

APPLICATION NOTE

LuxaPrint Ortho Comfort NX

Validated workflow with DMG DentaMile

DMG

LuxaPrint Ortho Comfort NX

As stable as necessary. As soft as possible.

The unique material properties of LuxaPrint Ortho Comfort NX allow you to print bite splints that are doubly impressive. They are hard enough to withstand functional therapy yet also soft enough for your patients to feel comfortable wearing them.

Validated workflow with DMG DentaMile

In this application guide, we present our validated DentaMile workflow, which you can use to easily and reliably achieve a result that meets the high requirements of dental users in terms of stability, fit and biocompatibility.

The DentaMile bite splint workflow was developed at DMG according to strict criteria, and carefully tested in our digital application centre. Please follow the below process exactly. That way, you can rest assured that you always deliver work of the highest quality with maximum safety for your patients.



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Required equipment and resources

- **Scan**
  Digital scanner or optical desktop scanner
- **Design**
  Dental design software for creating splints (e.g. DMG DentaMile connect)
- **Print**
  Please use validated printing systems for printing LuxaPrint Ortho Flex NX, together with the associated cleaning and post-curing units, as well as print profiles that are stored in the system and validated.
  This is the only way that will you obtain biocompatible and safe medical devices with optimum properties.

You can find an up-to-date list of validated printing systems on our **DentaMile.com website**

Practical tip:

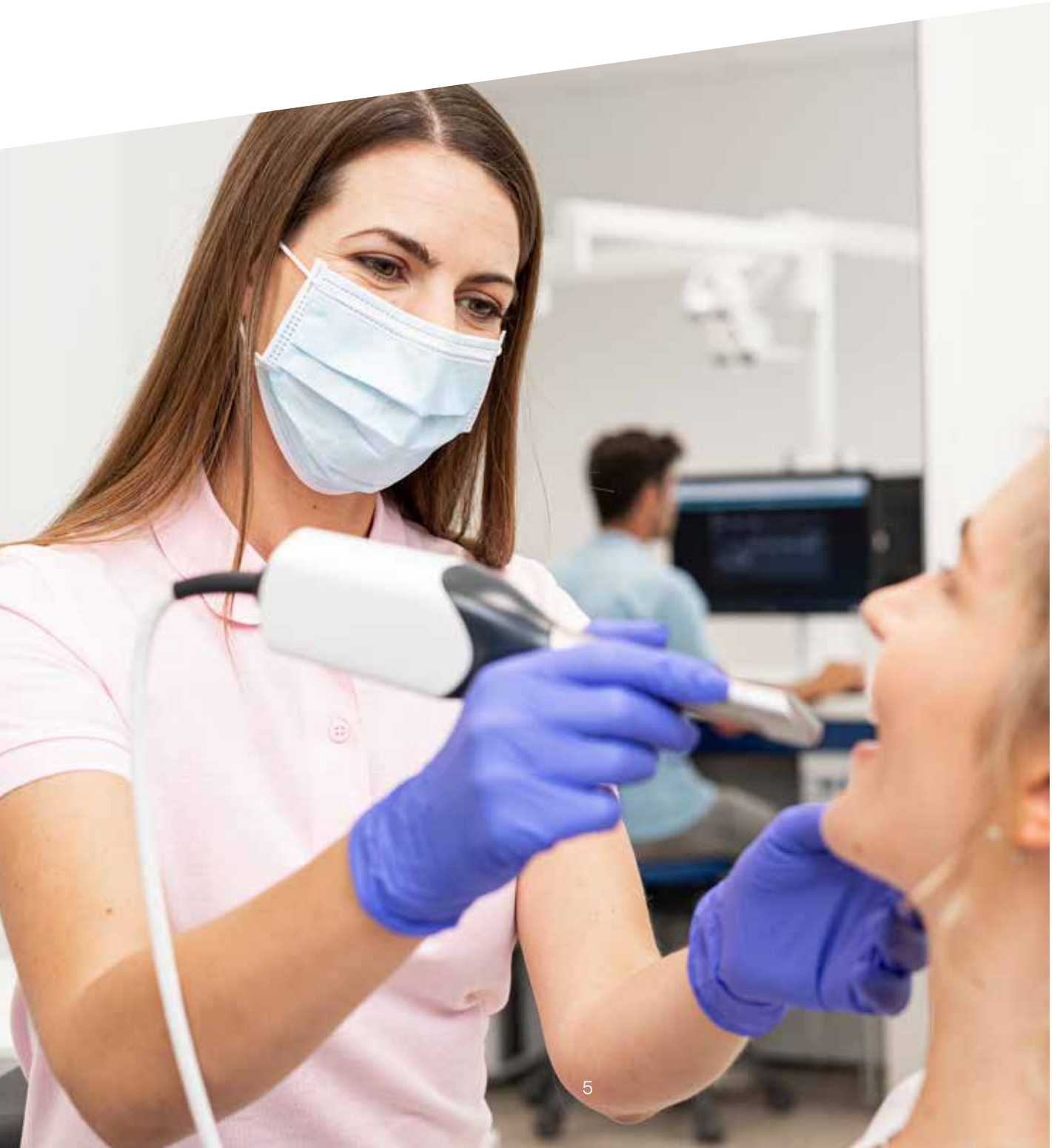
Please use validated printing systems for printing LuxaPrint Ortho Comfort NX, together with the associated cleaning and post-curing units, as well as print profiles that are stored in the system and validated. This is the only way that will you obtain biocompatible and safe medical devices with optimum properties.



1. Scan

In order to design a bite splint, you need a digital impression of the patient's dentition. To create one, scan the patient with a digital scanner in the dental clinic or scan a model or a physical impression with a lab scanner.

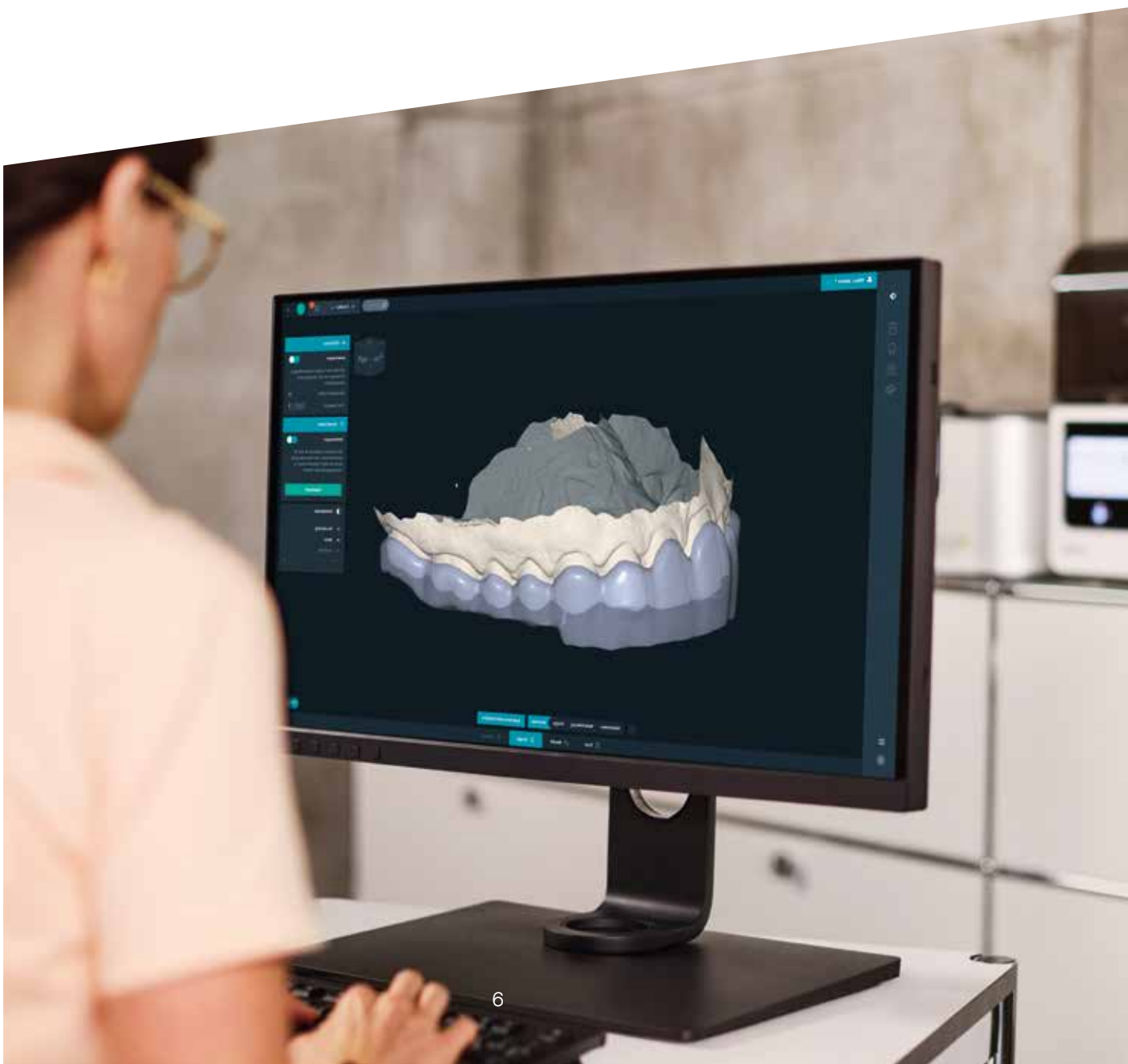
On the basis of this digital dentition, a bite splint is then designed with suitable dental design software.



