

For customer

HITACHI
Inspire the Next



INK JET PRINTER FOR INDUSTRIAL MARKING

HITACHI Printer

Handling Guidance and Precautions for Ink



- ◆ Please read SDS(Safety Data Sheet) of purchased ink and makeup.
- ◆ Before using IJ printer, please read following precautions for stable operation.
- ◆ Please refer "Basic Operation Manual", "Instruction Manual" and "Technical Manual" also.

 WARNING	WARNING is used to indicate the presence of a hazard which may cause severe personal injury or death if the warning against performing an incorrect handling procedure is ignored.
 CAUTION	CAUTION is used to indicate the presence of a hazard which may cause personal injury or property damage if the warning against performing an incorrect handling procedure is ignored.

Version; W5.03

Basic Precautions

[i]

Precautions of Storage

- (1) Please read SDS(Safety Data Sheet) of purchased ink and makeup.
- (2) Store inks and makeups in the cold dark place (0 to 20°C).(Please store them in the same way regardless before and after opening cartridge/bottle.)
- (3) There is an opening deadline for inks and makeups. Please fill them into the IJ printer before the "Expiration date" described on the cartridge/bottle. ("Expiration date" means "Opening deadline".)
- (4) Once the cartridge/bottle is opened, even if it is stored in a cold dark place, the ink begins to deteriorate in the same manner as the ink in the printer. If "Ink Replacement Cycle" base on guideline have passed, dispose the ink.

[Note] Regarding to (3) and (4), please see detail on following "[v] Guideline for the "Ink Replacement Cycle" and applicable makeup" .



WARNING

Do not drain the ink or makeup waste solution into public sewer systems or elsewhere. Waste disposal must comply with all appropriate regulations. Have the used wiping papers and the empty container disposed by an industrial waste processor. Consult the appropriate regulatory agency for further information.

[ii]

Consideration of "Air purge" Install

Depend on usage environment, air purge is necessary. Below is the conditions under which air purge is required.(*1).

- (1) When the printer is used in a high-humidity environment, such as a beverage can or beer can line (Perform air purge when using it in the 85 % RH or higher humidity environment.)
- (2) When a water drainage blow sequence is performed before printing.
- (3) When you use the printer in an environment with a lot of paper powder or dust.
- (4) When the end of the print head becomes dirty because the distance between the print head and the target is too close and ink splashing occurs.
- (5) When you use the ink for which the need for air purge is described in the handling guidance of each ink.

[Note] Depending on the ink, "Air purge" is required regardless of the usage environment.
On the contrary, there is case installing is not available. Please see "Precautions for each ink".

