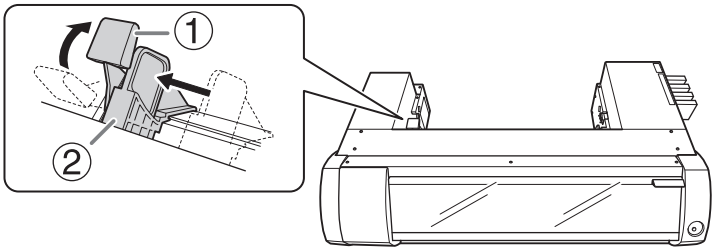
Loading Roll Media

Procedure

1. **Move the left media guide to the left edge.**

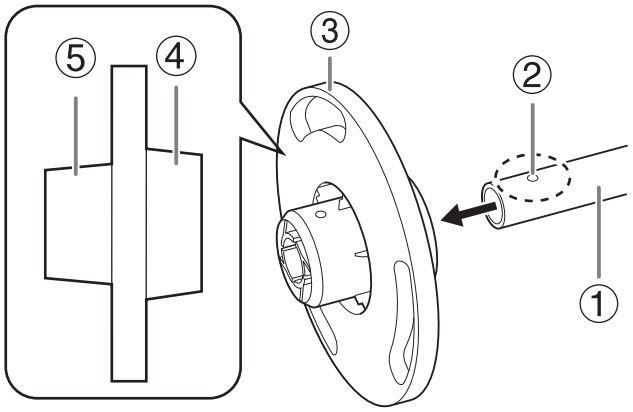
(1) **Push the loading lever (①) backward.**

(2) **Move the left media guide (②) to the left.**

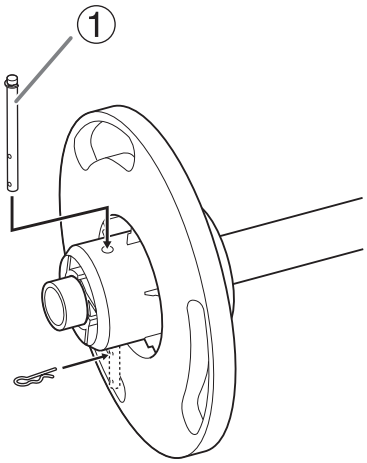


2. **Attach the media flange (③) to one end of the media bar (①).**

Insert the side of the media bar with a hole (②) into the media flange. When loading roll media with a 3-inch paper tube inner diameter, attach the media flange with (④) on the inside. When loading roll media with a 2-inch paper tube inner diameter, attach the media flange with (⑤) on the inside.



3. **Secure the media flange and media bar with the mounting pin (①).**

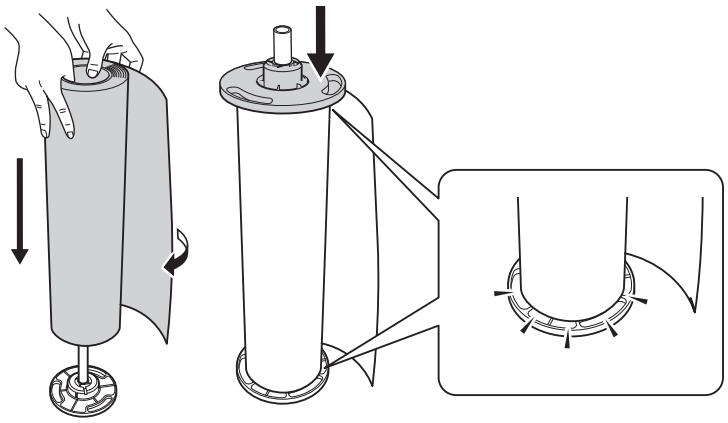


4. **Load the roll media onto the media flange.**

Install the roll media so there is no gap between it and the media flange.

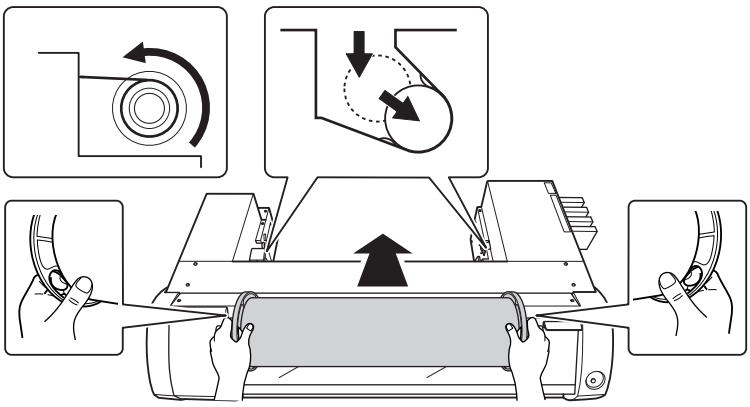
MEMO

Place the secured media flange at the bottom, so that the media feeds in the clockwise direction when viewed from above. You cannot load the media correctly if the feed direction is incorrect.



5. **Place the roll media loaded onto the media bar on the printer.**

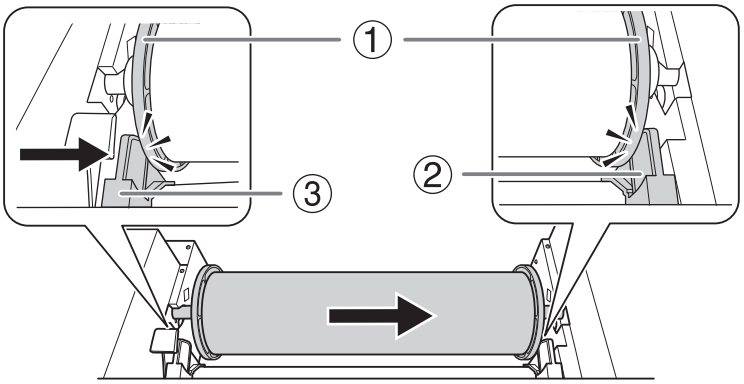
Press both ends of the media bar into the grooves at the back of the printer while making sure the media does not become loose.



6. **Adjust the loaded position of the roll media.**

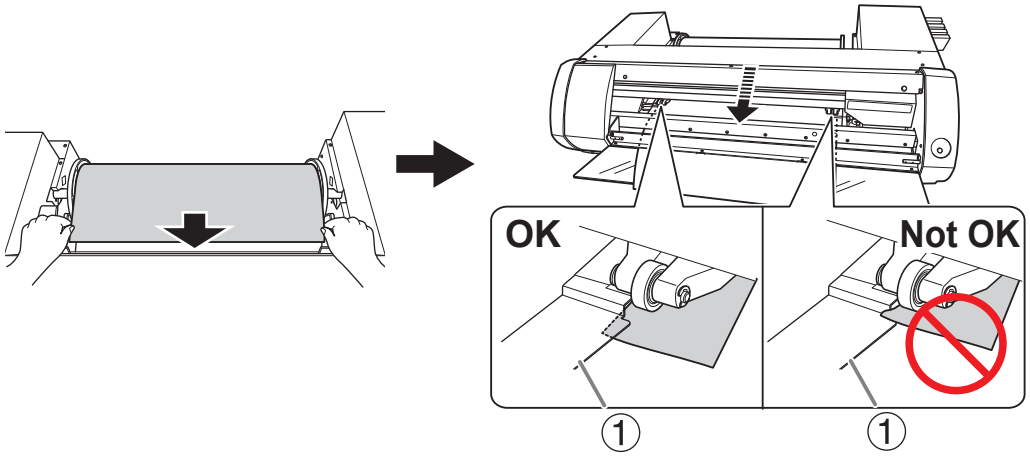
(1) **Move the roll media to the right so the media flange (①) touches the right media guide (②).**

(2) **Slide the left media guide (③) and press it against the media flange.**



7. **Pass the media through the printer.**

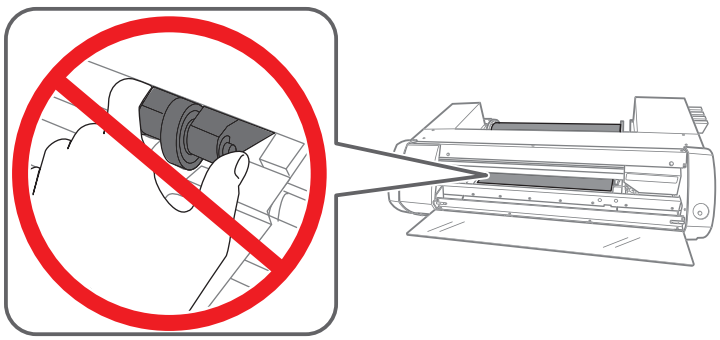
Pull the media straight to keep it taut, and then pass it beneath the media clamps (①).



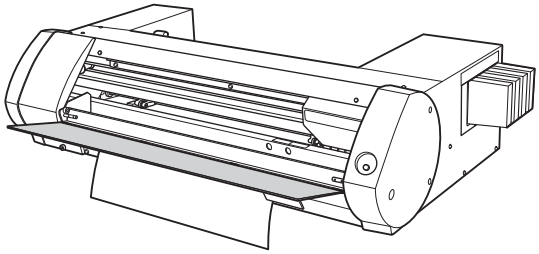
⚠ CAUTION

The pinch rollers cannot be moved directly by hand. Move them with the media guide.

Attempting to forcibly move these rollers may result in injury.



8. **As shown in the figure, pass the media under the front cover and pull the media out the other side.**



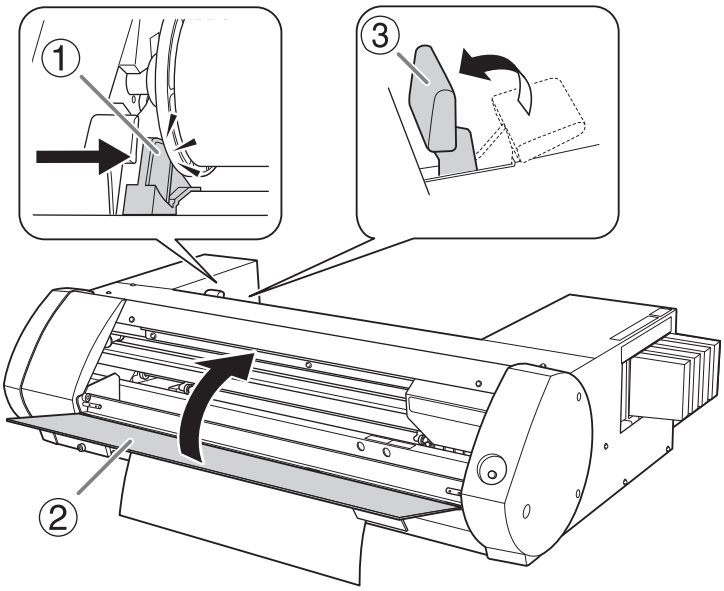
9. **Start initial operation.**

(1) **Make sure the left media guide (①) is pressed against the media flange.**

(2) **Close the front cover (②).**

(3) **Pull the loading lever (③) forward.**

Pull the loading lever forward to start initial operation. When the [**POWER**] key indicator changes from flashing to steady, initial operation is complete.



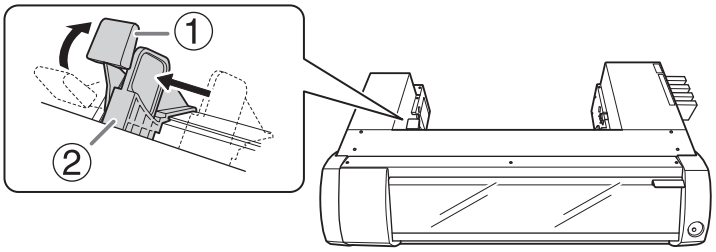
Loading Sheet Media

Procedure

1. **Move the left media guide to the left edge.**

(1) **Push the loading lever (①) backward.**

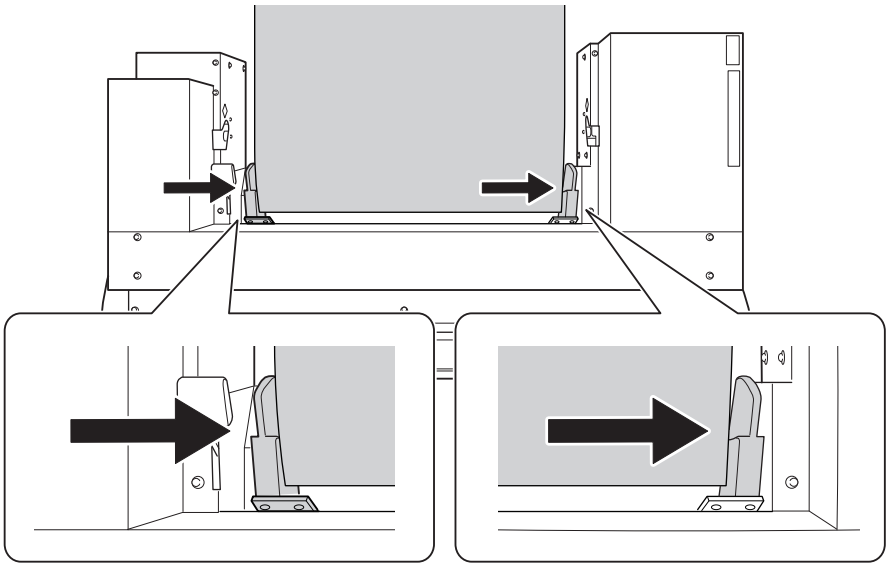
(2) **Move the left media guide (②) to the left.**



2. **Install the sheet media.**

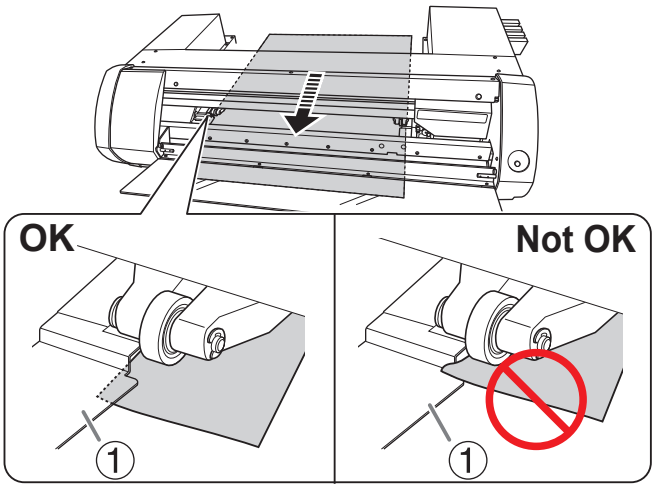
(1) **Move the media to the right so it touches the right media guide.**

(2) **Slide the left media guide so it touches the media.**



(3) **Pass the media through the printer.**

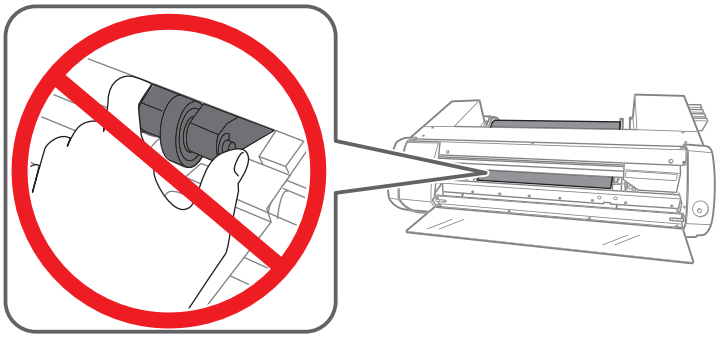
Pull the media straight to keep it taut, and then pass it beneath the media clamps (①).



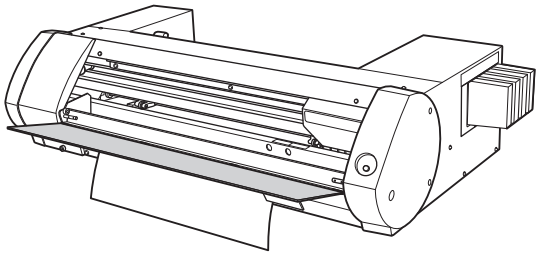
⚠ CAUTION

The pinch rollers cannot be moved directly by hand. Move them with the media guide.

Attempting to forcibly move these rollers may result in injury.



3. **As shown in the figure, pass the media under the front cover and pull the media out the other side.**



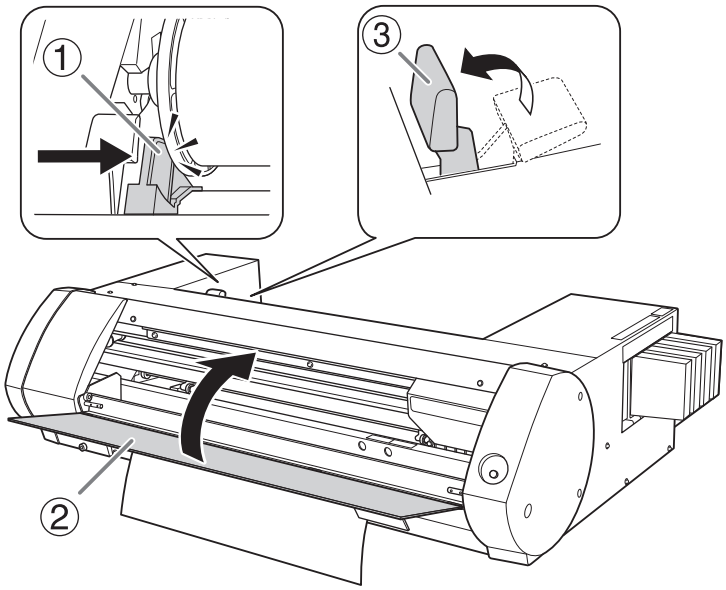
4. **Start initial operation.**

(1) **Make sure the left media guide (①) is pressed against the media flange.**

(2) **Close the front cover (②).**

(3) **Pull the loading lever (③) forward.**

Pull the loading lever forward to start initial operation. When the [**POWER**] key indicator changes from flashing to steady, initial operation is complete.


1
3
2

Step 2: Bidirectional Adjustment

Perform adjustment in the following situations. You do not need to perform adjustment in other situations. Go to Step 3: Printing Tests and Normal Cleaning(P. 31).

- When using this machine for the first time
- When changing the media to use for the first time

What are bidirectional printing and bidirectional adjustment?

This machine can perform "Bidirectional Printing," which means that the print heads print when moving in both directions. Bidirectional printing offers the advantage of being able to shorten output times, but subtle misalignment occurs during the outbound and return passes. The operation to correct these misalignments is called "Bidirectional Adjustment".

