Confidential

Limitations and recommendations to use for Truepress Jet520HD V1-2 (with SCink)

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SCREEN Graphic Solutions Co., Ltd.

There are limitations and recommendations described in this document to use SC ink for Truepress Jet520HD.

■ Limitations and recommendations

1. For printing with SC ink, please refer to P3“1. Print Condition Setting”.

2. Limitation of when printing offset coated paper using SC ink
   1) It can be used in high density range for paper weight of 120 gsm or more.
   2) It is recommended to operate with 90 gsm to 120 gsm weight paper with density and ink amount considering cockling.
   3) Sheets with paper weight of 90 gsm or less are markedly wavy and difficult to use
   Please refer to “SC ink Media Samples explanation sheet_add 600x600 150mpm .pdf”.

3. When the job which dry by 120 degree C is used to book and book binding.
   Please note, when the job which dry by 120 degree C is used to book and book binding.
   - After rewind the paper on the rewinder, and after cut the paper to make the book block, please leave the book blocks about 1 day. After that, please cut edge of block with the cover together.
   Please refer to P13“11. When the job which dry by 120 degree C is used to book and book binding.”.

4. The Line flushing setting should choose “CS”, when printing in 1200x1200 dpi,.
   Please refer to P7“2. Flushing recommendation”.

5. The Star flushing is not able to use, when printing in 1200x1200 dpi,
   Please refer to P8“2. Flushing recommendation”.

6. Page length should set up to 26 inches, when printing in 1200x1200 dpi.
   Please refer to P7“2. Flushing recommendation”.

7. When DRY temperature setting is 120 ° C, paper width of 343 mm or more should be used.
   Please refer to P10“4. Limitation from the paper width”.

8. Blocking (transcription) may occur in general coated paper, IJ coated paper and the like.
   Blocking may occur in both the winding core and the winding, so please check the print evaluation beforehand with your winding device, base material (paper type / thickness).
   For blocking occurring outside the roll, it may be possible to avoid blocking by winding cushioning material 2-3 turns, using a dolly, etc.

Please refer to P11“8. Handling of printed roll paper”.

9. When leaving the machine powered on for more than 6 hours, please turn off the power or execute the printhead cleaning before printing.
Please refer to P13“9. Attention when leaving the machine powered on”.

10. At 1200x1200dpi printing, rattling issue occurs on the first 5 pages, so you need to insert the flushing pages.
Please refer to P13“10. Quality at the start of printing”.

11. At 600x600dpi printing, DRY temperature should set 100℃ or lower.
Please refer to P10“4. Limitation from the paper width”.

12. When connecting paper with tape, please paste it in the vertical direction and the horizontal direction.
When feeding the paper by slow speed and temperature of the heat roller is high (more than 110 degree Celsius), the tape on the paper may peel off by the hot temperature.

Following notices are common both MD ink and SC ink.

13. In use of a heavy weight paper, please use 2 nip rollers at the printer exit.
Please refer to P3“1. Print Condition Setting”.

14. In use of light weight paper, the nip rollers at the printer exit may cause paper wrinkles. Please move the position of nip roller or release one of 2 nip rollers to reduce the wrinkles.
Please refer to P3“1. Print Condition Setting”.

15. The highest print speed is limited depending on the paper width and the heat roller temperature setting.
Please refer to P10“4. Limitation from the paper width”.

16. The printhead alignment adjustment should be performed after 60 minutes idling time or longer. (Ex. First in the morning, after lunch break) Do not make an alignment soon after a long run.
Please refer to P11“5. Caution for the printhead alignment”.

17. The printhead uniformity needs to execute every print speed.
When changing the print speed, re-execute the printhead uniformity.

18. The low humidity condition may cause nozzle clogging and droplet deviations.
Please refer to P11“7. Operation environment (Temperature / Humidity)”.

■ Details of Limitations and recommendations

1. Print Condition Setting
   SC ink can be printed at 600x600dpi@120mpm and 1200x1200dpi@50mpm.
   Print resolutions for paper types are shown below.

