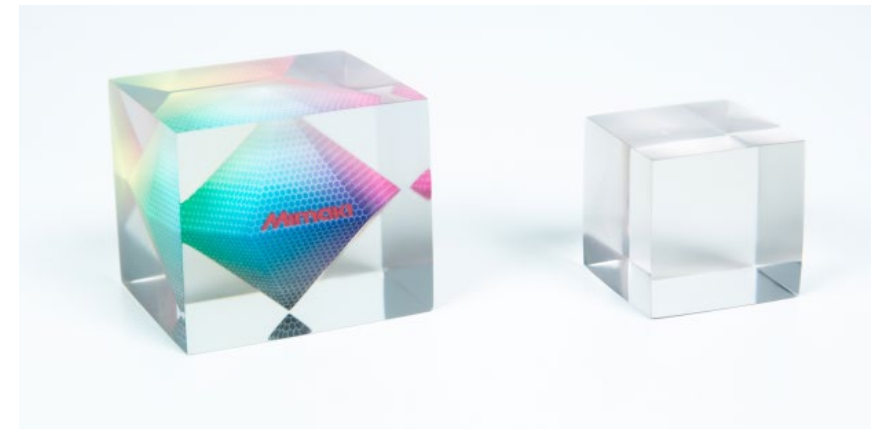


# PRODUCT GUIDE

Mimaki



## MH-110PCL

MIMAKI UV-LED CLEAR INK FOR 3D MODELLING

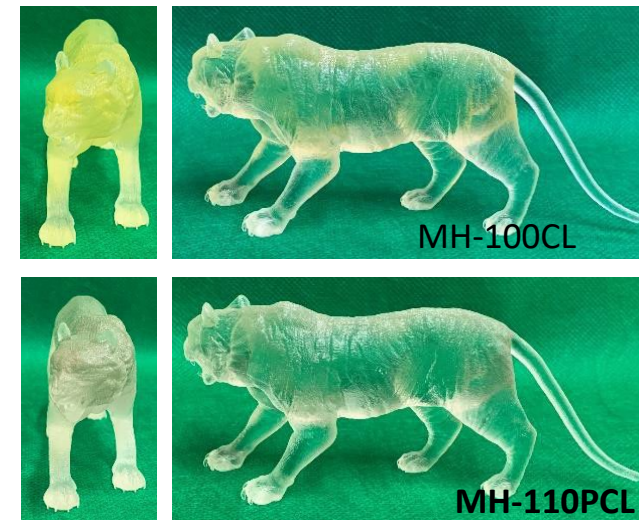
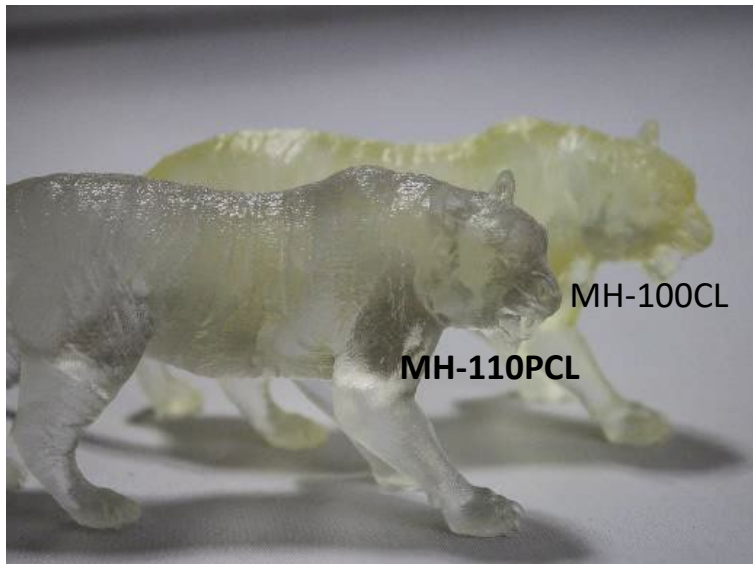
# 1. MH-110PCL Ink Product Overview, Features

## MH-110PCL Ink Product Summary

- Available in a 4.8-liter ink bottle, the new clear ink MH-110PCL has higher transparency than the current clear ink MH-100CL, allowing artists, designers, architects and others to model 3D objects more clearly and transparently.

## Features

- MH-110PCL prevents the yellowish tint seen in MH100CL ink, allowing for more transparent modelling.
- The ink delivers visibly brighter output as desired by designers and architects.
- The MH-110PCL ink can be combined with color inks to reproduce translucent color effects.
- Available in a 4.8L ink bottle.

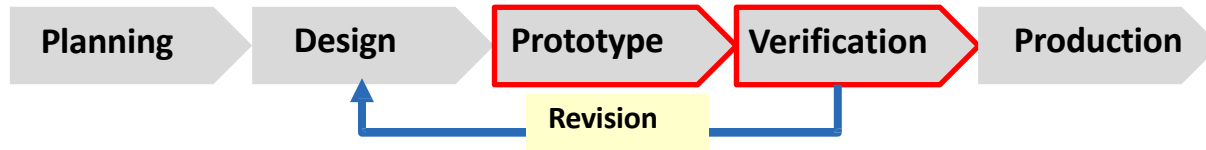


Front view Side view  
(Thickness: max. 127 mm) (Thickness: max. 34 mm)

## 2. Application: Product Design

- Development of new product in the early stage requires continuous evaluation and verification of functionality, shapes and colors.
- A full-color 3D printer allows instant prototyping and verification by feeling the product and seeing how it looks like a 3D model.
- 3D modeling with true transparency effect is ideal for visualizing glass or acrylic effect showing the interior structure or engineering construction in color and how it will look like a finished product.

