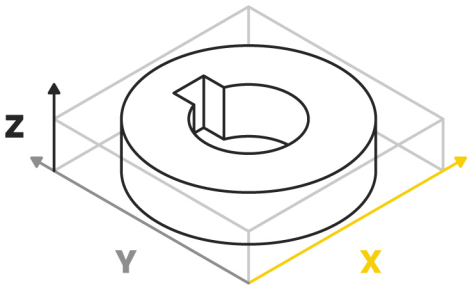
FDM

Design Guidelines

Minimum part size

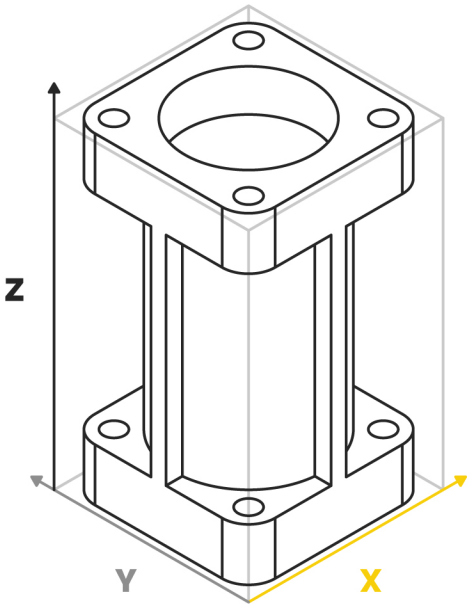
Minimum part dimensions. Even within the range shown, they must be analyzed due to possible limiting geometric details.



	Width	Length	Height
EON PLA	1,6 mm	1,6 mm	0,8 mm
EON PET			
EON PET ESD-SAFE			
EON ABS/ASA			
EON PA			
EON PA-CF			
EON PC			
EON PC-CF			
EON PA-CF + Continuous Carbon Fiber	9,5 mm	9,5 mm	1,2 mm
EON PA-CF + Continuous Kevlar Fiber	9,5 mm	9,5 mm	0,9 mm
EON PA-CF + Continuous Fiberglass			
EON TPU	4,0 mm	4,0 mm	1,0 mm
EON PEKK	2,0 mm	2,0 mm	1,0 mm

Maximum part size

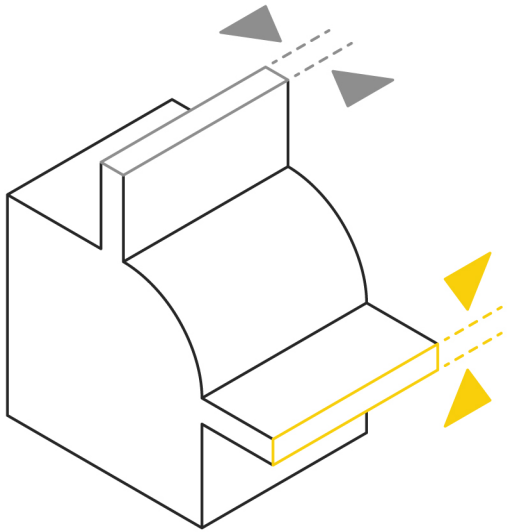
Maximum part dimensions. Even within the range shown, they must be analyzed due to possible limiting geometric details.



	Width	Length	Height
EON PLA	350 mm	350 mm	350 mm
EON PET	900 mm	900 mm	1500 mm
EON PET ESD-SAFE	350 mm	350 mm	350 mm
EON ABS/ASA	250 mm	200 mm	200 mm
EON PA	320 mm	130 mm	150 mm
EON PA-CF			
EON PC	250 mm	200 mm	200 mm
EON PC-CF	350 mm	350 mm	350 mm
EON PA-CF + Continuous Carbon Fiber	320 mm	130 mm	150 mm
EON PA-CF + Continuous Kevlar Fiber			
EON PA-CF + Continuous Fiberglass			
EON TPU			
EON PEKK	160 mm	160 mm	200 mm

