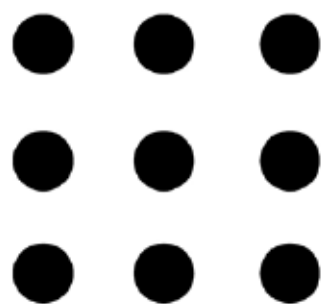


SELF- SHAPING TEXTILES

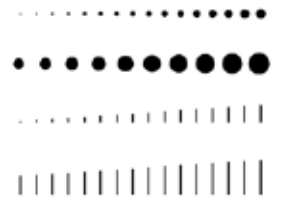
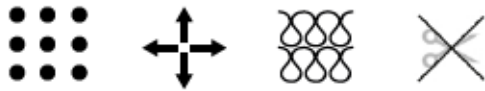
**Form-Finding of Tensile Surface Structures
through 3D Printing on Pre-stressed Fabric**

AGATA KYCIA

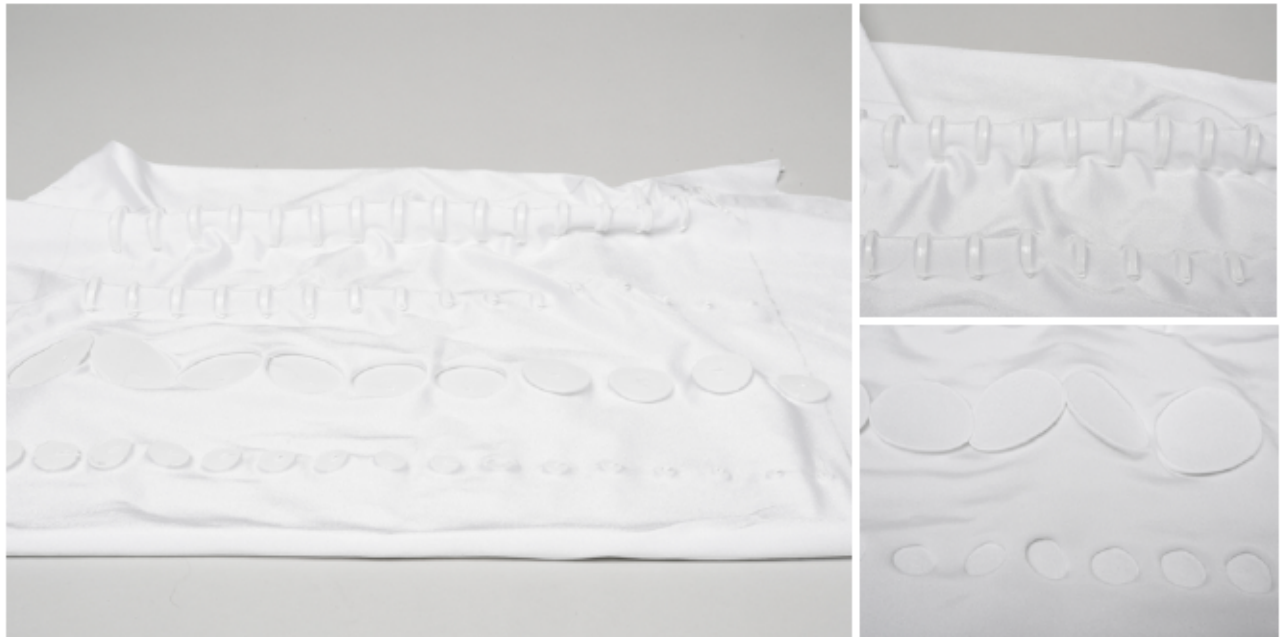


Prototype nr. 01_01

Geometry: Open shapes / Multiple shapes / Field
Textile: 2D tension / regular knit / no cut



top view of the geometry



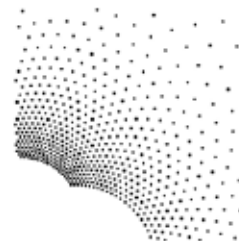
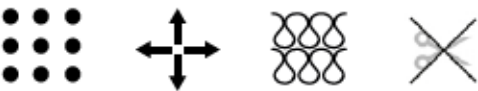
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Ciroles, Lines	MATERIAL FLOW:	100%
DIMENSIONS:	Ciroles (d=3-40mm, t= 0.4mm) Lines (l= 3-65mm, w= 3mm, t= 0.4mm)	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 01_02

Geometry: Open shapes / Multiple shapes / Field
Textile: 2D tension / regular knit / no cut



top view of the geometry



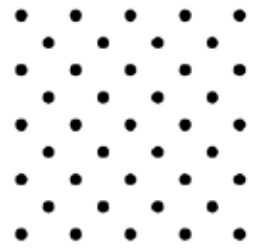
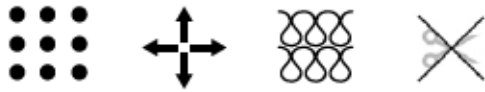
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Circles, variable spacing	MATERIAL FLOW:	100%
DIMENSIONS:	d= 4mm, t= 0.4mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 01_03

Geometry: Open shapes / Multiple shapes / Field
Textile: 2D tension / regular knit / no cut



top view of the geometry



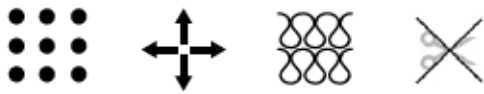
3D printed prototype

SPECIFICATIONS:

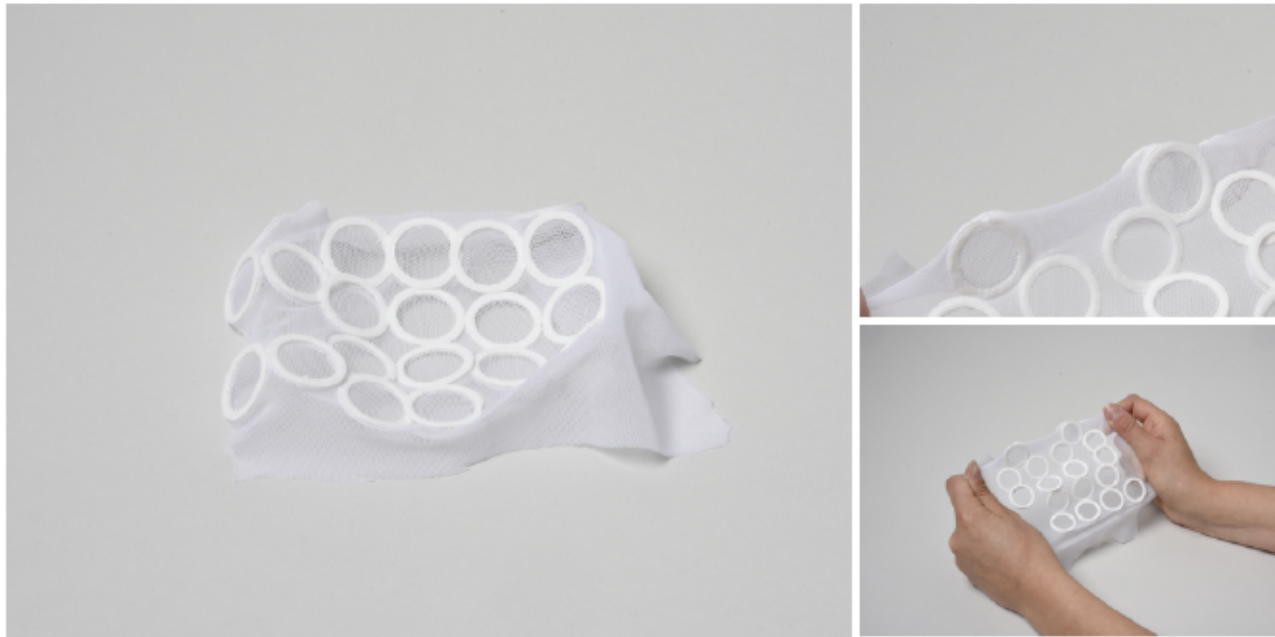
GEOMETRY:	Field of circles	MATERIAL FLOW:	100%
DIMENSIONS:	$r=5\text{mm}$, $t=1.2\text{mm}$	INFILL LINE DISTANCE:	1 mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	1mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Lines
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	25 mm/s, initial layer 12.5 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype created as part of the course 4D Fabrics at the weissensee khb, SoSe 2019

Prototype nr. 01_04

Geometry: Open shapes / Multiple shapes / Field
Textile: 2D tension / regular knit / no cut



top view of the geometry



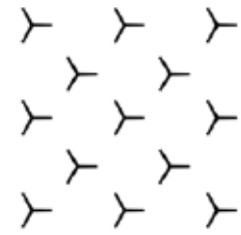
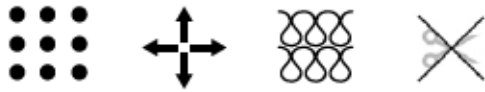
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Rings	MATERIAL FLOW:	100%
DIMENSIONS:	d=22.5mm, w= 2.5mm, t= 0.8mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Stretch Tüll Suleika 810 Weiss 93% PA 7%EL CA.120G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 130 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	42 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype created as part of the course 4D Fabrics at the weissensee khb, SoSe 2019

Prototype nr. 01_05

Geometry: Open shapes / Multiple shapes / Field
Textile: 2D tension / regular knit / no cut



top view of the geometry



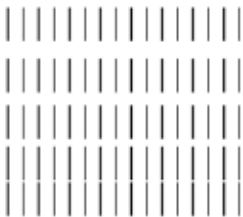
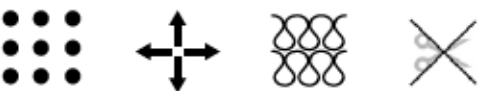
3D printed prototype

SPECIFICATIONS:

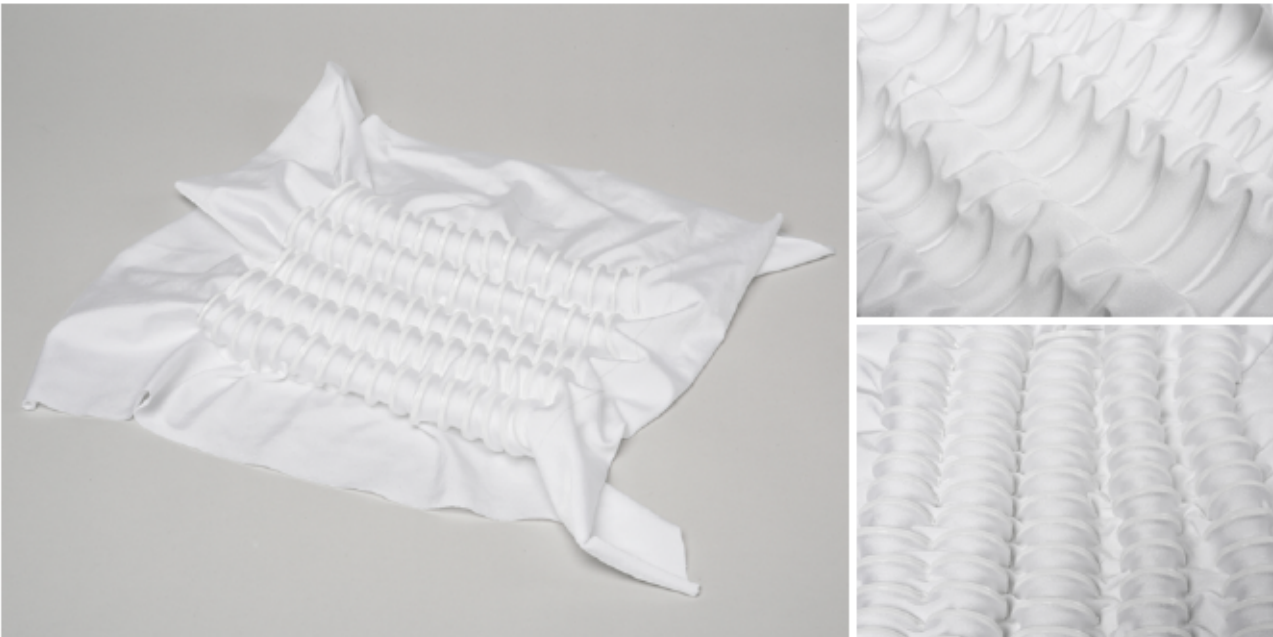
GEOMETRY:	Field of polylines	MATERIAL FLOW:	100%
DIMENSIONS:	w=2mm, t=0.8mm	INFILL LINE DISTANCE:	1 mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	1mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Lines
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	25 mm/s, initial layer 12.5 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype created as part of the course 4D Fabrics at the weissensee khb, SoSe 2019

Prototype nr. 01_06

Geometry: Open shapes / Multiple shapes / Field
 Textile: 2D tension / regular knit / no cut



top view of the geometry



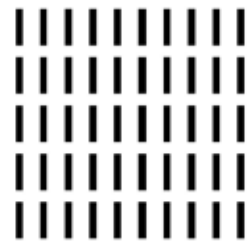
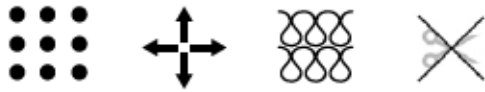
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple lines (spacing 30mm)	MATERIAL FLOW:	100%
DIMENSIONS:	l=65mm, w=3mm, t=0.4mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 01_07

Geometry: Open shapes / Multiple shapes / Field
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Multiple lines
(spacing $s=20\text{mm}$)

DIMENSIONS: $l=30\text{mm}$, $w=6\text{mm}$,
 $t=1.2\text{mm}$

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 25 mm/s,
initial layer 12.5 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 1mm

WALL THICKNESS: 1mm

INFILL PATTERN: Lines

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

3D PRINTER: Custom-built

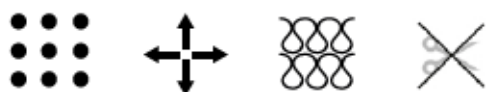
NOZZLE: 1mm

COMMENTS: Prototype created as part of
the course 4D Fabrics at the
weissensee khb, SoSe 2019

Prototype nr. 01_08

Geometry: Open shapes / Multiple shapes / Field

Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Multiple lines
(spacing $s=50\text{mm}$, angle 45°)

DIMENSIONS: $l=50\text{mm}$, $w=3\text{mm}$,
 $t=0.8\text{mm}$

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230°C
(initial 220°C , final 215°C)

PRINTING SPEED: 25 mm/s ,
initial layer 12.5 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm , first layer 0.3mm

PRINTING BED SIZE: $500 \times 500\text{mm}$

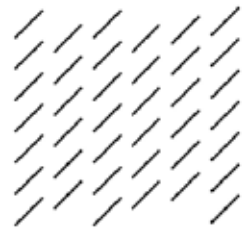
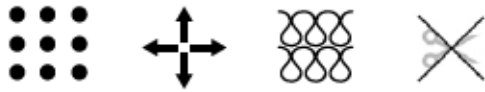
3D PRINTER: Custom-built

NOZZLE: 1mm

COMMENTS: Prototype created as part of
the course 4D Fabrics at the
weissensee khb, SoSe 2019

Prototype nr. 01_09

Geometry: Open shapes / Multiple shapes / Field
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Multiple lines
(angle 45°, rows shifted)

DIMENSIONS: l=50mm, w=3mm,
t=0.8mm

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 25 mm/s,
initial layer 12.5 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 1 mm

WALL THICKNESS: 1mm

INFILL PATTERN: Lines

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

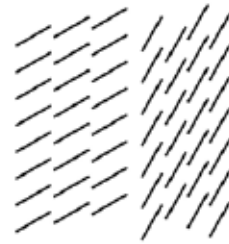
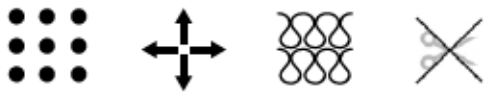
3D PRINTER: Custom-built

NOZZLE: 1mm

COMMENTS: The rows of single lines are shifted against each other. Prototype created as part of the course 4D Fabrics at the weissensee khb, SoSe 2019

Prototype nr. 01_10

Geometry: Open shapes / Multiple shapes / Field
Textile: 2D tension / regular knit / no cut



top view of the geometry



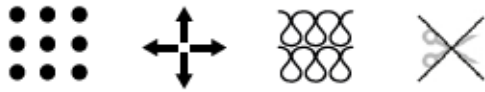
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple lines (left side: angle 30°, right side: angle 60°, rows shifted)	MATERIAL FLOW:	100%
DIMENSIONS:	l=50mm, w=3mm, t=0.8mm	INFILL LINE DISTANCE:	1 mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	1mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Lines
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	25 mm/s, initial layer 12.5 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype created as part of the course 4D Fabrics at the weissensee khb, SoSe 2019

Prototype nr. 01_11

Geometry: Open shapes / Multiple shapes / Field
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

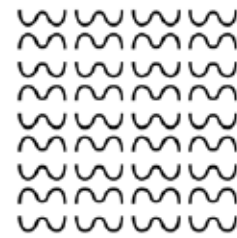
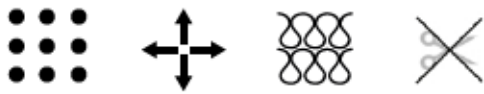
SPECIFICATIONS:

GEOMETRY:	Multiple lines (left side: angle 30°, spacing s=15mm, right side: angle 45°, spacing s=20mm)
DIMENSIONS:	l=50mm, w=3mm, t=0.8mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M
TENSION:	Bi-directional, 150 %
FILAMENT:	PLA (Filafarm)
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)
PRINTING SPEED:	25 mm/s, initial layer 12.5 mm/s

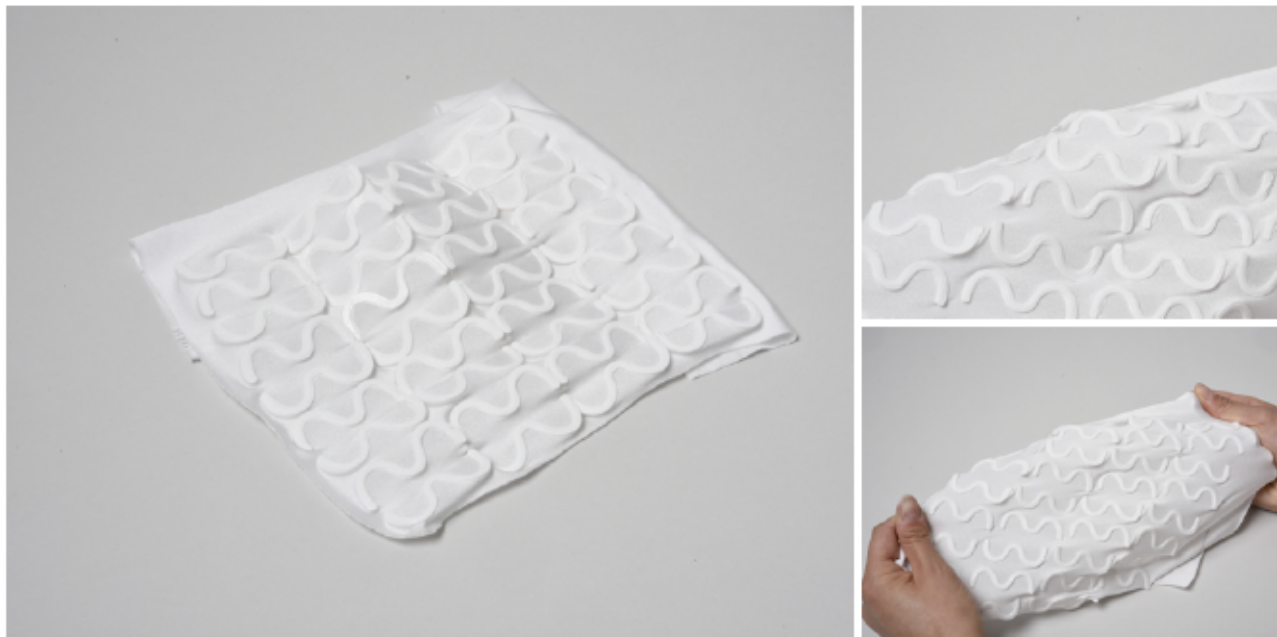
MATERIAL FLOW:	100%
INFILL LINE DISTANCE:	1 mm
WALL THICKNESS:	1mm
INFILL PATTERN:	Lines
LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING BED SIZE:	500 x 500mm
3D PRINTER:	Custom-built
NOZZLE:	1mm
COMMENTS:	Prototype created as part of the course 4D Fabrics at the weissensee khb, SoSe 2019

Prototype nr. 01_12

Geometry: Open shapes / Multiple shapes / Field
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

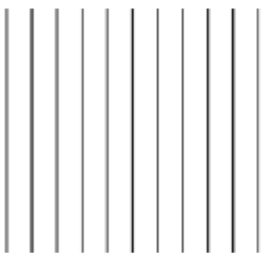
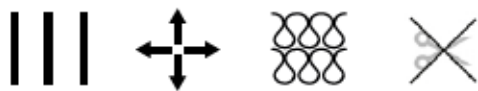
SPECIFICATIONS:

GEOMETRY:	Multiple curves	MATERIAL FLOW:	100%
DIMENSIONS:	w=2.5mm, t=1.2mm	INFILL LINE DISTANCE:	1mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	1mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Lines
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	25 mm/s, initial layer 12.5 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	prototype created as part of the course 4D Fabrics at the weissensee khb, SoSe 2019



Prototype nr. 02_01

Geometry: Open shapes / Multiple shapes / Multiple lines
 Textile: 2D tension / regular knit / no cut



top view of the geometry



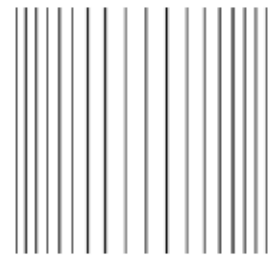
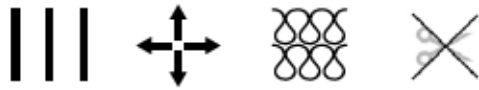
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple parallell lines spacing 40mm	MATERIAL FLOW:	100%
DIMENSIONS:	l= 465mm, w= 3mm, t= 0.4mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 02_02

Geometry: Open shapes / Multiple shapes / Multiple lines
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

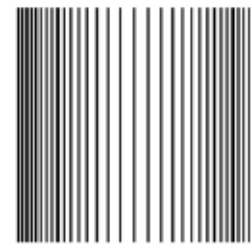
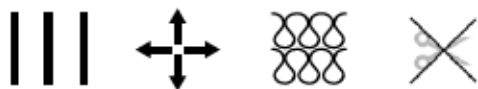
SPECIFICATIONS:

GEOMETRY:	Multiple parallell lines
DIMENSIONS:	l= 465mm, w= 3mm, t= 0.4mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M
TENSION:	Bi-directional, 150 %
FILAMENT:	PLA (Filafarm)
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s