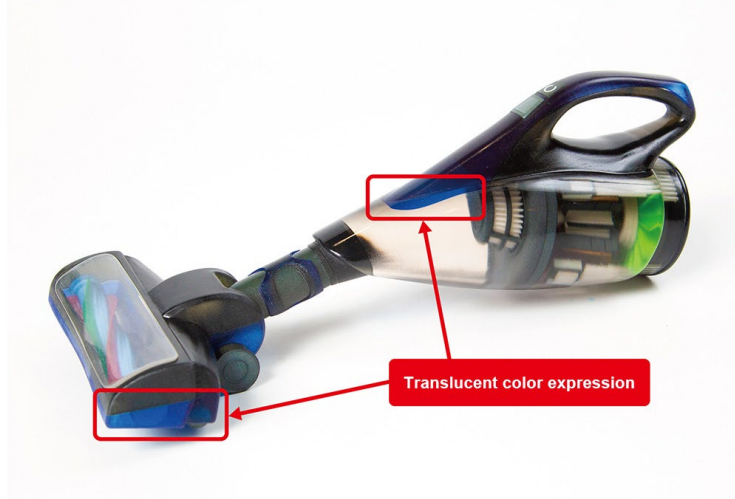
### • Product Development Flow Example



### • Applications

- Prototyping to confirm the shape and appearance of products and parts

#### Prototype for visualizing internal structure



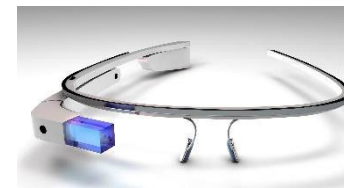
#### Prototype to show the form and appearance



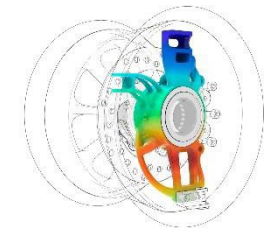
Automotive light covers



Cosmetic bottle (product package)



Head Mounted Display)



Wheel parts (Stress analysis)

## 2. Application: Medical models

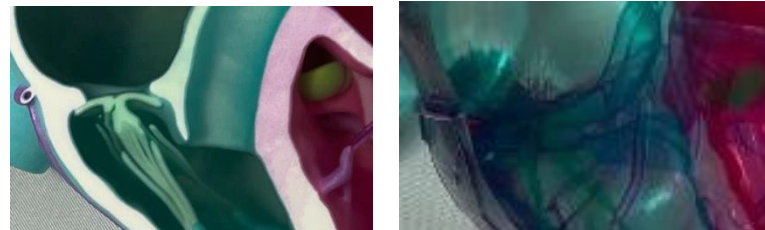
- Medical models are used for the visualization of the human body and in surgical practice by modeling the CT-scanned organs of the patient.
- With 3DUJ-553 it is possible to create realistic looking organs with full color and transparent ink.
- It is also possible to make models with specific color markings on the diseased parts.

### • Applications

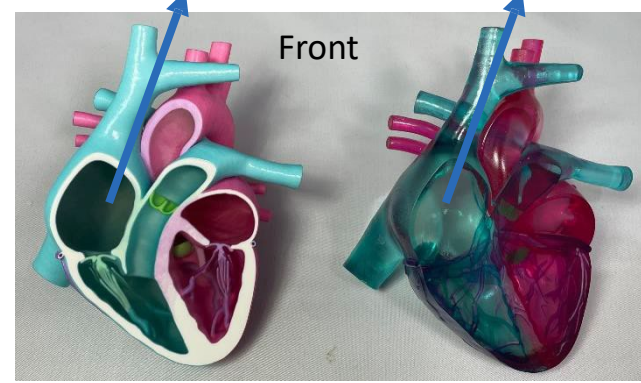
- Medical sample models
- Surgical practice models
- Organ and cell models



Anatomical Model

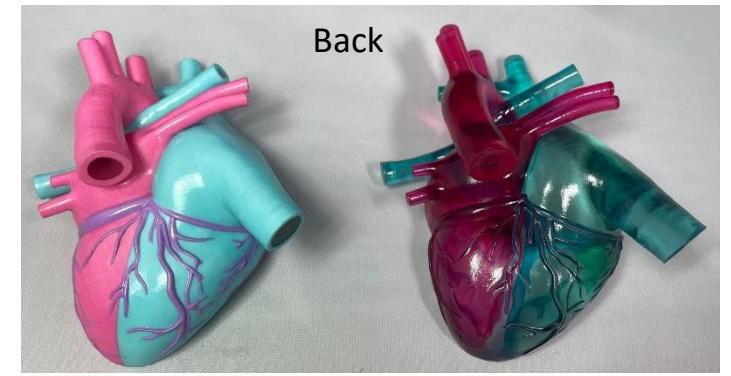


Organ Model



Color/Clear

Skeleton Color/Clear



Color/Clear

Skeleton Color/Clear



## 2. Application: Architectural Models

- The 3DUJ-553 combines full-color expression and transparent design effects such as glass or acrylic panels, difficult to achieve with conventional architectural model production methods, such as handmade modelling or modelling using a powder 3D printer.
- **Applications**
  - The exterior of an architectural model
  - Interior modeling of objects in perspective
  - Construction model showing the inner structure by making the outside transparent



Architectural Model



Modeling of interior models, expression to show internal structure

## 2. Applications: 3DCG design, figures

- Expressing transparent materials in 3DGC models and protecting small delicate shapes that break easily if left unprotected.

### • Applications

- 3D models with a floating effect
- The expression of clear water
- Protection of delicate shapes with transparent ink



Floating models  
(3D data by Olaf Diegel)






Clear water expression (3D  
data by Nobuaki Fukui)



Clear ink protects fine, fragile shapes  
(Not an actual modeling object, but an image)

### 3. Ink set comparison chart

- MH-110PCL is supported only by the 3DUJ-553 printer.

| Item                             | 3DUJ-553 MH-100CL ink set   | 3DUJ-553 MH-110PCL ink set  | Remark  |
|----------------------------------|---|---|---|
| Ink Set                          |    |   |  |
| Pros                             | <ul style="list-style-type: none"> <li>Possible to combine the color and clear ink.</li> </ul>  | <ul style="list-style-type: none"> <li>Possible to combine the color and clear ink</li> <li>Reduced yellowing compared to MH-100CL resulting in transparent and clear expression.</li> </ul>  | P4~P5   |
| Clear ink usage conditions       | MH-100CL only   | Choice between<br>MH-110PCL<br>MH-100CL   | P9  |
| Color change over time           | <ul style="list-style-type: none"> <li>The yellowish tint is present direct after modeling and it is reduced over the time.</li> <li>Additional radiation with UV light speeds up the reduction of yellowish tint.</li> </ul> | <ul style="list-style-type: none"> <li>The light yellowish tint is present direct after modelling, and it is reduced over the time.</li> <li>Additional radiation with UV light speeds up the reduction of yellowish tint.</li> </ul> | P10~11  |
| Ink and modeling characteristics | Strength, heat resistance (softening/deformation).<br>Please check the notes for color bleeding and streaking on the top surface of the modeled object.   |   | P12~13  |
| Required Options                 | None (factory default)  | Required OPT-J0510 PCL compatible kit. Setup by Authorized Service Partner only.  | P15   |

