PROGRAMME DE COOPÉRATION TRANSFRONTALIÈRE
GRENSOVERSCHRIJDEND SAMENWERKINKSPROGRAMMA

Interreg
France-Wallonie-Vlaanderen
UNION EUROPÉENNE
EUROPESE UNIE

www.interreg-fwvl.eu
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GoToS3
Elasto-Plast

Impression 3D avec des élastomères

3D printen met elastomeren

Cofinanciering

met de steun van west-vlaanderen de gedreven provincie

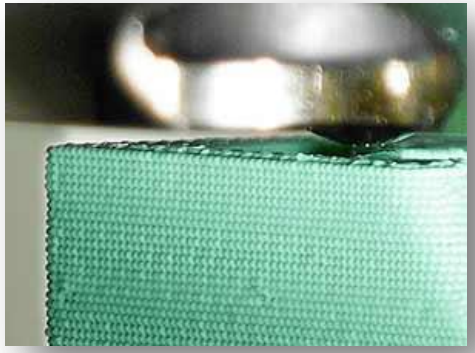
Wallonie

AGENTSCHAP INNOVEREN & ONDERNEMEN

AVEC LE SOUTIEN DU FONDS EUROPÉEN DE DÉVELOPPEMENT RÉGIONAL
MET STEUN VAN HET EUROPEES FONDS VOOR REGIONALE ONTWIKKELING

Impression 3D – Polymères thermoplastiques
3D printing – Thermoplastische polymeren