(*1) UX2/UX/RX2 : [Technical Manual] 3.1 Print head air purge

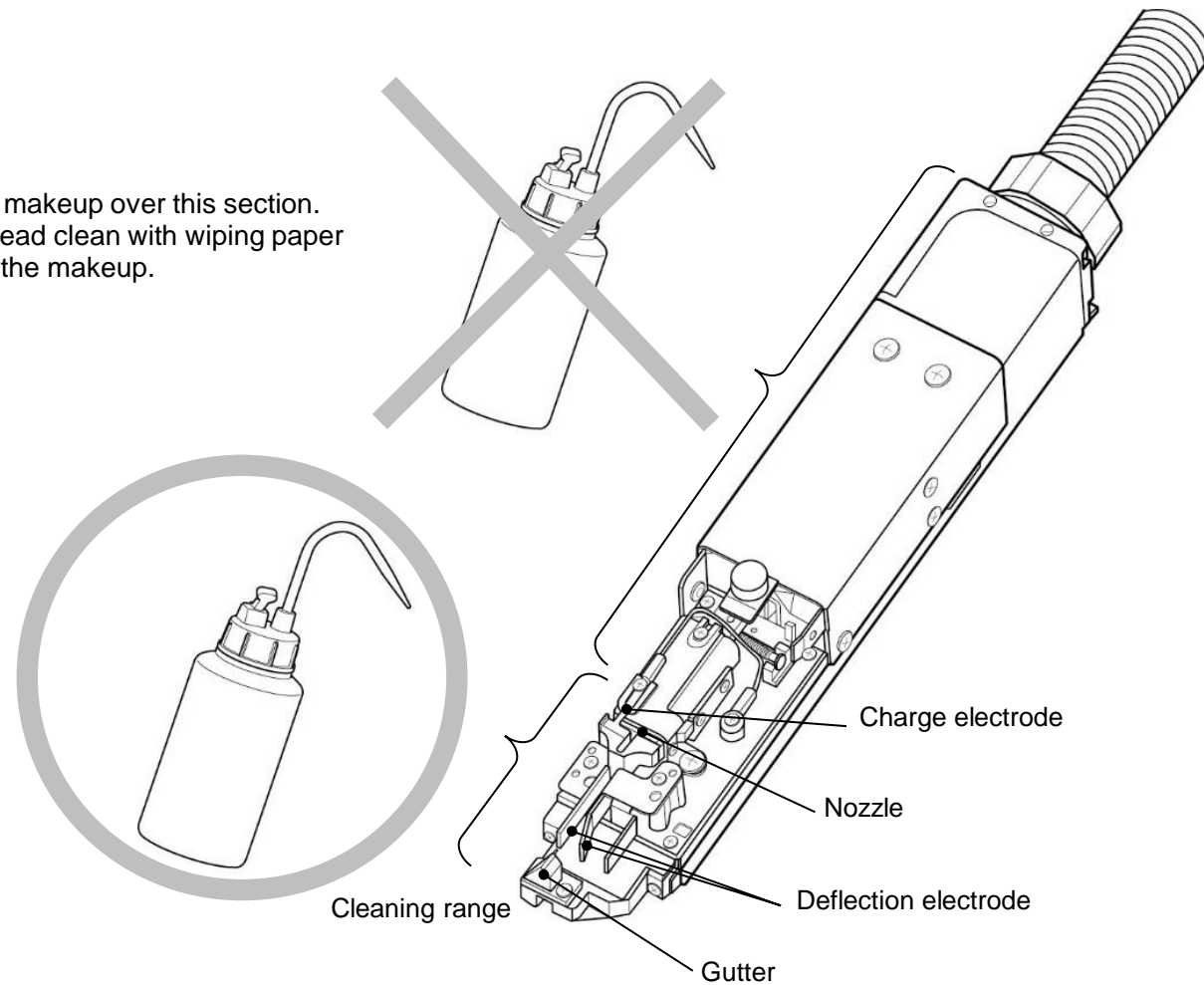
[iii]

Print Head Cleaning

Take the following precautions when cleaning ink from around the nozzle.

- (1) Face the end of the print head downward and pour makeup onto the dirty part and clean while catching the makeup in a beaker.

Do not pour the makeup over this section.
Wipe the print head clean with wiping paper dampened with the makeup.



*This figure is an image of UX2 series. There are some difference between UX2 and UX/RX2, but basic structure is same.

- (2) After cleaning, thoroughly wipe the print head with wiping paper and allow it to dry.
 - Thoroughly dry the nozzle orifice, charge electrode, deflection electrode, and mounting base and fringe of the gutter. Make sure that the parts are sufficiently dry before starting the next operation. If operated while wet, the printer will not start normally.
 - While the print head is wet, do not orient its end upward.
- (3) Do not immerse the print head in the makeup.
- (4) When printing is frequently performed or the distance between the print material and the print head is short, ink splashes may stain the end of the print head and the print head cover. If this condition is left unresolved, the staining will be worse, resulting in a print error or emergency stop. If a print error or emergency stop frequently occurs due to staining caused by ink splashes, stop the operation in progress and clean the end of the print head (around the nozzle, charge electrode, deflection electrode, mounting base and gutter) and the print head cover. Perform this operation in addition to the cleaning at the end of each day's work.

Air purging of the print head is effective against staining due to ink splashing. See the "Print head air purge(*1)".

(*1) UX2/UX/RX2 : [Technical Manual] 3.1 Print head air purge

[iv]

Gutter Cleaning

This unit collects ink from the gutter. At the same time, it sucks in atmospheric gas, dust, and other matter from the air. If these substances are mixed with the ink in the gutter, undissolved components in the ink or makeup may stick to the gutter. If the unit runs for a long time without the gutter being cleaned, these components will gradually accumulate in the gutter. This, together with the ink coming into contact with it, may cause an error stemming from a dirty head.

If this fault occurs, perform the following actions (1) and (2):

- (1) Clean the gutter and its perimeters with makeup periodically.
- (2) See the procedures described in the Technical Manual "Cleaning the Gutter(*1)" to clean the gutter and the ink recovery route.