Minimum unsupported walls thickness

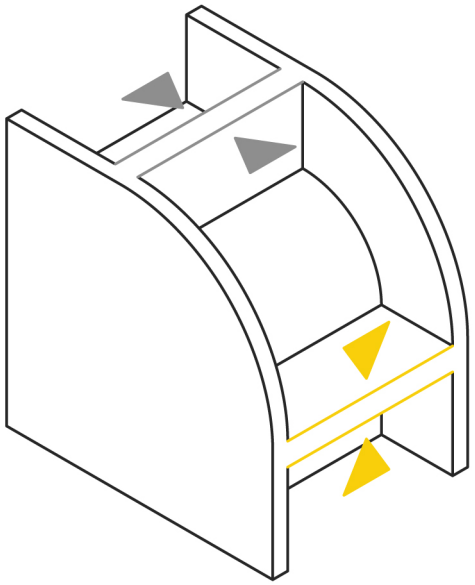
The minimum unsupported wall thickness is the minimum thickness required for a wall supported on less than two sides. Walls that are too thin may warp or separate from the model.



	Thickness
EON PLA	0,6 mm
EON PET	
EON PET ESD-SAFE	
EON ABS/ASA	0,8 mm
EON PA	0,6 mm
EON PA-CF	
EON PC	
EON PC-CF	0,5 mm
EON PA-CF + Continuous Carbon Fiber	0,6 mm
EON PA-CF + Continuous Kevlar Fiber	
EON PA-CF + Continuous Fiberglass	
EON TPU	0,7 mm
EON PEKK	0,8 mm

Minimum supported walls thickness

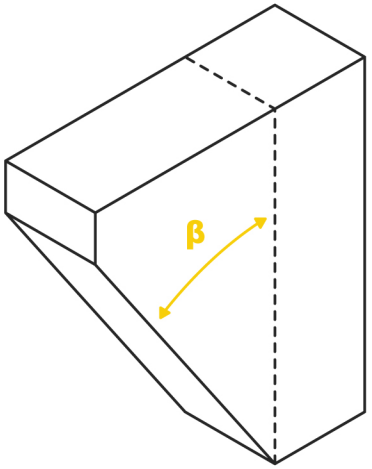
Minimum supported wall thickness is the minimum thickness required for a wall supported on two or more sides. Walls that are too thin may warp or separate from the model.



	Thickness
EON PLA	0,6 mm
EON PET	0,5 mm
EON PET ESD-SAFE	
EON ABS/ASA	0,8 mm
EON PA	0,5 mm
EON PA-CF	
EON PC	
EON PC-CF	
EON PA-CF + Continuous Carbon Fiber	
EON PA-CF + Continuous Kevlar Fiber	
EON PA-CF + Continuous Fiberglass	
EON TPU	0,7 mm
EON PEKK	

Maximum overhang angle without supports

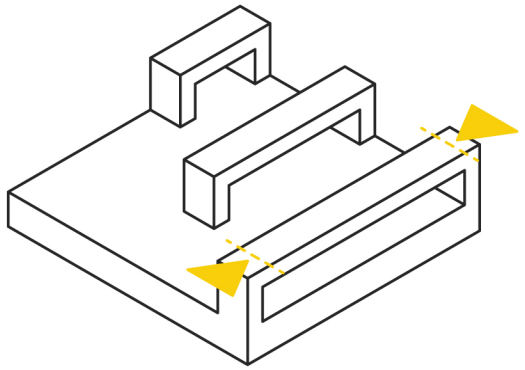
Overhangs are geometric shapes in a 3D model that extend outside the model and beyond the previous layers. These geometries have no direct support, so they can add problems when printing, but up to a certain inclination, it is possible to materialize them.



	Maximum	Recommended
EON PLA	55°	50°
EON PET	50°	45°
EON PET ESD-SAFE		
EON ABS/ASA	55°	50°
EON PA	45°	40°
EON PA-CF	55°	40°
EON PC	50°	45°
EON PC-CF	45°	40°
EON PA-CF + Continuous Carbon Fiber	55°	40°
EON PA-CF + Continuous Kevlar Fiber		
EON PA-CF + Continuous Fiberglass		
EON TPU	40°	35°
EON PEKK	45°	40°