2. Design

When it comes to designing splints, for dentists and dental technicians, the possibilities are endless. LuxaPrint Ortho Comfort NX offers an optimal solution for manufacturing bite splints used to treat bruxism and temporomandibular disorders. The material is characterised by its hardness and, at the same time, its slight flexibility, which means it meets the requirements of modern splints. The splints can be designed digitally and flexibly using any standard software.

LuxaPrint Ortho Comfort NX enables the manufacture of splints in all material thicknesses. Thinner designs in particular, i.e. from around 1.0 mm, see patients benefit from flexible and extremely comfortable splints. Adjusted bite splints and designs with greater wall thicknesses combine the advantages of traditional, hard splints, whilst remaining robust, unbreakable and comfortable to wear.



2.1 DentaMile connect

The DentaMile connect software's validated digital bite splint workflow enables the creation of precision-fit dental splints for a variety of purposes. Adjusted bite splints for the upper or lower jaw, grinding splints to treat bruxism or TMD bite splints? All of these are easily possible with just one patient session.

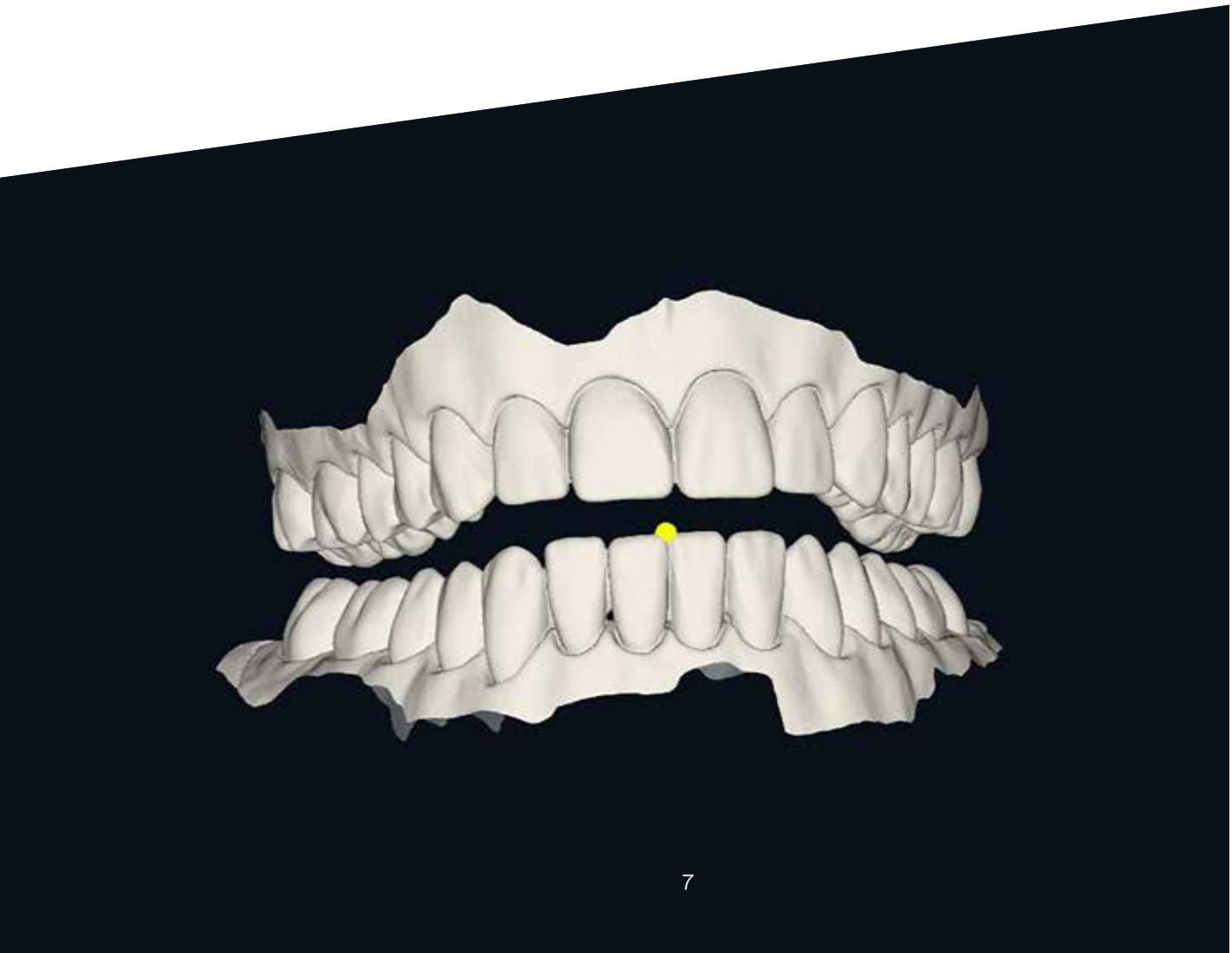
For extensive and up-to-date step-by-step instructions you can select the menu item 'Manual' in DentaMile connect directly or access the following link in your browser:
dentamile-connect-manual.com

2.2 Third-party software

There are various dental software solutions available for the digital design of bite splints, including 3Shape Dental System and exocad. Choose the software that best suits your personal preferences and requirements. Export it as an STL file in order to prepare it in the printer software for 3D printing.

2.3 DentaMile Design & Print Service

Don't have time to design yourself? No problem! Our DentaMile Design & Print Service can create the splint design in accordance with your specifications and you can then print it on your own system.



3. Print preparation

The digitally designed splint must now be imported in the printer software in order to prepare it for printing.

In this step, the splint is oriented in the build area of the 3D printer, provided with support structures and transferred to the printer.

3.1 DentaMile connect

With DentaMile connect from DMG, the splint is prepared for printing automatically in the cloud. The orientation, arrangement, adding of supports and transfer to your DMG 3D printer are all performed in a validated process in the background. Simply start the print job on your 3D printer.

Practical tip:

Please always ensure that the correct machine parameters and material parameters are used. Incorrect settings can lead to misprints and poor-fitting trays, as well as inadequate mechanical properties and a lack of biocompatibility.



