

Product Guide

Mimaki



3DUJ-553

UV-LED Full Color 3D Printer

Date: 24-09-2018

Version: 1.11EU

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FEATURES

- **LED-UV Curable full color 3D inkjet printer**
 - Combining Mimaki technology with high quality 3D printing results in more than 10 million colors, twice more than any current available 3D printer
- **Clear ink is available to enhance product variations**
 - 3DUJ-553 utilizes clear inks that can be jetted independently or combined with colored ink to create translucent objects
- **Compatible with ICC profile**
 - Output color simulation is easy to proceed from Photoshop for fast and optimized modeling output
- **Ultra-thin layers for high quality modeling**
 - Using the ultra-thin layer thickness enables smooth details expression
- **Water soluble support material**
 - Simple removal enables highly detailed models to be created without the support material removal affecting the final result
- **Stable operation**
 - Ink circulation system and NCU prevents missing nozzles and maintains a stable print environment



PRODUCT OVERVIEW



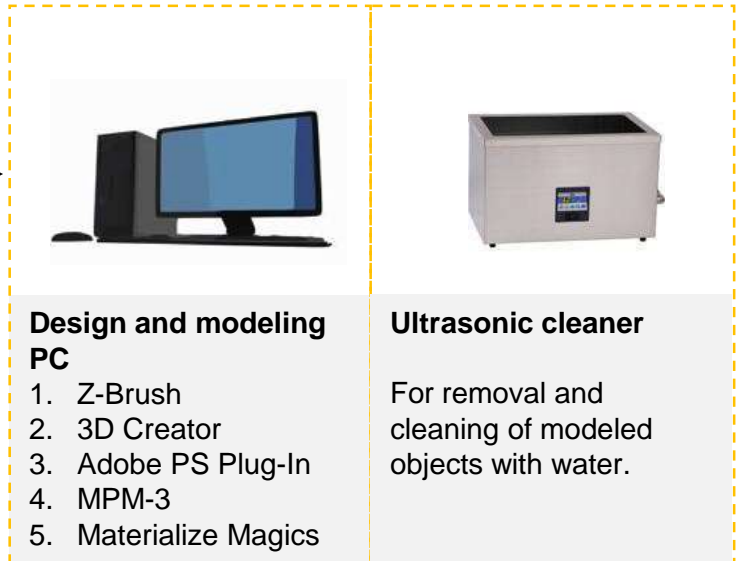


SYSTEM CONFIGURATION

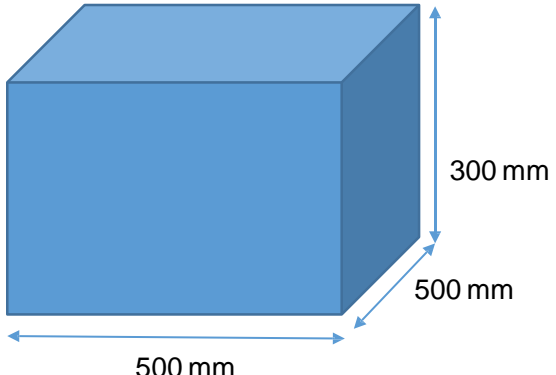
Standard configuration



Prepared by customer



Maximum Modeling Size



WORKFLOW



3D Data Creation

- Photoshop*
- 3D modeling software* (Z-Brush, SOLIDWORKS, etc)
- 3D scanner

Color Simulation

- Photoshop*
- Input profile created by MPM-3*
- MPM-3

Data error correction

- Materialise Magics* error checking software

Layout and Modeling

- “Mimaki 3D Link” Mimaki’s Layout Software
- Panel software

Post-processing

- Removal of Support Material



Design and data preparation



Arranging the layout and modeling



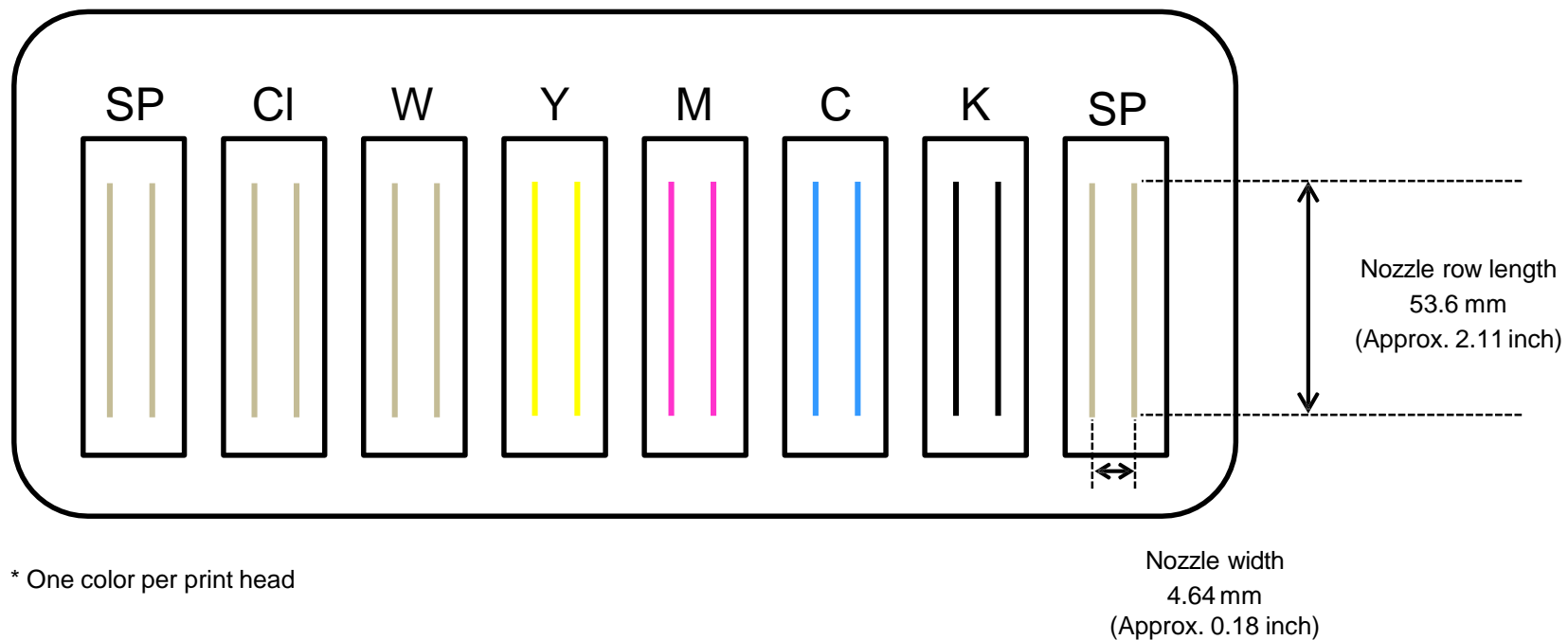
Removal and cleaning of modeled objects with water