MATERIAL FLOW:	100%
INFILL LINE DISTANCE:	0.9mm
WALL THICKNESS:	3mm
INFILL PATTERN:	Concentric
LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING BED SIZE:	500 x 500mm
3D PRINTER:	Custom-built
NOZZLE:	1mm
COMMENTS:	Prototype by author

Prototype nr. 02_03

Geometry: Open shapes / Multiple shapes / Multiple lines
Textile: 2D tension / regular knit / no cut



top view of the geometry



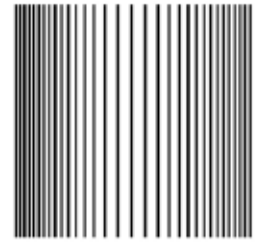
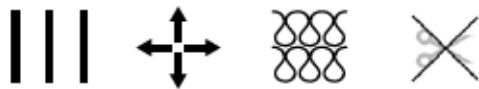
3D printed prototype

SPECIFICATIONS:

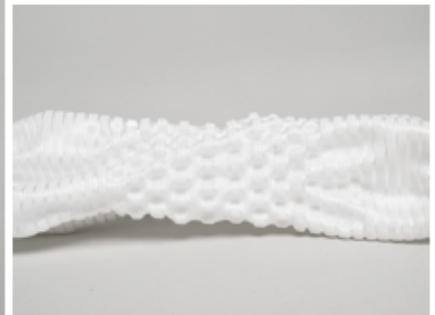
GEOMETRY:	Multiple parallell lines variable spacing	MATERIAL FLOW:	100%
DIMENSIONS:	l= 170mm, w= 2mm, t= 0.8mm	INFILL DENSITY:	20%
FABRIC:	Lycra 4-Stretch Jersey 85% PA, 15% EL	INFILL PATTERN:	Concentric
TENSION:	Bi-directional, 150 %	LAYER HEIGHT:	0.1 mm, first layer 0.27mm
FILAMENT:	PLA (Filafarm)	PRINTING BED SIZE:	215 x 215mm
PRINTING TEMP.:	200 °C	3D PRINTER:	Ultimaker 3 extended
PRINTING SPEED:	25 mm/s, initial layer 12.5 mm/s	NOZZLE:	0.4mm
		COMMENTS:	Prototype by author

Prototype nr. 02_04

Geometry: Open shapes / Multiple shapes / Multiple lines
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Multiple parallel lines
variable spacing

DIMENSIONS: l= 170mm, w= 2mm,
t= 0.4mm

FABRIC: Lycra 4-Stretch Jersey
85% PA, 15% EL

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 200 °C

PRINTING SPEED: 25 mm/s,
initial layer 12.5 mm/s

MATERIAL FLOW: 100%

INFILL DENSITY: 20%

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.1 mm,
first layer 0.27mm

PRINTING BED SIZE: 215 x 215mm

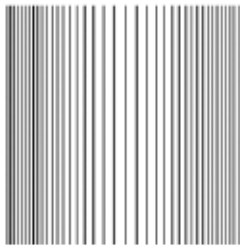
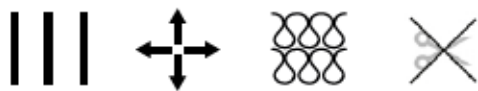
3D PRINTER: Ultimaker 3 extended

NOZZLE: 0.4mm

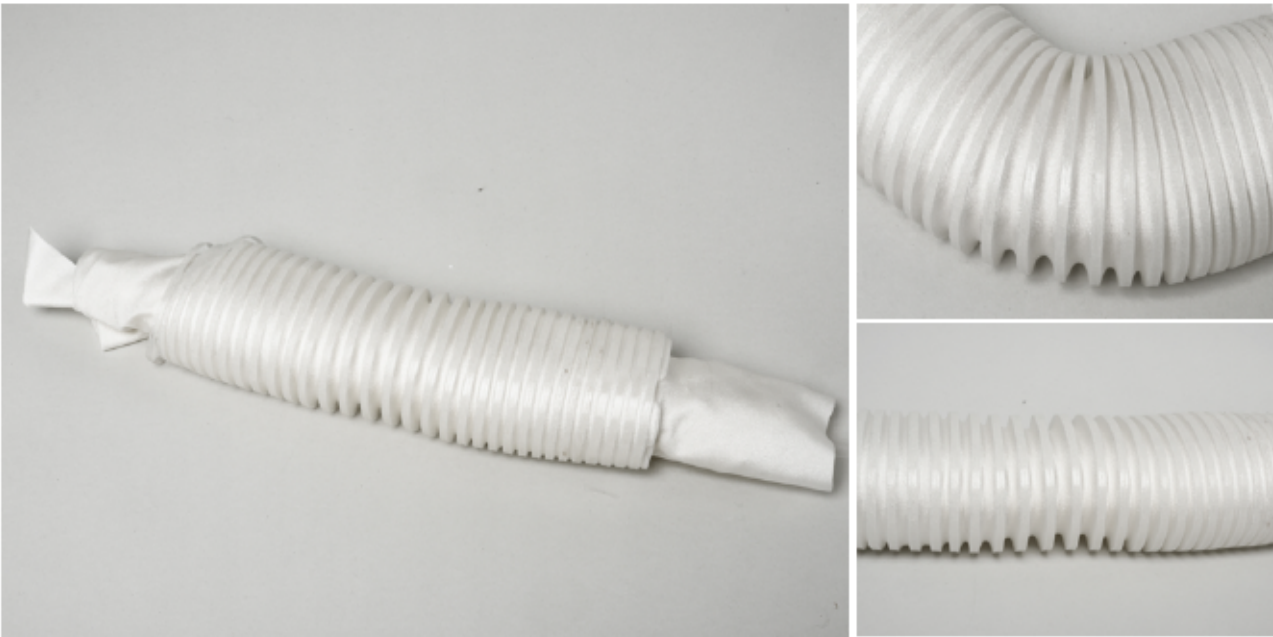
COMMENTS: Prototype by author

Prototype nr. 02_05

Geometry: Open shapes / Multiple shapes / Multiple lines
Textile: 2D tension / regular knit / no cut



top view of the geometry



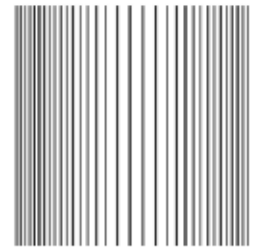
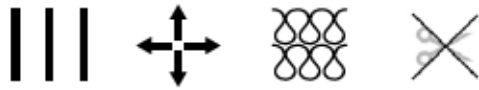
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple curves, variable spacing	MATERIAL FLOW:	100%
DIMENSIONS:	w= 3mm, t= 0.4mm, l=500mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA Glow in the dark 1.24 g/cm ³ (Spectrum)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 02_06

Geometry: Open shapes / Multiple shapes / Multiple lines
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

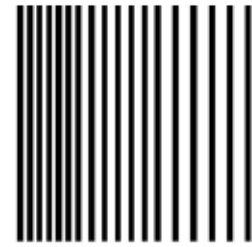
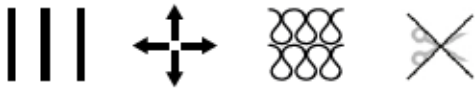
SPECIFICATIONS:

GEOMETRY:	Multiple curves, variable spacing
DIMENSIONS:	w= 3mm, t= 0.8mm, l=500mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M
TENSION:	Bi-directional, 150 %
FILAMENT:	PLA Glow in the dark 1.24 g/cm3 (Spectrum)
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s

MATERIAL FLOW:	100%
INFILL LINE DISTANCE:	0.9mm
WALL THICKNESS:	3mm
INFILL PATTERN:	Concentric
LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING BED SIZE:	500 x 500mm
3D PRINTER:	Custom-built
NOZZLE:	1mm
COMMENTS:	Prototype by author

Prototype nr. 02_08

Geometry: Open shapes / Multiple shapes / Multiple lines
Textile: 2D tension / regular knit / no cut



top view of the geometry



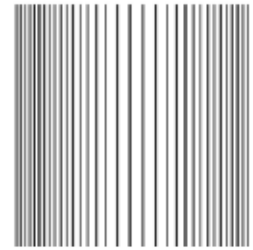
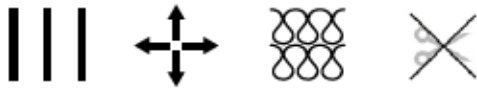
3D printed prototype

SPECIFICATIONS:

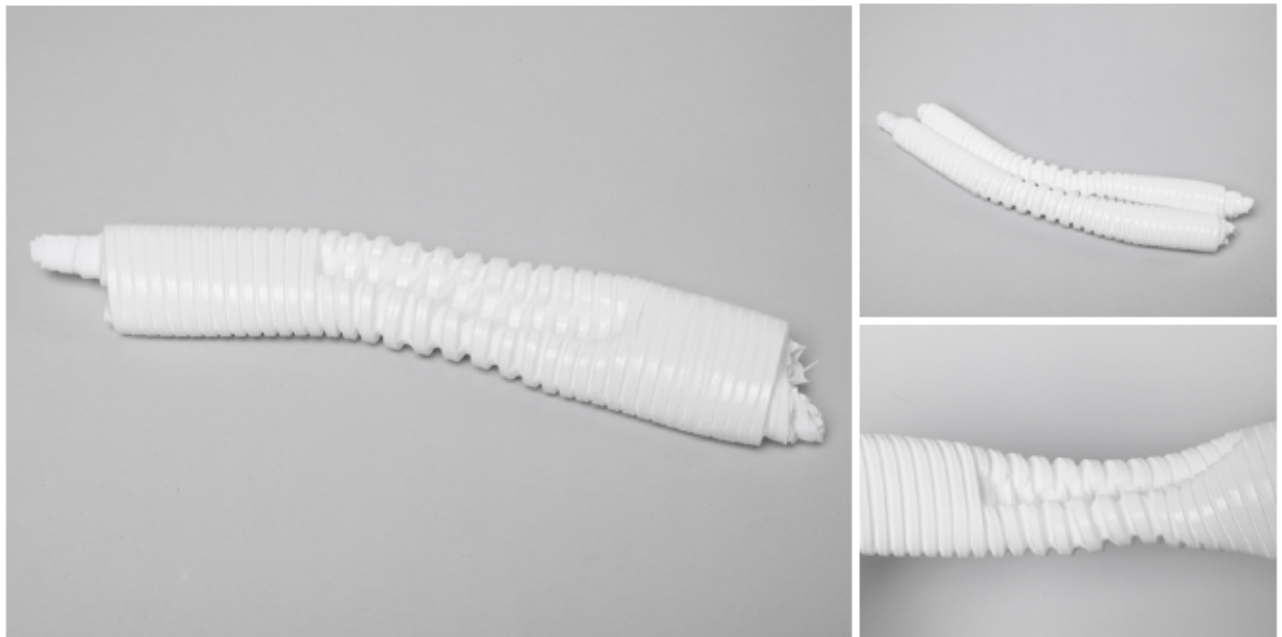
GEOMETRY:	Multiple curves, variable spacing (s=8/11/15mm)	MATERIAL FLOW:	100%
DIMENSIONS:	w=5mm, t=0.8 mm	INFILL LINE DISTANCE:	1mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	1mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Lines
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	25 mm/s, initial layer 12.5 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype created as part of the course 4D Fabrics at the weissensee khb, SoSe 2019

Prototype nr. 02_07

Geometry: Open shapes / Multiple shapes / Multiple lines
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

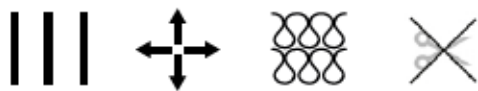
SPECIFICATIONS:

GEOMETRY:	Multiple curves, variable spacing
DIMENSIONS:	w= 3mm, t= 0.8mm, l=500mm
FABRIC:	Bi Stretch Laguna Weiß 80% PA 20%EA CA.280G/M
TENSION:	Bi-directional, 150 %
FILAMENT:	PLA (Filafarm)
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s

MATERIAL FLOW:	100%
INFILL LINE DISTANCE:	0.9mm
WALL THICKNESS:	3mm
INFILL PATTERN:	Concentric
LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING BED SIZE:	500 x 500mm
3D PRINTER:	Custom-built
NOZZLE:	1mm
COMMENTS:	Prototype by author

Prototype nr. 02_09

Geometry: Open shapes / Multiple shapes / Multiple lines
Textile: 2D tension / regular knit / no cut



top view of the geometry



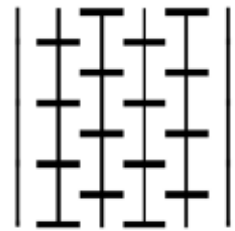
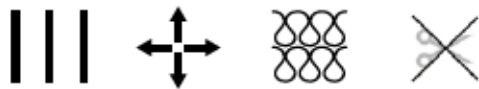
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple lines, not parallel variable spacing	MATERIAL FLOW:	100%
DIMENSIONS:	w= 3mm, t= 0.8mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiß 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 02_10

Geometry: Open shapes / Multiple shapes / Multiple lines
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

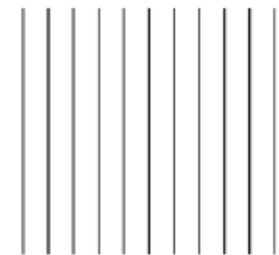
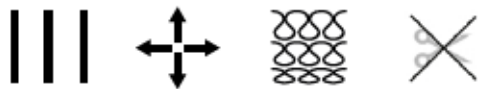
SPECIFICATIONS:

GEOMETRY: Multiple polylines
DIMENSIONS: w=3-6mm, t=0.6mm
FABRIC: Lycra 4-Stretch Jersey
85% PA, 15% EL
TENSION: Bi-directional, 150 %
FILAMENT: PLA (Filafarm)
PRINTING TEMP.: 210 °C
PRINTING SPEED: 40 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%
INFILL LINE DISTANCE: 0.2mm
INFILL PATTERN: Lines
LAYER HEIGHT: 0.2mm
PRINTING BED SIZE: 250 x 200mm
3D PRINTER: Craftbot Plus Pro
NOZZLE: 0.4mm
COMMENTS: Prototype created as part of
the seminar Self-Shaping
Textiles at the weissensee
kfb, SoSe 2017

Prototype nr. 02_11

Geometry: Open shapes / Multiple shapes / Multiple lines
Textile: 2D tension / custom knit / no cut



top view of the geometry



3D printed prototype

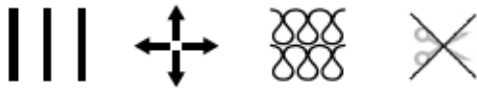
SPECIFICATIONS:

GEOMETRY:	Multiple parallell lines spacing s=40mm
DIMENSIONS:	l= 465mm, w= 3mm, t= 0.8mm
FABRIC:	custom knitted PES 167dtex f144/1 + Roica 150dtex mit 2[oN] EFS strength, machine fineness E14, fabric width: 425 needles
TENSION:	Bi-directional, 150 %
FILAMENT:	PLA (Filafarm)
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s

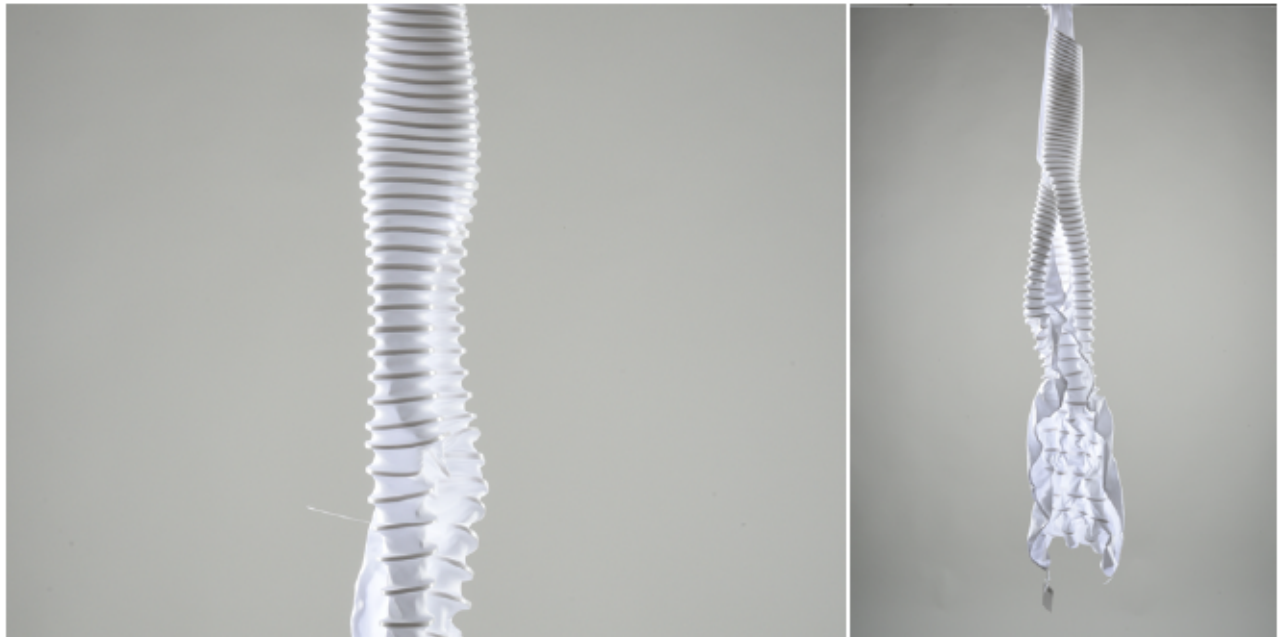
MATERIAL FLOW:	100%
INFILL LINE DISTANCE:	0.9mm
WALL THICKNESS:	3mm
INFILL PATTERN:	Concentric
LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING BED SIZE:	500 x 500mm
3D PRINTER:	Custom-built
NOZZLE:	1mm
COMMENTS:	Prototype by author, fabric by STFI

Prototype nr. 02_12

Geometry: Open shapes / Multiple shapes / Multiple lines
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Multiple parallel lines,
variable spacing
(s=11/43mm)

AMOUNT OF PRINTS: 3

DIMENSIONS: w=3mm, t= 0.4mm

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

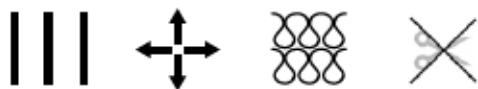
3D PRINTER: Custom-built FDM printer

NOZZLE: 1mm

COMMENTS: Prototype by author

Prototype nr. 02_13

Geometry: Open shapes / Multiple shapes / Multiple lines
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

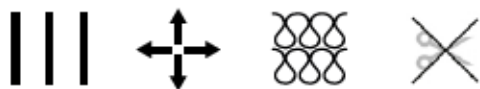
SPECIFICATIONS:

GEOMETRY:	Multiple parallell lines, variable spacing (s=11/61mm)	MATERIAL FLOW:	100%
		INFILL LINE DISTANCE:	0.9mm
AMOUNT OF PRINTS:	4	WALL THICKNESS:	3mm
DIMENSIONS:	D= 3mm, H= 0.4mm	INFILL PATTERN:	Concentric
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
TENSION:	Bi-directional, 150 %	PRINTING BED SIZE:	500 x 500mm
FILAMENT:	PLA (Filafarm)	3D PRINTER:	Custom-built FDM printer
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	NOZZLE:	1mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	COMMENTS:	Prototype by author

Prototype nr. 02_14

Geometry: Open shapes / Multiple shapes / Multiple lines

Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Multiple parallel lines,
variable spacing
(s=11/43mm)

AMOUNT OF PRINTS: 4

DIMENSIONS: w=3mm, t= 0.8mm

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

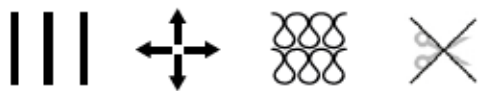
3D PRINTER: Custom-built FDM printer

NOZZLE: 1mm

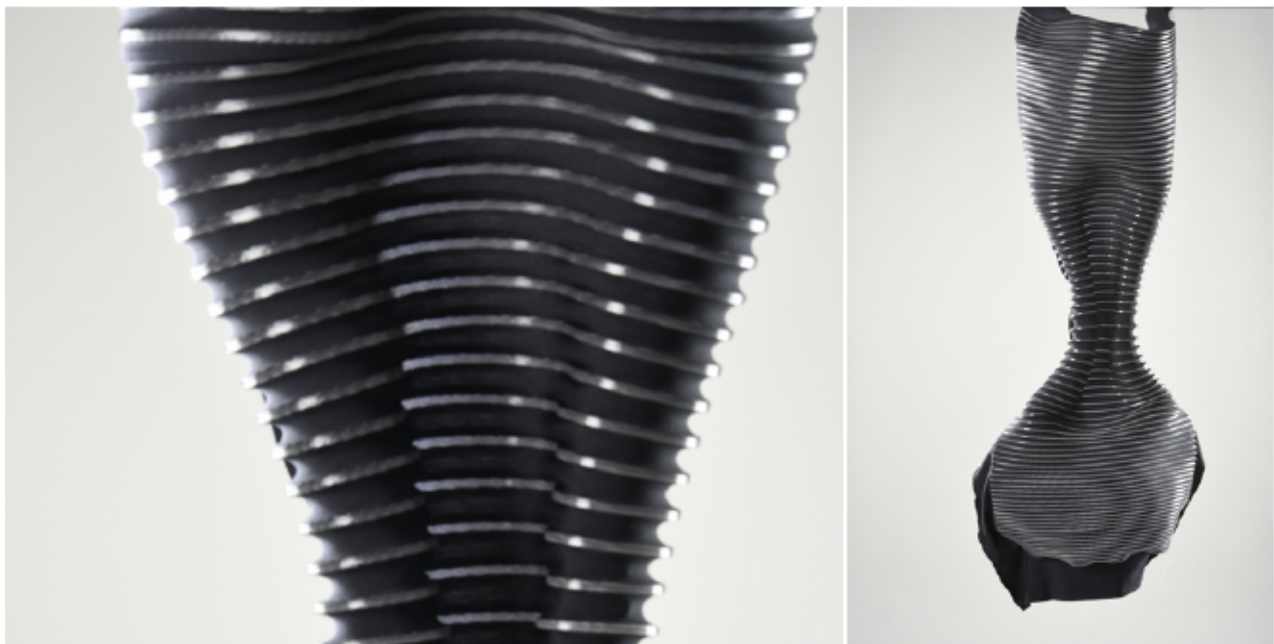
COMMENTS: Prototype by author

Prototype nr. 02_15

Geometry: Open shapes / Multiple shapes / Multiple lines
Textile: 2D tension / regular knit / no cut



top view of the geometry



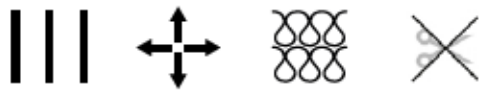
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple parallell lines, variable spacing (s=11/61mm)	MATERIAL FLOW:	100%
		INFILL LINE DISTANCE:	0.9mm
AMOUNT OF PRINTS:	4	WALL THICKNESS:	3mm
DIMENSIONS:	w= 3mm, t= 0.8mm	INFILL PATTERN:	Concentric
FABRIC:	Bi Stretch Laguna Schwarz 80% PA 20%EA CA.280G/M	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
TENSION:	Bi-directional, 150 %	PRINTING BED SIZE:	500 x 500mm
FILAMENT:	PLA Glow in the Dark (Spectrum)	3D PRINTER:	Custom-built FDM printer
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	NOZZLE:	1mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	COMMENTS:	Prototype by author