3.2 Rapid Shape Print Studio

For the following printing systems:

- DMG DentaMile Desk RS-5
- DMG DentaMile Desk RS-1
- Rapid Shape PRO 20
- Rapid Shape ONE
- Straumann PRO20

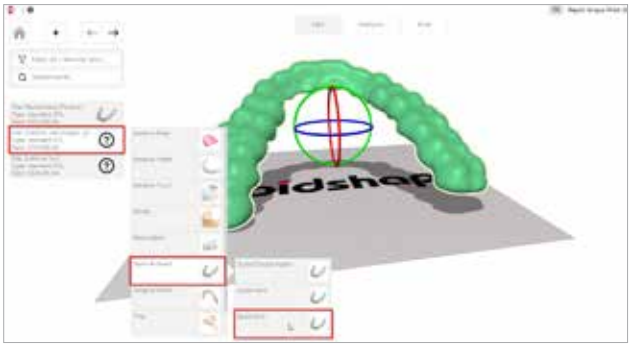
3.2.1 Preparing the Splints

Open RS Print Studio. Import your splints by simply dragging your files into the 3D view of the software or selecting them via the + icon.

Prepare the splints for printing by selecting the desired pieces on the left-hand side of the screen and specifying the relevant indication (“Splint & Guard” > “Splint Soft”). Repeat these steps for each individual splint.



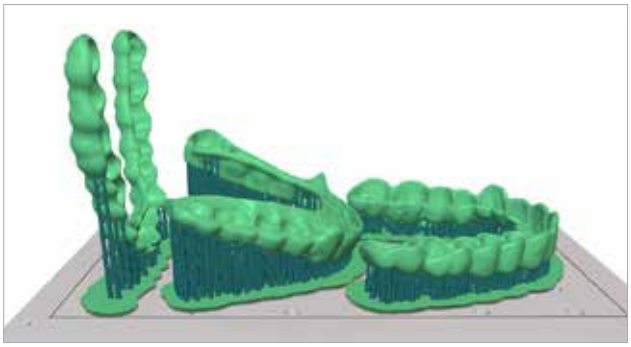
Importing STL files in Rapid Shape Print Studio



Selecting the indication in Rapid Shape Print Studio

3.2.1.1 Orientation

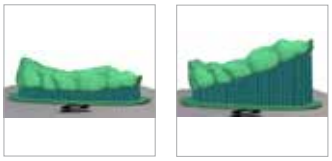
In this step, the desired orientation of the pieces can be specified. In many cases, the software recognises the splint based on the selected indication and automatically aligns it accordingly. Alternatively, the objects can be rotated manually using the mouse via the on-screen rings, or adjusted around a spatial axis in 90-degree increments or other angles via the “Orientation” menu option.



Alignment of the splints in Rapid Shape Print Studio (from left to right: 90°, 20°, 0°)

LuxaPrint Ortho Comfort NX can be printed in any orientation. For maximum precision and the shortest printing time, we recommend printing in a horizontal orientation (between 0° and 20°). Upright orientation is ideal for printing multiple splints and minimising the effort required to remove and finish off support residue.

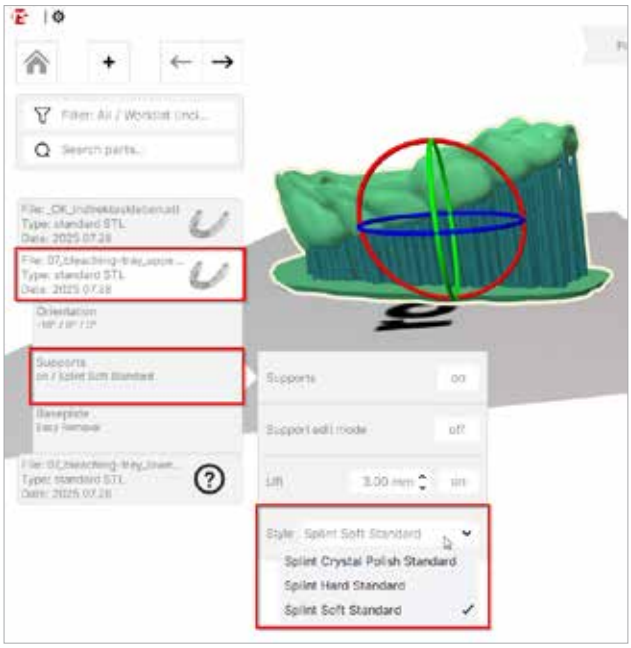
Recommended orientations:

Orientation	Benefits	Example
▸ Flat ▸ 0° to 20°	▸ Maximum accuracy ▸ Fastest printing time	
▸ Upright ▸ 80° to 90°	▸ Largest number of trays per print job ▸ Least effort required to grind away support residue	
▸ Crystal Polish ▸ Tilted 70° and rotated 30° around the z-axis	▸ Best results with the Crystal Polish bath	
▸ Flat on the molars ▸ -10° to -15°	▸ Avoids horizontal lines on the trays	

3.2.1.2 Editing support structures

Print Studio automatically generates the appropriate support structures depending on the splint indication. For soft splints, the “Splint Soft Standard” script is used; this is optimised for these materials and usually works without any issues. To change the support script, click on the desired piece and adjust the “Style” in the “Supports” menu.

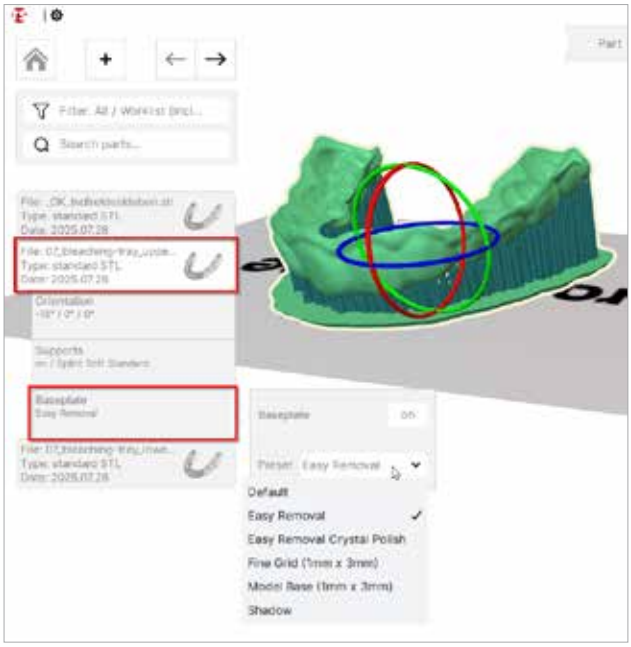
There is generally no need to remove or add individual support bars. If you would like to add or remove individual bars, click on the “Support” sub-item and activate “Support edit mode”. Left-clicking with the mouse allows you to remove existing support bars or add new ones.



Selecting the support script in Rapid Shape Print Studio

3.2.1.3 Baseplate

Print Studio automatically adds a suitable baseplate to the tray. The baseplate can be deactivated, or a different shape selected, under the “Baseplate” sub-item.



Selecting the baseplate in Rapid Shape Print Studio

3.2.2 Preparing the platform

Once all pieces have been prepared, the next process step, “Platform”, can be selected in the top-centre section of the screen. In this section, you can specify the hardware being used and the relevant material. In addition, the objects to be printed can be selected and positioned on the platform.

Please first click on the “Platform 1” box displayed. Select the desired 3D printer, the appropriate reservoir, the correct platform and the material “DMG LuxaPrint Ortho Comfort NX TRA”. There are also options available to configure the placement of the parts on the build platform (“Placement”) and the spacing between the individual pieces. With the “Auto-Quick” setting, two trays (in a flat orientation) are automatically positioned on the build platform. The “Auto-Smart” option takes a little longer, but generally allows three trays to be placed on the platform.

Now select the trays you would like to print from the “Available parts” list. Only objects whose indication matches the selected material are displayed here. As soon as you select a tray, it is automatically placed on the build platform.



Selecting machine and material settings in Rapid Shape Print Studio

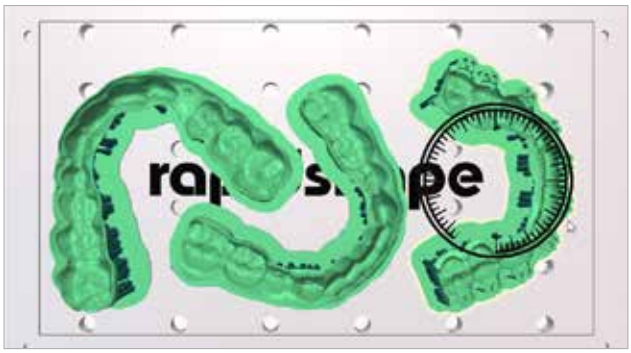


Selecting the trays to be printed

Practical tip:

If your printer and/or the correct material is not displayed in the dropdown list, you will need to add them to your printer or material library in the software’s “Settings”.

