cara

CARA PRINT SYSTEM

APPLICATION GUIDE

FOR CARA PRINT 4.0 PRO // CARA PRINT CLEAN PRO CARA PRINT LEDCURE

Version 05.2022

KULZER
MITSUI CHEMICALS GROUP

VALIDATED, EFFICIENT, SIMPLE

3D-PRINTING PRO SOLUTION

VALIDATED WORKFLOW
KULZER

1 IMPORT
Just 10 seconds: from import to final printed file!*
cara CAM 2.0

2 SELECT
Select a resin for a variety of indications.
dima Print materials

3 PRINT
Start printing in an easy & efficient way.
cara Print 4.0 pro

4 CLEAN
Automate your post-processing with hands-free cleaning.
cara Print Clean pro

5 CURE
Fast curing process thanks to the smart air heating system.
cara Print LEDcure

*e.g. using cara CAM 2.0, dima Print C&B temp, 6-unit anterior bridge.

Contents

Equipment you need

Design Software
CAD Software, such as 3shape or exocad (which generate .stl output files)

Print Materials
dima Print

3D printer
cara Print 4.0 pro or cara Print 4.0

Wash unit
cara Print Clean pro or ultra sonic bath

Post curing unit
cara Print LEDcure or HiLite power 3D

Extra equipment
- Nitril gloves
- Protective eye wear
- Appropriate protecting clothing

SAFETY WARNING:
ALWAYS USE PROTECTIVE NITRILE GLOVES, PROTECTIVE EYEWEAR AND APPROPRIATE PROTECTIVE CLOTHING WHEN WORKING WITH MONOMERIC LIQUIDS AND ISOPROPANOL. DO NOT INHALE THE VAPORS AND AVOID SKIN CONTACT.

1. Review of STL files

THE 3SHAPE MATERIALS FILE FOR DIMA PRINT MATERIALS IS AVAILABLE VIA DOWNLOAD:

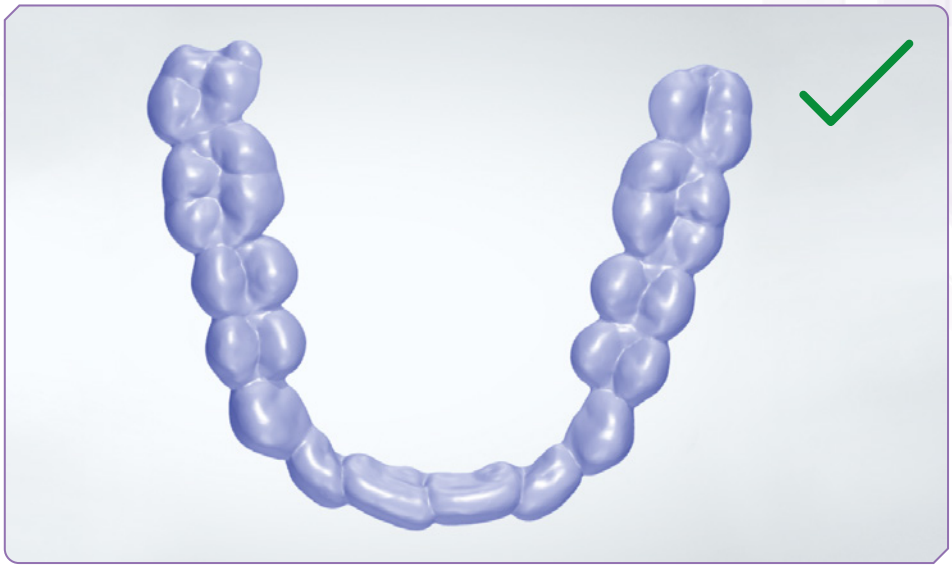
ALL APPROVED MATERIALS ARE ALREADY STORED IN THE EXOCAD (EXOPRINT) SOFTWARE.