Prototype nr. 02_16

Geometry: Open shapes / Multiple shapes / Multiple lines
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Multiple parallel lines,
variable spacing
(s=11/61mm)

AMOUNT OF PRINTS: 4

DIMENSIONS: w= 3mm, t= 0.4mm

FABRIC: Bi Stretch Laguna Schwarz
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

3D PRINTER: Custom-built FDM printer

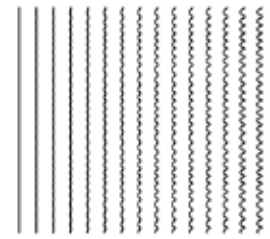
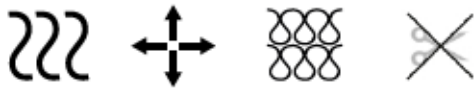
NOZZLE: 1mm

COMMENTS: Prototype by author

222

Prototype nr. 03_01

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Multiple curves,
spacing $s=33\text{mm}$

DIMENSIONS: $w=3\text{mm}$, $t=0.4\text{mm}$,
 $l=500\text{mm}$

FABRIC: Bi Stretch Laguna Schwarz
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

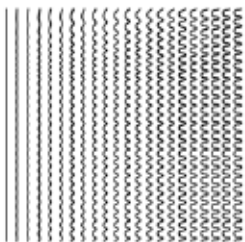
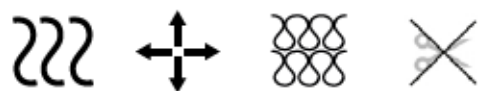
3D PRINTER: Custom-built

NOZZLE: 1mm

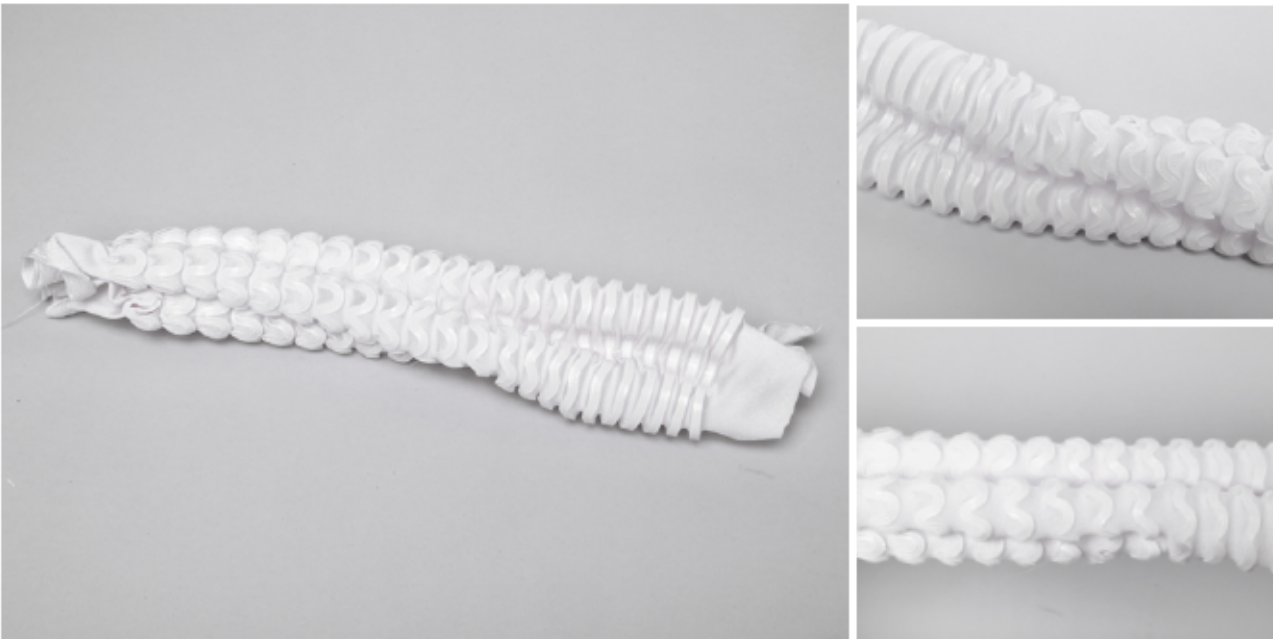
COMMENTS: Prototype by author

Prototype nr. 03_02

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / no cut



top view of the geometry



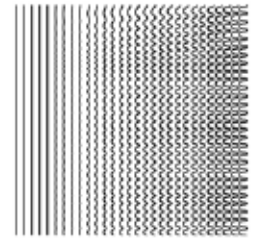
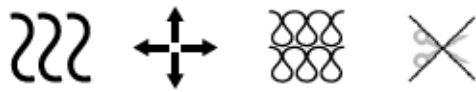
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple curves, spacing s=22.5mm	MATERIAL FLOW:	100%
DIMENSIONS:	w= 3mm, t= 0.4mm, l=500mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 03_03

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Multiple curves,
spacing $s=17\text{mm}$

DIMENSIONS: $w=3\text{mm}$, $t=0.4\text{mm}$,
 $l=500\text{mm}$

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

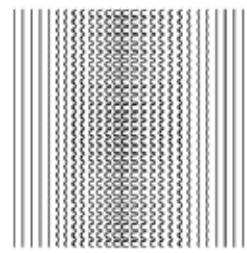
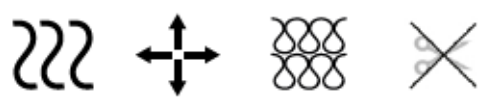
3D PRINTER: Custom-built

NOZZLE: 1mm

COMMENTS: Prototype by author

Prototype nr. 03_04

Geometry: Open shapes / Multiple shapes / Multiple curves
 Textile: 2D tension / regular knit / no cut



top view of the geometry



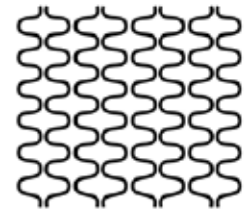
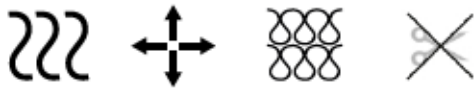
3D printed prototype

SPECIFICATIONS:

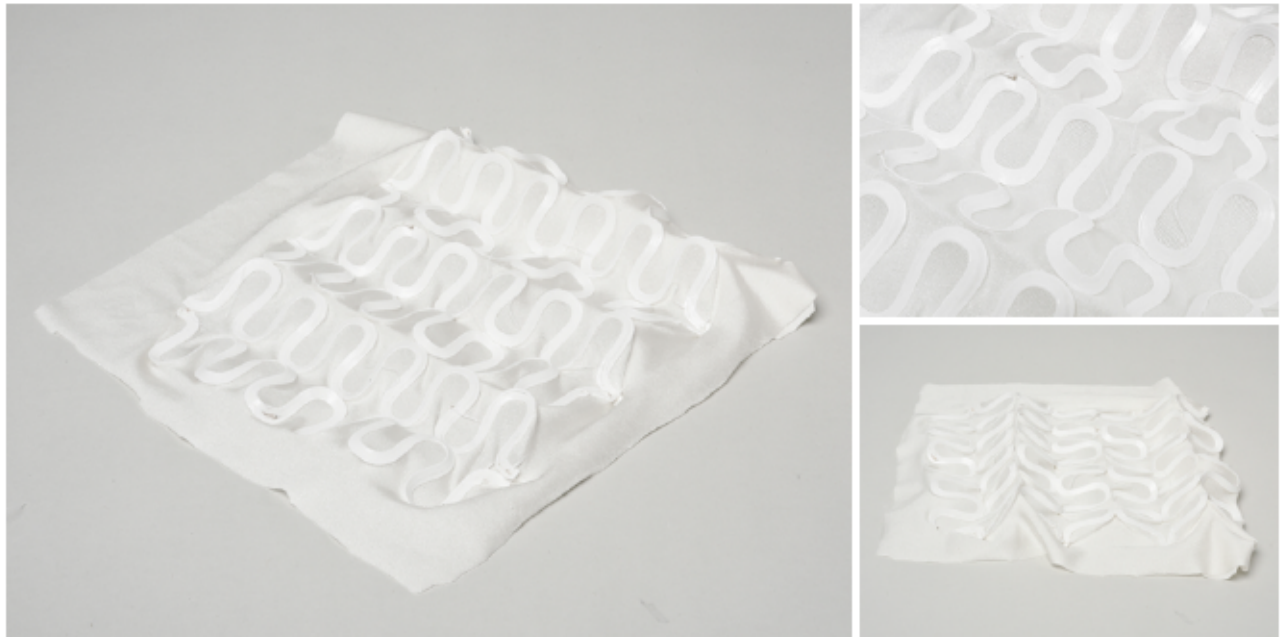
GEOMETRY:	Multiple curves, spacing s=17mm	MATERIAL FLOW:	100%
DIMENSIONS:	w= 3mm, t= 0.4mm, l=500mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA Glow in the dark (Spectrum)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 03_05

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

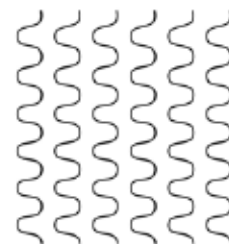
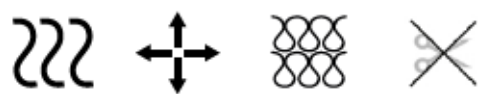
SPECIFICATIONS:

GEOMETRY:	Multiple curves,
DIMENSIONS:	w= 4mm, t= 1mm, l=250mm
FABRIC:	Bi Stretch Laguna Schwarz 80% PA 20%EA CA.280G/M
TENSION:	Bi-directional, 150 %
FILAMENT:	PLA (Filafarm)
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s

MATERIAL FLOW:	100%
INFILL LINE DISTANCE:	0.9mm
WALL THICKNESS:	3mm
INFILL PATTERN:	Concentric
LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING BED SIZE:	500 x 500mm
3D PRINTER:	Custom-built
NOZZLE:	1mm
COMMENTS:	Prototype by author

Prototype nr. 03_06

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / no cut



top view of the geometry



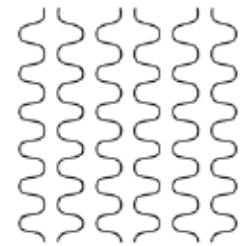
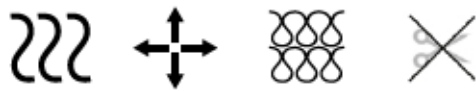
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple curves, spacing s=70mm	MATERIAL FLOW:	100%
DIMENSIONS:	w= 3mm, t=0.4mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 03_07

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Multiple curves,
spacing $s=70\text{mm}$

DIMENSIONS: $w=3\text{mm}$, $t=0.4\text{mm}$

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

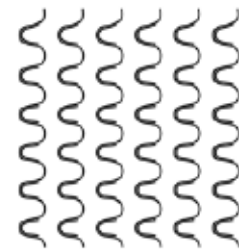
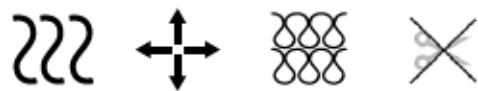
3D PRINTER: Custom-built

NOZZLE: 1mm

COMMENTS: Prototype by author
:

Prototype nr. 03_08

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

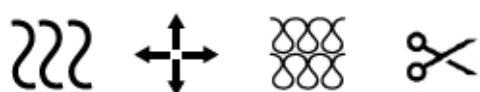
SPECIFICATIONS:

GEOMETRY:	Multiple curves, spacing s=70mm	MATERIAL FLOW:	100%
DIMENSIONS:	w= 3mm, t= 0.8mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 03_09

Geometry: Open shapes / Multiple shapes / Multiple curves

Textile: 2D tension / regular knit / with cut



top view of the geometry



3D printed prototype

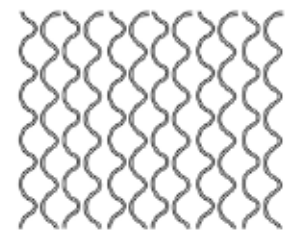
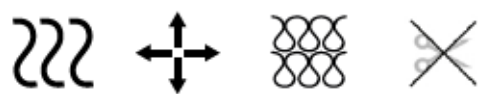
SPECIFICATIONS:

GEOMETRY:	Multiple curves, spacing $s=70\text{mm}$
DIMENSIONS:	$w=2\text{-}6\text{mm}$, $t=0.8\text{mm}$
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M
TENSION:	Bi-directional, 150 %
FILAMENT:	PLA (Filafarm)
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s

MATERIAL FLOW:	100%
INFILL LINE DISTANCE:	0.9mm
WALL THICKNESS:	3mm
INFILL PATTERN:	Concentric
LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING BED SIZE:	500 x 500mm
3D PRINTER:	Custom-built
NOZZLE:	1mm
COMMENTS:	Prototype by author :

Prototype nr. 03_10

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / no cut



top view of the geometry



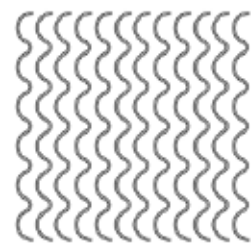
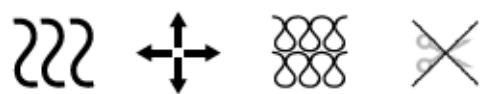
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple curves	MATERIAL FLOW:	100%
DIMENSIONS:	w= 2mm, t=0.8mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Schwarz 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm))	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 03_11

Geometry: Open shapes / Multiple shapes / Multiple curves
 Textile: 2D tension / regular knit / no cut



top view of the geometry



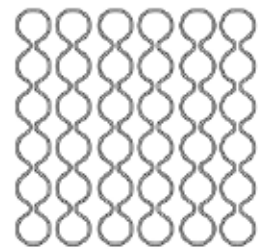
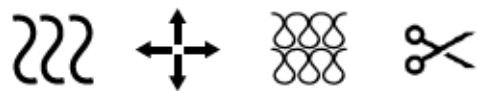
3D printed prototype

SPECIFICATIONS:

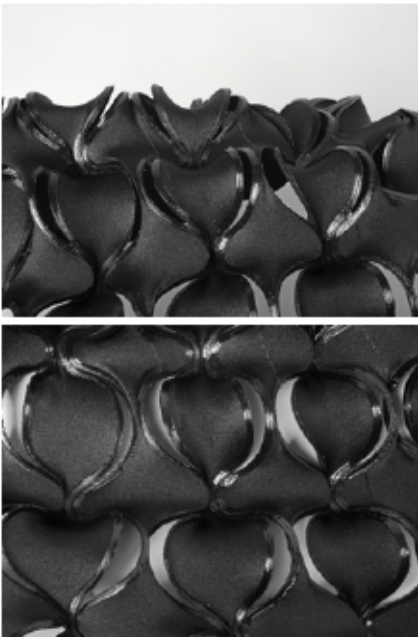
GEOMETRY:	Multiple curves	MATERIAL FLOW:	100%
DIMENSIONS:	w= 2mm, t= 0.8mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Schwarz 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author :

Prototype nr. 03_12

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / no cut



top view of the geometry



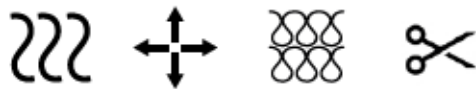
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple curves	MATERIAL FLOW:	100%
DIMENSIONS:	w= 2mm, t=0.8mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Schwarz 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm))	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 03_13

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / with cut



top view of the geometry



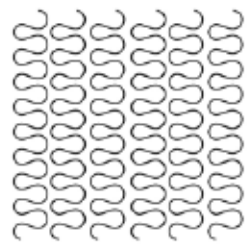
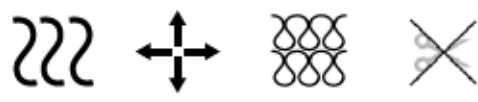
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple curves	MATERIAL FLOW:	100%
DIMENSIONS:	w= 2-3mm, t= 0.4-0.8mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Schwarz 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author A mixture of open and closed shapes
		:	

Prototype nr. 03_14

Geometry: Open shapes / Multiple shapes / Multiple curves
 Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

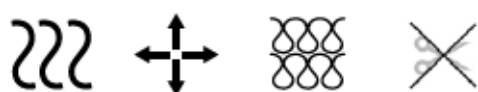
SPECIFICATIONS:

GEOMETRY:	Multiple curves, spacing s=76mm	MATERIAL FLOW:	100%
DIMENSIONS:	w= 3mm, t= 0.4mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author
		:	

Prototype nr. 03_15

Geometry: Open shapes / Multiple shapes / Multiple curves

Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Multiple curves

DIMENSIONS: w= 3mm, t=0.4-0.8mm

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

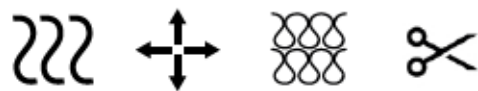
3D PRINTER: Custom-built

NOZZLE: 1mm

COMMENTS: Prototype by author
A mixture of open and closed
shapes

Prototype nr. 03_16

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / with cut



top view of the geometry



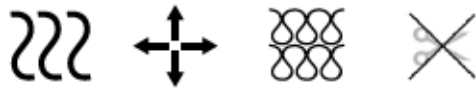
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple curves	MATERIAL FLOW:	100%
DIMENSIONS:	w= 3mm, t=0.4-0.8mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author A mixture of open and closed shapes

Prototype nr. 03_17

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / no cut



top view of the geometry



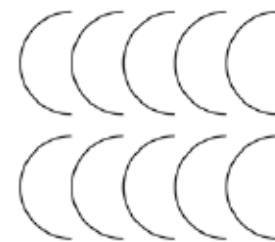
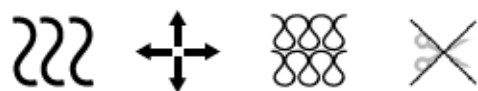
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple arcs	MATERIAL FLOW:	100%
DIMENSIONS:	w= 2mm, t= 1.6mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Schwarz 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 03_18

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / no cut



top view of the geometry



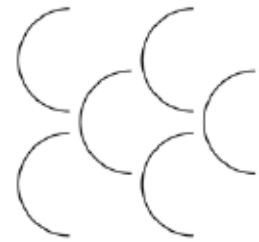
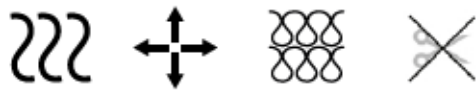
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple arcs	MATERIAL FLOW:	100%
DIMENSIONS:	w= 3mm, t= 1.6mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Schwarz 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 03_19

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / no cut



top view of the geometry



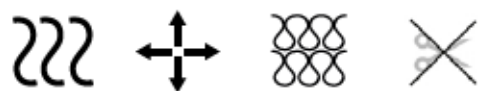
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple arcs	MATERIAL FLOW:	100%
DIMENSIONS:	w= 3mm, t= 1.6mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 03_20

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

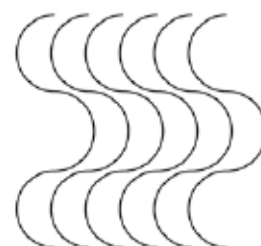
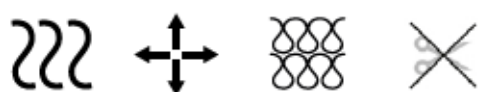
SPECIFICATIONS:

GEOMETRY:	Multiple arcs	MATERIAL FLOW:	100%
DIMENSIONS:	w= 3mm, t= 1.6mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Schwarz 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 03_21

Geometry: Open shapes / Multiple shapes / Multiple curves

Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Multiple curves,
spacing $s=65\text{mm}$

DIMENSIONS: $w=3\text{mm}$, $t=0.8\text{mm}$

FABRIC: Bi Stretch Laguna Schwarz
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

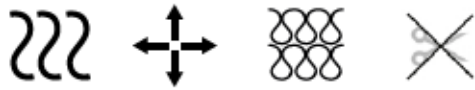
3D PRINTER: Custom-built

NOZZLE: 1mm

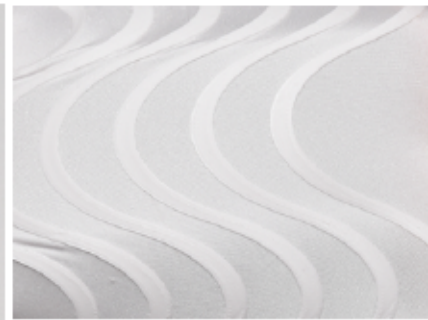
COMMENTS: Prototype by author

Prototype nr. 03_22

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / no cut



top view of the geometry



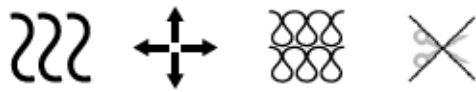
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple curves (spacing s=25mm)	MATERIAL FLOW:	100%
DIMENSIONS:	w=4-6mm, t=0.6mm	INFILL LINE DISTANCE:	0.2mm
FABRIC:	Lycra 4-Stretch Jersey 85% PA, 15% EL	INFILL PATTERN:	Lines
TENSION:	Bi-directional, 150 %	LAYER HEIGHT:	0.2mm
FILAMENT:	PLA (Filafarm)	PRINTING BED SIZE:	250 x 200mm
PRINTING TEMP.:	210 °C	3D PRINTER:	Craftbot Plus Pro
PRINTING SPEED:	40 mm/s, initial layer 30 mm/s	NOZZLE:	0.4mm
		COMMENTS:	Prototype created as part of the seminar Self-Shaping Textiles at the weissensee khb, SoSe 2017

Prototype nr. 03_23

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / no cut



top view of the geometry



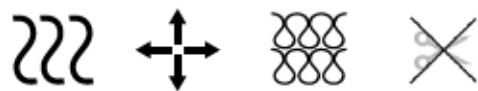
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple polylines	MATERIAL FLOW:	100%
DIMENSIONS:	w=2.5mm, t=0.8mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	42 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype created as part of the course 4D Fabrics at the weissensee khb, SoSe 2019