*Software is not included

HEAD CONFIGURATION



- **Print head configuration**
 - 8 print heads in an in-line configuration



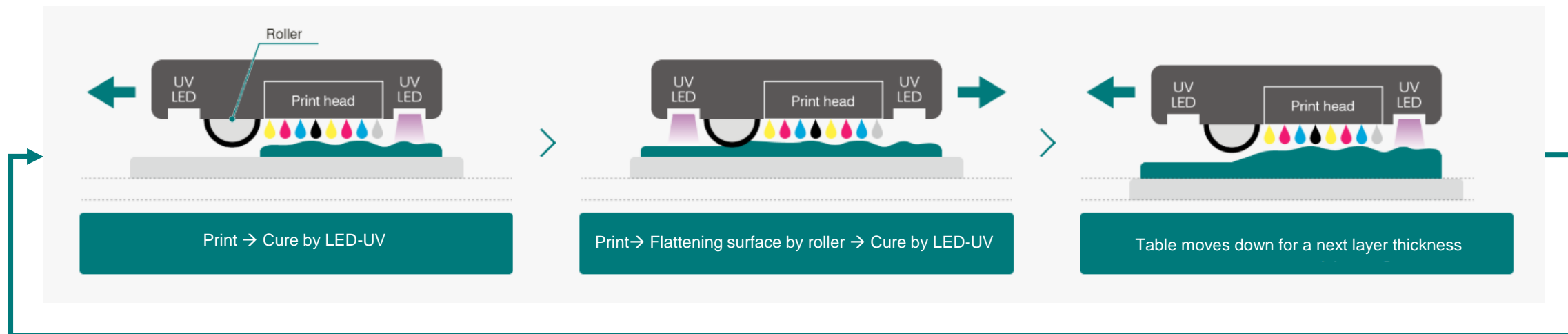
INK TYPE / INK SET

Ink type	Color	Volume	Capacity of ink tanks in the printer
MH-100	C	1L bottle	3L
	M		
	Y		
	K		
SW-100	W (White)	4.8L bottle	5L
	CI (Clear)		
SP (Support)			

UV CURING INKJET METHOD

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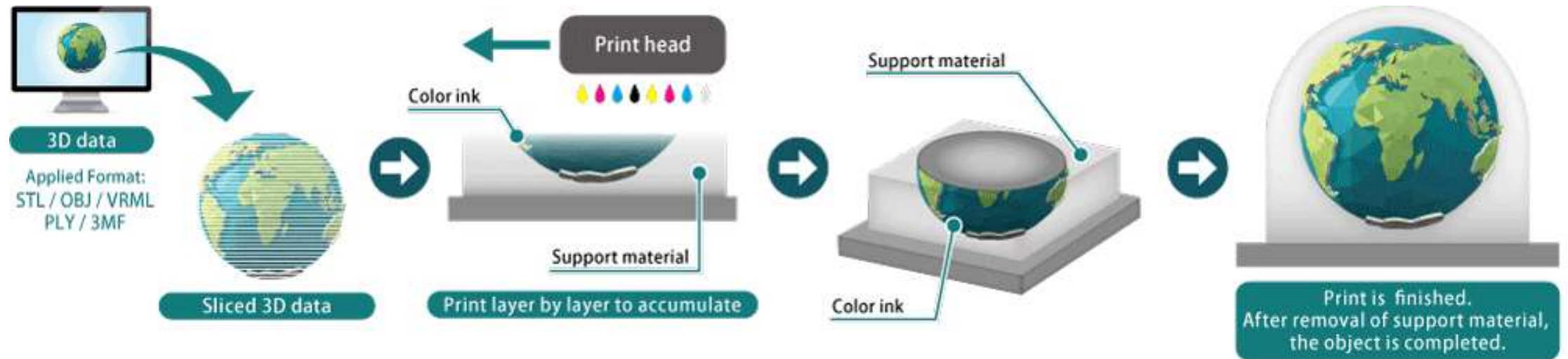
- 3DUJ-553 performs the 3D-modeling by printing and curing UV ink layers.
- This method is producing full colored objects.
- Combining color, white and transparent inks allows you to produce a colored object with photorealistic high accuracy or with varying transparency.



LAYERING AND COLORING

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- Modeling is done by a simultaneous print of sliced data of 3D object with color ink and support material



FULL COLOR

The Mimaki logo is displayed in white text on a red rectangular background.

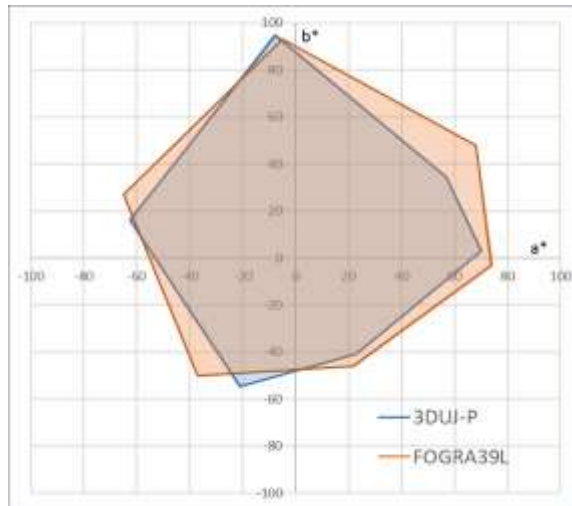
- **Reach full color combinations of more than 10-million colors***
 - Color representation that cannot be realized with powder-based technology
 - Over 10-million colors for photorealistic high accuracy modeling
- **Combining Mimaki technology with high-quality 3D printing**
 - Mimaki's printing and ink technologies are used for high quality 3D printing solutions
 - Extremely fine details, precise line patterns and incredible real expression samples are possible



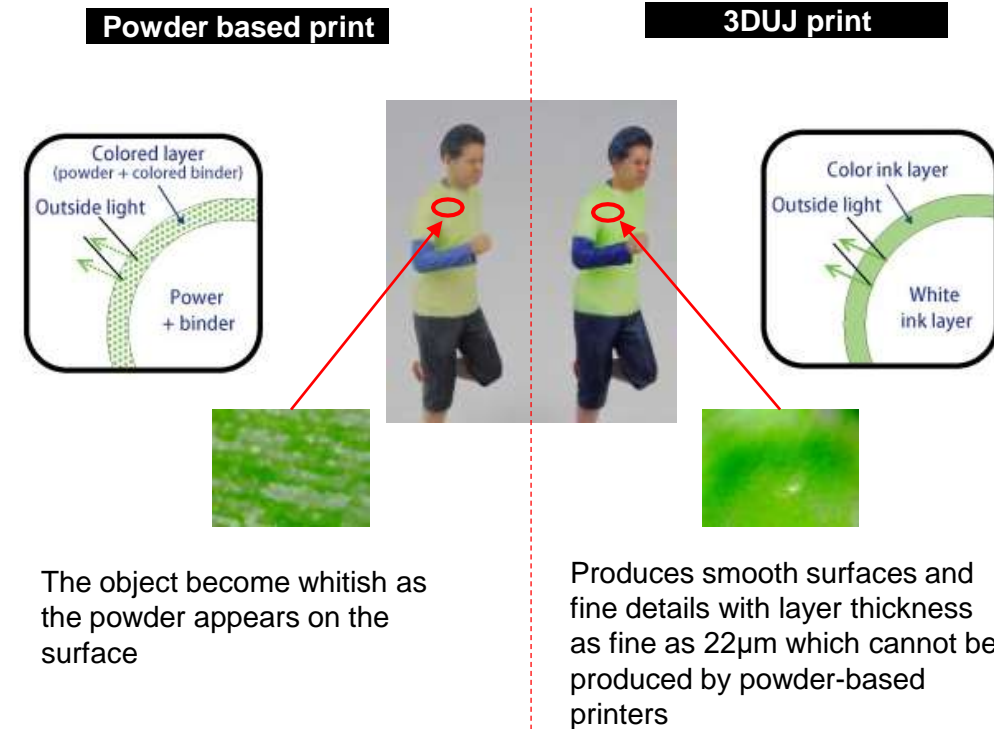
FULL COLOR



- Mimaki 3D printer can realize approx. **84%** of FOGRA39L color gamut



- Comparison with powder based printing



COLOR MATCHING BY CALIBRATION



- **Calibration function maintains constant modeling color of a single printer**
 - Color of a modeled object can be affected by factors such as print head replacement or environment condition change.
 - Calibration function with MPM3 adjusts the device profile to achieve the initial color.