	1200x1200dpi 50mpm	1200x600dpi 75mpm	600x600dpi 120mpm（High speed）	600x600dpi 150mpm（High speed 2）
Offset Gross	○	—※		
Offset Matte	○	—※		
IJ coated	○	○		
IJ treated	○	○	○	○
Wood free	○	○	○	○

When printing on coated paper or IJ coated paper, depending on paper characteristics and density, drying may become poor, which may contaminate rollers etc inside the equipment. Also, if you use thick paper and do not dry thoroughly, you need to take measures such as increasing the resolution (lowering the printing speed) and increasing the drying temperature. Please use it after sufficient preliminary testing.

※About 1200 x 600 dpi / 75 mpm operation

Operation at 1200 x 600 dpi / 75 mpm, in our showroom in advance,
Please test preliminary check with the actual paper which is expected to be used, check on the effect.

Set the printer tension, UW/RW tension and the dryer temperature in accordance with paper type, paper width and paper weight.

Tension setting for the printer

Paper Width（mm）	Paper Weight (gsm)			
	40 – 63	64 - 80	81 – 158	159 - 250
330 - 520	3	6	8	10
165 - 330	3	5	6	8

(Note) For a perforated paper, lower the tension “1” than the tension value in the table above.

For a coated paper, higher the tension than the tension value in the table above.

In case of using 150mpm, the tension setting for the printer is up to 8.

Tension setting for Hunkeler UW/RW

Paper Width（mm）	Paper Weight (gsm)	
	40 - 128	128 - 250
330 - 520	50%	100%
165 - 330	30%	80%

(Note) For a perforated paper, lower the tension 10% - 20% than the tension setting in the table above.

（Nots）Blocking may occur if the winding machine's tension is too high.

Please check the recommended tension of the winding machine.

Dryer temperature setting　(HR temp./Air temp.)

In case of using 600x600dpi@120mpm

Paper Type	Paper Weight (gsm)			
	40 – 63	64 - 80	81 - 158	159 - 250
Wood free paper IJ uncoated paper	80°C /OFF	80°C /OFF	90°C /OFF	100°C /100°C

In case of using 600x600dpi@150mpm

Paper Type	Paper Weight (gsm)			
	40 – 63	64 - 80	81 - 158	159 - 250
Wood free paper IJ uncoated paper	Out of spec	80°C /OFF	90°C /OFF	Out of spec

In case of using 1200x1200dpi@50mpm

Paper Type	Paper Weight (gsm)			
	40 – 63	64 - 80	81 - 158	159 - 250
Wood free paper IJ uncoated paper	80°C /OFF	80°C /OFF	90°C /OFF	100°C /100°C
IJ coated paper Coated papper	90°C /90°C	100°C /100°C	120°C /100°C	120°C /100°C

<Notes on use of IJ coated paper and coated paper>

In case of using IJ coated paper and coated paper, insufficient drying causes the contamination of the rollers inside the machine.

Heavy paper may require reducing ink amount, selecting lower print speed and selecting higher dryer temperature.

Please use it after checking on print tests in advance.

<Notes on use of heavy/light weight papers>

Truepress Jet520HD supports 40-250gsm paper weights in the specification.

A heavy paper (160-250gsm) and a light paper (40-64gsm) need to be careful with the following points more than a standard paper (64-160gsm). Please, use it after checking on print test in advance.

- In use of a heavy weight paper
  - Use 2 nip rollers at the printer exit.
  - Use inching to thread the paper in the dancer of UW/RW after changing paper rolls.
    (Note on Hunkeler : You cannot feed the paper in Ready state.)
  - [If the tension error occurs at the printer entrance due to rough paper moving, increase the tension value at the unwinder.]??
  - The paper type or the page design may require reducing ink amount and selecting lower print speed due to insufficient drying.

- In use of light weight paper
  - The nip rollers at the printer exit may cause paper wrinkles. Move the position of nip roller or release one of 2 nip roller to reduce the wrinkles.
  - Use the pressure roller of RW to reduce uneven winding due to low tension setting.
  - Wet flushing line may cause paper tearing. Please be careful when a low dryer temperature setting.

<Notes on use of the paper with “corner cuts”>

DNS (Dynamic Nozzle Shift to cancel web wandering) does not work correctly if the paper is with “corner cuts”. Please, disable DNS in this case.