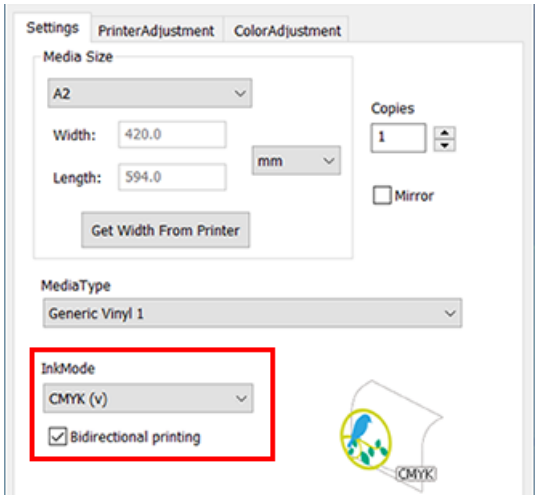
BN-20 Driver: How to Perform Bidirectional Printing

Procedure

1. **Display the BN-20 driver's Printing Preferences dialog box.**
   P. 11Displaying the BN-20 Driver's Printing Preferences Dialog Box

2. **Select [CMYK (v)] from [Ink Mode] on the [Settings] tab.**

3. **Select the [Bidirectional Printing] check box.**



VersaWorks: How to Perform Bidirectional Printing

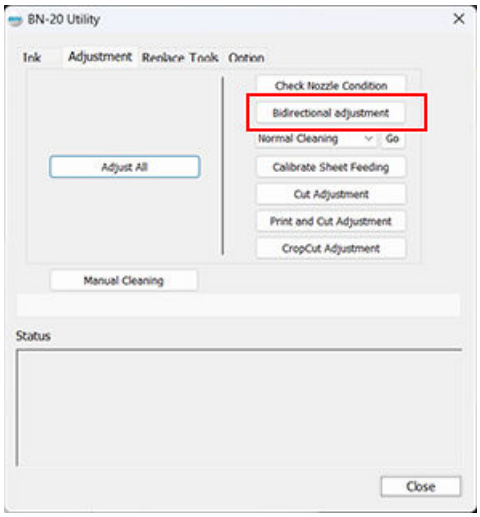
Bidirectional printing occurs when "Draft" is selected for the print quality in VersaWorks. For details on how to set the printing quality, refer to [**Output Settings**]>[**Setting the Printing Quality**] in the VersaWorks Help.

Procedure

1. **Open the Utility window.**

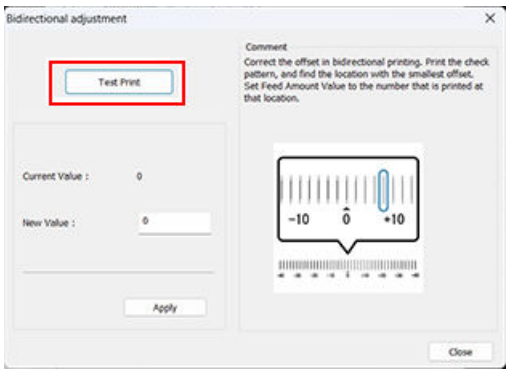
   P. 12Starting/Exiting Utility

2. **Click [Bidirectional adjustment].**



3. **Click [Test Print].**

   A test pattern is printed.



4. **Follow the on-screen instructions and enter the value for [New Value].**

5. **Click [Apply].**

   The value in [**Current Value**] changes to the entered value.

6. **Click [Close].**

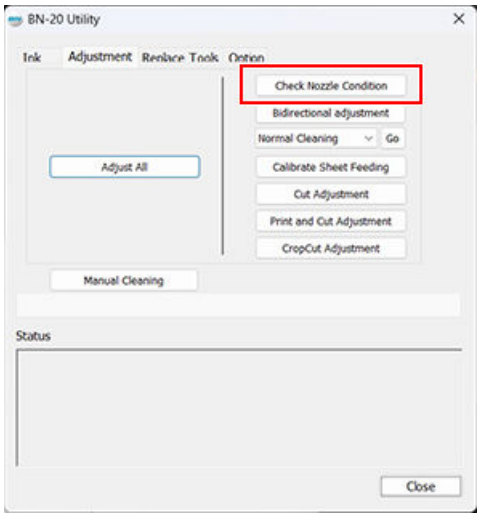
Step 3: Printing Tests and Normal Cleaning

Procedure

1. **Open the Utility window.**

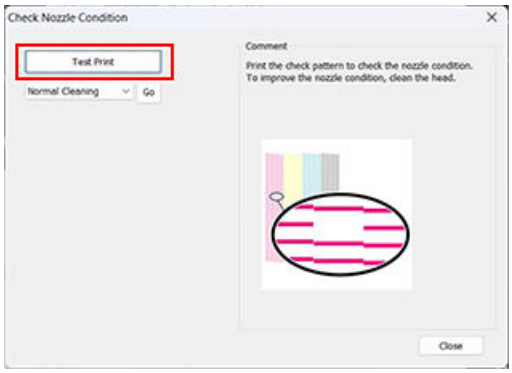
   P. 12Starting/Exiting Utility

2. **Click [Check Nozzle Condition].**



3. **Click [Test Print].**

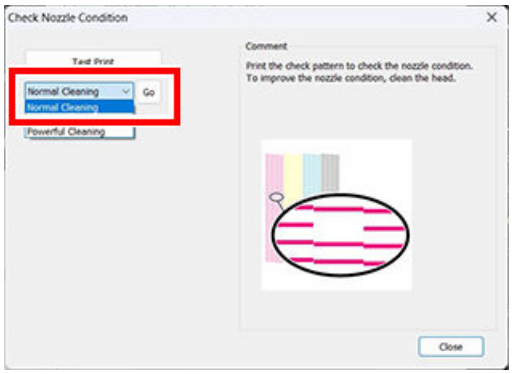
   A test pattern is printed. Follow the on-screen instructions to check for nozzle drop-out.



   - Nozzle drop-out is present. -> Proceed to step 4.
   - No nozzle drop-out is present. -> Click [**Close**] to finish the procedure.

4. **Select the [Normal Cleaning], and then click [Go].**

   Normal cleaning starts.



5. **Check for nozzle drop-out again.**

If the nozzle drop-out is not fixed, perform [**Normal Cleaning**] again. For information about [**Medium Cleaning**] and [**Powerful Cleaning**], refer to the following topic.

RELATED LINKS

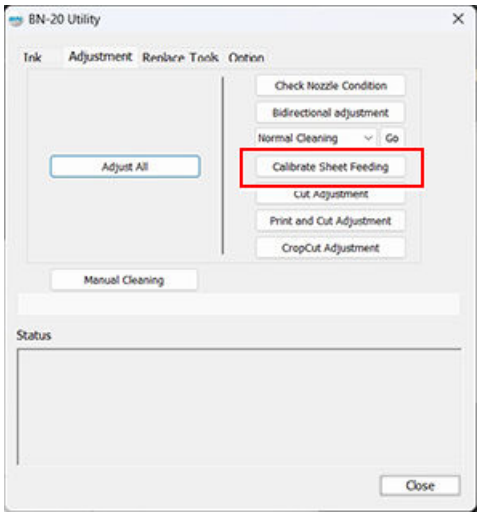
- P. 73Medium/Powerful Cleaning

Step 4: Correcting the Media Feed

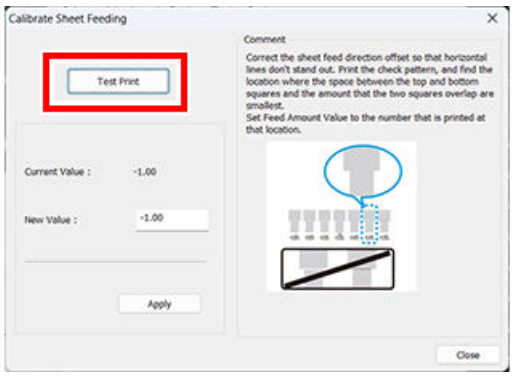
Procedure

1. **Open the Utility window.**
   P. 12Starting/Exiting Utility

2. **Click [Calibrate Sheet Feeding].**



3. **Click [Test Print].**
   A test pattern is printed.



4. **Follow the on-screen instructions and enter the value for [New Value].**

5. **Click [Apply].**
   The value in [**Current Value**] changes to the entered value.

6. **Click [Close].**

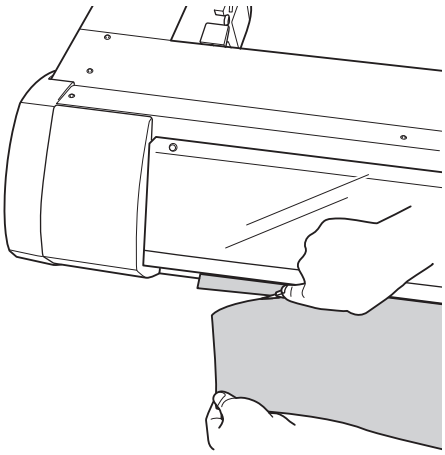
Step 5: Starting Print Output

Procedure

1. **Prepare the print data.**

2. **Output the print data.**
   - **When outputting from commercial application software for creating drawings**
     Refer to the documentation supplied with your application software.
   - **When outputting from VersaWorks**
     Refer to the [**VersaWorks Help**]>[**Basic Operations for Output**].

3. **Cut the media when outputting is complete.**



IMPORTANT

Output Is Not Possible in These Situations

- The machine does not run when a cover (front, or maintenance) is open.
- This machine does not complete startup until the heater reaches the specified temperature, and does not accept any operation.
  When the ambient temperature is low, the heater is slow to warm up. Use the machine in an environment where the temperature is 20 to 32° C (68 to 90° F).
- Output is not performed when [**POWER**] key does not stay steadily lighted. After the media is loaded, pull the loading lever. When the [**POWER**] key flashes, no operation except for canceling output is accepted.
- If you send the output data in a state where there is no ink left, a warning buzzer will sound and the machine will stop temporality. A message indicating that ink has run out is displayed in the Status field of Utilities. When the ink cartridge is replaced with a new one, printing or cutting starts.

Points that must be observed

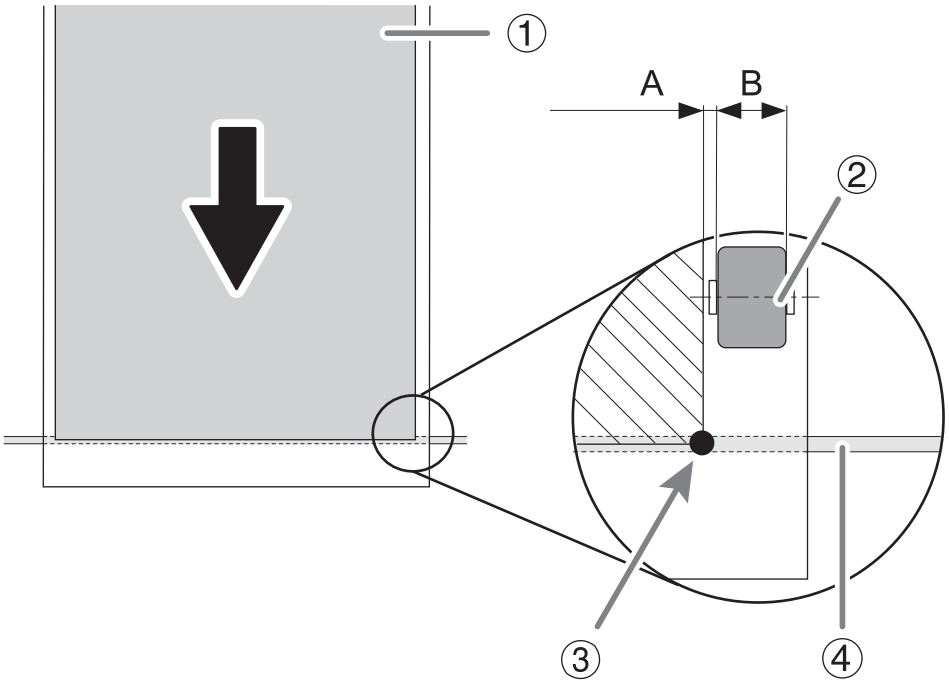
- Never open a cover (front, or maintenance) while output is in progress. Doing so interrupts printing.
- When you are performing printing, clamp the edges of the media with the media clamps. Otherwise, the edges of the media may warp and catch on the print heads.
- During output, do not touch the media. Doing so may obstruct the media feed or cause the media to rub against the print heads, which may result in a paper jam or damage to the heads.
- Keep the loading lever raised when the machine is not in use.

When not using the machine, remove any media and store it in a suitable environment.

- If the machine is left with the media loaded, the media may be damaged, which may adversely affectprinting. When not using the machine, remove any media and store it in a suitable environment.

Output-start Location

The output-start location is always the point shown in the figure below.



①	Printing area
②	Right pinch roller
③	Output-start location
④	Blade protector
A	1.4 mm (0.06 in.)
B	5 mm (0.2 in.)

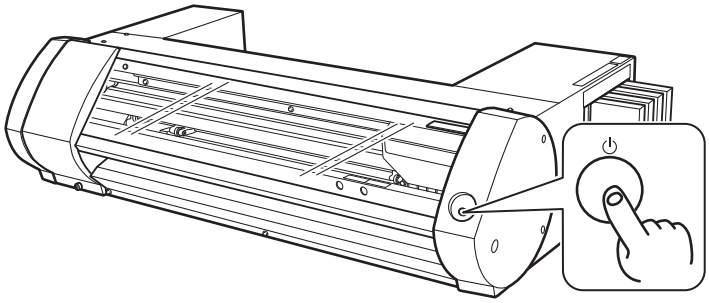
Stopping Print Output

To stop output on the printer side

Procedure

1. **Press and hold down the [POWER] key for one second or more during output.**

   Output stops. You cannot resume output from the stop point.



2. **Press the [POWER] key to turn the machine on.**

   This operation does not cancel standby output data on the computer. Follow the steps below to cancel data that is still on the computer.

RELATED LINKS

- P. 36Stopping Output on the Computer Side

Stopping Output on the Computer Side

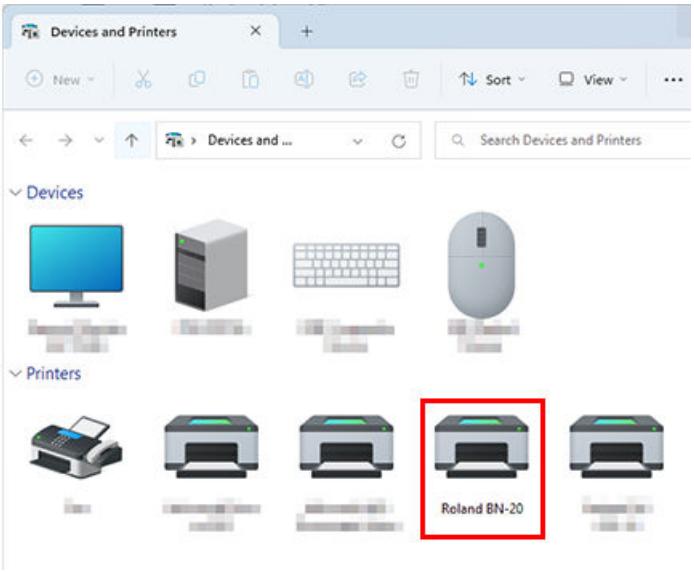
Procedure

1. **Open the [Devices and printers] window.**
   - Windows 11

     From the Start menu, click **[All apps]**>**[Windows Tool]**>**[Control Panel]**>**[View devices and printers]**.
   - Windows 10

     From the Start menu, click **[Windows System]**>**[Control Panel]**>**[View devices and printers]**.

2. **Double-click the BN-20 icon.**



3. **Click [Printers]>[Cancel All Documents].**

Depending on the computer data transfer status, it may be too late to cancel output. In this case, you need to cancel output from the printer.

Fully Utilizing the Machine

Optimizing the Output Quality

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Performing Printing and Cutting Separately 49
- To Perform Printing and Cutting Separately 49
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- Cutting by Automatically Aligning the Position 52
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Cutting / Printing and Cutting

Adjusting Cutting

Adjust the cutting conditions to obtain clear cutting lines. Make adjustments to match the media thickness.

Procedure

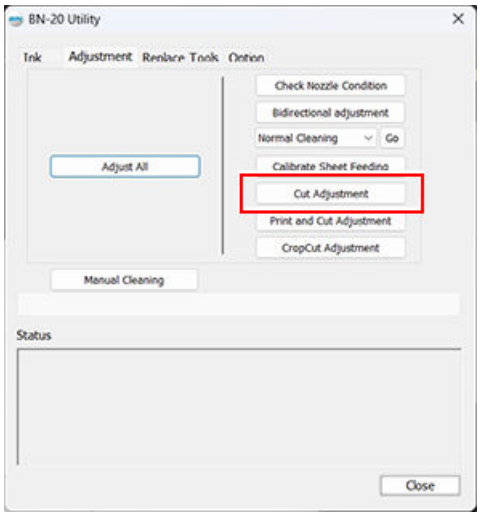
1. **Load the media to be cut.**

   P. 22Step 1: Loading Media

2. **Open the Utility window.**

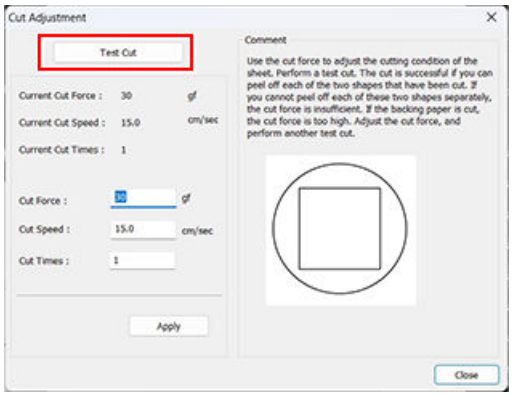
   P. 12Starting/Exiting Utility

3. **Click [Cut Adjustment].**



4. **Click [Test Cut].**

   A cutting test is performed.



5. **Enter the [Cut Force][Cut Speed][Cut Times].**

   [Cut Force]

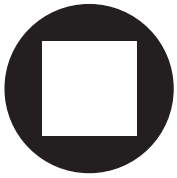
   This is the force of the blade during cutting. If this force is too strong, the blade cuts into the backing paper. (Default setting: 50 gf)

[Cut Speed]

This is the speed of the blade during cutting. If this speed is too fast, the cutting line will be crooked. (Default setting: 15 cm/sec.)