Prototype nr. 03_24

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / no cut



top view of the geometry



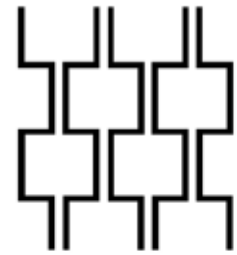
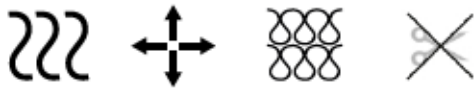
3D printed prototype

SPECIFICATIONS:

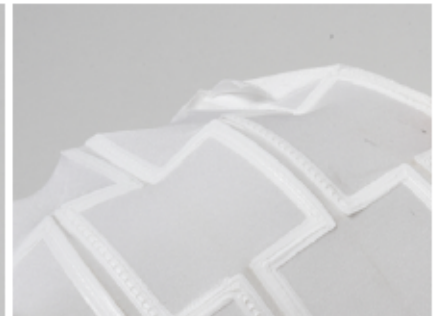
GEOMETRY:	Multiple curves variable spacing	MATERIAL FLOW:	100%
DIMENSIONS:	w=2.5mm, t=0.6mm	INFILL LINE DISTANCE:	0.2mm
FABRIC:	Lycra 4-Stretch Jersey 85% PA, 15% EL	INFILL PATTERN:	Lines
TENSION:	Bi-directional, 150 %	LAYER HEIGHT:	0.2mm
FILAMENT:	PLA (Filafarm)	PRINTING BED SIZE:	250 x 200mm
PRINTING TEMP.:	210 °C	3D PRINTER:	Craftbot Plus Pro
PRINTING SPEED:	40 mm/s, initial layer 30 mm/s	NOZZLE:	0.4mm
		COMMENTS:	Prototype created as part of the seminar Self-Shaping Textiles at the weissensee khb, SoSe 2017

Prototype nr. 03_25

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / no cut



top view of the geometry



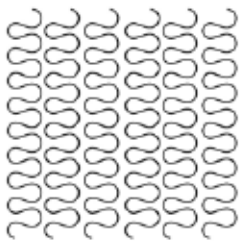
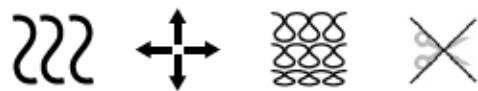
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple polylines	MATERIAL FLOW:	100%
DIMENSIONS:	w=6mm, t=0.8mm	INFILL LINE DISTANCE:	1mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	1mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Lines
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	42 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype created as part of the course 4D Fabrics at the weissensee khb, SoSe 2019

Prototype nr. 03_26

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / custom knit / no cut



top view of the geometry



3D printed prototype

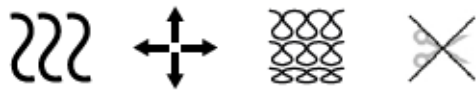
SPECIFICATIONS:

GEOMETRY:	Multiple curves, spacing s=65mm
DIMENSIONS:	w= 3mm, t= 0.4mm
FABRIC:	custom knitted PES 167dtex f144/1 + Roica 150dtex mit 2[oN] EFS strength, machine fineness E14, fabric width: 425 needles
TENSION:	Bi-directional, 150 %
FILAMENT:	PLA (Filafarm)
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s

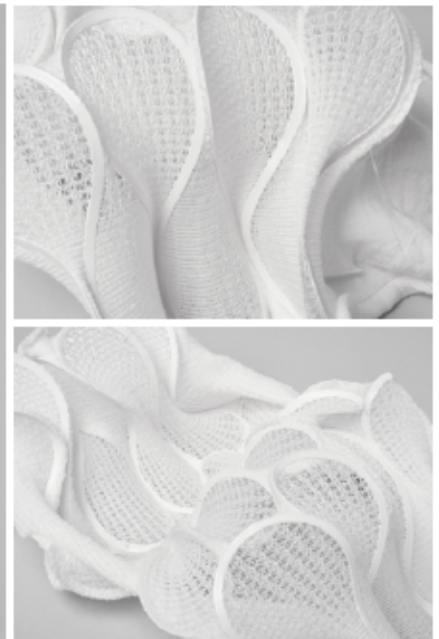
MATERIAL FLOW:	100%
INFILL LINE DISTANCE:	0.9mm
WALL THICKNESS:	3mm
INFILL PATTERN:	Concentric
LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING BED SIZE:	500 x 500mm
3D PRINTER:	Custom-built
NOZZLE:	1mm
COMMENTS:	Prototype by author, fabric by STFI

Prototype nr. 03_27

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / custom knit / no cut



top view of the geometry



3D printed prototype

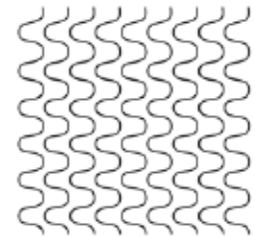
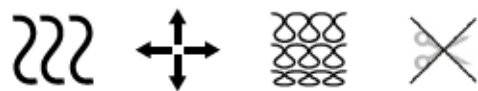
SPECIFICATIONS:

GEOMETRY:	Multiple curves
DIMENSIONS:	w= 3mm, t= 1.2mm
FABRIC:	custom knitted PES 167dtex f144/1 + Roica 150dtex mit 2[cN] EFS strength, machine fineness E14, fabric width: 425 needles
TENSION:	Bi-directional, 150 %
FILAMENT:	PLA (Filafarm)
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s

MATERIAL FLOW:	100%
INFILL LINE DISTANCE:	0.9mm
WALL THICKNESS:	3mm
INFILL PATTERN:	Concentric
LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING BED SIZE:	500 x 500mm
3D PRINTER:	Custom-built
NOZZLE:	1mm
COMMENTS:	Prototype by author, fabric by STFI

Prototype nr. 03_28

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / custom knit / no cut



top view of the geometry



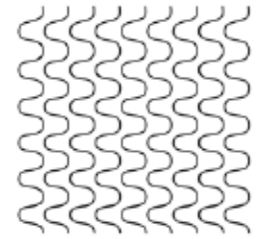
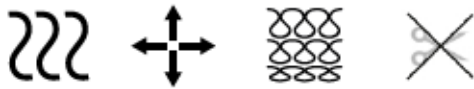
3D printed prototype

SPECIFICATIONS:

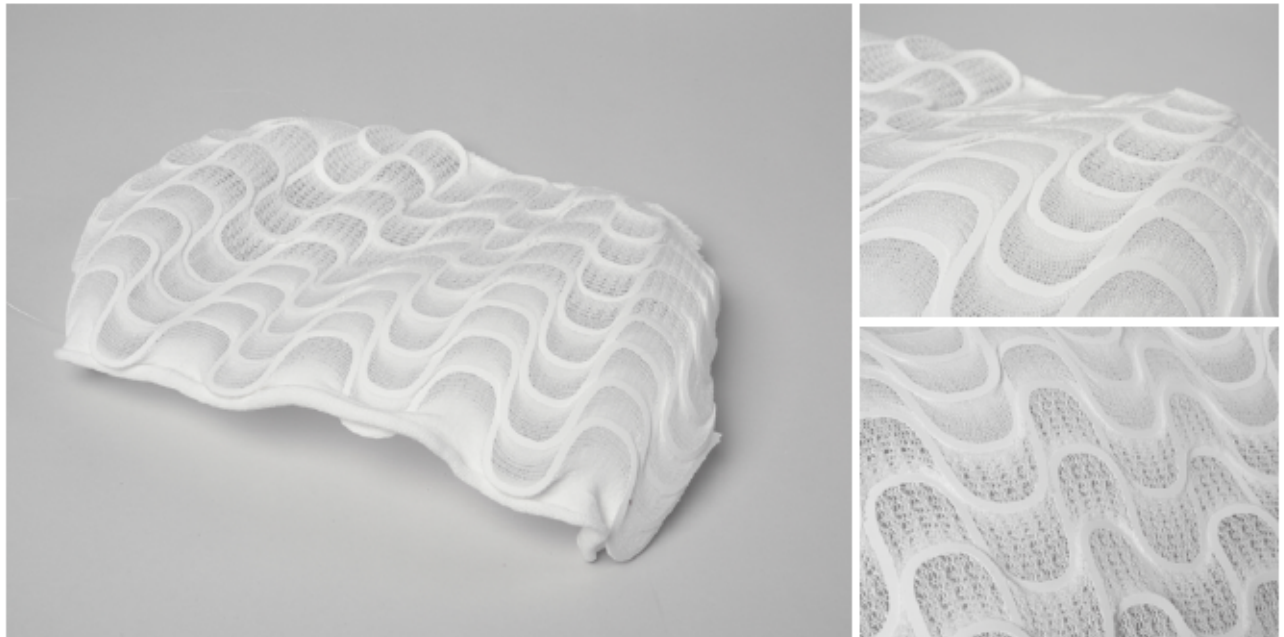
GEOMETRY:	Multiple curves, spacing s=50mm	MATERIAL FLOW:	100%
DIMENSIONS:	w= 3mm, t= 0.8mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	custom knitted PES 167dtex f144/1 + Roica 150dtex mit 2[oN] EFS strength, machine fineness E14, fabric width: 425 needles	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author, fabric by STFI First layer printed before tensioning the fabric

Prototype nr. 03_29

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / custom knit / no cut



top view of the geometry



3D printed prototype

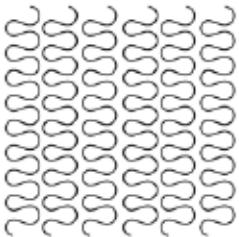
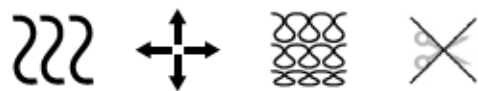
SPECIFICATIONS:

GEOMETRY:	Multiple curves, spacing s=50mm
DIMENSIONS:	w= 3mm, t= 0.8mm
FABRIC:	custom knitted PES 167dtex f144/1 + Roica 150dtex mit 2[oN] EFS strength, machine fineness E14, fabric width: 425 needles
TENSION:	Bi-directional, 150 %
FILAMENT:	PLA (Filafarm)
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s

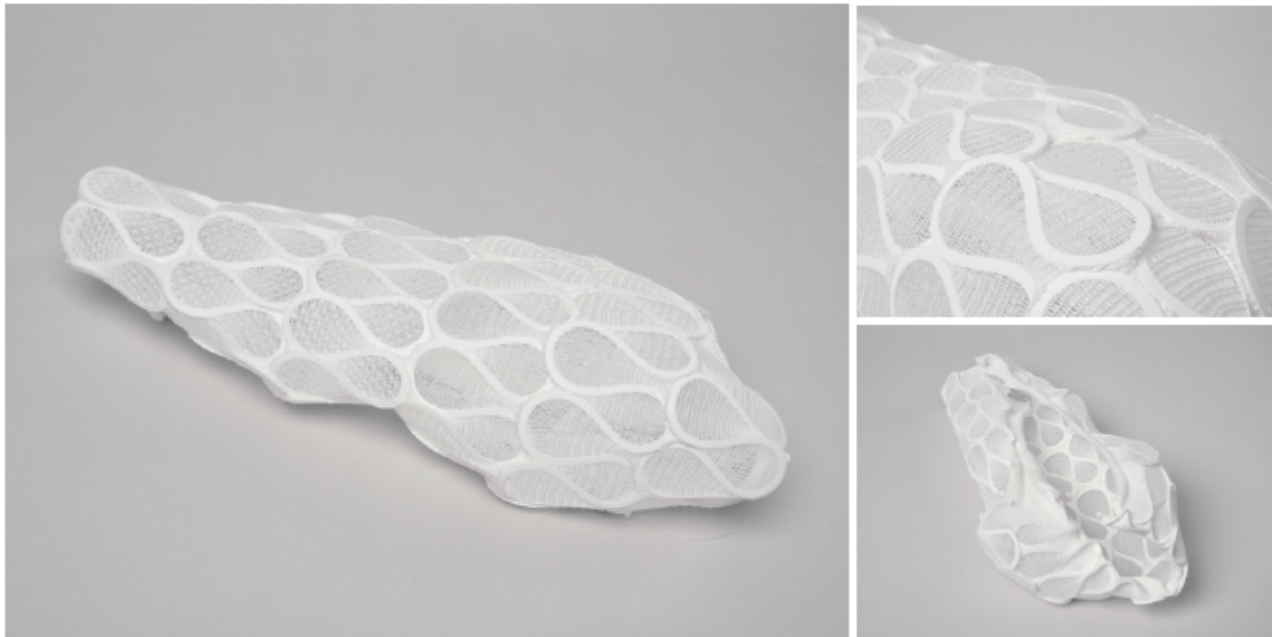
MATERIAL FLOW:	100%
INFILL LINE DISTANCE:	0.9mm
WALL THICKNESS:	3mm
INFILL PATTERN:	Concentric
LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING BED SIZE:	500 x 500mm
3D PRINTER:	Custom-built
NOZZLE:	1mm
COMMENTS:	Prototype by author, fabric by STFI First layer printed before tensioning the fabric

Prototype nr. 03_30

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / custom knit / no cut



top view of the geometry



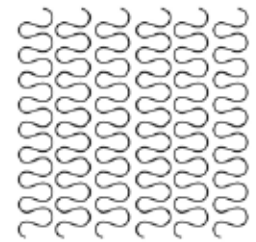
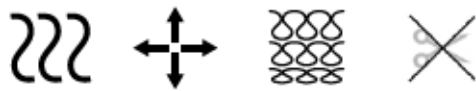
3D printed prototype

SPECIFICATIONS:

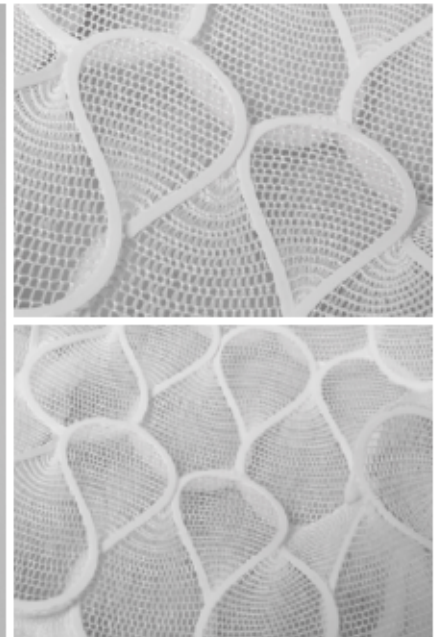
GEOMETRY:	Multiple curves,	MATERIAL FLOW:	100%
DIMENSIONS:	w= 3mm, t= 0.8mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	custom knitted PES 167dtex f144/1 + Roica 150dtex mit 2[cN] EFS strength, machine fineness E14, fabric width: 425 needles	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author, fabric by STFI First layer printed before tensioning the fabric

Prototype nr. 03_31

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / custom knit / no cut



top view of the geometry



3D printed prototype

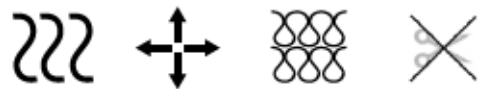
SPECIFICATIONS:

GEOMETRY: Multiple curves,
DIMENSIONS: w= 2mm, t= 0.8mm
FABRIC: custom knitted
PES 167dtex f144/1 +
Roica 150dtex mit 2[oN]
EFS strength,
machine fineness E14,
fabric width: 425 needles
TENSION: Bi-directional, 150 %
FILAMENT: PLA (Filafarm)
PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)
PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%
INFILL LINE DISTANCE: 0.9mm
WALL THICKNESS: 3mm
INFILL PATTERN: Concentric
LAYER HEIGHT: 0.4 mm, first layer 0.3mm
PRINTING BED SIZE: 500 x 500mm
3D PRINTER: Custom-built
NOZZLE: 1mm
COMMENTS: Prototype by author,
fabric by STFI
First layer printed before
tensioning the fabric

Prototype nr. 03_32

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / regular knit / no cut



top view of the geometry



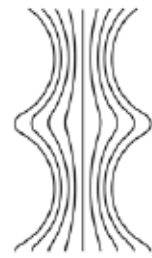
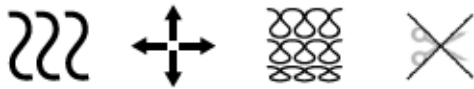
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple curves, variable spacing	MATERIAL FLOW:	100%
AMOUNT OF PRINTS:	3	INFILL LINE DISTANCE:	0.9mm
DIMENSIONS:	w= 3mm, t= 0.4mm	WALL THICKNESS:	3mm
FABRIC:	Bi Stretch Laguna Schwarz 80% PA 20%EA CA.280G/M	INFILL PATTERN:	Concentric
TENSION:	Bi-directional, 150 %	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
FILAMENT:	PLA (Filafarm)	PRINTING BED SIZE:	500 x 500mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	3D PRINTER:	Custom-built FDM printer
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	NOZZLE:	1mm
		COMMENTS:	Prototype by author,

Prototype nr. 03_33

Geometry: Open shapes / Multiple shapes / Multiple curves
Textile: 2D tension / custom knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Multiple curves

AMOUNT OF PRINTS: 6

DIMENSIONS: w= 3mm, t= 1.6mm

FABRIC: Knit pattern C,
Thread PES 167dtex
f144/1, Elastan Roica
150dtex (NP value 11,0),
Machine fineness E14,
Width 690 needles,
frey areas small tuck stitch
(NP-Wert 13,5), hite areas
large tuck stitch (NP-Wert
13,5), Speed 0.70 m/s

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

3D PRINTER: Custom-built FDM printer

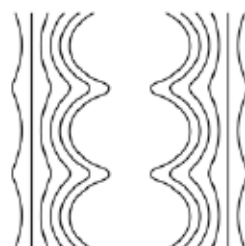
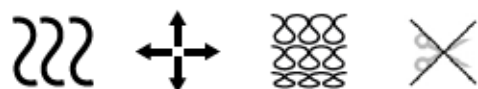
NOZZLE: 1mm

COMMENTS: Prototype by author,
fabric by STFI

Prototype nr. 03_34

Geometry: Open shapes / Multiple shapes / Multiple curves

Textile: 2D tension / custom knit / no cut



top view of the geometry



3D printed prototype

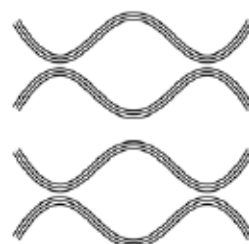
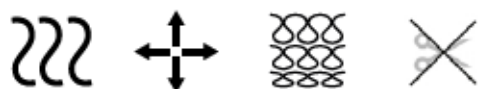
SPECIFICATIONS:

GEOMETRY:	Multiple curves	PRINTING SPEED:	60 mm/s, initial layer 30 mm/s
AMOUNT OF PRINTS:	6	MATERIAL FLOW:	100%
DIMENSIONS:	w= 3mm, t= 1.2mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Knit pattern B & C, Thread PES 167dtex f144/1, Elastan Roica 150dtex (NP value 11,0), Machine fineness E14, Width 690 needles, fry areas small tuck stitch (NP-Wert 13,5), hite areas large tuck stitch (NP-Wert 13,5), Speed 0.70 m/s	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
		3D PRINTER:	Custom-built FDM printer
		NOZZLE:	1mm
		COMMENTS:	Prototype by author, fabric by STFI The fabric consists of 2 parts sewn together

Prototype nr. 03_35

Geometry: Open shapes / Multiple shapes / Multiple curves

Textile: 2D tension / custom knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Multiple curves

AMOUNT OF PRINTS: 3

DIMENSIONS: w= 3mm, t= 0.4-0.8mm

FABRIC: Knit pattern E,
Thread PES 167dtex
f144/1, Elastan Roica
150dtex (NP value 11,0),
Machine fineness E14,
Width 690 needles,
fry areas small tuck stitch
(NP-Wert 13,5), hite areas
large tuck stitch (NP-Wert
13,5), Speed 0.70 m/s

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

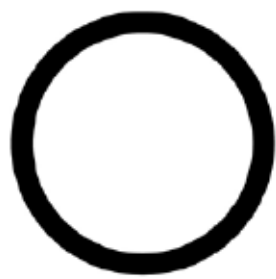
LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

3D PRINTER: Custom-built FDM printer

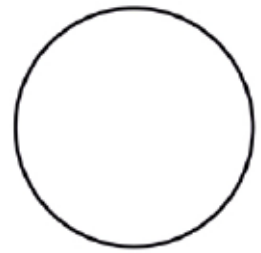
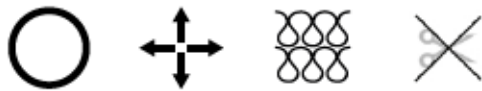
NOZZLE: 1mm

COMMENTS: Prototype by author,
fabric by STFI

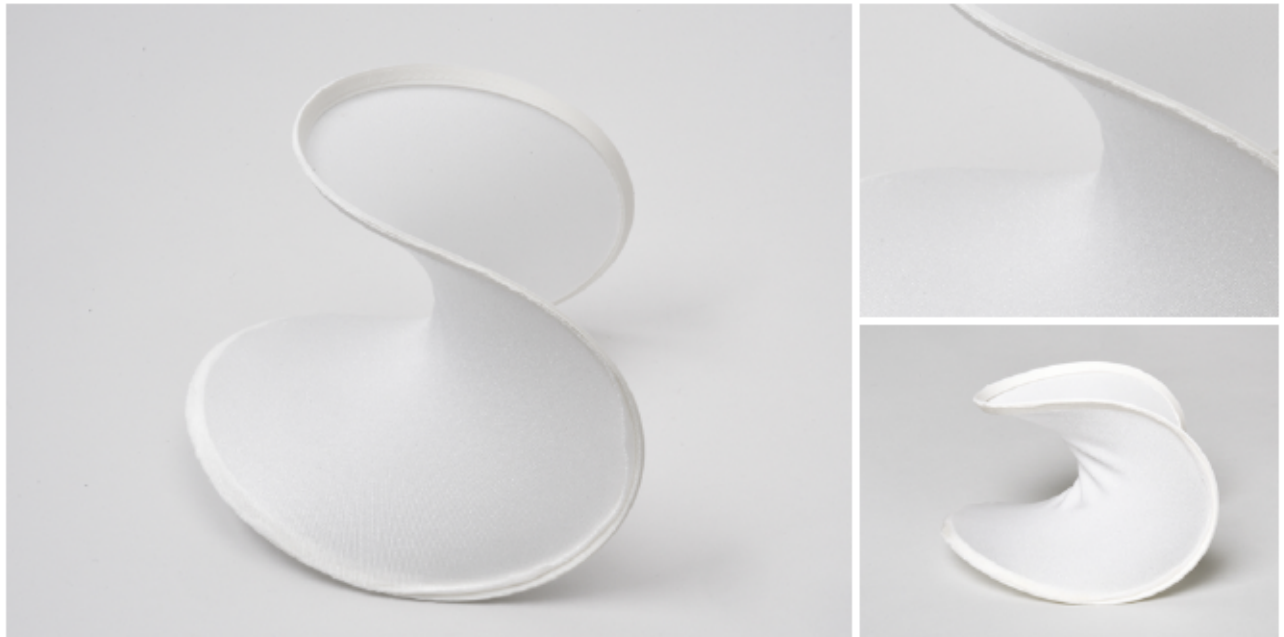


Prototype nr. 04_01

Geometry: Closed shapes / Curvilinear / Circular / Primitive
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Ring,
diameter $d=180\text{mm}$