If the above actions (1) and (2) do not solve the issue, contact your nearest distributor.

(*1) UX2 : [Technical manual] 5.6 Cleaning Gutter

UX/RX2: [Technical manual] 6.6 Cleaning the Gutter

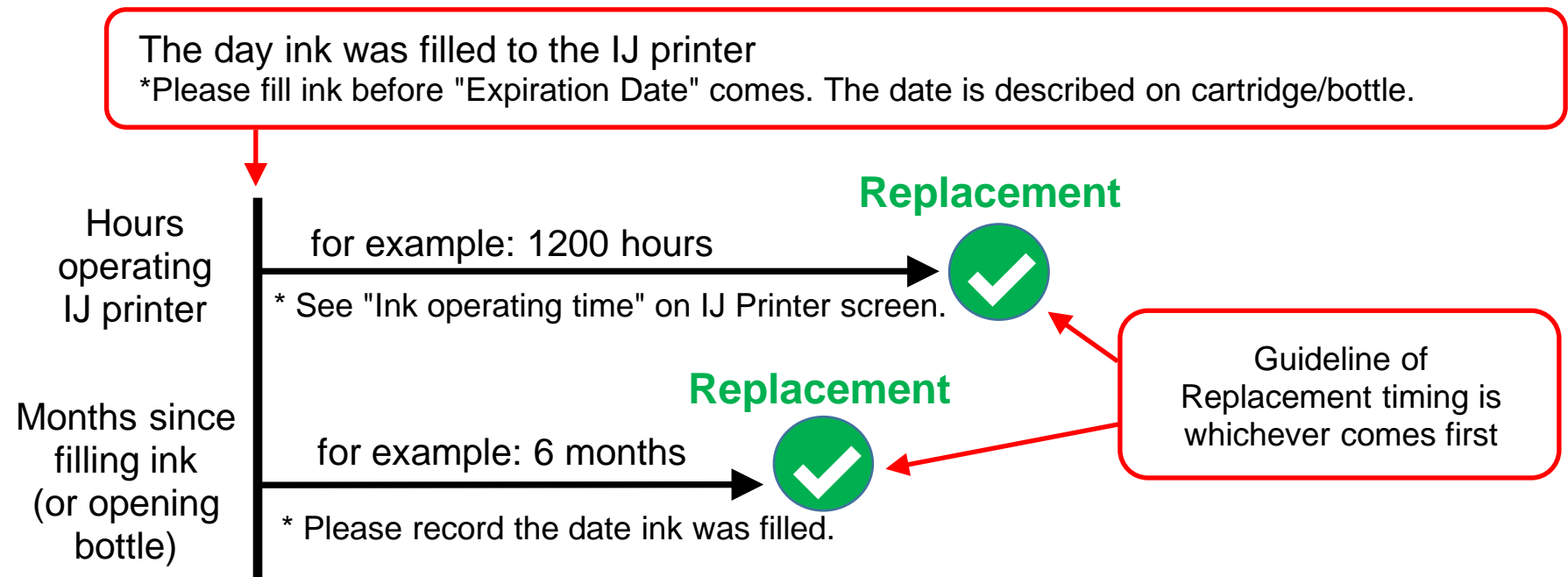
[v] Guideline for the "Ink Replacement Cycle"

While the IJ printer ink circulates for operations, it reacts with atmospheric air elements and deteriorates with time. Therefore, it needs periodic replacement. Each ink has several guideline for the ink replacement cycle. Also, since the proper replacement intervals vary with the printer operating environmental conditions (temperature, humidity, dust, etc.). Please determine the best replacement cycle in accordance with the obtained printing results, and replace all ink in the printer with new ink.

[Note] The makeup must be filled to the printer within one year after opening the cartridge.
 Note that basically the makeup filled to the printer needs no replacement.

(*1) UX2 : [Technical Manual] 5.3 Replacing the ink
 UX/RX2: [Technical Manual] 6.3 Replacing the ink

[Guideline for ink replacement timing]



[Remark] "Hours operating on IJ printer" and "Months since filling ink" are depend on Ink model. Please refer to the attached document for each ink.

[vi] Stoppable Period and Long-term Shutdown

If the IJ printer is not operated on regular basis, ink may stick in circulation system. If it sticks, error such as ink not ejecting and ink can not be recovered are occur. To prevent these issues, refer to "IJ printer Stoppable period (*1)", and operate IJ printer (eject ink from the nozzle) on a regular basis. The period that can be stopped depends on the storage temperature. Also, please note that the period may be shorter dramatically depending on the usage environment(*2).