[Cut Times]

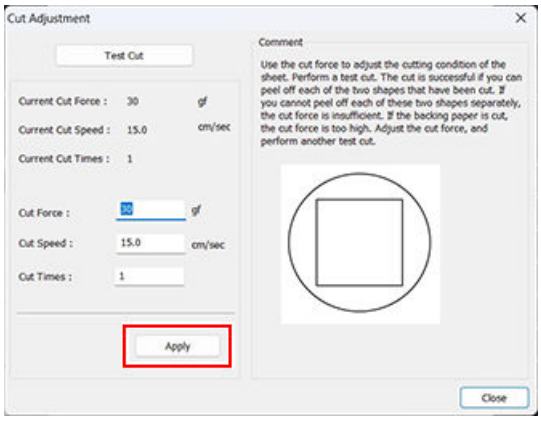
This is the number of times to cut the same location. If cutting is not possible even after adjusting the force and speed of cutting, increase the number of cuts. (Default setting: 1)



Check item	Result	Setting item	Adjustment
Check the shape.	The cut shape is distorted.	**[Cut Speed]**	Reduce
Peel off the circle.	The square also peels off.	**[Cut Force]**	Increase
	Some uncut areas remain.	**[Cut Speed]**	Reduce
Peel off the square.	The blade leaves faint traces on the backing paper.	**[Cut Force]**	No change
	The blade trace is indistinct.		Increase
	The blade trace is too deep and cuts into the backing paper.		Reduce

6. **Click [Apply].**

Repeatedly perform [**Test Cut**] and make adjustments until the appropriate adjustments are obtained.



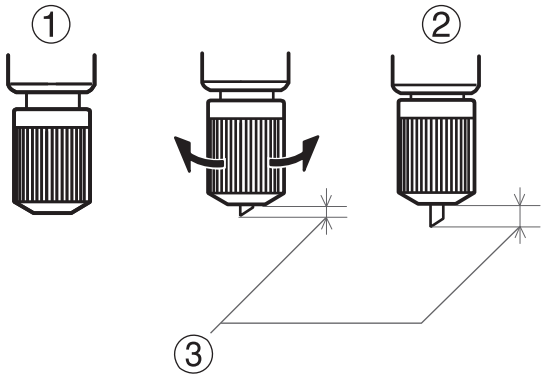
7. **Click [Close].**

Accurately Adjusting the Cutting-in Amount

When you want to perform accurate and fine adjustment of the cutting-in amount (③), such as when cutting media with thin backing paper, you can obtain good results by adjusting the tip of the blade. Turn the cap portion of the blade holder to adjust the amount of blade extension. Each indicator tick corresponds to 0.1 millimeters, and adjustment for 0.5 millimeters can be made by rotating the cap one full turn.

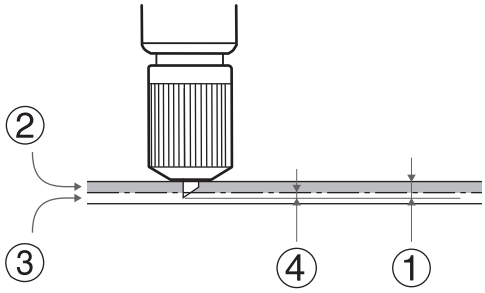
Note that making the amount of blade extension too small may cause the tip of the blade holder cap to touch, and may soil and damage the printed surface. It's important to be especially careful about this when you're using media that has poor ink adhesion properties.

The amount of blade extension (③) is 0 mm (①) at minimum and 2.5 mm (98.4 mil) (②) at maximum.



Rough Estimate for the Amount of Blade Extension

Set the amount of blade extension (①) to an amount that is the sum of the thickness of the material portion (②) and half (④) the thickness of the backing paper (③).



Print and Cut Adjustment

When performing both printing and cutting, adjust and align the printing and cutting positions. Depending on the media thickness, sometimes printing and cutting positions are very slightly out of alignment. We recommend that you make corrections to match the media you are using.

Procedure

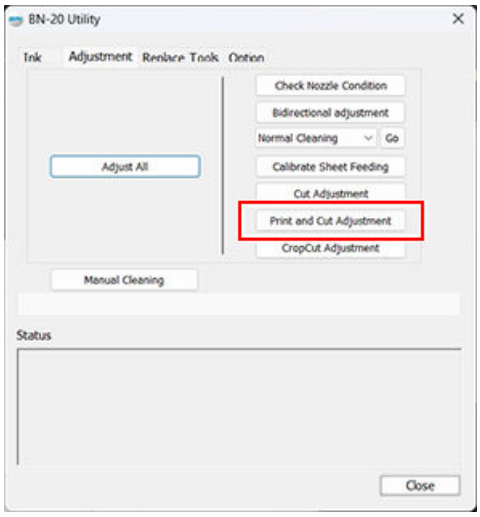
1. **Load the media to be cut.**

   P. 22Step 1: Loading Media

2. **Open the Utility window.**

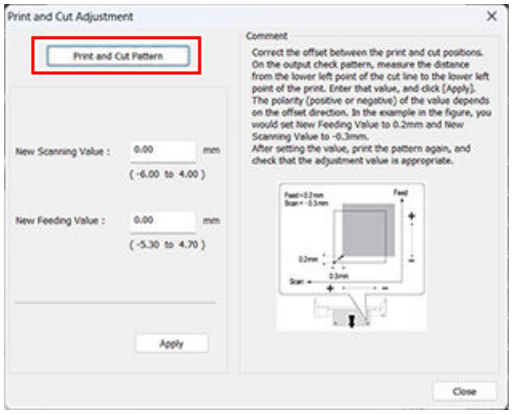
   P. 12Starting/Exiting Utility

3. **Click [Print and Cut Adjustment].**



4. **Click [Print and Cut Pattern].**

   A test pattern is printed.



5. **Follow the on-screen instructions and enter the corrected values for [New Scanning Value] and [New Feeding Value].**

6. **Click [Apply].**

   The values in [**New Scanning Value**] and [**New Feeding Value**] change to "0."

7. Click [Close].

Creating Data for Cutting / Printing and Cutting

When using VersaWorks, refer to the [**VersaWorks Help**].

When using application software to create drawings

Verified application software

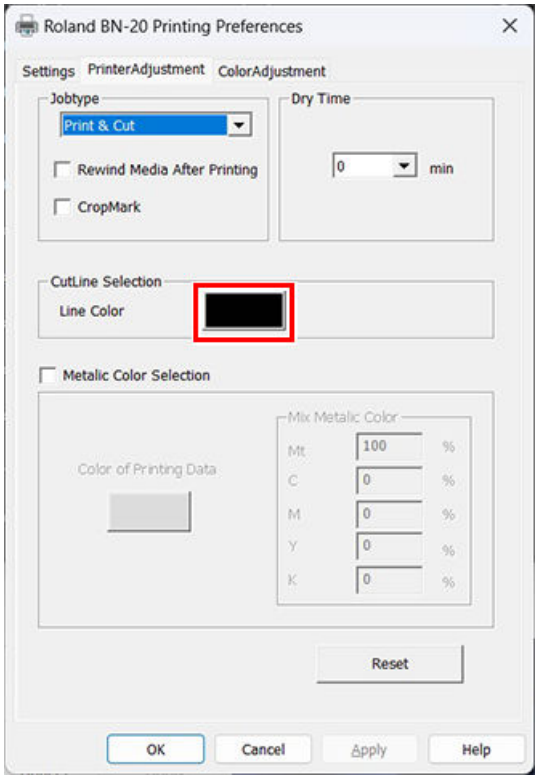
- Adobe Illustrator : after CS6
- CorelDRAW : after X3

1. Set the color that the BN-20 driver will identify as the cutting line.

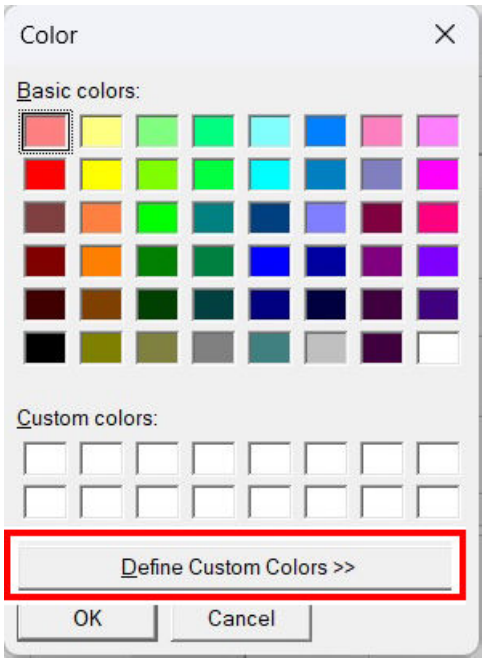
Procedure

1. **Display the BN-20 driver's Printing Preferences dialog box.**
P. 11Displaying the BN-20 Driver's Printing Preferences Dialog Box

2. **Click the [Line Color] button from [CutLine Selection] on the [Printer Adjustment] tab.**
The [**Color**] dialog box opens.

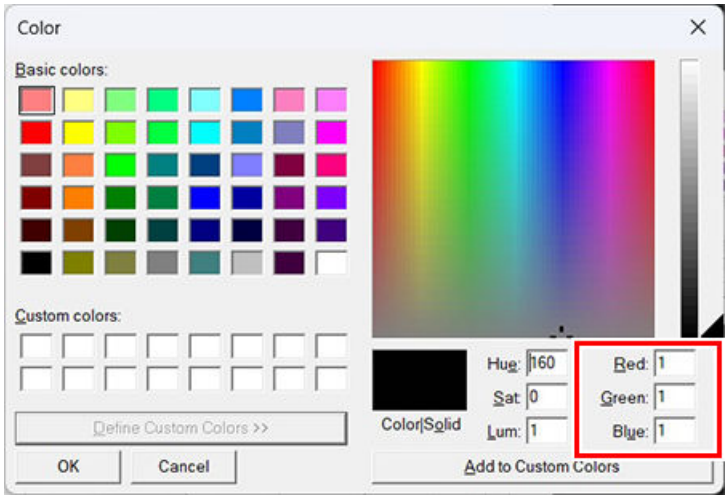


3. **Click [Define Custom Colors].**
The Color Settings dialog box opens, allowing you to create colors.



4. **Enter values for [Red], [Green], and [Blue].**

The BN-20 driver identifies the color specified using the values entered here as the cutting line and outputs the color.



2. Creating print data

Procedure

1. **Create the print data using application software for creating drawings.**

MEMO

Set the Document Color Mode to [**RGB**]. The color (RGB value) specified as the cutting line may change because CMYK is converted to RGB when outputting in CMYK mode.
In this case, it may not be possible to perform cutting because the color specified for the driver as the cutting line and the color output from the application software differ.

2. **Specify the RGB value set for the part to be identified as the cutting line in step 1. - 4.**

If the color for the part you want to print and the color set in **step 1. - 4** overlap, redo the settings from **step 1. - 4**.

3. **Specify the line width for cutting lines as follows.**

MEMO

It may not be possible to cut lines of the specified width.

- Adobe Illustrator : 0.001 pt
- CorelDRAW : Hairline

Cautionary Notes on Making Output with Cutting

Points to Note When Cutting Only

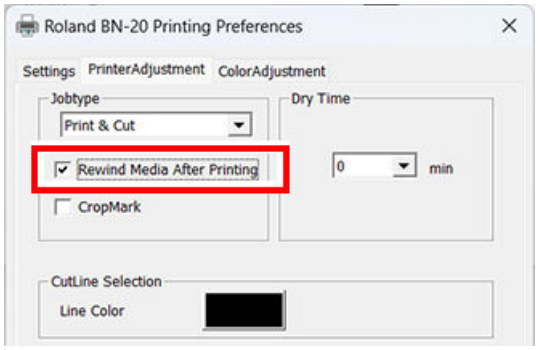
For roll media, let the media hang down to the rear before outputting.

When using roll media and only performing cutting, let the media hang down to the rear of the machine. This prevents motor errors and the roll falling from the machine due to the media being pulled with excessive force.

Do not cut the media before it is pulled back if "Take back after printing" is specified in the BN-20 driver.

Do not cut the media before it is pulled back when the [**Rewind Media After Printing**] check box is selected in the [**Printer Adjustment**] tab of the BN-20 driver.

When the [**Rewind Media After Printing**] check box is selected, the media is pulled back after printing. If the media is cut before it is pulled back, ink might be discharged to a location where there is no media.



When you are performing printing and cutting, allow the ink to dry sufficiently before starting cutting.

You can set the time for the printer to wait before cutting (Dry Time) with the BN-20 driver or VersaWorks. The drying time varies according to the media.

RELATED LINKS

- P. 56Setting of Dry Time

Performing Printing and Cutting Separately

To Perform Printing and Cutting Separately

You can remove the printed media and then reload it and perform cutting.

(Example: Perform lamination or other processing after printing, then reload the media and perform cutting.)

Then, carry out alignment to prevent misalignment of the printing results and the cut lines. Perform this adjustment in the next Procedure.

Procedure

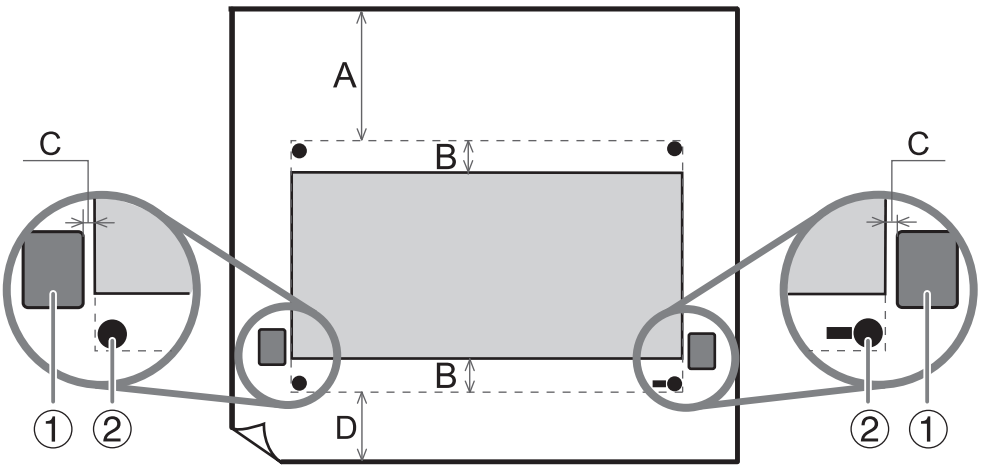
1. **Printing with Crop Marks.**

P. 50Printing with Crop Marks

2. **Align to the printed crop marks and perform cutting.**

P. 52Cutting by Automatically Aligning the Position

Media Sizes Allowing Automatic Crop Mark Detection



①	Pinch roller
②	Crop mark
A	65 mm (2.56 in.) or more
B	22.5 mm (0.89 in.)
C	1.4 mm (0.06 in.)
D	60 mm (2.37 in.) or more

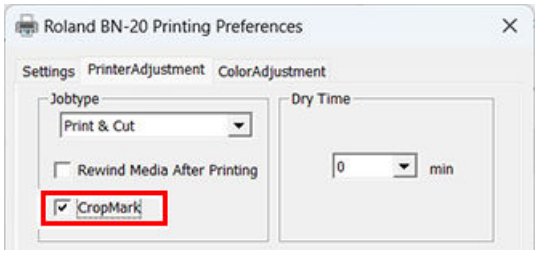
Printing with Crop Marks

This section explains how to specify settings when using the BN-20 driver. When using VersaWorks, refer to the[**VersaWorks Help**].

Procedure

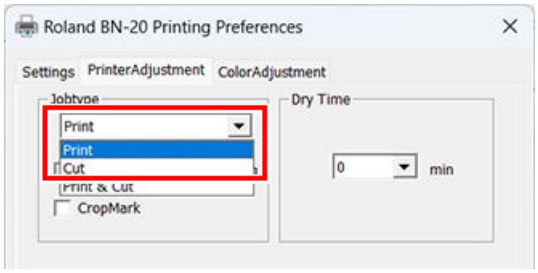
1. **Display the BN-20 driver's Printing Preferences dialog box.**
   P. 11Displaying the BN-20 Driver's Printing Preferences Dialog Box

2. **On the [Printer Adjustment] tab, select the [CropMark] check box.**



3. **Select [Print].**

   When [**Printing & Cut**] is selected, the media is pulled back after printing with crop marks is performed, and then cutting starts immediately. The printer detects the crop marks to perform cutting.



IMPORTANT

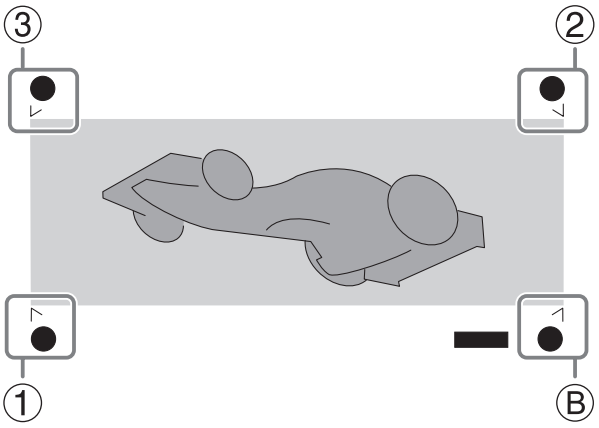
Before you start printing, check the media size on the [**Settings**] tab on the Printing Preferences dialog box and write it down. If the media size during cutting is not set to the same size as that used during printing, the cutting lines may be misaligned compared to printing.

4. **Click [OK].**

5. **Start printing.**

   P. 34Step 5: Starting Print Output

   The crop marks are printed as shown in the figure.



① ② ③: Align points

(B): Base point

IMPORTANT

Alignment marks and symbols drawn using graphics software cannot be used as crop marks.

Cutting by Automatically Aligning the Position

This section explains how to specify settings when using the BN-20 driver. When using VersaWorks, refer to the[**VersaWorks Help**].

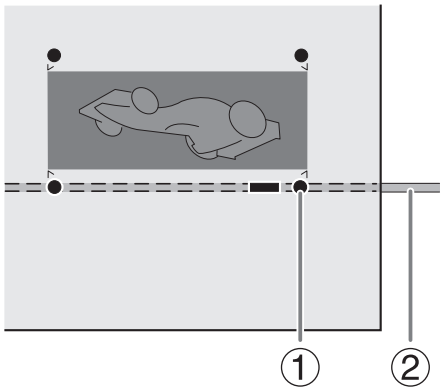
Procedure

1. **Print with crop marks, remove the media, and then reload it.**

   Points for Media Setting

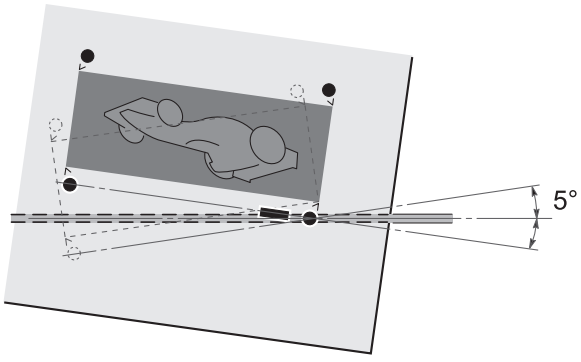
   Place the crop marks (①) on the blade protector (②).

