



CORE MATERIALS' FINISHING OPTIONS

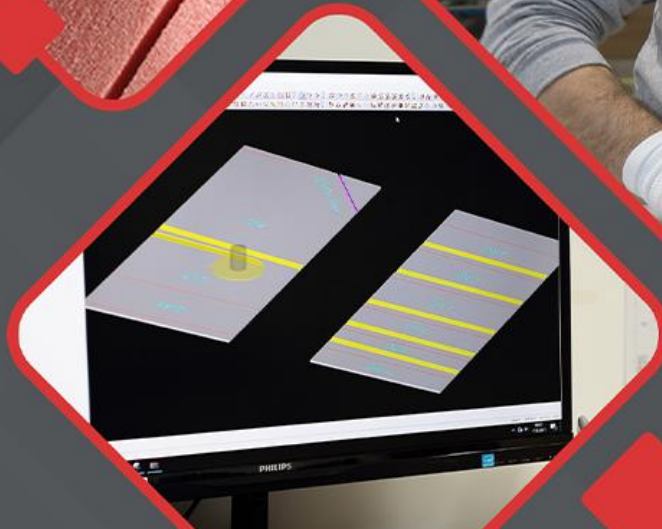
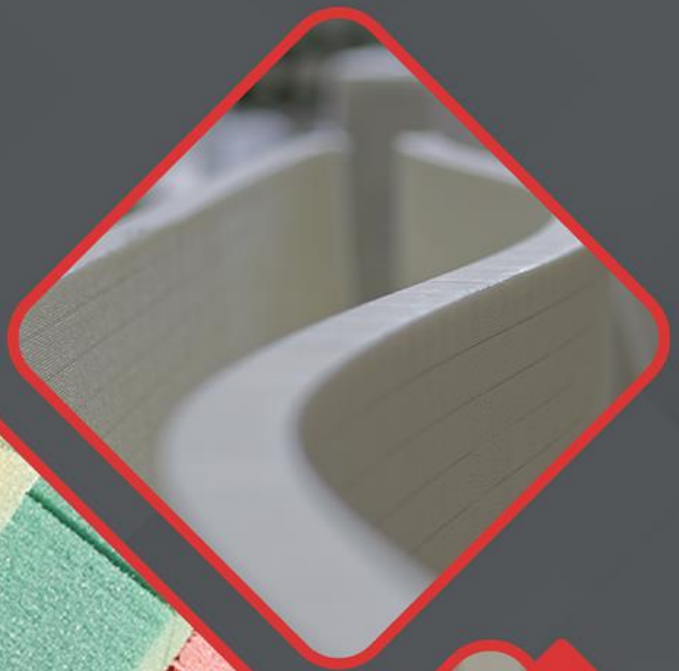


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CORE MATERIALS' FINISHING OPTIONS

Finishing of core materials for composite industry

"Finishing" is the machining of core material panels to aid vacuum infusion process and assure final product quality. Targets:

- Insure air evacuation through holes across core material.
- Improve resin flow with grooves along core material.
- Allow core material to adapt to mold curvatures reducing 'spring-back' by introducing deep grooves.

This brochure collects some of the finishing options currently available at METYX. This is a starting point, introducing the customer to the variety of METYX 'typical finishing options' while, at the same time, offering 'tailor made' solutions to specific customer requirements as needed.

Different finishing options are obtained from 3 machining: perforation, shallow grooving, deep grooving. Single machining, their combinations and lightweight fiberglass scrim heat fastening are the bases for finishing options categories:

- Perforated - **P**
- Shallow grooved - **G**
- Shallow grooved and perforated - **G P**
- Scrim cloth (deep grooved) - **SC**
- Scrim cloth (deep grooved), shallow grooved and perforated - **SC G P**
- Double cut and flexi cut (deep grooved) - **DC, FC**

Some finishing options may have limitations in terms of raw material typology, density, thickness. All deep grooved panels are supplied with the half of the plane sheet length.

Perforated - P

To ensure air evacuation during vacuum infusion, core material can be perforated.

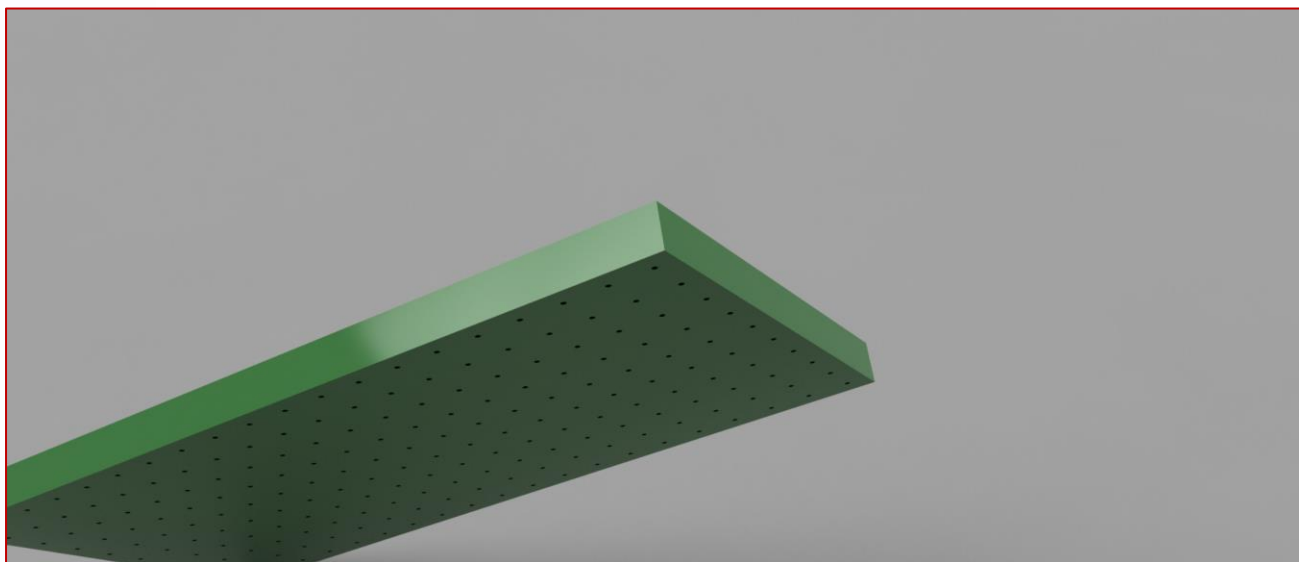
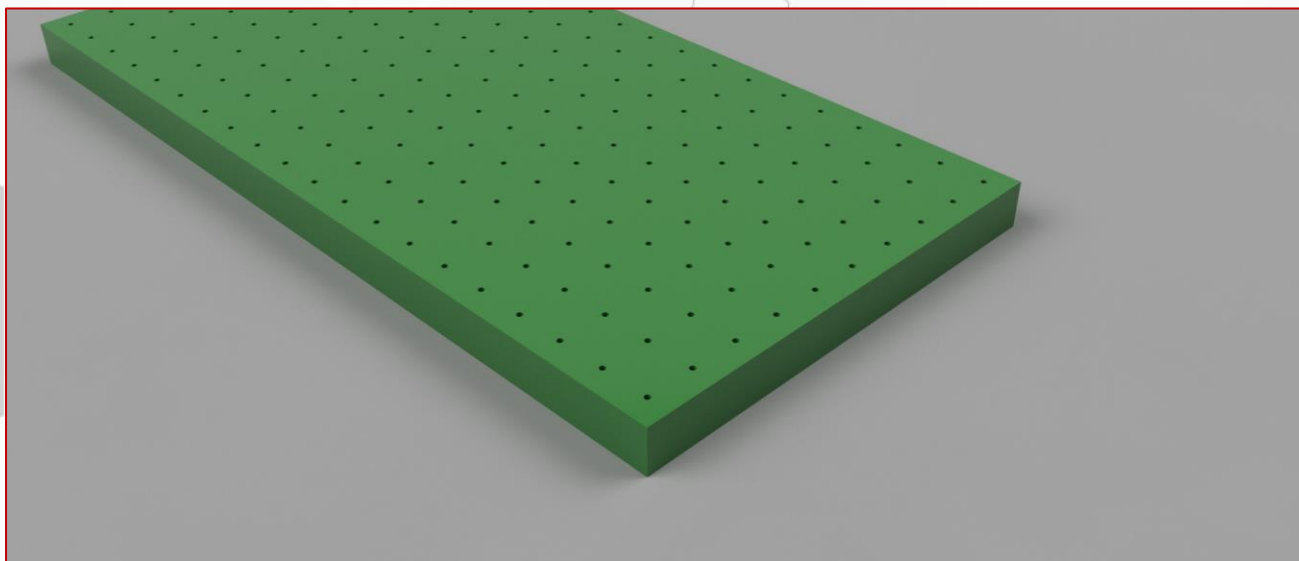
Holes can have various diameters and arrays on the surface.

According to various needs, different patterns may be chosen.

Standard perforation patterns foresee 2.5mm hole diameter and 20 or 40mm holes spacing.

Code	Hole diameter [mm]	Spacing along sheet ↕ [mm]	Spacing across sheet ↔ [mm]
P20x2.5	2.5	20	20
P2040x2.5	2.5	20	40
P4020x2.5	2.5	40	20
P40x2.5	2.5	40	40

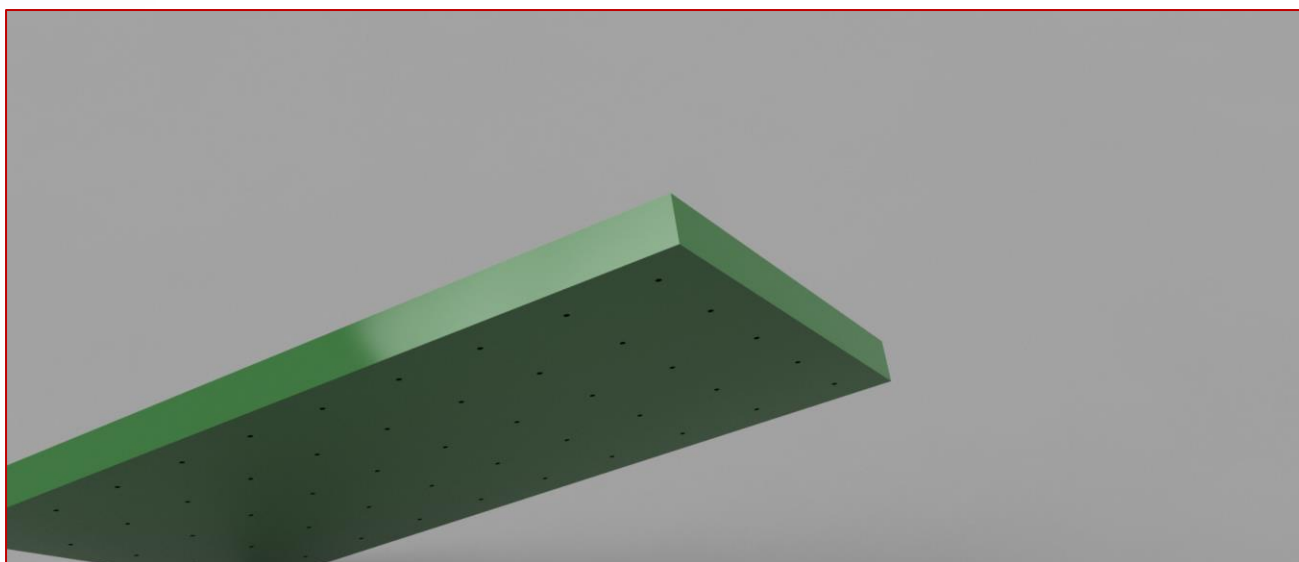
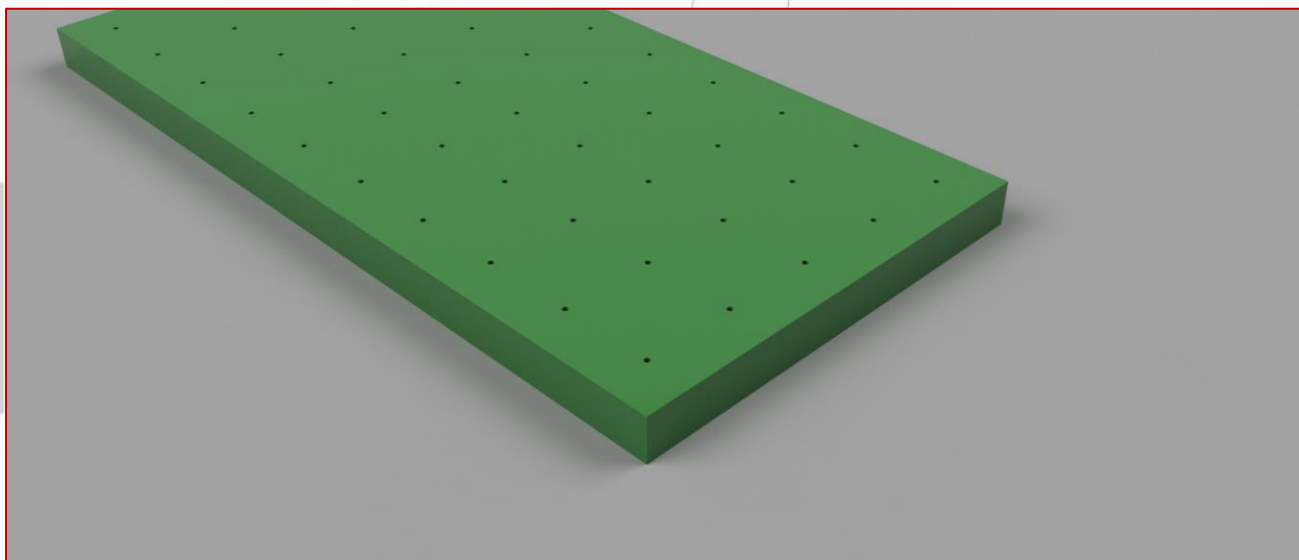
P20x2.5



Perforation

Hole diameter [mm]	Spacing along sheet ↕ [mm]	Spacing across sheet ↔ [mm]
2.5	20	20

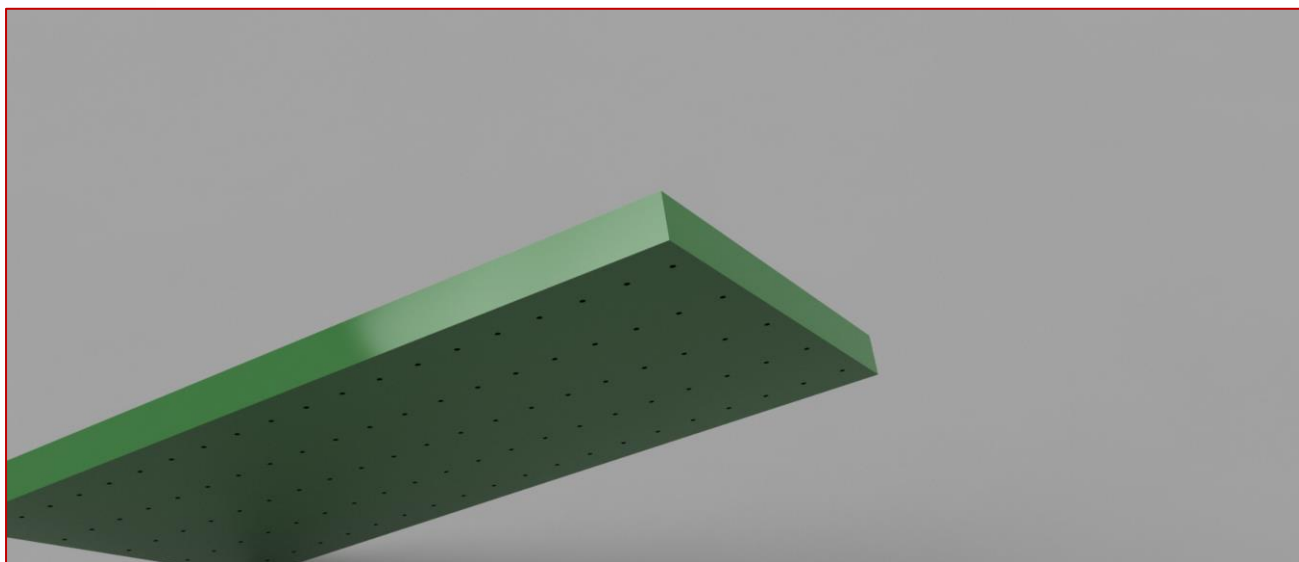
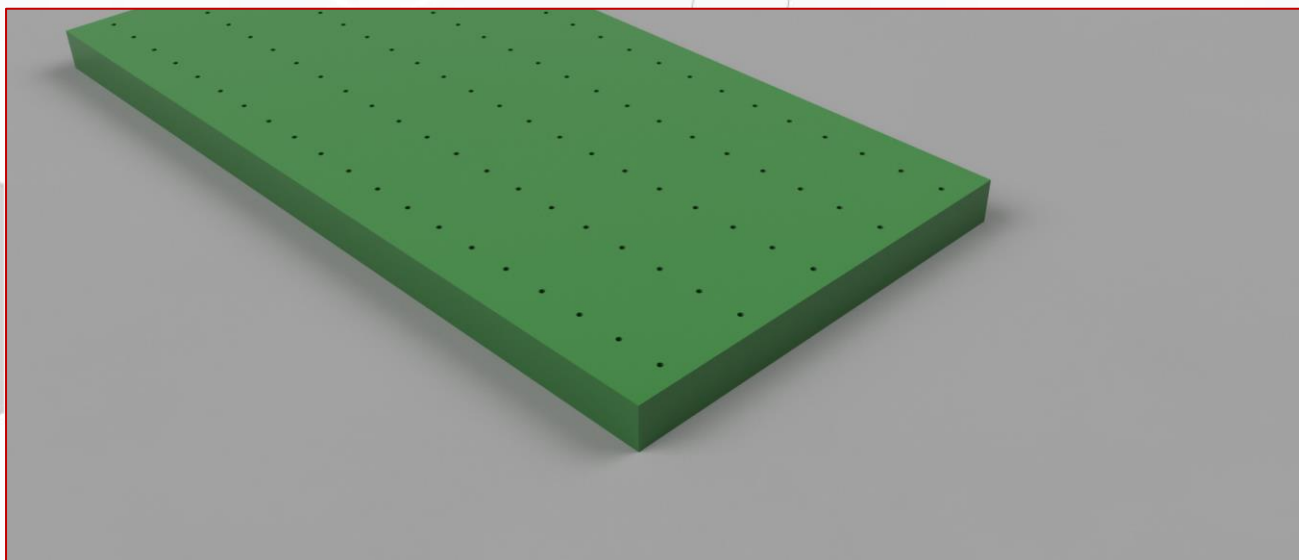
P40x2.5



Perforation

Hole diameter [mm]	Spacing along sheet \updownarrow [mm]	Spacing across sheet \leftrightarrow [mm]
2.5	40	40

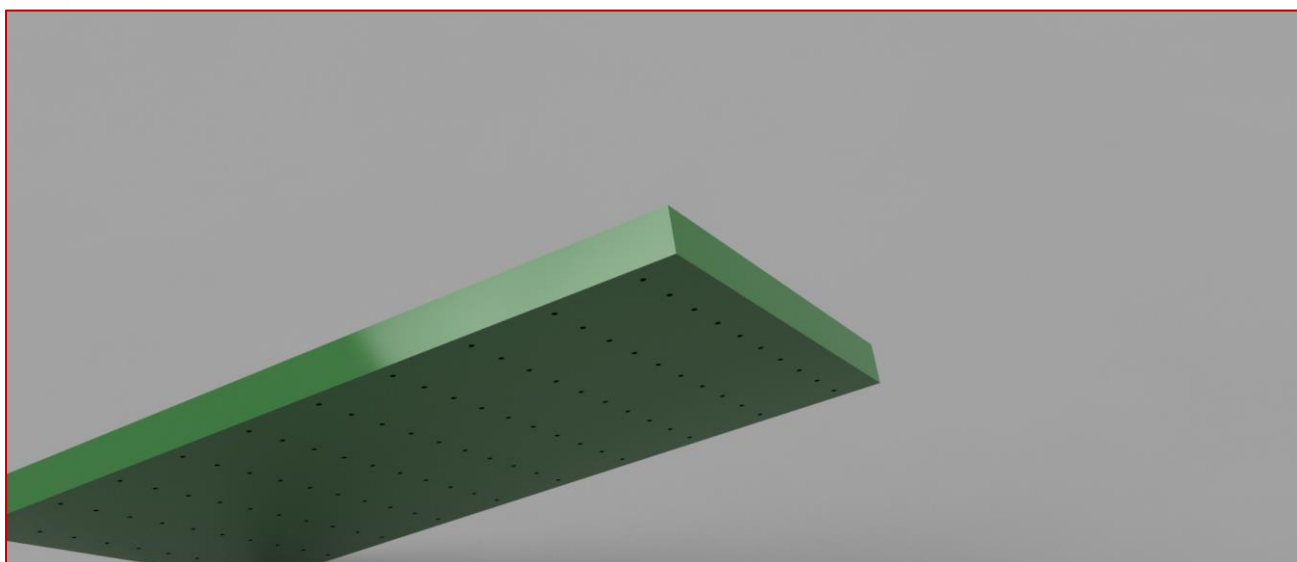
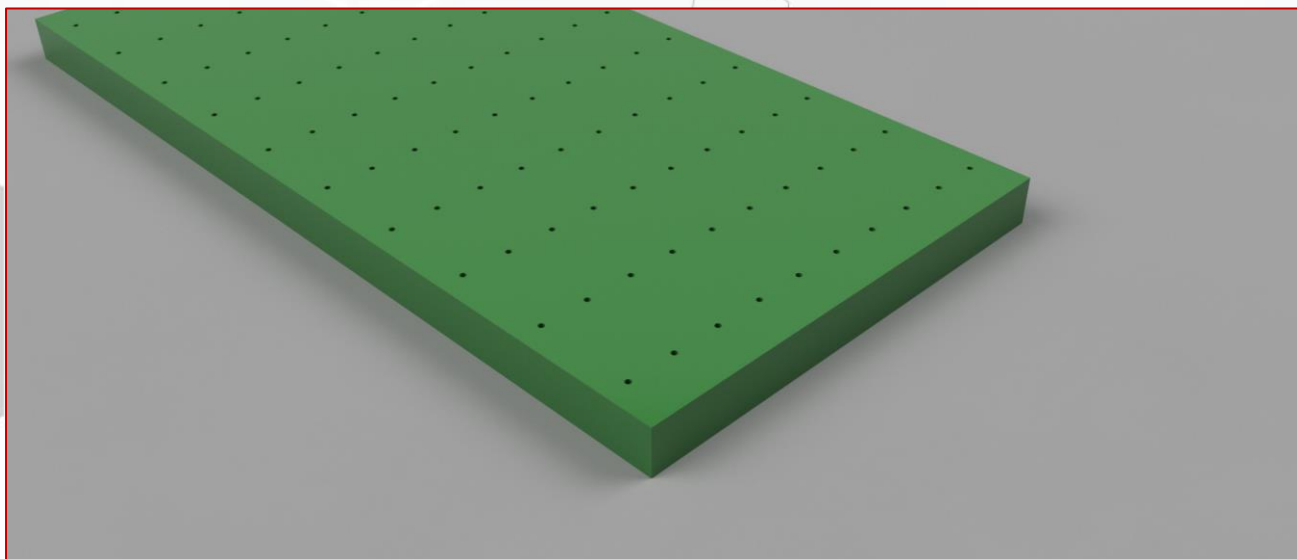
P2040x2.5