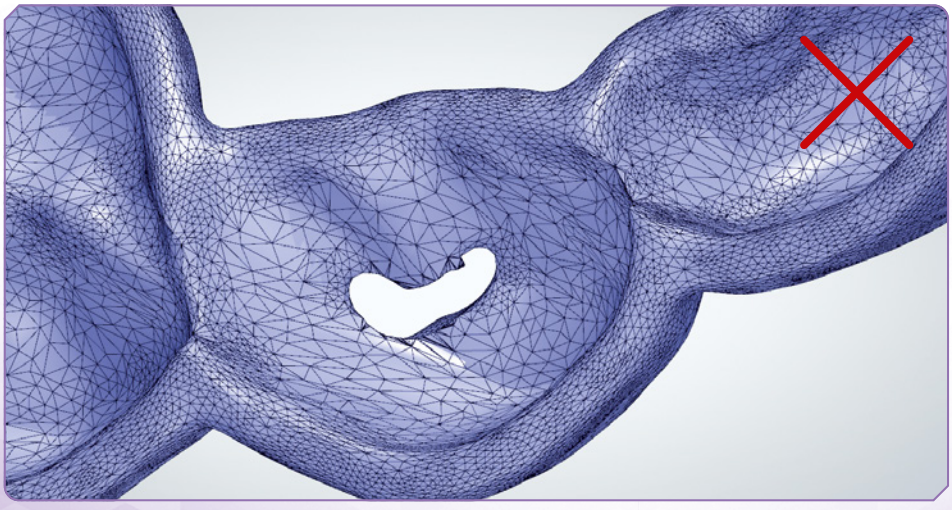
WWW.KULZER.COM/
CARA-PRINT-3SHAPE-DME

Construction and design guidelines:

It is critically important to review all files prior to printing and to ensure that they are completely free of errors, visible or otherwise. Please always check the mesh visually to ensure that the structure is truly “closed”. If it is not, the file must be adjusted using your CAD software.

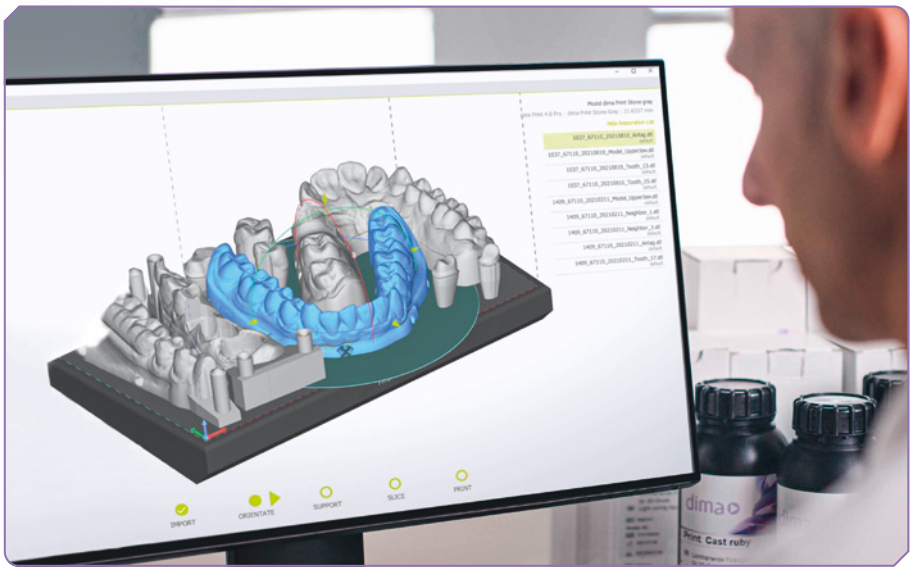
The surfaces of structures to be printed must be as smooth as possible. If there are any mesh problems (i.e. self-intersections, open faces or inverted triangles), please repair them or, if needed, smooth the surface again.





2. Positioning

With CAM 2.0 most of the settings are generated automatically. After automatic calculation by the CAM software, please double check the right positioning.
Overlapping areas should be strictly avoided.