No calibration:

Colors are affected by print head replacement



Result at purchase



Head replacement



Result after head replacement



MPM3 calibration:

color differences are automatically calculated after measuring color charts by using a colorimeter.



Result at purchase.



Head replacement



Calibration measures color charts before and after head replacement and creates a device profile



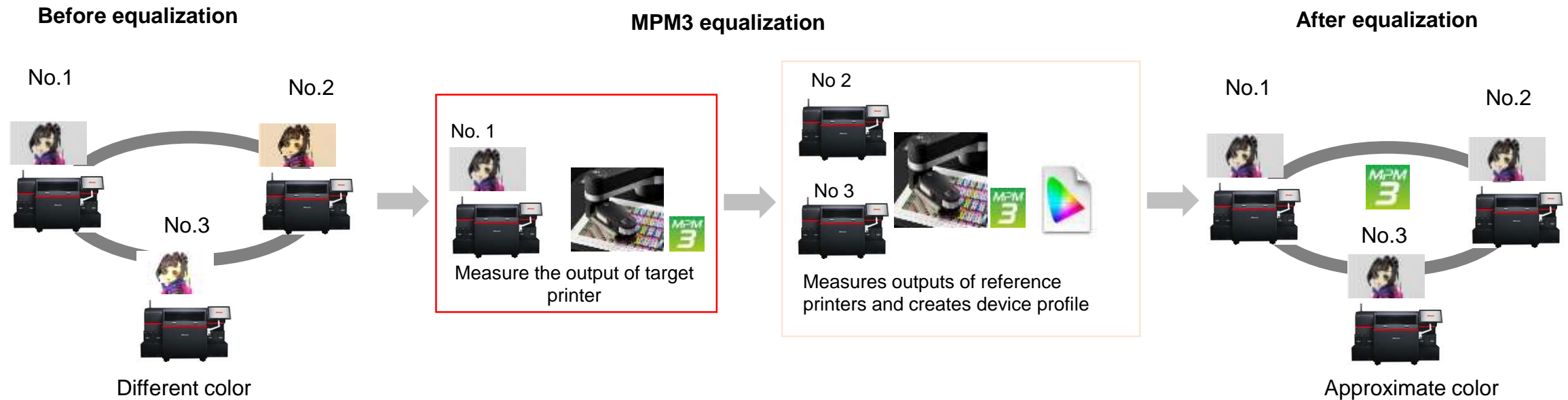
Result after calibration



COLOR MATCHING BY EQUALIZATION



- **Matching colors among the same printer models**
 - Color differences between multiple printers* are simply equalized by measuring color charts.
 - This capability allows the same color output on multiple 3D printers

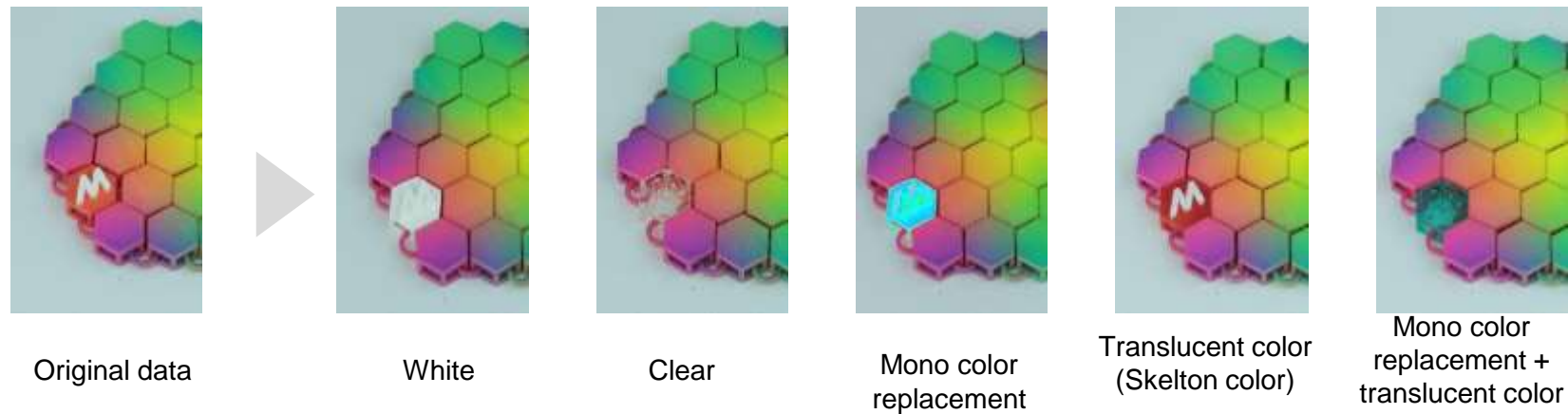


*The printer model and the ink set has to be the same

CLEAR INK



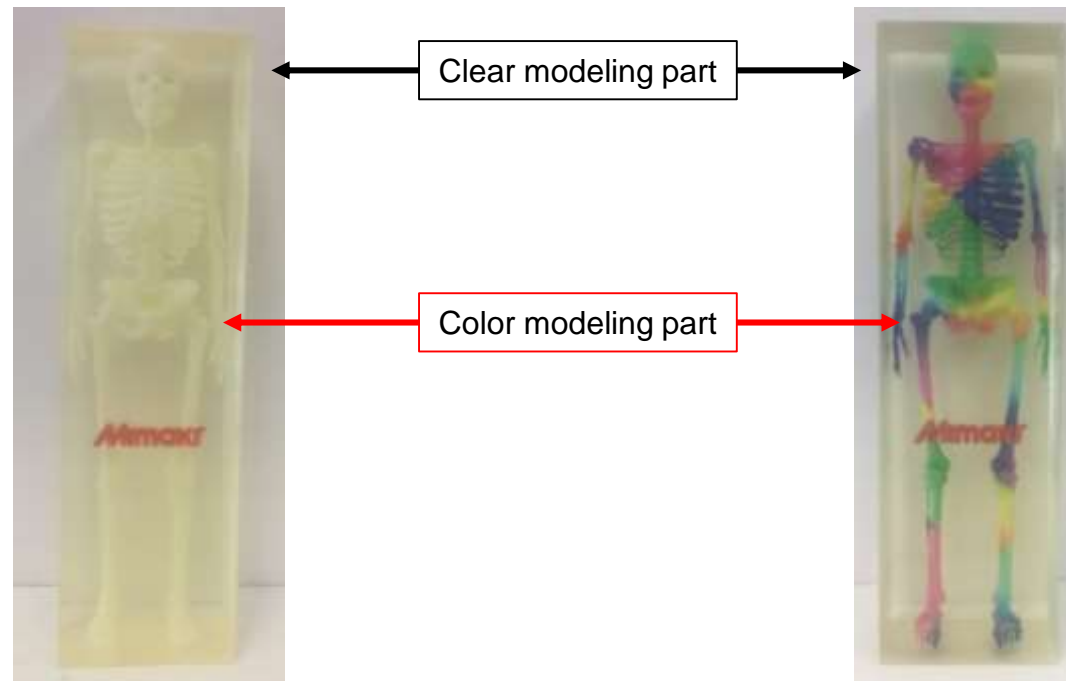
- Clear ink can be printed independently or combined with colored ink to create translucent objects
- Clear ink produces a nice effect and shows a different image when the object is lighted from inside