Perforation

Hole diameter [mm]	Spacing along sheet ↕ [mm]	Spacing across sheet ↔ [mm]
2.5	20	40

P4020x2.5



Perforation

Hole diameter [mm]	Spacing along sheet \updownarrow [mm]	Spacing across sheet \leftrightarrow [mm]
2.5	40	20

Shallow grooved - G

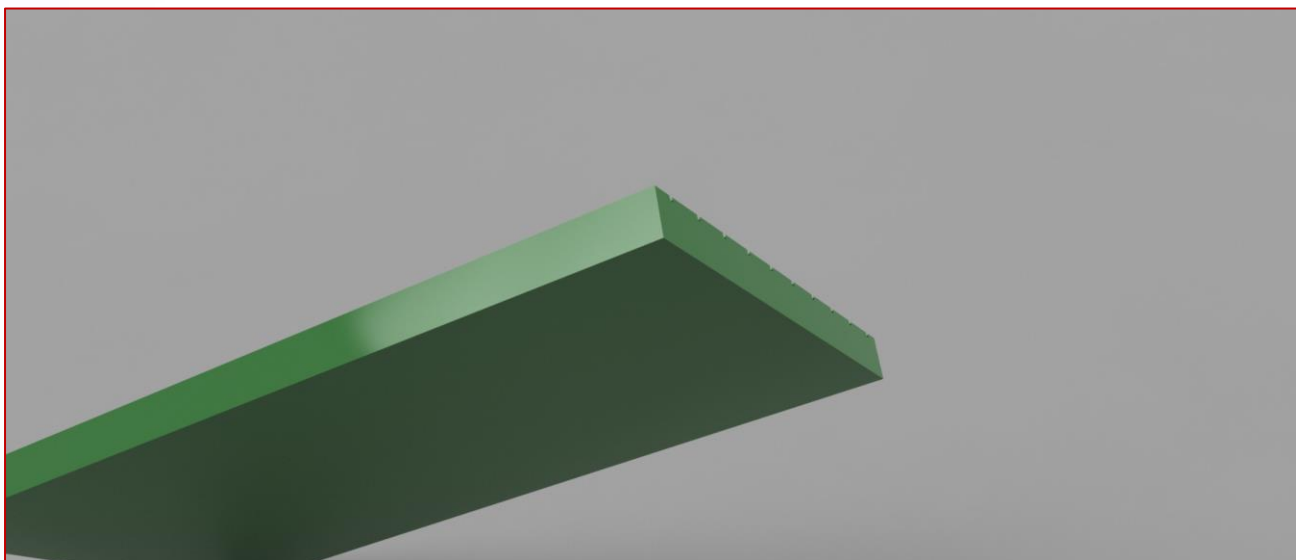
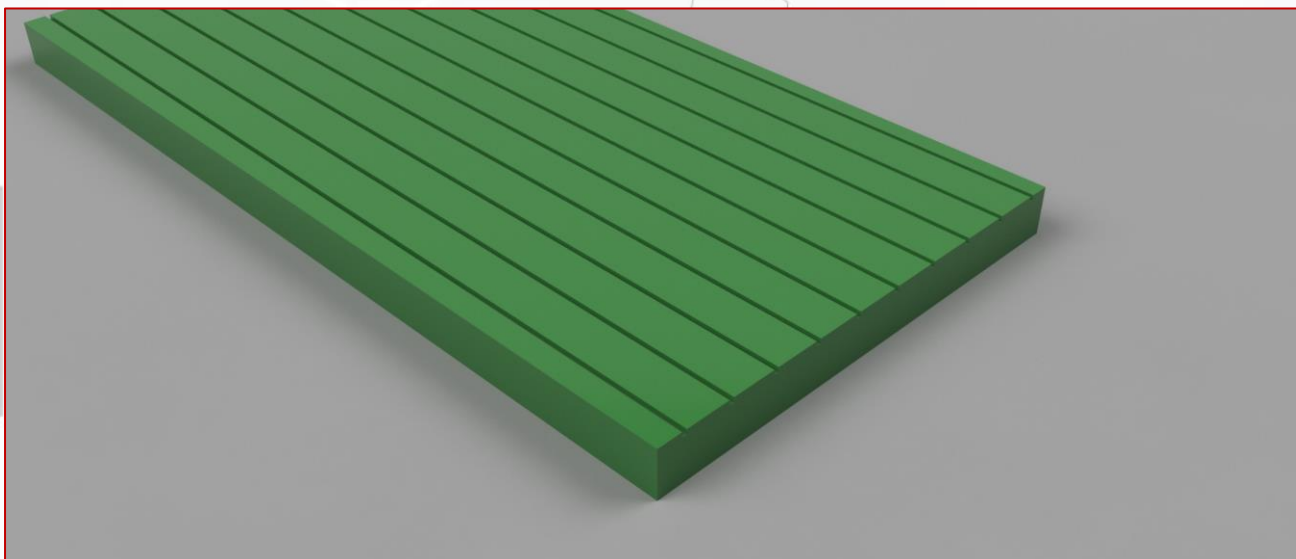
To improve resin flow, shallow grooves are machined on core surface.

Grooves may be on one or both sides, along longitudinal or transverse directions or both (cross grooves).

Standard patterns have 20mm grooves spacing and two different groove sections: the common 2x2mm and the 'resin saving' 1.2x2.5mm.

Code	Top Surface Groove [mm]				Bottom Surface Groove [mm]			
	Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
G10	2.0	2.0	20	↕				
G13	2.0	2.0	20	↔				
G1	2.0	2.0	20	↔↕				
G11	2.0	2.0	20	↕	2.0	2.0	20	↕
G14	2.0	2.0	20	↔	2.0	2.0	20	↔
G12	2.0	2.0	20	↕	2.0	2.0	20	↔
G2	2.0	2.0	20	↔↕	2.0	2.0	20	↔↕
G5	1.2	2.5	20	↕				
G18	1.2	2.5	20	↔				
G15	1.2	2.5	20	↔↕				
G6	1.2	2.5	20	↕	1.2	2.5	20	↕
G19	1.2	2.5	20	↔	1.2	2.5	20	↔
G17	1.2	2.5	20	↕	1.2	2.5	20	↔
G16	1.2	2.5	20	↔↕	1.2	2.5	20	↔↕

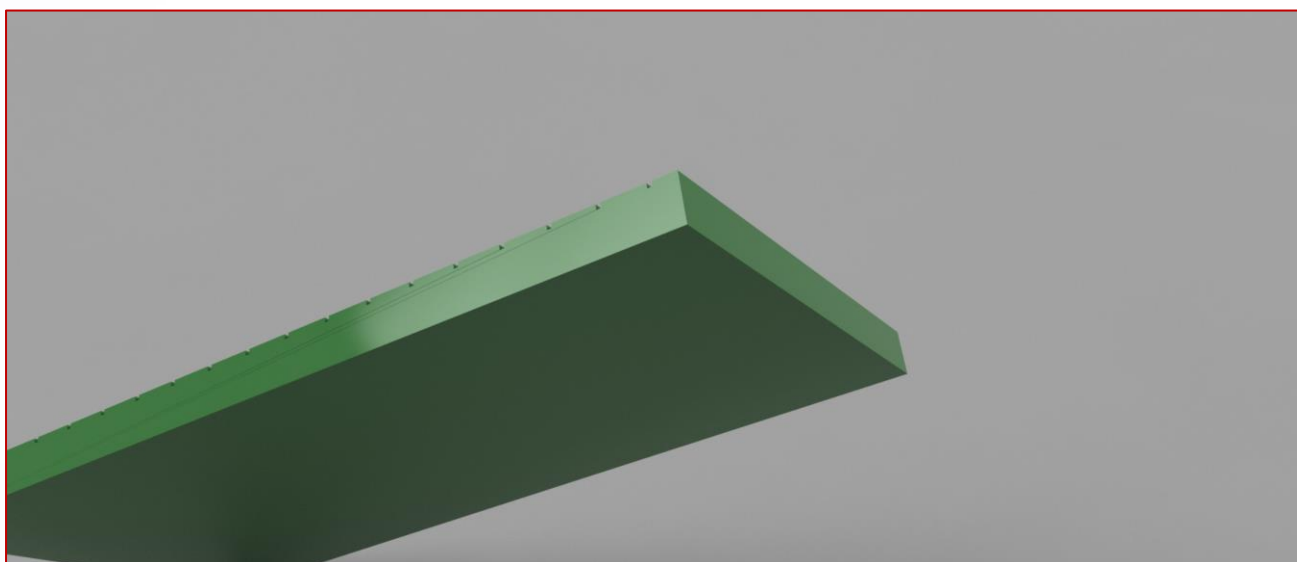
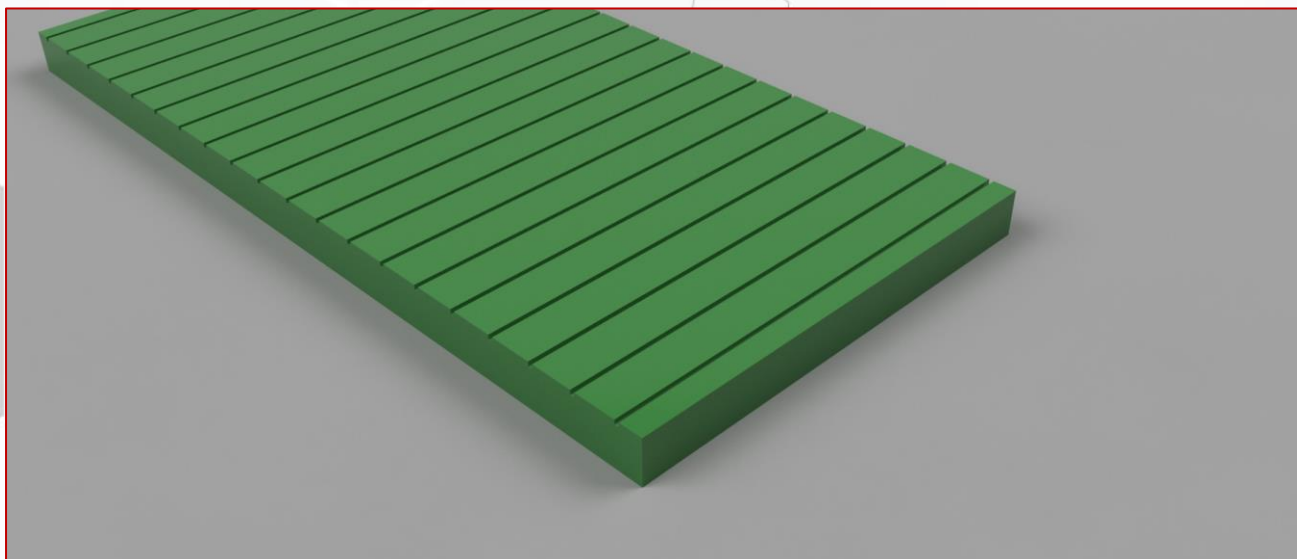
G10



Shallow groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
2.0	2.0	20	↕				

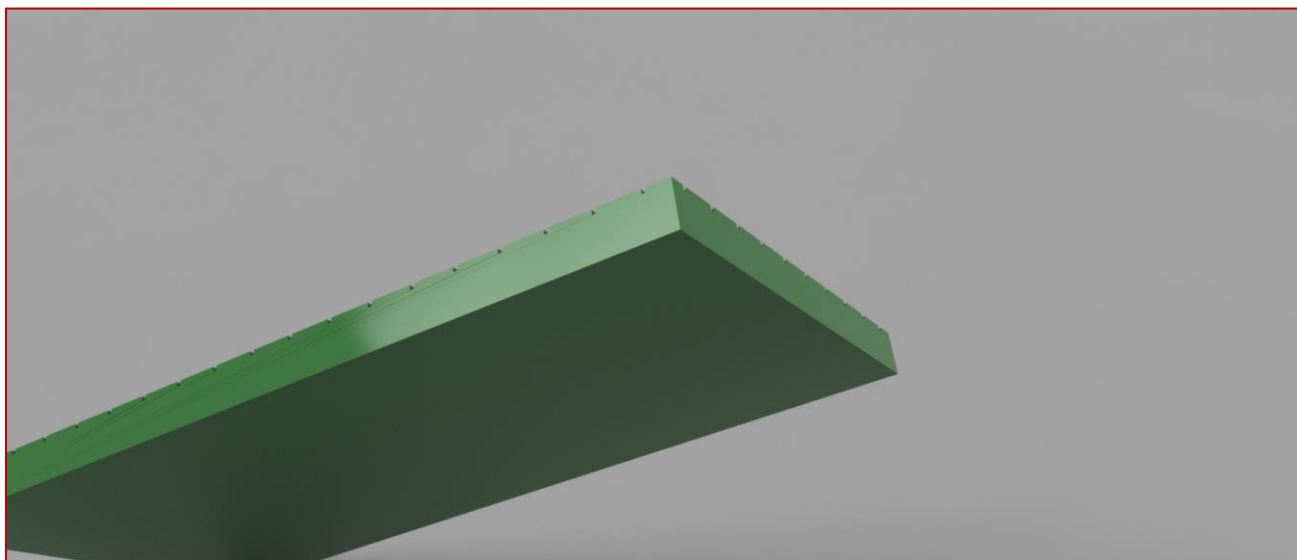
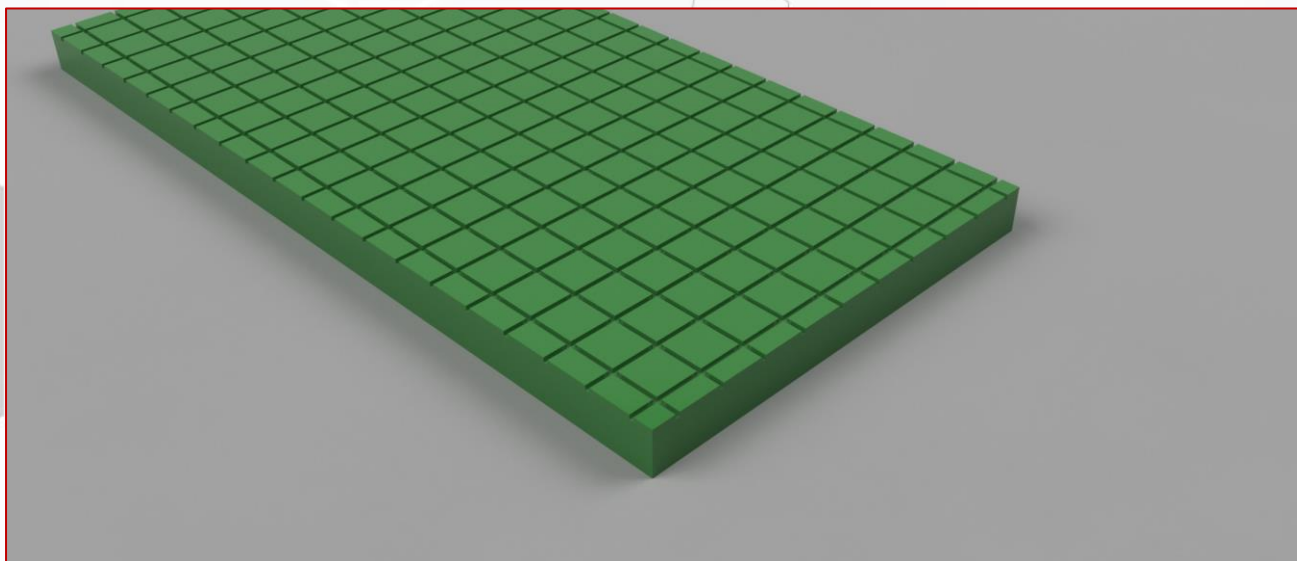
G13



Shallow groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
2.0	2.0	20	↔				

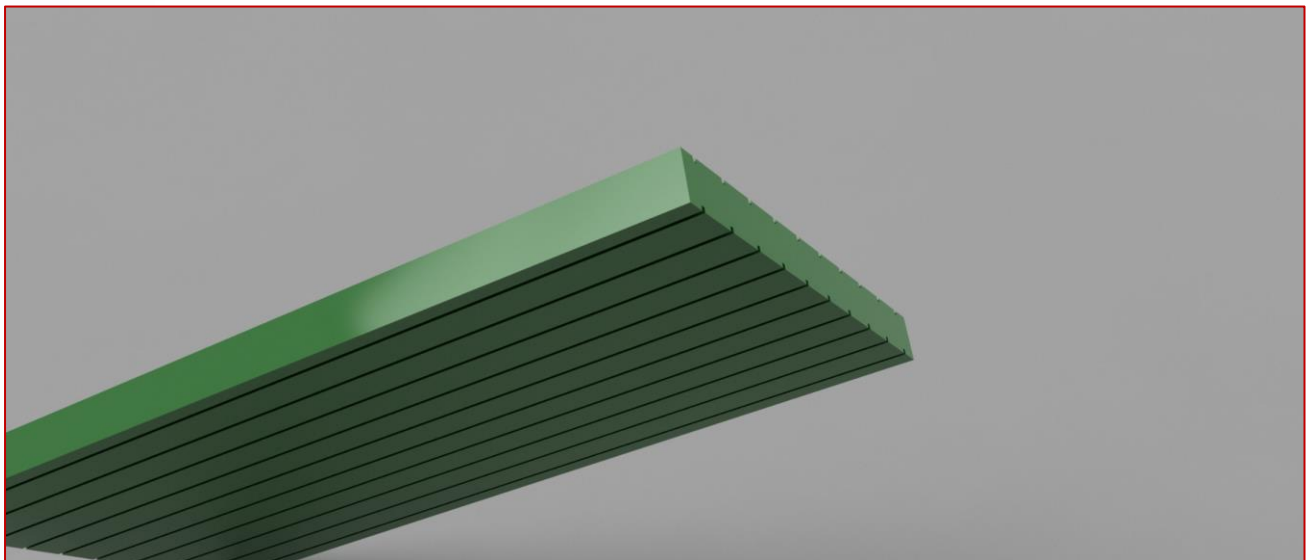
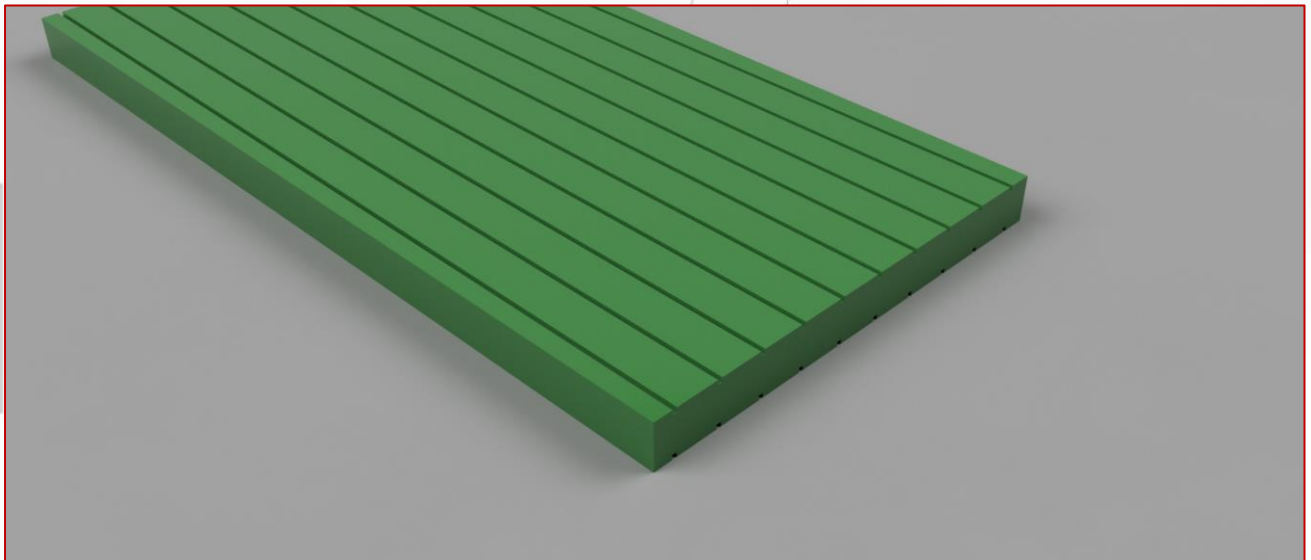
G1