2. Flushing recommendation

2-1. Line flushing

The line flushing needs to satisfy nozzle clogging prevention performance and also the drying of the flushing line itself. (The drying of the flushing line varies by its width.)

The setting recommendations are listed in the table below for your reference.

(Note) The line flushing conditions are valid under the recommended operation environment.

Print condition	Page length	Flushing setting	Line width
Resolution: 600x600dpi@120mpm Paper: Next-IJ 81.4gsm Dryer setting: HR 80℃/Air OFF	Under 12inch	Line2-2-C0/Std	0.4mm
	12-26inch	Line8-10-C0/Std	1.7mm
	26-54inch	Line32+Star-34-C0/Std	5.8mm
Resolution: 600x600dpi@150mpm Paper: Next-IJ 81.4gsm Dryer setting: HR 80℃/Air OFF	Under 12inch	Line2-2-C0/Std	0.4mm
	12-17inch	Line4-4-C0/Std	0.8mm
	17-26inch	Line8-10-C0/Std	1.7mm
	26-54inch	Line32+Star-34-C0/Std	5.8mm
Resolution: 1200x1200dpi@50mpm Paper: OKT+ 127.9gsm Dryer setting: HR120℃/Air 100℃	Under 12inch	Line8-10-C0/CS	1.7mm
	12-26inch	Line32+Star-34-C0/CS	5.7mm
	26-54inch	Not recommended	
Resolution: 1200x600dpi@75mpm Paper: SWORD Gloss 127.9gsm Dryer setting: HR100℃/Air 100℃	Under 12inch	Line4-5-C0/CS	1.7mm
	12-26inch	Line8+Star-9-C0/CS	2.9mm
	26-54inch	Line16+Star-17-C0/CS	5.9mm

(*) The star flushing of “Line32+Star-34-C0/Std(600x600dpi@120mpm/150mpm)” is Star1.
The star flushing of “Line32+Star-34-C0/CS(1200x1200dpi@50mpm)” is Star4.
The star flushing of “Line8+Star-9-C0/CS(1200x600dpi@75mpm)” is Star2.
The star flushing of “Line16+Star-17-C0/CS(1200x600dpi@750mpm)” is Star2.

2-2. Star flushing

Resolution	Speed	Star flushing
600x600dpi High speed	120mpm	Star4
	100mpm	Star8
	75mpm	Star8
600x600dpi High speed	150mpm	Star4
	120mpm	Not recommended
	100mpm	Not recommended
	75mpm	Not recommended
1200x1200dpi	50mpm	Not recommended
1200x600dpi	75mpm	Star8
	50mpm	Not recommended
	30mpm	Not recommended

(Note) The star flushing is more likely to be affected by the usage environment of the customer. Please, use it after the print test in advance.
Depending on the star flushing setting, the quality of barcodes may be degraded and incorrect decoding may occur on the inspection unit (JI-500II). If this occurs, reduce the star flushing setting.

3. Example of print condition

The print condition for the reference paper is recommended below.

Paper	Resolution Print speed	Dryer Temperature Roller / Air	Flushing	
			Line (up to 12 inch page length)	Star
Next-IJ 81.4gsm	600×600dpi 120mpm High Speed	80°C / OFF	Line2-2-C0/std	Star4
Next-IJ 81.4gsm	600×600dpi 150mpm High Speed 2	80°C / OFF	Line2-2-C0/std	Star4
SWORD-Gloss 127.9gsm	1200×1200dpi 50mpm	120°C / 100°C	Line8-10-C0/CS	Not recommended
OKT+ 127.9gsm	1200×1200dpi 50mpm	120°C / 100°C	Line8-10-C0/CS	Not recommended

(Note 1) 600x600dpi printing on Sword-Gloss and OKT+127.9gsm are not recommended due to insufficient drying. Use 1200x1200dpi in this case.

(Note 2) The flushing condition is valid under the recommended operation environment.

4. Limitation from the paper width

The highest print speed is limited depending on the paper width and the heat roller temperature setting. The highest speed is shown below.

(Note) In yellow cell, the print speed is limited.