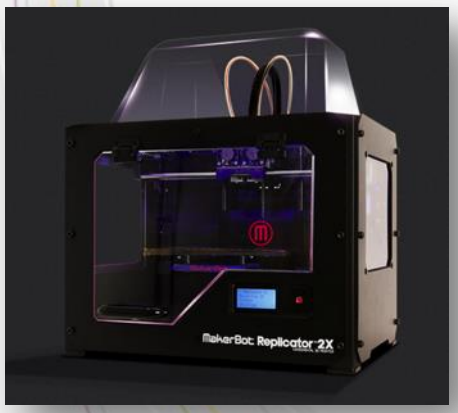
Freeformer – AKF Arburg technology

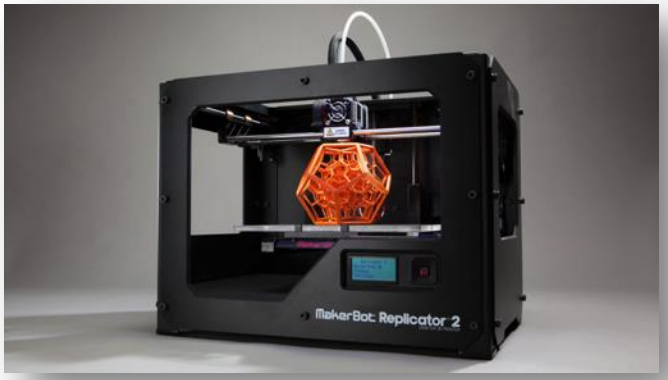


Source: Arburg

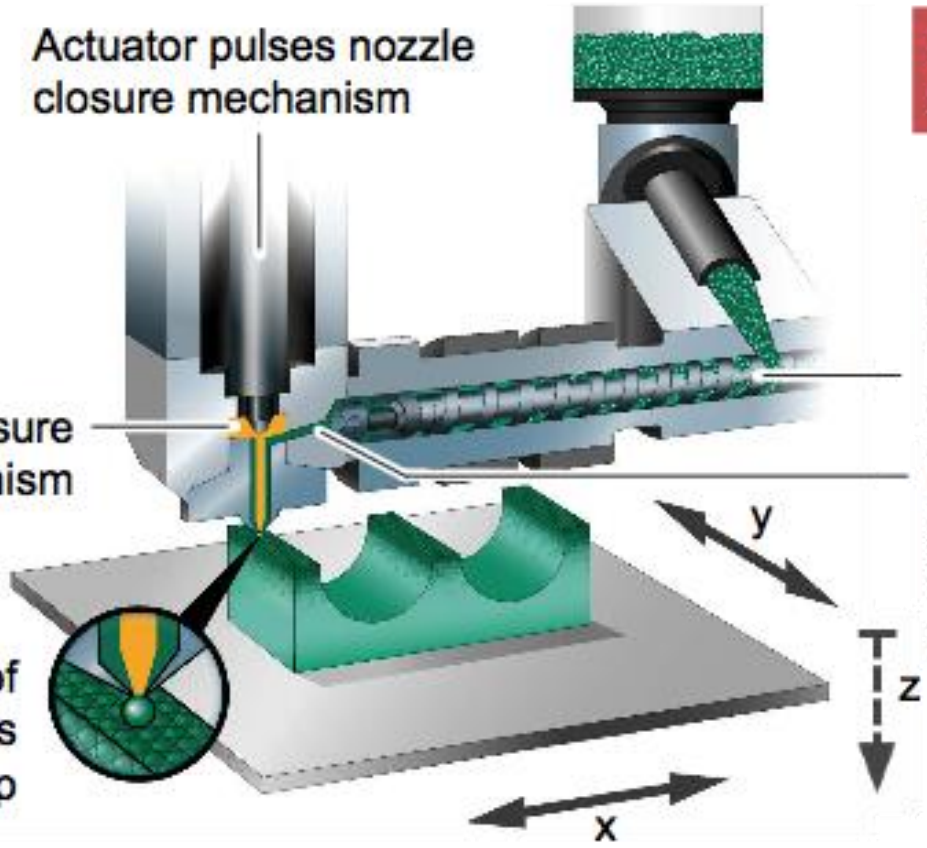
Markforged, Mark One

Replicator, Makerbot - FDM





Principe de fonctionnement
Werkingsprincipe



Base material: standard granulate

Material processing with plasticizing screw as with injection molding

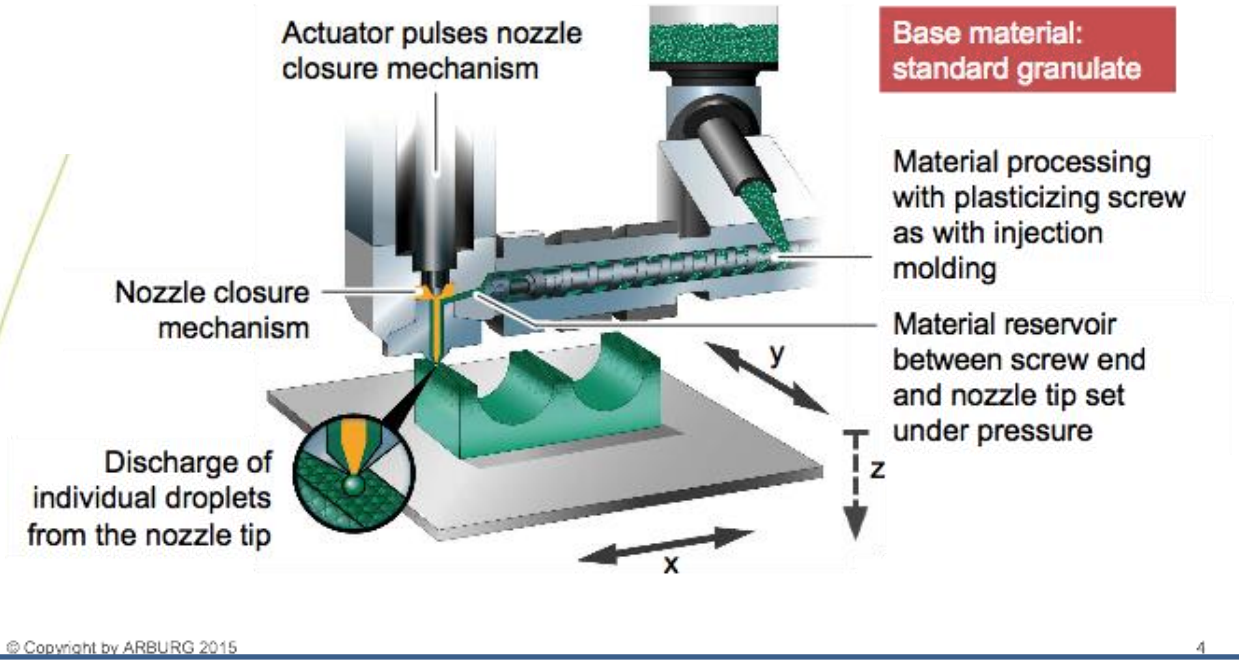
Material reservoir between screw end and nozzle tip set under pressure

Matériaux et limitations
Materialen en beperkingen

- 2 unités de décharge – 2 laadeenheden, pièces multi-matières , 2 couleurs – 2 kleuren, dur/mou – hard/zacht, matériaux support – steunmaterialen
- Matières - materialen: ABS, PA12, TPE, PC, PEI. …
- PP, PA6
- Limitations - beperkingen:
  - maximum temperature 350°C
  - chamber temperature 120-130°C

Open system

Paramètres
Instellingen



- Discharge parameter **n** = f(pression matière dans la buse, position de la vis, fréquence d'obturation) ~ volume de la goutte – (druk van het materiaal in het mondstuk, schroefpositie, sluiter frequentie) ~ druppelvolume
- Distance entre la buse et le support - Afstand tussen de nozzle en de drager **z** (mm) et la dernière couche - en de laatste laag $\mathbf{d_{n-l}}$ (mm) (= slicing distance)
- Température de buse - nozzle temperatuur **Tn** (°C)
- Température chambre - temperature van de kamer **Tch** (°C)