Shallow groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
2.0	2.0	20	↔↕				

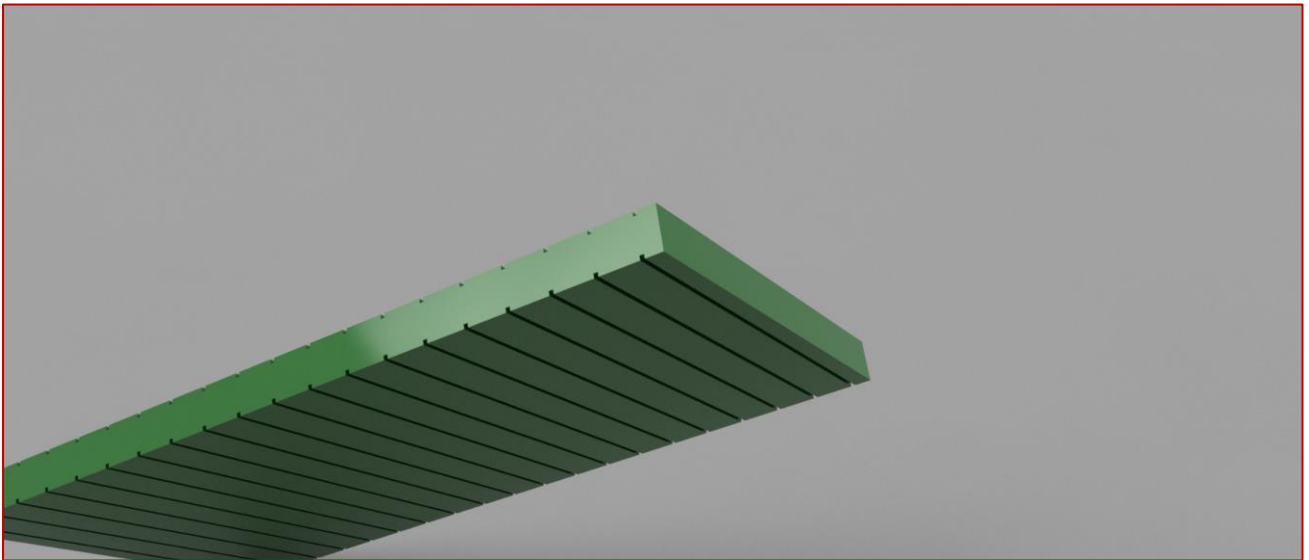
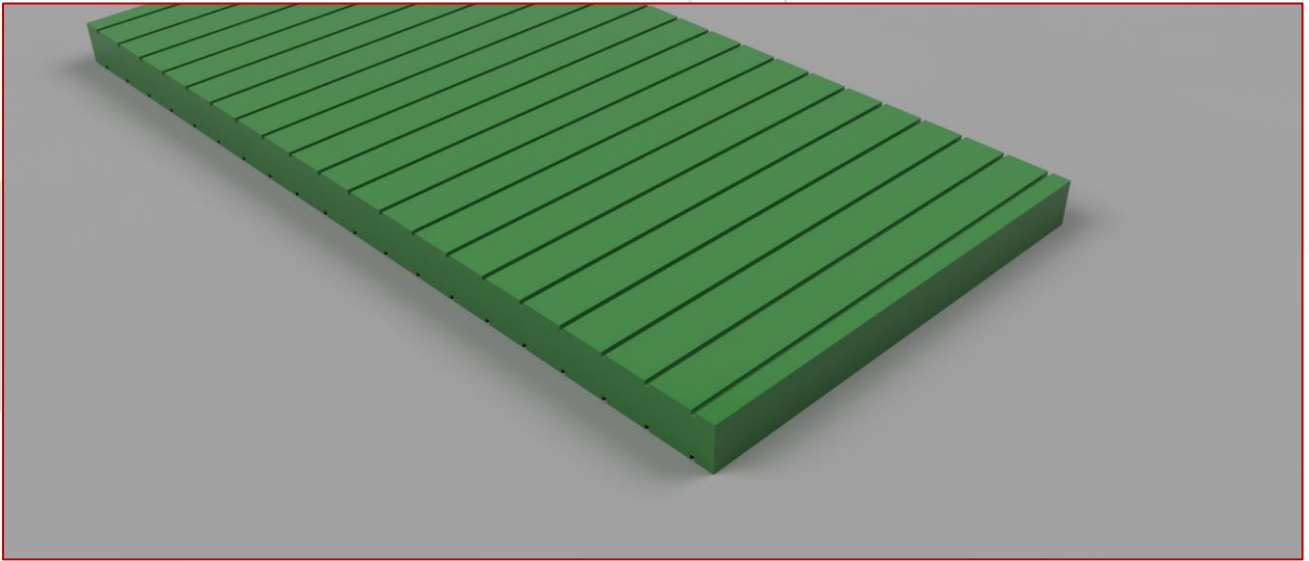
G11



Shallow groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
2.0	2.0	20	↕	2.0	2.0	20	↕

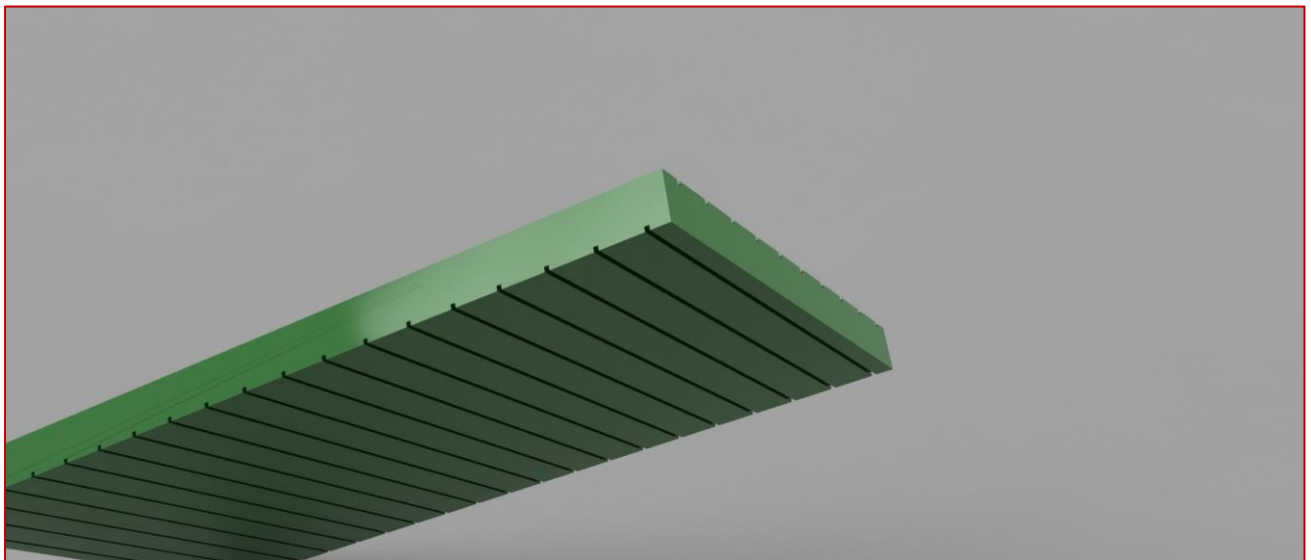
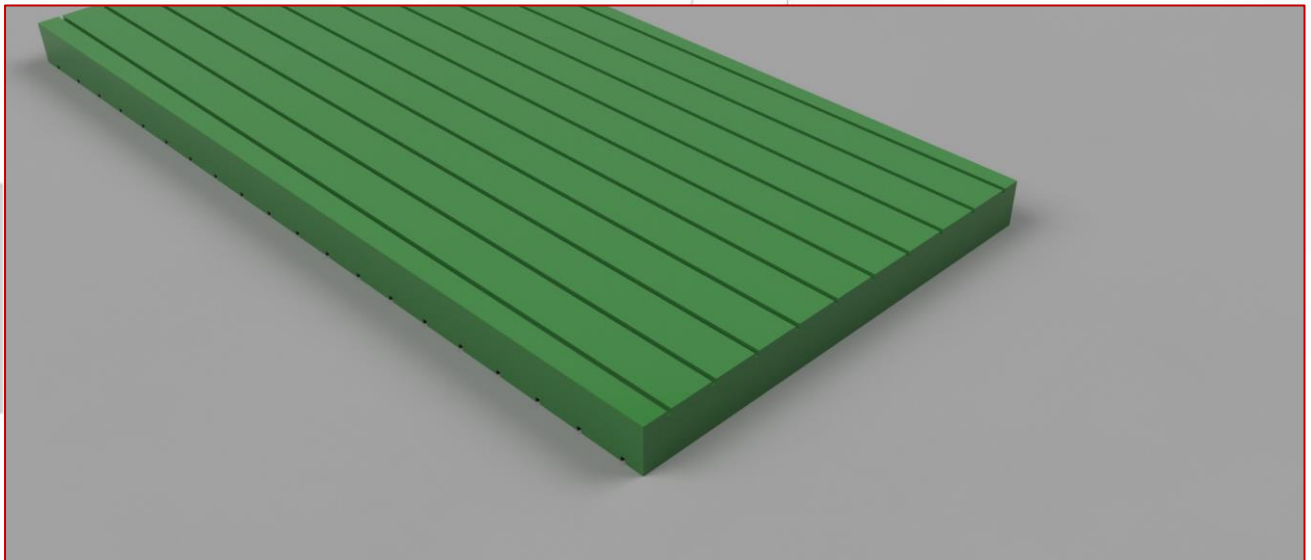
G14



Shallow groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
2.0	2.0	20	↔	2.0	2.0	20	↔

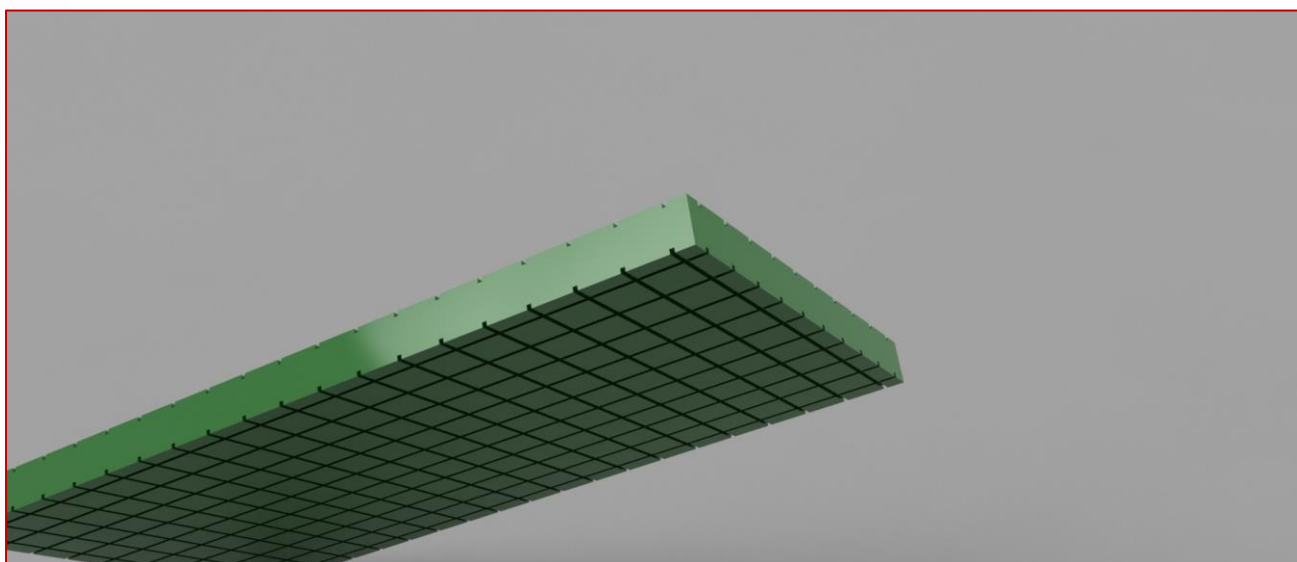
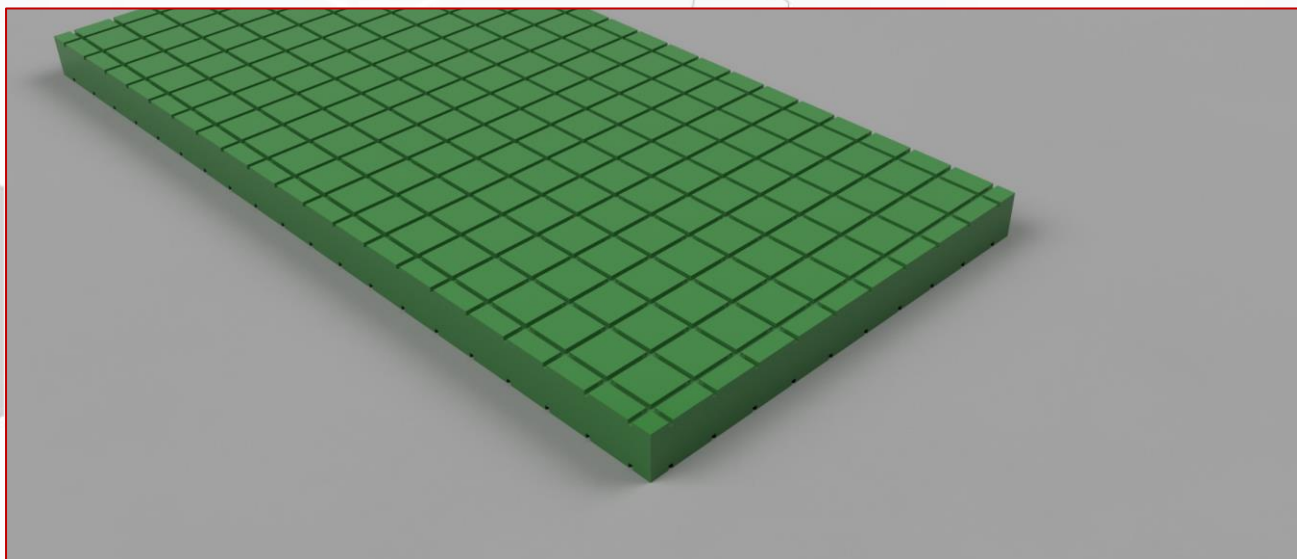
G12



Shallow groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
2.0	2.0	20	↕	2.0	2.0	20	↔

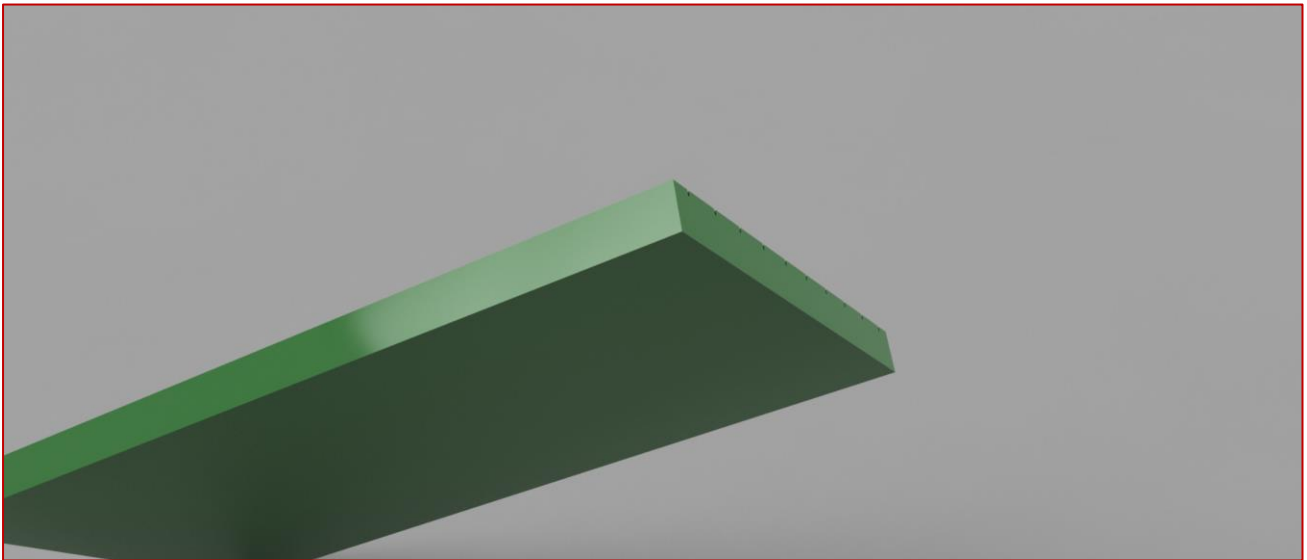
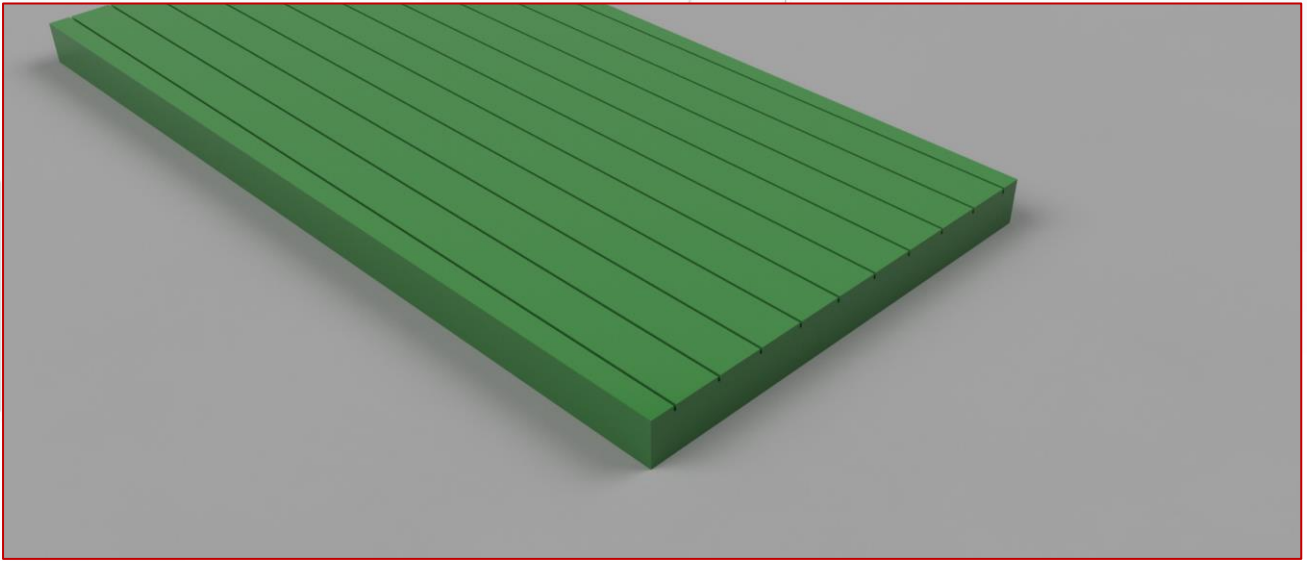
G2



Shallow groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
2.0	2.0	20	↔↕	2.0	2.0	20	↔↕

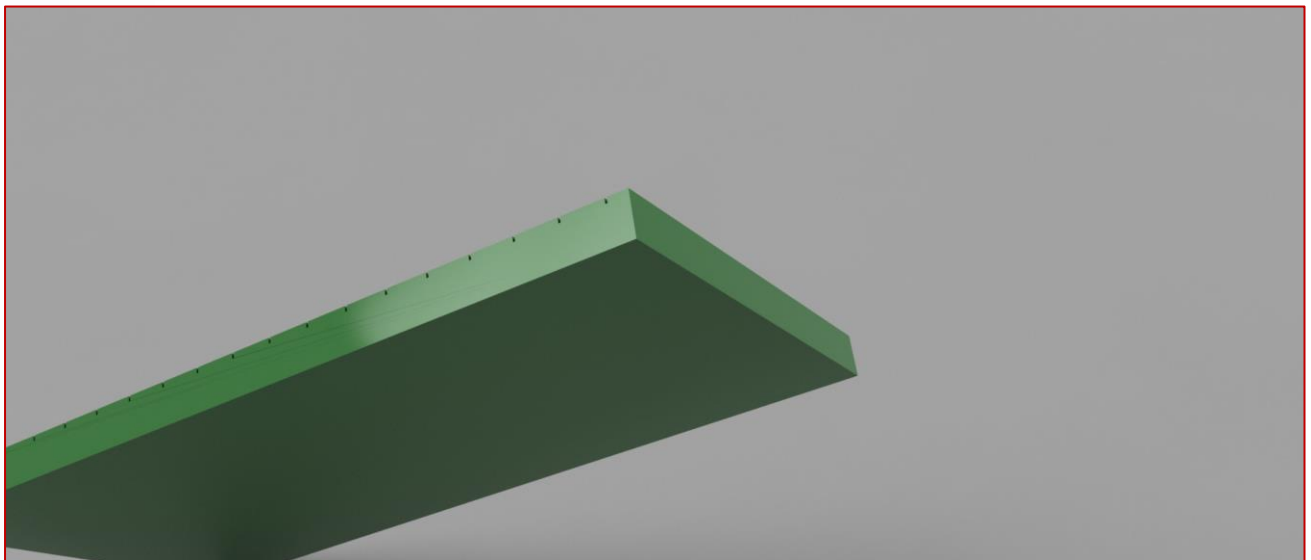
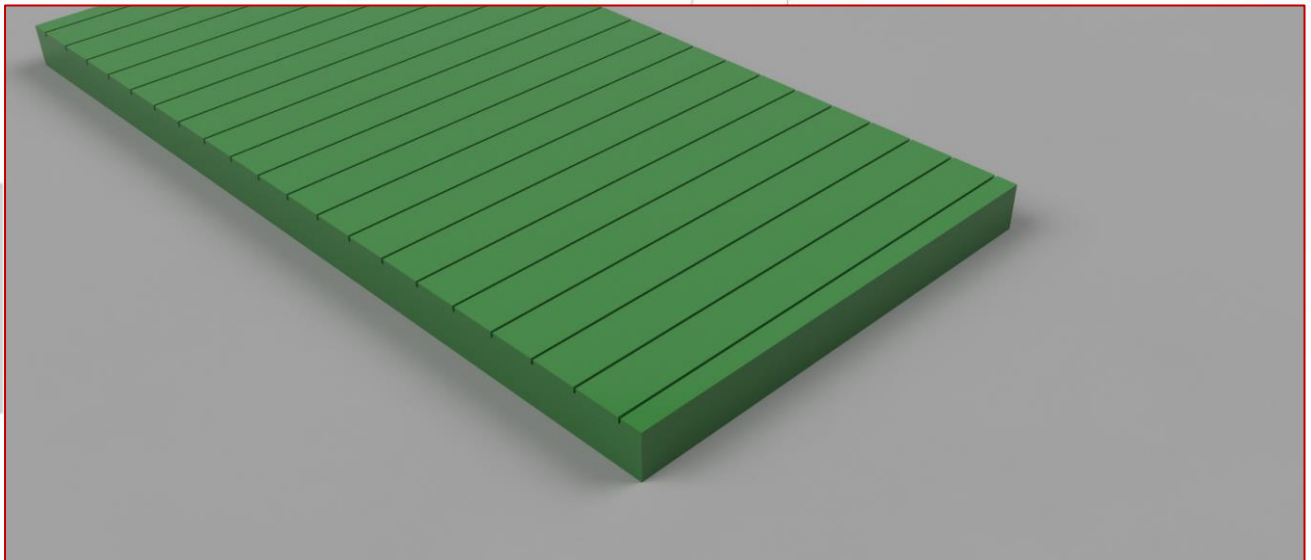
G5