   Good

   Ensure that the angle is less than 5 degrees. Failing to do so will make alignment impossible.

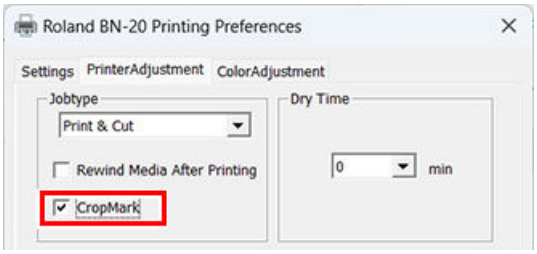
   Not Good

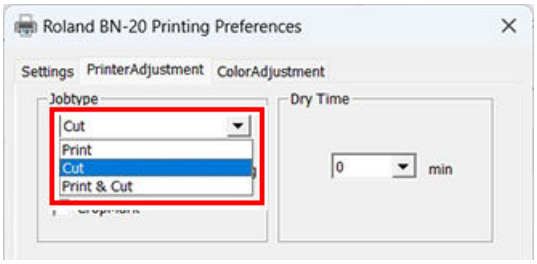
2. **Display the BN-20 driver's Printing Preferences dialog box.**

   P. 11Displaying the BN-20 Driver's Printing Preferences Dialog Box

3. **On the [Printer Adjustment] tab, select the [CropMark] check box.**

4. **Select [Cut].**



IMPORTANT

Before you start cutting, check that the media size on the [**Settings**] tab on the Printing Preferences dialog box is the same as the size used for printing. If the media size during cutting is not set to the same size as that used during printing, the cutting lines may be misaligned compared to printing.

5. **Start cutting.**

P. 34Step 5: Starting Print Output

RELATED LINKS

- P. 50Printing with Crop Marks

Crop Cut Adjustment

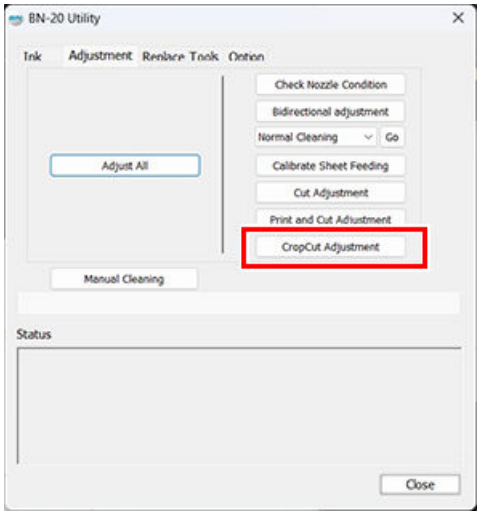
Depending on the composition of the media, the positioning of printing and cutting may be misaligned even when you are using crop marks. Make corrections for misaligned printing and cutting for the media you are using.

Procedure

1. **Open the Utility window.**

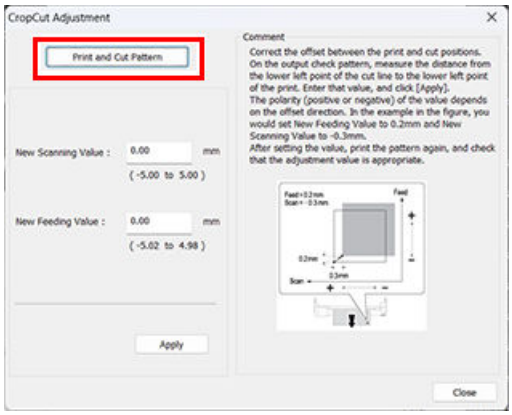
   P. 12Starting/Exiting Utility

2. **Click [CropCut Adjustment].**



3. **Click [Print and Cut Pattern].**

   A test pattern is printed.



4. **Follow the on-screen instructions and enter the values for [New Scanning Value] and [New Feeding Value].**

5. **Click [Apply].**

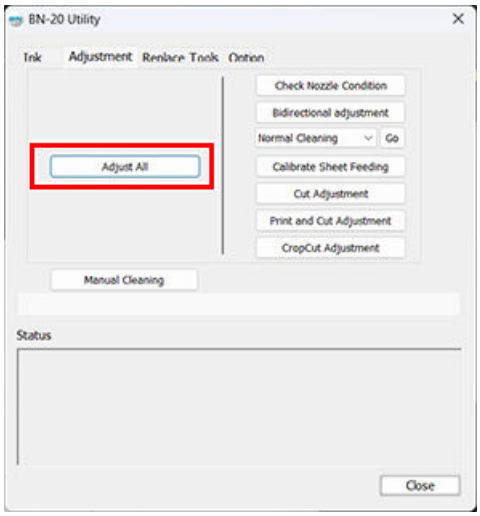
   The values in [**New Scanning Value**] and [**New Feeding Value**] change to "0."

6. **Click [Close].**

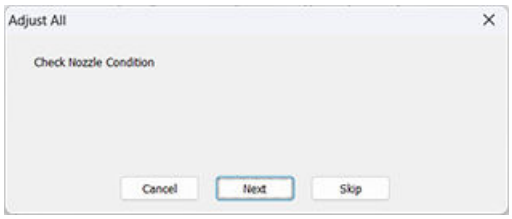
Utility : Other Function

Performing Various Adjustments Through a Sequence of Operations

You can perform various output adjustments through a sequence of operations by clicking [**Adjust All**] on the [**Adjustment**] tab. The adjustment method is the same as when adjusting settings individually.



Click [**Adjust All**] to display the screen shown in this figure.



[**Next**]: Continues to the screen for the adjustment currently displayed on the screen.

[**Skip**]: Skips the adjustment currently displayed on the screen.

[**Cancel**]: Cancels the adjustment process.

The adjustments vary depending on the output method. Refer to the table below.

	Printing (Only)	Cutting (Only)	Printing and Cutting	Crop-Cut
Check Nozzle Condition	✓	-	✓	✓
Bidirectional adjustment*1	✓	-	✓	✓
Calibrate Sheet Feeding	✓	✓	✓	✓
Cut Adjustment	-	✓	✓	✓
Print and Cut Adjustment	-	-	✓	✓
Crop Cut Adjustment	-	-	-	✓

*1 This is available when bidirectional printing is set in the BN-20 driver or VersaWorks.

Setting of Dry Time

This section explains the method of setting the time that the printer needs to wait before it starts printing or cutting the next page.

Especially, in the case of printing and cutting, ink needs to be sufficiently dried before cutting is started.

When you make output via the BN-20 driver using a general drawing application

Make the following setting in the BN-20 driver first, and then make output from the application.

Procedure

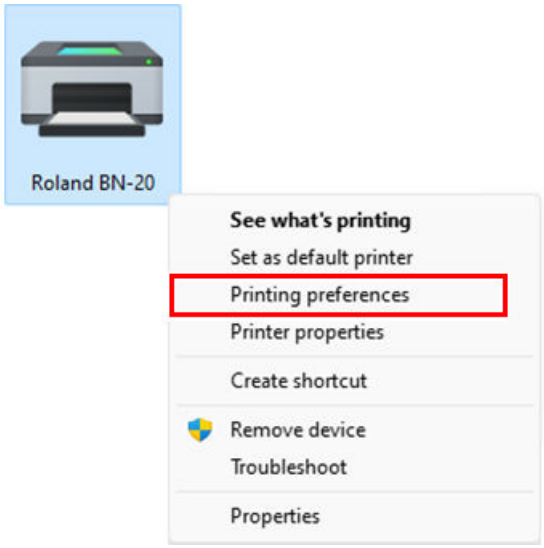
1. **Open the [Devices and printers] window.**
   - Windows 11

     From the Start menu, click **[All apps]**>**[Windows Tool]**>**[Control Panel]**>**[View devices and printers]**.
   - Windows 10

     From the Start menu, click **[Windows System]**>**[Control Panel]**>**[View devices and printers]**.

2. **Right-click the [Roland BN-20] icon, and then click [Printing preferences].**

   The BN-20 driver's Printing Preferences dialog box opens.



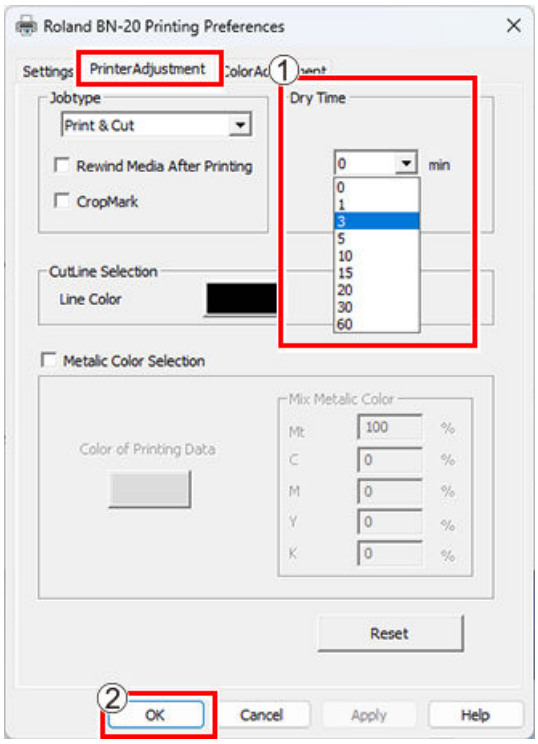
3. **Set the drying time.**

   (1) **Select [Dry Time] on the [Printer Adjustment] tab.**

   The appropriate setting time varies according to the media. Set a longer time when you use media on which it takes time to dry ink.

   (2) **Click [OK].**

   When the printer starts drying, the remaining dry time is displayed in Utility.



When you make output from VersaWorks

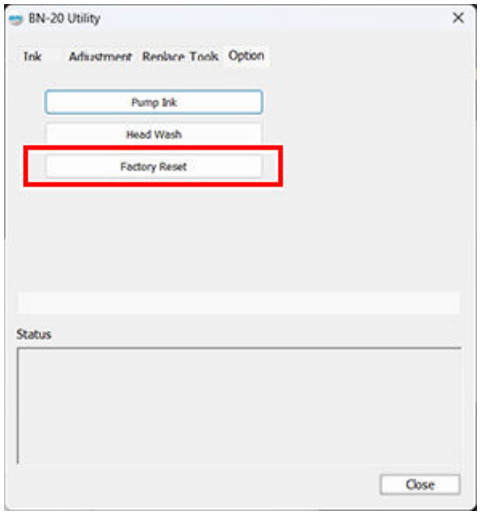
You can set the dry time in VersaWorks as well. For information on its setting method, refer to [**VersaWorks Help**].

IMPORTANT

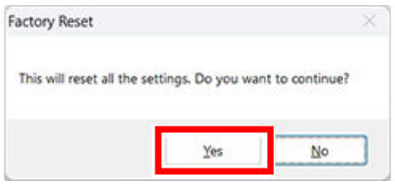
When you set the dry time in VersaWorks, if [**Use Printer Settings**] is set, 0 is set to the dry time. You should note that the setting in the BN-20 driver is not reflected.

Resetting All Adjustments to Factory Default Values

Click [**Factory Reset**] on the [**Option**] tab of Utility to reset all the Utility settings to their factory default values.



When you click [**Factory Reset**], the message shown in the figure is displayed. Click [**Yes**] to reset the settings.



Maintenance

Introduction

Important Notes on Handling and Use.....61
Automatic Maintenance Function: Points to Note.....61
Maintenance Schedule.....61
When Not in Use for a Prolonged Period.....61
Checking Ink Levels and Replacing.....63
Checking for Remaining Ink.....63
How to Replace the Ink Cartridge 64

Important Notes on Handling and Use

Automatic Maintenance Function: Points to Note

This machine has a function to automatically perform periodical maintenance tasks, e.g. to prevent the print heads from drying out. To ensure the maintenance is properly carried out, please observe the following points:

- Make sure that the main power is on at all times.
- Do not leave the front cover and maintenance cover open.

Maintenance Schedule

Daily maintenance

To keep this machine in tip-top condition, make sure that daily maintenance is actually performed every day.

Periodical maintenance

To maintain reliable output conditions, some maintenance tasks need to be carried out at least once a month.

Switch the sub power on at least every 2 weeks

Switch the sub power on at least every 2 weeks. When the sub power is on, operations to prevent the print heads from drying out are automatically performed. If the machine is not used for a long period of time, print heads may be damaged. It is important o make sure to include this task in your maintenance schedule.

Maintain the temperature and humidity within the specified range

Even when the machine is not in use, maintain the temperature between 5 to 40°C (41 to 104 °F), with a relative humidity of 20 to 80%, with no condensation. Failure to keep the temperature and humidity within the specified range may cause a machine malfunction.

RELATED LINKS

- P. 67Daily Maintenance
- P. 72Periodical Cleaning Maintenance

When Not in Use for a Prolonged Period

In advance, insert ink cartridges that have a large amount of ink remaining.

If the ink runs out, the machine will not be able to periodically perform automatic maintenance. If the machine is left in this state, the print heads may malfunction. If you know that you will not use the machine for a prolonged period, insert ink cartridges that have a large amount of ink remaining.

Replace the waste cartridge in advance of prolonged periods of disuse.

If you know that you will not use the machine for a prolonged period, follow the procedure below to replace the drain cartridge. For information about purchasing drain cartridges, contact your authorized Roland DG Corp. dealer.

IMPORTANT

Do not reuse drain cartridges. Doing so makes it impossible to manage the amount of discharged fluid, which may overflow.

RELATED LINKS

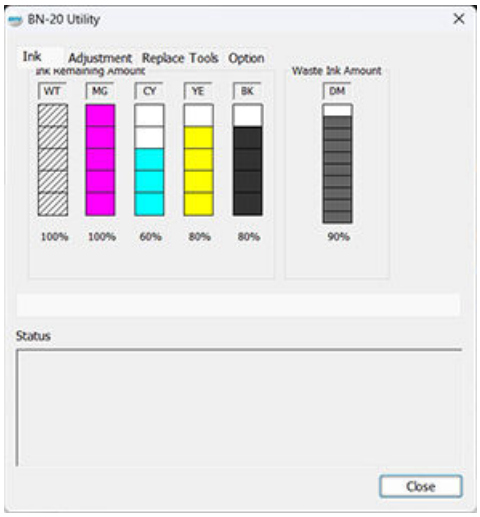
- P. 69Replacing the Drain Cartridge

Checking Ink Levels and Replacing

Checking for Remaining Ink

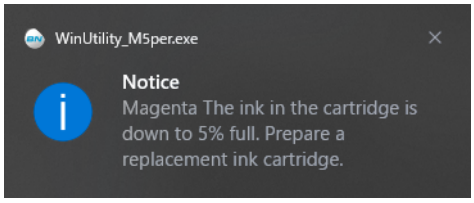
Ink levels can be checked in the Ink tab of the Utility window. A simple bar scale indicates the level of ink in each cartridge. Percentage values also indicate the level of ink remaining. When the ink cartridge is removed, "No Cartridge" is displayed.

- MG: Magenta
- CY: Cyan
- YE: Yellow
- BK: Black



* The display shows approximately how much ink remains. It may differ somewhat from the actual amount remaining.

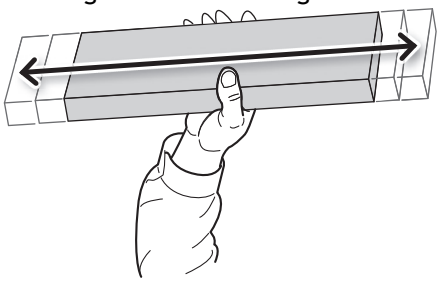
When an ink level is low, a message appears on the Utility icon in the notification area. Check the ink that is running out in the Utility window and prepare a relevant cartridge for replacement.

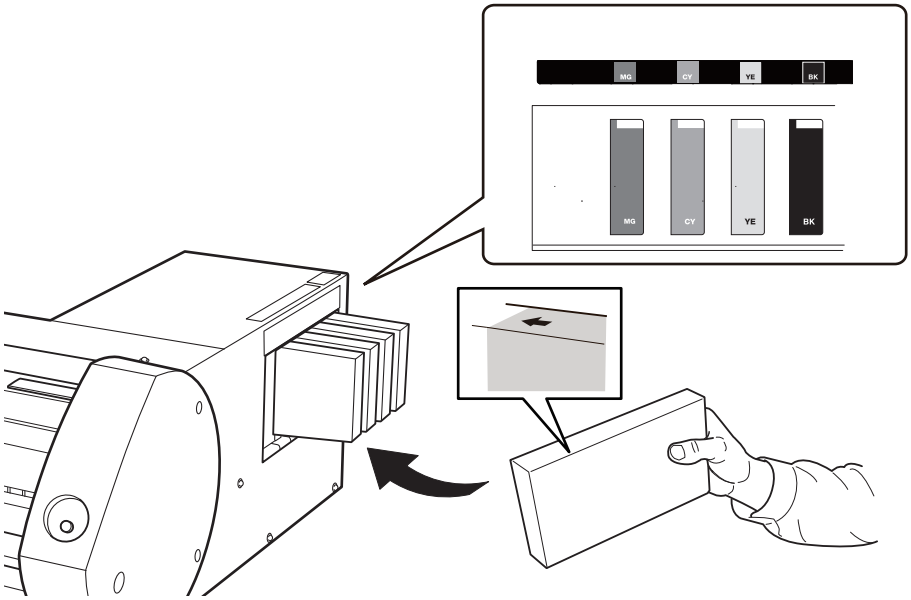


How to Replace the Ink Cartridge

When ink runs out, a warning beep sounds and printing pauses. Pull out the empty cartridge and insert a new one. Printing resumes.

The precipitation of the ingredients in the ink disables printing in normal color. So that the ink mixes well, shake each ink cartridge 50 times (about 20 seconds) horizontally with a stroke length of around 5 cm (1.97 in.) from each end of the ink cartridge before inserting it.





IMPORTANT

Important notes on replacing cartridges

- Replace the cartridge with an item of identical type and color.
  - Insert the cartridge so that the side with the arrow faces up.
  - Insert and remove cartridges slowly, one at a time.
  - Insert the cartridge firmly, as far as it will go.
- Never mix different types of items.
- Never leave the machine with an ink cartridge removed. The print heads may become clogged.
- Never insert or remove a partially used ink cartridge with undue force.
- Never remove an ink cartridge suddenly while the printer is in operation.

