

LaserRPD™



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General information

These guidelines provide information for consideration when designing LaserRPD™ metal 3D printed removable partial dentures (RPDs). They should be used by trained dental technicians in conjunction with traditional methodologies and clinical experience in order to design RPDs which meet the patient's, technician's and dentist's requirements. Final designs are ultimately the responsibility of the duly qualified practitioner.

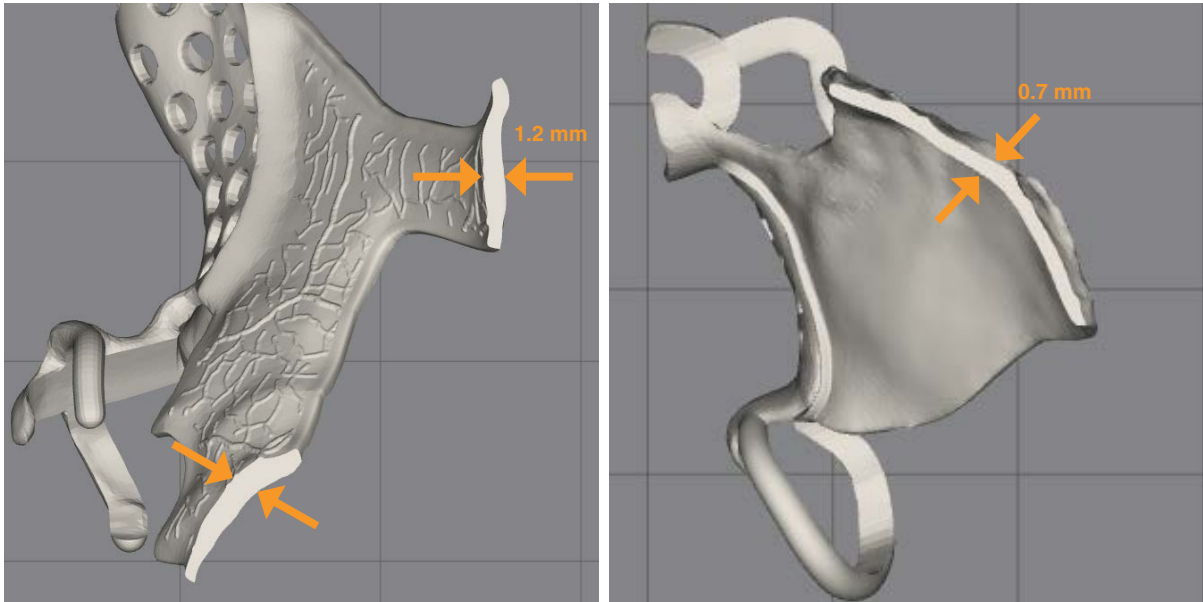
There are certain constraints which must be considered when designing for metal 3D printing, as with any manufacturing process. To achieve good feature definition, Renishaw advises avoiding features which are smaller than 0.5 mm or which taper to very fine points, such as sharp lips on acrylic boundaries or the tips of clasps. Renishaw cannot guarantee successful manufacture if features include geometry under 0.5 mm.

If you require any help with designing for manufacture, or if you experience design software issues, contact Renishaw Dental Support on 01453 524543.

If Renishaw encounters any issues or considers a design to be unsuitable for manufacture, you may be contacted to discuss the design modification.

Connector design – major connectors

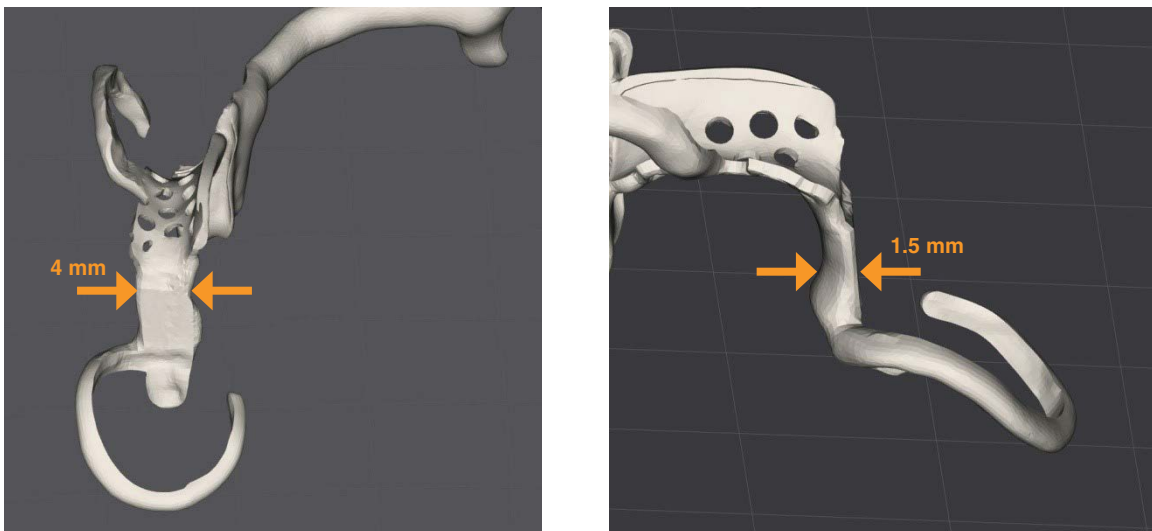
A thickness of between 0.7 mm and 1.2 mm is recommended for major connectors in order to ensure framework stability. Critical features such as clasps and meshwork boundaries should also be at least 0.7 mm thick