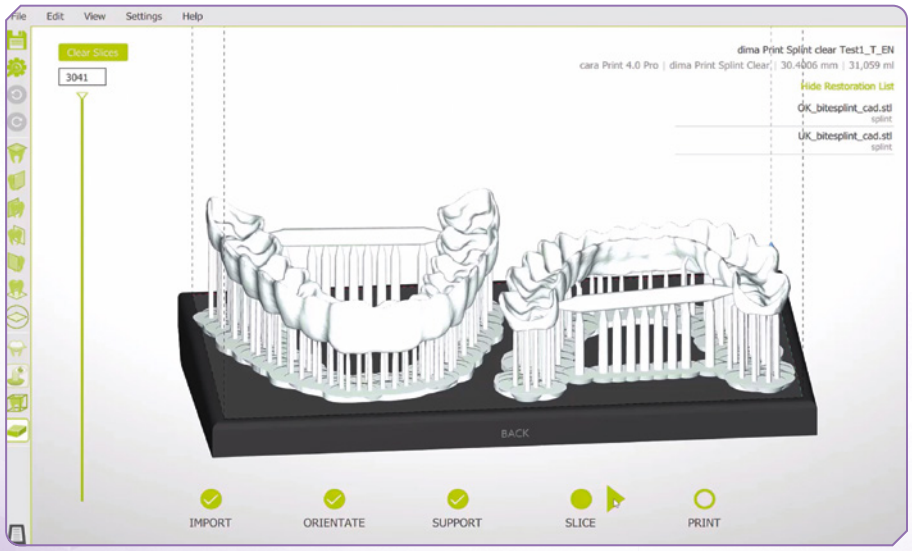


3. CAM notes: cara Print CAM 2.0

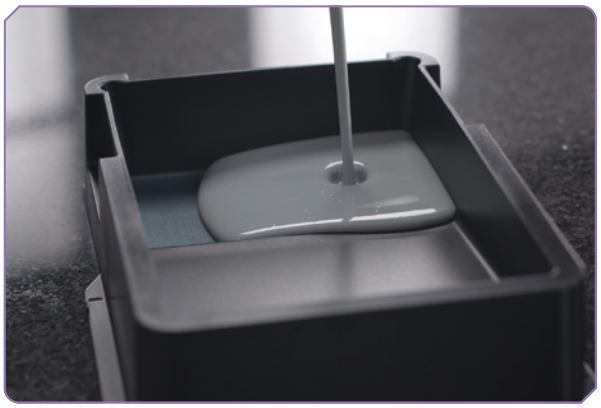
For further instructions regarding cara Print CAM 2.0, please refer to the Instructions For Use (IFU):
www.kulzer.qarad.eifu.online/Kulzer
Training videos are available here:

WWW.KULZER.COM/
3DP-TUTORIALS

WWW.KULZER.COM/
CARAPRINT-REGISTER

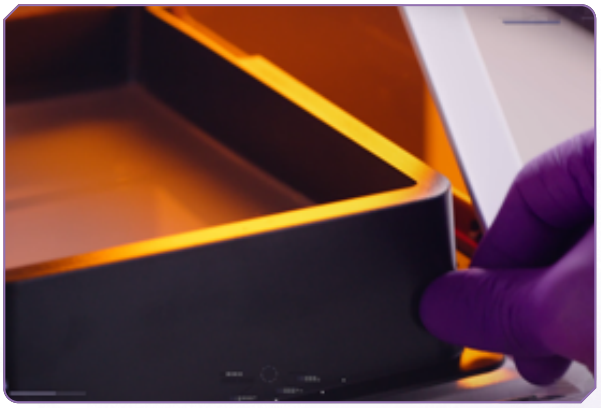


4. 3D printer: cara Print 4.0 pro



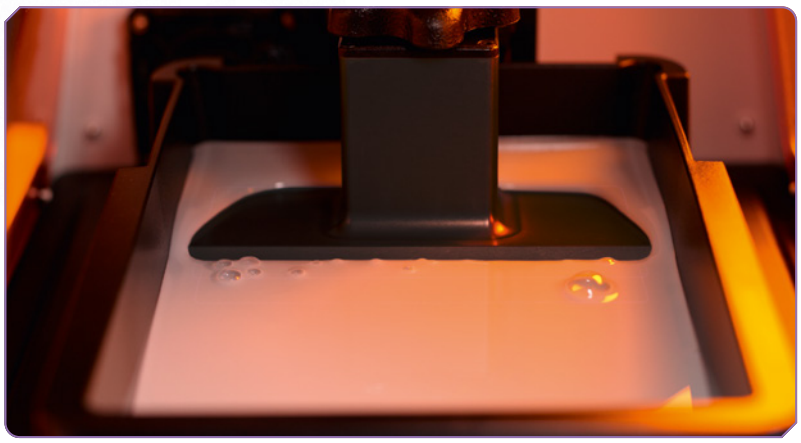
3D print process – filling the resin tray

Please always check, how much photopolymer you have in the tray: Never use too much or too little of a photopolymer. Always fill the photopolymer up to the MAX line (approximately 250–300 ml). Shake the dima Print material vigorously before use if requested in the material IFU.



Always make sure that the windows inside the printer are free of dust and dirt.