⚠ WARNING

Never store ink, cleaning liquid, or discharged fluid in any of the following locations.

- **Any location exposed to open flame**

- **Any location where high temperature may occur**
- **Near bleach or any other such oxidizing agent or explosive material**
- **Any location within the reach of children**

Fire may be a danger. Accidental ingestion by children may pose a health hazard.

Regular Maintenance

Daily Maintenance 67
- Maintenance of Ink Cartridges 67
- Cleaning 67
- Replacing the Drain Cartridge 69
- Care and Maintenance of the Print Heads 71

Periodical Cleaning Maintenance 72
- Periodic Cleaning Menus 72
- Medium/Powerful Cleaning 73

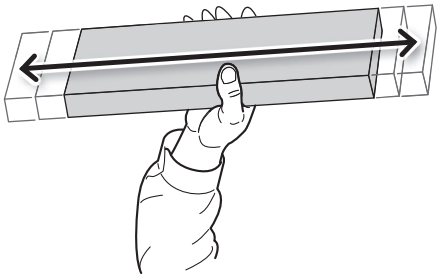
Manual Cleaning 75
- When Manual Cleaning Is Necessary 75
- Manual Cleaning Method 76

Daily Maintenance

Maintenance of Ink Cartridges

The ink ingredients have a tendency to separate and settle. Allowing the ink to stand can cause the settled material to harden, resulting in malfunction or other problems.

So that the ink mixes well, periodically shake each ink cartridge 50 times (about 20 seconds) horizontally with a stroke length of around 5 cm (1.97 in.) from each end of the ink cartridge before reinserting it.



Cleaning

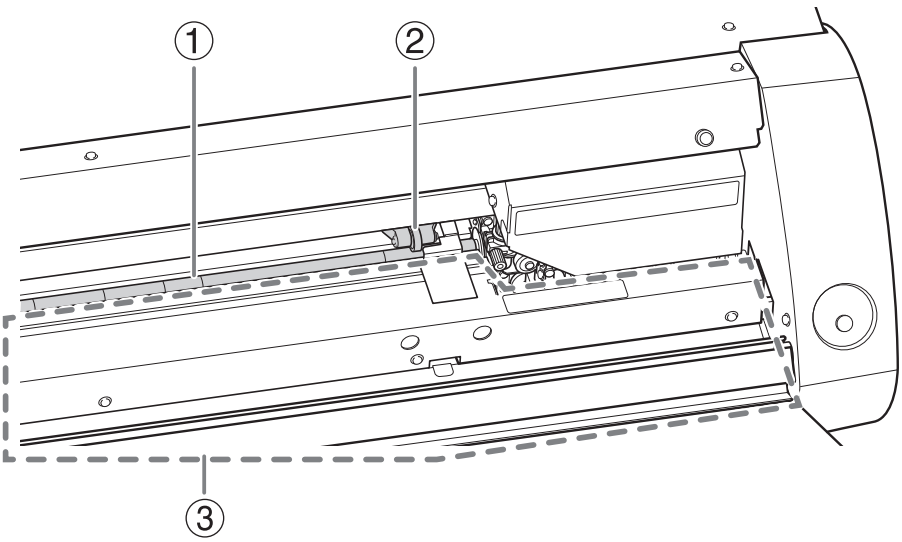
⚠ WARNING

Never use gasoline, alcohol, thinner, or any other flammable material.
Doing so may cause a fire.

Wipe away any ink or grime on the media path and other areas as part of the daily cleaning procedure. Pinch rollers, grit rollers, and the platen are particularly prone to the buildup of grime. Wipe away any buildup of ink or grime on the media path. Clean by wiping with a cloth moistened by neutral detergent diluted with water then wrung dry.

MEMO

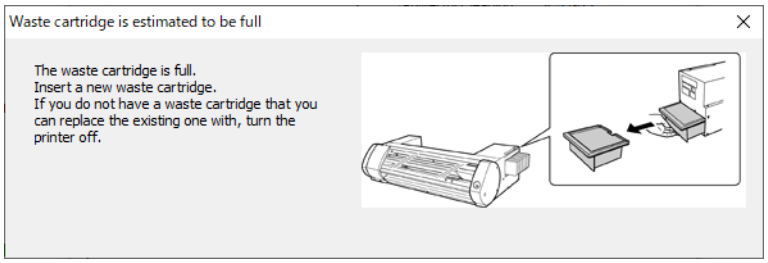
- This machine is a precision device and is sensitive to dust and dirt. Perform cleaning on a daily basis.
- Never attempt to oil or lubricate the machine.



①	Grit roller	Remove buildup of media scraps and other material using a brush. Never use a metal brush.
②	Pinch roller	Periodically wipe away any grime. Failure to clean this part properly may result in the transfer of grime to the surface of media.
③	Platen	Wipe away any buildup of ink or grime on the media path.

Replacing the Drain Cartridge

When the drain cartridge is filled with discharged fluid, the Utility window automatically opens and displays a message in the Status field that prompts the replacement of the cartridge. Follow the message's instructions and prepare a replacement drain cartridge or replace the cartridge.



⚠ CAUTION

Before you remove the drain cartridge, wait for a message to be displayed in the utility.

Failing to follow this procedure may cause discharged fluid to flow out of the tube and spill, soiling your hands or the floor.

If you know that you will not use the machine for a prolonged period, follow the procedure below to replace the drain cartridge.

⚠ WARNING

Never place the drain cartridge or ink near an open flame.

Doing so may cause a fire.

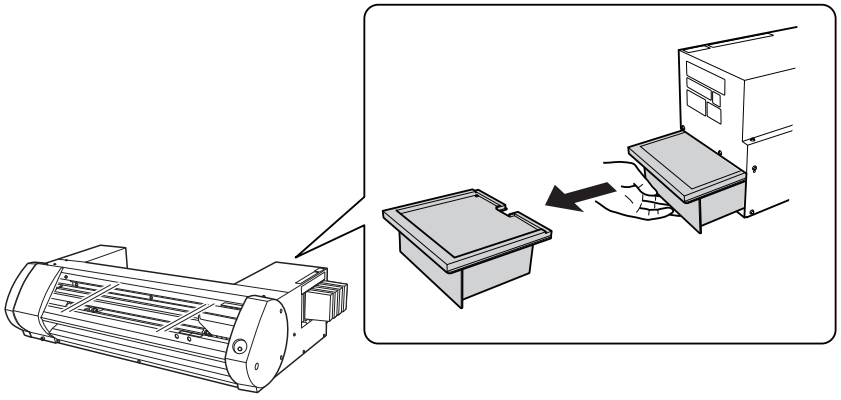
⚠ CAUTION

Do not open the lid on the drain cartridge.

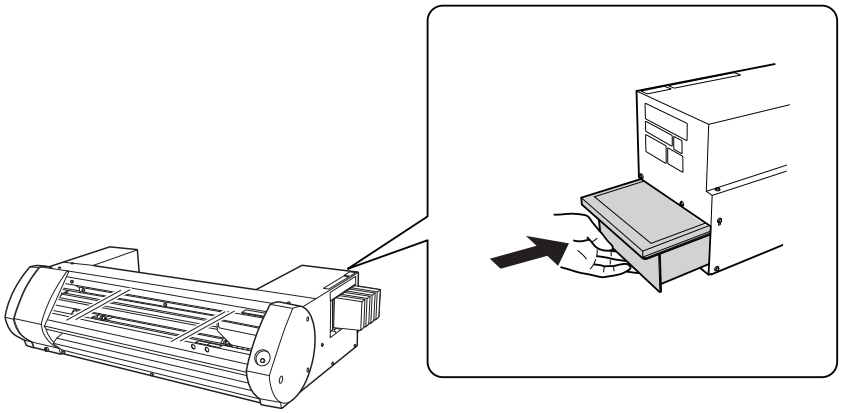
Any spillage or vapor leakage may cause fire, odor, or physical distress.

Procedure

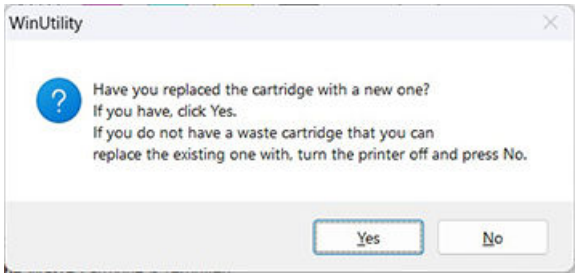
1. **Remove the drain cartridge.**



2. **Insert a new drain cartridge.**



3. **When the dialog box shown below is displayed, click [Yes].**



IMPORTANT

Do not reuse drain cartridges.
Doing so makes it impossible to manage the amount of discharged fluid, which may overflow.

IMPORTANT

Dispose of discharged fluid properly, in accordance with the laws in effect in your locale.
Discharged fluid is flammable and contains toxic ingredients. Never attempt to incinerate discharged fluid or discard it with ordinary trash. Also, do not dispose of it in sewer systems, rivers, or streams. Doing so may have an adverse impact on the environment.

For information about purchasing drain cartridges, contact your authorized dealer.

Care and Maintenance of the Print Heads

To ensure optimum printing, the print heads need to be maintained in good condition. There are two kinds of maintenance: daily maintenance and periodical maintenance.

Daily care and maintenance

Normal Cleaning

We recommend performing Normal Cleaning everyday before the start of operations.

P. 31Step 3: Printing Tests and Normal Cleaning

Periodical care and maintenance

P. 72Periodical Cleaning Maintenance

* Print heads are consumable parts and subject to wear. Depending on the frequency of use, periodical replacement is required. Please order them directly from us or your authorized Roland DG Corp. dealer.

Periodical Cleaning Maintenance

Periodic Cleaning Menus

This machine has several cleaning menus. Perform the appropriate level of cleaning in accordance with the ink type, the cleaning period, and the machine condition.

When Using ECO-SOL MAX/ECO-SOL MAX 2 Ink

Normal cleaning	Carry out a printing test before the start of work each day. If nozzle drop-out occurs, perform this cleaning. P. 31Step 3: Printing Tests and Normal Cleaning
Medium cleaning	If you cannot fix nozzle drop-out with normal cleaning, try medium cleaning. If medium cleaning does not fix the problem, perform powerful cleaning. P. 73Medium/Powerful Cleaning
Powerful cleaning	
Manual cleaning	Perform manual cleaning periodically according to the frequency of use. To maintain stable output conditions at all times, perform manual cleaning more than once a month. P. 75Manual Cleaning

When Using ECO-SOL MAX 3 Ink

Normal cleaning	Carry out a printing test before the start of work each day. If nozzle drop-out occurs, perform this cleaning. P. 31Step 3: Printing Tests and Normal Cleaning
Manual cleaning	The message [**Clean the printer manually.**] is displayed approximately once per week, but it may be displayed more frequently depending on the usage conditions. When this message is displayed, be sure to perform manual cleaning. P. 75Manual Cleaning
Medium cleaning	If you cannot fix nozzle drop-out with normal cleaning, try medium cleaning. If medium cleaning does not fix the problem, perform powerful cleaning. P. 73Medium/Powerful Cleaning
Powerful cleaning	
Manual cleaning	Perform manual cleaning periodically according to the frequency of use. To maintain stable output conditions at all times, perform manual cleaning more than once a month. P. 79Replacing the Wiper P. 81Replacing the Felt Wiper

Medium/Powerful Cleaning

If problems such as nozzle drop-out persist even after you have performed normal cleaning, carry out the more powerful [**Medium Cleaning**] two or three times. If this still does not resolve the problem, carry out the even more forceful [**Powerful Cleaning**].

MEMO

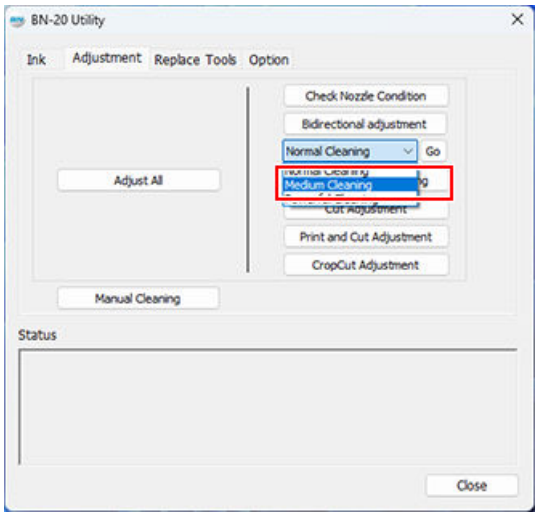
Medium cleaning consumes more ink than normal cleaning. Powerful cleaning consumes more ink than medium cleaning. Because the print heads are prone to damage if cleaned too frequently, do not perform cleaning more than necessary.

Procedure

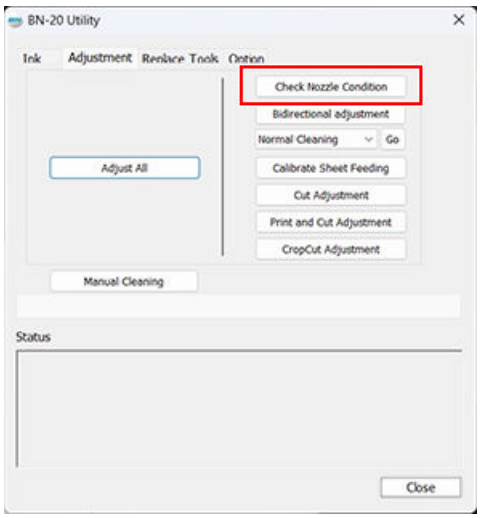
1. **Open the Utility window.**

   P. 12Starting/Exiting Utility

2. **On the [Adjustment] tab, select [Medium Cleaning] and click [Go].**

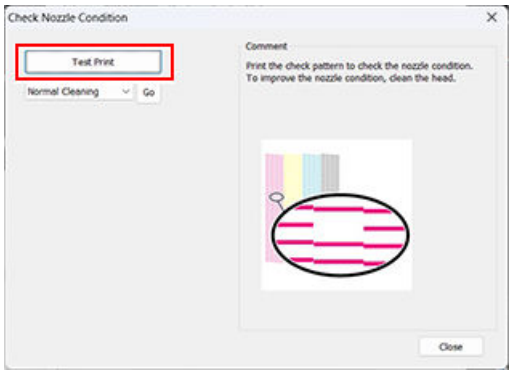


3. **Click [Check Nozzle Condition].**



4. **Click [Test Print].**

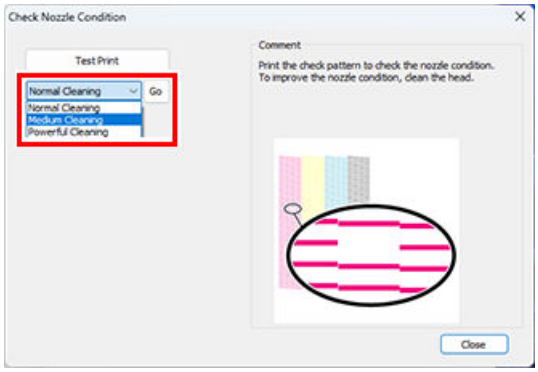
A test pattern is printed. Follow the on-screen instructions to check for nozzle drop-out.



- Nozzle drop-out is present. -> Proceed to step 5.
- No nozzle drop-out is present. -> Click [**Close**] to finish the procedure.

5. **Select the [Medium Cleaning], and then click [Go].**

Medium cleaning starts.



6. **Check for nozzle drop-out again.**

If nozzle drop-out is not fixed by [**Medium Cleaning**], perform [**Powerful Cleaning**].

MEMO

If problems such as nozzle drop-out persist even after you have performed powerful cleaning several times, perform [**Manual Cleaning**].

RELATED LINKS

- P. 75Manual Cleaning

Manual Cleaning

When Manual Cleaning Is Necessary

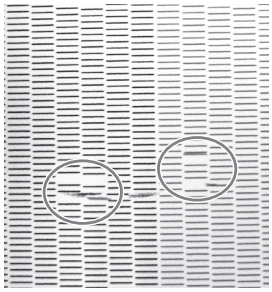
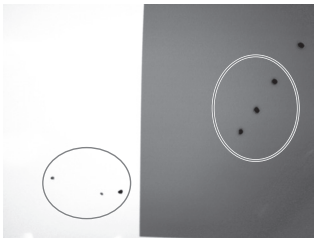
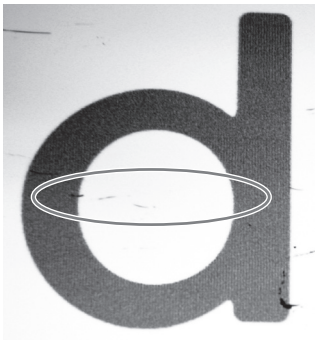
The timing with which manual head cleaning is required varies depending on the type of ink you are using. Be sure to perform this cleaning with the required timing.

P. 72Periodic Cleaning Menus

Manual cleaning is recommended when the following symptoms occur.

When any of the following symptoms occur and cannot be solved by automatic cleaning functions such as normal cleaning, perform manual cleaning.

Wiper replacement may also be effective in improving these symptoms.

Nozzle drop-out	Ink drips	Dragging dirt
		
Dust or other foreign matter adheres to the print heads and impedes correct ink discharge.	Ink pools in dust or dirt adhered to the print heads, and drips onto the media.	The phenomenon where dirt or dust accumulates on the print heads.

MEMO

- When the cleaning stick and cleaning liquid used for manual cleaning runs out, purchase them from your authorized dealer.
- The print heads are components that wear out. Periodic replacement is required, with the frequency of replacement depending on use. Contact your authorized dealer.

RELATED LINKS

- P. 79Replacing the Wiper

Manual Cleaning Method

IMPORTANT

Important notes on this procedure

- Before attempting this operation, remove any media.
- To prevent the heads from drying out, finish this procedure in 30 minutes or less. An alarm sounds after 30 minutes.
- Never use any implements other than the included cleaning sticks. Cotton swabs or other lint-producing items may damage the heads. If you use up the cleaning sticks, contact your authorized dealer.
- Use one cleaning stick per cleaning session, and then discard the stick after use. Reusing cleaning sticks may reduce print quality.
- Do not put a cleaning stick that has been used for cleaning into the cleaning liquid. Doing so will deteriorate the cleaning liquid.
- Never rub the nozzle surface of the heads.
- Stroke the sponges very gently, applying as little pressure as possible. Never rub, scrape, or crush them.

When an alarm sounds during cleaning

To prevent the print heads from drying out, an alarm sounds about 30 minutes after the start of the operation. Perform the operation by following the message displayed in the Utility window.

⚠ WARNING

Be sure to perform operations as specified by the instructions, and never touch any area not specified in the instructions.