Essais de traction (ISO527-2) Eprouvette 1BA
trekproeven (ISO527-2) Specimen 1BA

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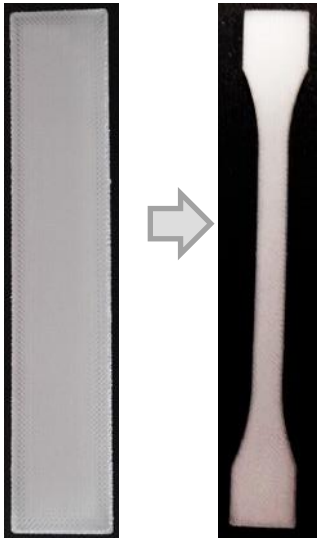
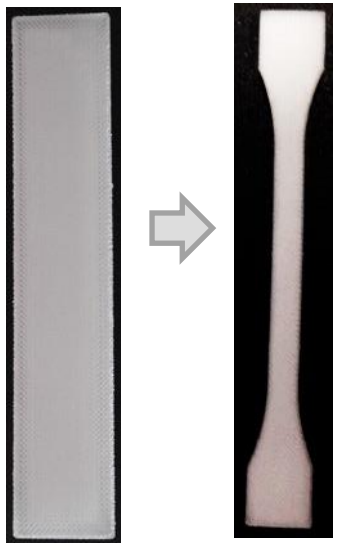
Eprouvettes imprimées 1 par 1 - proefstaven gedrukt 1 op 1

Eprouvettes imprimées 10 par 10 - proefstaven gedrukt 10 op 10

Eprouvettes découpées au laser (plaque imprimée 1 par 1) – lasergesneden proefstaven (printplaat 1 bij 1)



Eprouvettes découpées au laser (plaque imprimée 10 par 10) – lasergesneden proefstaven (printplaat 10 bij 10)



Injection

Essais de traction (ISO527-2) Eprouvette 1BA
trekproeven (ISO527-2) Specimen 1BA

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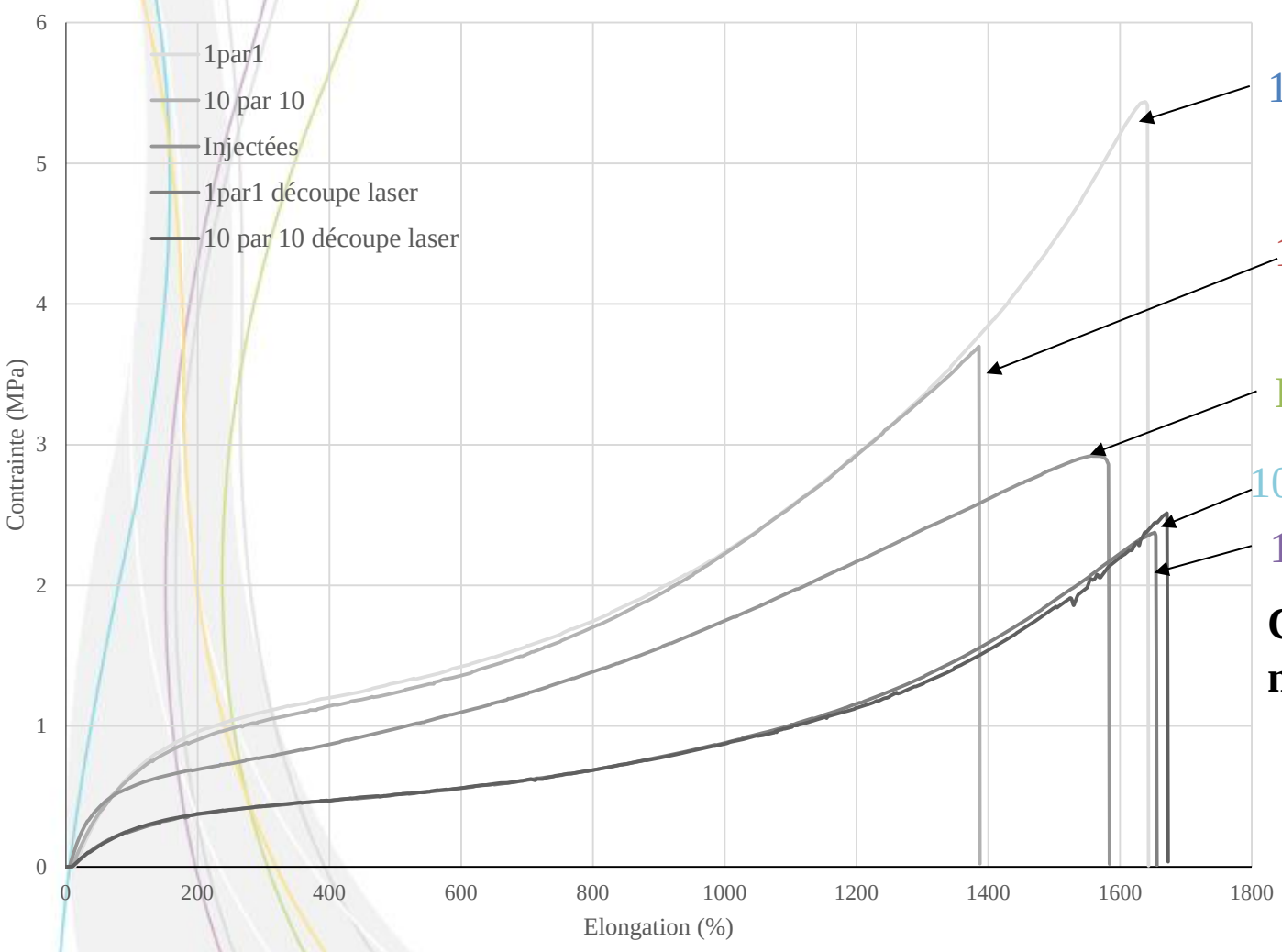