Shallow groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
1.2	2.5	20	↕				

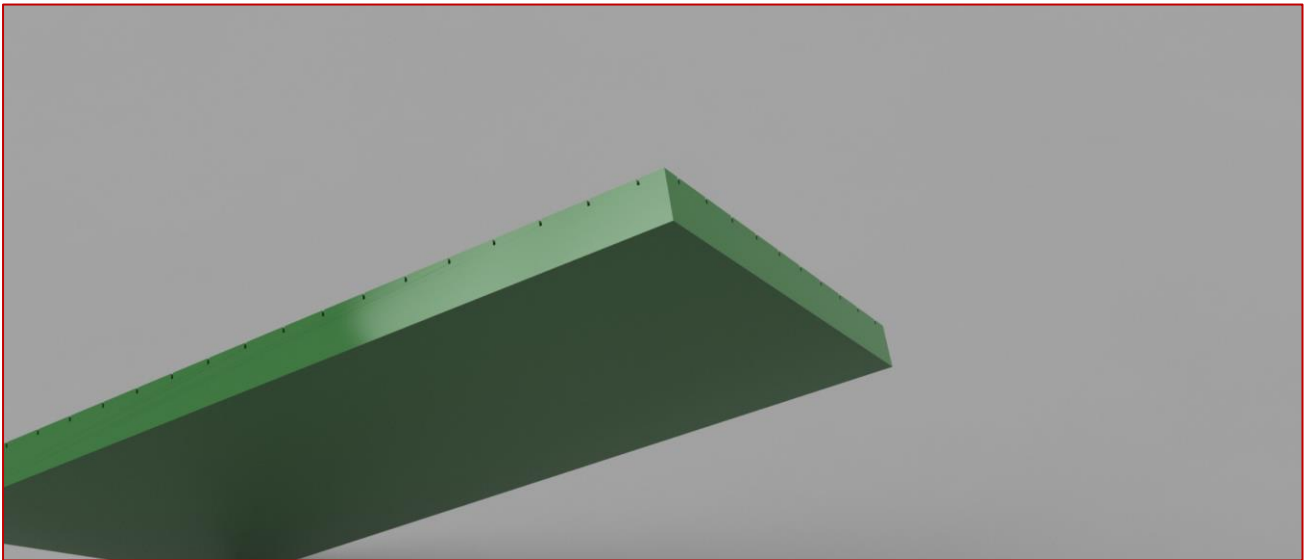
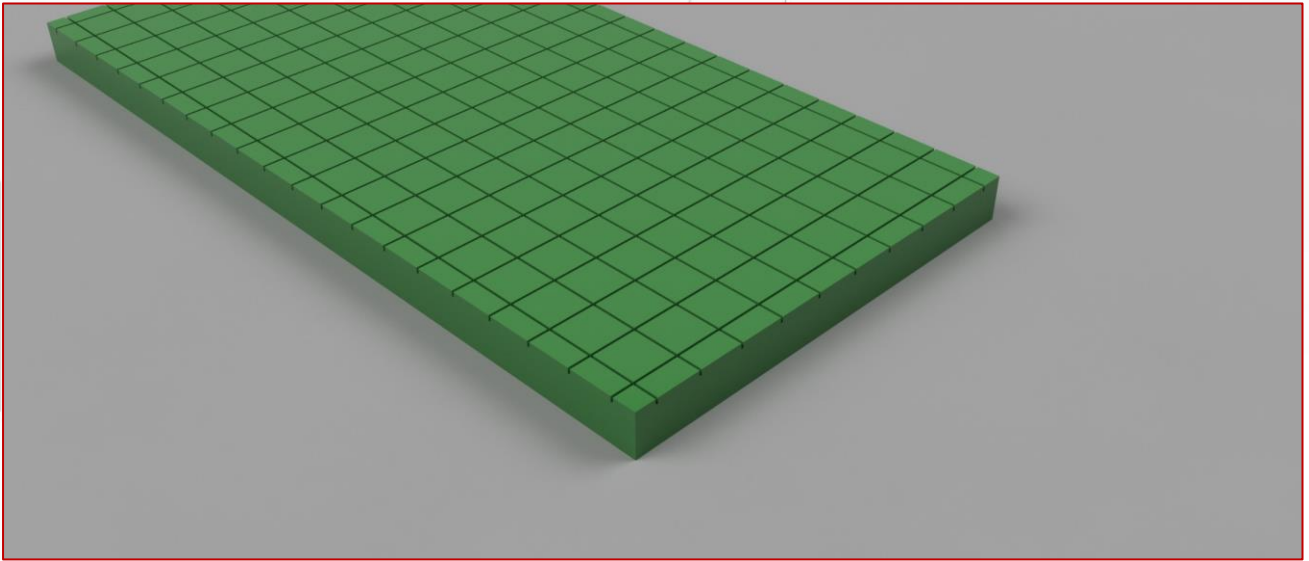
G18



Shallow groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
1.2	2.5	20	↔				

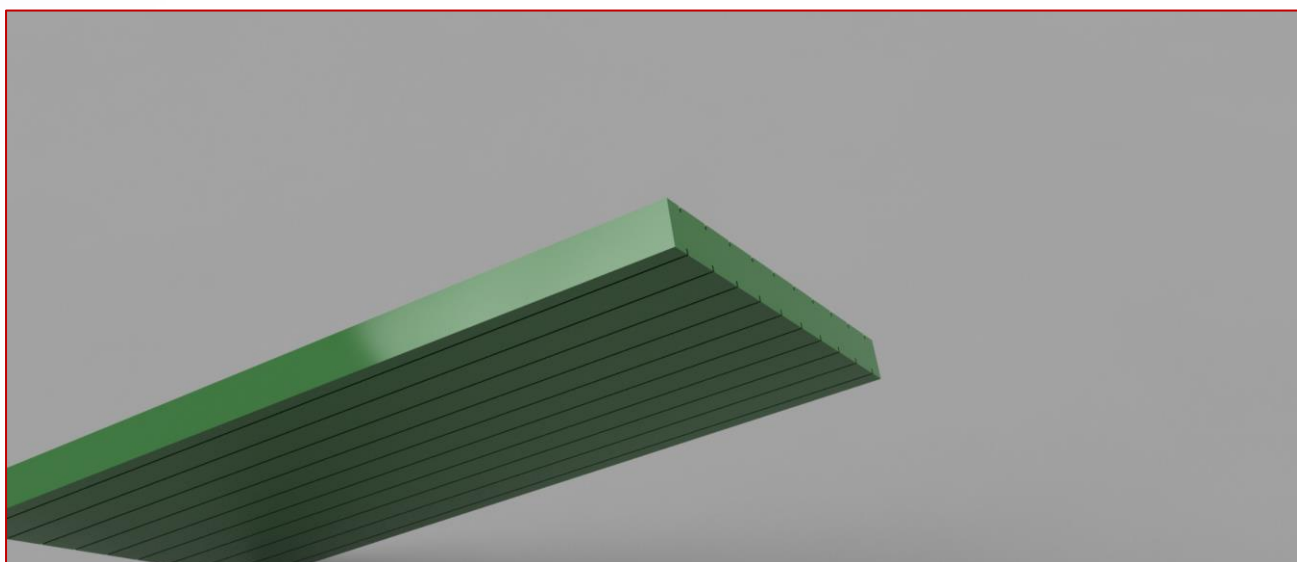
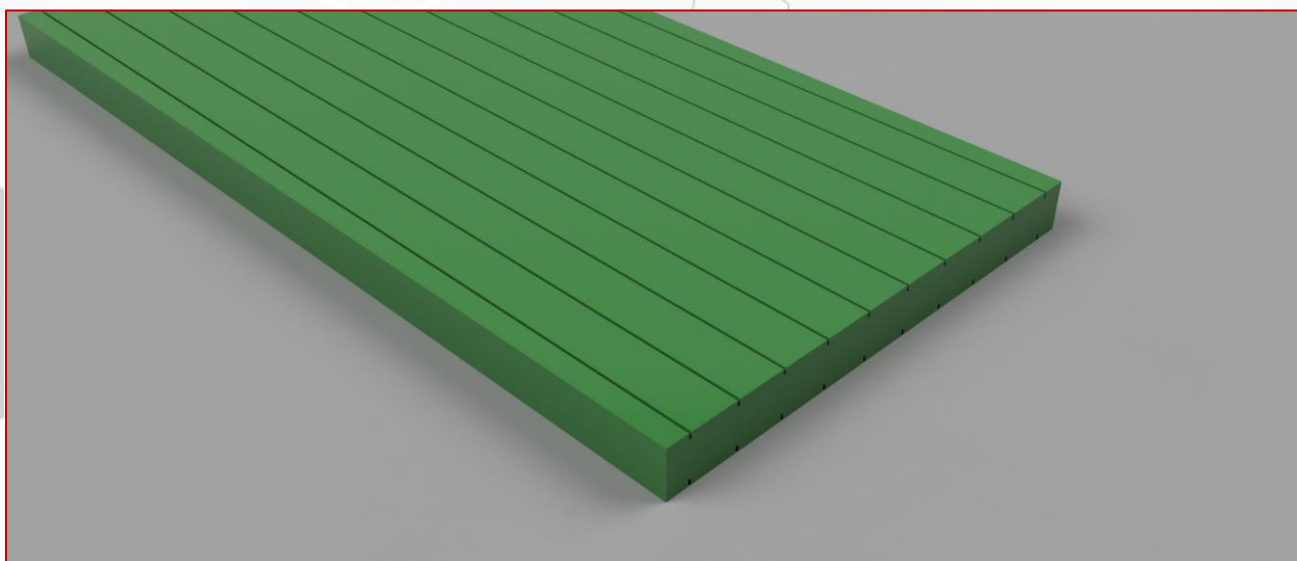
G15



Shallow groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
1.2	2.5	20	↔↕				

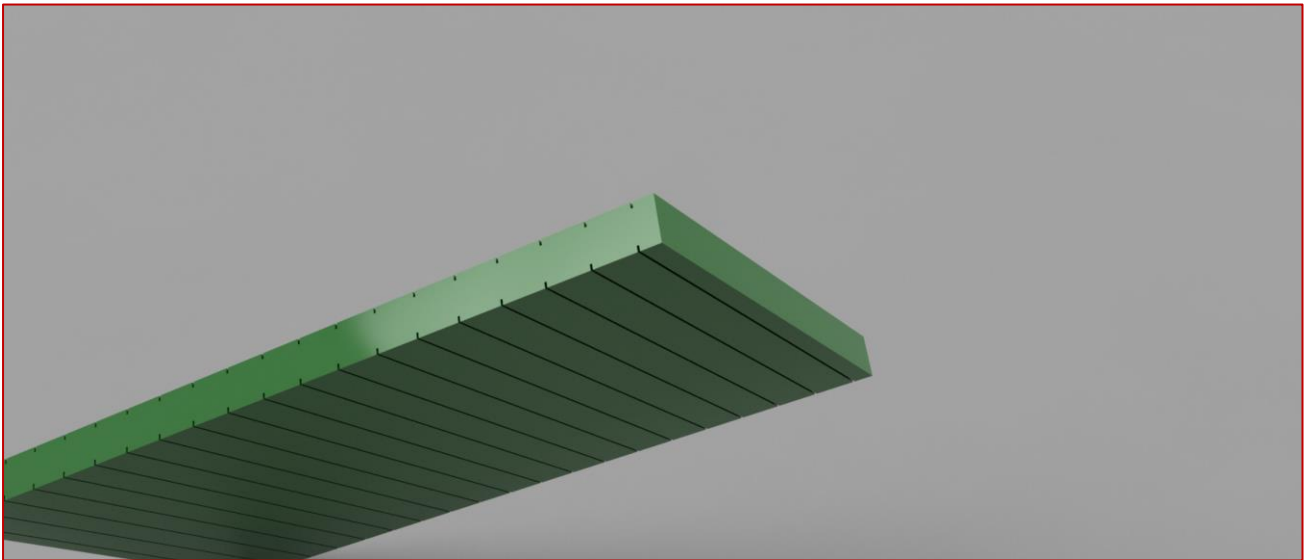
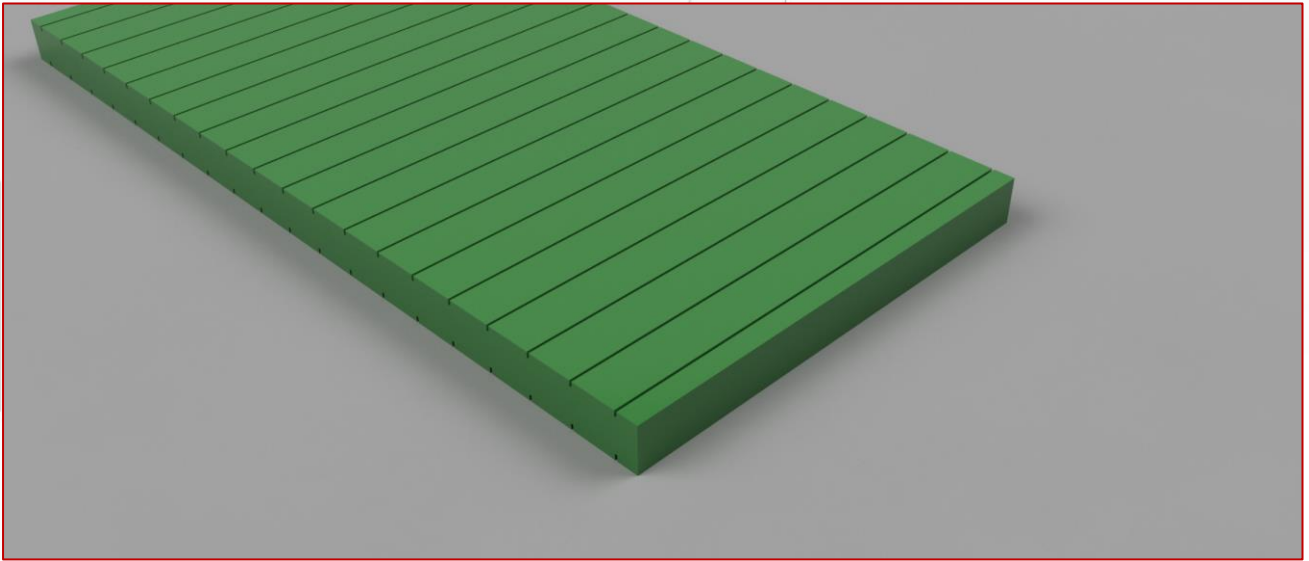
G6



Shallow groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
1.2	2.5	20	↕	1.2	2.5	20	↕

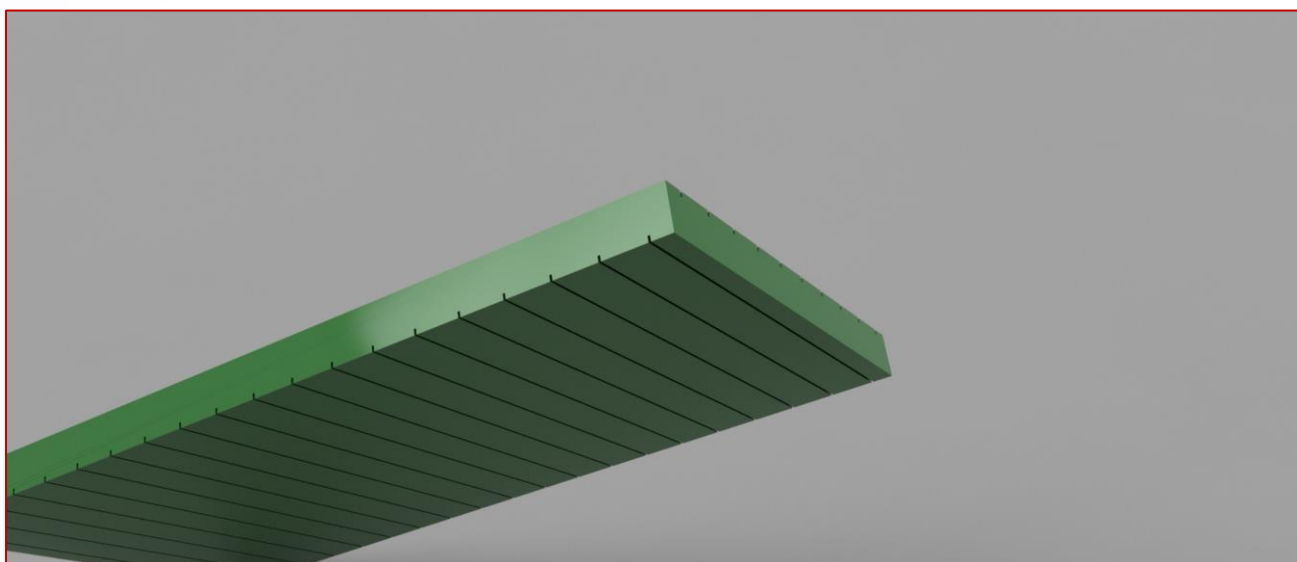
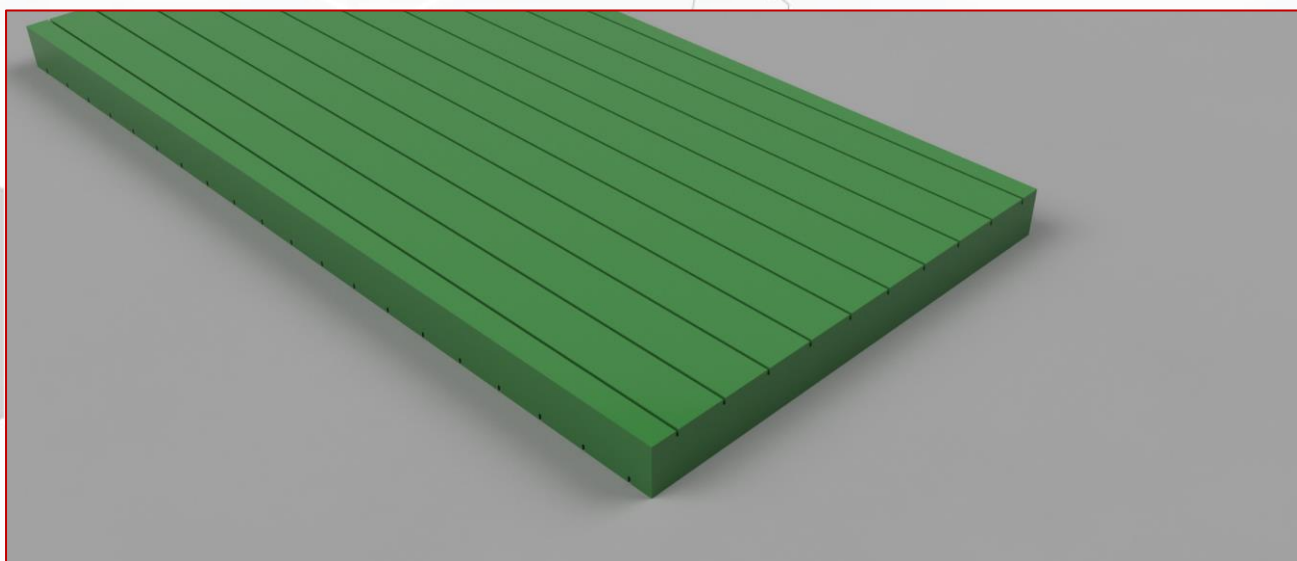
G19



Shallow groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
1.2	2.5	20	↔	1.2	2.5	20	↔

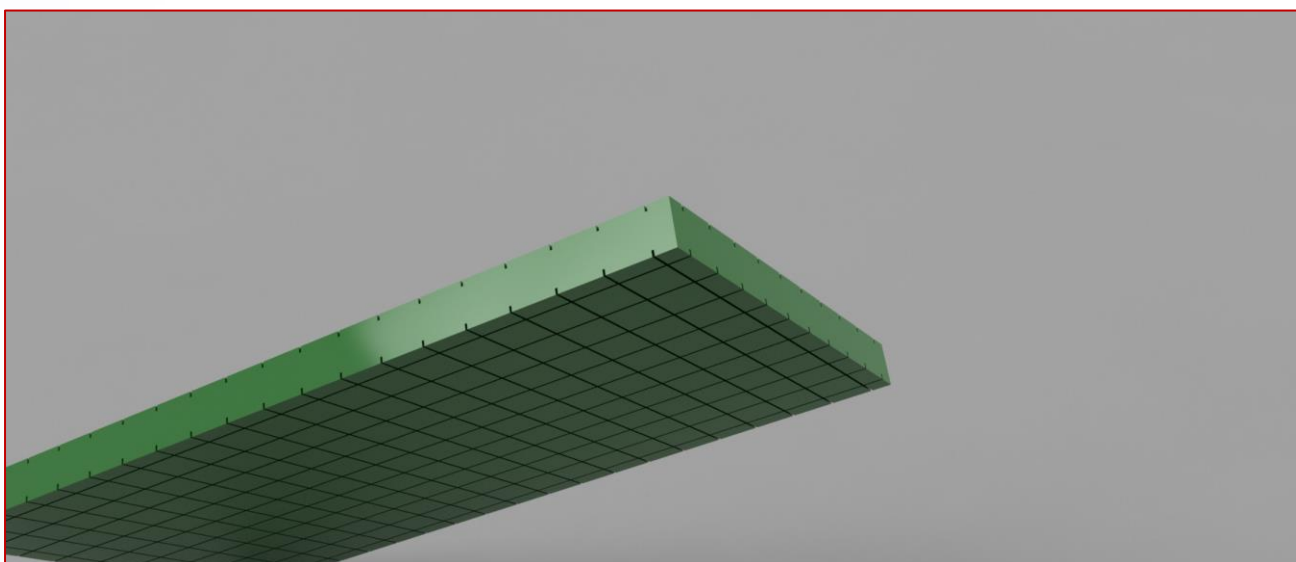
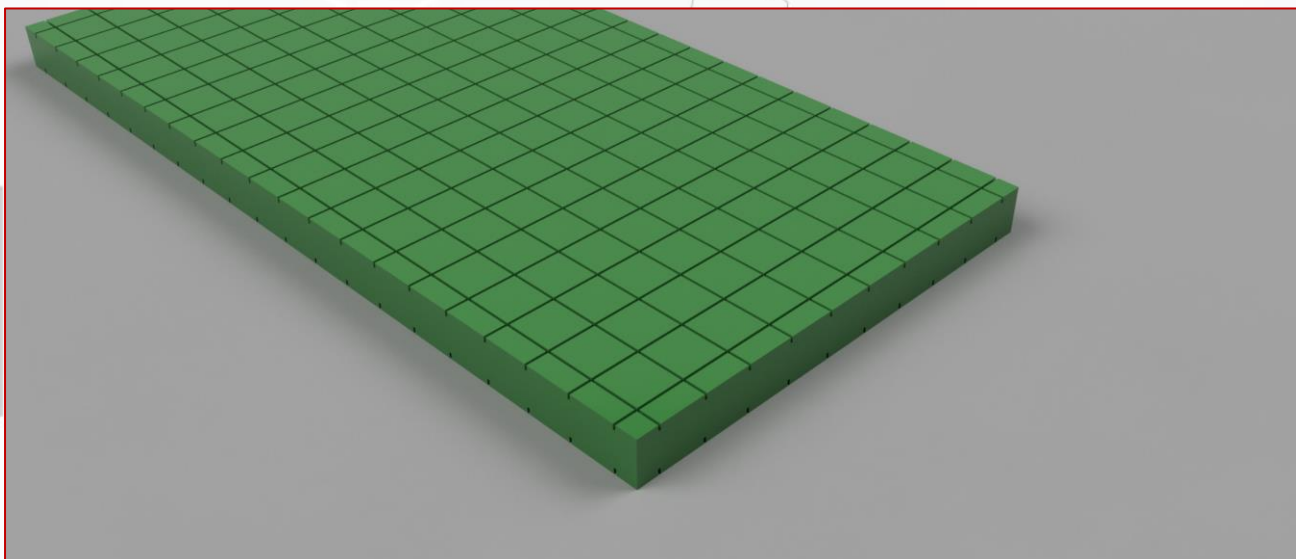
G17