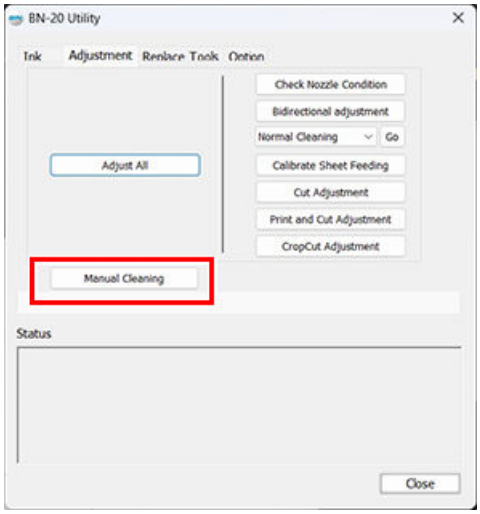
Sudden movement of the machine may cause injury.

Procedure

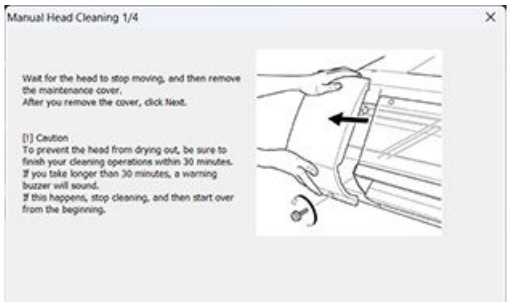
1. **Open the Utility window.**

   P. 12Starting/Exiting Utility

2. **On the [Adjustment] tab, click [Manual Cleaning].**



The manual cleaning procedure is displayed. Carefully read the on-screen instructions and carry out the work.



3. **Perform a printing test to check the results.**

Perform cleaning using the machine's cleaning feature several times when necessary.

RELATED LINKS

- P. 31Printing Tests and Normal Cleaning

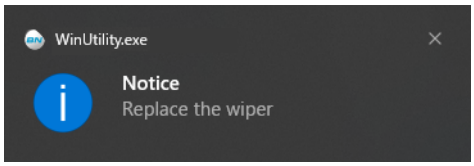
Replacing Consumable Parts

Replacing Parts for Maintenance 79
Replacing the Wiper 79
Replacing the Felt Wiper 81
Replacing the Blade 83

Replacing Parts for Maintenance

Replacing the Wiper

The wiper is a component that is used for cleaning the print heads. When the message appears on the Utility icon in the computer's notification area, it is time to replace the wiper with a new one. Replace with new items. For information about purchasing wipers, contact your authorized dealer.



When an alarm sounds during wiper replacement

To prevent the print heads from drying out, an alarm sounds about 30 minutes after the start of the operation. Perform the operation by following the message displayed in the Utility window.

⚠ WARNING

Be sure to perform operations as specified by the instructions, and never touch any area not specified in the instructions.

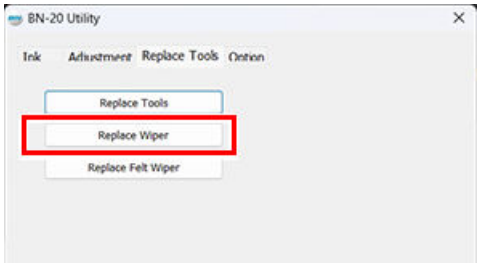
Sudden movement of the machine may cause injury.

Procedure

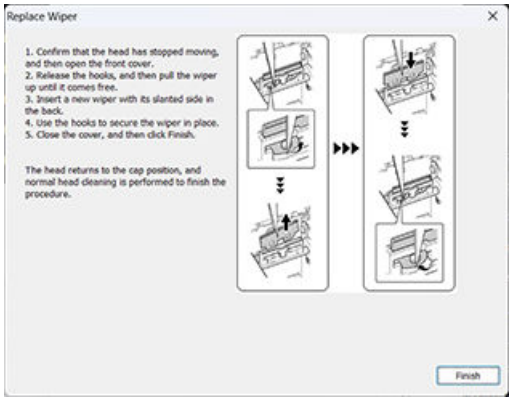
1. **Open the Utility window.**

P. 12Starting/Exiting Utility

2. **On the [Replace Tools] tab, click [Replace Wiper].**



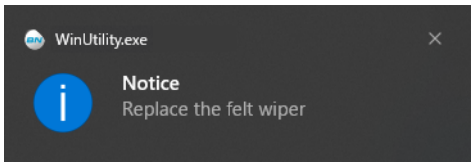
A procedure for replacing the wiper is displayed. Carefully read the on-screen instructions and carry out the work.



3. When the operation is completed, close the front cover.

Replacing the Felt Wiper

The felt wiper is a component that is used for cleaning the print heads. When the message appears on the Utility icon in the computer's notification area, it is time to replace the wiper with a new one. Replace with new items. For information about purchasing felt wipers, contact your authorized dealer.



When an alarm sounds during felt wiper replacement

To prevent the print heads from drying out, an alarm sounds about 30 minutes after the start of the operation. Perform the operation by following the message displayed in the Utility window.

⚠ WARNING

Be sure to perform operations as specified by the instructions, and never touch any area not specified in the instructions.

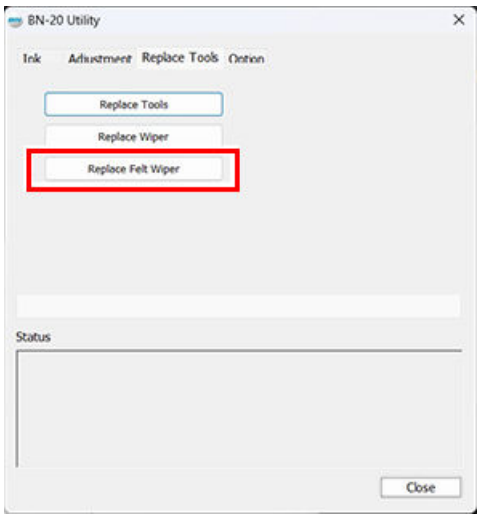
Sudden movement of the machine may cause injury.

Procedure

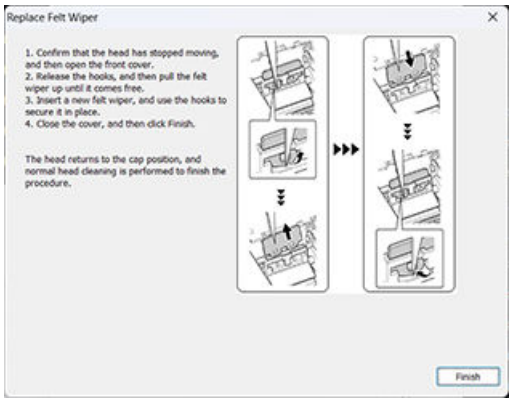
1. **Open the Utility window.**

   P. 12Starting/Exiting Utility

2. **On the [Replace Tools] tab, click [Replace Felt Wiper].**



A procedure for replacing the felt wiper is displayed. Carefully read the on-screen instructions and carry out the work.



3. When the operation is completed, close the front cover.

Replacing the Blade

If the blade becomes dull, if the edge of the blade is chipped, or if the cutting quality is lowered, replace the blade with a new blade.

⚠ WARNING

Be sure to perform operations as specified by the instructions, and never touch any area not specified in the instructions.
Sudden movement of the machine may cause injury.

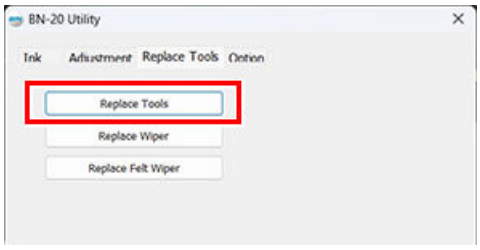
⚠ CAUTION

Never touch the tip of the knife.
Doing so may result in injury. The cutting performance of the blade will also be impaired.

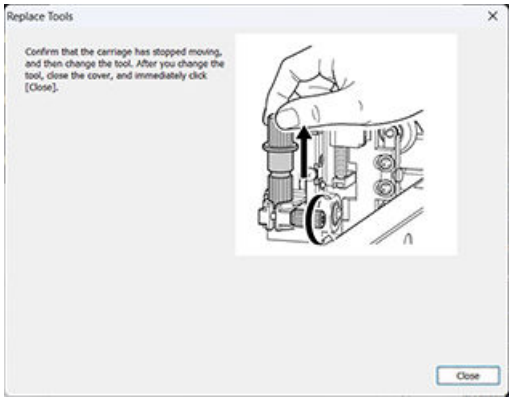
Procedure

1. **Open the Utility window.**
   P. 12Starting/Exiting Utility

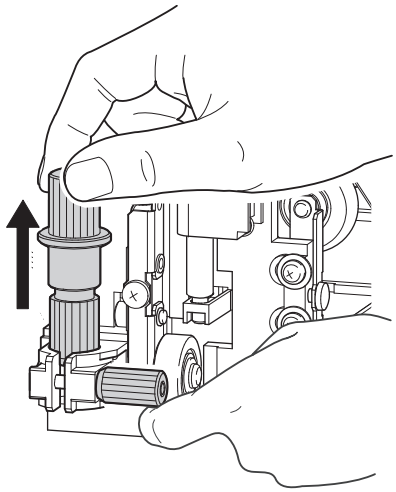
2. **On the [Replace Tools] tab, click [Replace Tools].**



When the screen shown in the figure appears, open the front cover and replace the blade.



3. **Remove the blade holder.**

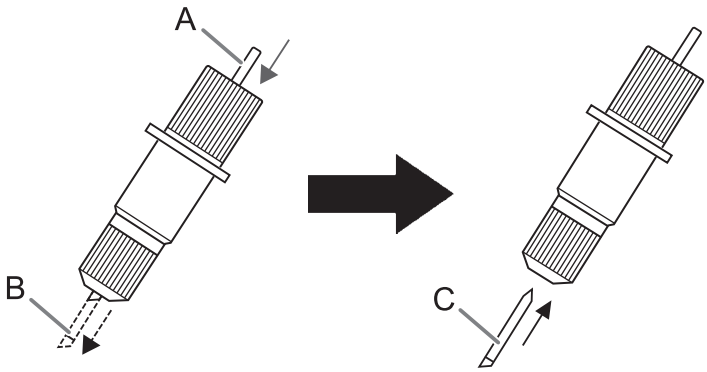


4. **Replace the blade.**

(1) **Press the pin (A).**

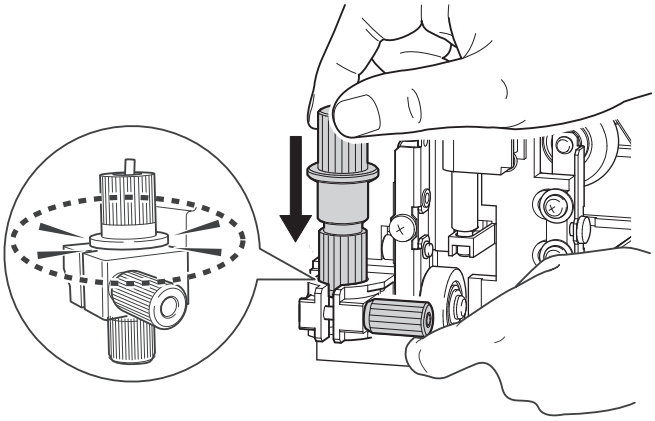
(2) **Remove the old blade (B).**

(3) **Install a new blade (C).**



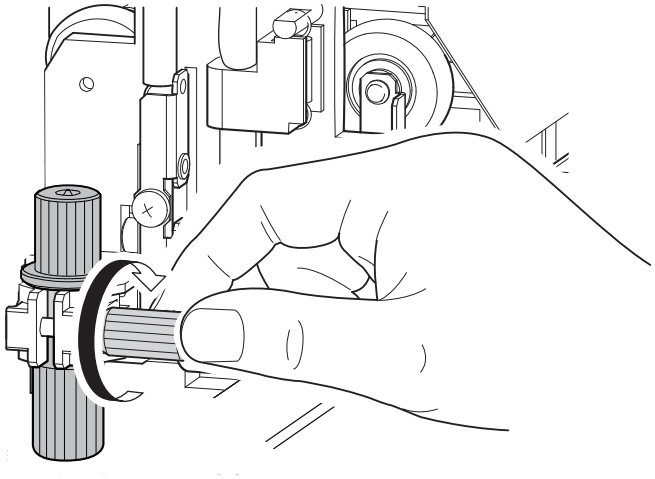
5. **Support the screw from below and insert the blade holder.**

Failure to do this may adversely affect the cutting quality.



6. **Tighten the screw.**

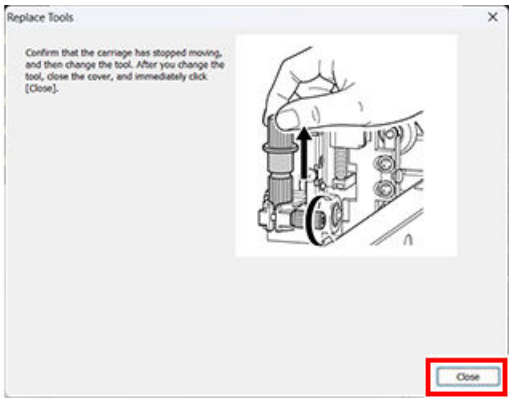
Tug the blade holder upward to make sure it does not come loose.



7. **Close the front cover.**

Click [**Close**].

This completes the replacement procedure.



8. **Make adjustments for cutting.**

RELATED LINKS

- P. 40Adjusting Cutting

Troubleshooting Methods.

Output Quality Problems

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Do the print heads show nozzle clogging?....88
Have you carried out[**Calibrate Sheet Feeding**] ?....88
Have you carried out [**Bidirectional adjustment**] ?....88
Is the temperature of the room too low?....88
Is the printer installed in a level and stable location?....88
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Is the media loaded and set up correctly?....88
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Did you shake the ink cartridges gently before installing them?....90
Is the media wrinkled?....90
Is the printer installed in a level and stable location?....90
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The printed surface is damaged when cutting....93
Does the tip of the blade holder cap scrap the printed surface?....93

Printed results are coarse or contain horizontal stripes

Do the print heads show nozzle clogging?

Carry out a printing test and make sure no nozzle clogging occurs. If nozzle clogging is present, perform head cleaning.

RELATED LINKS

- P. 31Printing Tests and Normal Cleaning
- P. 73Medium/Powerful Cleaning
- P. 75Manual Cleaning

Have you carried out[Calibrate Sheet Feeding] ?

Large misalignment in the amount of feed of the media may result in printing that seems coarse or contains horizontal stripes. We recommend performing [**Calibrate Sheet Feeding**] before daily operations and when changing the media type.

RELATED LINKS

- P. 33Correcting the Media Feed

Have you carried out [Bidirectional adjustment] ?

We recommend performing [**Bidirectional adjustment**] before daily operations and when changing the media type. The optimal adjustment value may vary, depending mainly on the thickness of the media.

RELATED LINKS

- P. 29Bidirectional Adjustment

Is the temperature of the room too low?

The heater may not warm up sufficiently when the ambient temperature is less than 20°C (68°F). Also, even when the heater warms up, an adequate effect may not be obtained if the media is thoroughly chilled. Before printing, allow the media to come to room temperature.

Is the printer installed in a level and stable location?

Never install the machine in a location where it is tilted or where it may wobble or experience vibration. Also make sure that the print heads are not exposed to moving air.

Is the printer installed in a location out of direct sunlight?

Never install in a location exposed to direct sunlight.

Is the media loaded and set up correctly?

If the media is not loaded and set up correctly, printing may be adversely affected. Make sure the media is loaded and set up correctly.

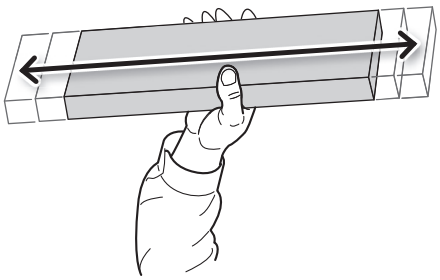
RELATED LINKS

- P. 94Media Feed Problems

Colors are unstable or uneven

Did you shake the ink cartridges gently before installing them?

Shake new cartridges gently before you install them. So that the ink mixes well, periodically shake each ink cartridge 50 times (about 20 seconds) horizontally with a stroke length of around 5 cm (1.97 in.) from each end of the ink cartridge before reinserting it.



Is the media wrinkled?

If the media is wrinkled and comes loose from the platen, colors may be uneven or printing quality may suffer.

RELATED LINKS

- P. 94Media Feed Problems

Is the printer installed in a level and stable location?

Never install the machine in a location where it is tilted or where it may wobble or experience vibration. Also, make sure that the print heads are not exposed to circulating air. These factors may lead to nozzle clogging or reduced printing quality.

Is the printer being used in a location subject to severe changes in the operating environment?

Large fluctuations in temperature or humidity while printing is in progress may cause the colors to change partway through. When you're performing printing, use the machine in a location where temperature and humidity are stable.

The media becomes soiled when printed

Are the print heads dirty?

The following may cause ink to drip on the media during printing.

- Buildup of fibrous dust (lint) around the heads.
- Ink transferred to the heads due to rubbing against the media.

  If this happens, perform manual head cleaning. We recommend carrying out periodic print heads cleaning.
- Too Low Humidity.
- Use this machine in the environment of 35 to 80 %RH (non condensation).

RELATED LINKS

- P. 72Periodical Cleaning Maintenance

Cutting is misaligned or skewed

Is the media loaded and set up correctly?

If the media is not loaded and set up correctly, or media feed is not smooth, cutting may be adversely affected. Make sure the media is loaded and set up correctly.

RELATED LINKS

- P. 94Media Feed Problems

Are the settings for the cutting conditions appropriate?

Misalignment or skewing may occur if the cutting speed is too fast or the blade force is too high. Try changing the cutting conditions. With media having a strong adhesive layer, the adhesive layer reattaches to itself immediately after cutting. However, if a cutting test shows that the peeling of the media and the blade traces on the backing paper are optimal, then the media is being cut properly. Be careful not to make the blade force too high.

RELATED LINKS

- P. 40Adjusting Cutting
- P. 42Accurately Adjusting the Cutting-in Amount

Is the length of output too long?

For printing & cutting in particular, the longer the page length (that is, the longer the distance the media is returned after printing), the greater is the chance of misalignment occurring. It is a good idea to keep the size of each single page to the minimum necessary.

Are you using media that exhibits large expansion and contraction?

When you're performing printing & cutting, misalignment occurs if the media expands or contracts. If this happens, try performing printing with crop marks, then setting the base point and one or more align points and performing cutting. This corrects for expansion and contraction of the media.

RELATED LINKS

- P. 49Performing Printing and Cutting Separately

The printed surface is damaged when cutting

Does the tip of the blade holder cap scrap the printed surface?