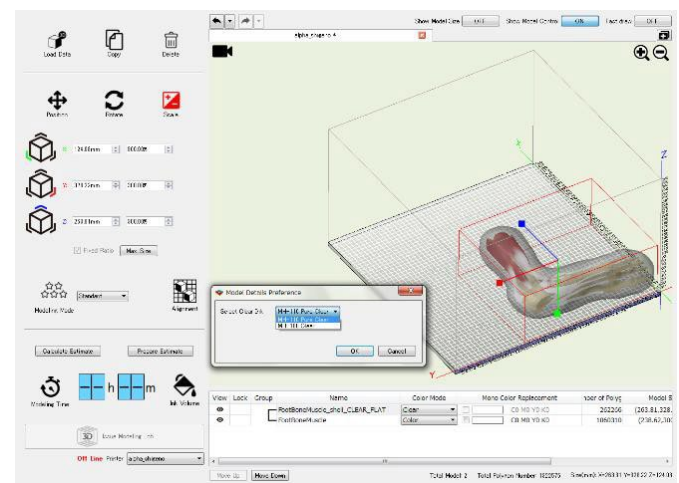


# 4. Clear ink usage conditions

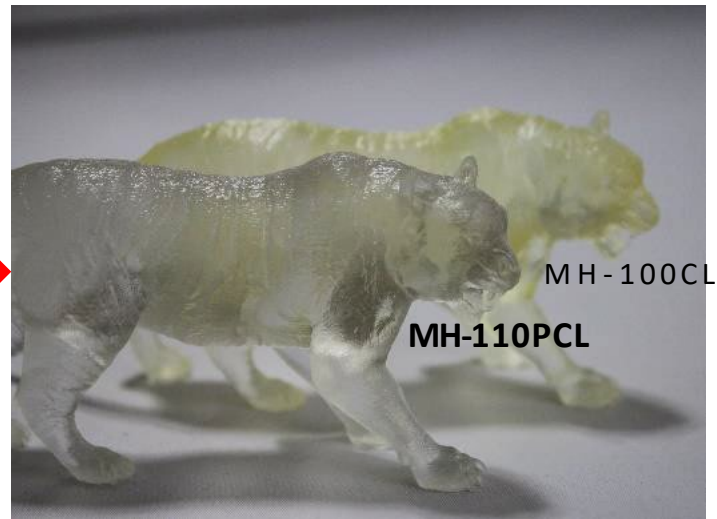
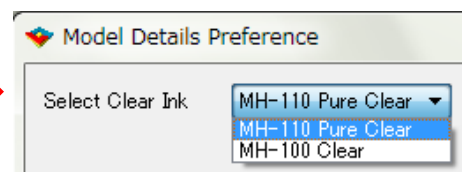
The ink set on the 3DUJ-553, when configured with the MH-110PCL, also includes the MH-100CL ink.

Some benefits of using MH-100CL ink:

1. When modeling objects in "Color" or "White" color mode with "Warp reduction setting: ON"
  - Reduction of warpage is achieved by combining the different modeling performance of the MH-100W and MH-100CL.
2. When expressing light-colored areas in models with "Color" or "Skeleton Color" color mode
  - MH-100CL is combined with MH-100 color to achieve the expression of light-colored areas.
3. Continuing modeling with MH-100CL ink
  - After changing the ink set to MH-110PCL ink set, it is still possible to perform modeling by choosing between MH-110PCL or MH-100CL in 3D Link.
  - This feature allows the customer to reproduce the previous models with MH-100CL ink, keeping the model preferences the same as before.



3D Link "Clear" and "Skeleton Color" selection screen (PCL/CL can be selected when PCL is installed)



Two types of clear ink can be selected after MH-110PCL is installed



## 5. Color change over time

- The yellowish tint of the MH-110PCL and MH-100CL models immediately after modeling will reduce over time.
- This reduction process of the yellow tint can be shortened by post-treatment with UV-light irradiation.