If you select more elements than the build platform can automatically accommodate, these are displayed in red next to the build platform. In many cases, it is possible to manually optimise the arrangement of the trays so that at least three trays can be placed on the build platform. To position a tray manually, select the desired element and adjust its orientation and position to ensure more efficient use of space.



Space-saving arrangement of three splints on the build platform

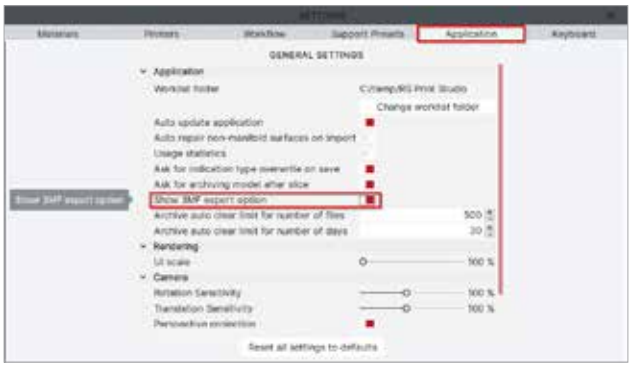
3.2.3 Sending the print job to the printer

Once you are satisfied with the arrangement of the pieces on the build platform, please proceed to the next step: To do this, click on “Print” at the top of the screen. You will then see an overview of your print job, showing the current build platform, the selected 3D printer and the print resin being used. To start the print job, select “Send to printer”; the job will then be sent directly to your 3D printer via the network.

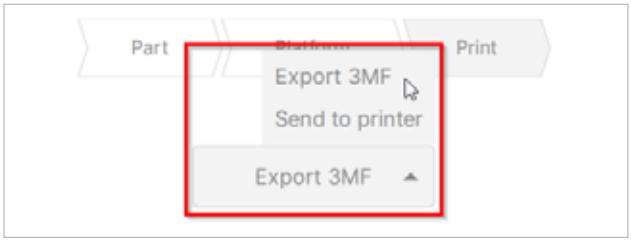


Print job overview in Rapid Shape Print Studio

If your printer is not connected to the network, you can also transfer the print job using a USB stick. To do this, first enable the “Show 3MF export option” in “Settings” (under the “Application” section) (this setting only needs to be applied once). Prepare your print job as described above. A drop-down arrow will now appear in the “Send to printer” section, from which you can select “Export 3MF”. Then save the print job to a USB stick and transfer the file to your 3D printer. Depending on the amount of data, it may take a moment for the print job to appear on your printer’s display.



Activating the 3MF export function



Exporting the print job to a USB stick

3.3 Autodesk Netfabb

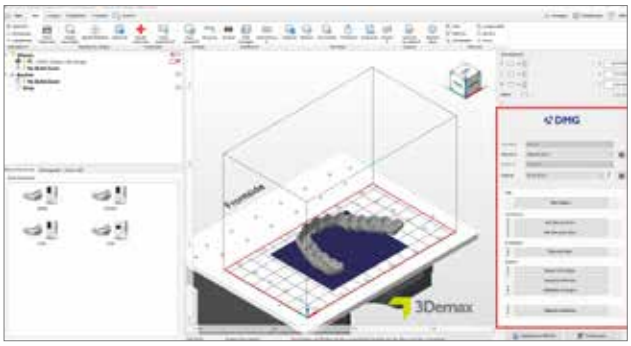
For the following printing systems:

- DMG DentaMile Lab 5 (Pro)
- DMG DentaMile Desk RS-5
- DMG 3Demax
- DMG 3Delite
- RapidShape D Series
- Straumann P Series

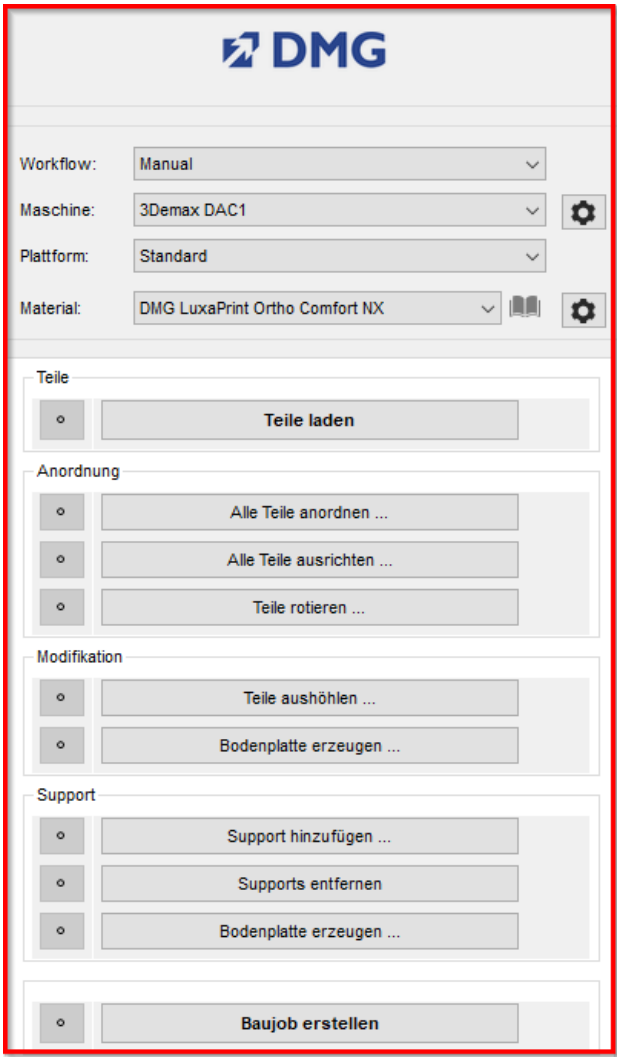
3.3.1 Selecting the material and machine

Open Netfabb and select your machine environment (e.g. DMG DentaMile Desk RS-5). The DMG workflow area is displayed on the right of the screen (marked by the blue DMG logo). Here, you will be guided through all the relevant steps from top to bottom.

First, select your printer and the material “DMG LuxaPrint Ortho Comfort NX”. If you have never worked with this material before, you may need to create it via the setting wheel next to the material line in the software.



Autodesk Netfabb user interface



Selection of machine and material parameters in Netfabb

3.3.2 Importing STL files

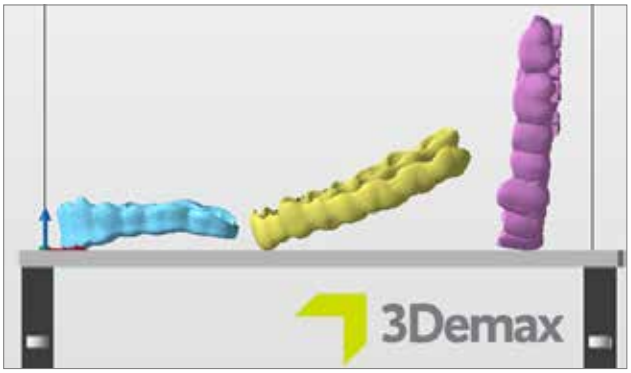
To import the previously created splints into Netfabb, open the software and either drag and drop the desired files directly into the 3D view or use the “Load pieces” function in the DMG workflow area to select the files. Once imported, the objects are displayed immediately in the 3D view.



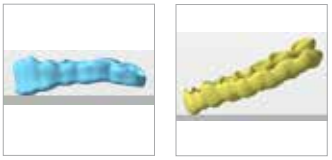
Importing STL files

3.3.3 Alignment

LuxaPrint Ortho Comfort NX can be printed in any orientation. For maximum precision and the shortest printing time, we recommend printing in a horizontal orientation (between 0° and 20°). Upright orientation is ideal for printing multiple splints and minimising the effort required to remove and finish off support residue.