1 by 1

10 by 10

Injection

10 by 10 laser

1 by 1 laser

Cassées dans les mors

Essais de traction (ISO527-2) Eprouvette 1BA
trekproeven (ISO527-2) Specimen 1BA

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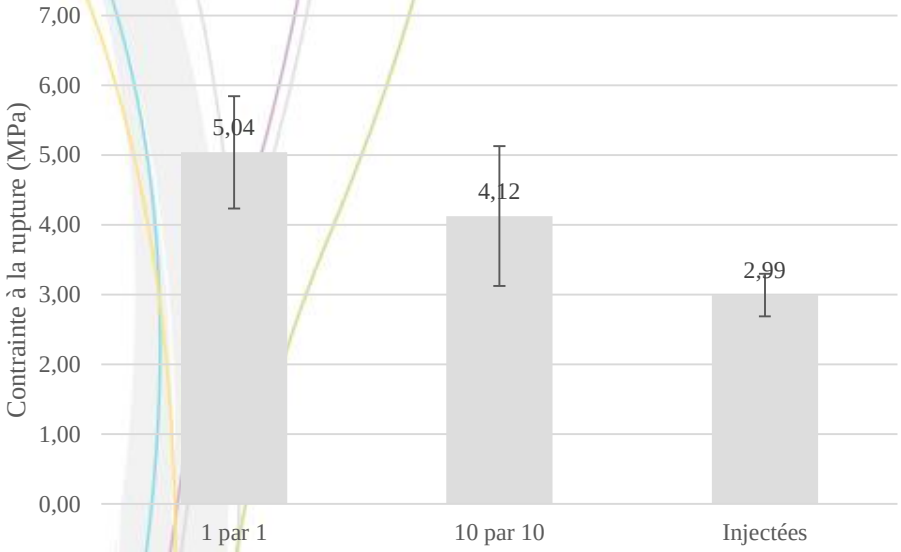
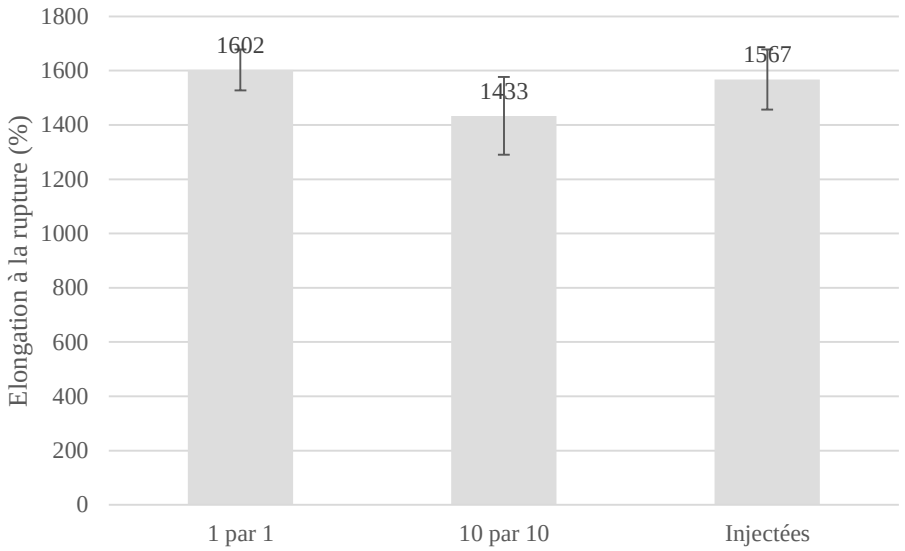
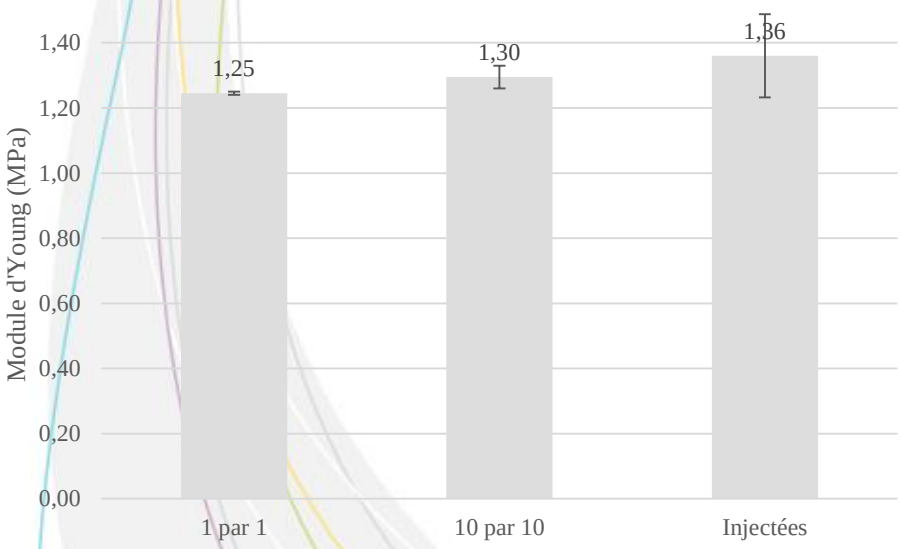
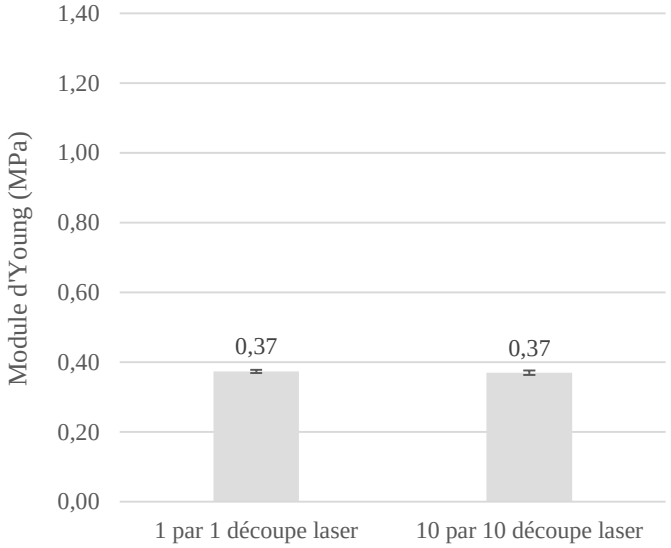