### Example 1

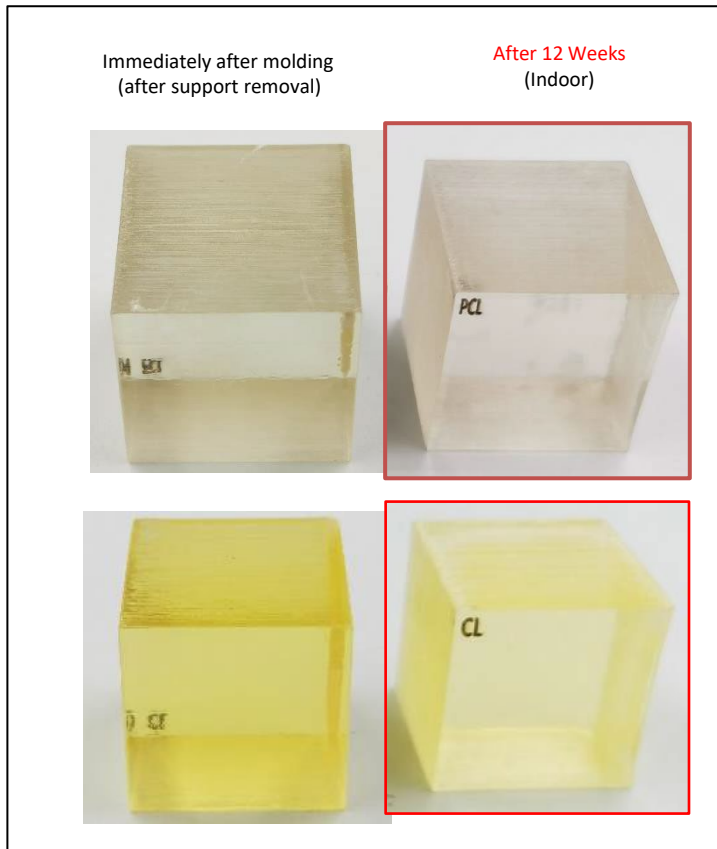


Figure 1: Comparison of color tone immediately after modeling and after 12 weeks

### Example 2

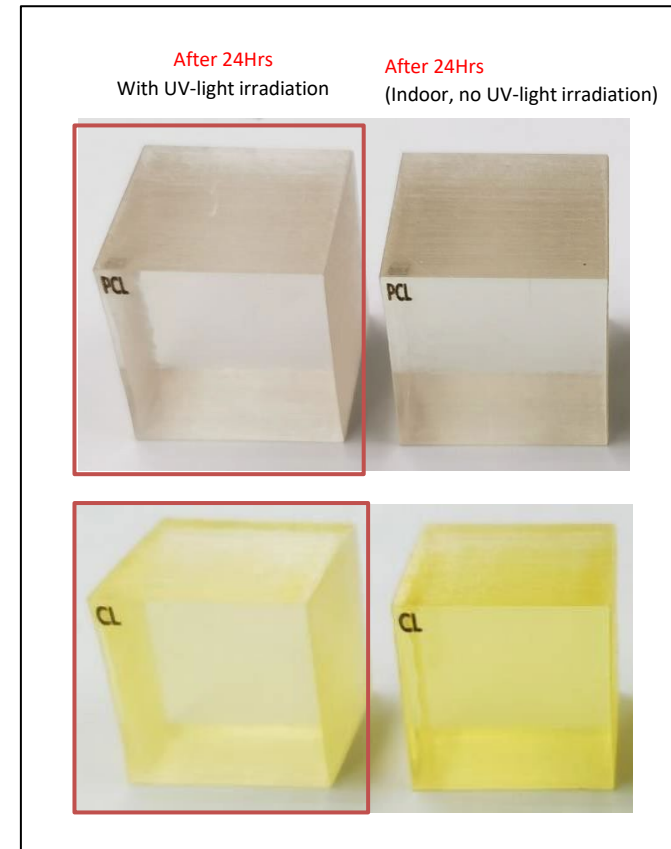


Figure 2: Comparison of color tone between unirradiated and UV-light irradiated model for 24 hours immediately after modeling.

- Modeling conditions:
- Modeling mode: Standard
  - Object size: 30 mm square cube

MH-110PCL  
Model

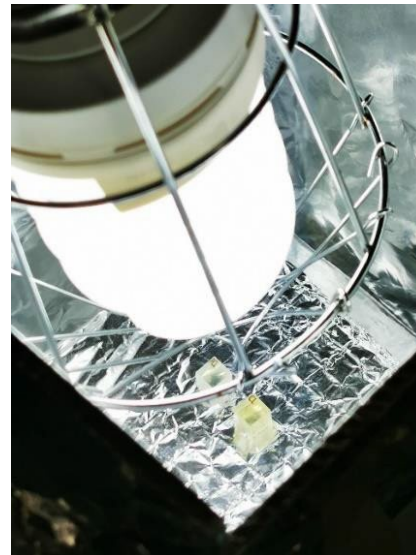
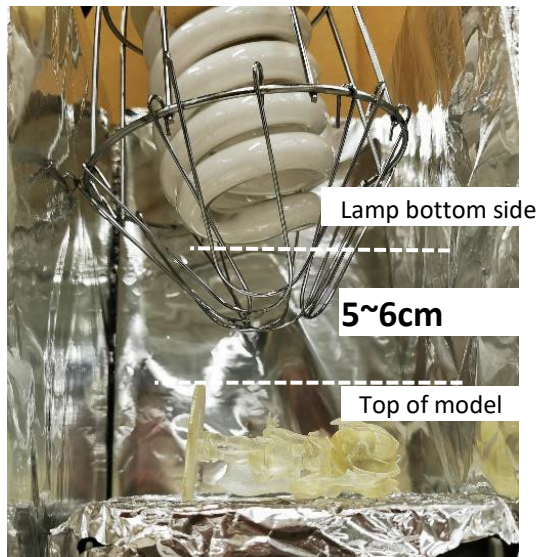
MH-100CL  
Model

## 5. Color change over time

- Commercially available fluorescent lamps can be used for post-treatment with UV-light irradiation.

- Recommended Conditions

|                                  |  |  |
|----------------------------------|--|--|
| Lamp type                        | 45W fluorescent lamp e.g. ALB-45F (Fujimac)  |  |
| Distance between lamp and object | 5~6cm  | The size and shape of the object, the distance between the object and the fluorescent lamp and the condition of the fluorescent lamp may affect the results, so check the conditions in advance. |
| Exposure time                    | 16 hours or more<br>(40x40x2mm flat object)  |  |
| Other                            | The light from the fluorescent lamp can be reflected around and at the bottom of the irradiated area for more efficient irradiation. |  |



### Note

- Overexposure may cause unwanted discoloration.
- When irradiating thin objects with light, the heat from the lamp can cause distortion. Place the object in a direction that is difficult to deform because of its own weight.
- Take protective measures when using the lamp as prescribed by the lamp manufacturer.

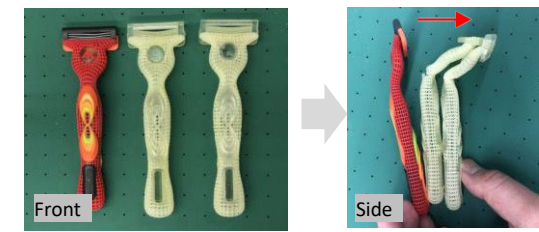
## 6. Ink and molding properties: strength, heat resistance (softening and deformation)

- MH-110PCL and MH-100CL clear inks are softer than MH-100 color inks.
- MH-110PCL is more prone to deformation in high temperature environment.
- When modelling the objects with MH-110PCL or MH-100CL that are prone to deform, take measures such as providing a support to prevent deformation.

| Item  | Unit              | MH-110PCL        | MH-100CL   | MH-100W          |
|---|-------------------|------------------|--|------------------|
| Tensile strength<br>(JIS K 7162, ISO 527-1)                     | MPa               | 35-45 (25°C)     | 3-10 (25°C)                                      | 15-60 (25°C)     |
| Tensile elongation<br>(JIS K 7162, ISO 527-1)                   | %                 | 10-90 (25°C)     | 10-40 (25°C)                                     | 1-7(25°C)        |
| Flexural strength<br>(JIS K7171, ISO 178)                       | MPa               | 45-75 (25°C)     | 1-7 (25°C)                                       | 25-85 (25°C)     |
| Flexural modulus (JIS<br>K7171, ISO 178)                        | MPa               | 1400-2600 (25°C) | 60-120(25°C)                                     | 1000-2400 (25°C) |
| Charpy impact strength<br>(JIS K7111-1, ISO 1710-1)             | KJ/m <sup>2</sup> | 1.0-1.5          | 3.5-5.0  | 1.0-3.0          |
| Deflection temperature<br>under load<br>(JIS K7191-2, ISO 75-2) | °C                | 30-50            | Not measurable<br>(Bends at room<br>temperature) | 40-55            |
| Shore D Hardness<br>(JIS K7215)                                 | —                 | 75-90            | 50-70  | 75-90            |

## 6. Ink and modeling properties: strength, heat resistance (softening and deformation)

- MH-110PCL models placed in a high temperature environment must have a shape that will not be easily deformed.
- If the shape cannot be changed, selecting MH-100CL that is more resistant to deformation at high temperatures can reduce the deformation.
- In general, MH-100CL/MH-110PCL are more prone to deform at the high temperatures than MH-100 color inks.