Shallow groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
1.2	2.5	20	↕	1.2	2.5	20	↔

G16



Shallow groove

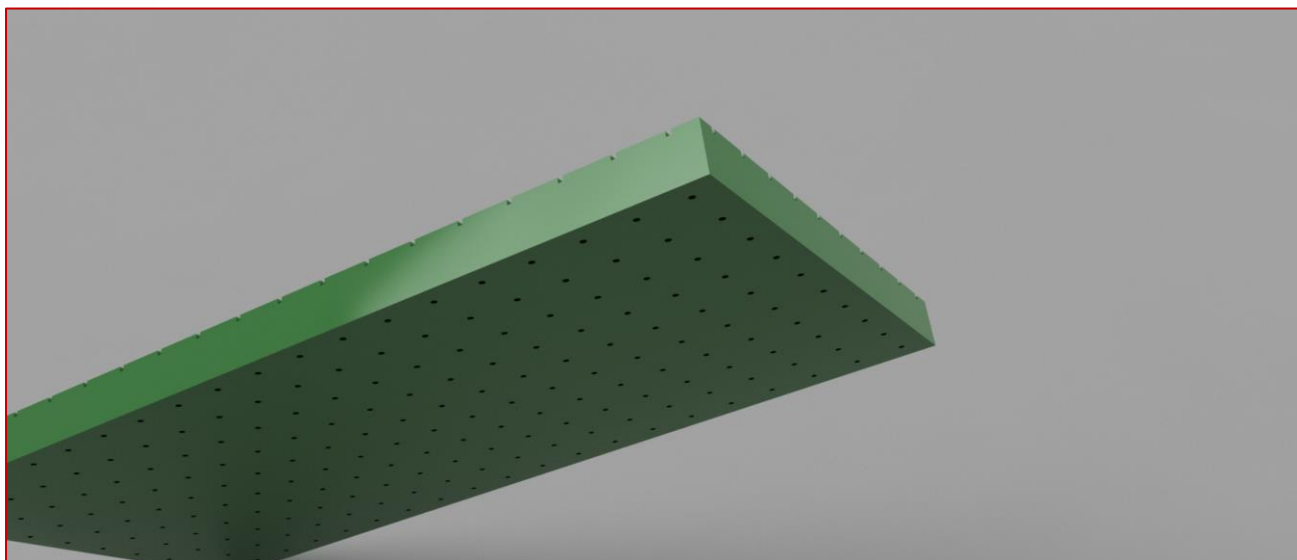
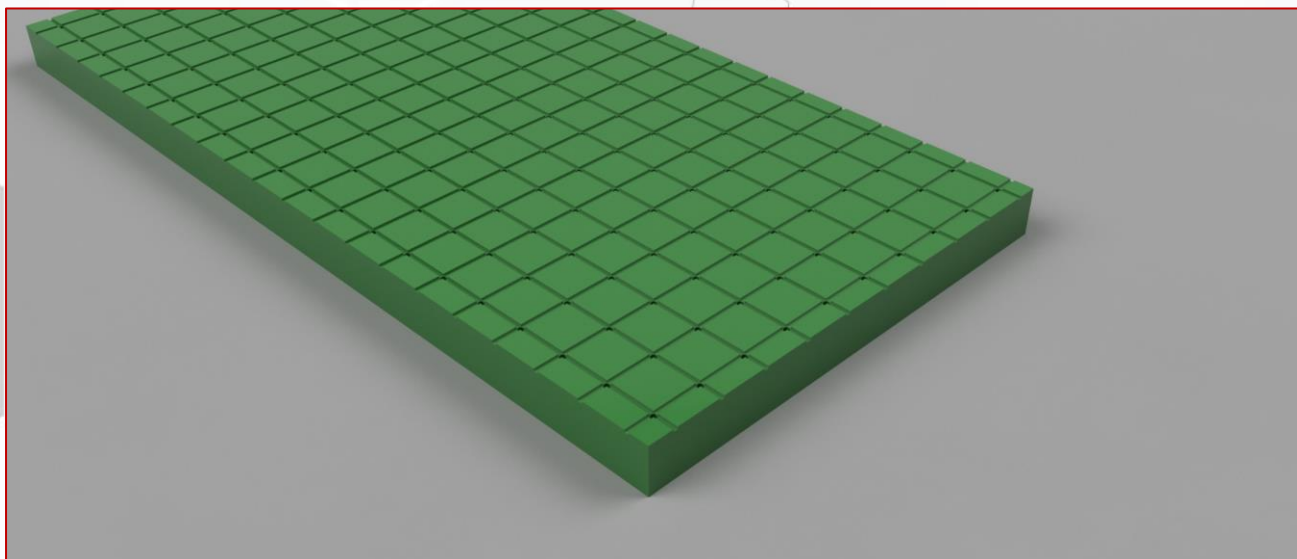
Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
1.2	2.5	20	↔↕	1.2	2.5	20	↔↕

Shallow grooved and perforated – G P

Combination of perforation and shallow groove will dramatically decrease the possibility of white spots and reduce the need for any further flow media. Among the numerous possibilities, METYX introduces the most common ones.

Code	Shallow groove	Perforation
G1 P20X2.5	Single Surface 20mm-2x2mm Cross	20x20x2.5mm
G2 P20X2.5	Double Surface 20mm-2x2mm Cross	20x20x2.5mm
G11 P4020X2.5	Double Surface 20mm-2x2mm Longitudinal	40x20x2.5mm
G15 P40X2.5	Single Surface 20mm-1.2x2.5mm Cross	40x40x2.5mm
G6 P4020X2.5	Double Surface 20mm-1.2x2.5mm Cross	40x20x2.5mm

G1 P20X2.5



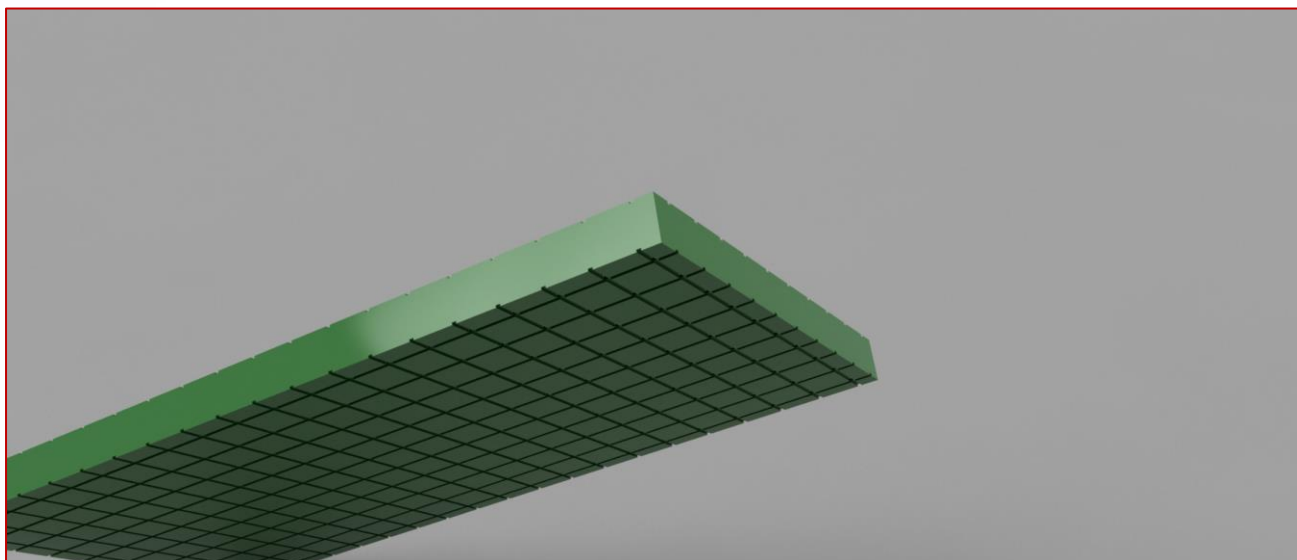
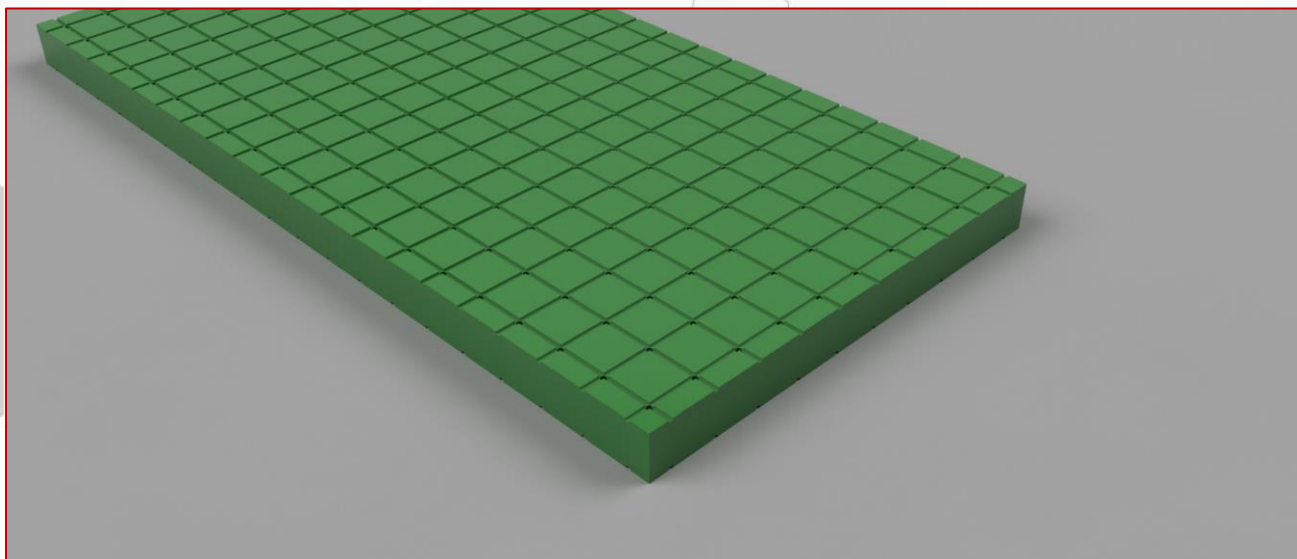
Shallow groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
2.0	2.0	20	↔↕				

Perforation

Hole diameter [mm]	Spacing along sheet ↕ [mm]	Spacing across sheet ↔ [mm]
2.5	20	20

G2 P20X2.5



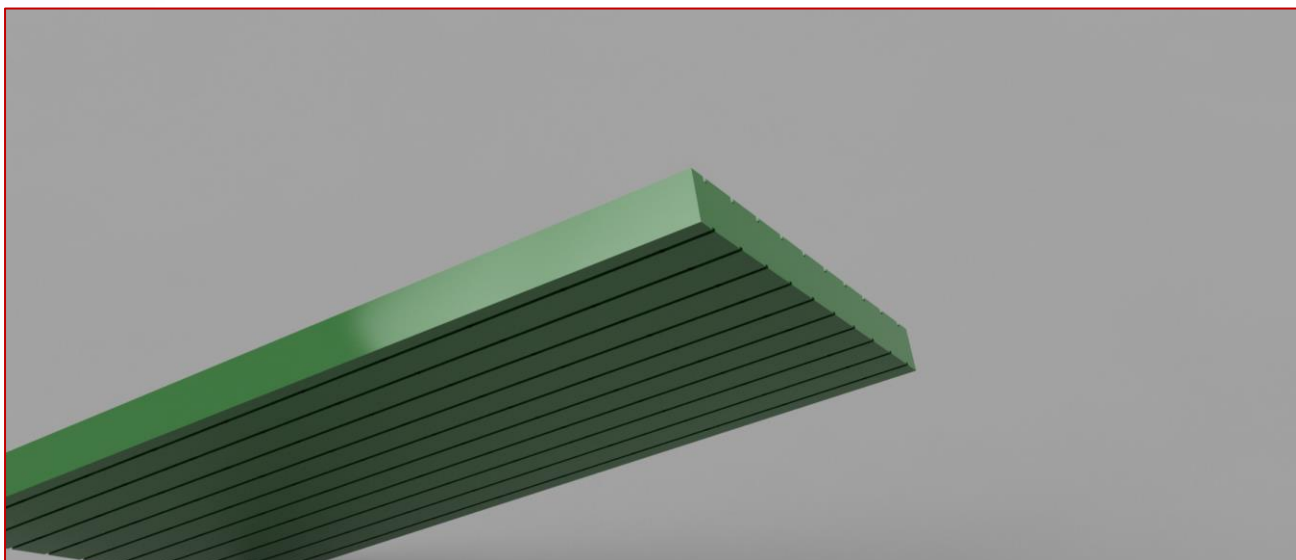
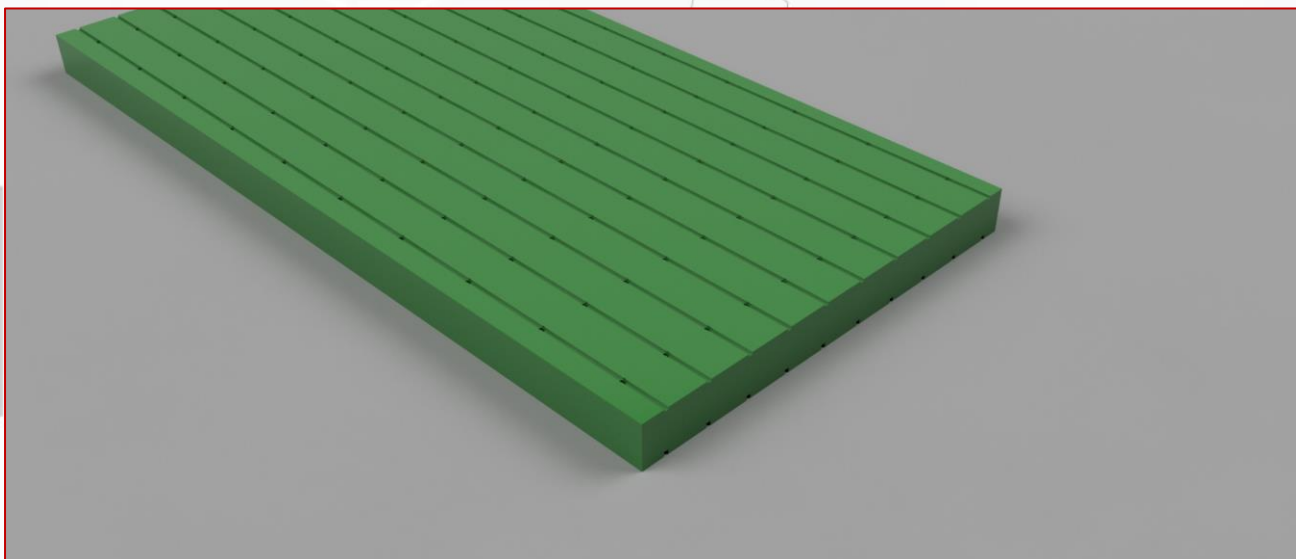
Shallow groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
2.0	2.0	20	↔↕	2.0	2.0	20	↔↕

Perforation

Hole diameter [mm]	Spacing along sheet ↕ [mm]	Spacing across sheet ↔ [mm]
2.5	20	20

G11 P4020X2.5



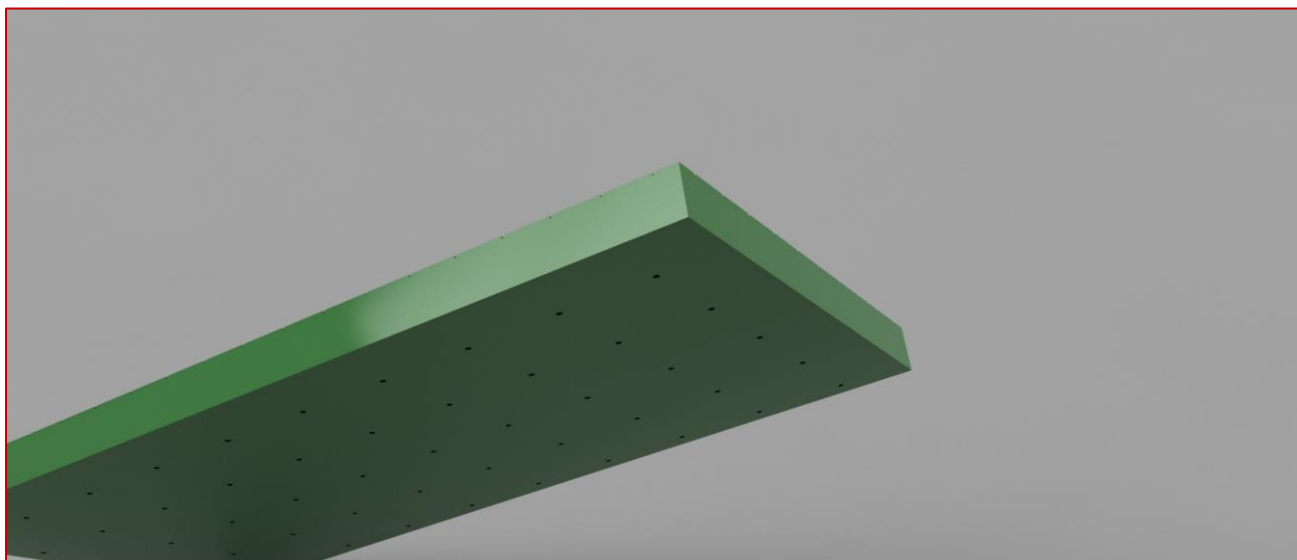
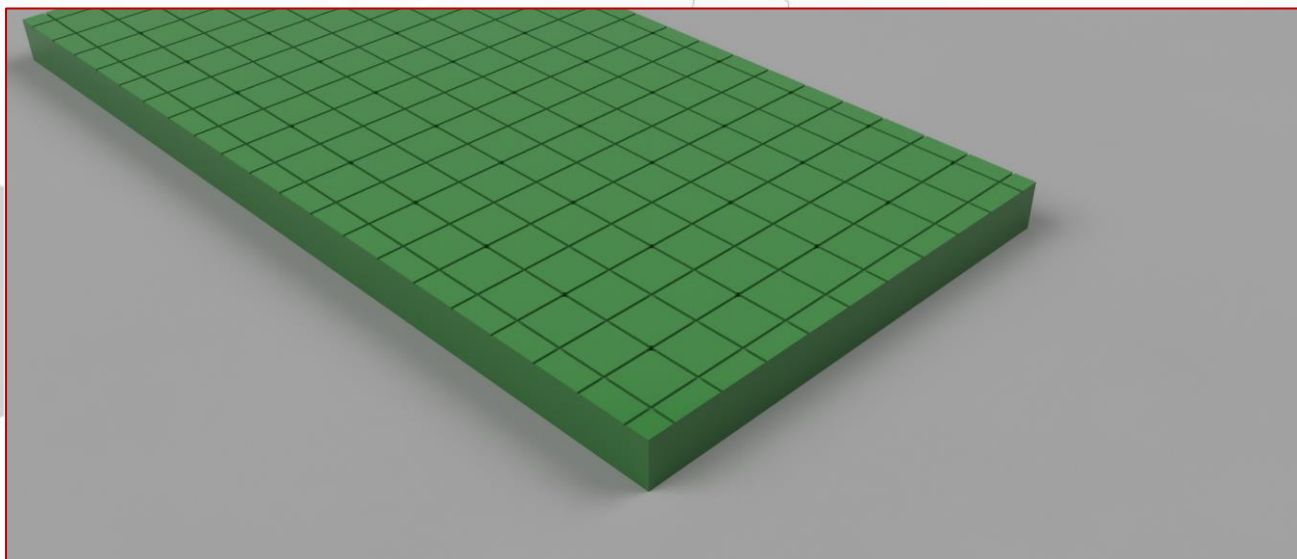
Shallow groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
2.0	2.0	20	↕	2.0	2.0	20	↕

Perforation

Hole diameter [mm]	Spacing along sheet ↕ [mm]	Spacing across sheet ↔ [mm]
2.5	40	20