Maximum bridge without supports

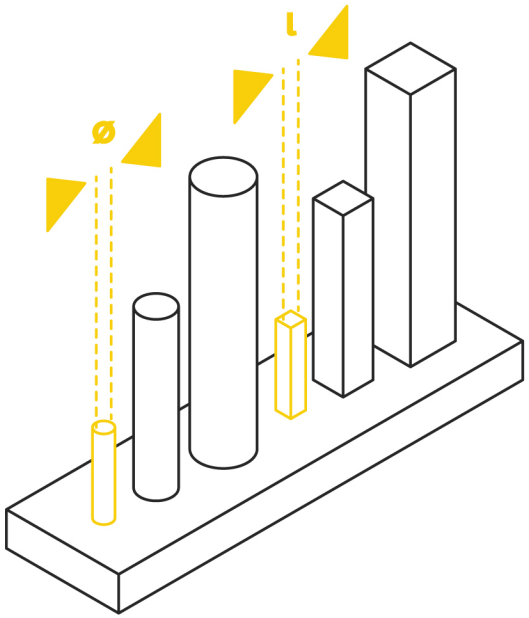
Bridges, in FDM printing processes, refer to segments where the extruder releases filament over air while moving between two supported positions on the same layer. These displacements, within a range of distances, do not compromise the print, however, beyond a certain distance, the print can have problems associated with these geometric details.



	Maximum	Recommended
EON PLA	70 mm	60 mm
EON PET	35 mm	30 mm
EON PET ESD-SAFE	40 mm	35 mm
EON ABS/ASA	50 mm	40 mm
EON PA	1 mm	1 mm
EON PA-CF		
EON PC	35 mm	30 mm
EON PC-CF	45 mm	40 mm
EON PA-CF + Continuous Carbon Fiber	1 mm	1 mm
EON PA-CF + Continuous Kevlar Fiber		
EON PA-CF + Continuous Fiberglass		
EON TPU		
EON PEKK	15 mm	10 mm

Minimum Diameter/Side (Pillars)*

The pillars should not be higher than five times the dimension of the pillar base. Otherwise, they will be more susceptible to cracking along the layers.



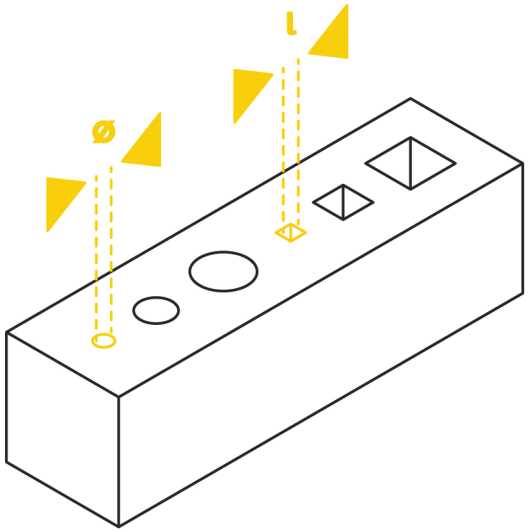
	Circular Pillars [Ø]	Square Pillars [l]
EON PLA	3 mm	4 mm
EON PET		
EON PET ESD-SAFE		
EON ABS/ASA	3 mm	3 mm
EON PA		
EON PA-CF		
EON PC		
EON PC-CF		
EON PA-CF + Continuous Carbon Fiber		
EON PA-CF + Continuous Kevlar Fiber		
EON PA-CF + Continuous Fiberglass		
EON TPU	4 mm	4 mm
EON PEKK	4 mm	3 mm

Note: In order to avoid brittle areas when post-processing the parts, at these base-pillar connection locations, add a fillet or a chamfer.

*Please note that a pillar should not be higher than five times the dimension of the pillar base. Otherwise, they will be more susceptible to shear in layer lines.

Minimum Diameter/Side (Holes)

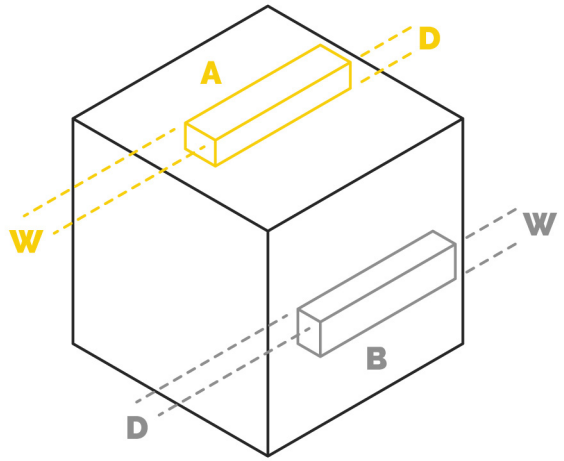
Too small diameters can cause melting of the deposited material and thus promote hole closure or a poor finish. The same can happen for square holes if their sides are too small.