CLEAR INK



- **Clear ink combined with colored ink**
 - The combination of colored and transparent material is possible in Color in Clear mode



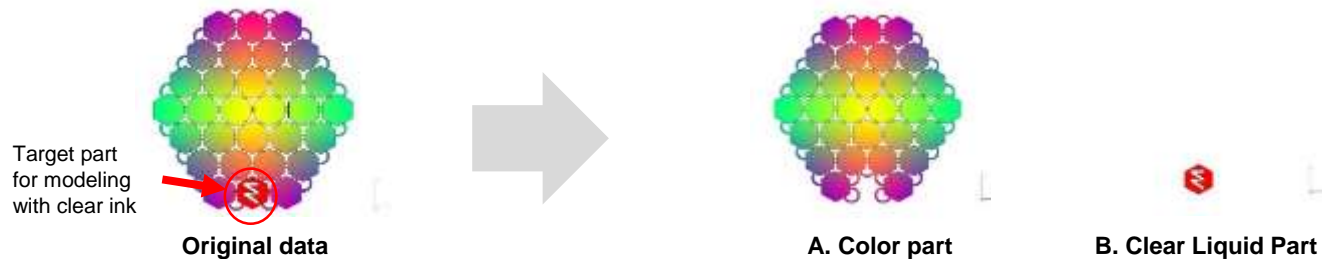
Color modeling expression within clear modeling

- The size of model is limited when modeling in Color om Clear mode (X : 250mm or less, Y: 250mm or less, Z: 150mm or less).
- Layer pitch in Color in Clear mode is 19 μm .
- Modeling in the other modes than Color in Clear may cause color bleeding.

EASY EXPRESSION WITH CLEAR LIQUID

• Step 1: create the data

- Use the software to separate the data that should be modeled with clear liquid



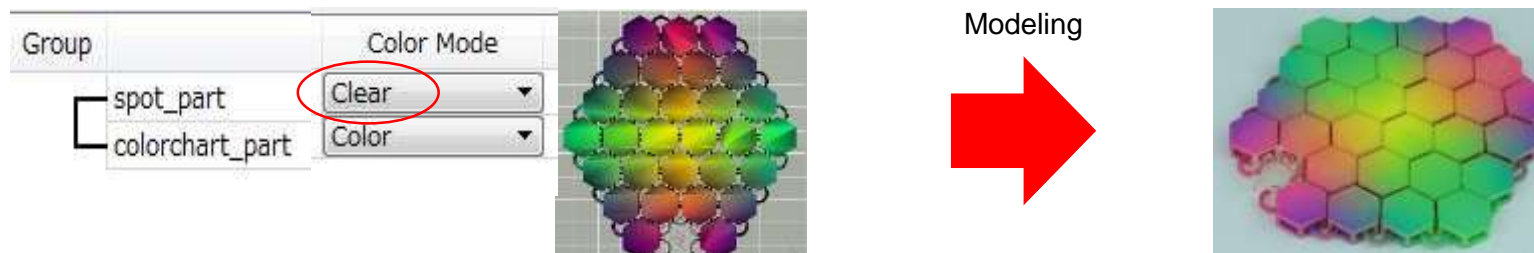
• Step 2: read data with 3D Link

- Import data to 3D Link and group Color Part with Clear Liquid Part



• Step 3: Specify Clear Mode

- Select "CLEAR" Color Mode for Clear liquid Part

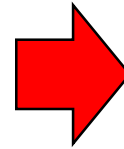
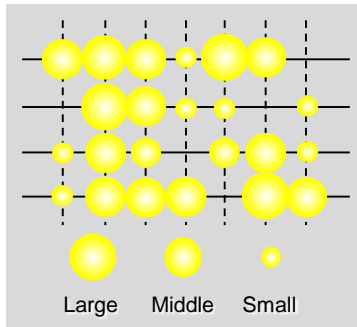


VARIABLE DOTS

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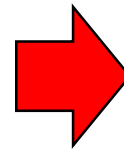
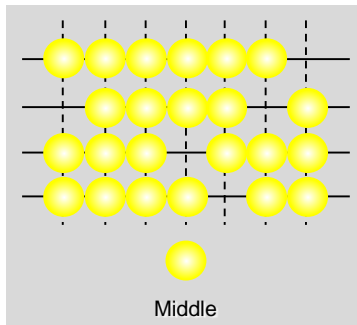
- **Grainy appearance reduction system**
 - It selects the 3 optimum drop sizes, depending on the print mode and provides less grainy appearance when printing colors

Variable dot



Smooth color modeling with high details

Fixed dot



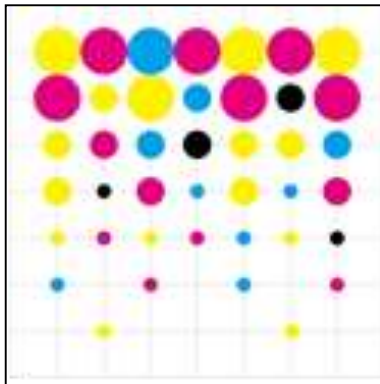
Grainy surface with low details

WAVEFORM CONTROL



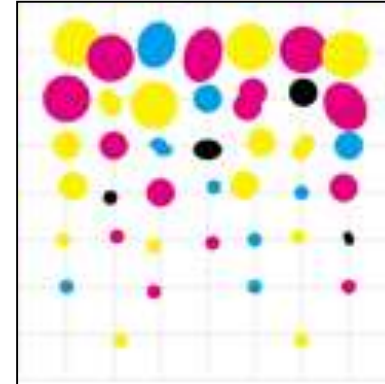
- **Waveform control**
 - It allows the print head to jet each ink droplet at an optimum angle and to maintain excellent ink droplet circularity
 - For accurate placement of ink drops

With waveform control
Ink droplets jetted in as nearly perfect circles



High accuracy dot placement
↓
Sharp finish without grainy appearance

Ink droplets jetted in as deformed circles

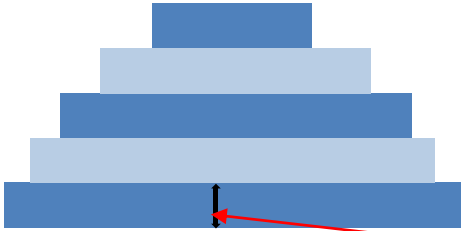
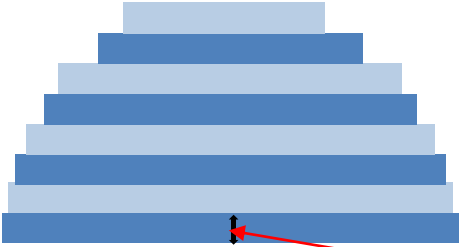
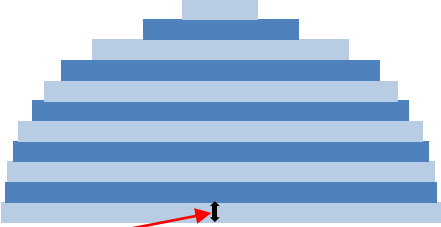
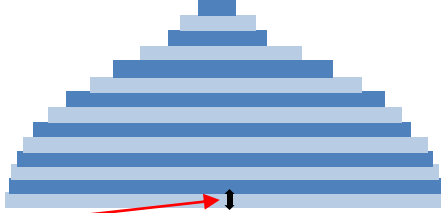