【Air dryer - off】

Paper thickness under t0.1		
HR[°C]	80	100
Width[mm]	Speed[mpm]	
165 - 249	120	30
250 - 342	150	50
343 - 405	150	75
406 - 456	150	150
457 - 520	150	150
Paper thickness under t0.18		
HR[°C]	80	100
Width[mm]	Speed [mpm]	
165 - 249	75	
250 - 342	120	30
343 - 405	150	50
406 - 456	150	120
457 - 520	150	120
Paper thickness under t0.25		
HR[°C]	80	100
Width[mm]	Speed [mpm]	
165 - 249	50	
250 - 342	75	15
343 - 405	100	30
406 - 456	120	75
457 - 520	120	75

【 Air dryer – on (100°C)】

Paper thickness under t0.1			
HR[°C]	80	100	120
Width[mm]	Speed [mpm]		
165 - 249	150	100	
250 - 342	150	100	
343 - 405	150	150	75
406 - 456	150	150	75
457 - 520	150	150	75
Paper thickness under t0.18			
HR[°C]	80	100	120
Width[mm]	Speed [mpm]		
165 - 249	120	75	
250 - 342	150	75	
343 - 405	150	120	40
406 - 456	150	150	50
457 - 520	150	150	75
Paper thickness under t0.25			
HR[°C]	80	100	100
Width[mm]	Speed [mpm]		
165 - 249	120	50	
250 - 342	120	50	
343 - 405	120	75	40
406 - 456	120	120	50
457 - 520	120	120	75

(Note 1) Yellow area in the above table, this print condition should reduce print speed.

(Note 2) Gray out area in the above table, this print condition does not support in SC ink.

(Note 3) When Air dryer setting is off or at 600x600dpi printing, please set HR temperature to 100℃ or lower.

(Note 4) When HR temperature setting is 120 ° C and paper which thickness is 0.1 mm or more is used, paper width of 343 mm or less cannot be used.

5. Caution for the printhead alignment

To prevent a mis-registration, please be aware of the following cautions when you take a printhead alignment, and even when you change the paper type.

・The alignment must be performed after 60 minutes idling time or longer. (Ex. First in the morning, after lunch break) Do not make an alignment soon after a long run.

・Keep a paper roll in the operation room in advance, to fit it into a room temperature.

・Do not use a first 100m of a brand new roll.

(Note) If you see a mis-registration after the printhead alignment, perform the printhead alignment once again.

6. Caution for the printhead uniformity

The printhead uniformity needs to execute every print speed.

When changing the print speed, re-execute the printhead uniformity.

7. Operation environment (Temperature / Humidity)

To maintain good print quality, keep the operation environment as shown below.

The low humidity condition may cause nozzle clogging and droplet deviations.

Temperature: 18 to 24°C (64 to 75°F) <No radical temperature fluctuations>

Humidity: 40 to 60% (50 to 60% is recommended) <No condensation>

8. Handling of printed roll paper

Blocking (transcription) may occur in general coated paper, IJ coated paper and the like.

Although the cause of blocking is mainly dry condition, it may occur in both winding core and outside winding,

Please check the print evaluation beforehand with your winding device, paper (type / thickness).

[Wound core side]

Blocking may occur if the winding machine's tension is too high.

Please check the recommended tension of the winding machine.

Please check the blocking by the following procedure.

1) Set a new winding core on the take-up device,
   Please print 300m of Job with a large amount of ink.
   For the printing conditions, please refer to the following documents.
   Table for paper evaluation result tested by TP-J520HD using SC ink (Ver.1.0)
2) After printing, please check the blocking near the winding core.
3) If you are blocking NG, please try the following two.
   · Reduce the ink amount (density / AIA).
   · Decrease printing speed

[Outboard motor]

Blocking (including rubbing) may occur on the outer part when storing and moving the printed roll after printing is finished. Risk of occurrence

· The heavier the roll weight

· The greater the number of times of sliding in the turning direction

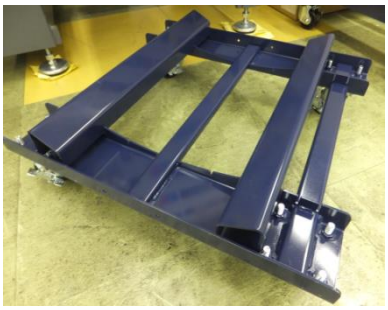
· Long storage time (rubbing occurs when the ground contact surface is raised)

It will be higher. Also, the risk of occurrence also changes greatly depending on the roll direction (good in the forward direction) during roll movement.