	Circular Pillars [Ø]	Square Pillars [l]
EON PLA	2,0 mm	2,0 mm
EON PET		
EON PET ESD-SAFE		
EON ABS/ASA		
EON PA	1,5 mm	1,5 mm
EON PA-CF		
EON PC	2,0 mm	2,0 mm
EON PC-CF		
EON PA-CF + Continuous Carbon Fiber	1,5 mm	1,5 mm
EON PA-CF + Continuous Kevlar Fiber		
EON PA-CF + Continuous Fiberglass		
EON TPU	2,0 mm	2,0 mm
EON PEKK		

Minimum embossed features

The values shown are for all materials referenced here. In cases of horizontal embosses, since the plastic extrusion alone is 0.4 mm, the width of this geometry should be dimensioned with multiples of 0.4 mm.

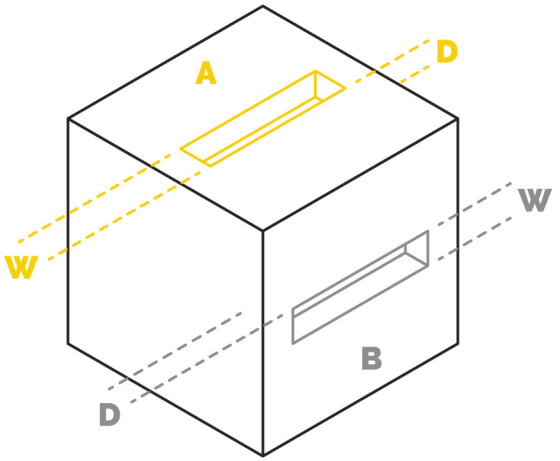


	Depth	Width
A) Horizontal Faces	0,2 mm	0,8 mm
B) Vertical Faces	0,5 mm	0,6 mm

Embossed details are extruded from the faces of the model. Embosses that are too small may become almost or completely unnoticeable. When associated with a font (text or numerical elements), use a bold font as it enhances the results.

Minimum engraved features

The values shown are for all materials referenced here. In cases of horizontal engraving, since the plastic extrusion alone is 0.4 mm, the width of the same geometry should be dimensioned with multiples of 0.4 mm.

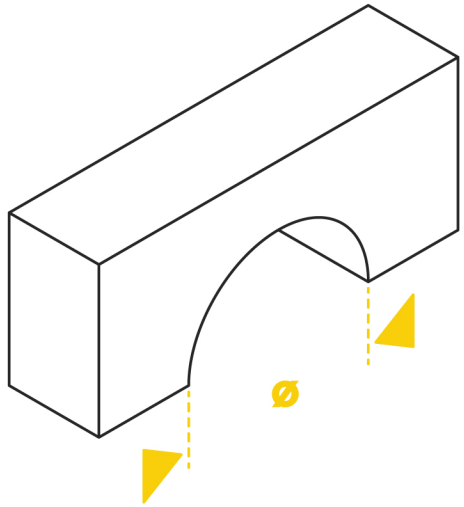


	Depth	Width
A) Horizontal Faces	0,2 mm	0,8 mm
B) Vertical Faces	0,5 mm	0,6 mm

Engraved details are cuts made from the surface of the model. Details that are too small may become almost or completely unnoticeable. When this cut is associated with a font (text or numerical elements), use a bold font as it enhances the results.