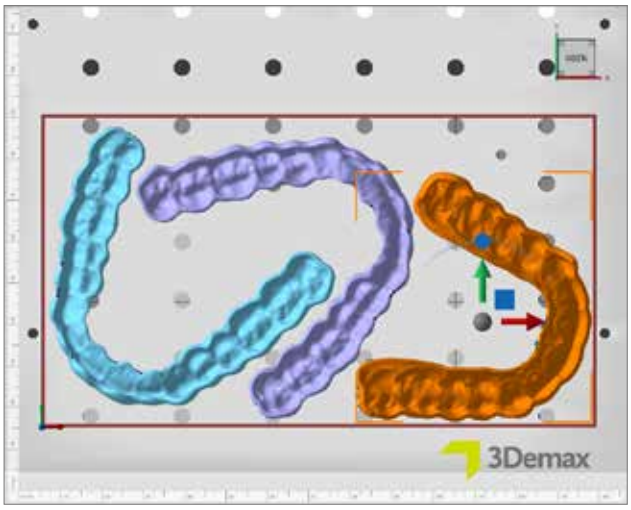


Alignment of the splints in Netfabb

Orientation	Benefits	Example
▸ Flat ▸ 0° to 20°	▸ Maximum accuracy ▸ Fastest printing time	
▸ Upright ▸ 80° to 90°	▸ Largest number of trays per print job ▸ Least effort required to grind away support residue	
▸ Crystal Polish ▸ Tilted 70° and rotated 30° around the z-axis	▸ Best results with the Crystal Polish bath	
▸ Flat on the molars ▸ -10° to -15°	▸ Avoids horizontal lines on the trays	

3.3.4 Arrangement on the build platform

The splints can be positioned flexibly on the build platform. On the DentaMile Desk RS-5, it is generally possible to arrange up to three splints on the platform at the same time. In upright orientation, up to eleven splints can be printed. For precise alignment, using the top view is recommended.

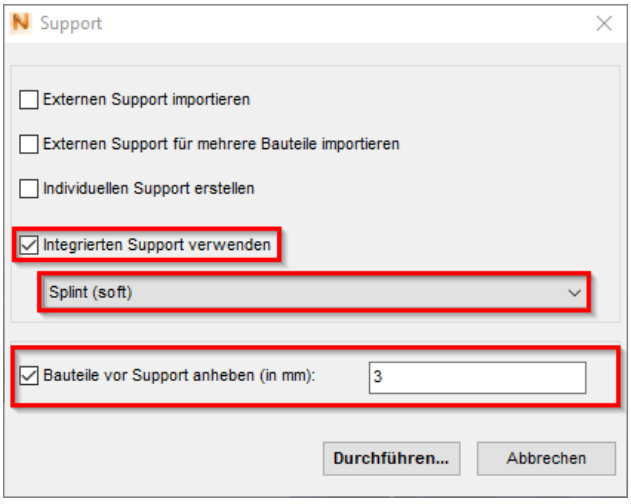


Arrangement of three splints on the build platform

3.3.5 Creating support structures

The splints require support structures to keep the build process running smoothly and without errors. In the DMG workflow area, select ‘Add support...’, and then select ‘Use integrated support’ in the next dialogue window. The default support style ‘Splint (soft)’ provides the best results and makes it possible to the remove the supports easily and cleanly. Activate the item ‘Lift parts before supporting (in mm)’ to lift your splints 2–4 mm from the build platform.

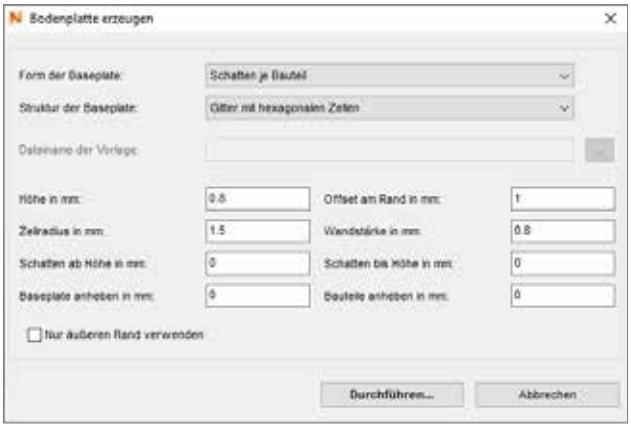
The software automatically calculates the optimal position of the support structures and positions them between the build platform and the splint. Manual editing of the support structures is generally not necessary. If you are printing in upright orientation, you should check the splints for support structures on the fitting surface and remove them if necessary.



Automatic support creation

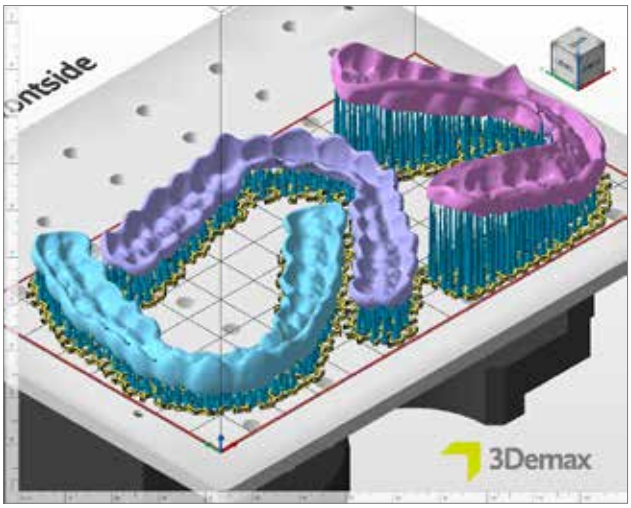
3.3.6 Creating the baseplate

A hexagonal grid baseplate should always be used when 3D-printing splints. The baseplate ensures better adhesion to the build platform and therefore prevents misprints from occurring. For LuxaPrint Ortho Comfort NX, we recommend the following settings: shadow of each part, grid with hexagonal cells, height: 0.8 mm; cell radius: 1.5 mm; offset from edge: 1 mm; wall thickness: 0.8 mm.



Creating the baseplate

Your project including support structures and baseplate should now be ready for printing and should look something like this:

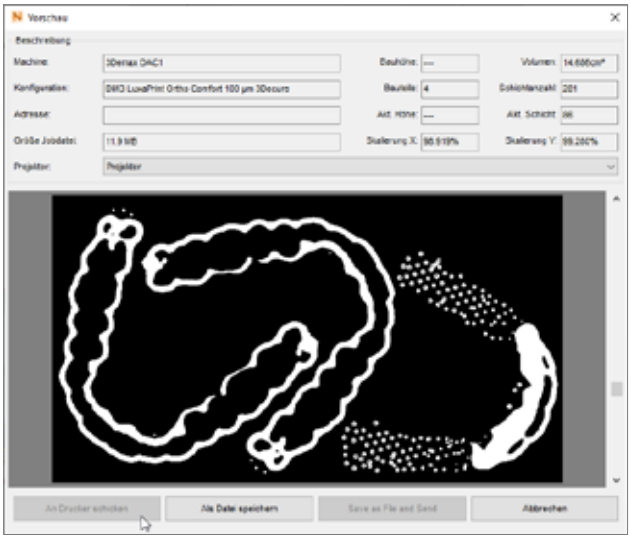


Complete build job in Netfabb with three splints. Two splints (left) with horizontal orientation, one splint (right) with an incline of roughly 20°.

3.3.7 Sending the build job to the 3D printer

Click on ‘Create build’ in the DMG workflow section to create the print job that includes the printing layers (‘slices’). Once calculation is complete, a preview window will be displayed where you can scroll through the slices and perform a final check to ensure that the parts and support structures are positioned correctly.

Next, transfer the build job to your 3D printer via a network connection or USB stick.



Preview of the print job with machine and material settings and a black-and-white depiction of the slices. This image shows slice 86. The white areas correspond to the exposed areas of the current layer.

