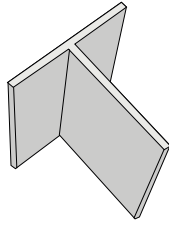


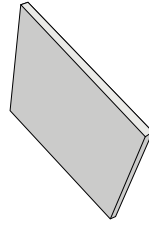


Design Rules for 3D Printing



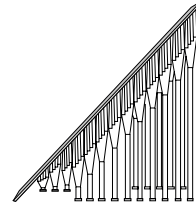
Supported walls 10x10mm

A supported wall is one that is connected to other walls on one or more ends. Supported walls thinner than detailed below (resin dependent) may delaminate or warp.



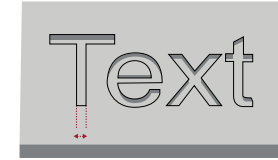
Unsupported walls 10x10mm

An unsupported wall is one that is not connected to any others. Unsupported walls thinner than detailed below (resin dependent) may delaminate or warp.



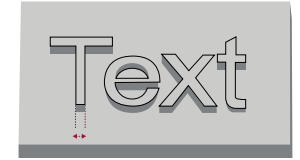
Supports and overhangs

An overhang refers to a part of the model that extends horizontally parallel to the build platform. Printing such features without supports is discouraged as the layers cannot maintain their structure. Horizontal overhangs will be slightly deformed beyond 1.5 mm and become increasingly deformed as the length of the overhang increases. Recommendation (where possible) is to orient your part at 45 degrees to platform plane.



Minimum engraved details

Engraved details are imprinted or recessed features on your model. Details recessed less than 1.0 mm in width and in height may not be visible because they will be fused with the rest of the model during the print process.



Minimum embossed details

Embossed details are shallow raised features on your model, such as text. Details smaller than detailed below in width and in height may not be visible on your print