Razor model: Example of a fine mesh shape with walls of 1 mm or less (MH-100 color model is better resistant against deformation compared to MH-100CL/PCL ink).

| Ink Type   | Size/Shape                         | 24hrs@25°C    | 24hrs@30°C           | 24hrs@35°C           | 24hrs@40°C           |
|------------|------------------------------------|---------------|----------------------|----------------------|----------------------|
| MH-110 PCL | Stable Shape<br>127x34mm<br>H49mm  | <br>No change | <br>No change        | <br>No change        | <br>No change        |
|            | Unstable Shape<br>44x42mm<br>H76mm | <br>No change | <br>Some deformation | <br>Deformation      | <br>Deformation      |
| MH-100 CL  | Unstable Shape<br>44x42mm<br>H76mm | <br>No change | <br>No change        | <br>Some deformation | <br>Some deformation |



# 6. Ink and molding characteristics: color bleeding, streaking on top surface

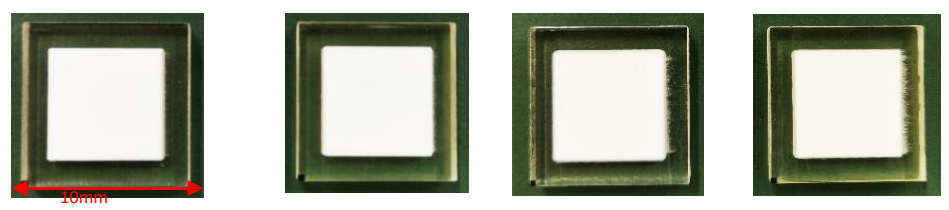
## 1. Bleeding color

- The MH-110PCL clear model is prone to "color bleeding" in areas where the clear and color designs overlap.
- Bleeding is reduced by selecting "Color In Clear" modeling mode

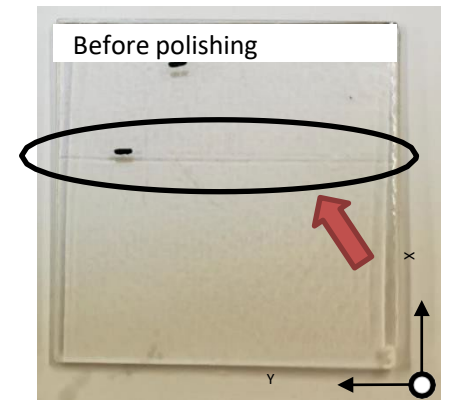
## 2. Stripes on the top surface

- MH-110PCL is prone to streaking on the top surface of the workpiece due to rolling motion during modeling
- Streaks can be eliminated by polishing

| Modeling Mode   | Color in Clear |            | Standard  |            |           |
|---|----------------|------------|-----------|------------|-----------|
|   | Clear Ink      | MH-110 PCL | MH-100 CL | MH-110 PCL | MH-100 CL |
| Color bleeding<br>Enlarged view<br>(Right side of the object)<br><br>Magnification: x12 |                |            |           |            |           |



1. Color bleeding of modeled object (10mm size portion of modeled object is enlarged)



2. Polished surface of the top side of the model

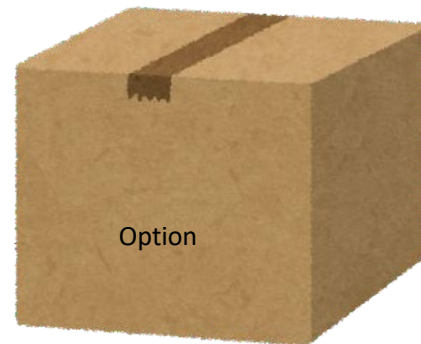
## 7. Required options

- The following preparations are required to install the MH-110PCL on both, the existing and new installations of 3DUJ-553.

1. Ink: MH-110PCL Purchase
2. Option: OPT-J0510 PCL compatibility kit purchase
3. Machine setup: OPT-J0510 installation by Mimaki Authorized Partner.



1. MH-110PCL



2. OPT-J0510 PCL



3. Machine Setup



## 8. Competitive comparison (Stratasys VeroUltraClear)

- Stratasys J850 with "VeroUltraClear ink" is a direct competitor to the 3DUJ-553 as a 3D printer that can model full color and clear transparent.
- Features of MH-100PCL
  1. MH-110PCL transparency is equal to VeroUltraClear
  2. MH-110PCL can be combined with clear and color expression to create the same expression as VeroUltraClear
  3. The lower cost of the MH-110PCL ink makes the 3DUJ-553 about 30% cheaper than Stratasys J850

|  | Mimaki MH-110PCL  | Stratasys VeroUltraClear  |
|--|---|---|
| 1. Transparency                        | Both are equally transparent  |   |
| Post-treatment: with Light irradiation | Both increase transparency by light irradiation treatment.  |   |
| Post-treatment: Polishing              | Unpolished state: Acceptable<br>Layer lines are noticeable (Figure 1)   | Unpolished state: OK<br>The "gloss modeling mode" makes the layer lines less noticeable (Figure 1). |
|  | Both require a post-treatment such as polishing to maximize surface shine.<br>After polishing, both inks have the same level of transparency (Figure 2) |   |
| 2. Color + Clear Color in Clear        | OK<br>Can be combined with full- color representation in more than 10 million colors  | Acceptable<br>Can be combined with full color representation in over 500,000 colors                 |
| Model Characteristics                  | At low temperatures: OK<br>At high temperatures: NG (when shape design is deformable)   | At low temperatures: OK<br>At low temperatures: Acceptable  |
| 3. Modeling Cost                       | OK<br>Transparent and vivid color expression is possible at low modeling costs.   | Acceptable  |