Allow extra material thickness at the initial design stage to avoid critical damage during post processing.

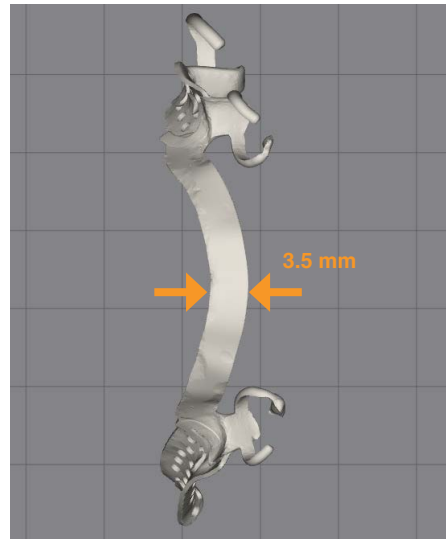
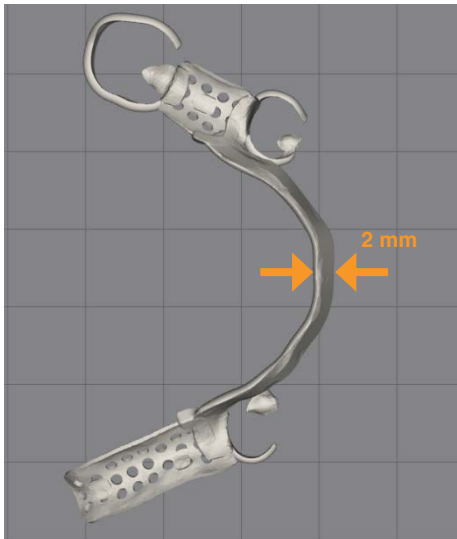
Connector design – minor connectors

It is recommended that minor connectors are at least 4 mm wide by 1.5 mm thick to be suitable for manufacture and to offer stability between clasps and the main RPD framework.



Sublingual bar design

Sublingual bars should be around 3.5 mm deep by 2 mm thick. This should offer adequate strength and flexibility. If clinical requirements are such that a thinner bar is required, 0.7 mm is the minimum recommended thickness for major connectors.