Adding a sufficient amount of photopolymer will help to ensure that bubbles are pushed out of the way when the building platform sinks down to the required level.



IF THE TRAY DOES NOT HAVE ENOUGH PHOTOPOLYMER, THE PRINTED OBJECT WILL CONTAIN FAULTS OR THE PROCESS WILL BE INTERRUPTED, RESULTING IN AN INCOMPLETE PRINT.

Before starting a print, it is always necessary to check the building platform and the tray. Clean the building platform thoroughly using isopropanol to remove all monomeric residues.

Furthermore, always check that the monomer used is homogeneous and, if necessary, stir it using the silicone spatula provided.

IF ANY POLYMERIZED FRAGMENTS ARE LEFT IN THE TRAY OR ON THE BUILDING PLATFORM FROM A PREVIOUS PRINT, THIS CAN DAMAGE THE FOIL OF THE TRAY. THIS FOIL, WHICH IS LOCATED ON THE TOP OF THE PROJECTOR WINDOW, CAN BE EASILY SCRATCHED. IT SHOULD BE CLEANED USING THE UTMOST CARE, AND SHOULD ONLY BE TOUCHED IN EXCEPTIONAL CAREFULNESS. IT WILL NO LONGER BE POSSIBLE TO MAKE PERFECT PRINTS IF THIS LAYER GETS DAMAGED, AND THE ENTIRE TRAY WILL HAVE TO BE REPLACED.

5. Cleaning: cara Print Clean pro

We recommend using **cara Print Clean pro** to wash printing objects, but you can also use ultra-sonic bath. For more information, see the instructions of the cleaning unit and the specific material IFU.

FURTHER INFORMATION ON CARA PRINT CLEAN PRO:

WWW.KULZER.COM/CLEANPRO

Cleaning printing objects with ultrasonic bath

You can still use an ultrasonic dental cleaner together with two separate containers for the isopropanol cleaning solution (one for pre-cleaning, one for post-cleaning). Avoid any mixing of cleaning solutions used for different materials (cross-contamination, medical devices).

Do not close the cleaning containers completely. Just lay the lids loosely on top. We recommend carrying out every step of the cleaning process using a good fume hood or ventilated cabinet.

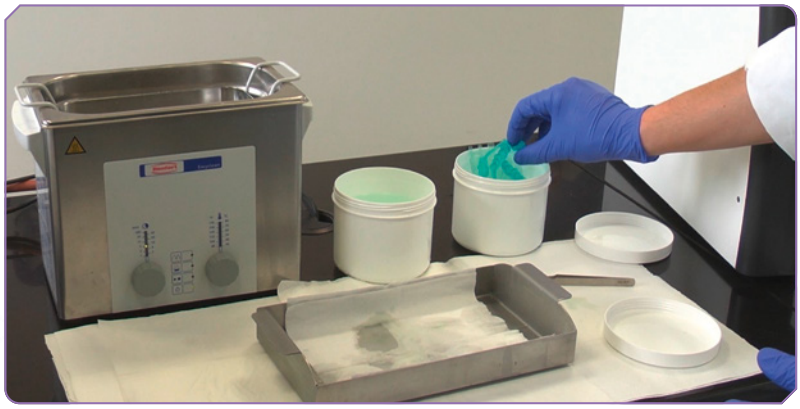
If the pieces contain long, thin indentations, the cleaning process can take longer.

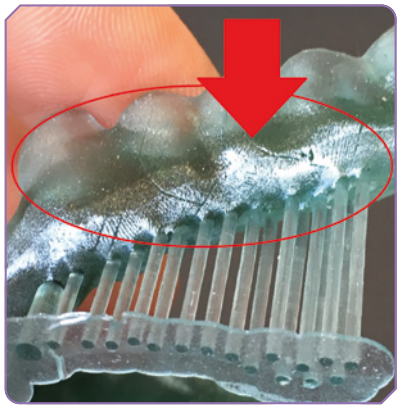
1. Carefully blow the pieces with pressurized air
2. 3 minute ultrasonic cleaning in container no. 1 (pre-cleaning)
3. Short drying/cleaning with pressurized air to remove any remaining monomer
4. 2 minute ultrasonic cleaning in container no. 2 (post-cleaning in fresh isopropanol)
5. Turn the pieces several times within the container for the best cleaning results
6. Dry with pressurized air

PLEASE NOTE THAT DIMA PRINT CAST RUBY NEEDS TO BE CLEANED DIFFERENTLY. PLEASE TAKE NOTICE OF THE INSTRUCTIONS FOR USE FOR EACH MATERIAL.