The tip of the blade holder cap may scrape, and soil or damage the printed surface. If this happens, increase the amount of blade extension.

RELATED LINKS

- P. 42Accurately Adjusting the Cutting-in Amount

Media Feed Problems

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Media Wrinkles or Shrinks 96
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Is the media loaded and set up straight and securely? 97
Media Feed Is Not Smooth 98
Do the media strike some other object? 98
Is the media too thick? 98
Are the grit rollers dirty? 98

The Media Jams

If an error message is displayed because the media has jammed, immediately correct the problem. Failure to do so may damage the print heads.

RELATED LINKS

- P. 114Error Messages

Is the media warped or wrinkled?

Many factors can cause warping or wrinkling. Refer to the following and correct the problem.

RELATED LINKS

- P. 94Media Feed Problems

Media Wrinkles or Shrinks

Is the media loaded and set up straight and securely?

Feed is not smooth when the media is not straight or is tensioned unevenly on the left and right. Reload the media.

RELATED LINKS

- P. 22Loading Media

Was loaded media allowed to stand for some time?

Media may shrink or wrinkle if it is heated for an extended time. When printing ends, press and hold down the [**POWER**] key to switch off the sub power or remove the media.

Was the media loaded while the heater was hot?

Loading media after the heater has warmed up causes the temperature of the media to rise suddenly, which may cause the media to shrink or wrinkle during printing. Before loading media, switch off the sub power and allow the platen to cool.

Is the temperature of room too low?

Use this machine in an environment having an ambient temperature of 20 to 32°C (68 to 90°F). If the machine is used at an ambient temperature less than 20°C, then depending on the type or width of the media, wrinkling or temperature-caused unevenness may occur. To obtain stable printing results, the machine should be used at an ambient temperature of 20 to 32°C (68 to 90°F).

Is the humidity of the room too high?

Use this machine in the environment of 35 to 80 %RH (non condensation).

Is the using media deflected?

If using the deflected media, it cause winkle of the media.

Media Feed Is Not Straight

Is the media loaded and set up straight and securely?

Feed is not smooth when the media is not straight or is tensioned unevenly on the left and right. Reload the media.

RELATED LINKS

- P. 22Loading Media

Media Feed Is Not Smooth

Do the media strike some other object?

Make sure the media do not touch anything else. This may affect output, even when feed appears to be smoothly.

RELATED LINKS

- P. 22Loading Media

Is the media too thick?

Media that is too thick may not only cause unstable feed, but may scrape the print heads, resulting in malfunction. Never use such media.

Are the grit rollers dirty?

Check to make sure the grit rollers are free of buildup of foreign material such as media scraps.

RELATED LINKS

- P. 67Cleaning

Machine Problems

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What to Do First 100
If the print-head carriage move to the standby 100
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Is the power switched on? 102
Does the [POWER] key stay steadily lighted? 102
Is the [POWER] key flashing? 102
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Is a message displayed on the Utility icon in the task tray or in the Utility window? 102
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Are two or more machines connected to a single computer? 103
Is the temperature of the room too low? 103
Did you forcibly remove any detachable external storage device connected by USB? 103

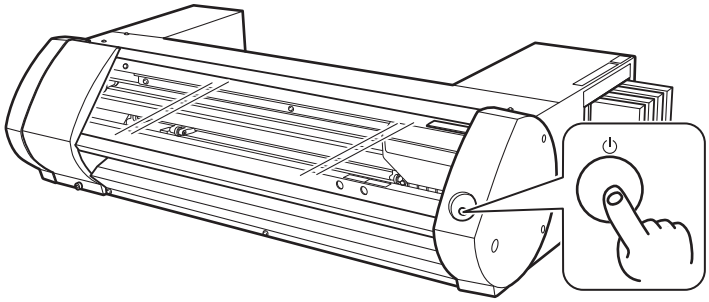
The Print Heads Stop Moving

If the print-head carriage stops over the platen, take action immediately to prevent the heads from drying out.

What to Do First

Hold down the [**POWER**] key for one second or longer to switch the sub power off, then back on. If the media is jammed, then also remove the media.

If the print-head carriage move to the standby position (on the right side of the machine), it means the operation has ended successfully.



If The Heads Still Do Not Move

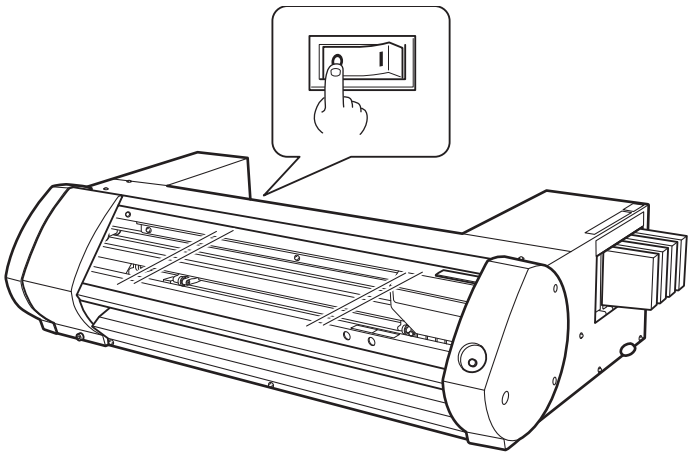
Try switching off the main power, then again switching on the main power, followed by the sub power.

If the print-head carriage move to the standby

If the heads still do not move after "What to Do First" is performed, carry out the following emergency response measure, then contact your authorized Roland DG Corp. dealer.

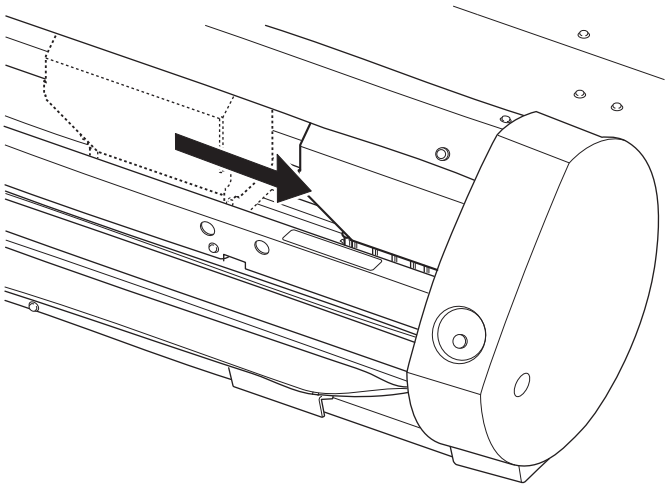
Procedure

1. **Switch off the main power and open the front cover.**



2. **Gently move the print heads to the standby position.**

   Stopping at the place where the audible click is heard locks the print heads in place.



3. **Gently apply pressure from the right side to make sure the print heads don't move to the left.**

   If the print heads move to the left, again move them slowly by applying pressure from the left side and make sure they lock in place.

The Printer Unit Doesn't Run

Is the power switched on?

Switch on the printer's main power, then press the [POWER] key and make sure the key lights up.

Does the [POWER] key stay steadily lighted?

Output is not performed when [POWER] key does not stay steadily lighted. After the media is loaded, pull the loading lever.

Is the [POWER] key flashing?

When the [POWER] key flashes, no operation except for canceling output is accepted.

Is the cover open?

Close front cover, and maintenance cover.

Has ink run out?

If you send the output data in a state where there is no ink left, a warning buzzer will sound and the machine will stop temporality. A message indicating that ink has run out is displayed in the Status field of Utilities. When the ink cartridge is replaced with a new one, printing or cutting starts.

RELATED LINKS

- P. 64How to Replace the Ink Cartridge
- P. 114Error Messages

Is a message displayed on the Utility icon in the task tray or in the Utility window?

RELATED LINKS

- P. 112Messages
- P. 114Error Messages

Is the cable connected?

Connect the cable securely.

RELATED LINKS

- BN-20A Preparation Before Use

Is the driver installed correctly?

If the connection to the computer is not made in the sequence described, the driver may fail to be installed correctly. The Utility does not function normally when driver is misconfigured. Check again to ensure that the connection was made using the correct procedure.

RELATED LINKS

- BN-20A Preparation Before Use

Are two or more machines connected to a single computer?

The utility cannot control more than one machine at the same time. Never connect two or more instances of this machine to a single computer.

Is the temperature of the room too low?

This machine does not complete startup until the heater reaches the specified temperature, and does not accept any operation. When the ambient temperature is low, the heater is slow to warm up. Use the machine in an environment where the temperature is 20 to 32 °C (68 to 90 °F).

Did you forcibly remove any detachable external storage device connected by USB?

When you remove the USB removable device (USB flash drive or USB hard disk etc.), you must run [**Safely Remove Hardware and Eject Media**] or [**Eject**] before detaching it. If you remove the USB device without it in process of printing, the printing may be aborted.

Driver Problems

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Installation is impossible

If installation quits partway through, or if the wizard does not appear when you make the connection with a USB cable, take action as follows.

Windows 11

Procedure

1. **Connect the machine and the computer with the USB cable, and switch on the machine.**
2. **If the [Found New Hardware] message appears, click [Cancel] to close it.**
3. **Right-click the Start menu, and then click [Device Manager].**
   When the [**User Account Control**] window appears, click [**Continue**]. The [**Device Manager**] window appears.
4. **From the [View] menu, click [Show hidden devices].**
5. **Search the list for [Printers] or [Other devices], and then double-click it.**
   The name of your machine or [**Unknown device**] appears below the selected item. Click the name to select it.
6. **From the [Action] menu, click [Uninstall Device].**
7. **In the [Confirm Device Uninstall] window, click [OK].**
8. **Close the [Device Manager].**
9. **Disconnect the USB cable from the computer, and restart Windows.**
10. **Uninstall the driver according to the procedure below.**
    P. 107Uninstalling the Driver
11. **Refer to "Preparation Before Use" to redo the installation from the beginning.**

RELATED LINKS

- BN-20A Preparation Before Use

Windows 10

Procedure

1. Connect the machine and the computer with the USB cable, and switch on the machine.
2. If the [Found New Hardware] message appears, click [Cancel] to close it.
3. Right-click the Start menu, and then click [Device Manager].
   When the [**User Account Control**] window appears, click [**Continue**]. The [**Device Manager**] window appears.
4. From the [View] menu, click [Show hidden devices].
5. Search the list for [Printers] or [Other devices], and then double-click it.
   The name of your machine or [**Unknown device**] appears below the selected item. Click the name to select it.
6. From the [Action] menu, click [Uninstall Device].
7. In the [Confirm Device Uninstall] window, click [OK].
8. Close the [Device Manager].
9. Disconnect the USB cable from the computer, and restart Windows.
10. Uninstall the driver according to the procedure below.
    P. 107Uninstalling the Driver
11. Refer to "Advance Preparation" to redo the installation from the beginning.

RELATED LINKS

- BN-20A Advance Preparation

Uninstalling the Driver

When uninstalling the driver, perform following operation.

IMPORTANT

If the driver is uninstalled without following the procedure given below, there is a possibility that it might not be able to be re-installed.

Windows 11

Procedure

1. Switch off the machine, and disconnect the connector cable between the computer and the machine.
2. Log on to Windows as an administrator.
3. Right-click the Start menu, and then click [Apps and Features].
4. Select the driver of the machine you want to delete by clicking it, and then click [Uninstall].
5. A message prompting you to confirm deletion appears. Click [Yes].

Windows 10

Procedure

1. Switch off the machine, and disconnect the connector cable between the computer and the machine.
2. Log on to Windows as an administrator.
3. Right-click the Start menu, and then click [Apps and Features].
4. Select the driver of the machine you want to delete by clicking it, and then click [Uninstall].
5. A message prompting you to confirm deletion appears. Click [Yes].

Important Notes When Performing Output from General Application

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Important Note When Performing Output from CorelDRAW..... 110

Important Notes When Performing Output from Adobe Illustrator

MEMO

These are cautionary notes on making output from Adobe Illustrator using the BN-20 driver.
These notes do not apply if you are using VersaWorks.

When you want to perform cutting, clear the [Print As Bitmap] check box in the [Print] dialog box.

To display the [**Print**] dialog box, click [**File**]>[**Print**].

Set the document's color mode to [RGB].

If you select CMYK mode, the CMYK values will be converted to RGB values when the output is generated, so the color (RGB value) specified as the cutting line may be changed. In this case, it may not be possible to perform cutting because the color specified for the driver as the cutting line and the color output from Illustrator differ.

Do not cancel printing by operating Illustrator.

To cancel printing, hold down the [POWER] key on the BN-20A. When you print from Illustrator, the now printing dialog box is displayed. Even if you click the [**Cancel**] button in this dialog box, the printing process will continue running, and you will not be able to operate Illustrator until this process finishes.

Important Note When Performing Output from CorelDRAW

MEMO

This is a cautionary note on making output from CorelDRAW using the BN-20 driver.
This note does not apply if you are using VersaWorks.

Set the document's color mode to [RGB].

If you select CMYK mode, the CMYK values will be converted to RGB values when the output is generated, so the color (RGB value) specified as the cutting line may be changed. In this case, it may not be possible to perform cutting because the color specified for the driver as the cutting line and the color output from CorelDRAW differ.

Handling Messages and Error Messages

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[XX ink : Shake the cartridge well] 112
[The Waste cartridge is full.] 112
[Replace the wiper.] 112
[Replace the felt wiper.] 112
[The connection to the printer has been released.] 112
[Clean the printer manually.] 112
Error Messages 114
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[The cleaning liquid cartridge is empty. Replace the cleaning liquid cartridge with a new one.] 116

Messages

These are the main messages that appear in the Utility window to prompt correct operation. They do not indicate any error. There are other messages that appear in the Utility window. Follow the displayed prompts and take action accordingly.

[XX ink : Shake the cartridge well]

Remove the ink cartridge that is indicated in *** and shake it well.

RELATED LINKS

- P. 67Maintenance of Ink Cartridges

[The Waste cartridge is full.]

The waste cartridge is full. Replace the waste cartridge with a new one.

RELATED LINKS

- P. 69Replacing the Drain Cartridge

[Replace the wiper.]

It is time to replace the wipers. Replace the wipers.

RELATED LINKS

- P. 79Replacing the Wiper

[Replace the felt wiper.]

It is time to replace the felt wiper. Replace the felt wiper.

RELATED LINKS

- P. 81Replacing the Felt Wiper

[The connection to the printer has been released.]

A USB cable that connects this machine and the computer is unplugged, or the main power of this machine is switched off. If the machine is allowed to stand with the main power switched off, the automatic maintenance fails to work and it may cause a machine malfunction. Make sure that the main power is on at all times.

[Clean the printer manually.]

If [**Clean the printer manually.**] message is displayed on the screen of the computer connected to the printer, be sure to perform manual cleaning.

RELATED LINKS

- P. 75Manual Cleaning

Error Messages

This topic describes some of the error messages that may appear in the Utility window, and how to take action to remedy the problem. In addition to the messages described below, the Utility window shows the causes of errors and troubleshooting information. If the troubleshooting information displayed in the Utility window or action described here does not correct the problem, or if an error message not described here appears, contact your authorized Roland DG Corp. dealer.

[The pinch roller position is incorrect.]

The media size is not acceptable for this machine, and thus the position of the pinch roller is not correct. If the pinch roller position is incorrect, the media cannot be secured properly. Specific media sizes can be positioned properly with the pinch roller on this machine.

RELATED LINKS

- P. 16Usable Media

[Crop marks could not be printed. Output will be canceled.]

The size of the data including the crop marks is larger than the printing or cutting area of the loaded media.
Make the printing or cutting area wider, such as by replacing the media with a larger piece of media or by changing the positions of the pinch rollers, then send the data again.

The size of the data being output is too small.
Set the size of the data in the new scanning value (direction in which the print heads move) to at least 65 mm (2.6 in.). Change the size of the data, then send the data again. There is no limitation in the size of the data in the new feeding direction.

RELATED LINKS

- P. 49Performing Printing and Cutting Separately

[Crop mark detection could not be started.] / [Crop marks were not found. Output will be canceled.]

Automatic detection of crop marks could not be accomplished.
Load the media at the correct position and perform detection of crop marks again. If repeating automatic crop-mark detection results in an error again, then change the type of media. Depending on the media, it may not be possible to detect crop marks automatically.

RELATED LINKS

- P. 49Performing Printing and Cutting Separately
- P. 54Crop Cut Adjustment

[The operation has been stopped to prevent the print heads from drying out. Turn the printer off.]

The print heads were forced to standby position to prevent them from drying out.
Operation cannot be continued. Switch the sub power off, then back on. Opening the front cover while printing is in progress causes an emergency stop. Never allow the print heads to remain in this state.

[Motor error]

A motor error occurred.
Operation cannot be continued. By following the messages displayed in the Utility window, remove the media, close the front cover, and then hold down the [POWER] key to switch the sub power off. This error may be caused by such factors as an incorrect loading of the media, a media jam, or an operation that pulls the media with excessive force. Eliminate the cause of the error before switching the sub power on, and then reload the media.

[Waste cartridge is estimated to be full]

Output is stopped because the waste cartridge is full.
Output cannot be resumed without correcting this error. Replace the waste cartridge with a new one by following the message displayed in the Utility window. If a new waste cartridge is not available for immediate replacement, switch the main power off.

[Temperature error]

The temperature of the location where the machine is installed has risen above or fallen below the ambient temperature at which the machine can operate.
Operation cannot be continued. Switch off the sub power. Bring the installed location to a temperature at which operation is possible (20 to 32°C) and allow the machine to come to room temperature, then turn on the power.

[Cover open error.]

Output is stopped because the front cover or the maintenance cover is open.
Start output again after closing the cover.

[Sheet setup error]

Setup of the media has failed. Load the media correctly.

RELATED LINKS

- P. 22Loading Media

[Data error]

Output was stopped because a problem was found in the data received.
Operation cannot be continued. Check for errors in the data. Check for a problem with the connector cable or the computer, and start output again.

[Ink has run out.]

Output is stopped because ink has run out.
In the [Ink] tab of the Utility window, check the color of the cartridge that has run out of ink, and replace the ink cartridge with a new one.

RELATED LINKS

- P. 63Checking for Remaining Ink

- P. 64How to Replace the Ink Cartridge

[Pinch lever was returned.]

Output is stopped because the loading lever is pushed backward while output is in progress.
Pushing the loading lever backward cancels the setup of the media, so output is stopped. Reload the media.

[No sheet is present.]

Output is attempted but it fails because no media is present.
Set up the media.

[Printing cannot continue because the end of the sheet was detected. Printing will be canceled.]

Printing is stopped because the trailing edge of the media is detected.
When the trailing edge of the media is detected, output is cancelled. Load new media.