DIMENSIONS: $w=5\text{mm}$, $t=1.8\text{mm}$

FABRIC: Lycra 4-Stretch Jersey
85% PA, 15% EL

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: $205\text{ }^{\circ}\text{C}$

BUILD PLATE TEMP.: $60\text{ }^{\circ}\text{C}$

PRINTING SPEED: 70 mm/s ,
initial layer 20 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm , first layer 0.3mm

PRINTING BED SIZE: $500 \times 500\text{mm}$

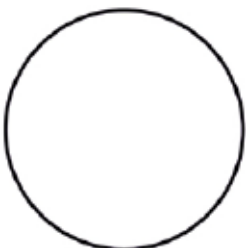
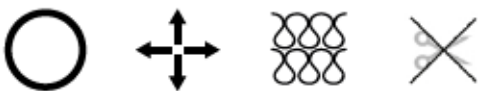
3D PRINTER: Custom-built

NOZZLE: 1mm

COMMENTS: Prototype created as part of
the course 4D Fabrics at the
weissensee khb, SoSe 2019

Prototype nr. 04_02

Geometry: Closed shapes / Curvilinear / Circular / Primitive
Textile: 2D tension / regular knit / no cut



top view of the geometry



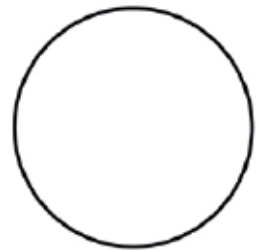
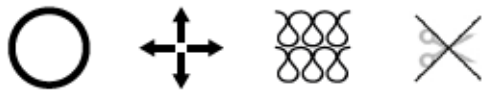
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Ring, diameter d=480mm	MATERIAL FLOW:	100%
DIMENSIONS:	w=7mm, t=2mm	INFILL LINE DISTANCE:	1 mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 04_03

Geometry: Closed shapes / Curvilinear / Circular / Primitive
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Ring,
diameter $d=494\text{mm}$

DIMENSIONS: $w=10\text{mm}$, $t=2\text{mm}$

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

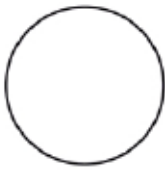
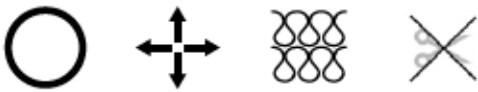
3D PRINTER: Custom-built

NOZZLE: 1mm

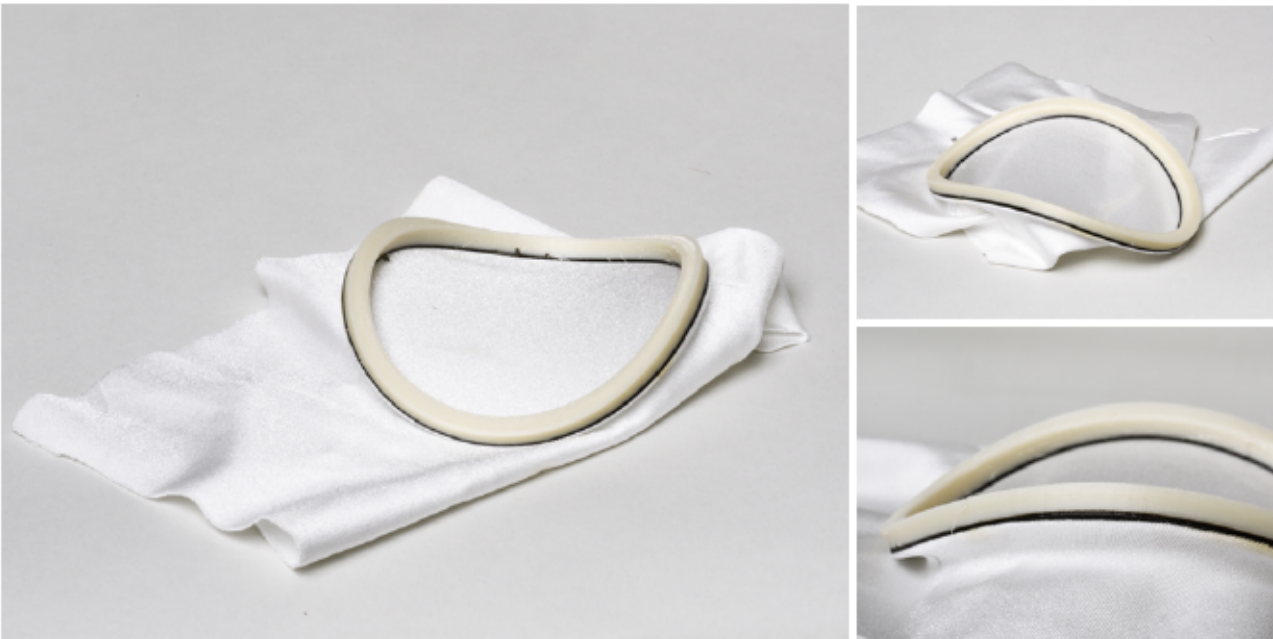
COMMENTS: Prototype by author

Prototype nr. 04_04

Geometry: Closed shapes / Curvilinear / Circular / Primitive
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

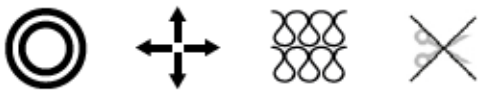
SPECIFICATIONS:

GEOMETRY:	Ring, diameter d=100mm	PRINTING SPEED:	TPU 95A: 20 mm/s, initial layer 15 mm/s LayFomm 60: 25 mm/s,
DIMENSIONS:	w=5mm, t=6mm (1mm-TPU 95A, 5mm-LayFomm 60)	MATERIAL FLOW:	110%
FABRIC:	Lycra 4-Stretch Jersey 85% PA, 15% EL	INFILL DENSITY:	100%
TENSION:	Bi-directional, 150 %	INFILL LINE DISTANCE:	0.35 mm
FILAMENT:	TPU 95A (Filafarm) LayFomm 60	WALL THICKNESS:	2.5mm
PRINTING TEMP.:	235 °C (TPU 95A) 225 °C (LayFomm 60)	LAYER HEIGHT:	0.2mm, initial 0.27mm
BUILD PLATE TEMP.:	60 °C	PRINTING BED SIZE:	215 x 215mm
		3D PRINTER:	Ultimaker 3 extended
		NOZZLE:	0.4mm
		COMMENTS:	Prototype by author

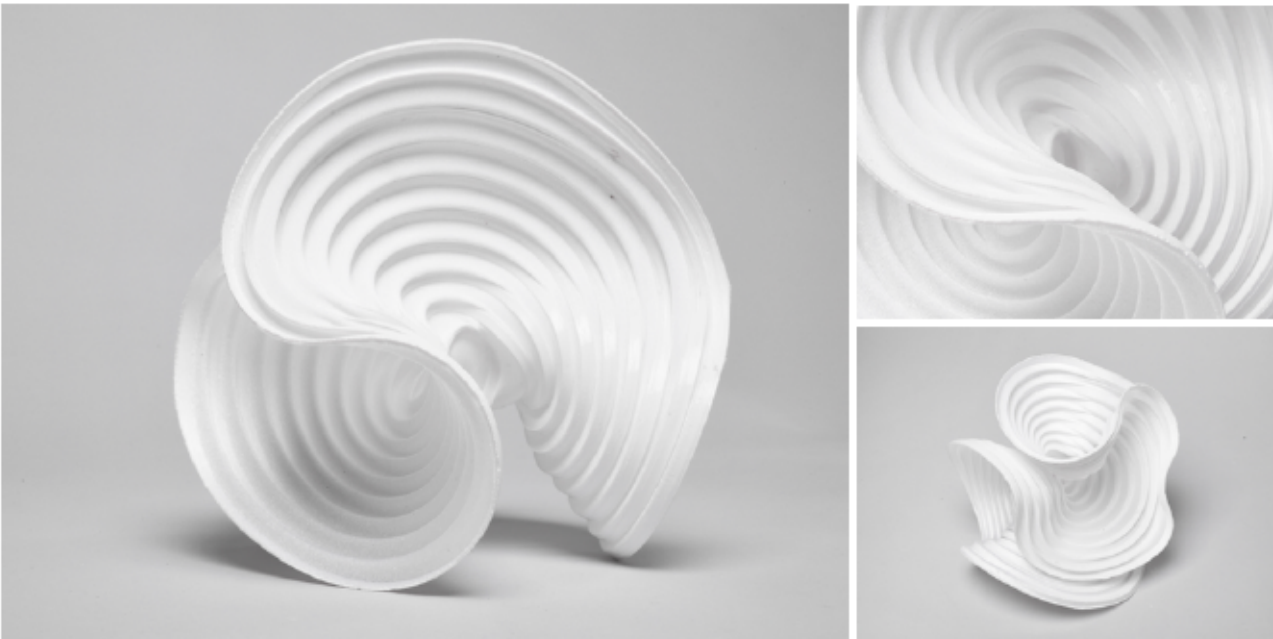


Prototype nr. 05_01

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



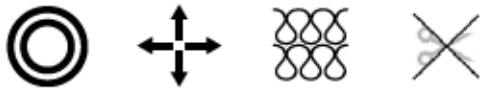
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Rings, spacing $s=20\text{mm}$	MATERIAL FLOW:	100%
DIMENSIONS:	$w=3\text{mm}$, $t=0.8\text{mm}$	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 05_02

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Rings, spacing $s=20\text{mm}$

DIMENSIONS: $w=3\text{mm}$, $t=0.8\text{mm}$

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

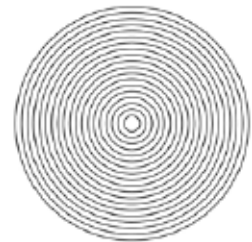
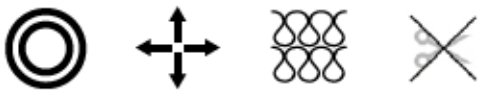
3D PRINTER: Custom-built

NOZZLE: 1mm

COMMENTS: Prototype by author

Prototype nr. 05_03

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



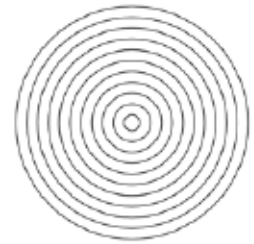
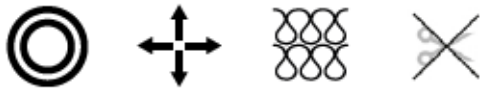
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Rings, spacing $s=10\text{mm}$	MATERIAL FLOW:	100%
DIMENSIONS:	$w=2\text{mm}$, $t=0.3\text{mm}$	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 05_04

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Rings, spacing $s=20\text{mm}$

DIMENSIONS: $w=2\text{mm}$, $t=0.3\text{mm}$

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

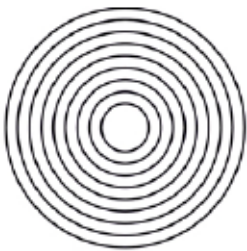
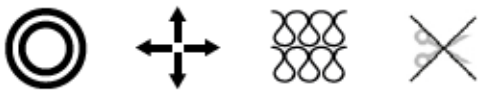
3D PRINTER: Custom-built

NOZZLE: 1mm

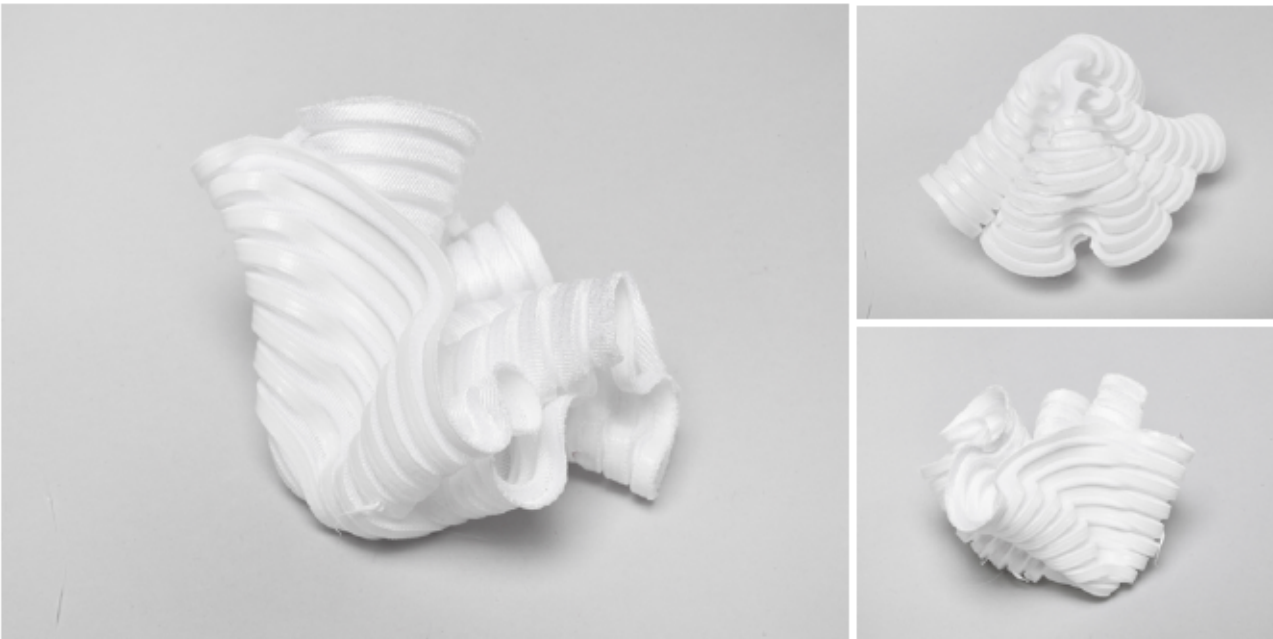
COMMENTS: Prototype by author

Prototype nr. 05_05

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



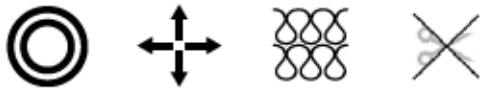
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Rings, spacing $s=10\text{mm}$	MATERIAL FLOW:	100%
DIMENSIONS:	$w=2\text{mm}$, $t=0.4\text{mm}$	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 05_06

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Rings, spacing $s = 20\text{mm}$

DIMENSIONS: $w = 2\text{mm}$, $t = 0.3\text{mm}$

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

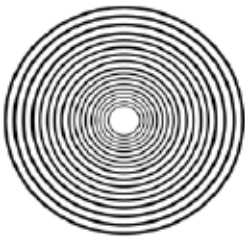
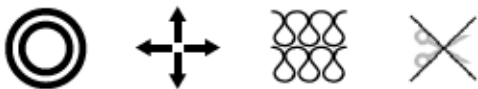
3D PRINTER: Custom-built

NOZZLE: 1mm

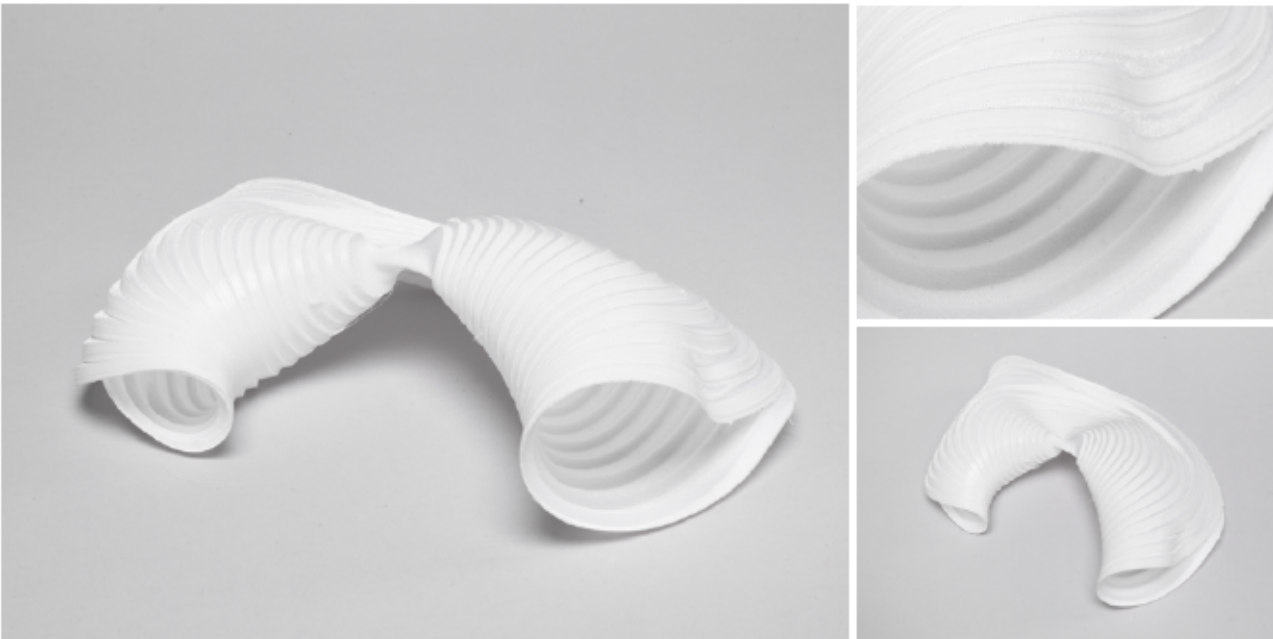
COMMENTS: Prototype by author

Prototype nr. 05_07

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



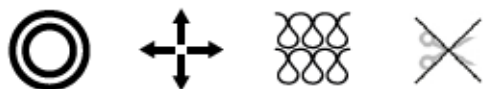
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Rings, spacing $s=10\text{mm}$	MATERIAL FLOW:	100%
DIMENSIONS:	$w=2.5\text{mm}$, $t=0.8\text{mm}$	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 05_08

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Rings, spacing $s = 7, 15, 30\text{mm}$

DIMENSIONS: $w = 2\text{mm}$, $t = 0.3\text{mm}$

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

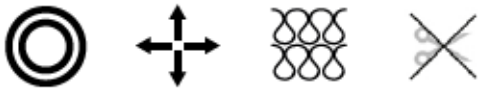
3D PRINTER: Custom-built

NOZZLE: 1mm

COMMENTS: Prototype by author

Prototype nr. 05_09

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



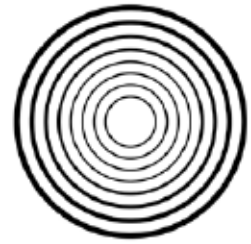
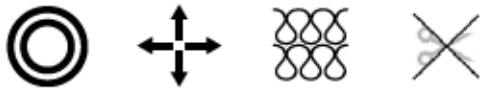
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Rings, spacing $s=12-30\text{mm}$	MATERIAL FLOW:	100%
DIMENSIONS:	$w=2\text{mm}$, $t=0.3\text{mm}$	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 05_10

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Rings, spacing $s = 10\text{mm}$

DIMENSIONS: $w = 2\text{-}6\text{mm}$, $t = 0.4\text{mm}$

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

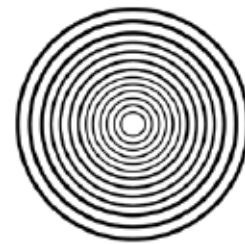
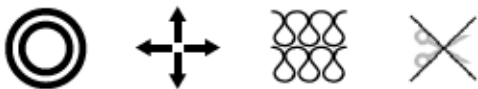
3D PRINTER: Custom-built

NOZZLE: 1mm

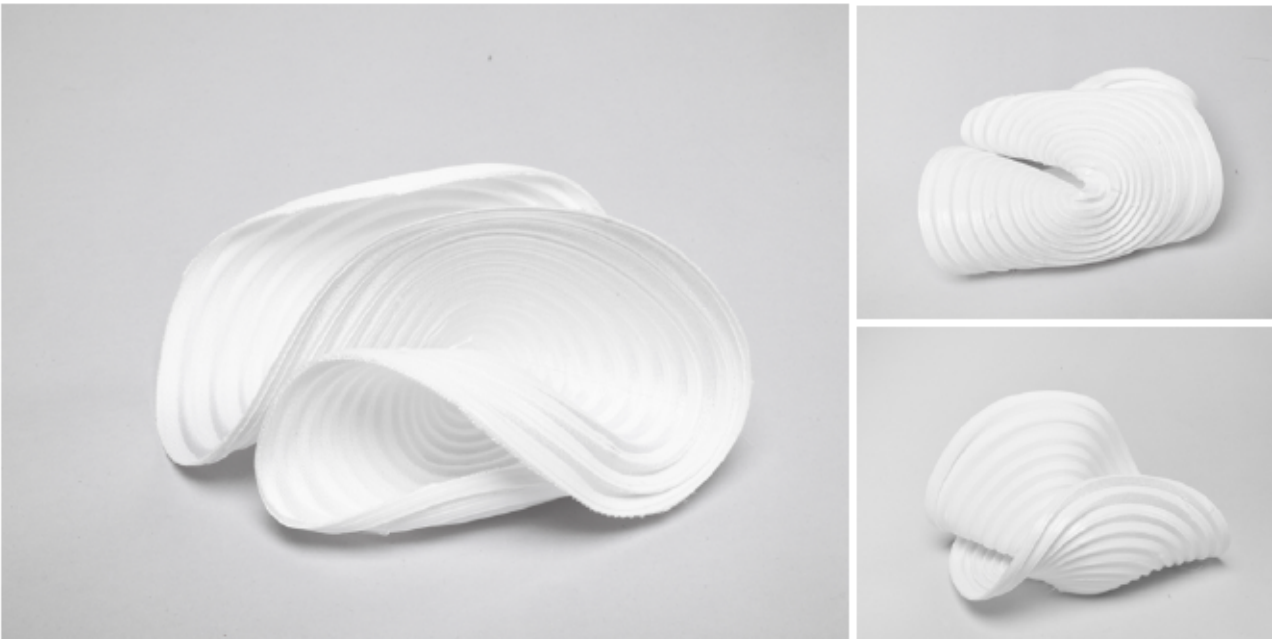
COMMENTS: Prototype by author

Prototype nr. 05_11

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



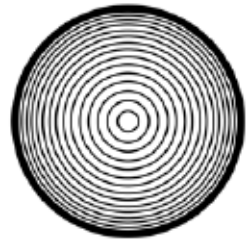
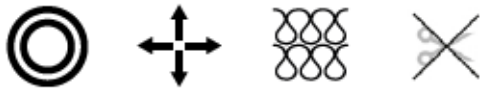
3D printed prototype