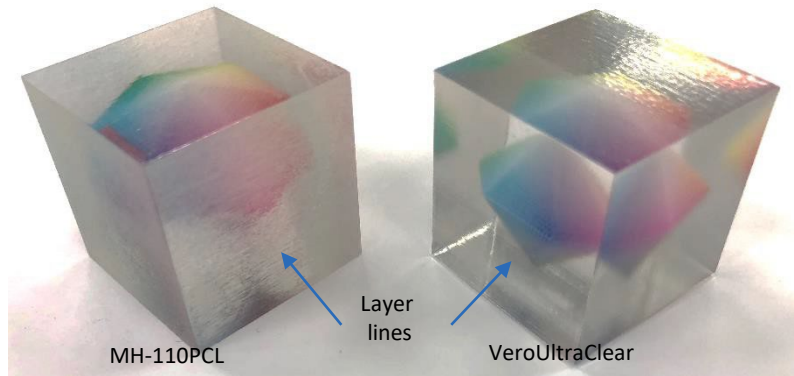


Figure 1. before polishing

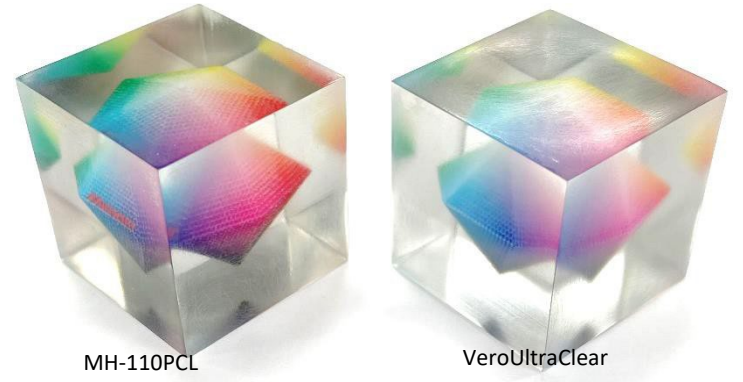
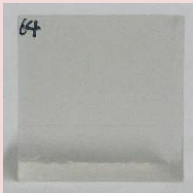

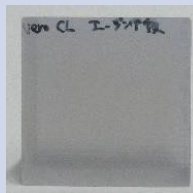
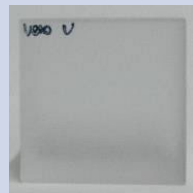


Figure 2. after polishing

MH-110PCL is more prone to deformation at high temperatures than VeroUltraClear.

## 8. Competitive comparison (Stratasys VeroUltraClear)

- At room temperature (ambient 25°C), MH-110PCL has comparable hardness to that of VeroUltraClear
- MH-110PCL and MH-100CL are more prone to deformation in high temperature environments.

|  |   | Mimaki<br>MH-110PCL   | Mimaki<br>MH-100CL   | Stratasys<br>Vero Clear   | Stratasys<br>Vero Ultra Clear   | Mimaki<br>MH-100W |
|--|---|---|--|---|---|-------------------|
| Photograph of model *After aging       |   |  |  |  |  | —                 |
| Tint                                   | Appearance after aging<br>(Internal research) | clear   | yellowish  | bluish  | clear   | —                 |
| Tensile test                           | Strength (MPa)                                | 35-45   | 5.9  | 50-65   | 39-43   | 15-60             |
|  | Elongation rate (%)<br>※ Elongation at break  | 10-90   | 23.6   | 10-25   | 20-35   | 1-7               |
| Flexural test                          | Strength (MPa)                                | 45-75   | 2.5  | 75-110  | 58-72   | 25-85             |
|  | Modulus of elasticity (MPa)                   | 1400-2600   | 33   | 2200-3200   | 1900-2300   | 1000-2400         |
| Impact test                            | Charpy Strength (kJ/m <sup>2</sup> )          | 1.9-1.5   | 4.2  | —   | —   | 1.0-3.0           |
|  | Izod strength (J/m)                           | —   | —  | 20-30   | 20-30   | —                 |
| Deflection temperature under load (°C) |   | 30-50   | Not measurable<br>(Bends at room temperature)                                      | 45-50   | 47-49   | 40-55             |
| Shore D hardness                       |   | 75-90   | 55.3   | 83-86   | 80-85   | 75-90             |

### Strength data is quoted from the manufacturer's catalog.

- The test standards are different because the test conditions differ. Refer to the numerical value equations for reference information.

Mimaki: JIS standard (ISO compliant)  
Stratasys: ASTM standard.

- The comparison and obtained results are no guarantee as the test methods are different.  
Temperature for tensile test, bend test, impact test and Shore D hardness: 25°C

The stated values are for reference only and are not a guarantee.

|                                   | ISO measurement method (JIS)  | ASTM Method  |
|-----------------------------------|---|--|
| Tensile strength test             | Test Specimen: ISO 527-1 ISO Multipurpose Test Specimen<br>Testing speed: 50mm/min  | Specimen: ASTM D638 ASTM No. 1<br>Specimen Test Speed: 5mm/min   |
| Flexural Test                     | ISO 178<br>Specimen: 80×10×4mmt<br>Testing speed: 2mm/min   | ASTM D790<br>Specimen: 127 x 12.7 x 6.4mmt Testing speed 2.5 mm/min Unit kg/cm <sup>2</sup>                                |
| Impact strength (notch side)      | ISO 179 <Charpy impact test><br>Test specimen : 80×10×4mmt notch Hammer speed: 2.9m/s (0.5~5J)<br>※ Impact on the horizontal, anti-notch side | ASTM D256 <Izod impact test><br>Specimen: 63.5 x 12.7 x 6.4mmt Notch hammer speed: 3.46m/s* Vertical, impact on notch side |
| Deflection temperature under load | ISO 751-1<br>Test piece: 80×10×4mmt Unit °C Testing method: Flatwise  | ASTM D648<br>Specimen: 127 x 12.7 x 6.4mmt Testing method: Edgewise  |



## 8. Competitive comparison (Stratasys VeroUltraClear)

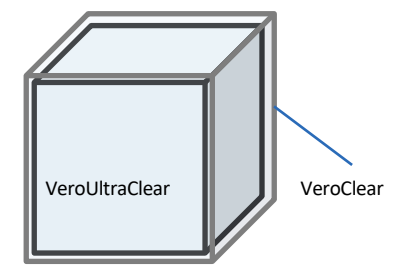
- Mimaki 3DUJ-553 produces vivid colors and transparency with a combination of more than 10 million colors and MH-110PCL clear ink at lower ink consumption.
- Note:
  - Stratasys has some specialty applications that cannot be met with 3DUJ-553 due to biocompatible and flexible inks, such as applications that adhere to the human body or for applications such as surgical practice models.
  - However, with 3DUJ-553 it is possible to produce the medical models where appearance is more important at much lower ink cost compared to Stratasys.