Resin	Minimum wall thickness	Minimum wall thickness	Minimum requirements	Minimum element width	Minimum element width
Hard	0.5mm (add 0.2mm thickness for each 10mm) If 10x10=0.5 then 100x100=2.3mm	0.5mm (add 0.25mm thickness for each 10mm) If 10x10=0.5 then 100x100=2.75mm	45 degrees (not taller than 100mm. If taller add supports to hold part under gravity force)	0.8mm (distance)	0.5mm
DL110HB	0.5mm (add 0.2mm thickness for each 10mm) If 10x10=0.5 then 100x100=2.3mm	0.5mm (add 0.25mm thickness for each 10mm) If 10x10=0.5 then 100x100=2.75mm	45 degrees (not taller than 100mm. If taller add supports to hold part under gravity force)	0.8mm (distance)	0.5mm
DL110HW	0.7mm (add 0.3mm thickness for each 10mm) If 10x10=0.5 then 100x100=3.45mm	0.8mm (add 0.35mm thickness for each 10mm) If 10x10=0.5 then 100x100=3.95mm	45 degrees (not taller than 50mm. If taller add supports to hold part under gravity force) anything below need support	1mm (distance)	0.8mm
DL110HTR	0.4mm (add 0.2mm thickness for each 10mm) If 10x10=0.4 then 100x100=2.2mm	0.5mm (add 0.25mm thickness for each 10mm) If 10x10=0.5 then 100x100=2.75mm	45 degrees (not taller than 100mm. If taller add supports to hold part under gravity force)	0.6mm	0.5mm
Durable	0.5mm (add 0.2mm thickness for each 10mm) If 10x10=0.5 then 100x100=2.3mm	0.5mm (add 0.25mm thickness for each 10mm) If 10x10=0.5 then 100x100=2.75mm	45 degrees (not taller than 100mm. If taller add supports to hold part under gravity force)	0.8mm (distance)	0.5mm
Duramax	0.5mm (add 0.2mm thickness for each 10mm) If 10x10=0.5 then 100x100=2.3mm	0.5mm (add 0.25mm thickness for each 10mm) If 10x10=0.5 then 100x100=2.75mm	45 degrees (not taller than 100mm. If taller add supports to hold part under gravity force)	0.8mm (distance)	0.5mm
Flexible DL220B	0.5mm (add 0.3mm thickness for each 10mm) If 10x10=0.5 then 100x100=3.2mm	2mm, while the Z built height should be <60mm Or can be 3mm, while the Z built height should be <110mm	45 degrees (not taller than 25mm. If taller add supports to hold part under gravity force) anything below need support	0.8mm	0.6mm
Dental Model White	Recommend only for Dental Models	Recommend only for Dental Models	45 degrees (not taller than 100mm. If taller add supports to hold part under gravity force) anything below need support	1mm	0.8mm
Dental Model Beige	Recommend only for Dental Models	Recommend only for Dental Models	45 degrees (not taller than 100mm. If taller add supports to hold part under gravity force) anything below need support	0.8mm	0.8mm
High Tensile White	0.6mm (add 0.2mm thickness for each 10mm) If 10x10=0.5 then 100x100=2.4mm (Do not recommend print parts over 24h)	0.8mm (add 0.25mm thickness for each 10mm) If 10x10=0.5 then 100x100=3.05mm	45 degrees (not taller than 100mm. If taller add supports to hold part under gravity force) anything below need support	1mm	0.8mm
Concept	0.6mm (add 0.2mm thickness for each 10mm) If 10x10=0.5 then 100x100=2.4mm (Prints should take less than 24hrs)	0.8mm (add 0.25mm thickness for each 10mm) If 10x10=0.5 then 100x100=3.05mm	45 degrees (not taller than 100mm. If taller add supports to hold part under gravity force) anything below need support	1mm	0.8mm
Draft	0.4mm (add 0.2mm thickness for each 10mm) If 10x10=0.4 then 100x100=2.2mm	0.5mm (add 0.25mm thickness for each 10mm) If 10x10=0.5 then 100x100=2.75mm	45 degrees (not taller than 100mm. If taller add supports to hold part under gravity force)	0.6mm	0.5mm
HighTemp DL400	0.4mm (add 0.2mm thickness for each 10mm) If 10x10=0.4 then 100x100=2.2mm	0.5mm (add 0.25mm thickness for each 10mm) If 10x10=0.5 then 100x100=2.75mm	45 degrees (not taller than 100mm. If taller add supports to hold part under gravity force)	0.6mm	0.5mm
Rigid DL240 Plant-Based	0.5mm (add 0.2mm thickness for each 10mm) If 10x10=0.5 then 100x100=2.3mm	0.5mm (add 0.25mm thickness for each 10mm) If 10x10=0.5 then 100x100=2.75mm	45 degrees (not taller than 100mm. If taller add supports to hold part under gravity force)	0.8mm	0.5mm

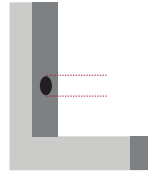


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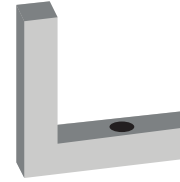
Horizontal Bridges

A horizontal bridge is the distance between two vertical structures. If the bridge is longer than detailed below (resin dependent) the bridge may break during printing.



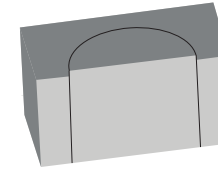
Horizontal Holes

Horizontal holes are those with their axis parallel to the XY plane. Minimum hole diameters are detailed below per resin. Holes greater than 5mm diameter will need supports.



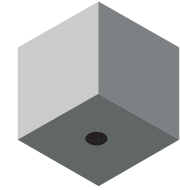
Vertical Holes

Vertical holes are holes with their axis parallel to the Z axis. Minimum hole diameter and depths are detailed below and are resin dependent. Due to shrinkage holes should be oversized by at least 0.15mm.



Connecting & Moving parts (Clearance between 2 parts to fit)

Clearance is the amount of distance needed between two moving parts of a model (e.g., the distance between gears or joints). Clearance recommendations are resin dependent. The parts must be printed separately and placed together after curing.



Escape holes (Drain Holes)

Escape (drain) holes are recommended for models with an enclosed volume that creates a 'cup' with the vat. Escape holes should be placed on the platform side of the enclosed volume. Minimum escape hole sizes are detailed below.