Ink dots overlap
↓
Grainy appearance with blurred edge

HIGH DEFINITION



- 3DUJ-553 prints achieves very fine layer thickness, in high-quality print mode

Modeling mode	Fast	Standard	High image quality	Color in Clear
Layer thickness	42 μm	32 μm	22 μm	19 μm
Modeling				
Suitable application	 For outdoor signage with far watch distance	 Standard color sample	 For precise modeling with small details (1mm or less)	 For mixing clear and color ink

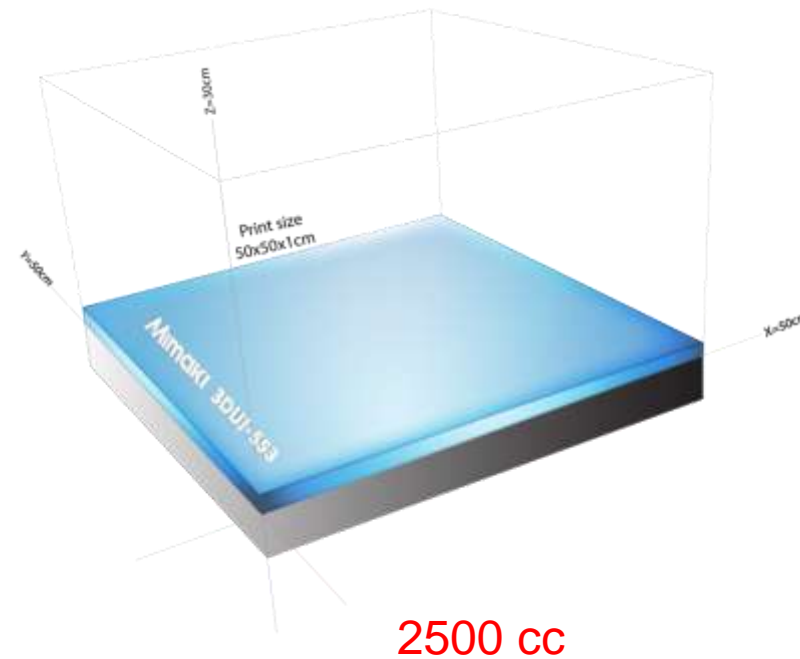
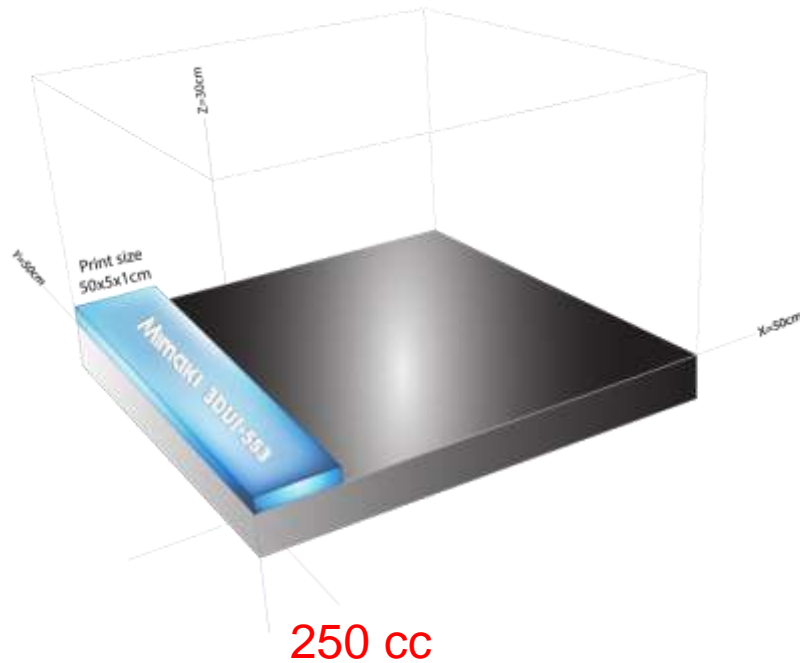
Layer thickness

PRODUCTIVITY

- Various modeling modes for best balance between quality and speed

Print size X: 5cm Y: 50cm Z: 1cm = 250cm³			
Print mode	Fast	Standard	High Quality
Layer thickness	42μm	32μm	22μm
Resolution	600x300x600	600x300x800	600x300x1270
Print time	1:30 h	1:45 h	2:24 h

Print size X: 50cm Y: 50cm Z: 1cm = 2500cm³			
Print mode	Fast	Standard	High Quality
Layer thickness	42μm	32μm	22μm
Resolution	600x300x600	600x300x800	600x300x1270
Print time	8:17 h	9:41 h	13:12 h



VARIETY OF PRINT CONDITION

- **Different print conditions can be applied depending on modeling requirements**

Modeling selection criteria

Modeling	Criteria for selection	Advantage	Disadvantage
High speed	Fast production is priority	Fast modeling time and low ink consumption	Layers becomes thicker and are more noticeable
Standard*	Optimal balance between speed and ink consumption		
High-quality	Modeling requires high and detailed quality	Smooth object surface	Modeling time is longer and ink consumption is slightly higher
Color in Clear mode	The combination of colored and transparent material		

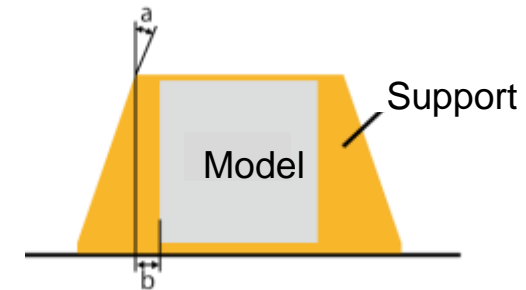
* Standard mode is recommended

SUPPORT MATERIAL SIZE SETTING

- Default support material size can be changed during modeling to reduce the modeling time and support ink consumption

Size setting	Advantage	Disadvantage
Reduced	The consumption of support ink is reduced.	Poor modeling may be increased.
Enlarged	The quality of edge parts of a modeled object are improved.	The consumption of support ink is increased.

Setting item	Description
a	Angle of support material
b	A distance between model and the angled part of support material



Example calculation of a 200 mm cube

Setting value	Amount of ink consumption	Difference in ink consumption from default value
6 (Maximum)	1,829.1 cc	+775.4 cc Increased by 74%
0 (Default)	1,053.7 cc	-
-2 (Minimum)	772.4 cc	- 281.28 cc Decreased by 27%

WATER-SOLUBLE SUPPORT MATERIAL

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- **Efficient removal of water soluble Support Material**
 - Easy to remove water-soluble support material
 - Support material can be removed without any damage on the fine shape of modeled objects



WATER-SOLUBLE SUPPORT MATERIAL

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Removal procedure of support material



1. Set the modeled object with support materials into the removal tank



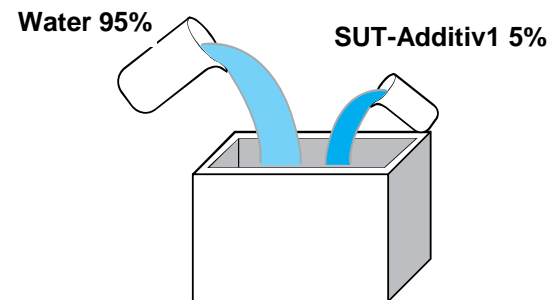
2. Support material is dissolved in water