3.4 DentaMile CAM MC for DentaMile Desk MC-5

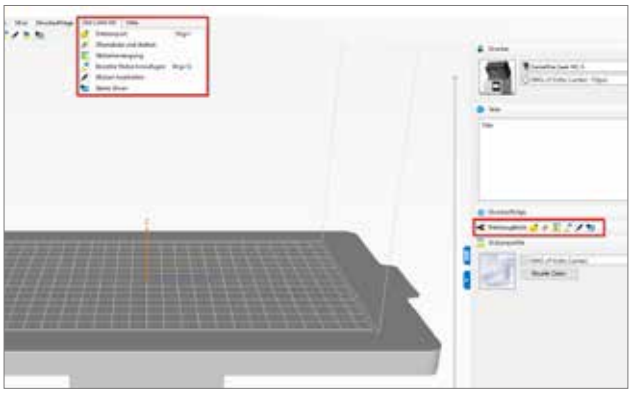
3.4.1 Selecting your printer and material

Open DentaMile CAM MC and select your printer (DentaMile Desk MC-5) along with the material and print profile for LuxaPrint Ortho Comfort NX.



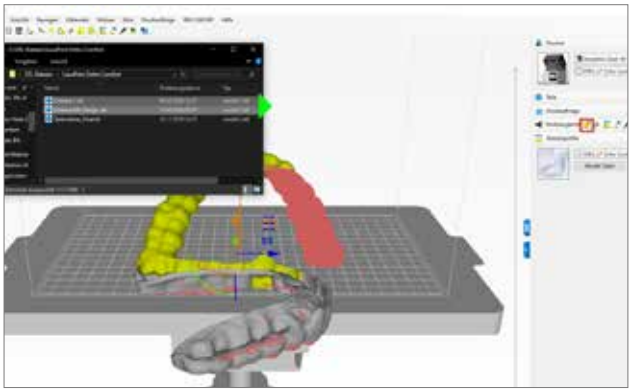
Selection of printer and material profile

The DentaMile CAM workflow area can be accessed via the 'DM CAM WF' tab at the top and from the menu on the right side of the screen. Here, you will be guided through the most important steps of the software.



3.4.2 Importing the print objects

The splints can be easily imported via drag-and-drop from the relevant directory. Alternatively, you can use the "File Import" function to navigate to your splint files. In both cases, you can select multiple objects at the same time.



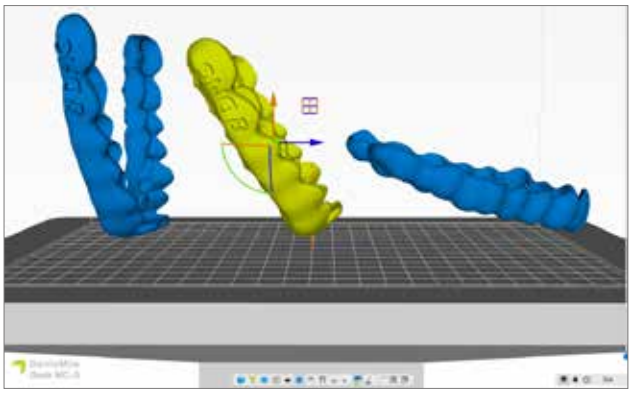
Importing splints into DentaMile CAM MC

3.4.3 Alignment

On the DentaMile Desk MC-5 system, trays can fundamentally be printed with a perfect fit in **any orientation**. For horizontal or angled orientations, the inside of the splint, which is relevant for the fit, should be turned away from the build platform (see figure 'Aligning splints') to prevent support structures from being generated on these surfaces.

For maximum precision and the fastest printing times for individual splints, we recommend using a flat orientation (0–20°). For printing multiple splints and for ease of removing support remnants, an upright orientation is the best choice.

For upright orientations, ensure that no overhangs ('islands') are created, as this would require support structures to be added for a perfect print. In many cases, this can be prevented by applying a slight incline.



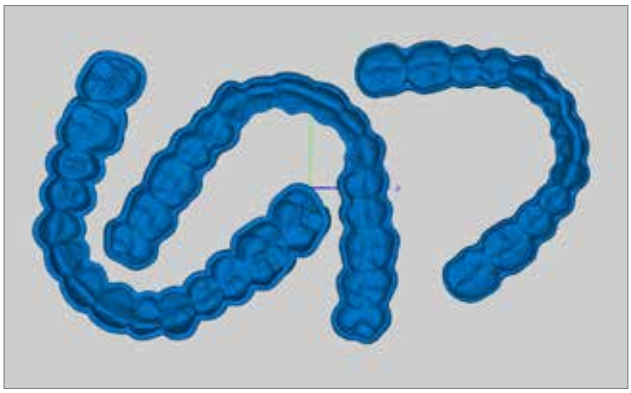
Alignment of the splints (from left to right: 90°, 60°, 15°).

Practical tip:

With LuxaPrint Ortho Comfort NX you can achieve high levels of accuracy in the printed splints on DentaMile Desk MC-5 in all orientations. Depending on the desired fit, it may be necessary to adjust the spacer (the distance between splint and tooth) in the CAD software (e.g. by ±0.1 mm).

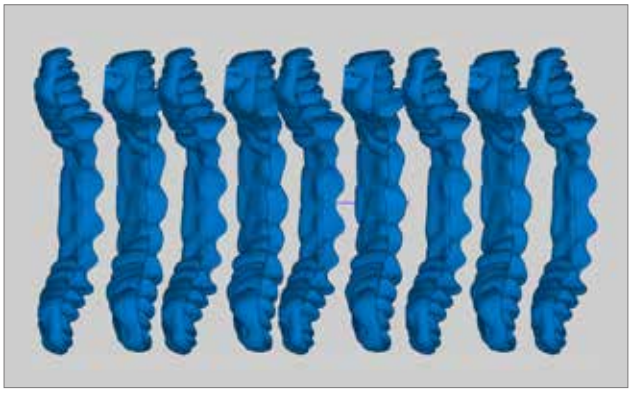
3.4.4 Arrangement on the build platform

The splints can be placed anywhere on the build platform. On the Desk MC-5, if a flat orientation is used, it is generally possible to position three splints on the build platform at a time. To enable exact positioning, it is helpful to work in the view from **above**.

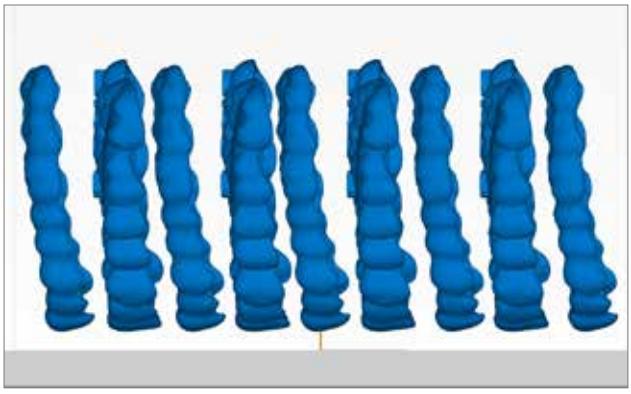


Three splints arranged with flat orientation on Desk MC-5

In the upright orientation, eight to ten splints can fit on the build platform of Desk MC-5, depending on the splint size. Once the splints have been oriented, they can then be positioned in the build area in the view from above. The splints can then be moved in the frontal view to achieve optimal spacing (see figure). The splints must not touch at any point. If the support structures or baseplates overlap in the next process step, this will not present any problems.