G15 P40X2.5



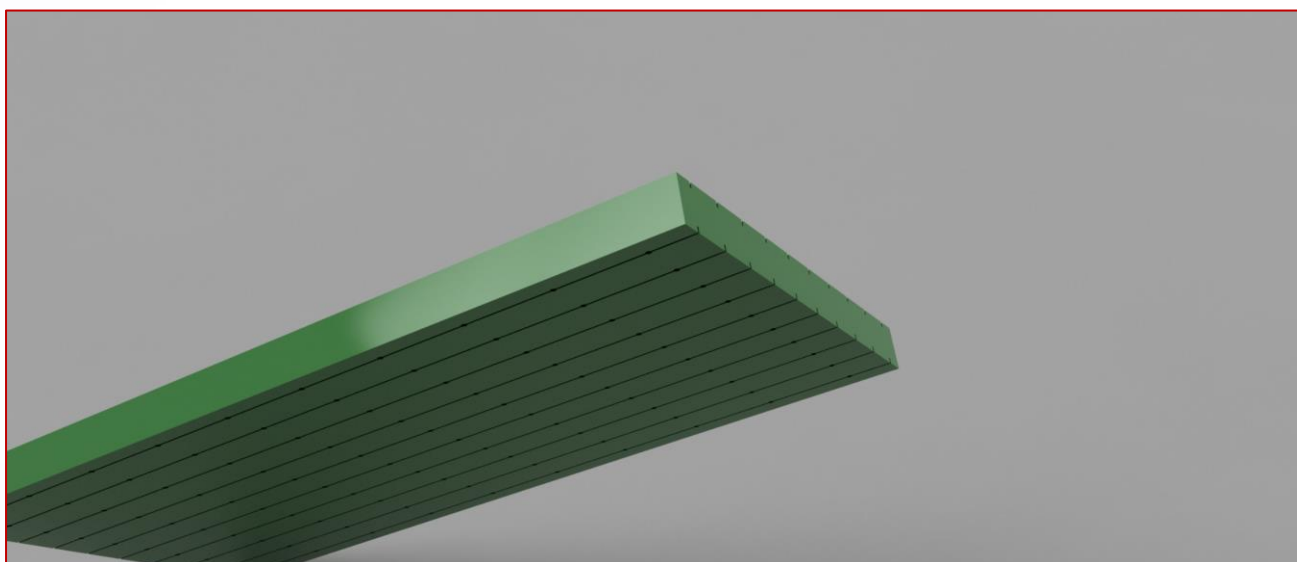
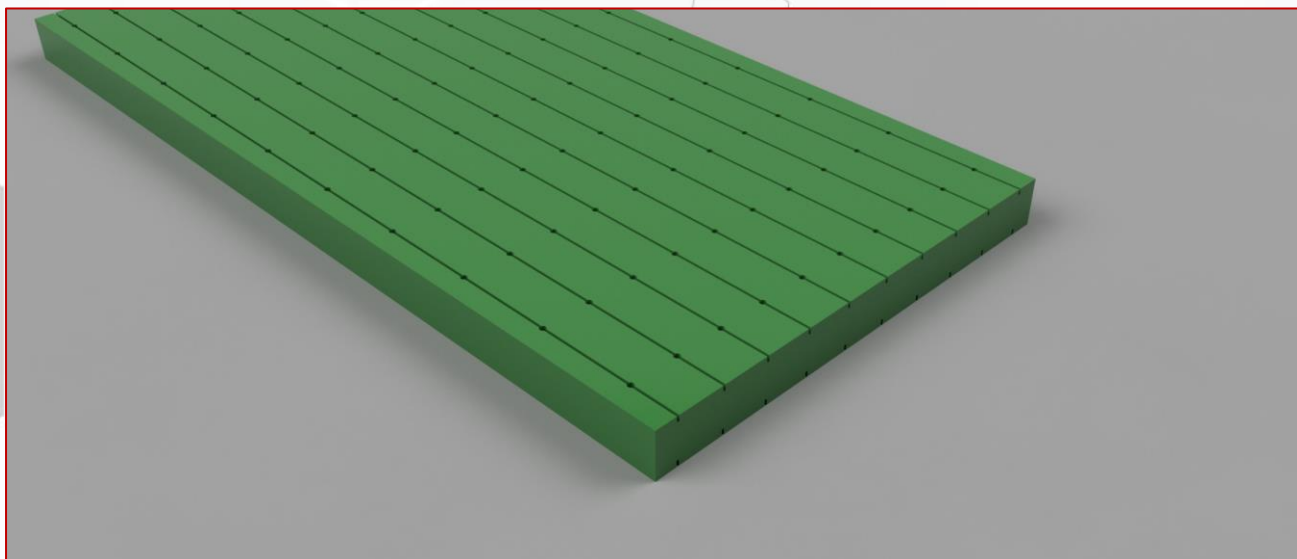
Shallow groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
1.2	2.5	20	↔↕				

Perforation

Hole diameter [mm]	Spacing along sheet ↕ [mm]	Spacing across sheet ↔ [mm]
2.5	40	40

G6 P4020X2.5



Shallow groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
1.2	2.5	20	↕	1.2	2.5	20	↕

Perforation

Hole diameter [mm]	Spacing along sheet ↕ [mm]	Spacing across sheet ↔ [mm]
2.5	40	20

Scrim cloth (deep grooved) – SC

Deep grooves on core material will allow adaptation to mold curvatures reducing panel spring-back. Deep grooves, with 30mm spacing, can be in longitudinal or transverse directions to follow one or two directional mold curvatures.





Standard groove widths are 1.2mm or resin saving 0.4mm (applicable with thickness and density limitations).

Core material is grooved up to 1.5mm from the bottom.

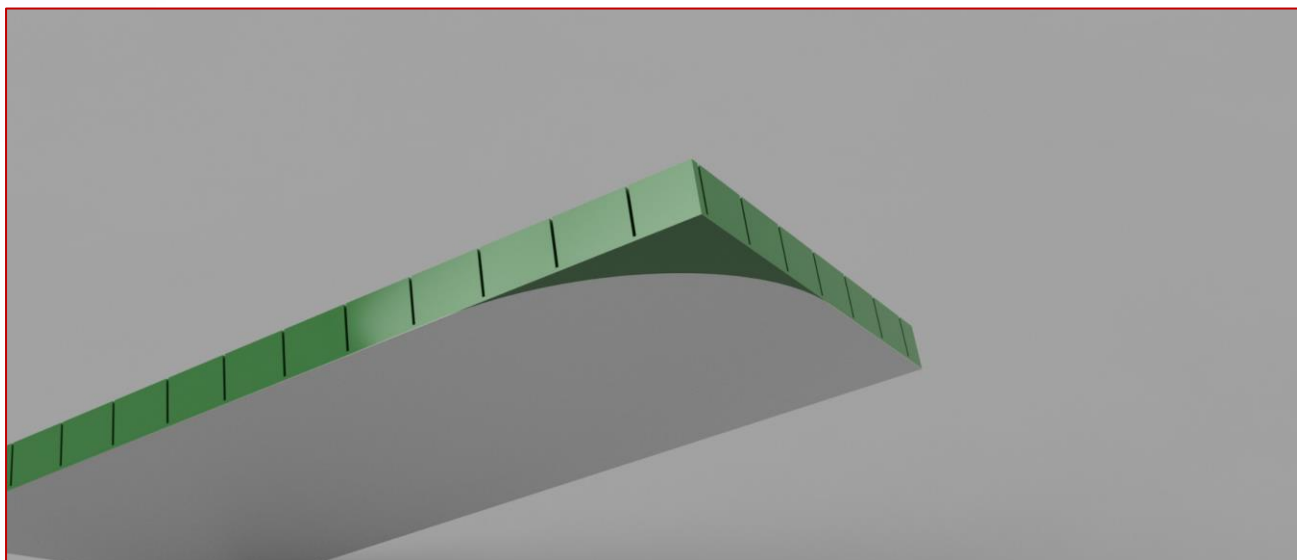
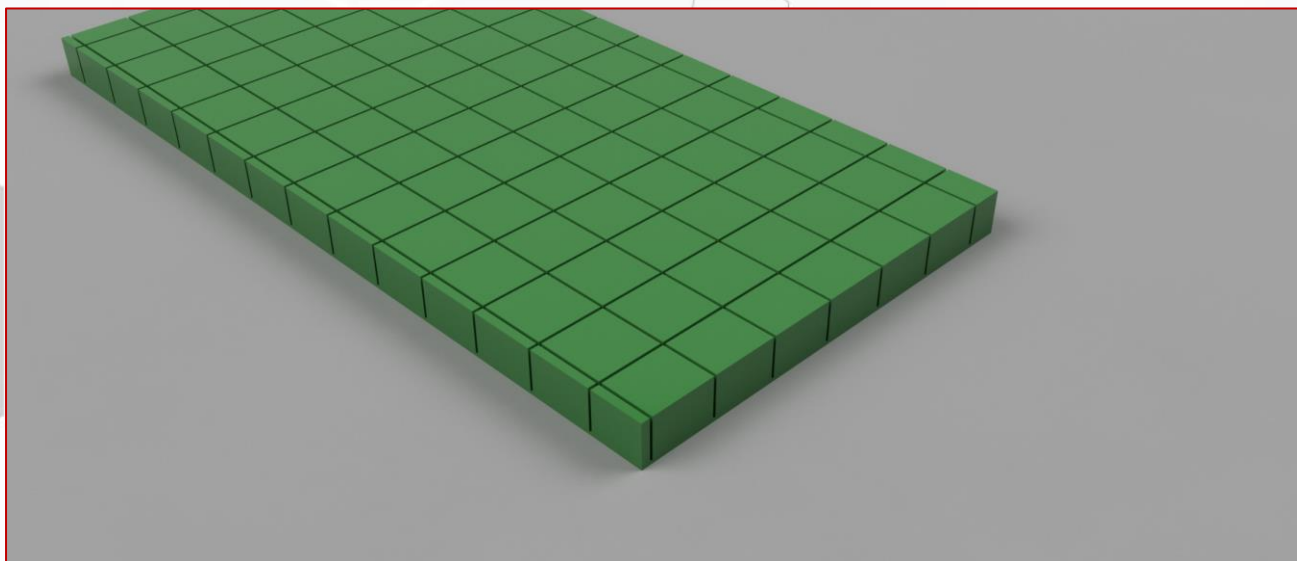
To provide more strength, a lightweight fiberglass scrim is heat fastened at the bottom of the panel. Molds with high curvatures can be followed leaving the scrim up (opening grooves), low curvatures leaving the scrim down (closing grooves) in the layup process

To insure air evacuation across core material, it is necessary to break the residual 1.5mm material at the bottom of the groove before using panels; scrim cloth will maintain panel geometry.

Panels are supplied with half of the length of the plain sheet.

Code	Top Surface Groove [mm]				Scrim cloth at the bottom
	Width	Depth	Spacing	Directions	
SC1	1.2	T-1.5	30	↔↕	
SC2	0.4	T-1.5	30	↔↕	
SC6	1.2	T-1.5	30	↕	
SC7	0.4	T-1.5	30	↕	

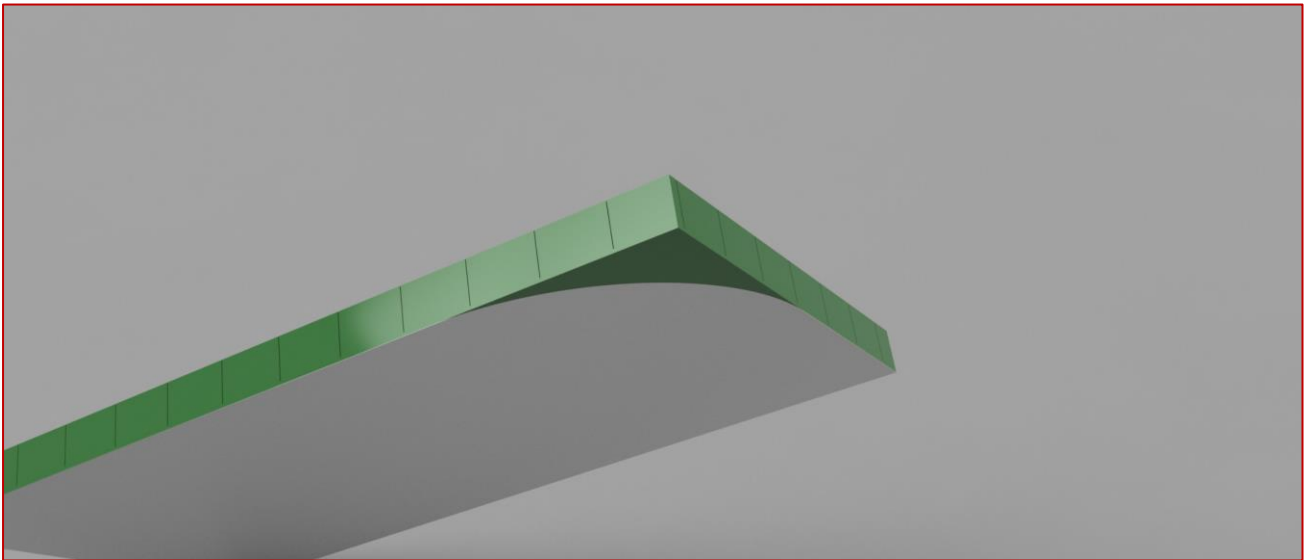
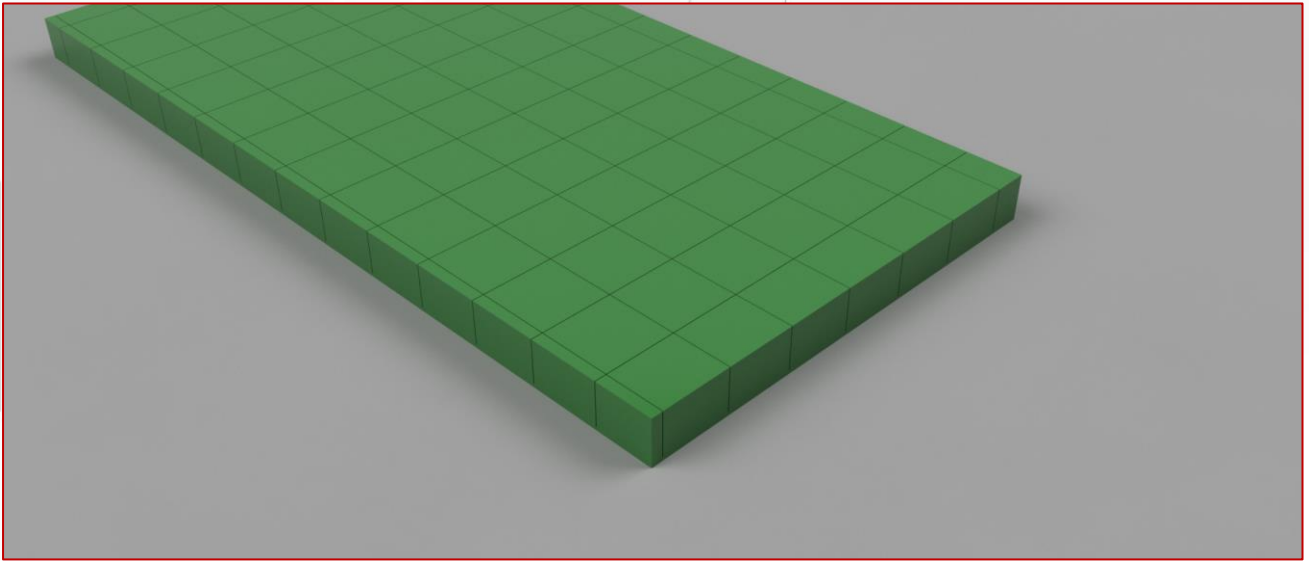
SC1



Deep groove

Top Surface Groove [mm]				Scrim Cloth at the bottom
Width	Depth	Spacing	Direction	
1.2	T-1.5	30	↔↕	

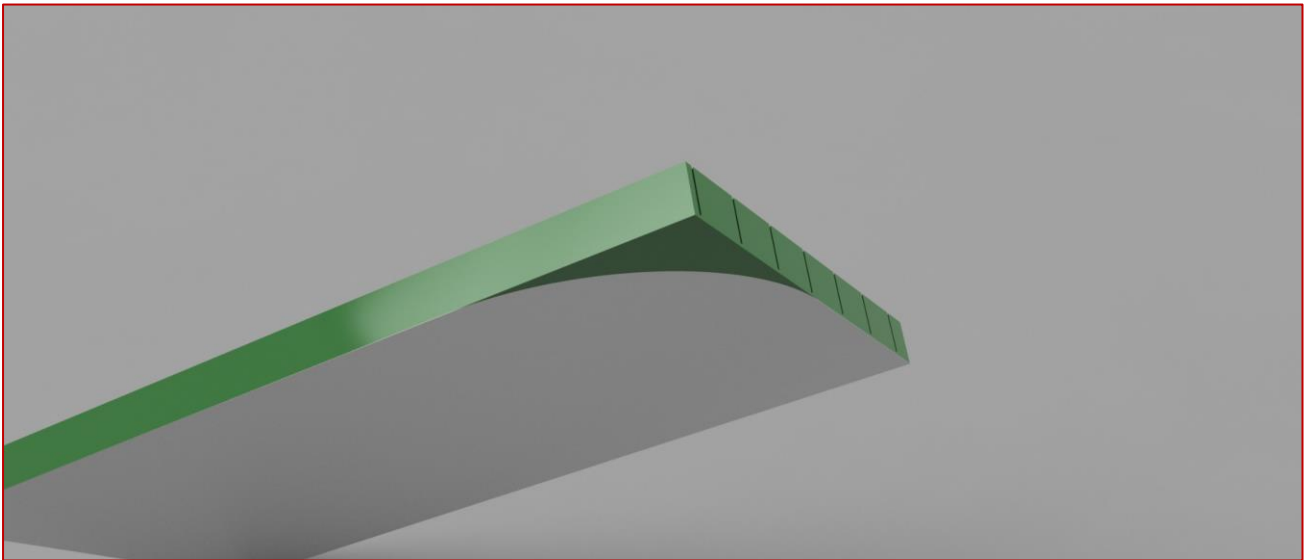
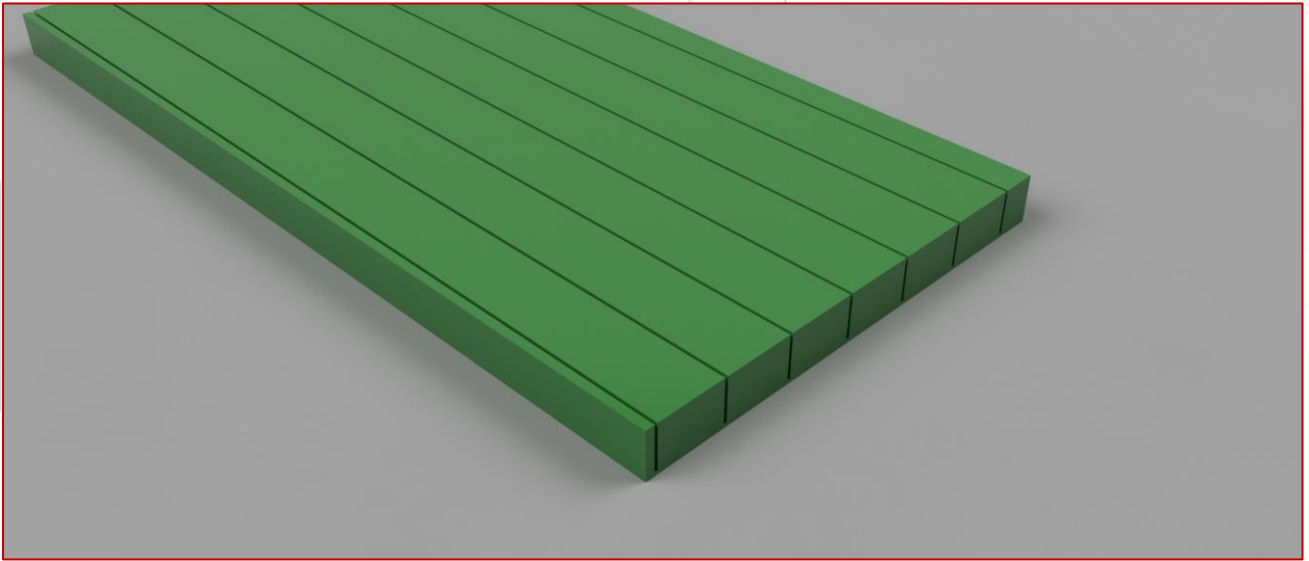
SC2



Deep groove

Top Surface Groove [mm]				Scrim Cloth at the bottom
Width	Depth	Spacing	Direction	
0.4	T-1.5	30	↔↕	