3. Take out the object from the removal tank. Wipe it with ethanol.

Recommendations for removal of support materials

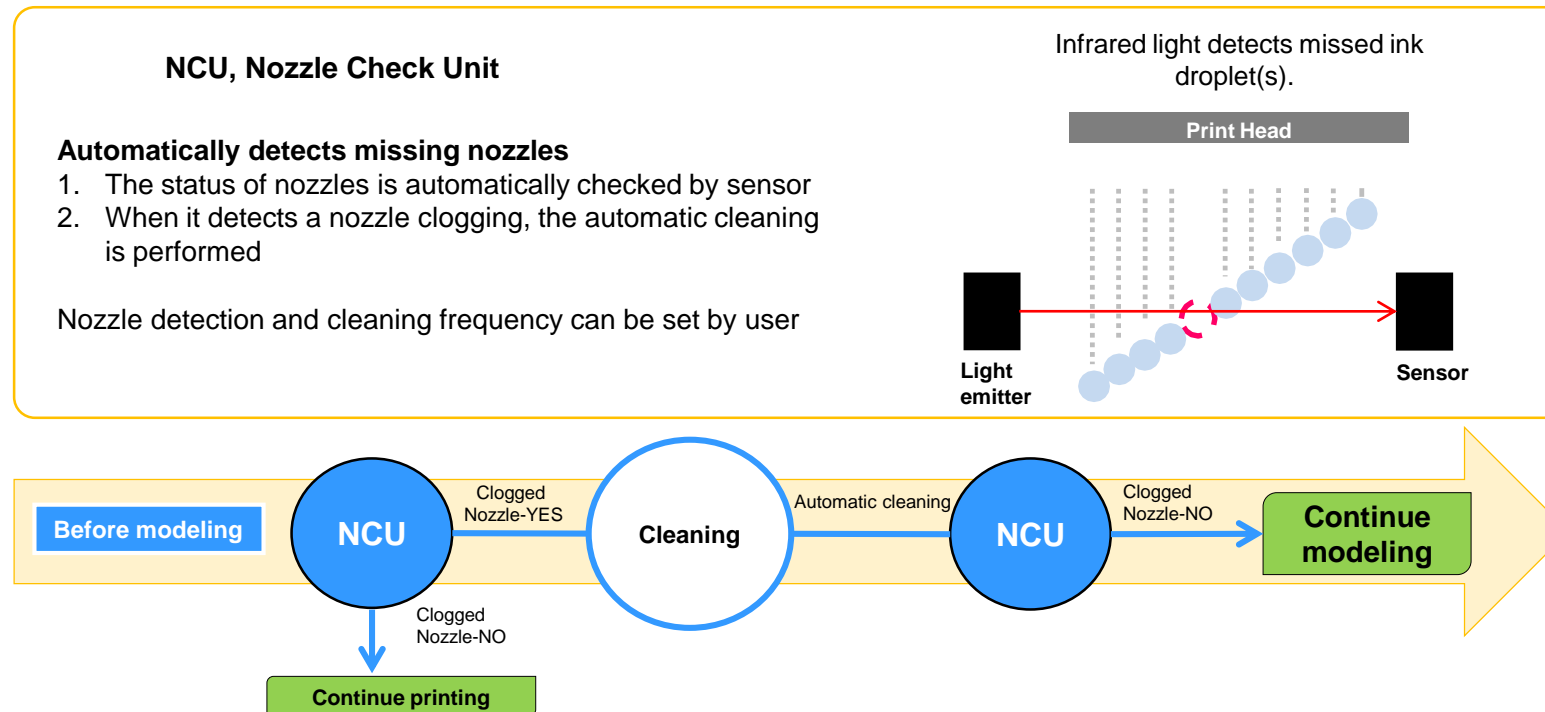
- Ultrasonic cleaner: Schmitt P-DW Ultrasound series
- Support removal material: Sut-Additiv1-10 to use with a 1:20 ratio with water



- * Water used for removing support materials is classed as industrial waste and it is necessary to consign disposal to an industrial waste handler.
- * Leaving the object soaked for a long time after removing the support material may result in a negative effect on the object, such as change in color.
- * Note that the strength of an object is lower when it is still wet.

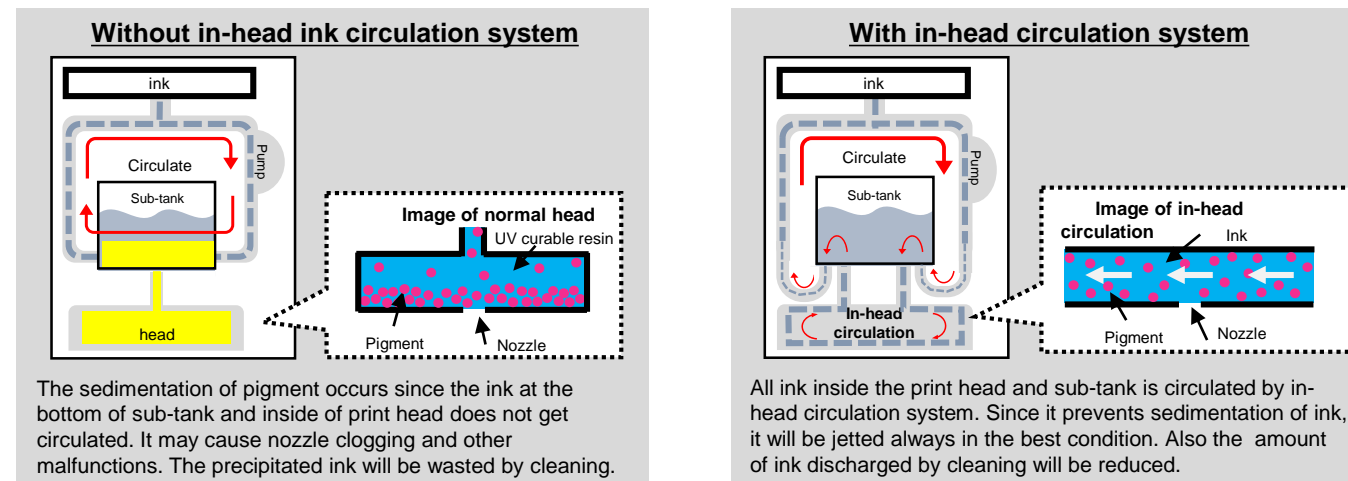
AUTOMATIC MAINTENANCE

- **Non-stop printing with automatic maintenance**
 - NCU (Nozzle Check Unit) automatically checks the nozzle condition
 - When there are missing nozzles, they will be automatically cleaned

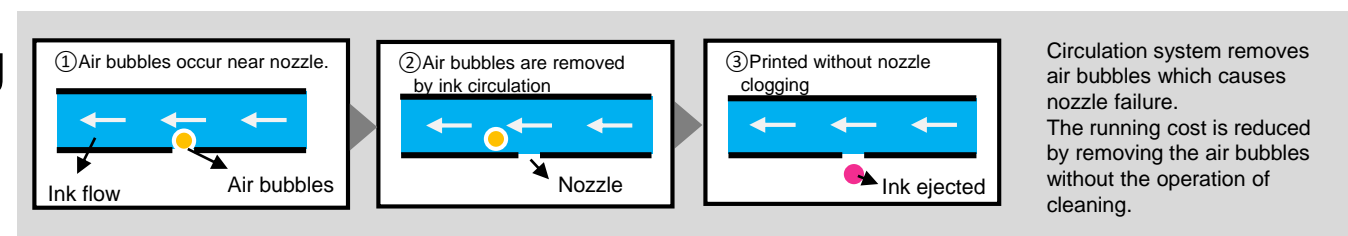


INK CIRCULATION

- Ink circulation system reducing missing nozzles
 - Ink circulation system is installed for all print heads
 - For preventing the pigment sedimentation and removing air bubbles which can occur near the nozzles
 - Resulting in a reduction of cleaning frequency and also providing the cost-effective and stable printing
- Prevents sedimentation of ink pigment