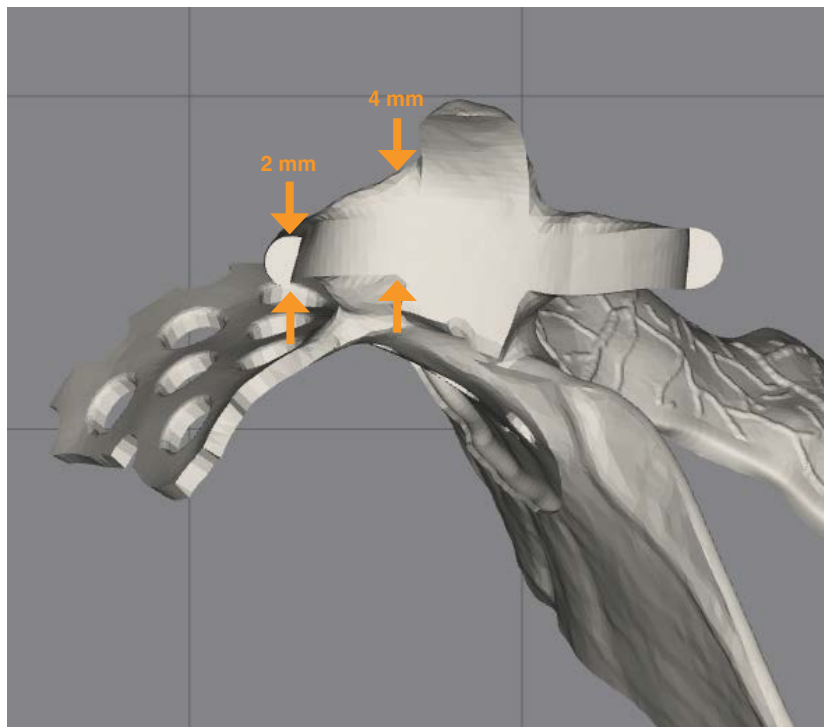


Clasp design

As with traditional manufacture, clasps must be designed at a thickness which allows for material removal during post processing. This reduces the risk of poor fit or lack of retention due to under-sizing. The figure below shows the cross section dimensions of a clasp suitable for production using additive manufacturing.



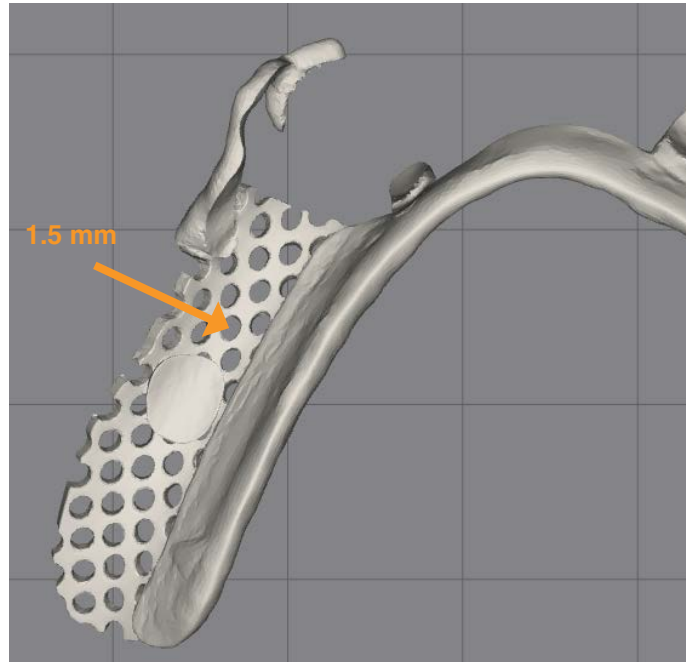
Clasps should thicken in a taper up to the clasp shoulder in order to provide adequate reinforcement during deflection caused by insertion/removal. The figure below shows where reinforcement has been added to the shoulder.



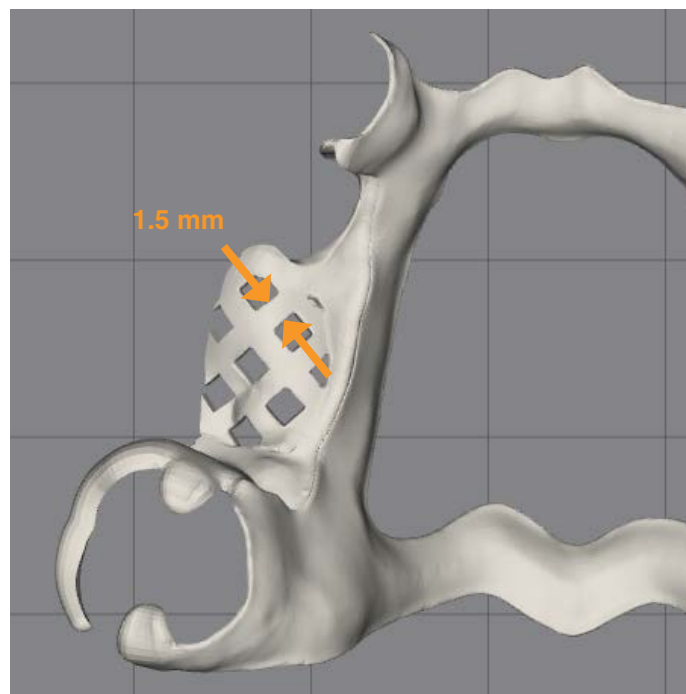
Clasp design is ultimately the responsibility of the qualified practitioner.

Meshwork design

Circular patterned meshwork is recommended to maintain mesh geometry during post processing. The recommended minimum diameter for mesh holes is 1.5 mm. Larger holes may allow better acrylic flow through the mesh.