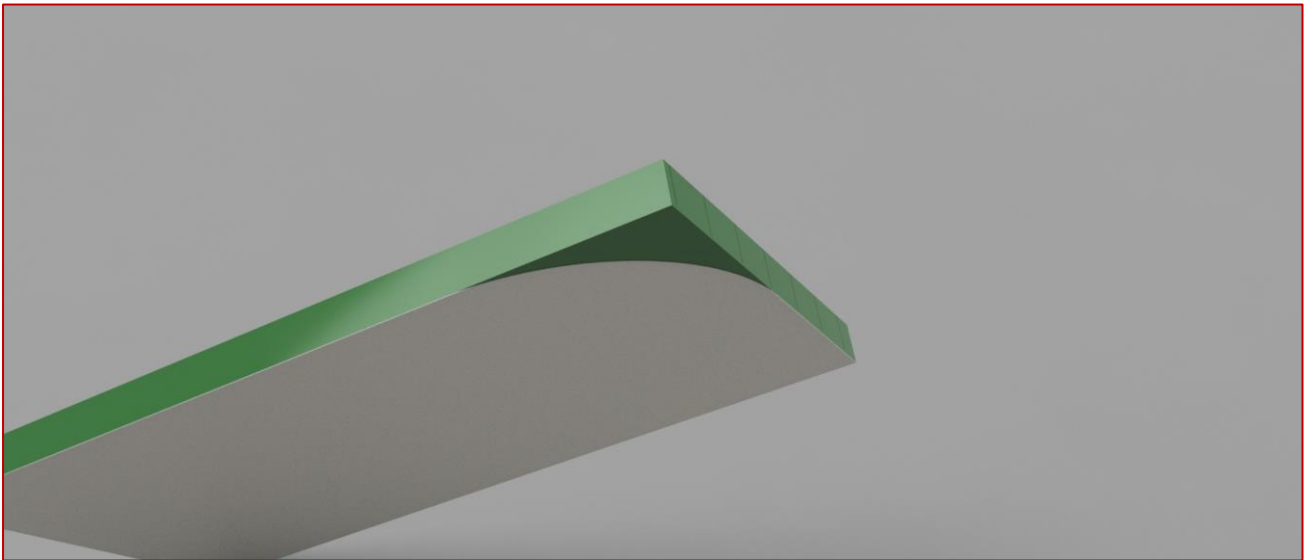
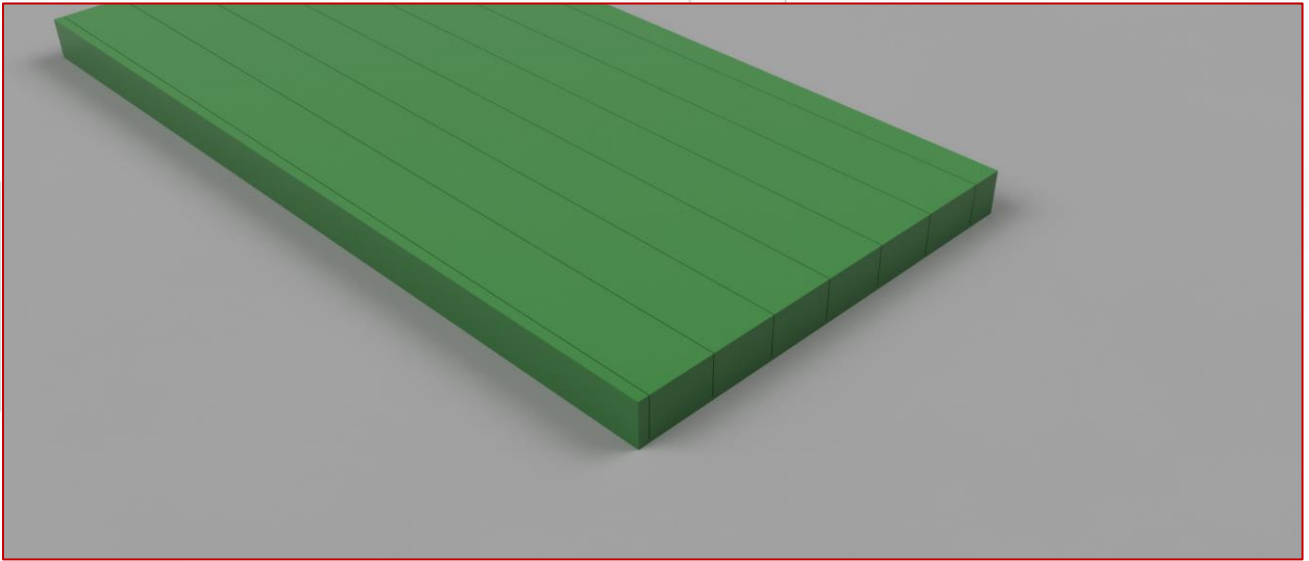
SC6



Deep groove

Top Surface Groove [mm]				Scrim Cloth at the bottom
Width	Depth	Spacing	Direction	
1.2	T-1.5	30	↕	

SC7



Deep groove

Top Surface Groove [mm]				Scrim Cloth at the bottom
Width	Depth	Spacing	Direction	
0.4	T-1.5	30	↕	

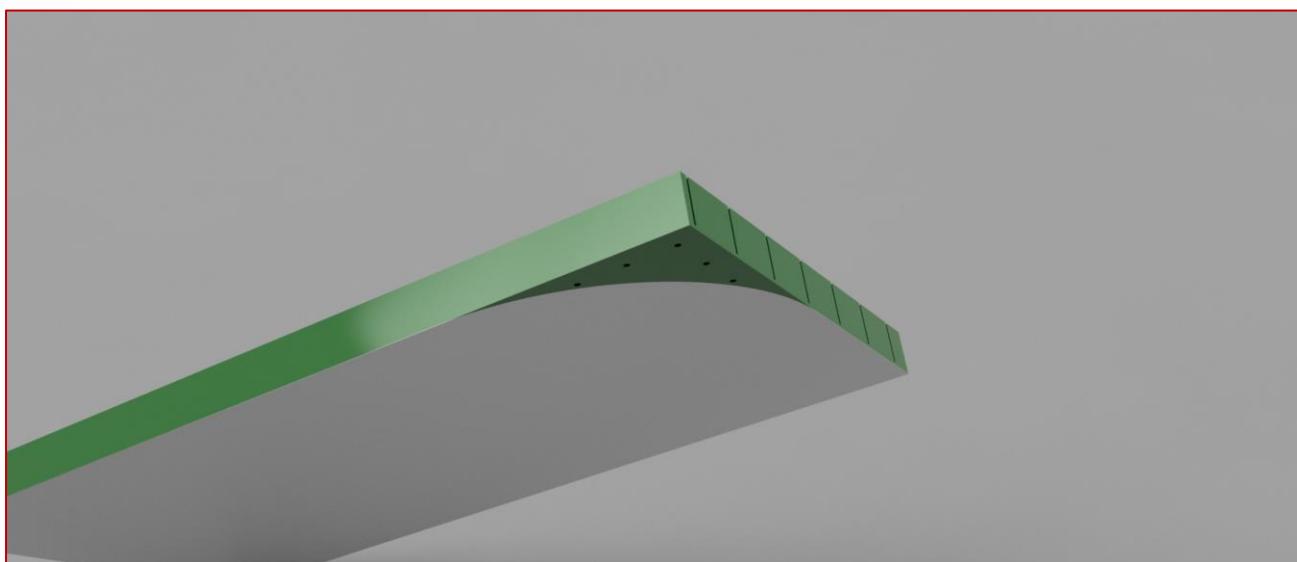
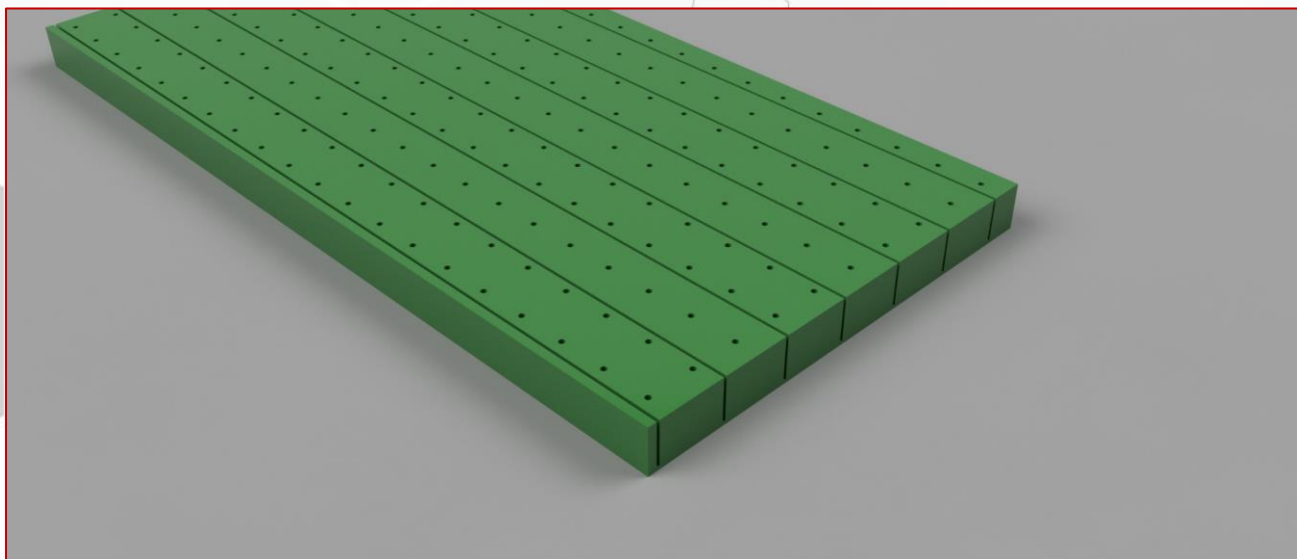
Scrim cloth (deep grooved), shallow grooved, perforated - SC G P

If needed, SC panels can be perforated or grooved perforated, joining formability and resin distribution capabilities. Among the numerous possibilities, METYX introduces the most common ones.

Panels are supplied with half of the length of the plane sheet.

Code	Scrim cloth and Deep Groove	Shallow groove	Perforation
SC6 P20X2.5	SC + Groove 30mm-1.2mm One dir.		20x20x2.5mm
SC1 P20X2.5	SC + Groove 30mm-1.2mm Cross		20x20x2.5mm
SC6 G1 P20X2.5	SC + Groove 30mm-1.2mm One dir.	Single Surface 20mm-2x2mm Cross	20x20x2.5mm
SC1 G1 P20X2.5	SC + Groove 30mm-1.2mm Cross	Single Surface 20mm-2x2mm Cross	20x20x2.5mm

SC6 P20X2.5



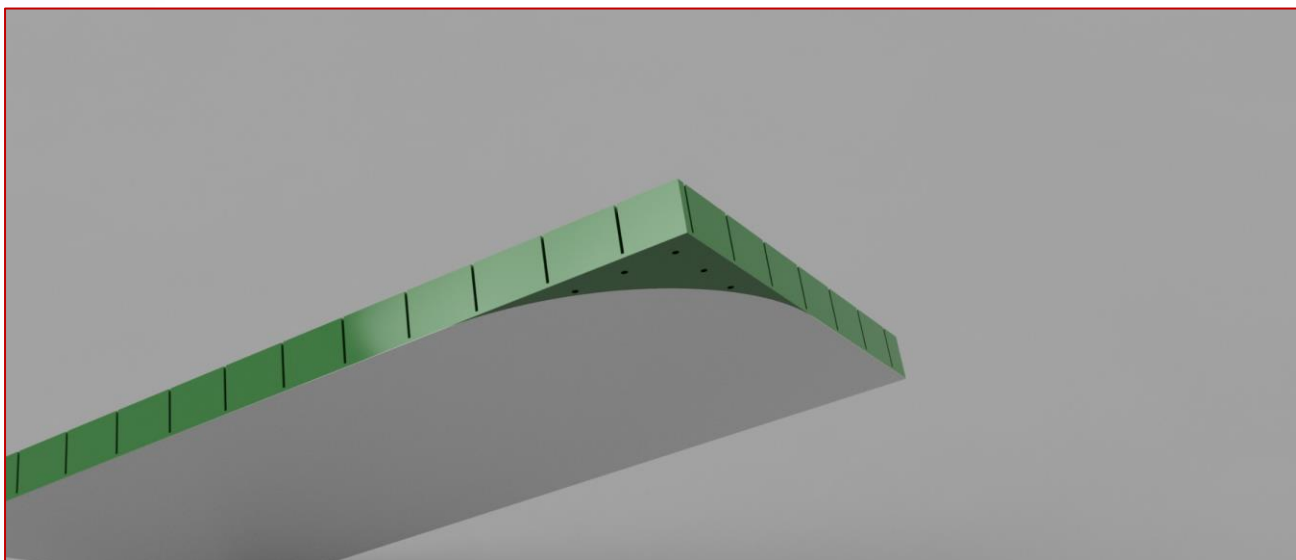
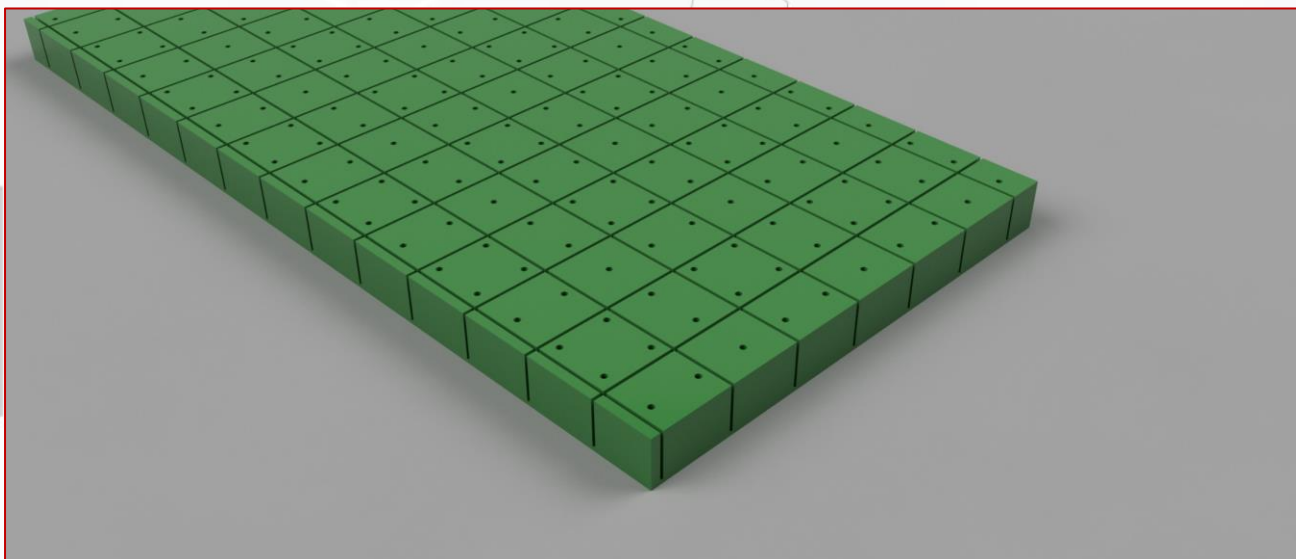
Deep groove

Top Surface Groove [mm]				Scrim Cloth at the bottom
Width	Depth	Spacing	Direction	
1.2	T-1.5	30	↕	

Perforation

Hole diameter [mm]	Spacing along sheet ↕ [mm]	Spacing across sheet ↔ [mm]
2.5	20	20

SC1 P20X2.5



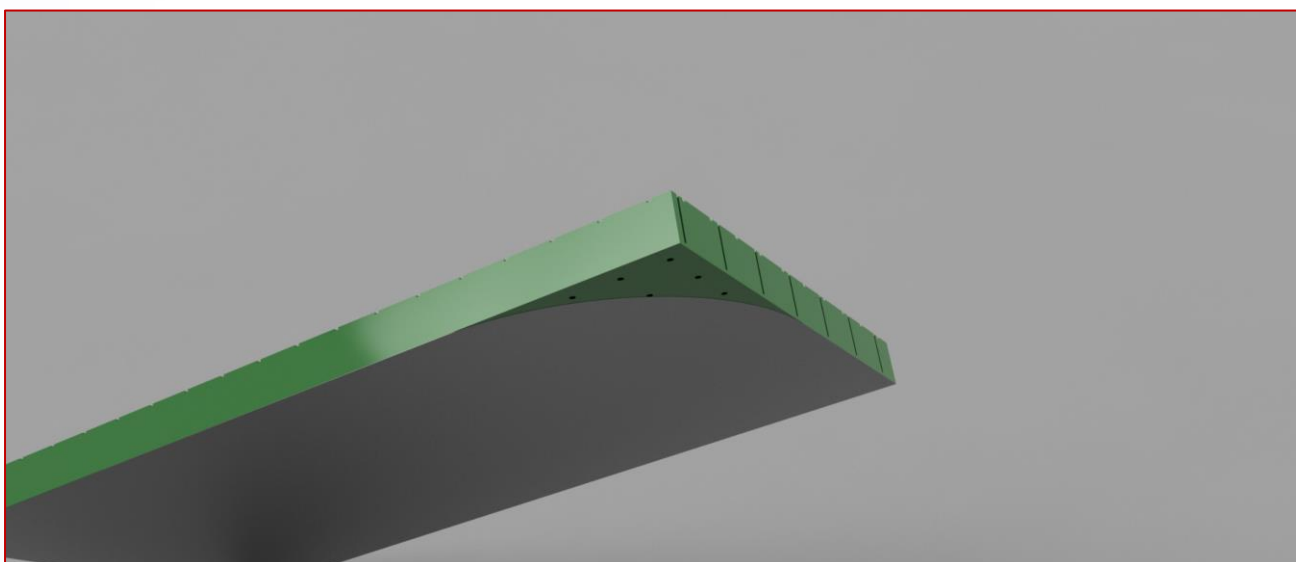
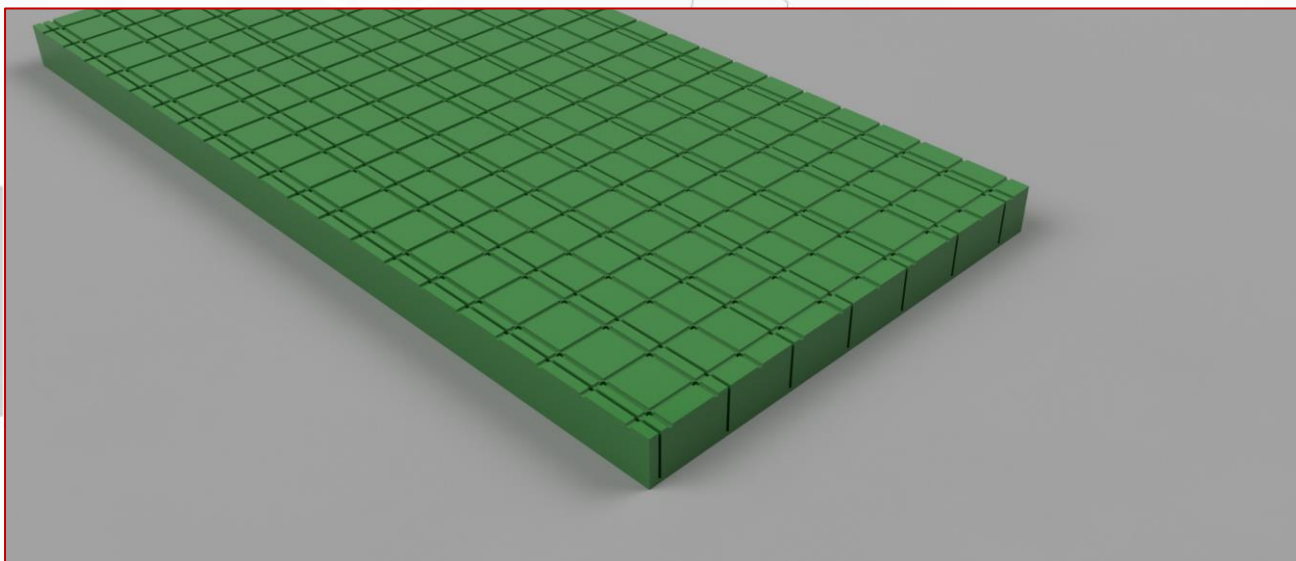
Deep groove

Top Surface Groove [mm]				Scrim Cloth at the bottom
Width	Depth	Spacing	Direction	
1.2	T-1.5	30	↔↕	

Perforation

Hole diameter [mm]	Spacing along sheet ↕ [mm]	Spacing across sheet ↔ [mm]
2.5	20	20

SC6 G1 P20X2.5



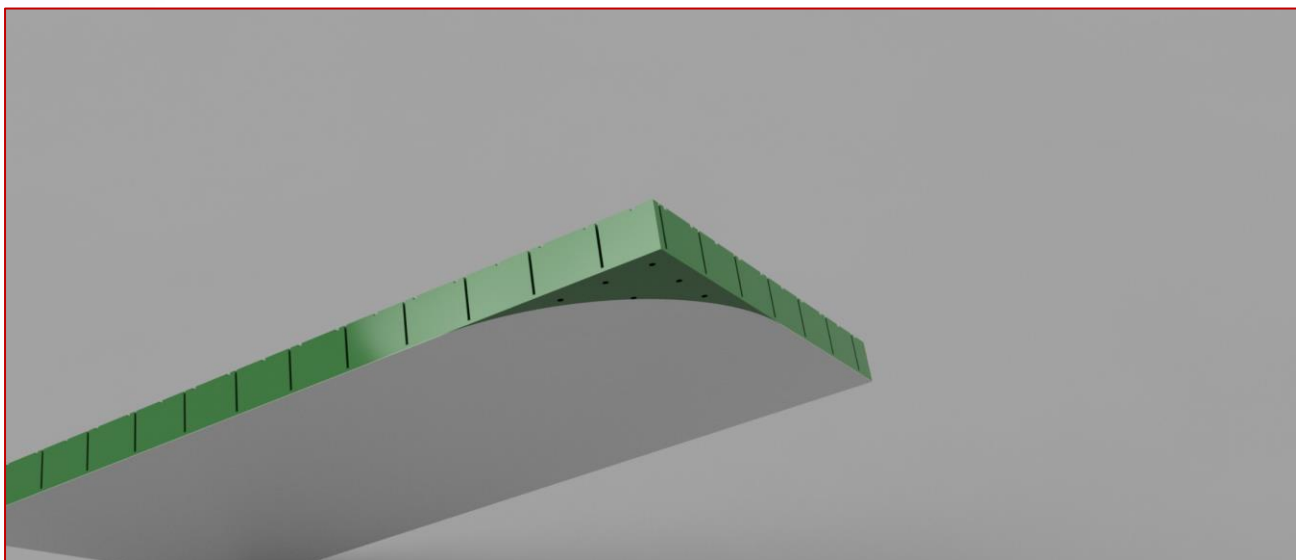
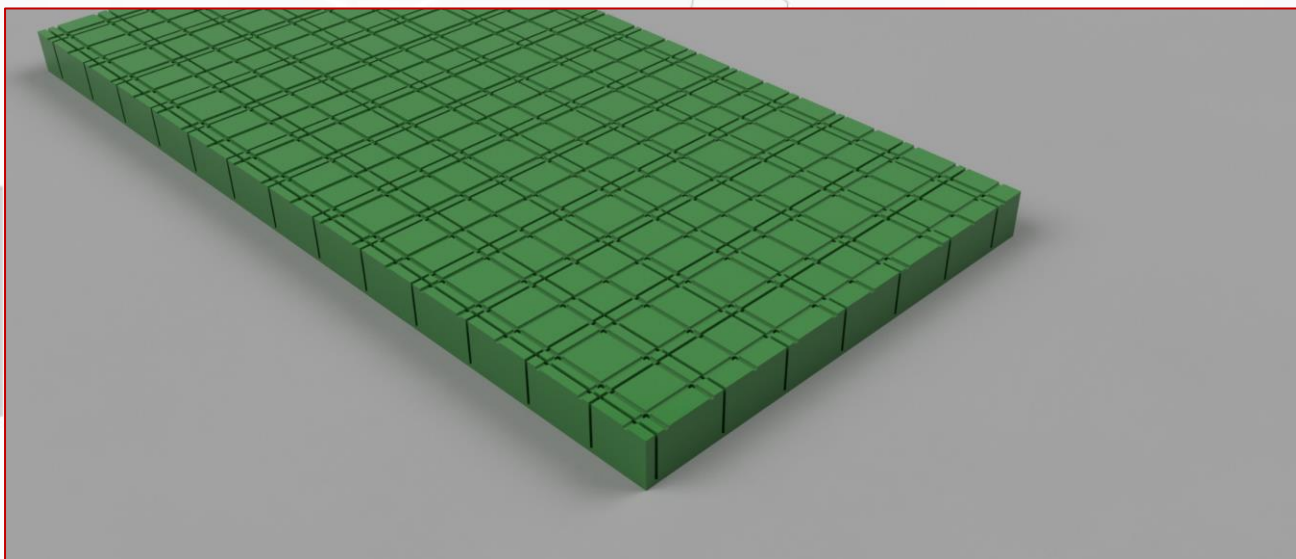
Grooves