Matériaux
Materialen

Elastollan® HPM Series (aliphatic)

Thermoplastic aliphatic polyester polyurethane elastomer

Elastollan® 1100 grades

Thermoplastic Polyether Polyurethane Elastomers with outstanding hydrolysis resistance, low

Elastollan® B Series

Thermoplastic polyester polyurethane elastomer

			1185 A W	1185 A	1185 A M	1185 A WM [1]
			83	87	88	87
Hardness	Shore D	DIN ISO 7619-1 (3s)		36	39	39
Density	g/cm³	DIN EN ISO 1183-1-A	1.16	1.12	1.11	1.13

Property	Unit of Measurement	Test Procedure	B 64 D 11
Hardness	Shore A	DIN ISO 7619-1 (3s)	
Hardness	Shore D	DIN ISO 7619-1 (3s)	64
Density	g/cm³	DIN EN ISO 1183-1-A	1.24
Tensile strength	MPa	DIN 53504-S2	55
Elongation at break	%	DIN 53504-S2	450
Stress at 20 % elongation	MPa	DIN 53504-S2	17
Stress at 100 % elongation	MPa	DIN 53504-S2	19
Stress at 300 % elongation	MPa	DIN 53504-S2	35
E-modulus from tensile test	MPa	DIN EN ISO 527	320
Tear strength	kN/m	DIN ISO 34-1.B(b)	180
Abrasion	mm³	DIN ISO 4649-A	25
Compression set at 23 °C / 72 hours	%	DIN ISO 815	35
Compression set at 70 °C / 24 hours	%	DIN ISO 815	50
Tensile strength after storage in water at 80 °C for 21 days	MPa	DIN 53504-S2	40
Elongation at break after storage in water at 80 °C for 21 days	%	DIN 53504-S2	400
Notched impact strength (Charpy) +23 °C Notched impact strength (Charpy) -30 °C	kJ/m² kJ/m²	DIN EN ISO 179-1	nb 8

For more detailed information, please refer to the product information and processing guidance.

AC70A 10 HPM

1185A 1000

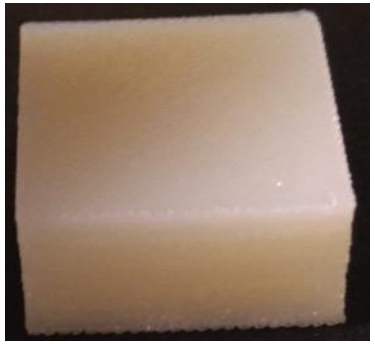
B64D 1100

Matériaux AC70A 10 HPM
Materialen AC70A 10 HPM

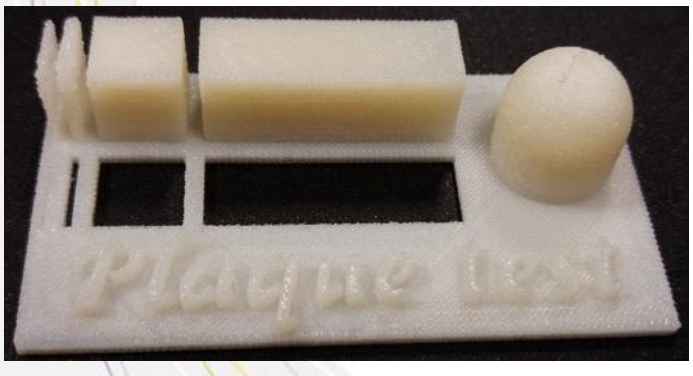
Tb=230°C (210, 190, 35°C), Tch=80°C, z=-0,9, SD=0,27, n=100%
299<P<317 bar
Plaque support = ABS/PA