In case of long period shut down more than the term shown in "Stoppable period and Long-term shutdown", to operate "Long-term shutdown" is necessary. This long-term shutdown prevents sticking by draining the ink in the IJ printer and filling makeup (solvent) instead. Dedicated operation is required even when restarting. Please refer to the [Technical Manual (* 3)] for details of the operation.

(*1) Maximum period possible to be continuously shut down without operation. it is necessary to operate it at least once during this period.

(*2) Please note that the ink may harden within a week if it is stored at 45 ° C or higher.

- (*3) UX2 : [Technical manual] 6.16 Long-term shutdown
- UX/RX2 : [Technical manual] 6.16 Long-term shutdown
- UX(Twin nozzle) : [Technical manual] 6.15 Long-term shutdown
- UX-P : [Technical manual] 6.15 Long-term shutdown
- RX2 : [Technical manual] 6.14 Long-term shutdown

#NAME?

 **CAUTION**

Since "Perform long-term shutdown storage work" requires special work, it is recommended to contact your local distributor and ask for the work.

[Remark] "Days printer can be stopped" depend on Ink model. Please refer to the attached document for each ink.

[vii]

Required Operating Minimum Hours to Prevent Ink Viscosity Decrease

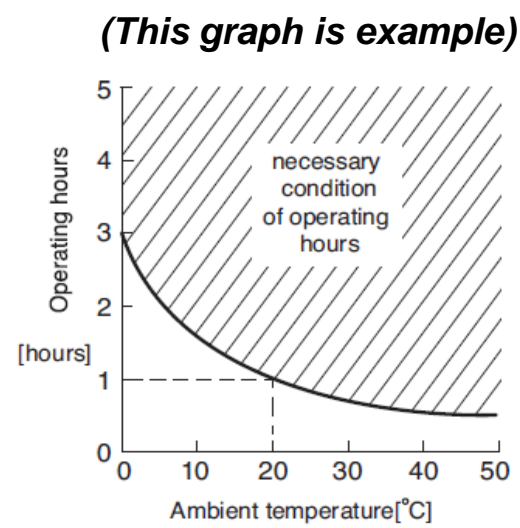
Following is precautions when repeating operation start and stop.

The IJ printer automatically cleans the circulation system with makeup (solvent) when stopped to prevent ink from sticking. At this time, the amount of solvent in the ink tank increases and the ink viscosity decreases. On the other hand, when the IJ printer is operated, the ink viscosity is automatically adjusted for stable operation. However, if the main tank is filled with a large amount of solvent by repeating "shutdown (automatic cleaning) in a short time", the ink viscosity may not be controlled normally. To prevent this, operate for a certain period of time (eject ink from nozzle) after starting operation. The required operating time depends on the ambient temperature and ink model.

[Note] For stable operation, limit the number of times "Shutdown" to be performed to two at a time.

[For example]

The table on the right showing the minimum required operating time is an example. In this case, if IJ printer is running under 20 °C ambient temperature, the required operating minimum hours is around 1 hour, after starting operation.



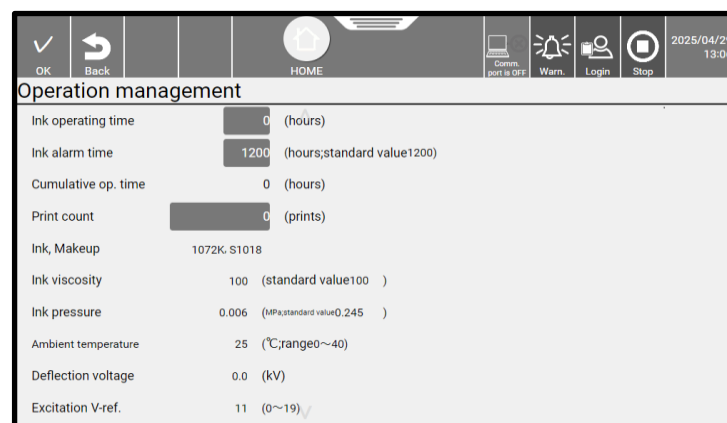
[Remark] "Required operating minimum hours" depend on Ink model. Please refer to the attached document for each ink.

