

## Supplementary Information

### Improving 3D printing sustainability in academic research: a PLA recycling initiative

*Tristan Perodeau, Nazim Boudjerada, Maxime Goulet, Stéphanie Poirier, Audrey Laventure\**

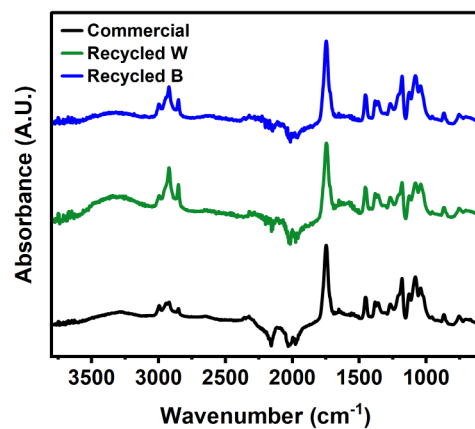
Département de Chimie, Université de Montréal, 1375 Avenue Thérèse-Lavoie-Roux, Montréal,  
Québec H2V 0B3, Canada

**Table S1.** Decomposition temperatures of the recycled and commercial filaments

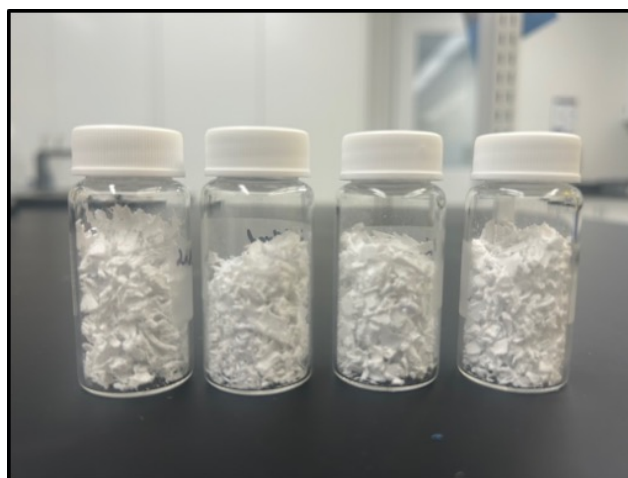
<b>Sample</b>	<b>T<sub>d</sub> (°C)</b>
<b>Commercial</b>	366
<b>Recycled W</b>	363
<b>Recycled B</b>	363

**Table S2.** Thermal transitions and crystallinity of the recycled and commercial filaments

<b>Sample</b>	<b>T<sub>g</sub> (°C)</b>	<b>T<sub>m</sub> (°C)</b>	<b>ΔH<sub>m</sub> (J·g<sup>-1</sup>)</b>	<b>χ (%)</b>
<b>Commercial</b>	66	176	36.14	34
<b>Recycled W</b>	66	178	40.68	38
<b>Recycled B</b>	60	156 / 168	31.63	30



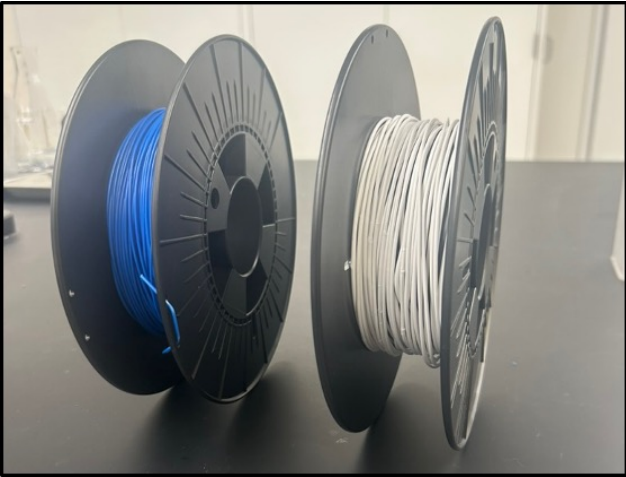
**Figure S1.** FT-IR spectroscopy of the different PLA materials used for the recycled filaments and comparison with a commercial filament.



**Figure S2.** Evolution of PLA granulate size with number of shredding cycles. From left to right, manually shredded, one, two and three shredding cycles with the FelFil Shredder+ instrument.





**Figure S3.** 3D printed particle sieve to homogenise the shredded material before drying and extrusion. The design files associated to the sieves can be found here: <https://makerworld.com/en/models/661908-modular-sieve-mesh#profileId-589154>.



**Figure S4.** Blue and white recycled filaments from the FilUM initiative.




**Figure S5.** Example of a poster advertising the QR code linked to the FilUM webpage, which includes a video explaining the recycling initiative.





## Survey on the FilUM initiative

Lorsque vous envoyez ce formulaire, il ne collecte pas automatiquement vos détails, tels que le nom et l'adresse de courriel, sauf si vous le fournissez vous-même.

1. To what extent do you agree or disagree with the following statements regarding the FilUM initiative? 

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
On the website, I've learned about poly(lactic acid) (PLA).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On the website, I've learned about the environmental issues related to PLA waste from 3D printing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On the website, I've learned about the recycling process of PLA.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The FilUM initiative raised my awareness towards sustainability of PLA.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The FilUM initiative is a good example of circular recycling for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would recommend this initiative to other members of the community.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Do you have any suggestions to improve the FilUM initiative ? 

Entrez votre réponse

**Figure S6.** Survey on the FilUM initiative that can be found on the website.