Resin	Maximum element size	Minimum diameter	Minimum diameter	Minimum clearance	Minimum hole size
Hard	No longer than 3mm support	1mm, need internal support if hole is bigger than 5mm	0.8mm but no deeper than 5mm (Holes need design bigger by 0.15 to 0.2mm)	0.15mm to 0.2mm for a tight fit or 0.4mm if loose fit	1x5mm hole for each 16 cubic centimetres of hollow part
DL110HB	No longer than 3mm support	1mm, need internal support if hole is bigger than 5mm	0.8mm but no deeper than 5mm (Holes need design bigger by 0.15 to 0.2mm)	0.15mm to 0.2mm for a tight fit or 0.4mm if loose fit	1x5mm hole for each 16 cubic centimetres of hollow part
DL110HW	No longer than 2mm support	2mm, need internal support if hole is bigger than 3mm	1mm but no deeper than 5mm (Holes need design bigger by 0.15 to 0.2mm)	0.06mm to 0.1mm for a tight fit or 0.25mm for loose fit	1x5mm hole for each 16 cubic centimetres of hollow part
DL110HTR	No longer than 5mm support	1mm, need internal support if hole is bigger than 5mm. (Light bleeding expected inside the hole)	0.8mm but no deeper than 5mm (Holes need design bigger by 0.15 to 0.2mm)	0.15mm to 0.2mm for a tight fit or 0.4mm if loose fit	1x5mm hole for each 16 cubic centimetres of hollow part
Durable	No longer than 3mm support	1mm, need internal support if hole is bigger than 5mm	0.8mm but no deeper than 5mm (Holes need design bigger by 0.15 to 0.2mm)	0.15mm to 0.2mm for a tight fit or 0.4mm if loose fit	1x5mm hole for each 16 cubic centimetres of hollow part
Duramax	No longer than 3mm support	1mm, need internal support if hole is bigger than 5mm	0.8mm but no deeper than 5mm (Holes need design bigger by 0.15 to 0.2mm)	0.15mm to 0.2mm for a tight fit or 0.4mm if loose fit	1x5mm hole for each 16 cubic centimetres of hollow part
Flexible DL220B	No longer than 3mm support (Light bleeding expected)	3mm, need internal support if hole is bigger than 5mm (Light bleeding expected)	1mm but no deeper than 5mm	0.5mm to 1mm for a tight fit or 2mm if parts need to move In/Out (Can vary depend of shape and thickness of the part)	1x5mm hole for each 16 cubic centimetres of hollow part
Dental Model White	No longer than 3mm support	2mm, need internal support if hole is bigger than 5mm	2mm but no deeper than 5mm (Holes need design bigger by 0.15 to 0.2mm)	0.2mm to 0.25mm for a tight fit or 0.4mm if loose fit	1x5mm hole for each 16 cubic centimetres of hollow part (recommend add minimum 3x5mm drain holes for each dental arch)
Dental Model Beige	No longer than 3mm support	2mm, need internal support if hole is bigger than 5mm	0.8mm but no deeper than 5mm (Holes need design bigger by 0.15 to 0.2mm)	0.1mm to 0.15mm for a tight fit or 0.25mm if loose fit	1x5mm hole for each 16 cubic centimetres of hollow part
High Tensile White	No longer than 3mm support	2mm, need internal support if hole is bigger than 5mm	2mm but no deeper than 5mm (Holes need design bigger by 0.15 to 0.2mm)	0.2mm to 0.25mm for a tight fit or 0.4mm if loose fit	1x5mm hole for each 16 cubic centimetres of hollow part
Concept	No longer than 3mm support	2mm, need internal support if hole is bigger than 5mm	2mm but no deeper than 5mm (Holes need design bigger by 0.15 to 0.2mm)	0.2mm to 0.25mm for a tight fit or 0.4mm if loose fit	1x5mm hole for each 16 cubic centimetres of hollow part
Draft	No longer than 5mm support	1mm, need internal support if hole is bigger than 5mm. (Light bleeding expected inside the hole)	0.8mm but no deeper than 5mm (Holes need design bigger by 0.15 to 0.2mm)	0.15mm to 0.2mm for a tight fit or 0.4mm if loose fit	1x5mm hole for each 16 cubic centimetres of hollow part
HighTemp DL400	No longer than 5mm support. (Light bleeding expected)	1mm, need internal support if hole is bigger than 5mm. (Light bleeding expected inside the hole)	0.8mm but no deeper than 5mm (Holes need design bigger by 0.15 to 0.2mm)	0.15mm to 0.2mm for a tight fit or 0.4mm if loose fit	1x5mm hole for each 16 cubic centimetres of hollow part
Rigid DL240 Plant-Based	No longer than 6mm support	1mm, need internal support if hole is bigger than 5mm	0.8mm but no deeper than 5mm (Holes need design bigger by 0.1 to 0.15mm)	0.1mm to 0.15mm for a tight fit or 0.3mm if loose fit	1x5mm hole for each 16 cubic centimetres of hollow part