Tb=210°C (190, 170, 35°C), Tch=80°C, z=-0,95, SD=0,27, n=100%
393<P<395 bar

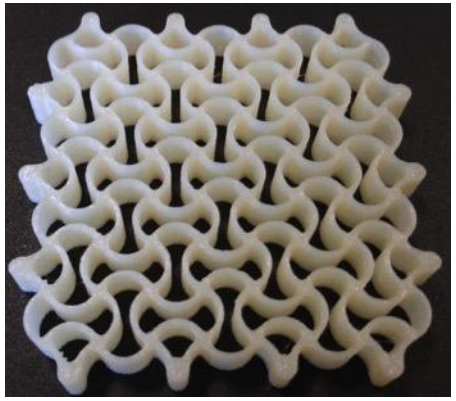
Tb=210°C (190, 170, 35°C), Tch=80°C, z=-0,95, SD=0,27, n=105%
396<P<401 bar



Tb=210°C (190, 170, 35°C), Tch=80°C, z=-0,95, SD=0,27, n=105%
396<P<401 bar



Tb=210°C (190, 170, 35°C), Tch=90°C, z=-0,95, SD=0,27, n=105%
396<P<401 bar



Matériaux 1185A 1000
Materialen 1185A 1000

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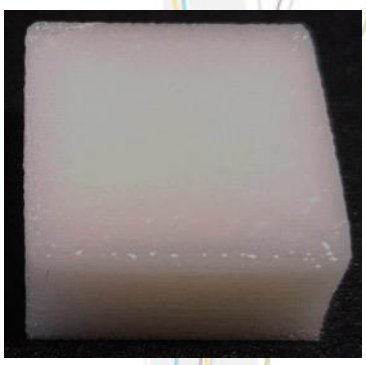
Tb=200°C (190, 180 35°C), Tch=80°C, z=-0,9, SD=0,27, n=100% 370<P<410 bar Plaque support = ABS/PA

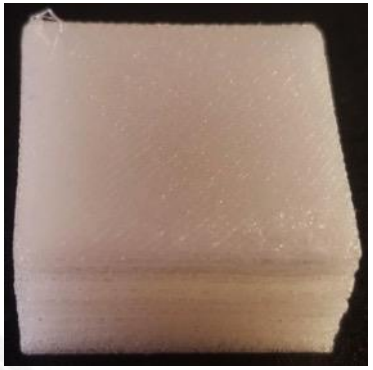


Tb=200°C, Tch=60°C, z=-0,9, SD=0,27, n=100% 370<P<410 bar Plaque support = ABS/PA

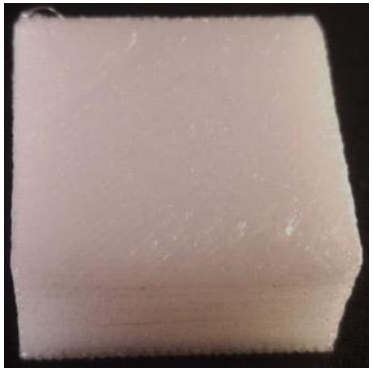
Tb=190°C (180, 170 35°C), Tch=60°C, z=-0,9, SD=0,27, n=100% 455<P<506 bar

Tb=190°C (175, 170 35°C), Tch=60°C, z=-0,9, SD=0,27, n=100% 499<P<530 bar

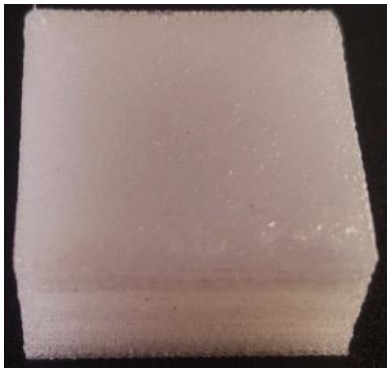
Tb=200°C (190, 180 35°C), Tch=30°C (porte ouverte), z=-0,9, SD=0,27, n=100% 372<P<391 bar



Tb=200°C (175, 170 35°C), Tch=40°C (porte fermée), z=-0,9, SD=0,27, n=100% 393<P< bar



Tb=200°C (180, 170 35°C), Tch=40°C (porte fermée), z=-0,9, SD=0,27, n=100% 393<P< bar