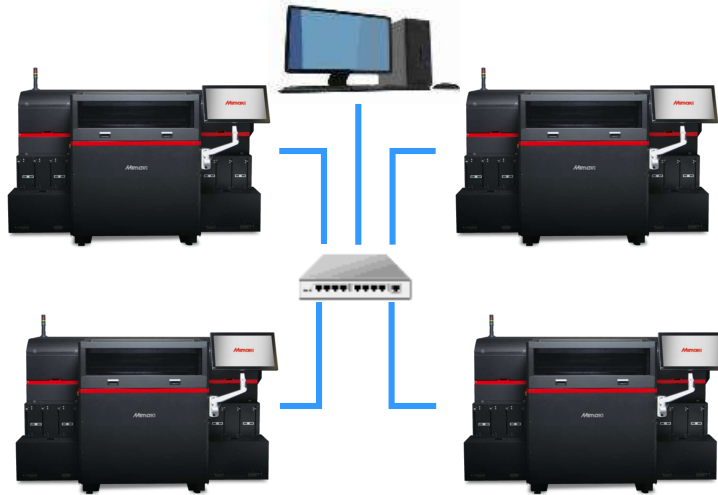
- Prevents nozzle clogging



ETHERNET CONNECTION



- **Ethernet**
 - Ethernet connection is available on the 3DUJ-553
 - It provides convenience by allowing to connect several printers with only one computer
 - Installation is just done by plugging cables into the network



*Please use CAT6 network cables

*Connecting by a relaying router is not supported

*When using a switching hub, please use a 1000BASE-T supported model

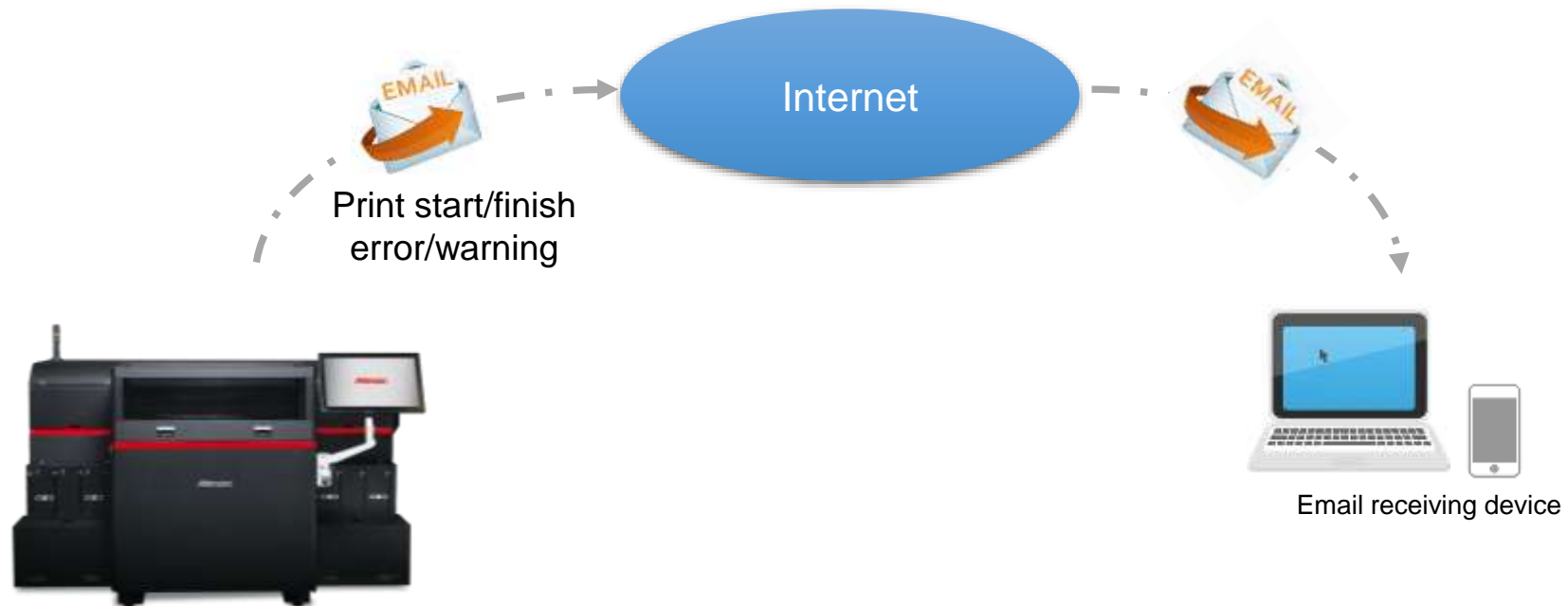
*Waiting for data can occur, depending on the condition of the network

EVENT MAIL



- **Event mail**

- **Status of the printer can be sent from the printer to a mobile phone via the Internet**
- **For remote status indication of the printer**



REMOTE MONITORING

- Modeling process can be monitored remotely via TeamViewer

TeamViewer Host license is installed



3DUJ-553



Camera



Modeling process monitored by camera

Internet

TeamViewer (free version).

- Free version of TeamViewer can be easily installed on remote PC
- Modeling process can be monitored from remote site by technical support or by operator



STATUS INDICATION LAMP

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- **Status notification**
 - Status indication lamp on the machine shows the basic printer status



LARGE OPERATIONAL DISPLAY



- 3DUJ-553 is standard equipped with 21-inch large Touch Panel screen for easy operation and overview



- Intuitive overview of all necessary job information such as ink level, modeling process status and required modeling time



- Clear overview of necessary and scheduled maintenance



- List of modeling history and repeating of modeling tasks is easy thanks to the innovative notification system



- Clear overview of remaining ink



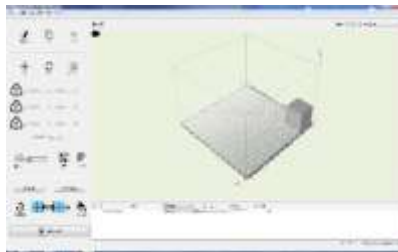
- Current progress of modeling process can be real-time monitored with built-in webcam

- Mimaki Printer Driver and software can be remotely updated via secured network.

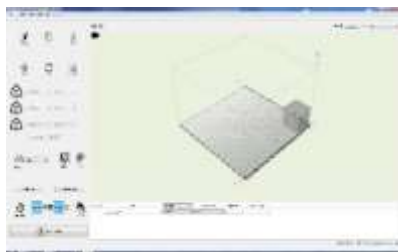
MIMAKI 3D LINK



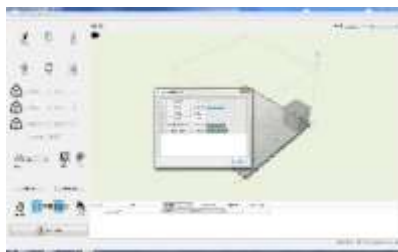
- 3D layout software designed to create and output a modeling job to Mimaki's 3D printer



- Job layout information*
- Settings such as rotation, enlarge/reduce, transfer, copy and special color are easy to apply to the modeling job



- Modeling instruction and usage of clear liquid can be set



- Estimated functions such as the estimated modeling time and ink consumption can be saved as PDF or CSV file

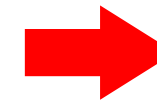
* Readable formats: STL, OBJ, VRML, PLY, 3MF

Convenient functions

- Job backup can be easily created and restored to shorten the repetitive modeling procedures