Please check the blocking by the following procedure.

1) Set a new or printed large diameter roll on the take-up device, and attach it to the base material actually used,
   Please print 300m of Job with a large amount of ink.
   For the printing conditions, refer to the following documents.
   Table for paper evaluation result tested by TP-J520HD using SC ink (Ver.1.0)
   Large diameter rolls should be used with the expected length (weight).
2) After printing, remove from the take-up device, move and store, move to the next process,
   Please check the blocking on the outside (ground plane / direction change).
   MEMO : When the storage time becomes long, bulging occurs near the ground surface, and if rolling in that state,
   Because ink transfer due to rubbing may occur, please move after the storage time usually elapse.
3) If you are blocking NG, please try the following three.
   · Cover paper around the roll by NG.
   · After completion of printing, cushion material (high-foam polyethylene sheet or bubble wrap) is wrapped around 2-3 turns on a take-up device.
   Example) HIGHLY FOAMED POLYETHYLENE SHEET (t 3 mm)
   Example) plastic packing material with air bubbles (D 10 mm / h 3.5 mm)

· Use a dolly.
Depending on the equipment of the winding device / next process and the diameter of the printed roll (weight).

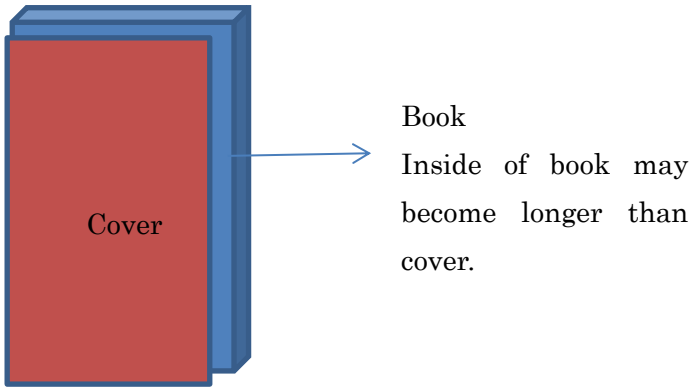


9. Attention when leaving the machine powered on
When leaving the machine powered on for more than 6 hours, please turn off the power or execute the printhead cleaning before printing.

10. Quality at the start of printing
At 1200x1200dpi printing, rattling issue occurs on the first 5 pages, so you need to insert the flushing pages.

11. Quality at the start of printing
Please note, when the job which dry by 120 degree C is used to book and book binding.
- After rewind the paper on the rewinder, and after cut the paper to make the book block, please leave the book blocks about 1 day. After that, please cut edge of block with the cover together.

When the paper dry by 120 degree C, the paper shrink by this hot temperature. After 1 day, the paper back to original length. If the edge of book with the cover together before the paper back to original length, the inside of book may become longer than the cover about 1mm.



12. Inspection specifications

The optical resolution for the paper feeding direction of the inspection unit (JI-500II) is shown below.

Print resolution	1200x1200dpi、1200x600dpi	600x600dpi(High speed mode)	600x600dpi(High speed2 mode)
Optical resolution	100um	135um	168um

The specification for barcode is shown below.