Nine splints arranged with upright orientation.
View from above



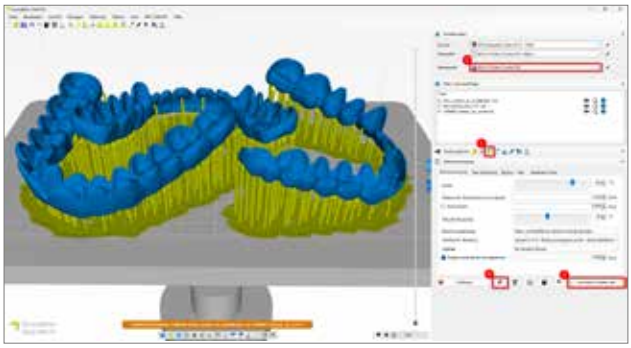
Nine splints arranged with upright orientation.
Side view

3.4.5 Support structures

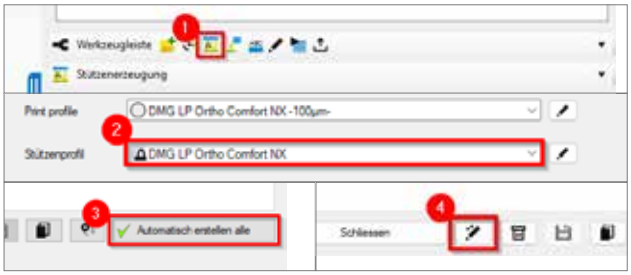
The trays require support structures for an error-free build process. Select ‘Support generation’ (1) in the tool bar. The support profile ‘DMG LP Ortho Comfort NX’ (2) has been specifically developed for the material and delivers optimal results. Click ‘Auto-Generate All’ (3) to generate the supports for all objects on the build platform. All parts will then be positioned a few millimetres above the build platform and given a base plate.

Please check your trays for any supports that have not been optimally put in place. Supports that collide with the component are shown in red and should be removed. You can do this simply by selecting them with the mouse and clicking ‘remove’. Ensure that both the tip and the base of the support are removed.

Using the “Edit” function (4), individual supports can be removed or added to the same support profile as required.



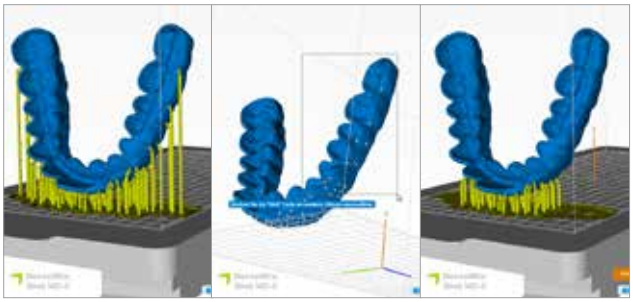
Generating supports in DentaMile CAM MC. For printing with flat orientation (0–20°), manual editing of the support structures is not normally needed.



Printing with upright orientation

For printing with upright orientation, the automatic support profile function creates more supports than are needed. The “Edit” function (4) can also be used to remove any excess structures. To do this, press and hold the mouse button and draw a rectangle around the area that you wish to remove supports from.

If the splint is printed **labially** in the direction of the build platform, it is generally sufficient if the splints are fully supported in the anterior region (see figure). This reduces the amount of work involved in sanding down the support remnants to a minimum.



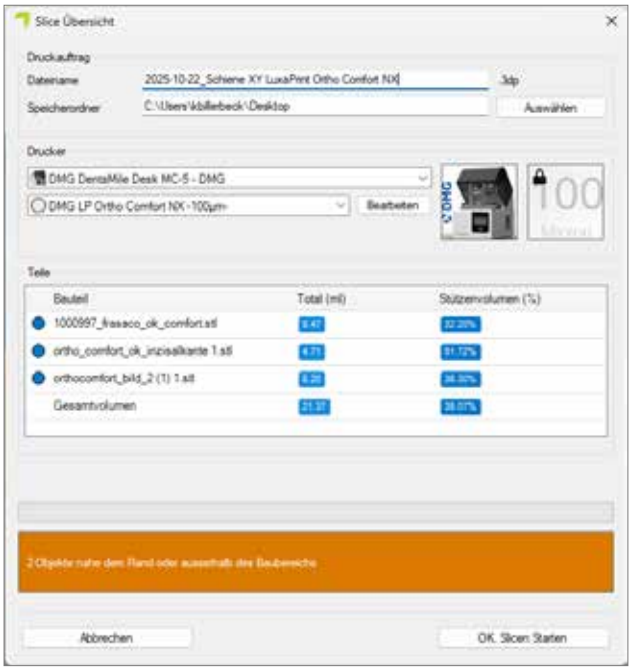
Generating supports for printing with upright orientation. Before (left) and after (right) manual editing of the supports. The editing function (centre) allows you to add and remove individual or multiple supports.

3.4.6 Creating a build job and transferring it to the printer

Once the parts have been arranged, oriented and supported, you can start the slicing process by clicking ‘start slicing’. In the next dialogue box, you can give your print job a suitable name or accept the suggested one. You can now also re-check and edit all of the printer and material parameters.

If you receive a warning message that objects are close to the edge or outside the build area, check whether this relates to the objects or the baseplates. If the warning concerns the baseplates, you can ignore it. If trays are located outside of the build area, their orientation and arrangement will need to be changed and their supports may need to be adjusted.

Click on ‘OK, start slicing’ to create the build job. Now transfer the finished print job to your DentaMile Desk MC-5 over a network connection or using a USB stick.



Slice overview in DentaMile CAM MC

4. Printing

Start printing immediately
LuxaPrint Ortho Comfort NX was developed to enable a fast and straightforward workflow and does not need any preparation. No shaking, no heating up. Simply get started with the 3D printing process immediately.

4.1 Scanning RFID tags

Scan the printing resin's RFID tag by holding it in front of the integrated reader on the 3D printer. The printer will recognise the LuxaPrint material being used and compare it with the information stored in the print job. This means that accidental incorrect entries in the software can be identified early on and any manufacturing errors avoided. The system thereby supports you in complying with the validated DentaMile workflow **(supported by DMG DentaMile Lab 5 (Pro), Desk RS-5, Desk RS-1, 3Demax, 3Delite and Rapidshape 3D printers).**

4.2 Adding material

Add LuxaPrint Ortho Comfort NX to the material tray of your 3D printer. Ensure that resin is filled to a sufficient level, so that the resin will not run out even if the build platform is fully occupied. Never fill the tray to the brim, as the resin may overflow and contaminate your printer.

4.3 Starting a 3D printing job

Start the print job on your 3D printer.

4.4 Storing and reusing the resin

After your printing process has been completed, any remaining resin can be reused. You have several options for doing this. We have outlined them below:

Storing the resin in the material tray
If you would like to keep the resin ready for subsequent print jobs or for short-term storage, you can simply leave it in the material tray. It should be stored either in the 3D printer itself or, alternatively, in a suitable, closed cabinet. Please ensure that the resin is stored at room temperature (between 15 and 25 °C), in a dry place where it is protected from light. This preserves the quality of the material and keeps it ready for use at all times.

Storing resin in the bottle
For longer-term storage, we recommend pouring the used resin back into the resin bottle. It is best to filter the resin using a disposable paper filter (recommended filter size: 190 micrometres) to remove any particles that may be present. This ensures that your resin continues to deliver optimum results for future print jobs. Storing the resin in the sealed bottle also reliably protects it from external influences.

5. Post-processing

Intelligent connectivity
As a user of a DMG DentaMile Desk RS-5, Desk RS-1, Lab5 (Pro), 3Demax or 3Delite, you can benefit from intelligent connectivity between devices. As soon as the print job is finished on the printer, all the relevant information is transferred to the post-processing units, where you only have to select the appropriate print job to start the individual post-processing.

5.1 Dripping off

Leave the finished splints in the 3D printer for around 10 minutes to allow excess resin to drip off. This saves on materials and reduces the amount of cleaning required.

5.2 Detaching pieces from the build platform

Carefully detach the printed splints from the build platform with the corresponding detachment tool (spatula, blade scraper or similar). Push the tool under the baseplate and loosen the parts using gentle lever movements.

Practical tip:

Avoid direct skin contact with the liquid printing resin and splints prior to post-curing. Always wear suitable protective gloves when working.

Practical tip:

Use the drip aid (dripping rabbit) to enable the liquid resin to drip even faster and more effectively off your print objects. This saves print material and will reduce the number of times the isopropyl alcohol of your cleaning unit will need changing (does not work for DentaMile Desk MC-5).

The drip aid for printing yourself is available in the downloads section at **dentamile.com/de/download**.

5.3 Cleaning

After printing, the splints must be thoroughly cleaned to remove any remaining resin residue from the surface of the parts. Please use only cleaning equipment that is suitable and tested for your printing system (see the section “Required equipment and software”).