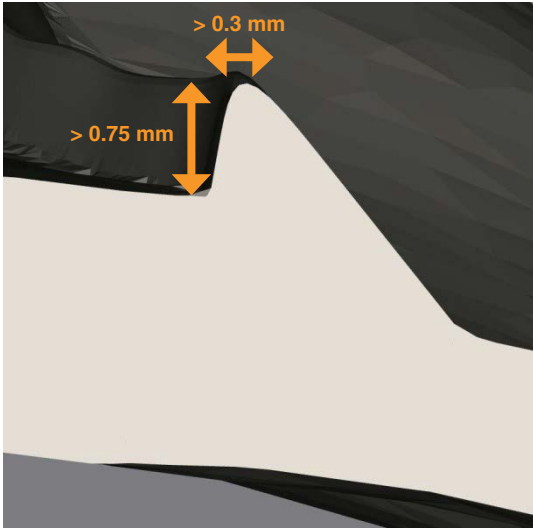
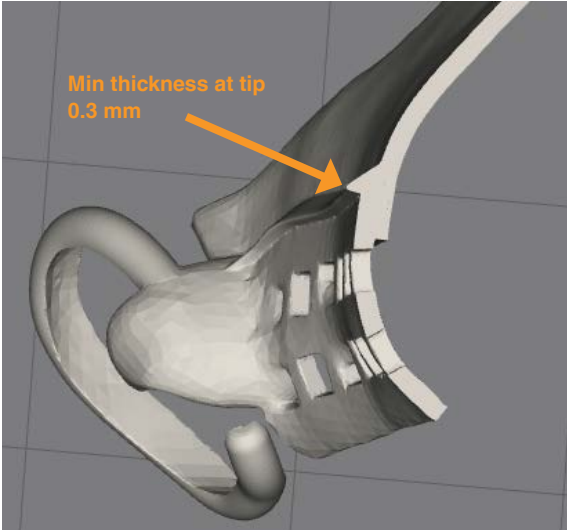
If square meshwork is required, a minimum strut thickness of 1 mm is recommended.



Ensure clasps are well connected to meshwork. Placing holes close to, or on, the minor connector is not recommended.

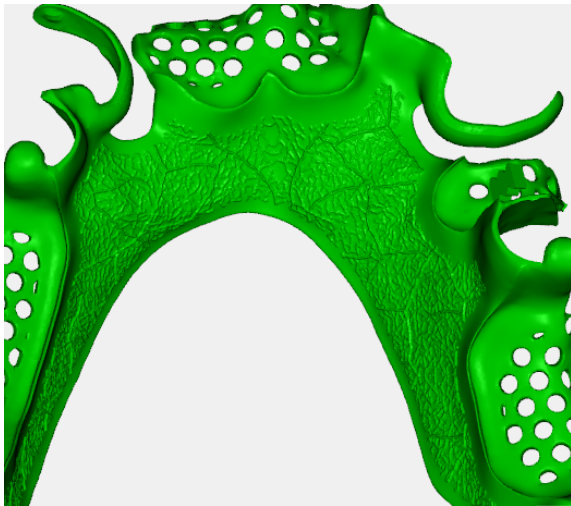
Finish line design

To ensure feature definition and ease post processing, thin lips at the acrylic boundary line (such as that shown in the figure below) should be avoided. The lip should not taper to less than a recommended minimum thickness of 0.3 mm, and should be a minimum of 0.75 mm tall.

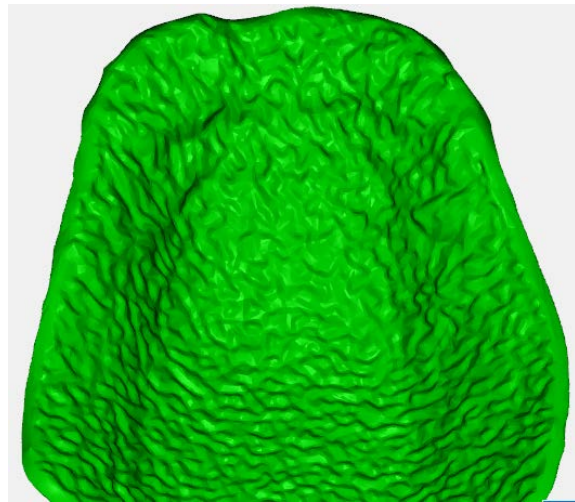


Stipple design

To avoid critical damage to the printed stipple, Renishaw recommends the stipple pattern is set to “fine” with a depth of 0.4 mm in ExoCAD, and set to “coarse type 1” with a height of 0.14 mm in 3Shape software.



3Shape coarse type 1, 0.14 mm height



ExoCAD fine, 0.4 mm depth

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