Supplementary Information

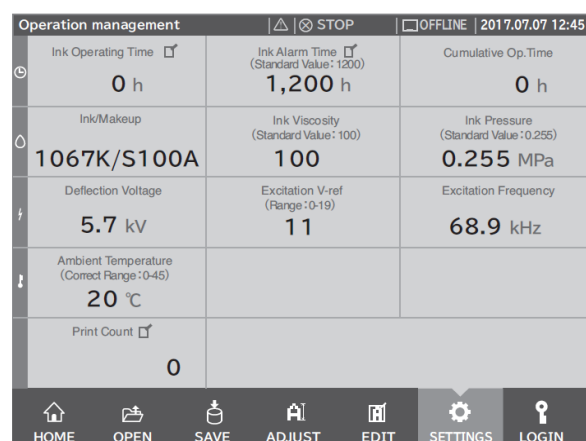
In case of using "Rotary encoder" in order to match production speed and printing speed, "Excitation frequency" information is necessary(*1). This value depends on ink model, nozzle size and setting. Please see "Operating management" screen, and confirm the value of excitation frequency. In addition, applicable makeup and other information are shown also on the screen.

(*1) UX2 [Technical Manual] 4.3.2 Speed Matching Function Using Rotary Encoder

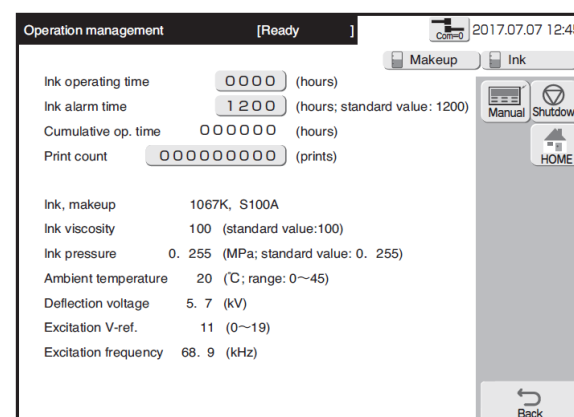
UX/RX2 [Technical Manual] 4.3.2-3 Method of calculating the conditions which allow product speed matching



UX2 style screen



UX/RX2 style screen



Classic style screen

Precautions (Basic precautions)

Note

For customer

Attachment for "Basic Precautions"

Detailed values for the following notes described in the main document depend on ink. Please refer to the contents described in the table of this document and use IJ printer and ink. Applicable makeup for each ink is described also.

- [v] Guideline for the "Ink replacement cycle"
- [vi] Stoppable period and Long-term shutdown
- [vii] Required operating minimum hours to prevent ink viscosity decrease

※ Depending on the ink, there may be special precautions. In this case, please see "Precaution for each ink" also.

Value of "Basic precautions [v], [vi] and [vii]" for each ink

1406W

Applicable Makeup	S1406	Base solvent	MEK
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[v]	Guideline for the "Ink replacement cycle"	
Guideline of replacement timing to new ink is the earlier of the following.		
	Hours operating on IJ printer	Months since filling ink (or opening bottle)
	400 - 600 hours	3 months

[vi]	Stoppable period and Long-term shutdown			
Guidelines for stoppable period (Days printer can be stopped)				
	Storage temperature	0-35°C	35-40°C	40-45°C
	Days printer can be stopped	10 days	7 days	5 days

[vii]	Required operating minimum hours to prevent ink viscosity decrease	
Please operate IJ printer for at least following hours per start-up of IJ printer.		
	For single nozzle	For Twin nozzle ((UX-D860J/W))
Estimated operating hours		