Avoid letting the isopropanol get warm. You can avoid this by regularly replacing the water in the ultrasonic cleaner with cold water. If any residue remains on the object after cleaning, we recommend repeating the cleaning process from step 4 above, using fresh isopropanol. The pieces should not remain submerged within the isopropanol for longer than described above. If left in isopropanol for too long, the pieces could begin to dissolve and absorb isopropanol (see the right picture below).

! **PLEASE FOLLOW STANDARD SAFETY PRECAUTIONS WHEN USING, STORING AND DISPOSING OF ISOPROPANOL AND ISOPROPANOL BASED SOLUTIONS. IF YOU HAVE ANY QUESTIONS RELATED TO STORAGE AND DISPOSAL, CONTACT YOUR ISOPROPANOL SUPPLIER.**





After cleaning, it is necessary to post-cure the printed pieces. Post-curing (post-exposure) is important, because it ensures the hardness and stability needed for dental applications and their biocompatibility.

Cleaning of the vat

The two resin trays provided with **cara Print 4.0 pro** can be filled and used with different materials. It is possible to store the light-curing material inside the tray on a temporary basis by closing it completely with the black silicone cover.

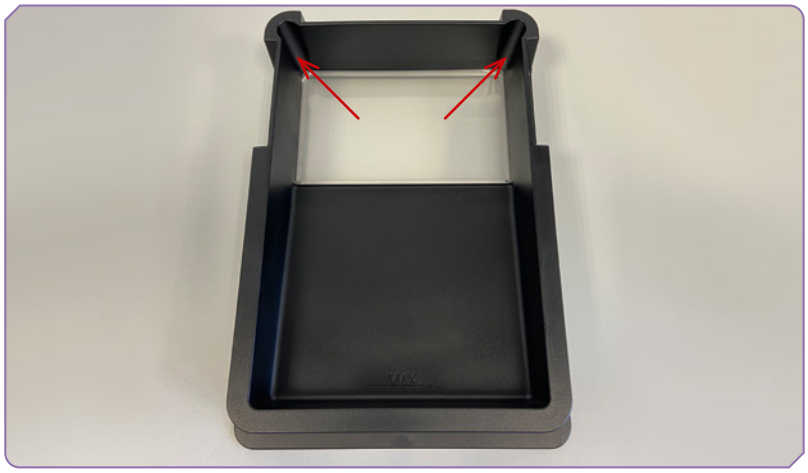
It is possible to store the light-curing material inside the tray on a temporary basis by closing it completely with the black silicone cover. If a resin has to sit for more than 12 hours, we recommend pouring it back into its original bottle using the supplied funnel and attached sieve.

KEY PRINCIPLE:
THE INSIDE OF THE VAT AND THE SURFACE OF THE ILLUMINATION WINDOW, WHICH IS HIGHLY SENSITIVE TO SCRATCHING, MUST ONLY BE TOUCHED USING THE PROVIDED SILICON SPATULA AND LINT-FREE, SOFT PAPER TOWELS SOAKED IN ISOPROPANOL.

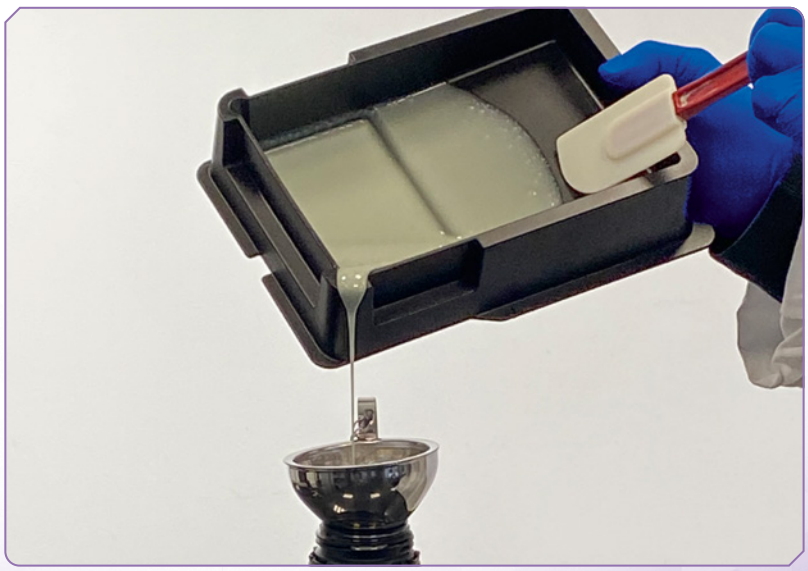
IMPORTANT NOTICE:
TO RULE OUT CONTAMINATION (CROSS-CONTAMINATION) OF DIFFERENT SUBSTANCES, USE A SEPARATE VAT (SUBSTANCE TRAY) FOR EACH SUBSTANCE YOU PLAN TO USE IN THE MANUFACTURE OF MEDICAL DEVICES. THAT IS THE ONLY WAY TO GUARANTEE THAT YOUR MEDICAL DEVICES ARE 100 % BIOCOMPATIBLE.