Matériaux 1185A 1000
Materialen 1185A 1000

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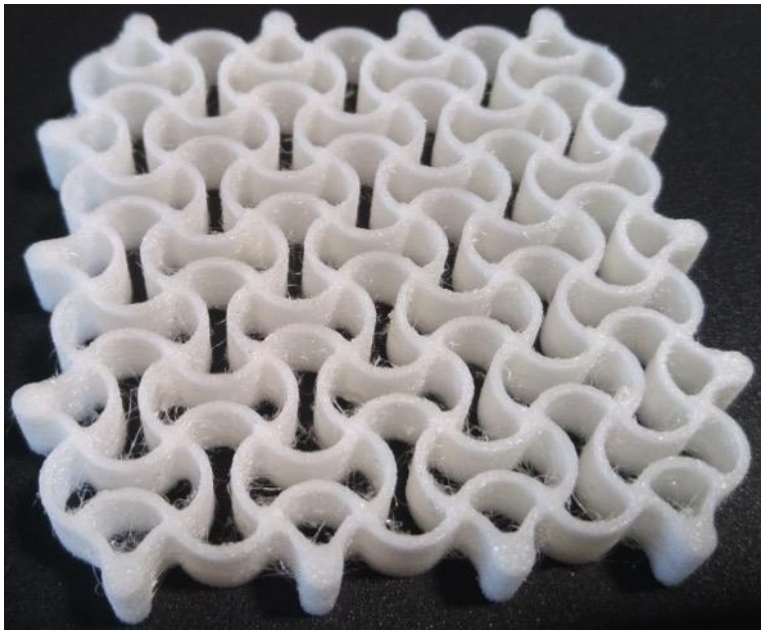
Tb=200°C (180, 170 35°C),
Tch=40°C (porte fermée),
z=-0,9, SD=0,27, n=100%
370<P<420 bar

Tb=200°C (180, 170 35°C),
Tch=40°C (porte fermée),
z=-0,9, SD=0,27, n=100%
370<P<420 bar

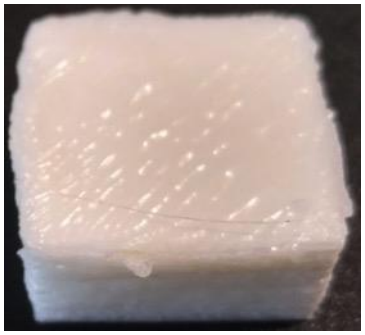


Matériaux 11B64D 1100
Materialen B64D1100

Tb=230°C (220, 210, 35°C), Tch=80°C, z=-0,9, SD=0,27, n=100%
282<P<367 bar
Plaque support = ABS/PA

Tb=230°C (220, 210, 35°C), Tch=80°C, z=-1, SD=0,27, n=100%
340<P<392 bar
Plaque support = ABS/PA

Tb=240°C (220, 210, 35°C), Tch=80°C, z=-1, SD=0,27, n=100%
264<P<322 bar
Plaque support = ABS/PA



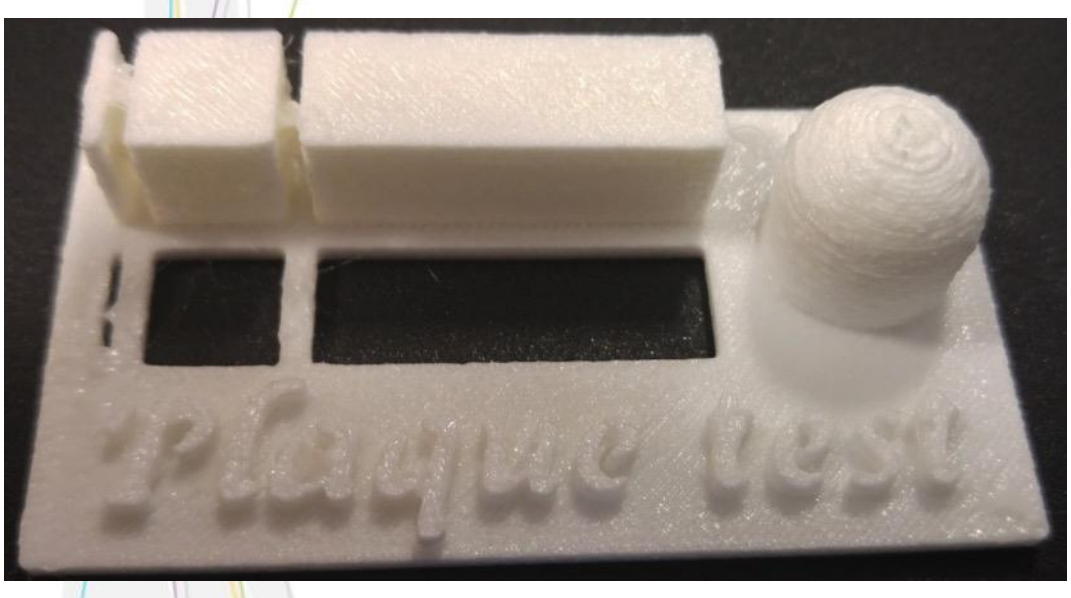
Tb=240°C (220, 210, 35°C), Tch=80°C, z=-1, SD=0,29, n=100%
254<P<305 bar
Plaque support = ABS/PA