5.3.1 DMG DentaMile Wash RS, 3Dewash (or RS wash/P wash)

Place the printed splints in the cleaning chamber with their inner side facing down and select the programme for LuxaPrint Ortho Comfort NX or the appropriate print job. The splints should be cleaned with 99% isopropyl alcohol (IPA).

5.3.2 DMG DentaMile Wash MC

Place the printed trays into the cleaning chamber of the DentaMile Wash MC with the inside facing downwards. Ensure that the isopropyl alcohol (99%) is sufficiently clean and change it as needed.

Select the cleaning programme ‘Low’ and set the timer to **5 minutes** for thorough cleaning of the printed objects.

5.3.3 Ultrasonic bath

If you do not have any of the above cleaning devices, you can also clean your model in an ultrasonic bath with isopropyl alcohol (99%). We recommend using two separate cleaning containers for this. The first for a prewash (max. 3 minutes) for removing most of the resin from the parts. This container will quickly become contaminated with resin, but can still be used for prewashing other pieces. The second container should contain fresh isopropyl alcohol and be used for fully removing all of the remaining resin residues (max. 2 minutes).

Practical tip:

The cleaning solution in the ultrasonic bath will start getting dirty once it has been used a number of times. Once this happens, you can use it to replace the now more heavily contaminated container used for the prewash, which requires proper disposal. You can then use a new isopropyl alcohol container as the main cleaning container.

Step 1 (Prewash)	Step 2 (Main wash)	Drying
Ultrasound	Ultrasound	Compressed air/air
Isopropyl alcohol	Isopropyl alcohol (fresh)	
3 min	2 min	10–60 s / 30 min

5.4 Drying and visual inspection

Ensure that the trays are completely dry before you proceed with post-curing. Use compressed air for this, or let the parts air dry for about 15 minutes.

Inspect the printed splints thoroughly after drying and ensure that:

- The splints are clean and completely dry and no cleaning fluid or resin residues remain on the surface (indicated by a shiny object surface)
- No imperfections, cracks or solid resin particles are evident on the surface.

If there are still liquid resin residues on the objects, they can be removed, e.g. with a spray bottle containing IPA or a cloth soaked in IPA. The remaining resin residues can also be rinsed away by briefly immersing the objects in a clean IPA container. Then dry your trays completely as described above.

5.5 Post-curing

Correct post-curing is essential for achieving biocompatible objects with optimal mechanical properties and a perfect fit. Therefore, make sure that the specified process conditions are always observed and only use the post-curing units (see Required equipment and software) that have been designed and validated for your printing system. Do not place the printed splints on top of each other in the light-curing chamber and make sure that the pieces receive light from all sides.

5.6 Removing the support structures

Remove the support structures with dental scissors, diagonal pliers or a hand tool with a cutting disc. The remnants can then be cut off with a plaster knife. The smaller remnants are sanded off when the splints are finished.

Check the splints for cracks as well as any other damage. Damaged parts should be discarded and reprinted.

Practical tip:

Although cutting off the support structures by hand is quicker than using a tool, it can tear out small areas from the splints and thus damage the splints or even make them unusable. We therefore recommend using a tool.

Light-curing unit	Settings
385 nm versions:	
DentaMile Cure RS	DMG LuxaPrint Ortho Comfort NX
DMG 3Decure	DMG LuxaPrint Ortho Comfort NX
DentaMile Cure MC*	OrthoCOM-DMG LP
Otoflash	2x2000 flashes (turn splints during the process)
RS Cure/ P Cure	DMG LuxaPrint Ortho Comfort NX
405 nm versions:	
Otoflash	2x3000 flashes (turn splints during the process)

* If the post-curing programme for Ortho Comfort NX is not available in the device favourites, please contact our support.

5.7 Finishing and polishing

LuxaPrint Ortho Comfort NX offers fast and easy grinding and polishing. Using a polishing machine creates a smooth, high-shine surface. To avoid defects on the splint surface, ensure low rotational speeds when milling and polishing. An active extraction system should be used when the dental trays are prepared to remove the dust that is generated.

5.7.1 Chairside processing

- A tungsten carbide bur and/or a fine non-woven web wheel can be used to remove support remnants and smooth the splint surface.
- A goat hair brush and polishing paste are used to polish the splint (ensure that a low rotational speed is used).
- A high-lustre buffing wheel is used to give the splint a smooth surface.

5.7.2 Processing with a polishing machine

Polishing steps	Material	Implementation
Rough preliminary polish	Goat-hair brush and pumice stone/water mixture	• Rough preliminary polish at 3000 rpm • The splint must be thoroughly wetted with the pumice stone/water mixture to enable cooling • A roughened surface is created
Fine preliminary polish	Nettle cloth buffer, fine, and pumice stone/ water mixture	• Fine preliminary polish at 3000 rpm • The splint must be thoroughly wetted with the pumice stone/water mixture to enable cooling • A fine rough surface is created
Intermediate cleaning	Water	• Rinse the pumice stone/water mixture from the splint under cold running water
High-gloss polish	Nettle cloth fine and polishing paste (e.g. Renfert universal polishing paste)	• High-gloss polish at 1500 rpm • Ensure that excessive heat build-up is prevented! • A good high-gloss finish is created
Final high-gloss polish	Cotton yarn and polishing paste (e.g. Renfert universal polishing paste)	• Final polish at 1500 rpm • A good final high-gloss finish is created

5.7.3 Cleaning polishing residue from the splints

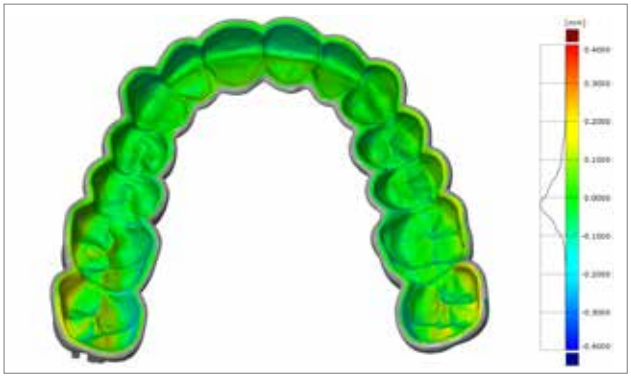
The splints can be cleaned in the ultrasonic bath at 30 °C in a soap solution for 15 min. Clean the splints with a toothbrush and soapy water as needed. Stubborn polishing residue can be removed by brief and targeted steam-cleaning. Attention: Longer targeted steam-cleaning may cause deformations in the splint.

6. Validated fit accuracy

The fit accuracy of the fabricated splints is very important for us at DMG. The accuracy and the mechanical parameters and biocompatibility of all our materials and validated printing processes are therefore tested and assessed on the basis of a specified process.

In various studies[1, 2], the accuracy of 3D-printed splints and their influence on the fit was examined in comparison with conventionally manufactured and milled splints. The studies indicate that mean deviations of up to 174 micrometres in relation to the fitting surface (i.e. the inside of the splint facing the teeth) are within the scope of clinical applicability. The deviation for splints manufactured by injection-moulding and subtractive machining (milling) was 42 micrometres.

The fitting surface of a dental splint produced with the validated workflow using LuxaPrint Ortho Comfort NX, the DMG 3Demax 3D printer, DMG 3Dewash cleaning unit and DMG 3Decure post-curing unit shows mean deviations of 46 micrometres, and its accuracy is therefore comparable to that of splints that are conventionally manufactured or milled.



Accuracy of the fitting surface of a splint manufactured in the validated DentaMile workflow. The average deviation is 46 µm. Almost the entire fitting surface (99%) shows deviations below 150 µm.

[1] Wesemann, Christian, et al. 'Accuracy and its impact on fit of injection molded, milled and additively manufactured occlusal splints.' Journal of the Mechanical Behavior of Biomedical Materials 114 (2021): 104179.
[2] Marcel, Reymus, Hickel Reinhard, and Keßler Andreas. 'Accuracy of CAD/CAM-fabricated bite splints: milling vs 3D printing.' Clinical oral investigations 24 (2020): 4607-4615.