Top Surface Deep Groove [mm]				Top Surface Shallow Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
1.2	T-1.5	30	↕	2.0	2.0	20	↔ ↕

Perforation and scrim cloth

Hole diameter [mm]	Spacing along sheet ↕ [mm]	Spacing across sheet ↔ [mm]	Scrim cloth at the bottom
2.5	20	20	

SC1 G1 P20X2.5



Grooves

Top Surface Deep Groove [mm]				Top Surface Shallow Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
1.2	T-1.5	30	↔↕	2.0	2.0	20	↔↕

Perforation and scrim cloth

Hole diameter [mm]	Spacing along sheet ↕ [mm]	Spacing across sheet ↔ [mm]	Scrim cloth at the bottom
2.5	20	20	

Double cut and flexi cut (deep grooved) - DC, FC

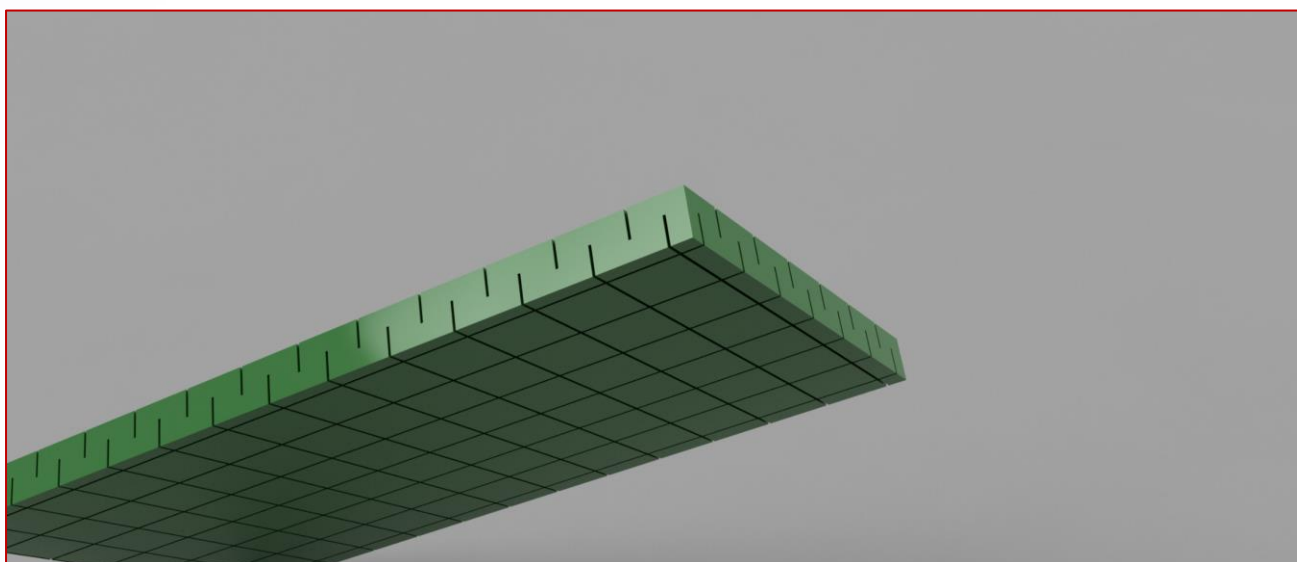
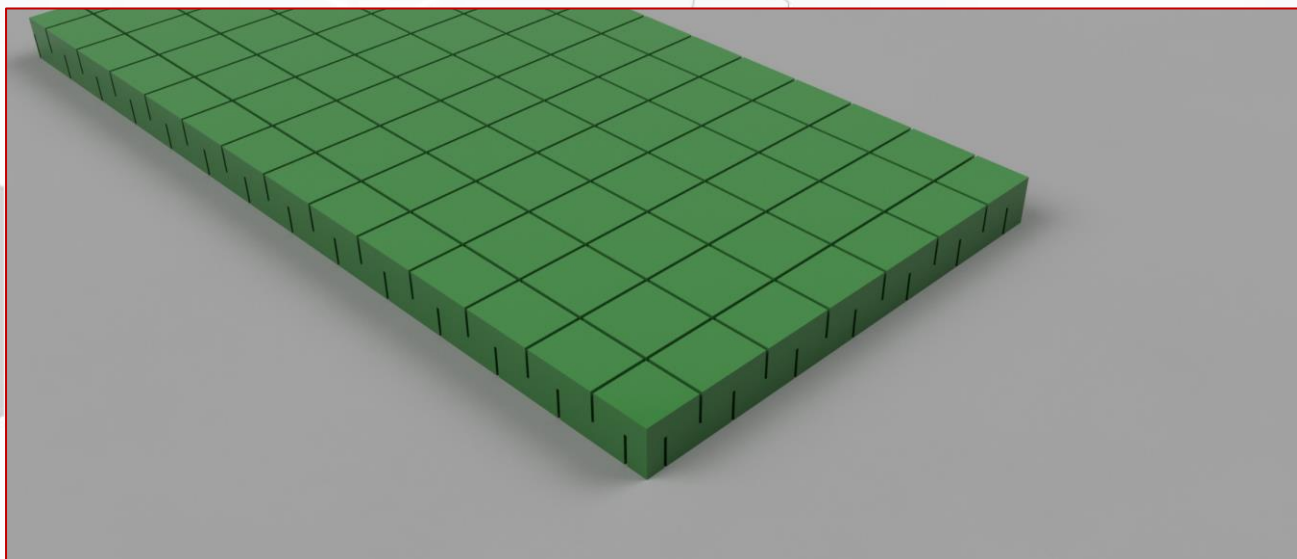
Double Cut and Flexi Cut finishing options are “all in one” multipurpose solutions (formability, air evacuation, resin distribution). The core material is grooved on top and bottom surfaces. Orthogonal grooves cross inside the material, generating intersecting points to allow air to flow across the panel. Deep and shallow grooves allow the resin to flow and the formability of the panel on single or double curvature surfaces. Standard options have 30mm spacing among grooves and two groove widths: 1.2 and 0.4mm. For Double Cut, deep grooves are longitudinal and transverse (cross cuts) for each surface. Grooves depth is 60% of panel thickness.

For Flexi Cut, on top surface, deep grooves (up to 5 or 3mm from the bottom) are on longitudinal direction, while, on bottom surface, shallow grooves (7 or 5mm deep) are on transverse direction.

Panels are supplied with half of the length of the plane sheet.

Code	Top Surface Groove [mm]				Bottom Surface Groove [mm]				Displac. [mm]
	Width	Depth	Spacing	Direct.	Width	Depth	Spacing	Direct.	
DC1	1.2	60% T	30	↔↕	1.2	60% T	30	↔↕	15
DC2	0.4	60% T	30	↔↕	0.4	60% T	30	↔↕	15
FC5	1.2	T-5	30	↕	1.2	7.0	30	↔	
FC6	0.4	T-3	30	↕	0.4	5.0	30	↔	

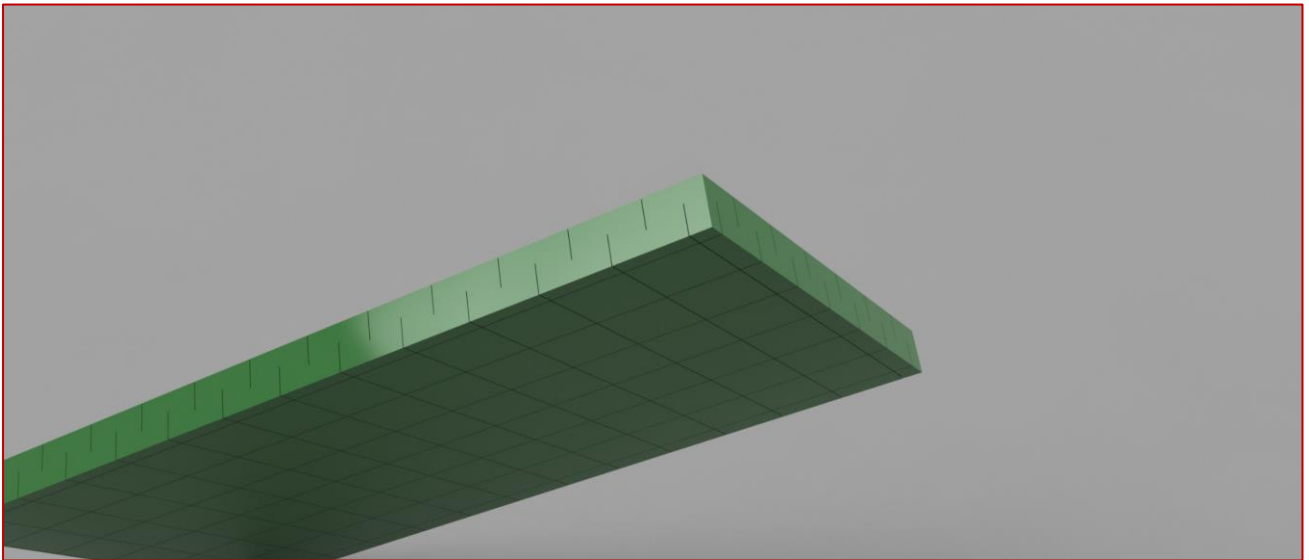
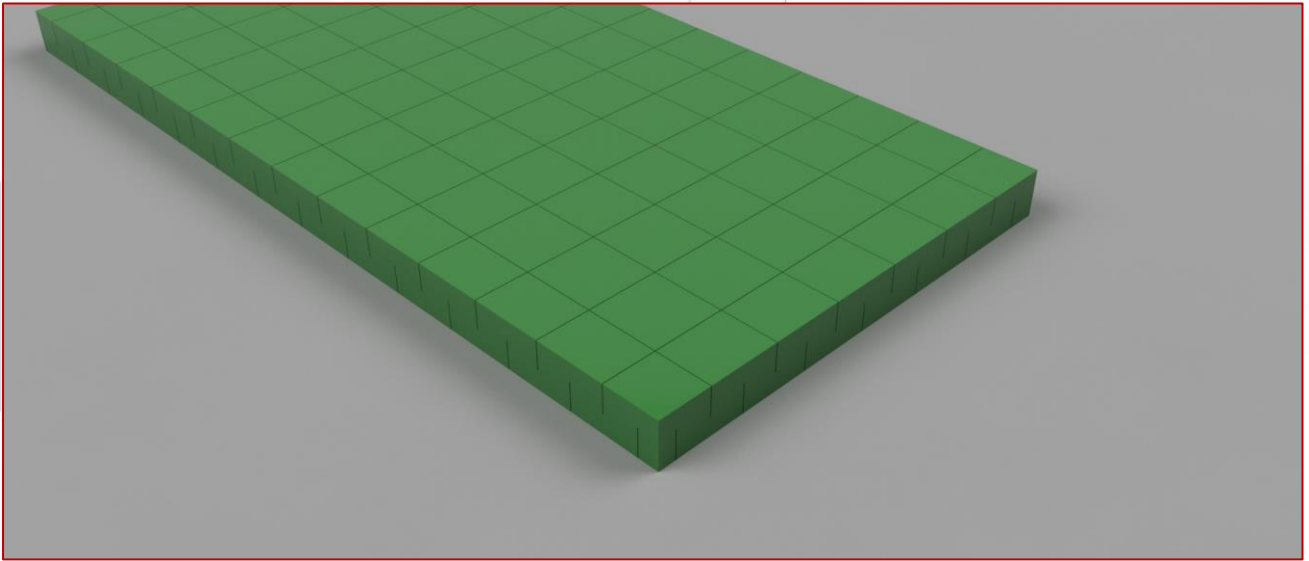
DC1



Deep groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]				Displacement [mm]
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction	
1.2	60% T	30	↔↕	1.2	60% T	30	↔↕	15

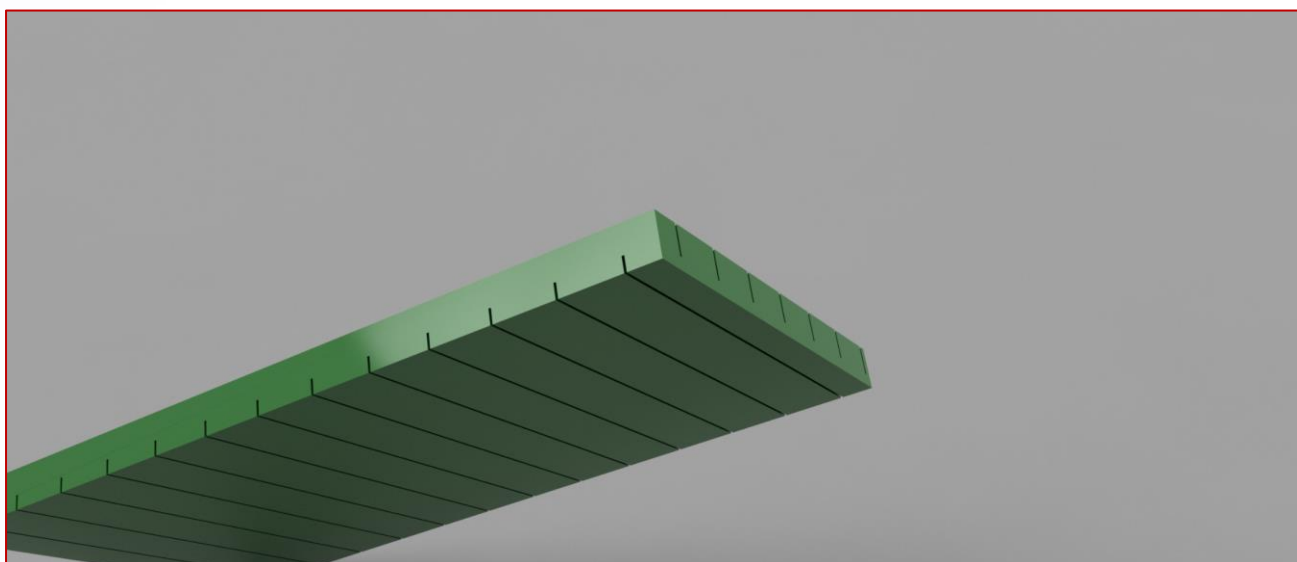
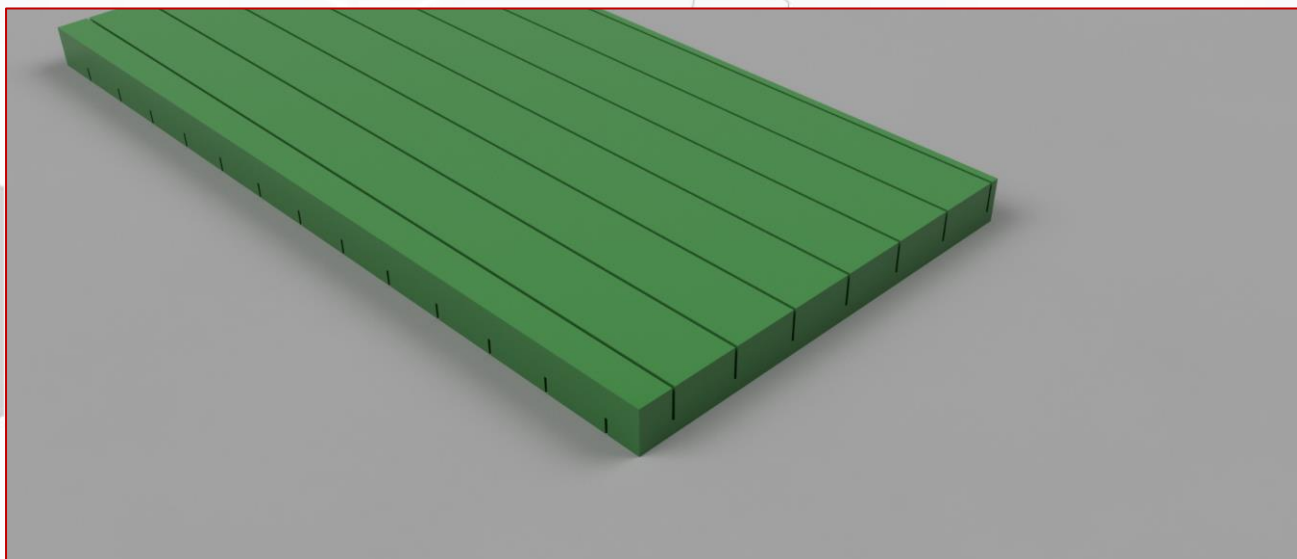
DC2



Deep groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]				Displacement [mm]
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction	
0.4	60% T	30	↔↕	0.4	60% T	30	↔↕	15

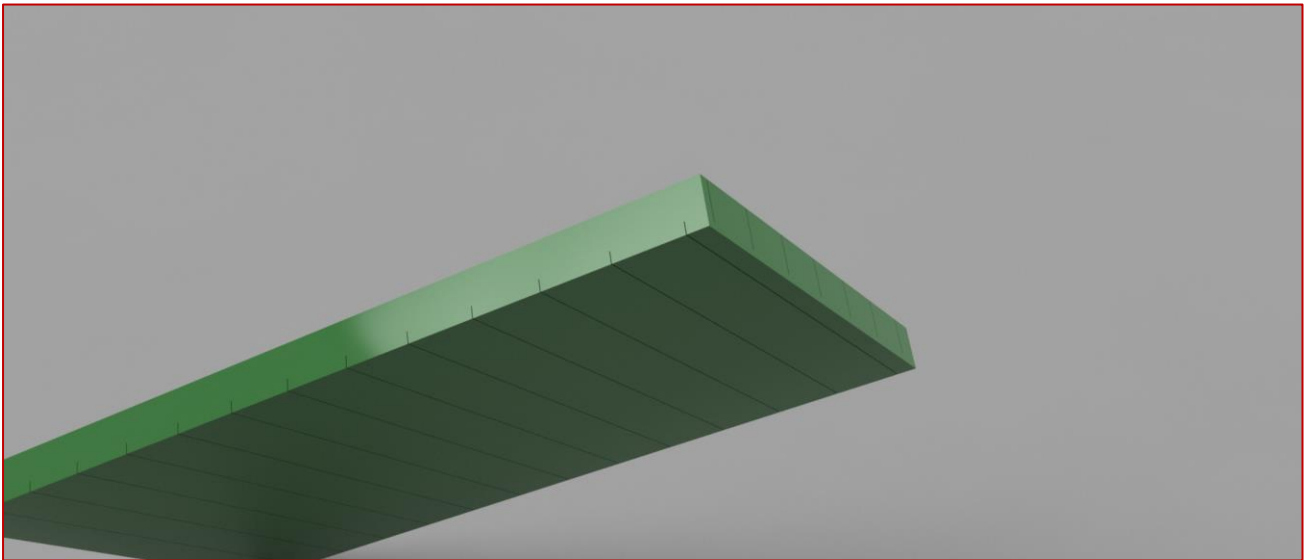
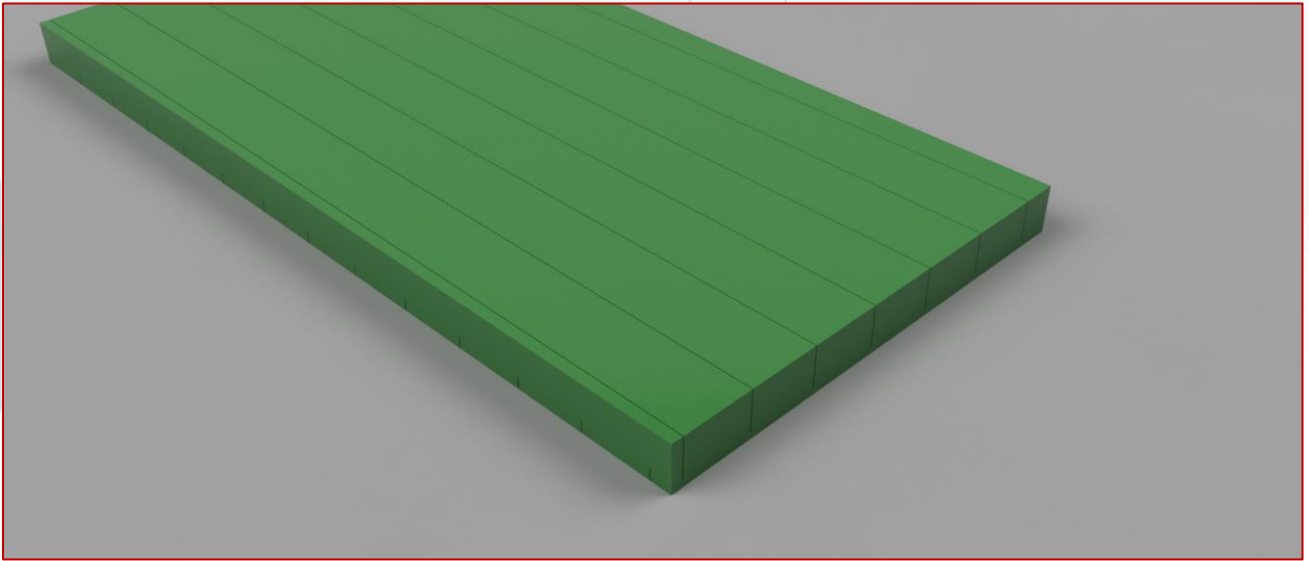
FC5



Deep groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
1.2	T-5	30	↕	1.2	7.0	30	↔

FC6



Deep groove

Top Surface Groove [mm]				Bottom Surface Groove [mm]			
Width	Depth	Spacing	Direction	Width	Depth	Spacing	Direction
0.4	T-3	30	↕	0.4	5.0	30	↔