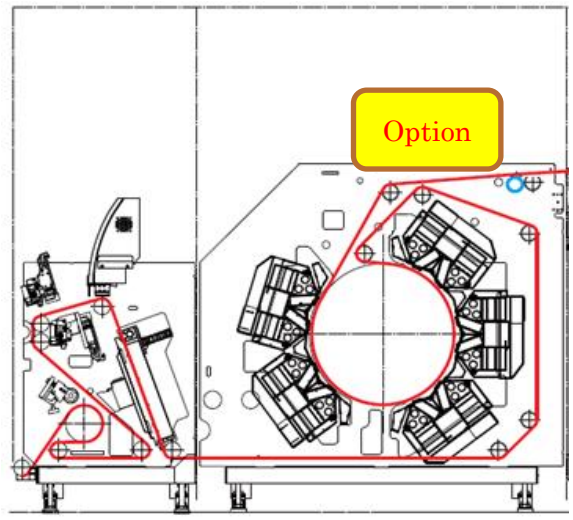
Print resolution		1200x1200dpi、1200x600dpi	600x600dpi(High speed mode)	600x600dpi(High speed2 mode)
OCR		12point or more	12point or more	14point or more
1D code				
NW7	Picket	0.21mm or more	0.21mm or more	0.21mm or more
	Ladder	0.3mm or more	0.3mm or more	0.38mm or more
Code39	Picket	0.21mm or more	0.21mm or more	0.21mm or more
	Ladder	0.3mm or more	0.3mm or more	0.38mm or more
Code128	Picket	0.17mm or more	0.17mm or more	0.17mm or more
	Ladder	0.3mm or more	0.34mm or more	0.42mm or more
2D code				
QR		0.3mm or more	0.42mm or more	0.52mm or more
DataMatrix		0.3mm or more	0.34mm or more	0.42mm or more
PDF417	Picket	0.21mm or more	0.21mm or more	0.26mm or more
	Ladder	0.34mm or more	0.34mm or more	0.42mm or more

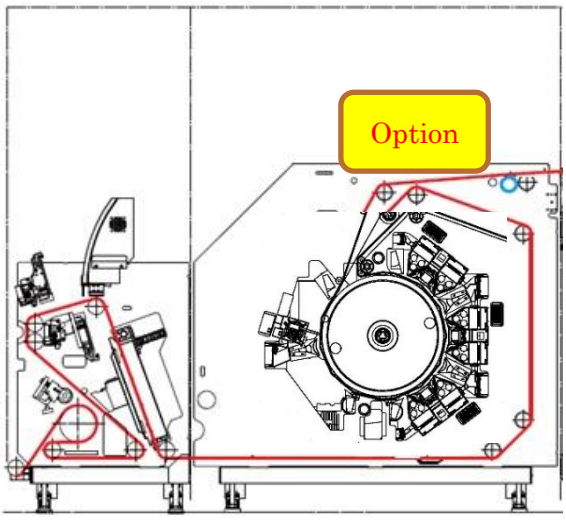
【Appendix】

For this NIR dryer option, it is necessary to set output value of 4 kW to 24 kW according to paper type, paper weight and speed. This option is used with the heat roller and hot air drying.

By using the heat roller 100° C (existing heat roller is 120° C) and hot air dryer 140° C (existing air dryer is 100° C), it is possible to improve productivity and cockling reduction by using optimized output value.

Please see the different settings for Existing Printer with this option and New Printer (new drying system) with this option.





Existing drying system setting
Heat roller 120° C
Hot air dryer 100° C

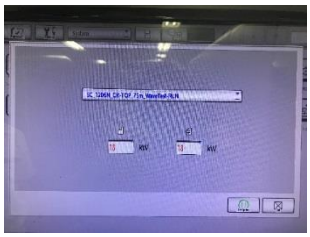
-> New drying system setting
-> Heat roller 100° C
-> Hot air dryer 140° C

[Output power adjustment procedure for this option]

① Printing condition Setting:
Printing conditions are created for each printing speed. (1200 x 1200 or 1200 x 600)
Evaluate paper have to be stored at a same environment where the printing machine is installed.

② Output of test chart
Input the recommended output power which is similar setting from the evaluated paper list (described later) and print the test chart from the GUI.
Note: Even with the same paper name and same weight, the output power is depending on the paper environment, so it is necessary to check output power test at the user environment.

Option icon



Test Chart Print GUI

(Test chart) ←Print direction

Both S /Both M / Both L / grids / Front S / Back S / Front M / Back M / Front L / Back L

③ Check test chart

Check the following three points on the test chart.

A) Blister and Paper Burns

B) Paper Roughness

C) Check black density on front side and back side.

A) Blister and Paper Burns

Does Test chart have no blister and no paper burns?

Blister Blister Paper Burns Paper Burns

Point:

· Blister is occur in a small printed area and/or duplex printing of glossy paper.