SPECIFICATIONS:

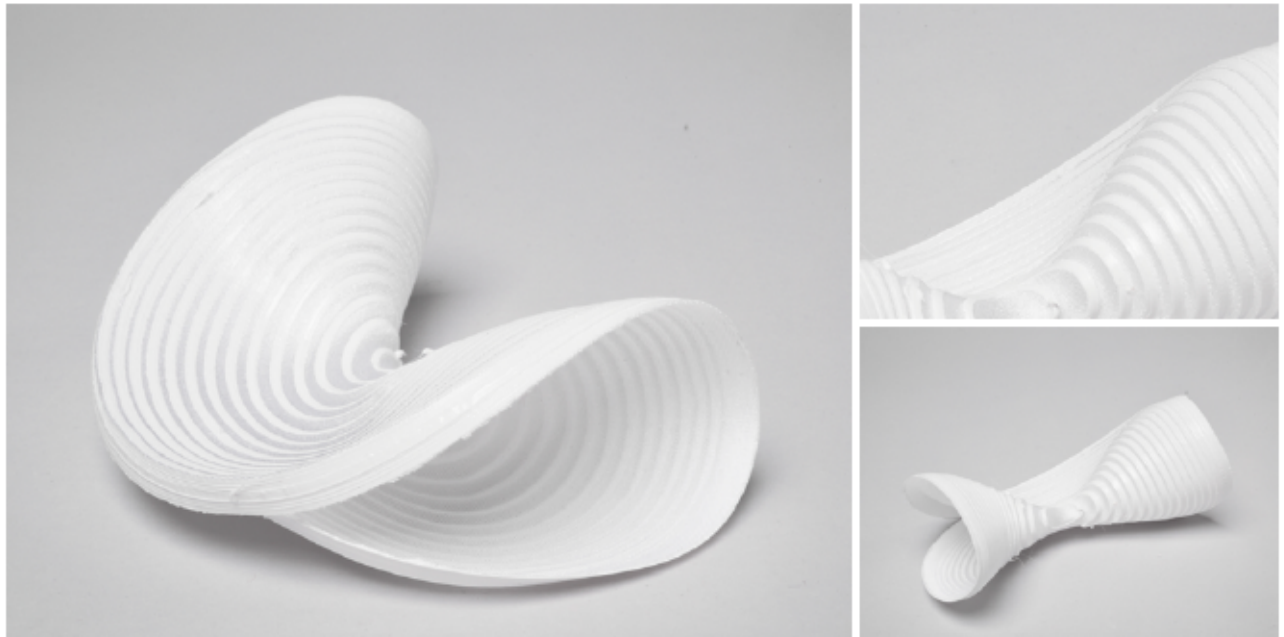
GEOMETRY:	Rings, spacing $s=8\text{mm}$	MATERIAL FLOW:	100%
DIMENSIONS:	$w=2\text{-}4\text{mm}$, $t=0.4\text{mm}$	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 05_12

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

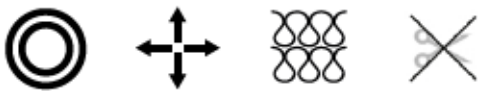
SPECIFICATIONS:

GEOMETRY:	Rings, spacing $s = 2\text{-}8\text{mm}$
DIMENSIONS:	$w = 2\text{mm}$ (outer ring 10mm), $t = 0.8\text{mm}$ (outer ring 0.4mm)
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M
TENSION:	Bi-directional, 150 %
FILAMENT:	PLA (Filafarm)
PRINTING TEMP.:	$230\text{ }^{\circ}\text{C}$ (initial $220\text{ }^{\circ}\text{C}$, final $215\text{ }^{\circ}\text{C}$)
PRINTING SPEED:	60 mm/s , initial layer 30 mm/s

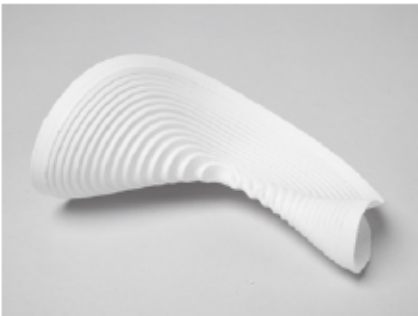
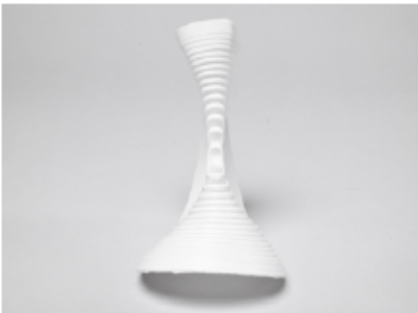
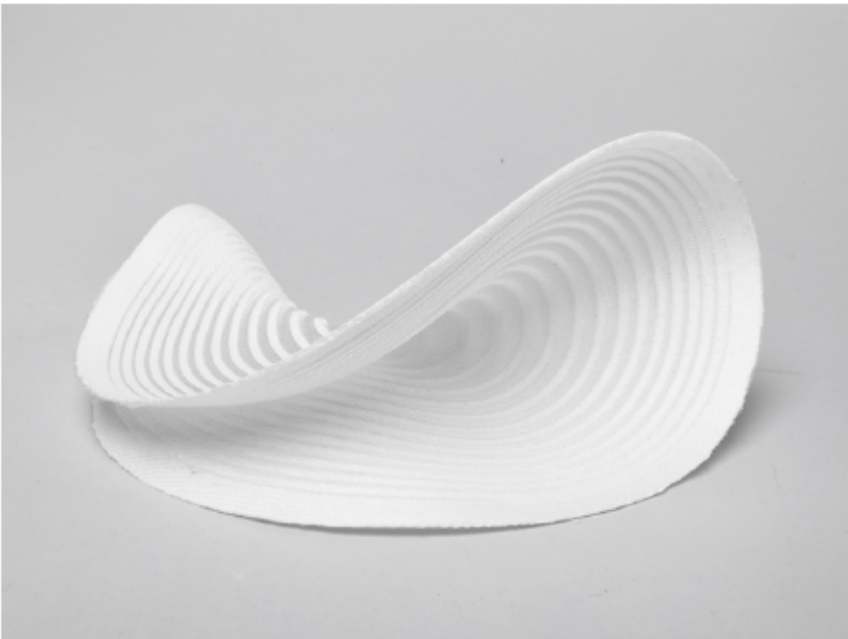
MATERIAL FLOW:	100%
INFILL LINE DISTANCE:	0.9mm
WALL THICKNESS:	3mm
INFILL PATTERN:	Concentric
LAYER HEIGHT:	0.4 mm , first layer 0.3mm
PRINTING BED SIZE:	$500 \times 500\text{mm}$
3D PRINTER:	Custom-built
NOZZLE:	1mm
COMMENTS:	Prototype by author

Prototype nr. 05_13

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



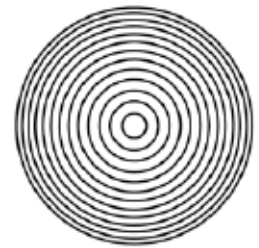
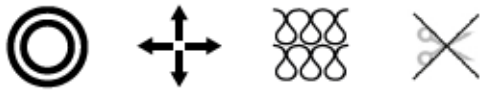
3D printed prototype

SPECIFICATIONS:

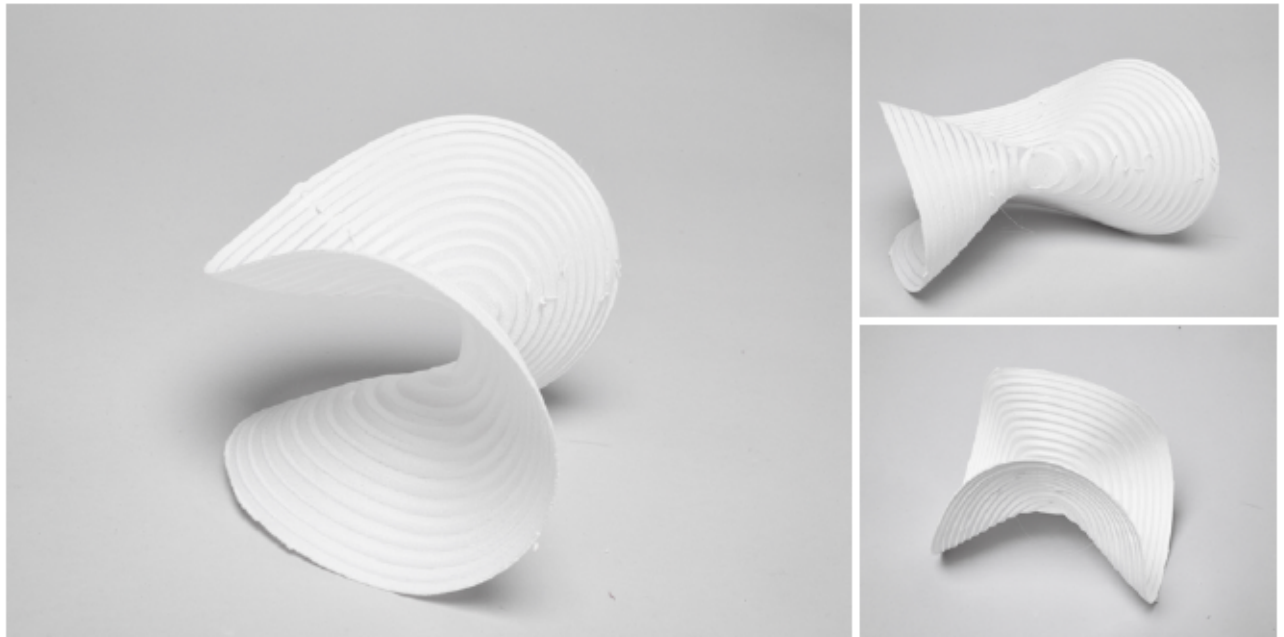
GEOMETRY:	Rings, spacing $s=1.6-7.4\text{mm}$	MATERIAL FLOW:	100%
DIMENSIONS:	$w= 1.6\text{mm}$ (outer ring 6.6mm), $t= 0.8\text{mm}$	INFILL DENSITY:	20%
FABRIC:	Lycra 4-Stretch Jersey 85% PA, 15% EL	INFILL PATTERN:	Concentric
TENSION:	Bi-directional, 150 %	LAYER HEIGHT:	0.2 mm, first layer 0.27mm
FILAMENT:	PLA (Filafarm)	PRINTING BED SIZE:	215 x 215mm
PRINTING TEMP.:	200 °C	3D PRINTER:	Ultimaker 3 extended
PRINTING SPEED:	25 mm/s, initial layer 12.5 mm/s	NOZZLE:	0.4mm
		COMMENTS:	Prototype by author

Prototype nr. 05_14

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Rings, spacing $s = 2\text{--}8\text{mm}$

DIMENSIONS: $w = 2\text{mm}$, $t = 0.8\text{mm}$

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

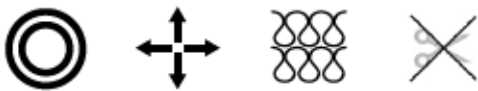
3D PRINTER: Custom-built

NOZZLE: 1mm

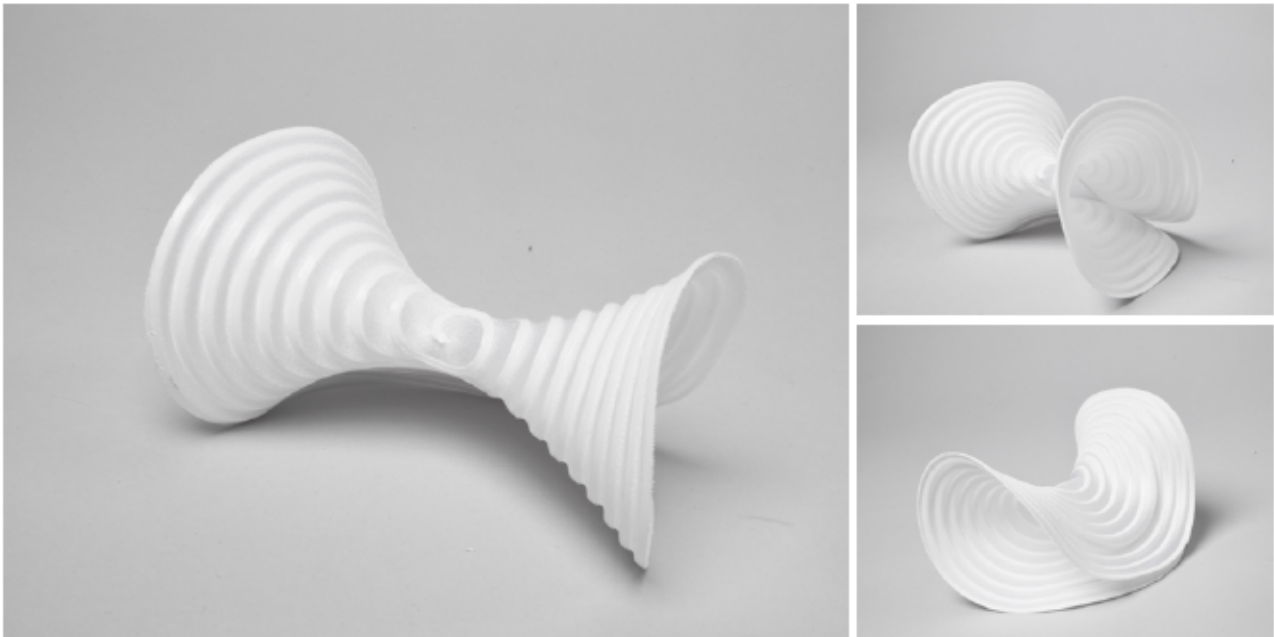
COMMENTS: Prototype by author

Prototype nr. 05_15

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



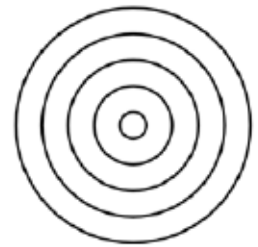
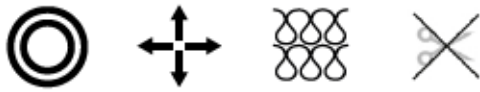
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	RSpiral, spacing $s=10\text{mm}$	MATERIAL FLOW:	100%
DIMENSIONS:	$w=1.6\text{mm}$, $t=0.8\text{mm}$	INFILL DENSITY:	20%
FABRIC:	Lycra 4-Stretch Jersey 85% PA, 15% EL	INFILL PATTERN:	Concentric
TENSION:	Bi-directional, 150 %	LAYER HEIGHT:	0.2 mm, first layer 0.27mm
FILAMENT:	PLA (Filafarm)	PRINTING BED SIZE:	215 x 215mm
PRINTING TEMP.:	200 °C	3D PRINTER:	Ultimaker 3 extended
PRINTING SPEED:	25 mm/s, initial layer 12.5 mm/s	NOZZLE:	0.4mm
		COMMENTS:	Prototype by author

Prototype nr. 05_16

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



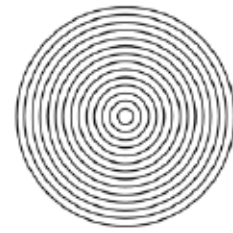
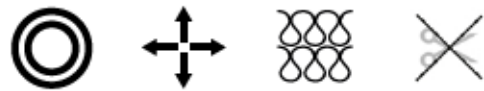
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple rings	MATERIAL FLOW:	100%
DIMENSIONS:	w=2mm, t=0.4mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	25 mm/s, initial layer 12.5 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype created as part of the course 4D Fabrics at the weissensee khb, SoSe 2019

Prototype nr. 05_17

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



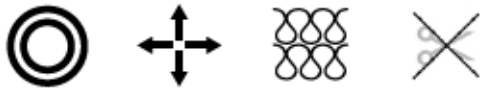
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple rings, spacing $s=10\text{mm}$	MATERIAL FLOW:	100%
DIMENSIONS:	$w=2\text{mm}$, $t=0.4\text{mm}$	INFILL LINE DISTANCE:	1mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	1mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Lines
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	42 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype created as part of the course 4D Fabrics at the weissensee khb, SoSe 2019

Prototype nr. 05_18

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Multiple rings, offcentered

DIMENSIONS: w=2mm, t=0.8mm

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 25 mm/s,
initial layer 12.5 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

3D PRINTER: Custom-built

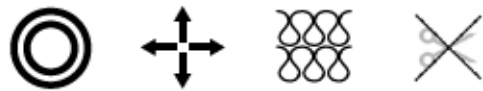
NOZZLE: 1mm

COMMENTS: Prototype created as part of
the course 4D Fabrics at the
weissensee khb, SoSe 2019

Prototype nr. 05_19

Geometry: Closed shapes / Curvilinear / Circular / Concentric

Textile: 2D tension / regular knit / no cut



top view of the geometry



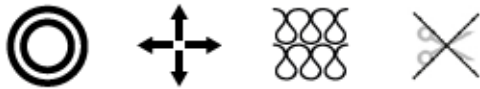
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple rings, offcentered	MATERIAL FLOW:	100%
DIMENSIONS:	w=2mm, t=0.8mm	INFILL LINE DISTANCE:	1mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	1mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Lines
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	42 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype created as part of the course 4D Fabrics at the weissensee khb, SoSe 2019

Prototype nr. 05_20

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

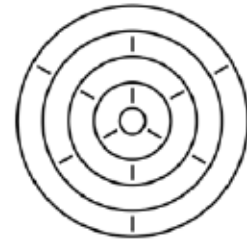
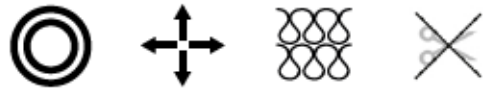
SPECIFICATIONS:

GEOMETRY:	Multiple rings, offcentered
DIMENSIONS:	w=2mm, t=0.8mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M
TENSION:	Bi-directional, 150 %
FILAMENT:	PLA (Filafarm)
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)
PRINTING SPEED:	25 mm/s, initial layer 12.5 mm/s

MATERIAL FLOW:	100%
INFILL LINE DISTANCE:	0.9mm
WALL THICKNESS:	3mm
INFILL PATTERN:	Concentric
LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING BED SIZE:	500 x 500mm
3D PRINTER:	Custom-built
NOZZLE:	1mm
COMMENTS:	Prototype created as part of the course 4D Fabrics at the weissensee khb, SoSe 2019

Prototype nr. 05_21

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

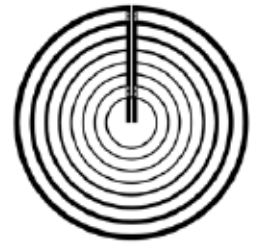
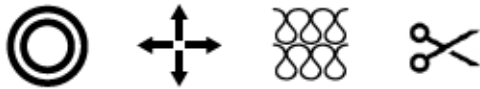
SPECIFICATIONS:

GEOMETRY:	Multiple rings and lines	MATERIAL FLOW:	100%
DIMENSIONS:	w=2mm, t=1.2mm	INFILL LINE DISTANCE:	1mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	1mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Lines
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	42 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype created as part of the course 4D Fabrics at the weissensee khb, SoSe 2019 A combination of concentric rings and radial ribs

Prototype nr. 05_22

Geometry: Closed shapes / Curvilinear / Circular / Concentric

Textile: 2D tension / regular knit / with cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Rings, spacing $s=10\text{mm}$

DIMENSIONS: $w=2\text{-}6\text{mm}$, $t=0.4\text{mm}$

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

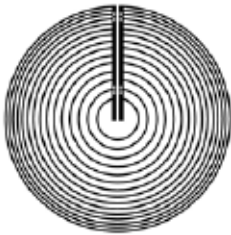
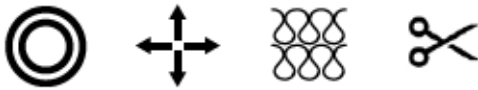
3D PRINTER: Custom-built

NOZZLE: 1mm

COMMENTS: Prototype by author

Prototype nr. 05_23

Geometry: Closed shapes / Curvilinear / Circular / Concentric
Textile: 2D tension / regular knit / with cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Rings, spacing $s=2-8\text{mm}$