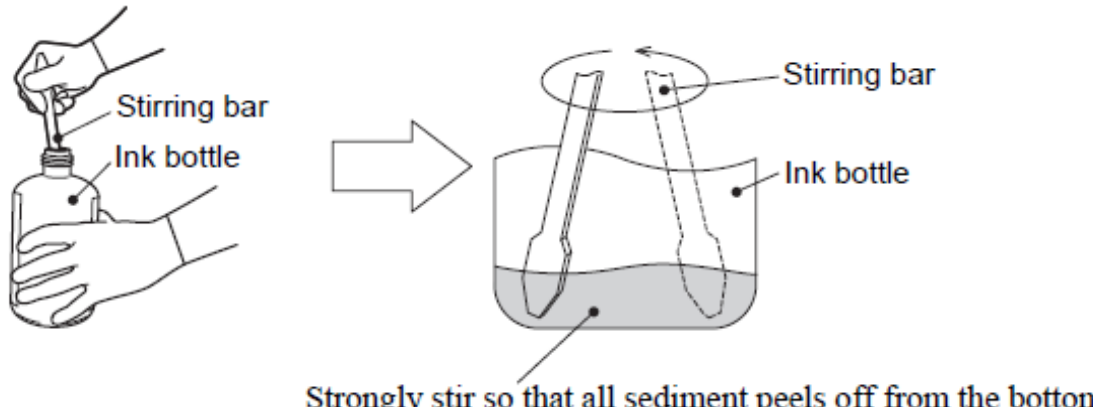
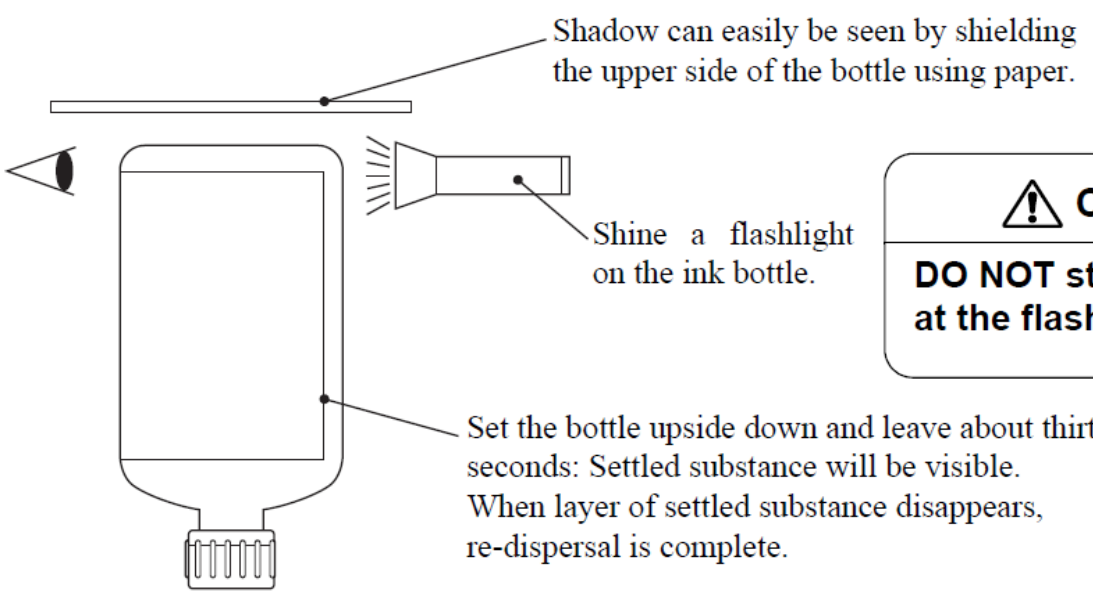
For customer

Precautions for each ink

Following items are precautions for each ink. In order to prevent errors, please be sure to check following matters before installing. In addition, please see "Basic Precautions" also.

Precaution Number	Precautions for ink <u>1406W</u>
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A01	Installing air purge is required	
Detail	It is required using air purge to the print head regardless of the humidity of the usage environment. If air purge was not installed, IJP may stop abnormally cause by charging error due to electrode dirt in the print head, ink sticking in the circulation system, and other. In addition, there is a case IJP need to be repaired. Be sure to install the air purge.	
Remark	Depend on the usage environment, even if air purge was installed, ink deposition is appears. Therefore, please open print head cover every 24 hours, and check if there is ink deposition around electrodes, then please clean them as necessary. Reference: UX2 : [Basic Operation Manual] 3.3 Print head cleaning : UX/RX2: [Basic Operation Manual] 2.3 Print head cleaning	
Manual	UX2 : [Technical Manual]	3.1 Print head air purge
	UX/RX2 : [Technical Manual]	3.1 Print head air purge