Minimum arc diameter

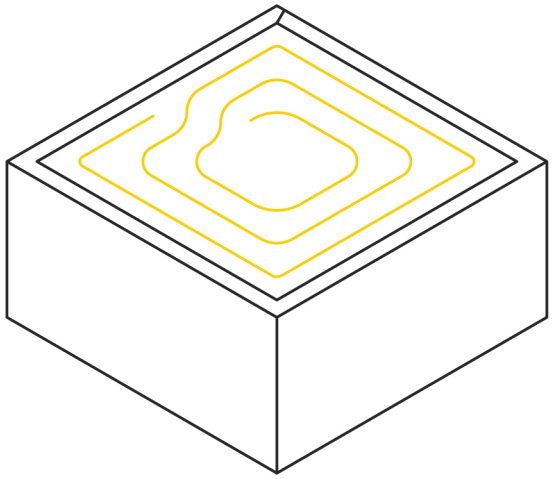
The geometry of an arc can potentialize a zone of possible overhangs depending on the diameter of the arc. Therefore, up to a certain diameter it is possible to execute an arc without running risks. However, beyond a certain diameter, unsupported structures start to enter the arc area, which can affect the print quality.

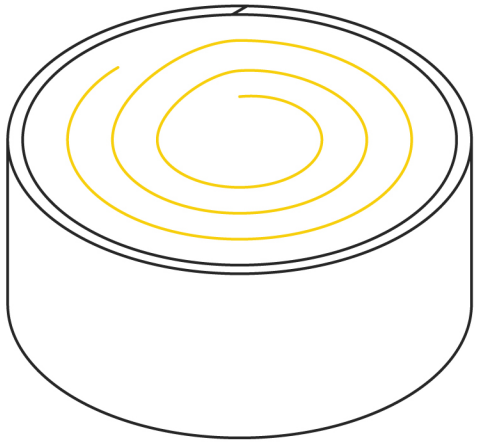


	Diameter [Ø]
EON PLA	2 mm
EON PET	
EON PET ESD-SAFE	
EON ABS/ASA	
EON PA	4 mm
EON PA-CF	2 mm
EON PC	3 mm
EON PC-CF	
EON PA-CF + Continuous Carbon Fiber	2 mm
EON PA-CF + Continuous Kevlar Fiber	
EON PA-CF + Continuous Fiberglass	
EON TPU	4 mm
EON PEKK	3 mm

Minimum area for continuous fiber reinforcement

Note that the minimum area that can be fiber-reinforced is limited to the smallest fiber strand that can be laid and cut. That said, the minimum fiber length is 45 mm.

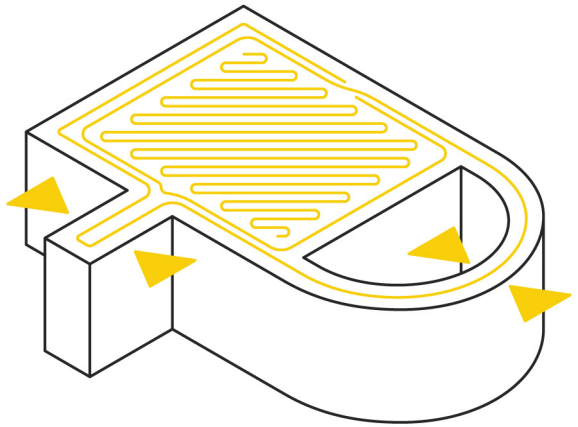




	Square Zones	Circular Zones
EON PA-CF + Continuous Carbon Fiber	90 mm^2	Ø9,6 mm
EON PA-CF + Continuous Kevlar Fiber		
EON PA-CF + Continuous Fiberglass		

Minimum width for continuous fiber reinforced zones

Depending on the geometry of the part to be reinforced, some of its zones may or may not allow the deposition of fibers. For this to be possible, some minimum dimensions must be respected.



	Rectilinear Zones	Curved Zones
EON PA-CF + Continuous Carbon Fiber	3,6 mm	2,8 mm
EON PA-CF + Continuous Kevlar Fiber		
EON PA-CF + Continuous Fiberglass		

Minimum height for continuous fiber reinforced areas

In order for a part/zone to be reinforced with continuous fiber, a minimum height must be respected so that sufficient layers are created for fiber deposition to take place.

	Height
EON PA-CF + Continuous Carbon Fiber	1,2 mm
EON PA-CF + Continuous Kevlar Fiber	0,9 mm
EON PA-CF + Continuous Fiberglass	