DIMENSIONS: $w=2\text{mm}$, $t=0.4\text{mm}$

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

3D PRINTER: Custom-built

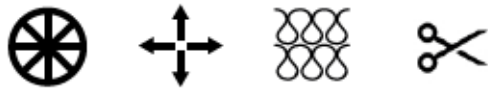
NOZZLE: 1mm

COMMENTS: Prototype by author

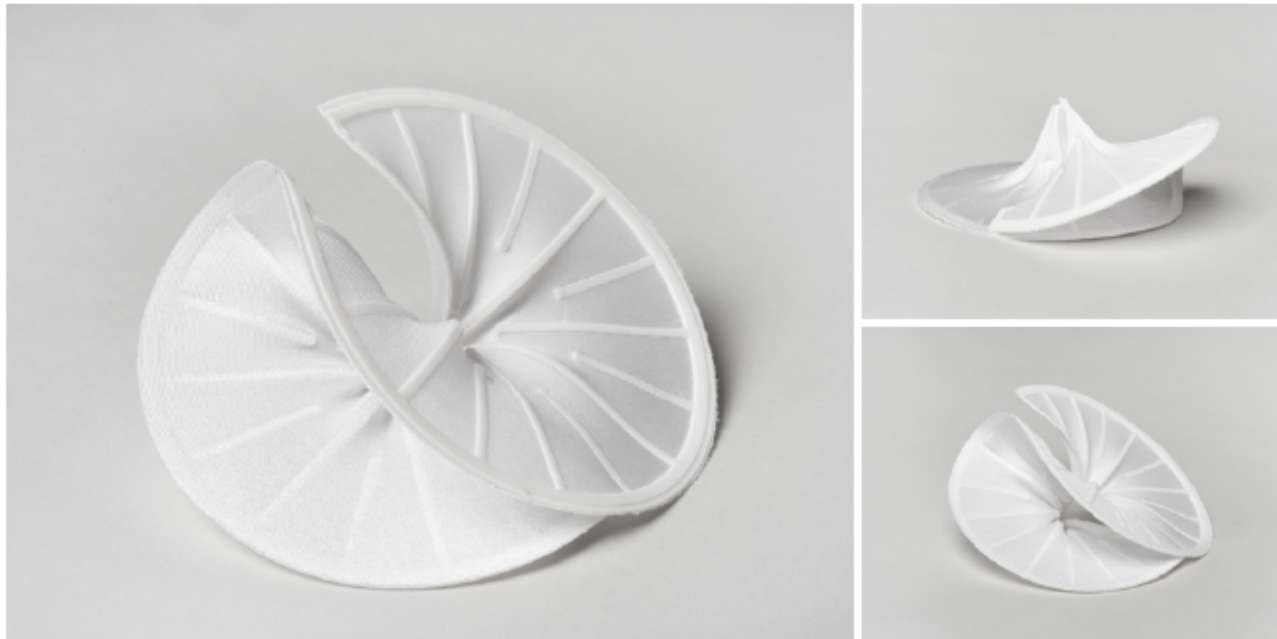


Prototype nr. 06_01

Geometry: Closed shapes / Curvilinear / Circular / Radial
Textile: 2D tension / regular knit / with cut



top view of the geometry



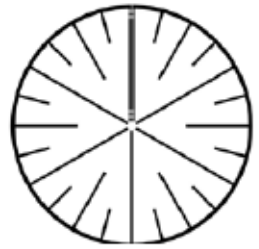
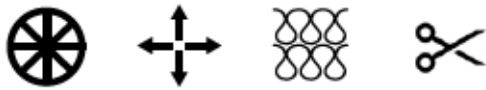
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Radial lines with boundary, diameter d=180mm	BUILD PLATE TEMP.:	60 °C
DIMENSIONS:	Outer Ring: w=3mm, t=0.6mm (PLA) w=2mm, t=0.6mm (TPU 95A) Inner lines (PLA): 2 x w=2.6mm x t=1.2mm 4 x w=2mm x t=1.2mm 6 x w=2mm x t=0.8mm 12 x w=2mm x t=0.6mm	PRINTING SPEED:	PLA: 70 mm/s, initial layer 20 mm/s TPU 95A: 25 mm/s, initial layer 18 mm/s
FABRIC:	Lycra 4-Stretch Jersey 85% PA, 15% EL	MATERIAL FLOW:	110%
TENSION:	Bi-directional, 150 %	INFILL DENSITY:	100%
FILAMENT:	PLA (Filafarm) TPU 95A (Filafarm)	INFILL LINE DISTANCE:	0.35 mm
PRINTING TEMP.:	205 °C (PLA), 235 °C (TPU 95A)	WALL THICKNESS:	1.5mm
		LAYER HEIGHT:	0.2 mm, initial 0.27mm
		PRINTING BED SIZE:	215 x 215mm
		3D PRINTER:	Ultimaker 3 extended
		NOZZLE:	0.4mm
		COMMENTS:	Prototype by author

Prototype nr. 06_02

Geometry: Closed shapes / Curvilinear / Circular / Radial
Textile: 2D tension / regular knit / with cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Radial lines with boundary, diameter d=180mm	PRINTING SPEED:	25 mm/s, initial layer 18 mm/s
DIMENSIONS:	Outer Ring: w=3mm, t=1 mm Inner lines: 24 x w:2mm x t: 1mm	MATERIAL FLOW:	110%
FABRIC:	Lycra 4-Stretch Jersey 85% PA, 15% EL	INFILL DENSITY:	100%
TENSION:	Bi-directional, 150 %	INFILL LINE DISTANCE:	0.35 mm
FILAMENT:	TPU 95A (Filafarm)	WALL THICKNESS:	1.5mm
PRINTING TEMP.:	235 °C	LAYER HEIGHT:	0.2 mm, initial 0.27mm
BUILD PLATE TEMP.:	60 °C	PRINTING BED SIZE:	215 x 215mm
		3D PRINTER:	Ultimaker 3 extended
		NOZZLE:	0.4mm
		COMMENTS:	Prototype by author

Prototype nr. 06_03

Geometry: Closed shapes / Curvilinear / Circular / Radial

Textile: 2D tension / regular knit / with cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Radial lines with boundary, diameter $d=180\text{mm}$

DIMENSIONS: Outer Ring:
 $w=3\text{mm}$, $t=0.6\text{mm}$ (PLA)
 $w=2\text{mm}$, $t=0.6\text{mm}$ (TPU 95A)
Inner lines (PLA):
 $2 \times w=2.6\text{mm} \times t=1.2\text{mm}$
 $4 \times w=2\text{mm} \times t=1.2\text{mm}$
 $6 \times w=2\text{mm} \times t=0.8\text{mm}$
 $12 \times w=2\text{mm} \times t=0.6\text{mm}$

FABRIC: Lycra 4-Stretch Jersey
85% PA, 15% EL

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)
TPU 95A (Filafarm)

PRINTING TEMP.: 205 °C (PLA),
235 °C (TPU 95A)

BUILD PLATE TEMP.: 60 °C

PRINTING SPEED: PLA: 70 mm/s,
initial layer 20 mm/s
TPU 95A: 25 mm/s,
initial layer 18 mm/s

MATERIAL FLOW: 110%

INFILL DENSITY: 100%

INFILL LINE DISTANCE: 0.35 mm

WALL THICKNESS: 1.5mm

LAYER HEIGHT: 0.2 mm, initial 0.27mm

PRINTING BED SIZE: 215 x 215mm

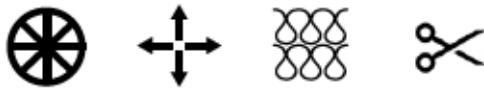
3D PRINTER: Ultimaker 3 extended

NOZZLE: 0.4mm

COMMENTS: Prototype by author

Prototype nr. 06_04

Geometry: Closed shapes / Curvilinear / Circular / Radial
Textile: 2D tension / regular knit / with cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Radial lines with boundary,
diameter d=180mm

DIMENSIONS: Outer Ring:
w=3mm, t=0.4mm
Inner lines:
20x w=2mm x t=1mm

FABRIC: Lycra 4-Stretch Jersey
85% PA, 15% EL

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 205 °C (PLA)

BUILD PLATE TEMP.: 60 °C

PRINTING SPEED: 70 mm/s,
initial layer 20 mm/s

MATERIAL FLOW: 110%

INFILL DENSITY: 100%

INFILL LINE DISTANCE: 0.35 mm

WALL THICKNESS: 1.5mm

LAYER HEIGHT: 0.2 mm, initial 0.27mm

PRINTING BED SIZE: 215 x 215mm

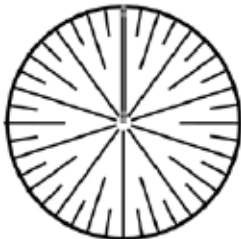
3D PRINTER: Ultimaker 3 extended

NOZZLE: 0.4mm

COMMENTS: Prototype by author

Prototype nr. 06_05

Geometry: Closed shapes / Curvilinear / Circular / Radial
Textile: 2D tension / regular knit / no cut



top view of the geometry



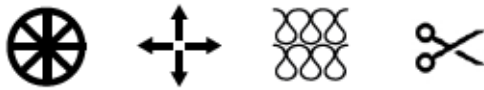
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Radial lines with boundary, diameter d=180 mm	PRINTING SPEED:	25 mm/s, initial layer 18 mm/s
DIMENSIONS:	Outer Ring: w=3 mm, t=1 mm Inner lines 40 x w:2 mm x t: 1 mm	MATERIAL FLOW:	110%
FABRIC:	Lycra 4-Stretch Jersey 85% PA, 15% EL	INFILL DENSITY:	100%
TENSION:	Bi-directional, 150 %	INFILL LINE DISTANCE:	0.35 mm
FILAMENT:	TPU 95A (Filafarm)	WALL THICKNESS:	1.5 mm
PRINTING TEMP.:	235 °C	LAYER HEIGHT:	0.2 mm, initial 0.27 mm
BUILD PLATE TEMP.:	60 °C	PRINTING BED SIZE:	215 x 215 mm
		3D PRINTER:	Ultimaker 3 extended
		NOZZLE:	0.4mm
		COMMENTS:	Prototype by author

Prototype nr. 06_06

Geometry: Closed shapes / Curvilinear / Circular / Radial
Textile: 2D tension / regular knit / with cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Radial lines with boundary,
diameter d=180mm

DIMENSIONS: Outer Ring:
w=3mm, t=0.4mm
Inner lines:
16 x w=2mm x t= 1.mm

FABRIC: Lycra 4-Stretch Jersey
85% PA, 15% EL

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 205 °C (PLA)

BUILD PLATE TEMP.: 60 °C

PRINTING SPEED: 70 mm/s,
initial layer 20 mm/s

MATERIAL FLOW: 110%

INFILL DENSITY: 100%

INFILL LINE DISTANCE: 0.35 mm

WALL THICKNESS: 1.5mm

LAYER HEIGHT: 0.2 mm, initial 0.27mm

PRINTING BED SIZE: 215 x 215mm

3D PRINTER: Ultimaker 3 extended

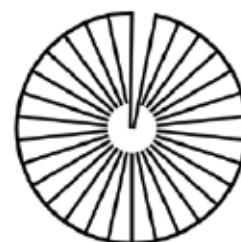
NOZZLE: 0.4mm

COMMENTS: Prototype by author

Prototype nr. 06_07

Geometry: Closed shapes / Curvilinear / Circular / Radial

Textile: 2D tension / regular knit / with cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Radial lines with boundary, diameter $d=180\text{mm}$

DIMENSIONS: Outer Ring:
 $w=3\text{mm}, t=0.6\text{mm}$ (TPU 95A)
Inner lines (TPU 95A):
 $30 \times w=3\text{mm} \times t=0.6\text{mm}$
Inner lines (PLA):
 $30 \times w=3\text{mm} \times t=2\text{mm}$

FABRIC: Lycra 4-Stretch Jersey
85% PA, 15% EL

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)
TPU 95A (Filafarm)

PRINTING TEMP.: 205 °C (PLA),
235 °C (TPU 95A)

BUILD PLATE TEMP.: 60 °C

PRINTING SPEED: PLA: 70 mm/s,
initial layer 20 mm/s
TPU 95A: 25 mm/s,
initial layer 18 mm/s

MATERIAL FLOW: 110%

INFILL DENSITY: 100%

INFILL LINE DISTANCE: 0.35 mm

WALL THICKNESS: 1.5mm

INFILL PATTERN: Lines

LAYER HEIGHT: 0.2 mm, initial 0.27mm

PRINTING BED SIZE: 215 x 215mm

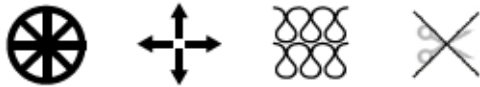
3D PRINTER: Ultimaker 3 extended

NOZZLE: 0.4mm

COMMENTS: Prototype by author

Prototype nr. 06_08

Geometry: Closed shapes / Curvilinear / Circular / Radial
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Radial lines with boundary,
diameter d=180mm

DIMENSIONS: Outer Ring (TPU 95A):
w=3mm, t=1 mm
Inner lines (PLA):
24 x w:2mm x t: 1mm

FABRIC: Lycra 4-Stretch Jersey
85% PA, 15% EL

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)
TPU 95A (Filafarm)

PRINTING TEMP.: 205 °C (PLA),
235 °C (TPU 95A)

BUILD PLATE TEMP.: 60 °C

PRINTING SPEED: PLA: 70 mm/s,
initial layer 20 mm/s
TPU 95A: 25 mm/s,
initial layer 18 mm/s

MATERIAL FLOW: 110%

INFILL DENSITY: 100%

INFILL LINE DISTANCE: 0.35 mm

WALL THICKNESS: 1.5mm

LAYER HEIGHT: 0.2 mm, initial 0.27mm

PRINTING BED SIZE: 215 x 215mm

3D PRINTER: Ultimaker 3 extended

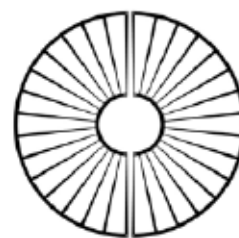
NOZZLE: 0.4mm

COMMENTS: Prototype by author

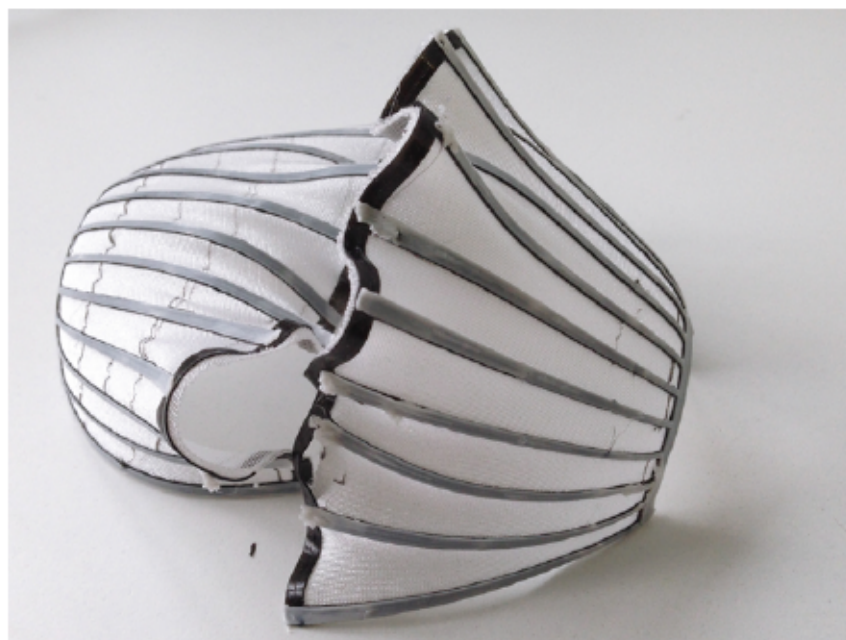
Prototype nr. 06_09

Geometry: Closed shapes / Curvilinear / Circular / Radial

Textile: 2D tension / regular knit / with cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Radial lines with boundary, diameter d=180mm

DIMENSIONS: Outer Ring (TPU 95A): w=3mm, t=1mm
Inner lines (TPU 95A): 32 x w=1.6-2.6, t=0.6mm
Inner lines (PLA): 32 x w=1.6-2.6, t=0.4mm

FABRIC: Lycra 4-Stretch Jersey
85% PA, 15% EL

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)
TPU 95A (Filafarm)

PRINTING TEMP.: 205 °C (PLA),
235 °C (TPU 95A)

BUILD PLATE TEMP.: 60 °C

PRINTING SPEED: PLA: 70 mm/s,
initial layer 20 mm/s
TPU 95A: 25 mm/s,
initial layer 18 mm/s

MATERIAL FLOW: 110%

INFILL DENSITY: 100%

INFILL LINE DISTANCE: 0.35 mm

WALL THICKNESS: 1.5mm

INFILL PATTERN: Lines

LAYER HEIGHT: 0.2 mm, initial 0.27mm

PRINTING BED SIZE: 215 x 215mm

3D PRINTER: Ultimaker 3 extended

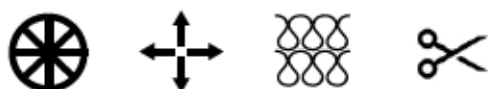
NOZZLE: 0.4mm

COMMENTS: Prototype by author

Prototype nr. 06_10

Geometry: Closed shapes / Curvilinear / Circular / Radial

Textile: 2D tension / regular knit / with cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Radial lines with boundary,
diameter $d=180\text{mm}$

DIMENSIONS: Outer Ring (TPU 95A):
 $w=3\text{mm}$, $t=1\text{mm}$
Inner lines (TPU 95A):
 $12 \times w=1.6-2.6$, $t=0.6\text{mm}$
Inner lines (PLA):
 $12 \times w=1.6-2.6$, $t=0.4\text{mm}$

FABRIC: Lycra 4-Stretch Jersey
85% PA, 15% EL

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)
TPU 95A (Filafarm)

PRINTING TEMP.: 205 °C (PLA),
235 °C (TPU 95A)

BUILD PLATE TEMP.: 60 °C

PRINTING SPEED: PLA: 70 mm/s,
initial layer 20 mm/s
TPU 95A: 25 mm/s,
initial layer 18 mm/s

MATERIAL FLOW: 110%

INFILL DENSITY: 100%

INFILL LINE DISTANCE: 0.35 mm

WALL THICKNESS: 1.5mm

LAYER HEIGHT: 0.2 mm, initial 0.27mm

PRINTING BED SIZE: 215 x 215mm

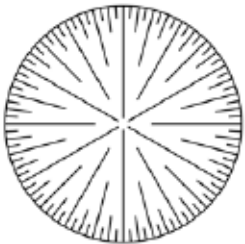
3D PRINTER: Ultimaker 3 extended

NOZZLE: 0.4mm

COMMENTS: Prototype by author

Prototype nr. 06_11

Geometry: Closed shapes / Curvilinear / Circular / Radial
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

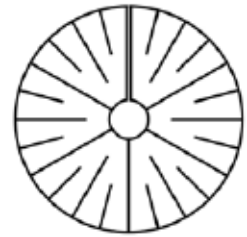
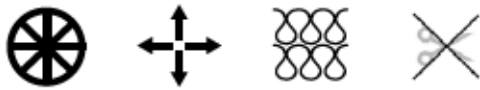
SPECIFICATIONS:

GEOMETRY:	Radial lines with boundary, diameter d=494mm
DIMENSIONS:	Outer Ring: w=3mm, t=0.8mm Inner lines: w=3mm, t=0.8-1.6mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M
TENSION:	Bi-directional, 150 %
FILAMENT:	PLA Glow in the dark (Spectrum)
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s

MATERIAL FLOW:	100%
INFILL LINE DISTANCE:	1 mm
WALL THICKNESS:	3mm
INFILL PATTERN:	Concentric
LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING BED SIZE:	500 x 500mm
3D PRINTER:	Custom-built
NOZZLE:	1mm
COMMENTS:	Prototype by author

Prototype nr. 06_12

Geometry: Closed shapes / Curvilinear / Circular / Radial
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Radial lines with boundary,
diameter $d=240\text{mm}$

DIMENSIONS: Outer Ring:
 $w=4\text{mm}$, $t=1\text{mm}$
Inner lines:
 $w=2-4.3\text{mm}$, $t=0.4\text{mm}$

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 1 mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

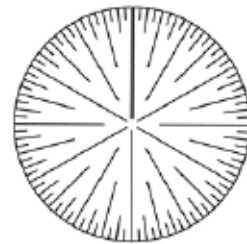
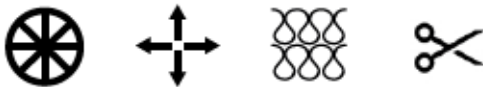
3D PRINTER: Custom-built

NOZZLE: 1mm

COMMENTS: Prototype by author

Prototype nr. 06_13

Geometry: Closed shapes / Curvilinear / Circular / Radial
Textile: 2D tension / regular knit / with cut



top view of the geometry



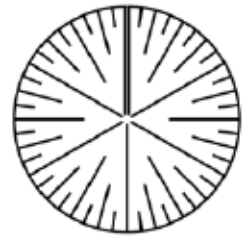
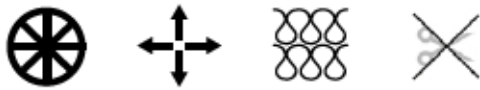
3D printed prototype

SPECIFICATIONS:

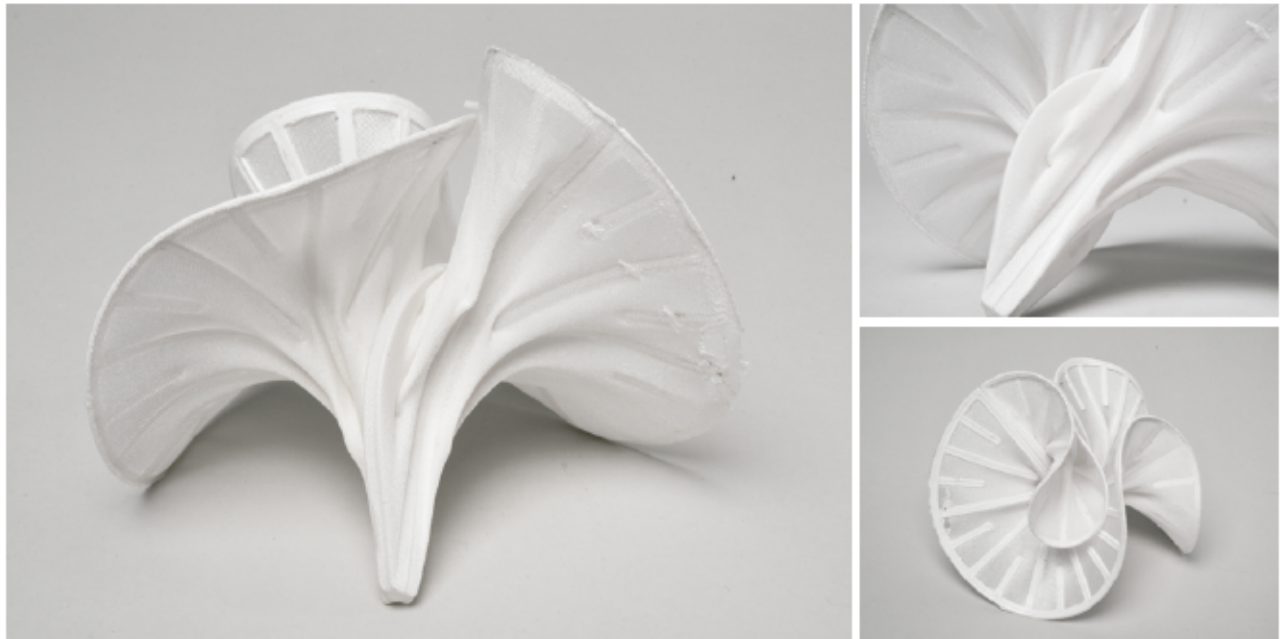
GEOMETRY:	Radial lines with boundary, diameter d=494mm	MATERIAL FLOW:	100%
DIMENSIONS:	Outer Ring: w=3mm, t=0.8mm Inner lines: w=3mm, t=0.8-1.6mm	INFILL LINE DISTANCE:	1 mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA Glow in the dark (Spectrum)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 06_14

Geometry: Closed shapes / Curvilinear / Circular / Radial
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Radial lines with boundary,
diameter d=276mm

DIMENSIONS: Outer Ring:
w=3mm, t=1.8mm
Inner lines:
w=3mm, t=0.9-1.8mm

FABRIC: Bi Stretch Laguna Weiss
80% PA 20%EA
CA.280G/M

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

PRINTING SPEED: 60 mm/s,
initial layer 30 mm/s

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 1 mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 300 x 300mm

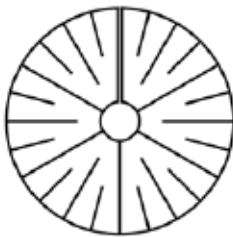
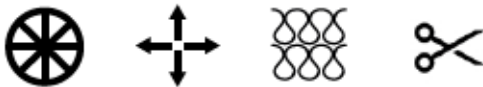
3D PRINTER: Custom-built