B03	Stirring before using ink <for white inks>	
Detail	<p>This ink contains oxidized titanium(inorganic pigment) as color material. Oxidized titanium settle on cartridge/bottle very easy due to high specific gravity. Please refer to following procedure and stir ink enough. If stirring is not enough, color density would be light.</p> <p>(1) Before using ink (filling, replenishment, or replacing ink), use the stirring bar attached to the IJ printer (pigment machine) to disperse the titanium oxide that has settled on the bottom of the cartridge / bottle.</p> <p style="margin-left: 20px;">-Settled pigment can be dispersed by peeling it off the bottom of the bottle.</p> <p style="margin-left: 20px;">-During stirring, ink may splash from cartridge/bottle. Be sure to wear protective glove, protective goggles, protective cloth, etc.</p> <div style="text-align: center; margin: 10px 0;">  </div> <p>(2) It takes about 5-10 minutes to re-disperse the settlings. To check the re-dispersion of the precipitate, illuminate the cartridge/bottle and look at the shadow by the settlings from the opposite direction. After settled substance disappears, replenish ink.</p> <div style="text-align: center; margin: 10px 0;">  </div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p style="text-align: center;">⚠ Caution</p> <p style="text-align: center;">DO NOT stare directly at the flashlight.</p> </div>	

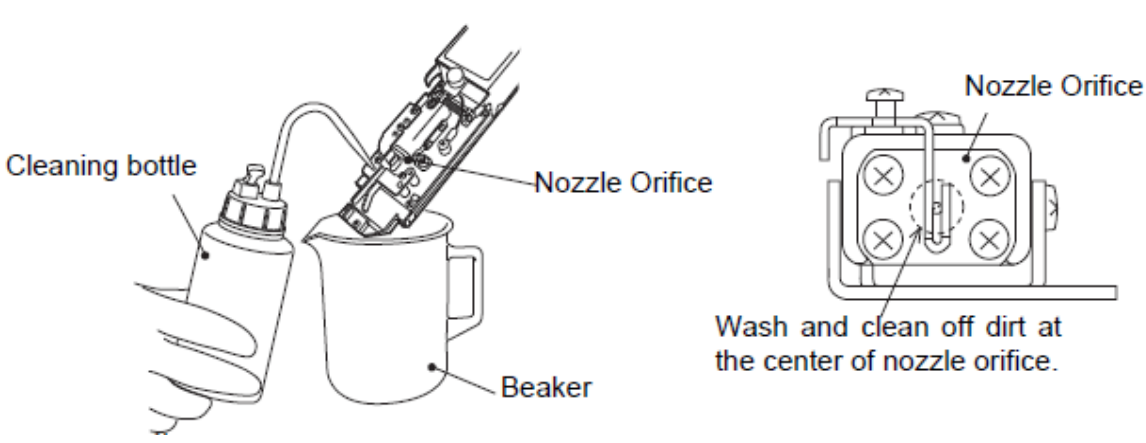
B05	Strict observance to ink replacement cycle	
	Detail	If certain amount of water is mixed into ink, circulation system may clog due to generated aggregates. To prevent this issue, referring guideline for ink replacement term, and please replace ink in this period.

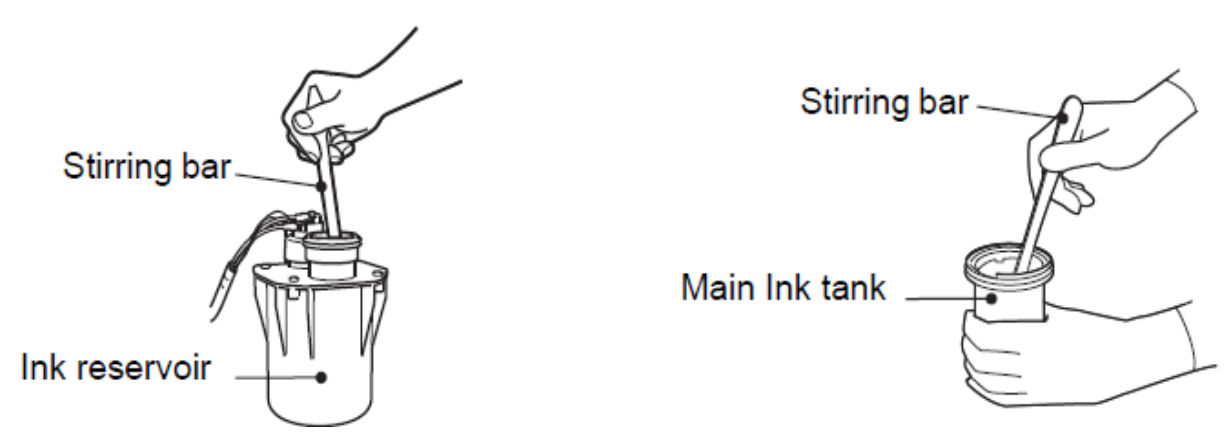
B07	Print condition confirmation on the downstream process <for white inks>	
	Detail	White ink is tendency the excess and shorts of dot configuration may occur (e.g. lack of dot). Please set up print condition confirmation process on the downstream process.