Recommended procedure:

1. Use one of the top corners of the vat to pour the remaining resin back into the appropriate dima Print bottle. Use the provided sieve in the funnel to filter the resin. Remove as much of the resin as possible using the silicone spatula.



2. Remove the remaining resin from the vat using a lint-free, soft paper towel soaked in clean isopropanol. Repeat this step several times until the vat is completely free of resin.



3. Next, lay the vat on a flat, even surface and wet the illumination window completely with isopropanol. Gently lift the print tray to drain the isopropanol over one of the upper corners. The illumination window should then be free of resin. If needed, blow off any remaining isopropanol using compressed air. Do not forget that the underside of the illumination window must also remain completely streak-free. Handle and clean it with equal care.

What should be done if printed objects are sticking to the illumination window?

Recommended procedure:

1. Clean the vat and illumination window as described above (points 1–2).
2. Fill the vat with enough isopropanol to cover the smudged illumination window.
3. Close the vat with its lid and let it sit for approx. 10 minutes. Drain the isopropanol over one of the upper corners.
4. Try to remove any stuck material with the silicone spatula or, if needed, compressed air. Protect your eyes!
5. Continue as described in point 3.

KEY PRINCIPLE:
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6. Curing: cara Print LEDcure

Flexible, easy, reliable post-curing for all 3D resins

- **Air heating system:** Fast curing process thanks to the smart air heating system & high-powered LEDs
- **No flipping of 3D-printed objects:** Thanks to fully mirrored illumination chamber & transparent turntable
- **Flexible programs:** Preset post-curing programs and individual settings

! THE FINAL MATERIAL PROPERTIES LIKE SHADE, STABILITY AND BIOCOMPATIBILITY ARE DEPENDING ON THE CORRECT POST-CURING PROCEDURE.

Steps:

1. Place the 3D-printed object in the post-curing device
2. Select the specific dima Print program

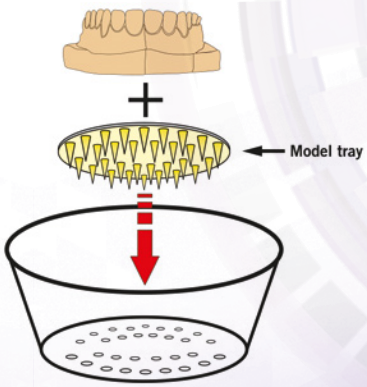
We generally recommend cara Print LEDcure for all 3D printing Kulzer materials.

HiLite power 3D

WWW.KULZER.COM/ HILITE-POWER-3D

When using HiLite power 3D, the objects need to be turned manually after half of the recommended curing time. For the exact post-curing times and conditions, always refer to the specific material IFUs and the individual material guides provided online.

We recommend to use the “model tray” (Article no. 66017525). This allows for the effective utilization of the full volume of the post-curing unit and its good ventilation. Carefully check the total height, as well as the x and y dimensions, to ensure clearance. If it won’t fit, you can use a cutting disc to separate the object into smaller components.



DIMA PRINT MATERIALS

DEVELOPED FOR INDIVIDUAL REQUIREMENTS

dima Print materials are light-curing monomers specially optimized for reliable results using the 3D-Printing pro Solution.

TESTED BY DENTAL EXPERTS

BROAD VARIETY OF INDICATIONS

IDEAL PROPERTIES FOR EACH INDICATION VISIT WWW.KULZER.COM/DIMA FOR A COMPLETE OVERVIEW.

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FURTHER INFORMATION CAN BE FOUND ON OUR WEBSITE

WWW.KULZER.COM/PRINTPRO

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