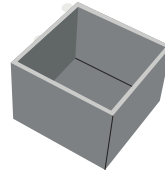


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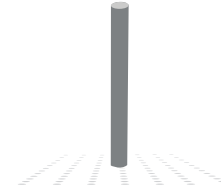
Maximum wall thickness (mm)

Thickness of the wall of the model should be limited to maximum of 10 mm. Wall thickness greater than 10mm will lead to sludging.



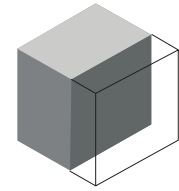
Minimum wall thickness (mm) for hollow part

Minimum thickness of the wall of the model which is hollow on the inside is resin dependent.



Pin Diameter 10mm long

A pin is a structure whose length is greater than two times its width. The ratio is key to printing pins; at 0.8 mm thickness you can print up to 10 mm tall before you start to see waving.



Tolerance (Accuracy)

Dimensional accuracy for a printed model

Resin

	Maximum element size	Minimum element size	Minimum element diameter	Best tolerance based on workflows in TDS
Hard	10mm. Anything bigger may cause sludging formed on the part. In this case 'Wait time' must be adjusted manually to 15s if part is no thicker than 50mm or 30s if part is thicker than 50mm	1.5mm if part is no bigger than 100x100x100mm. Add 1mm in thickness for every 100mm in size. Large flat part may need add a ribs or lattice to avoid warpage. After hollowing recommend add infill.	0.5mm increase thickness by 0.25mm every 10mm	+/-100µm to 1% of the part volume
DL110HB	10mm. Anything bigger may cause sludging formed on the part. In this case 'Wait time' must be adjusted manually to 15s if part is no thicker than 50mm or 30s if part is thicker than 50mm	1.5mm if part is no bigger than 100x100x100mm. Add 1mm in thickness for every 100mm in size. Large flat part may need add a ribs or lattice to avoid warpage. After hollowing recommend add infill.	0.5mm increase thickness by 0.25mm every 10mm	+/-100µm to 1% of the part volume
DL110HW	10mm. Anything bigger may cause sludging formed on the part. In this case 'Wait time' must be adjusted manually to 15s if part is no thicker than 50mm or 30s if part is thicker than 50mm	2mm if part no bigger 50x50x50mm, 3.45mm if part is no bigger than 100x100x100mm. Add 1mm in thickness for every 100mm in size. Large flat part may need add a ribs or lattice to avoid warpage. After hollowing recommend add infill.	0.8mm increase thickness by 0.25mm every 10mm	+/-100µm to 1% of the part volume
DL110HTR	10mm. Anything bigger may cause sludging formed on the part. In this case 'Wait time' must be adjusted manually to 15s if part is no thicker than 50mm or 30s if part is thicker than 50mm	1.5mm if part is no bigger than 100x100x100mm. Add 1mm in thickness for every 100mm in size. Large flat part may need add a ribs or lattice to avoid warpage. After hollowing recommend add infill.	0.5mm increase thickness by 0.25mm every 10mm	+/-100µm to 1% of the part volume
Durable	10mm. Anything bigger may cause sludging formed on the part. In this case 'Wait time' must be adjusted manually to 15s if part is no thicker than 50mm or 30s if part is thicker than 50mm	1.5mm if part is no bigger than 100x100x100mm. Add 1mm in thickness for every 100mm in size. Large flat part may need add a ribs or lattice to avoid warpage. After hollowing recommend add infill.	0.5mm increase thickness by 0.25mm every 10mm	+/-100µm to 1% of the part volume
Duramax	10mm. Anything bigger may cause sludging formed on the part. In this case 'Wait time' must be adjusted manually to 15s if part is no thicker than 50mm or 30s if part is thicker than 50mm	1.5mm if part is no bigger than 100x100x100mm. Add 1mm in thickness for every 100mm in size. Large flat part may need add a ribs or lattice to avoid warpage. After hollowing recommend add infill.	0.5mm increase thickness by 0.25mm every 10mm	+/-100µm to 1% of the part volume