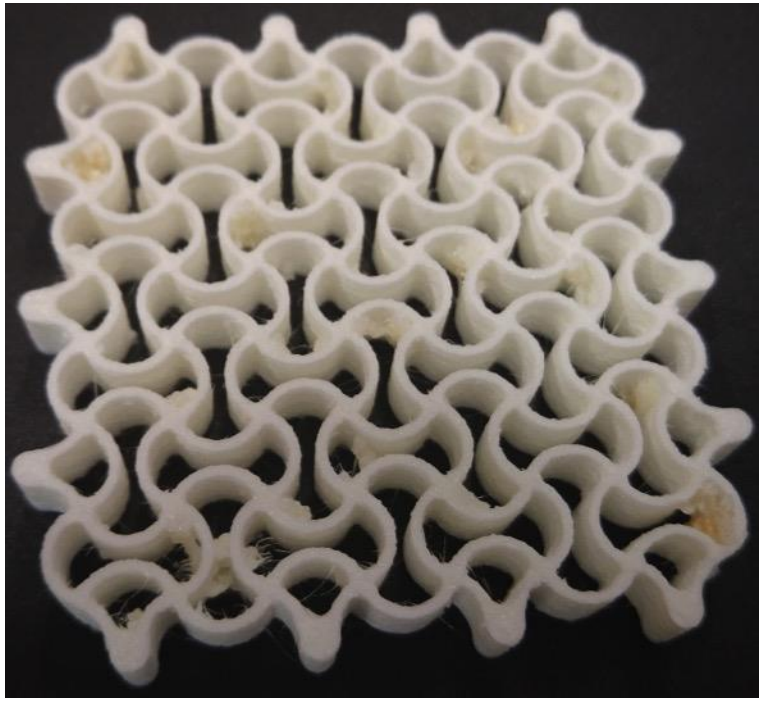
Tb=240°C (220, 210, 35°C), Tch=90°C, z=-1, SD=0,29, n=90%
229<P<288 bar
Plaque support = ABS/PA

Tb=240°C (220, 210, 35°C), Tch=90°C,

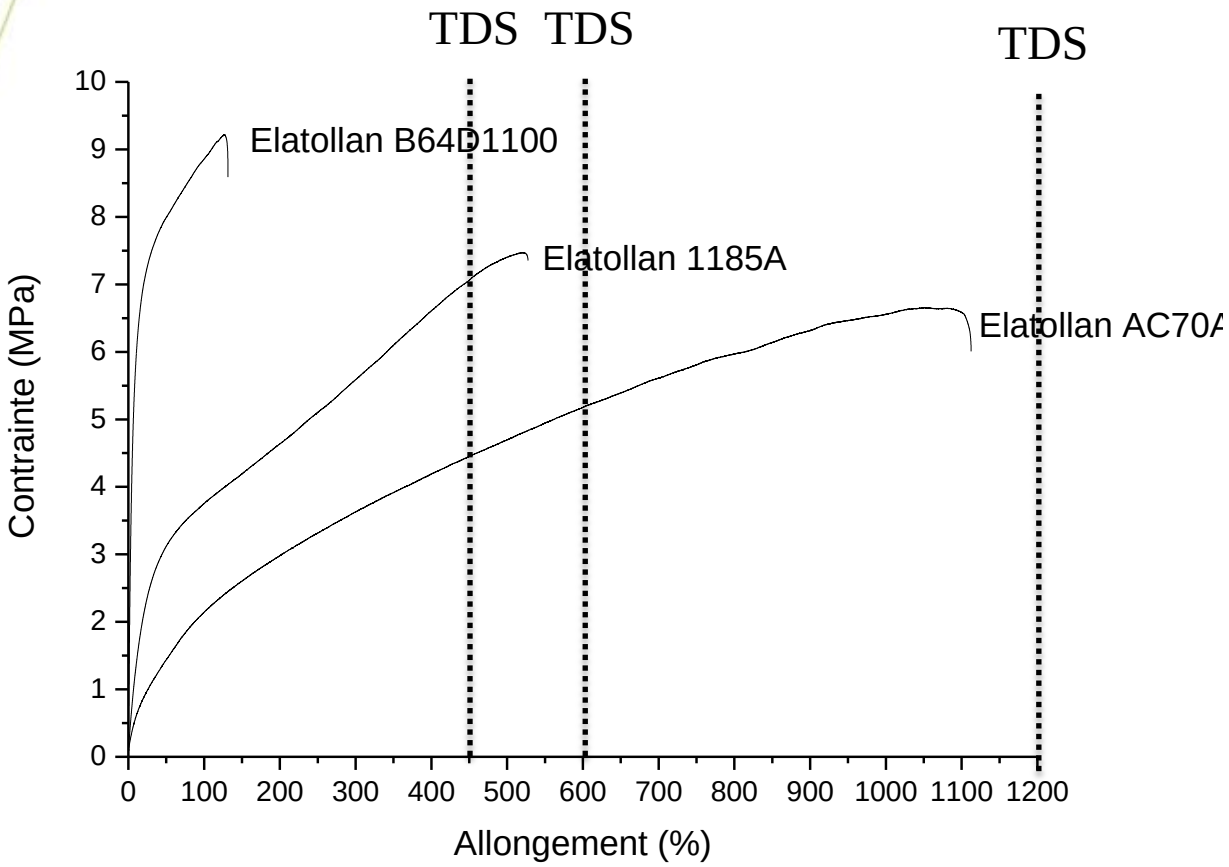
Matériaux 11B64D 1100
Materialen B64D1100

Tb=235°C (220, 210, 35), Tch=90°C,
z=-1, SD=0,29, n=90%
260<P<316 bar
Plaque support = ABS/PA





Essais de traction
trekproeven



Merci de votre attention

Dank u voor uw aandacht

Projectleider
Chef de projet

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KU LEUVEN

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