NOZZLE: 1mm

COMMENTS: Prototype by author

Prototype nr. 06_15

Geometry: Closed shapes / Curvilinear / Circular / Radial
Textile: 2D tension / regular knit / with cut



top view of the geometry



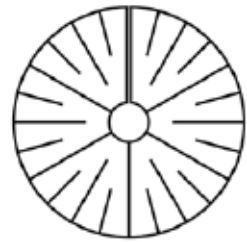
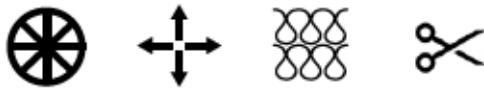
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Radial lines with boundary, diameter d=240mm	MATERIAL FLOW:	100%
DIMENSIONS:	Outer Ring: w=4mm, t=1.6mm Inner lines: w=2-4.3mm, t=1-1.6mm	INFILL LINE DISTANCE:	1 mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 06_16

Geometry: Closed shapes / Curvilinear / Circular / Radial
Textile: 2D tension / regular knit / with cut



top view of the geometry



3D printed prototype

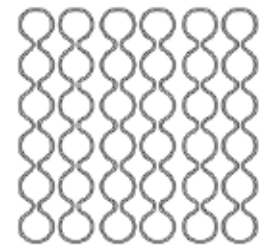
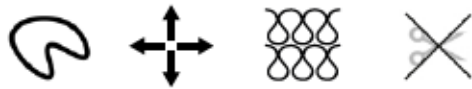
SPECIFICATIONS:

GEOMETRY:	Radial lines with boundary, diameter d=240mm	MATERIAL FLOW:	100%
DIMENSIONS:	Outer Ring: w=4mm, t=1mm Inner lines: w=2-4.3mm, t=1mm	INFILL LINE DISTANCE:	1 mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	300 x 300mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

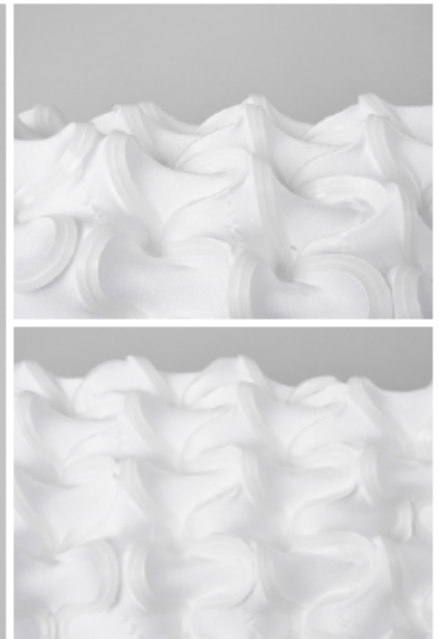


Prototype nr. 07_01

Geometry: Closed shapes / Curvilinear shapes / Free-form
Textile: 2D tension / regular knit / no cut



top view of the geometry



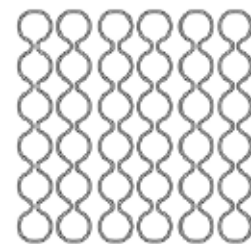
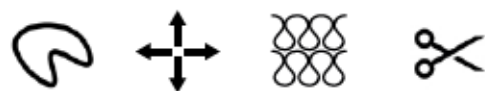
3D printed prototype

SPECIFICATIONS:

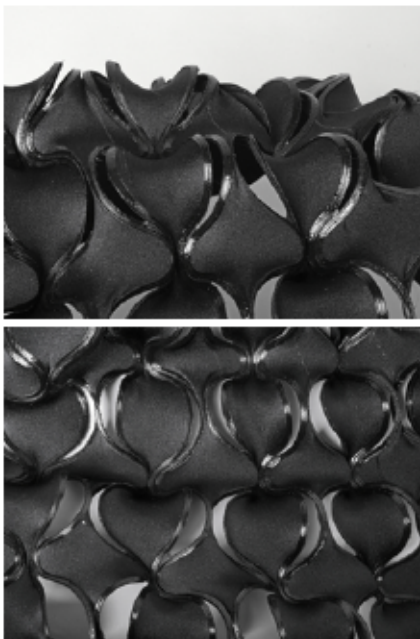
GEOMETRY:	Multiple curves	MATERIAL FLOW:	100%
DIMENSIONS:	w= 2mm, t=0.8mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA Glow in the Dark (Spectrum)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 07_02

Geometry: Closed shapes / Curvilinear shapes / Free-form
Textile: 2D tension / regular knit / with cut



top view of the geometry



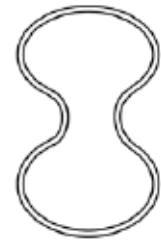
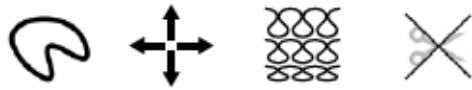
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Multiple curves	MATERIAL FLOW:	100%
DIMENSIONS:	w= 2mm, t=0.8mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Schwarz 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 07_03

Geometry: Closed shapes / Curvilinear shapes / Free-form
Textile: 2D tension / custom knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Multiple closed curves

AMOUNT OF PRINTS: 6

DIMENSIONS: w= 3mm, t= 1.2mm

FABRIC: Knit pattern D,
Thread PES 167dtex
f144/1, Elastan Roica
150dtex (NP value 11,0),
Machine fineness E14,
Width 690 needles,
fry areas small tuck stitch
(NP-Wert 13,5), hite areas
large tuck stitch (NP-Wert
13,5), Speed 0.70 m/s

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 230 °C
(initial 220 °C, final 215 °C)

MATERIAL FLOW: 100%

INFILL LINE DISTANCE: 0.9mm

WALL THICKNESS: 3mm

INFILL PATTERN: Concentric

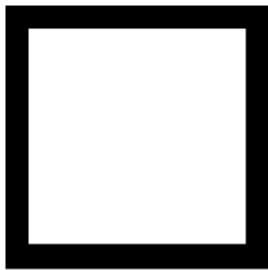
LAYER HEIGHT: 0.4 mm, first layer 0.3mm

PRINTING BED SIZE: 500 x 500mm

3D PRINTER: Custom-built

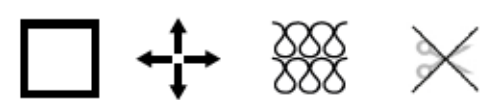
NOZZLE: 1mm

COMMENTS: Prototype by author,
fabric by STFI



Prototype nr. 08_01

Geometry: Closed shapes / Polygonal / Orthogonal / Primitive
 Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Square 60 x 60mm	MATERIAL FLOW:	100%
DIMENSIONS:	w=4mm, t=0.8mm	INFILL LINE DISTANCE:	1mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA Glow in the dark (Spectrum)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	300 x 300mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 08_02

Geometry: Closed shapes / Polygonal / Orthogonal / Primitive
Textile: 2D tension / regular knit / no cut



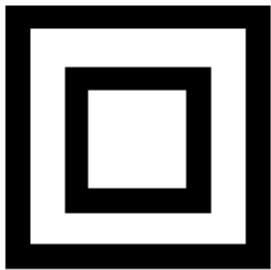
top view of the geometry



3D printed prototype

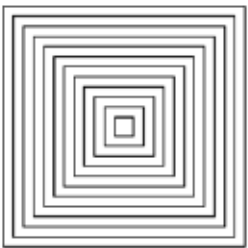
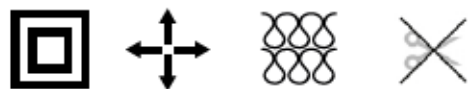
SPECIFICATIONS:

GEOMETRY:	Square 50 x 50mm	MATERIAL FLOW:	100%
DIMENSIONS:	w=5mm, t=0.6mm	INFILL DENSITY:	20%
FABRIC:	Lycra 4-Stretch Jersey 85% PA, 15% EL	INFILL PATTERN:	Concentric
TENSION:	Bi-directional, 150 %	LAYER HEIGHT:	0.2 mm, first layer 0.27mm
FILAMENT:	PLA (Filafarm)	PRINTING BED SIZE:	215 x 215mm
PRINTING TEMP.:	210 °C	3D PRINTER:	Ultimaker 3 extended
PRINTING SPEED:	40 mm/s, initial layer 30 mm/s	NOZZLE:	0.4mm
		COMMENTS:	Prototype by author



Prototype nr. 09_01

Geometry: Closed shapes / Polygonal / Orthogonal / Concentric
Textile: 2D tension / regular knit / no cut



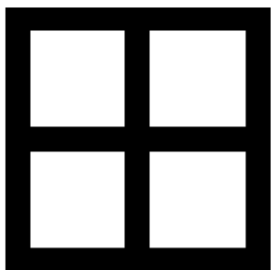
top view of the geometry



3D printed prototype

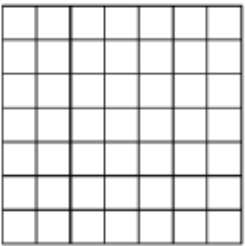
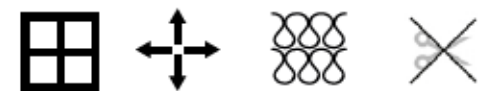
SPECIFICATIONS:

GEOMETRY:	Line spacing 20mm	MATERIAL FLOW:	100%
DIMENSIONS:	w=3mm, t=0.4mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA (Filafarm)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	300 x 300mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author



Prototype nr. 10_01

Geometry: Closed shapes / Polygonal / Orthogonal / Grid
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

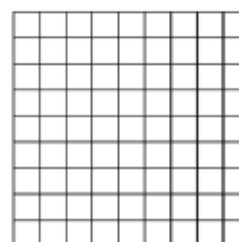
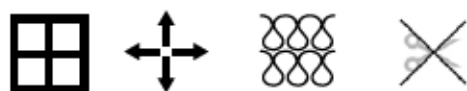
SPECIFICATIONS:

GEOMETRY:	Grid 60 x 60mm	MATERIAL FLOW:	100%
DIMENSIONS:	w=4mm, t=0.8mm	INFILL LINE DISTANCE:	0.9mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M	WALL THICKNESS:	3mm
TENSION:	Bi-directional, 150 %	INFILL PATTERN:	Concentric
FILAMENT:	PLA Glow in the dark (Spectrum)	LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)	PRINTING BED SIZE:	500 x 500mm
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s	3D PRINTER:	Custom-built
		NOZZLE:	1mm
		COMMENTS:	Prototype by author

Prototype nr. 10_02

Geometry: Closed shapes / Polygonal / Orthogonal / Grid

Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

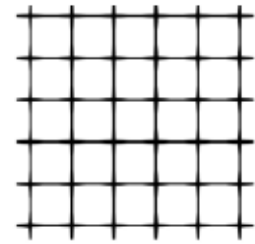
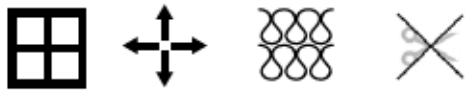
SPECIFICATIONS:

GEOMETRY:	Grid 50 x 50mm
DIMENSIONS:	w=3mm, t=0.4mm
FABRIC:	Bi Stretch Laguna Weiss 80% PA 20%EA CA.280G/M
TENSION:	Bi-directional, 150 %
FILAMENT:	PLA Glow in the dark (Spectrum)
PRINTING TEMP.:	230 °C (initial 220 °C, final 215 °C)
PRINTING SPEED:	60 mm/s, initial layer 30 mm/s

MATERIAL FLOW:	100%
INFILL LINE DISTANCE:	0.9mm
WALL THICKNESS:	3mm
INFILL PATTERN:	Concentric
LAYER HEIGHT:	0.4 mm, first layer 0.3mm
PRINTING BED SIZE:	500 x 500mm
3D PRINTER:	Custom-built
NOZZLE:	1mm
COMMENTS:	Prototype by author

Prototype nr. 10_03

Geometry: Closed shapes / Polygonal / Orthogonal / Grid
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

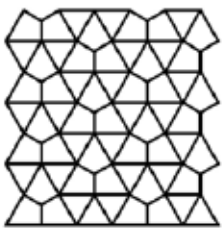
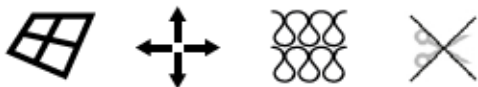
SPECIFICATIONS:

GEOMETRY:	Grid 20 x 20mm	MATERIAL FLOW:	100%
DIMENSIONS:	w=3-4mm, t=0.6mm	INFILL LINE DISTANCE:	0.2mm
FABRIC:	Lycra 4-Stretch Jersey 85% PA, 15% EL	INFILL PATTERN:	Lines
TENSION:	Bi-directional, 150 %	LAYER HEIGHT:	0.2mm
FILAMENT:	PLA (Filafarm)	PRINTING BED SIZE:	250 x 200mm
PRINTING TEMP.:	210 °C	3D PRINTER:	Craftbot Plus Pro
PRINTING SPEED:	40 mm/s, initial layer 30 mm/s	NOZZLE:	0.4mm
		COMMENTS:	Prototype created as part of the seminar Self-Shaping Textiles at the weissensee khb, SoSe 2017



Prototype nr. 11_01

Geometry: Closed shapes / Polygonal / Non-orthogonal / Grid
Textile: 2D tension / regular knit / no cut



top view of the geometry



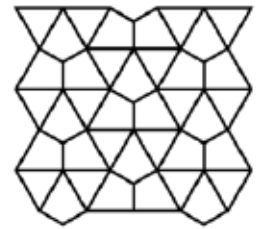
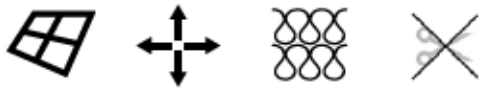
3D printed prototype

SPECIFICATIONS:

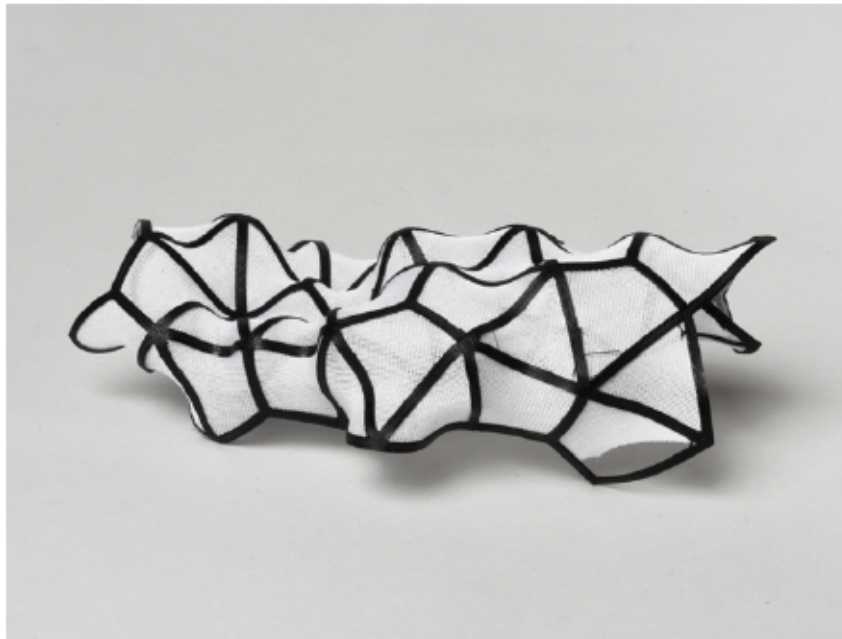
GEOMETRY:	Triangular grid (edge length $l=60\text{mm}$)	MATERIAL FLOW:	110%
DIMENSIONS:	$w=2.5\text{mm}$, $t=0.4\text{--}10\text{mm}$	INFILL LINE DISTANCE:	0.35mm
FABRIC:	Lycra 4-Stretch Jersey 85% PA, 15% EL	INFILL PATTERN:	Lines
TENSION:	Bi-directional, 150 %	LAYER HEIGHT:	0.2 mm
FILAMENT:	PLA (Filafarm)	PRINTING BED SIZE:	215 x 215mm
PRINTING TEMP.:	205 °C	3D PRINTER:	Ultimaker 2
PRINTING SPEED:	70 mm/s, initial layer 20 mm/s	NOZZLE:	0.4mm
BUILD PLATE TEMP.:	60 °C	COMMENTS:	Prototype by author,

Prototype nr. 11_02

Geometry: Closed shapes / Polygonal / Non-orthogonal / Grid
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Triangular grid
(edge length 60mm)

DIMENSIONS: w=2.5mm, t=0.6mm

FABRIC: Lycra 4-Stretch Jersey
85% PA, 15% EL

TENSION: Bi-directional, 150 %

FILAMENT: PLA conductive
(Proto-pasta)

PRINTING TEMP.: 205 °C

PRINTING SPEED: 70 mm/s,
initial layer 20 mm/s

BUILD PLATE TEMP.: 60 °C

MATERIAL FLOW: 110%

INFILL LINE DISTANCE: 0.35mm

INFILL PATTERN: Lines

LAYER HEIGHT: 0.2 mm

PRINTING BED SIZE: 215 x 215mm

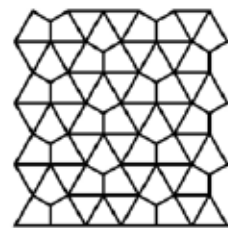
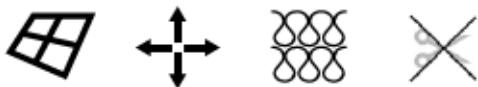
3D PRINTER: Ultimaker 2

NOZZLE: 0.4mm

COMMENTS: Prototype by author,

Prototype nr. 11_03

Geometry: Closed shapes / Polygonal / Non-orthogonal / Grid
Textile: 2D tension / regular knit / no cut



top view of the geometry



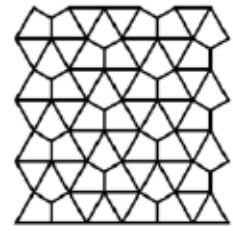
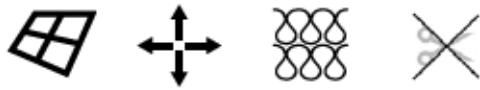
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Polygonal grid	MATERIAL FLOW:	110%
DIMENSIONS:	w=4mm, t=0.2mm	INFILL LINE DISTANCE:	0.35mm
FABRIC:	Lycra 4-Stretch Jersey 85% PA, 15% EL	INFILL PATTERN:	Lines
TENSION:	Bi-directional, 150 %	LAYER HEIGHT:	0.2 mm
FILAMENT:	PLA (Filafarm)	PRINTING BED SIZE:	215 x 215mm
PRINTING TEMP.:	205 °C	3D PRINTER:	Ultimaker 2
PRINTING SPEED:	70 mm/s, initial layer 20 mm/s	NOZZLE:	0.4mm
BUILD PLATE TEMP.:	60 °C	COMMENTS:	Prototype by author,

Prototype nr. 11_04

Geometry: Closed shapes / Polygonal / Non-orthogonal / Grid
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Triangular grid
(edge length $l=60\text{mm}$)

DIMENSIONS: $w=2.5\text{mm}$, $t=0.6\text{mm}$

FABRIC: Lycra 4-Stretch Jersey
85% PA, 15% EL

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 205 °C

PRINTING SPEED: 70 mm/s,
initial layer 20 mm/s

BUILD PLATE TEMP.: 60 °C

MATERIAL FLOW: 110%

INFILL LINE DISTANCE: 0.35mm

INFILL PATTERN: Lines

LAYER HEIGHT: 0.2 mm

PRINTING BED SIZE: 215 x 215mm

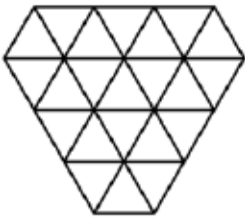
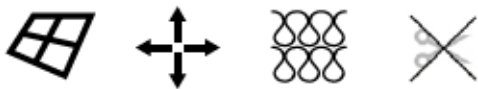
3D PRINTER: Ultimaker 2

NOZZLE: 0.4mm

COMMENTS: Prototype by author,
Fabric detached from the print
after several months

Prototype nr. 11_06

Geometry: Closed shapes / Polygonal / Non-orthogonal / Grid
Textile: 2D tension / regular knit / no cut



top view of the geometry



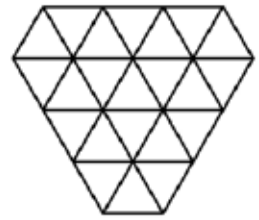
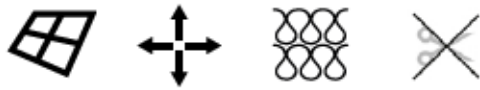
3D printed prototype

SPECIFICATIONS:

GEOMETRY:	Triangular grid (edge length l=60mm)	MATERIAL FLOW:	110%
DIMENSIONS:	w=2.5mm, t=0.4-1.8mm	INFILL LINE DISTANCE:	0.35mm
FABRIC:	Lycra 4-Stretch Jersey 85% PA, 15% EL	INFILL PATTERN:	Lines
TENSION:	Bi-directional, 150 %	LAYER HEIGHT:	0.2 mm, initial 0.27mm
FILAMENT:	PLA (Filafarm)	PRINTING BED SIZE:	215 x 215mm
PRINTING TEMP.:	205 °C	3D PRINTER:	Ultimaker 3 extended
PRINTING SPEED:	70 mm/s, initial layer 20 mm/s	NOZZLE:	0.4mm
BUILD PLATE TEMP.:	60 °C	COMMENTS:	Prototype by author, Thickness changing n a linear manner

Prototype nr. 11_05

Geometry: Closed shapes / Polygonal / Non-orthogonal / Grid
Textile: 2D tension / regular knit / no cut



top view of the geometry



3D printed prototype

SPECIFICATIONS:

GEOMETRY: Triangular grid
(edge length $l=60\text{mm}$)

DIMENSIONS: $w=2.5\text{mm}$, $t=0.4\text{-}10\text{mm}$

FABRIC: Lycra 4-Stretch Jersey
85% PA, 15% EL

TENSION: Bi-directional, 150 %

FILAMENT: PLA (Filafarm)

PRINTING TEMP.: 205 °C

PRINTING SPEED: 70 mm/s,
initial layer 20 mm/s

BUILD PLATE TEMP.: 60 °C

MATERIAL FLOW: 110%

INFILL LINE DISTANCE: 0.35mm

INFILL PATTERN: Lines

LAYER HEIGHT: 0.2 mm, initial 0.27mm

PRINTING BED SIZE: 215 x 215mm

3D PRINTER: Ultimaker 3 extended

NOZZLE: 0.4mm

COMMENTS: Prototype by author,
Thickness changing
exponentially