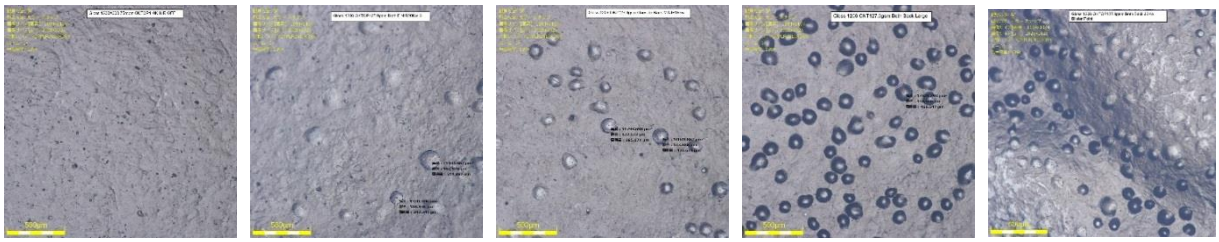
· Paper burns is occur in a small printed backside area and/or simplex printing of matte paper.

Corrective action: Down the output power.

B) Paper Roughness (Loupe with 25 magnifications or more)

Is there a rough surface on the test chart?

Gloss paper (OKTOP coat 127.9gsm 1200 X 600) ※ Image magnification 140 times



Option OFF Small Roughness Medium Roughness Large Roughness Blister

Point:

· The ink is boiled by drying of over output and the paper surface becomes rough.

· Gross is easier to make roughness than matte.

· The back side of the duplex printing area is easier to make roughness than front side.

· When the roughness occurs, the density is down.

Corrective action: Down the output power.

C) Check of front and back density difference (Density meter)

Is the density difference between front and back side of duplex printing area of the test chart less than 0.1?

Point:

· Over output power makes density down sharply at some point.

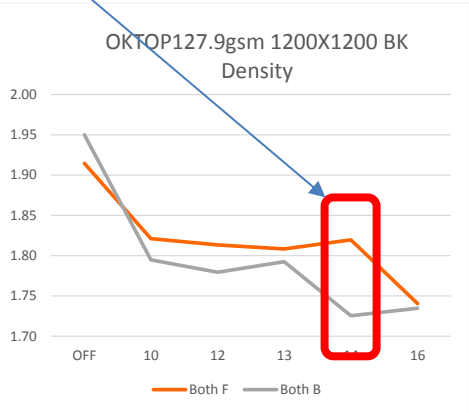
· Large roughness on the paper makes density down sharply.

· Gross coated paper is easier to occur density difference than matte coated paper.

Corrective action: Down the output power.

OKTOP 110K 1200X1200 (Gloss coated paper)

NIR Power	Printing Side	Both side Density	Both side Roughness	One side Density	One side Roughness	Burn	Blister
OFF	Front	1.91	OK	1.89	OK	OK	OK
	Back	1.95	OK	1.93	OK	OK	
10	Front	1.82	OK	1.86	OK	OK	OK
	Back	1.79	OK	1.84	OK	OK	
12	Front	1.81	OK	1.83	OK	OK	OK
	Back	1.78	OK	1.79	OK	OK	
13	Front	1.81	OK	1.83	OK	OK	OK
	Back	1.79	OK	1.82	OK	OK	
14	Front	1.82	OK	1.80	OK	OK	NG
	Back	1.73	Large	1.80	Medium	OK	
16	Front	1.74	Small	1.77	OK	OK	NG
	Back	1.73	Large	1.78	Medium	OK	



Note: Tendency of Black density down a little can be seen by Using this option.

④ Set the output power satisfying three check test. (Blister/Burns, Roughness, front and back density)
After that adjust the normal printing condition.

※ Please use recommended “density” and recommended “ink amount for profile creation”.

⑤ Check print quality with job data
After all the printing conditions are fixed, please check print quality with actual job data.
Depending on the print data, adjustment to lower output value is required.

※ Handling of paper after printing, limitation of paper width, etc. are in accordance with Truepress Jet520HD_Limitation and Recommendation_Scink document.

End of Document