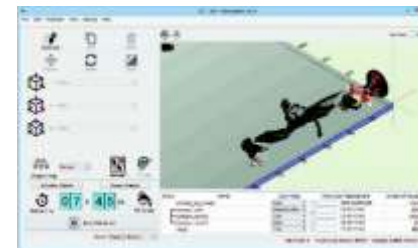


Backup modeling job



Restore job from backup file

- Create an estimate of the modeling time and ink and export the results as PDF report



3D Link Estimate Result 2017/10/13 9:40 AM

Modeling Mode		Settings	
No.	Model Name	Surface Finishes	Color Mark
1	Modeling Mode	White	Color
2	Modeling Mode	White	Color
3	Modeling Mode	White	Color
4	Modeling Mode	White	Color
5	Modeling Mode	White	Color
6	Modeling Mode	White	Color

Estimate Results

Estimated Modeling Time	12min
① Ink	20.00ml
② Ink	20.00ml
③ Ink	20.00ml
④ Ink	20.00ml
⑤ Ink	20.00ml
⑥ Ink	20.00ml
⑦ Ink	20.00ml
⑧ Ink	20.00ml
⑨ Ink	20.00ml
⑩ Ink	20.00ml
⑪ Ink	20.00ml
⑫ Ink	20.00ml
⑬ Ink	20.00ml
⑭ Ink	20.00ml
⑮ Ink	20.00ml
⑯ Ink	20.00ml
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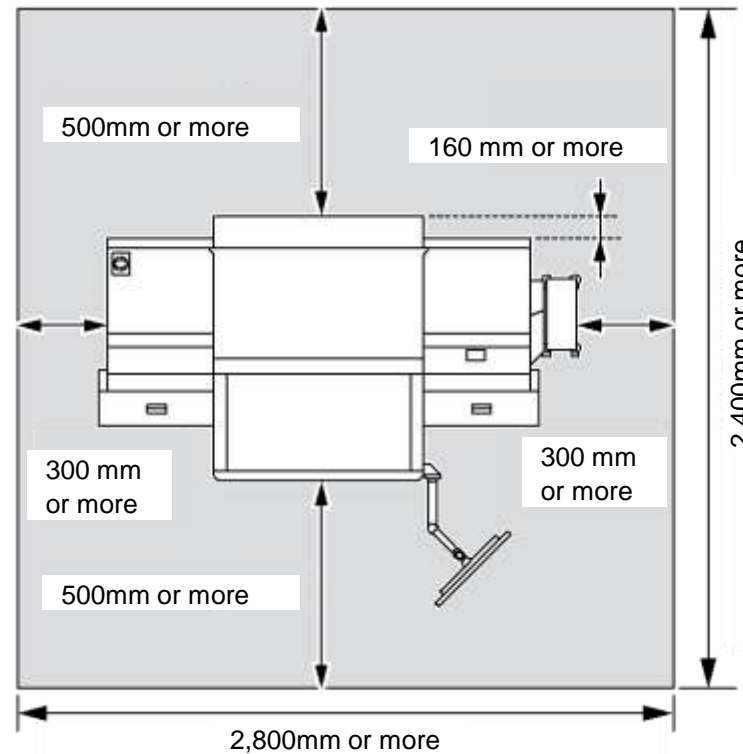
Model List

No.	Model Name	Surface Finishes	Color Mark	Model Size (mm)
1	Modeling Mode	White	Color	100
2	Modeling Mode	White	Color	100
3	Modeling Mode	White	Color	100
4	Modeling Mode	White	Color	100
5	Modeling Mode	White	Color	100
6	Modeling Mode	White	Color	100

INSTALLATION SPACE



Machine	Outer dimension	Width	Depth	Height	Weight
3DUJ-553	Packed	2,420mm	1,800mm	1,560mm	720kg
	Installed	2,250mm	1,500mm	1,550mm	600kg



- **About installation space**

- Do not install on the weak surface floor.
- Environmental temperature must be 15° to 35 °C
- Relative humidity must be 35% to 65% Rh
- Dust level must be less than 0,15mg/m³

- **Do not install on carpets etc.**

- because those are easy to be charged, and it can effect the image quality.

- **Generates ink odor**

- Please use the machine in a well-ventilated environment.

- **Use the foot base**

- in order to prevent floor deformation

MAIN SPECIFICATION



Item		3DUJ-553	
Print head		On-demand piezo head, 8-heads inline	
Ink type		MH-100 (modeling material ink), SW-100 (support material ink)	
		C, M, Y, K, W, CI, SP	
Ink supply	Built-in tank	C, M, Y, K	3L / color
		W, CI	5L / color
		SP	5L x 2 paths
	With bottle ink installed	C, M, Y, K	4L + 1L x 1 bottle/color
		W, CI	9.8L + 4.8L x 1 bottle/color
		SP	9.8L + 4.8L x 1 bottle x 2 paths
Maximum modeling size / weight		X: 508 mm / Y: 508 mm / Z: 305 mm - 70 kg or less	
Circulation function		Available (ink circulation through heads)	
UV device		Water-cooled LED-UV irradiation device x 2 units (installed on the head carriage)	
Interface		Ethernet 1000 BASE-TX	
Noise		Standby: 55 dB or less (FAST-A, 1m in four directions) / Continuous operation noise: 65 dB or less / Intermittent operation noise: 75 dB or less	
Power supply		Single-phase 100-240 VAC, +/- 10%, 50/60Hz +/- 1Hz x3 (Main unit 1 / Monitor 1 / External PC 1)	
Power consumption (including main unit, monitor, and external PC)		Less than 1.63kWh	
Outer dimensions (mm)		W: 2,250 x D: 1,500 x H: 1,550	
Installation space (mm)		2,850 x 2,400 or more	
Weight		600 kg	
RIP software		Mimaki 3DLink	
Applicable standards		VCCI Class A / FCC CLASS A / ETL, IEC60950-1 CE marking(EMC Directive, Low Voltage Directive) / CB certification / RoHS compliant / REACH	

APPENDIX

- **Supply items**
- **Optional items**

SUPPLY ITEMS - INKS



Part No.	Description	Volume	Packaging	Remarks
MH100-x-BA	3D MODEL INK MH-100 1L BOTTLE	1,000ml	Bottle	M, C, Y, K,
MH100-x-BD	3D MODEL INK MH-100 4.8L BOTTLE	4,800ml		W and CI
SW100-Z-BD	3D SUPPORT INK SW-100 4.8L BOTTLE			SP
SPC-0568	F-200/LF-200 Washing Liquid	100ml		Cleaning liquid for daily maintenance

SUPPLY ITEMS – CONSUMABLES



Part No.	Description	Volume	Packaging	Remarks
SPC-0569	F-200/LF-200 CLEANING KIT	100ml x 2	100ml bottlex2	Daily maintenance kit
SPC-0386	UJ Cleaning Swab		10 pcs	
SPC-0387	UV Goggle		1 pce	
SPC-0394	Anti freezing liquid	1,000ml	1,000ml bottlex2	
SPC-0421	Nozzle Swab		100 pcs	
SPC-0499	KIM TOWEL		50 pcs	
SPC-0574	MAINTENANCE CLOTH		150 sheets	
SPA-0297	INK SAUCER ASSY		1 pce	
SPA-0298	WIPER BLADE ASSY		1 pce	
SPA-0299	WASTE INK TANK		1 pce	
SPA-0300	MOLDING STAND ASSY		1 pce	
SPC-0834	MIST FILTER SET		1 set	Filter 1: 10 pcs, Filter 2: 2 pcs

OPTIONAL ITEMS

The Mimaki logo is displayed in white text on a red rectangular background.

Part No.	Description	3DUJ-553
SPM-007	MPM3	Option

Mimaki

Thank you



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