Stratasys J850\_HighMIX mode(27μm)

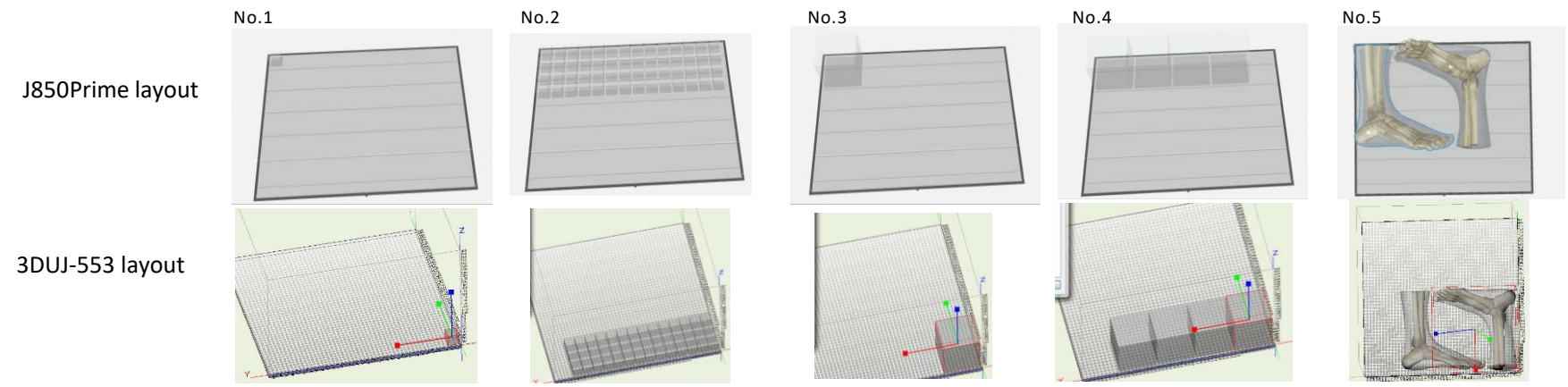
| No | Model               | Ink (ml) |       |       |       | C,M,Y,K | VeroCl | VeroUltraCl | W       | Sp      | Total Ink |
|----|---------------------|----------|-------|-------|-------|---------|--------|-------------|---------|---------|-----------|
|    |                     | Y        | M     | C     | K     |         |        |             |         |         |           |
| 1  | 30mm ClearCube x 1  | 4.0      | 4.0   | 4.0   | 4.0   | 16.0    | 9.0    | 38.0        | 5.0     | 6.0     | 74.0      |
| 2  | 30mm ClearCube x 56 | 22.0     | 22.0  | 22.0  | 22.0  | 88.0    | 301.0  | 1,942.0     | 62.0    | 134.0   | 2,527.0   |
| 3  | 100mm ClearCube x 1 | 32.0     | 32.0  | 32.0  | 32.0  | 128.0   | 82.0   | 1,432.0     | 39.0    | 53.0    | 1,734.0   |
| 4  | 100mm ClearCube x 4 | 45.0     | 45.0  | 45.0  | 45.0  | 180.0   | 246.0  | 5,655.0     | 75.0    | 131.0   | 6,287.0   |
| 5  | 270mm foot x2       | 225.0    | 216.0 | 276.0 | 234.0 | 951.0   | 529.0  | 2,890.0     | 1,680.0 | 1,682.0 | 7,732.0   |

Mimaki 3DUJ-553\_High Quality mode(22μm) PCL

| No | Model               | Ink (ml) |      |      |      | C,M,Y,K | CL   | PCL     | W       | Sp      | Total Ink |
|----|---------------------|----------|------|------|------|---------|------|---------|---------|---------|-----------|
|    |                     | Y        | M    | C    | K    |         |      |         |         |         |           |
| 1  | 30mm ClearCube x 1  | 1.4      | 1.4  | 1.4  | 1.4  | 5.7     | 2.6  | 41.4    | 1.4     | 17.1    | 68.2      |
| 2  | 30mm ClearCube x 56 | 4.1      | 4.1  | 4.1  | 4.1  | 16.3    | 4.1  | 2,171.0 | 4.1     | 612.3   | 2,807.7   |
| 3  | 100mm ClearCube x 1 | 11.7     | 10.5 | 10.5 | 10.5 | 43.2    | 11.7 | 1,445.1 | 11.7    | 228.3   | 1,740.0   |
| 4  | 100mm ClearCube x 4 | 11.7     | 11.7 | 11.7 | 11.7 | 46.8    | 11.7 | 5,744.3 | 11.7    | 702.1   | 6,516.5   |
| 5  | 270mm foot x2       | 22.9     | 22.9 | 22.9 | 21.8 | 90.5    | 55.6 | 3,381.2 | 1,440.1 | 2,742.8 | 7,710.4   |



Model's surface produced with J850 VeroUltraClear ink **requires** additional coating layer with VeroClear ink



## Appendix: Example of MH-100CL/MH-110PCL Ink Usage

- The ink consumption when modelling with the MH-110PCL (CL + PCL) is slightly higher than when modeling only with the MH-100CL.

Comparison of modeling ink consumption

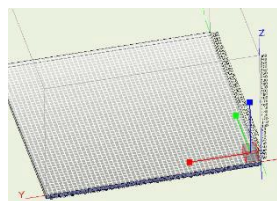
### Mimaki 3DUJ-553\_High Quality mode(22μm) PCL

| No | Model               | Ink (ml) |      |      |      | C,M,Y,K | CL   | PCL     | W       | Sp      | Total Ink |
|----|---------------------|----------|------|------|------|---------|------|---------|---------|---------|-----------|
|    |                     | Y        | M    | C    | K    |         |      |         |         |         |           |
| 1  | 30mm ClearCube x 1  | 1.4      | 1.4  | 1.4  | 1.4  | 5.7     | 2.6  | 41.4    | 1.4     | 17.1    | 68.2      |
| 2  | 30mm ClearCube x 56 | 4.1      | 4.1  | 4.1  | 4.1  | 16.3    | 4.1  | 2,171.0 | 4.1     | 612.3   | 2,807.7   |
| 3  | 100mm ClearCube x 1 | 11.7     | 10.5 | 10.5 | 10.5 | 43.2    | 11.7 | 1,445.1 | 11.7    | 228.3   | 1,740.0   |
| 4  | 100mm ClearCube x 4 | 11.7     | 11.7 | 11.7 | 11.7 | 46.8    | 11.7 | 5,744.3 | 11.7    | 702.1   | 6,516.5   |
| 5  | 270mm foot x2       | 22.9     | 22.9 | 22.9 | 21.8 | 90.5    | 55.6 | 3,381.2 | 1,440.1 | 2,742.8 | 7,710.4   |