[ServiceCall No**]

An unrecoverable error occurred, or part replacement that must be performed by a service technician is required.
An unrecoverable error occurred, or part replacement that must be performed by a service technician is required.

[Ink Cartridge error : *** ink cartridge]

A cartridge that cannot be used was installed.
Remove the ink cartridge of the indicated color to clear the error. Use an ink cartridge of the specified type. ("***" is the color of the ink)

[BN-20 Utility is already running.]

You try to start BN-20 utility though it is already running.
Utility is resident software that remains active even when it is hidden from the screen. When it is hidden from the screen, it is located in the task tray in the lower right corner of the computer screen.

RELATED LINKS

- P. 12Starting/Exiting Utility

[The cleaning liquid cartridge is empty. Replace the cleaning liquid cartridge with a new one.]

Operation is stopped because the cleaning liquid cartridge is empty.
This message appears when operations such as "Head Wash" are in progress. Operation cannot be resumed without correcting this error. Replace with a new cleaning liquid cartridge immediately. If the machine is allowed to stand with the empty cartridge, it may result in a malfunction.

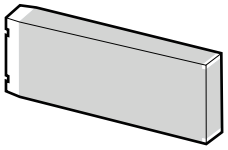
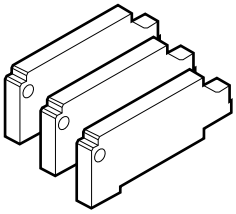
Appendix

Operations When Moving the Unit

Preparing to Move the Machine..... 119
Procedures from Preparing to Move to Reinstallation..... 120

Preparing to Move the Machine

To move the machine, you must completely drain all ink inside the machine and secure the print heads in place with packing materials to protect them. Attempting to move the machine without first doing this may result in damage to internal components due to leaking ink or damage to the print heads.

Required items	
	
Unused cleaning cartridge (1)	Dummy cartridges (3)

To purchase items that are sold separately, contact your authorized dealer.

IMPORTANT

Make sure to use a cleaning cartridge that corresponds to the ink type. Using the wrong cartridge may cause a machine malfunction.

Procedures from Preparing to Move to Reinstallation

Procedure

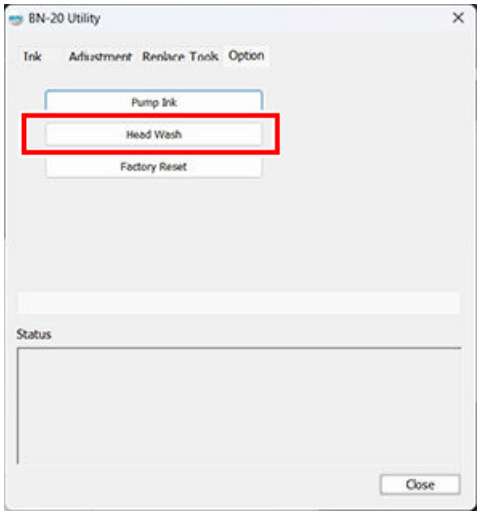
1. **Open the Utility window.**

   P. 12Starting/Exiting Utility

2.

3. **On the [Option] tab, click [Head Wash].**

   Proceed with the work by following the on-screen instructions. Do not switch off the power until the work is completed.



4. **Move the machine as soon as possible.**

5. **Immediately reinstall the machine and fill with ink.**

   Refer to "Advance Preparation" and promptly fill the machine with ink.

IMPORTANT

Important notes on moving

- Once the preparations for moving are complete, move the machine and fill it with ink with as little delay as possible. Leaving the machine alone without ink may damage the print heads.
- When moving the machine, keep it at a temperature of 5˚C to 40˚C (41˚F to 104˚F) and at a humidity of 20%RH to 80%RH (with no condensation). Failure to do so may result in malfunction.
- Handle the machine with care when moving it, keeping it level (not tilted at an angle) and preventing it from striking other objects.

Main Specifications

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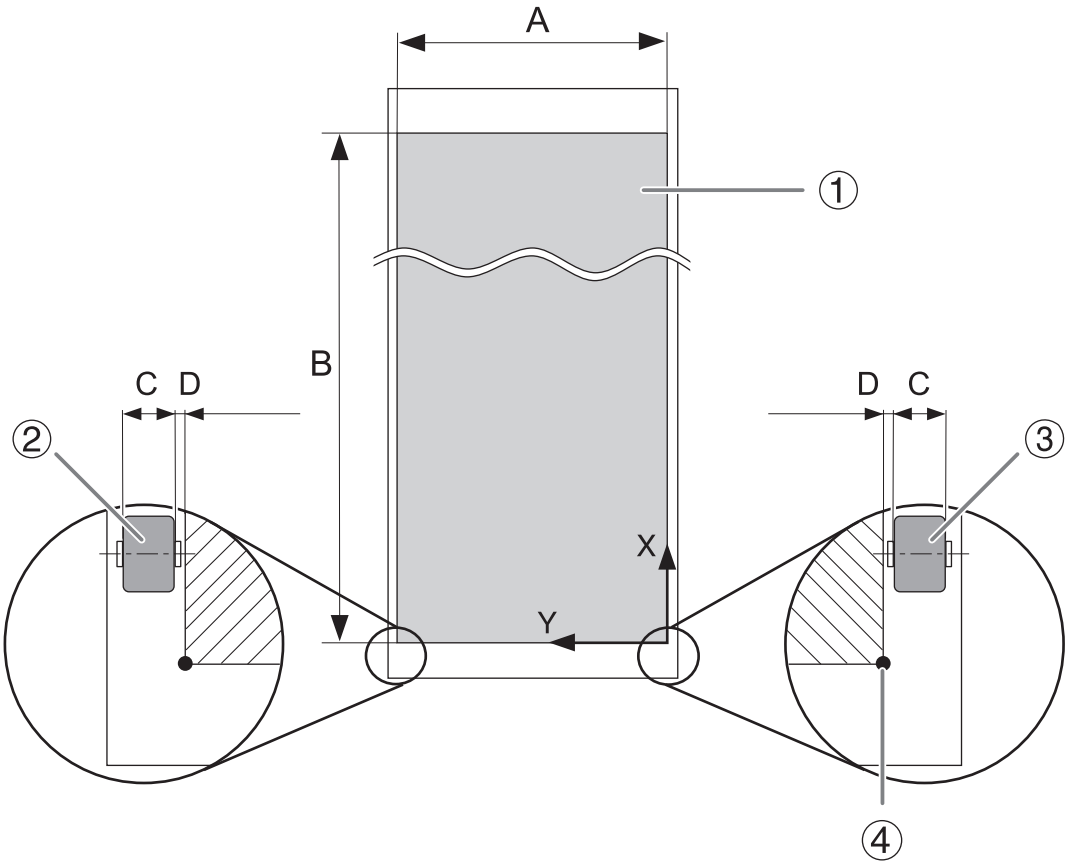
Printing Area

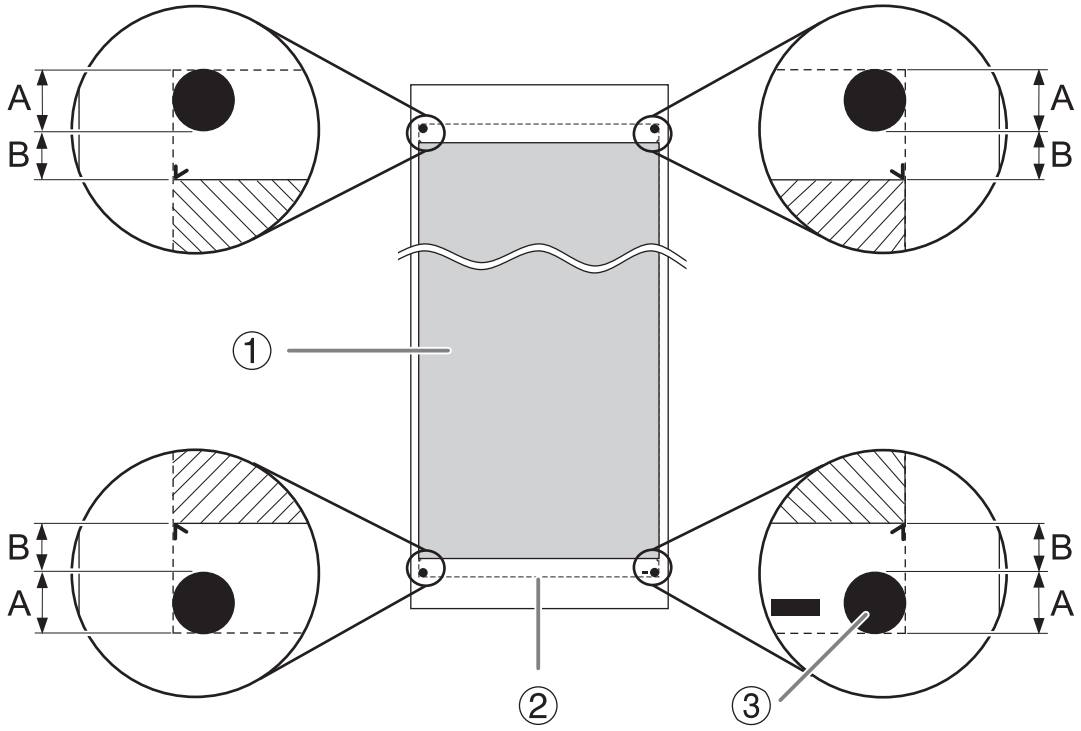
Maximum Area

The printing or cutting area along the horizontal plane (the direction in which the carriages move) is determined by the position of the pinch rollers.



①	Printing or cutting area
②	Left pinch roller
③	Right pinch roller
④	Printing or cutting coordinates origin (0,0)
A	Max. 480 mm (18.89 in.)
B	Max. 24,998 mm (984.2 in.)
C	5 mm (0.2 in.)
D	1.4 mm (0.06 in.)

Maximum Area When Using Crop Marks



①	Printing or cutting area
②	Maximum area
③	Crop mark
A	12.5 mm (0.5 in.)
B	10 mm (0.4 in.)

About the Blade

The cutting conditions and the service life of the blade change according to the media and the operating environment, even when you're using identical blades. The service life also differs according to the type of blade. A rough guide is shown below.

Blade	Media	Blade force	Amount of blade offset (amount of blade tip correction)	Blade life (general guide)*1
ZEC-U1005	General Signage Vinyl	50 to 150 gf	0.25 mm (0.01 in.)	8000 m (26,246.72 ft.)
ZEC-U5025	General Signage Vinyl Fluorescent Vinyl Fluorescent Vinyl	30 to 100 gf 120 to 200 gf 100 to 200 gf	0.25 mm (0.01 in.) 0.25 mm (0.01 in.) 0.25 mm (0.01 in.)	4000 m (13,123.36 ft.) 4000 m (13,123.36 ft.) 4000 m (13,123.36 ft.)

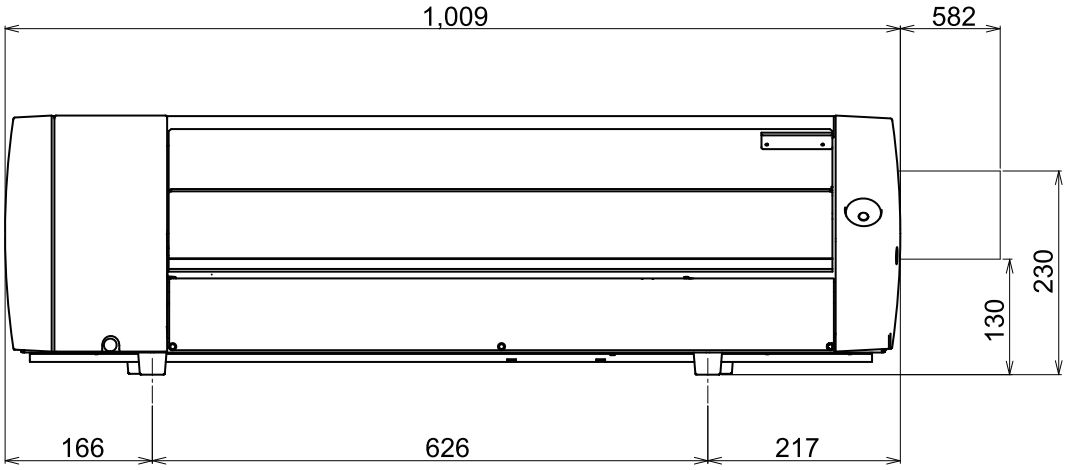
*1 The values for "Blade life" are estimates for when an identical type of material is used.

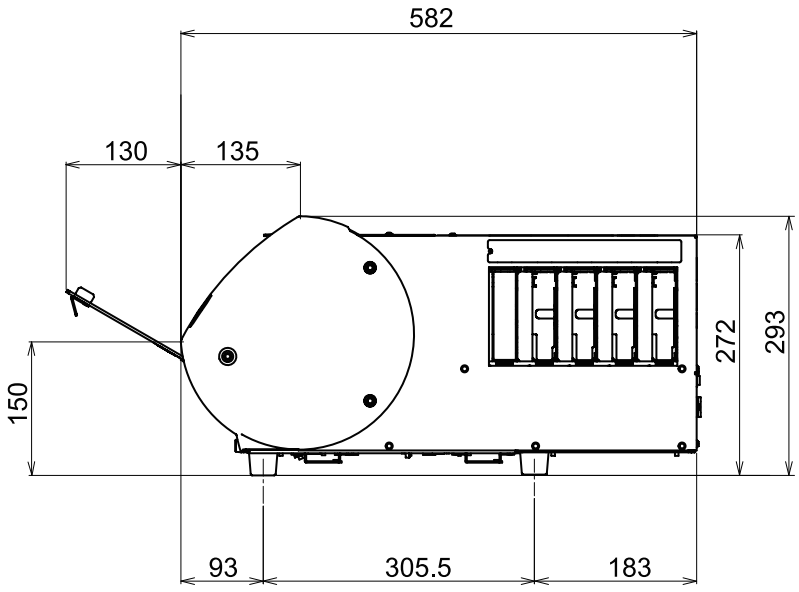
MEMO

When uncut areas remain even when the blade force is increased to a value that is higher than the values shown in this chart by 50 to 60 gf, replace the blade.

Dimensional Drawings

Unit: mm





Specifications

		BN-20A
Printing technology		Piezoelectric inkjet
Media	Width[*1]	150 to 515 mm (5.9 to 20.3 in.)
	Thickness	Max. 1.0 mm (39.3 mil) with liner, for printing Max. 0.4 mm (16 mil) with liner and 0.22 mm (9 mil) without liner, for cutting
	Roll outer diameter	Max. 150 mm (5.9 in.)
	Roll weight	Max. 6 kg (13.2 lb.)
	Core diameter	76.2 mm (3 in.) or 50.8 mm (2 in.)
Printing/cutting width[*2]		Max. 480 mm (18.9 in.)
Ink cartridges	Type	220-cc cartridge
	Colors	Four colors (cyan, magenta, yellow, and black)
Print resolution (dpi)		Max. 1,440 dpi
Cutting blade	Type	Roland CAMM-1 series compatible
	Blade offset	0.25 mm (9 mil)
Cutting speed		1 to 15 cm/s
Blade force		30 to 300 gf
Software resolution (when cutting)		0.025 mm/step
Distance accuracy (when printing)[*4]		Error of less than ±0.3% of distance traveled, or ±0.3 mm, whichever is greater
Repeatability (when cutting)[*3*5]		Error of less than ±0.4% of distance traveled, or ±0.3 mm, whichever is greater
Repeatability (when cutting)[*3*6]		±0.1 mm or less
Alignment accuracy for printing and cutting[*3*7]		±0.5 mm or less
Alignment accuracy for printing and cutting when reloading media[*3*8]		Error of less than ±0.5% of distance traveled, or ±3 mm, whichever is greater
Print heater[*9]		Temperature: 35 °C (95 °F) (fixed)
Connectivity		USB (compliant with Universal Serial Bus Specification Revision 2.0)
Power-saving function		Automatic sleep feature
Power requirements		AC 100 to 240 V ±10 %, 1.0 A, 50 / 60 Hz
Power consumption	During operation	Approx. 90 W
	Sleep mode	Approx. 5.5 W
Acoustic noise level	During operation	62 dB (A) or less
	During standby	42 dB (A) or less
Outer dimensions		1009 (W) x 582 (D) x 293 (H) mm (39.7 (W) x 22.9 (D) x 11.5 (H) in.)
Weight		36 kg (79.4 lb.)
Environment	Power on[*10]	Temperature: 20 to 32 °C (68 to 90 °F) Humidity: 35 to 80 %RH (non-condensing)
	Not operating	Temperature: 5 to 40 °C (41 to 104 °F) Humidity: 20 to 80 %RH (non-condensing)
Included items		Power cord, USB cable, blade, blade holder, User's Manual, etc.

*1 It must be within the ranges shown below:

- 150 to 170 mm (5.9 to 6.7 inch)
- 200 to 235 mm (7.9 to 9.3 inch)
- 287 to 322 mm (11.3 to 12.7 inch)
- 348 to 383 mm (13.7 to 15.1 inch)
- 393 to 429 mm (15.5 to 16.9 inch)

- 439 to 474 mm (17.3 to 18.7 inch)
- 487 to 515 mm (19.2 to 20.3 inch)

*2 The length of printing or cutting is subject to the limitations of the program.

*3
- Media type: Media specified by Roland DG Corp.
- Temperature: 25°C (77°F), Humidity: 50%
- Roll media must be loaded correctly.
- Front margin: 35 mm or more
- Excluding expansion/contraction of the media
- All correction or adjustment function of this machine has been made properly.

*4 With Roland PET film, print travel: 1 m

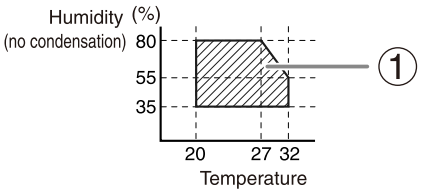
*5 Range for assured repetition accuracy: Length 1,000 mm

*6 Range for assured repetition accuracy: Length 1,000 mm

*7
- Provided that media length is under 1,000 mm
- Excludes the effects of slanted movement and of expansion and contraction of the media.

*8
- Data size: 1,000 mm in the media-feed direction, 480 mm in the carriage-movement direction
- No lamination
- Automatic detection of crop marks at 4 points when media is reloaded.
- Excluding possible shift caused by expansion/contraction of the media and/or by reloading the media.

*9
- Warm-up is required after power up. This may require 5 to 20 minutes, depending on the operating environment.
- Depending on the ambient temperature and media width, the temperature may fail to be reached 35 (°F).

*10 Operating environment

①： Use in an operating environment within this range.