Flexible DL220B	10mm. Anything bigger may cause sludging formed on the part. In this case 'Wait time' must be adjusted manually to 15s if part is no thicker than 50mm or 30s if part is thicker than 50mm	3mm if part is no bigger than 100x100x100mm. Add 2mm in thickness for every 100mm in size. Large part may need add a ribs or internal lattice to avoid warpage. Big number of supports need to manage keep shape. (part is very floppy when printing)	0.7mm increase thickness by 0.35mm every 10mm	+/-100µm to 1.5% of the part volume
Dental Model White	10mm. Anything bigger may cause sludging formed on the part. In this case 'Wait time' must be adjusted manually to 15s if part is no thicker than 50mm or 30s if part is thicker than 50mm	2.5mm for Dental Arch (Recommend print solid models to achieve 95% yield)	0.8mm increase thickness by 0.25mm every 10mm	80-95%<100µm
Dental Model Beige	10mm. Anything bigger may cause sludging formed on the part. In this case 'Wait time' must be adjusted manually to 15s if part is no thicker than 50mm or 30s if part is thicker than 50mm	3mm for Dental Arch (Recommend print solid models to achieve 95% yield)	0.7mm increase thickness by 0.25mm every 10mm	85-95%<100µm
High Tensile White	10mm. Anything bigger may cause sludging formed on the part. In this case 'Wait time' must be adjusted manually to 15s if part is no thicker than 50mm or 30s if part is thicker than 50mm	2mm if part is no bigger than 100x100x100mm. Add 1mm in thickness for every 100mm in size. Large flat part may need add a ribs or lattice to avoid warpage	0.8mm increase thickness by 0.25mm every 10mm	+/-100µm to 1% of the part volume
Concept	10mm. Anything bigger may cause sludging formed on the part. In this case 'Wait time' must be adjusted manually to 15s if part is no thicker than 50mm or 30s if part is thicker than 50mm	2mm if part is no bigger than 100x100x100mm. Add 1mm in thickness for every 100mm in size. Large flat part may need add a ribs or lattice to avoid warpage	0.8mm increase thickness by 0.25mm every 10mm	+/-100µm to 1% of the part volume
Draft	10mm. Anything bigger may cause sludging formed on the part. In this case 'Wait time' must be adjusted manually to 15s if part is no thicker than 50mm or 30s if part is thicker than 50mm	1.5mm if part is no bigger than 100x100x100mm. Add 1mm in thickness for every 100mm in size. Large flat part may need add a ribs or lattice to avoid warpage. After hollowing recommend add infill.	0.5mm increase thickness by 0.25mm every 10mm	+/-100µm to 1% of the part volume
HighTemp DL400	10mm. Anything bigger may cause sludging formed on the part. In this case 'Wait time' must be adjusted manually to 15s if part is no thicker than 50mm or 30s if part is thicker than 50mm	1.5mm if part is no bigger than 100x100x100mm. Add 1mm in thickness for every 100mm in size. Large flat part may need add a ribs or lattice to avoid warpage. After hollowing recommend add infill.	0.5mm increase thickness by 0.25mm every 10mm	+/-100µm to 1% of the part volume
Rigid DL240 Plant-Based	10mm. Anything bigger may cause sludging formed on the part. In this case 'Wait time' must be adjusted manually to 15s if part is no thicker than 50mm or 30s if part is thicker than 50mm	1.5mm if part is no bigger than 100x100x100mm. Add 1mm in thickness for every 100mm in size. Large flat part may need add a ribs or lattice to avoid warpage. After hollowing recommend add infill.	0.2mm increase thickness by 0.25mm every 10mm	+/-100µm to 1% of the part volume. Dental Models 97%<100µm