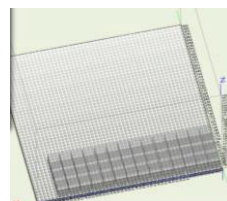
### Mimaki 3DUJ-553\_High Quality mode(22μm) CL

| No | Model               | Ink (ml) |      |      |      | C,M,Y,K | CL      | PCL  | W       | Sp      | Total Ink |
|----|---------------------|----------|------|------|------|---------|---------|------|---------|---------|-----------|
|    |                     | Y        | M    | C    | K    |         |         |      |         |         |           |
| 1  | 30mm ClearCube x 1  | 1.4      | 1.4  | 1.4  | 1.4  | 5.7     | 39.6    | 2.7  | 1.4     | 17.1    | 66.4      |
| 2  | 30mm ClearCube x 56 | 4.1      | 4.1  | 4.1  | 4.1  | 16.3    | 2,075.0 | 4.2  | 4.1     | 612.3   | 2,711.9   |
| 3  | 100mm ClearCube x 1 | 11.7     | 10.5 | 10.5 | 10.5 | 43.2    | 1,381.3 | 12.1 | 11.7    | 228.3   | 1,676.6   |
| 4  | 100mm ClearCube x 4 | 11.7     | 11.7 | 11.7 | 11.7 | 46.8    | 5,490.3 | 12.1 | 11.7    | 702.1   | 6,262.9   |
| 5  | 270mm foot x2       | 22.9     | 22.9 | 22.9 | 21.8 | 90.5    | 3,265.1 | 23.1 | 1,440.1 | 2,742.8 | 7,561.8   |

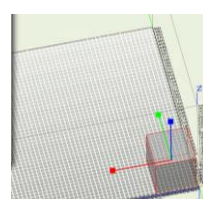
No.1



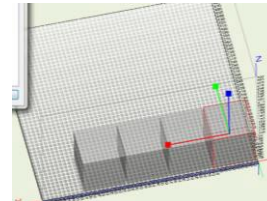
No.2



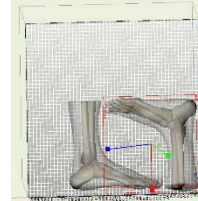
No.3



No.4










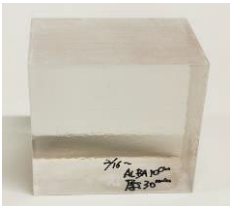




No.5



Mimaki  
3DUJ-553  
layout

## Appendix: Change in color tone over time

- In post-curing process by UV-light irradiation with fluorescent lamps (P11), the more effective reduction of the yellowish tint will be achieved by keeping the distance between the lamp and the molding object as small as possible.
- Notice:
  - The surface temperature of the object rises due to the heat of the lamp, so be careful not to distort the object with a delicate shape.
  - Find the optimal distance between the lamp and the object to minimize the surface temperature and reduce the yellowish tint.

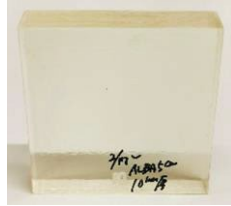





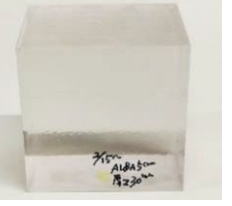
| Distance between light and object                                   | Initial   | After 8h of irradiation   | After 24h of irradiation  | After 48h of irradiation  |
|---|---|---|---|---|
| <b>5cm</b><br>Sample surface temperature<br>Approx. 45°C            |    |    |    |    |
| <b>10cm</b><br>Sample surface temperature<br>Approx. 30°C           |   |   |   |   |
| <b>Reference without irradiation</b><br>Storage temperature<br>25°C |  |  |  |  |

Model thickness: 30mm

The results shown are for reference only and are not guaranteed.

## Appendix: Change in color tone over time

- Post-treatment by UV-light irradiation using fluorescent lamps tends to take more time with a thicker object.

| Model Thickness | Initial  | After 8h of irradiation   | After 24h of irradiation  | After 48h of irradiation  |
|-----------------|--|---|---|---|
| 6mm             |    |    |    |    |
| 10mm            |    |    |    |    |
| 20mm            |   |   |   |   |
| 30mm            |  |  |  |  |

The results shown are for reference only and are not guaranteed.

Distance between light and object: 5cm



## Appendix

- Supplies
- Safety of UV inks (MH/SW series)
- FAQ

## Supplies

- Ink

| Part No.     | Description                         | Volume  | Packaging | Remarks |
|--------------|-------------------------------------|---------|-----------|---------|
| MH110-PCL-BD | 3D MODEL INK MH-110 4.8L BOTTLE PCL | 4,800ml | Bottle    |         |

- Options

| Part No.      | Description           | Remarks  |
|---------------|-----------------------|--|
| OPT-J0510 PCL | PCL Compatibility Kit | Required for new or existing installation of 3DUJ-553 with the MH-100PCL ink |

## FAQ

|   | Question   | Answer   |
|---|--|--|
| 1 | Is there any detail to be aware of when replacing a SP ink set to MH-110PCL? | Since the maximum amount of SP ink is reduced (from 2 bottles: 9.6L to 1 bottle: 4.8L), it is necessary to pay attention to the remaining amount of SP ink bottles when creating models that use a large amount of support material. |
| 2 |  | Warranty conditions for SP heads remain unchanged.   |
| 3 | Are there any additional environment requirements when using MH-110PCL       | No   |
| 4 | MH-110PCL outdoor lightfastness  | Avoid placing in direct sunlight to prevent yellowing over the time.<br>Please refer to the Application Notes for information on outdoor lightfastness, including how to take mitigating measures with topcoat.                      |

## Appendix: Safety of UV inks (MH/SW series)

- Uncured ink components harmful to the human body may still remain in the modeled object.
- Therefore, be careful when using objects for prototyping purposes when the objects may come into direct contact with the human body or be accidentally swallowed.
- When exporting modeled products, check the laws and regulations of each country and confirm in advance that the product complies with such regulations.
  
- Examples of applications of objects requiring attention
  1. Food packaging and other items that can be swallowed
  2. Toys and other objects that children can put in their mouths
  3. Items that may come into direct contact with the human body, such as clothing
  4. Items that can adhere to the human body, such as medical items