D01	Cleaning of print head (per 24 hours)	
	Detail	The inside of the print head tends to get dirty with ink. To prevent the missing dots which are caused by the ink stains, open the head cover every 24 hours and check it the deflection electrodes and the gutter are clean. If they are stained, stop IJ printer and clean the deflection electrodes and the gutter.
	Manual	UX2 : [Basic Operation Manual] 3.3 Print head cleaning. UX/RX2 : [Basic Operation Manual] 2.3 Print head cleaning.

D06	Regularly print head cleaning in case of printing frequency is high <for pigment inks>	
	Detail	<p>Compare with dye ink, it tends to get ink deposits on the gutter. Ink deposits on gutter may lead to problems of stoppage and printing errors. Especially, It may occur when printing frequency is high. In order to do stable operation, please check deposits around gutters and print-head regularly, then clean them if there are deposited.</p> <p>[Note] The following message is displayed when a certain number of prints are made. The display timing differs depending on the print characters, print settings, and print frequency. If this message is displayed, please check the gutter and electrodes, and if they are dirty, clean them immediately. *Please contact service station for details of software specifications.</p> <div data-bbox="758 1436 1575 1780" data-label="Image"> </div>
	Manual	UX2 : [Basic Operation Manual] 3.3 Print head cleaning. UX/RX2 : [Basic Operation Manual] 2.3 Print head cleaning.

D07	Nozzle cleaning method <for yellow inks and white inks>		
	Detail	If ink dries and sticks to the nozzle or gutter and cannot be repaired by cleaning with makeup, please clean them with following method. (1) Remove orifice nozzle or gutter, and soak them in about 0.5% household dish detergent. (2) Clean them with ultrasonic washer for approximately 10 minutes.	
Manual	UX2 : [Technical manual]	5.4.2. Disassembly and Cleaning of Nozzle Orifice	
	UX/RX2 : [Technical manual]	6.4.2 Nozzle orifice disassembly and cleaning	
	UX-P : [Technical manual]	6.3.2 Nozzle orifice disassembly and cleaning	

D09	Nozzle cleaning before start operation <for white inks>		
	Detail	The nozzle orifice tends to get dirty with ink. Before start operation, please clean nozzle orifice with pouring makeup.	
			
Manual	UX-P/H : [Basic Operation Manual]	7.1.1 Start operation	

D10	Ink stirring after 1 week stopping and automatic stirring function <for white and yellow inks>		
	Target inks and machine models	Ink	Note
		White inks	-
Yellow inks	In case of using yellow inks with "Pigment machine" or "UX-H(48μm)"		
Detail	<p>Pigment as color material may accumulate on the bottom of ink tanks due to that of high heavy specific gravity. If stoppage period exceeds one week(168 hours), stirrer for ink stirring may not rotate. Before starting IJ printer, please stir ink inside of ink reservoir and main ink tank with using stirring bar.</p>  <p>IJ printer for this ink has the function "Automatic stirring" while stopping. This function circulates part of circulation system paths and rotates the stirrer once every 24 hours during IJ printer stopping. To use this function, power must be supplied even while IJ printer stopping.</p> <p>[Note] This function does not do circulation for all circulation system paths. Please refer to "Note for long-term shutdown" and operate IJ printer regularly.</p>		
Manual	UX-P/H : [Technical Manual]	6.16 Automatic stirring during shutdown	

D13	Pigment accumulation in the print head cable <for white and yellow inks>		
	Detail	Pigment as color material may accumulate in print head cable due to that of high heavy specific gravity. To prevent that accumulation of pigment, please perform "Ink circulation" once every month. ※Perform "Ink circulation" to end without interruption. Printing is not available while "Ink circulation" is being performed.	
Manual	UX2 : [Technical Manual]	5.1. Operation and details on circulation	
	UX/RX2 : [Technical Manual]	6.1 Circulation control screen operation and contents	