

## POROLAY-Serie overview:

POROLAY is a serie of experimental filaments, printable with standard printers at about 220 - 240°C.

It's a kind of meta-material with different properties at different stages:

1. in it's delivery form, it's hard and easy to print
  2. after rinsing in water, remaining in water it's very soft and gelly-like
  3. dried it's visco-elastic, depending on quality of rinsing, it will be soft, leather like, or similar as cardbord
- All filaments in delivery-form are stiff and unbreakable, printable with standard home-printers (repraps)
  - All objects are hot-sealable after drying
  - All properties: fibrous, felty, jelly-like, varies from environment (humidity), f.e. if an object is printed and rinsed in water, it is **cuddlesome\***, after drying it is a little more robust than in water
  - Micro-porous means micrometer-dimensions! You may not see the pores with eyes.
  - All POROLAY-objects may filled not only with water, try to use emulsions of oil, glycerine, inks, salty solutions, or ionic liquids to make it conductive !
  - use it to transmit electronic signals by electric current, , fill the pores with an electrolyte (f.e.salt water, or ionique fluids)
  - us it as membranes in electro-cells
  - the rinsable components of POROLAY are biocompatible (PVA is even often used as food-packing material, and the remaining porous part is also a harmless polymer)

### \* An analogy:

Put an soft piece of leather in water and feel it between fingers, it's more soft and snuggle than in dry condition.

Why? The water in the pores reduces the friction inside pores and between the felty fibres.

	press or video release	theme
1	<a href="http://www.3ders.org/articles/20131222-printing-porous-and-fibrous-3d-objects-with-new-filament-line-poro-lay.html">http://www.3ders.org/articles/20131222-printing-porous-and-fibrous-3d-objects-with-new-filament-line-poro-lay.html</a>	announcing the POROLAY line of Filaments, with it's features
2	<a href="http://www.3ders.org/articles/20141006-3d-printing-a-sponge-using-layfomm-filament-flexible-viscoelastic-properties.html">http://www.3ders.org/articles/20141006-3d-printing-a-sponge-using-layfomm-filament-flexible-viscoelastic-properties.html</a>	printing sponges and about visco-elastic properties
3	<a href="https://www.youtube.com/watch?v=Pkaus3DN2w0">https://www.youtube.com/watch?v=Pkaus3DN2w0</a>	PORO-LAY / print porous & fibrous objects / foam, felt, jelly / a new 3D-Filament / 2013
4	<a href="https://www.youtube.com/watch?v=2w-9KvBHago">https://www.youtube.com/watch?v=2w-9KvBHago</a>	3D printed sponge by LAYFOMM filament / and visco-elastic propertiess
5	<a href="http://www.3ders.org/articles/20141027-german-scientists-turn-to-3d-printing-technology-to-create-artificial-textiles.html">http://www.3ders.org/articles/20141027-german-scientists-turn-to-3d-printing-technology-to-create-artificial-textiles.html</a>	Titel: German scientists turn to 3D printing technology to create artificial textiles

## POROLAY-Serie / Filament-Versions:

<p><b>LAY-FOMM 40</b></p> <p>Print at: 220°-230°C heated bed (Capton) may be cold to 50 °C</p>	<p>After rinsing:  <b>micro-porous &amp; elastic</b>          for printing soft rubber objects with something about ShoreA40</p> <p>the filament is made from an rubber-elastomeric polymer and a PVA-component, that you rinse out with water, the rubber polymer remains as your micro-porous object</p>	<ul style="list-style-type: none"> <li>• Rubber-like things</li> <li>• Dampers</li> <li>• Stretchable bands</li> <li>• "40" stands for very soft rubber</li> <li>• = Shore A 40</li> <li>• see the pic with the printed " X ", after printing and after rinsing with water</li> <li>• print sponges with FOMM 40</li> </ul>
<p><b>LAYFOMM 60</b></p> <p>Print at: 220°-230°C heated bed (Capton) may be cold to 50 °C</p>	<p>ShoreA60,          (more stiff than Shore40)</p>	<p>as above,          but Shore 60,          (more stiff than Shore40)</p>
<p><b>GELLAY vers.505</b>          (stiff jelly like)</p> <p>Print at: 230°-240°C heated bed (Capton) 80 °C</p>	<p>After rinsing:  <b>if wet: jelly-like</b>  <b>if dry: stabil, not elastic, but bendable</b></p>	<ul style="list-style-type: none"> <li>• f.e. floatables</li> <li>• marine animals</li> <li>• body parts</li> </ul>
<p><b>LAYFELT</b></p> <p>Print at: 230°-240°C heated bed (Capton) 80 °C</p>	<p>After rinsing:  <b>like orientated felt, stabil, not elastic, but bendable</b></p>	<ul style="list-style-type: none"> <li>• to print stabil fibrous objects, f.e. water treatment membranes, in eletro-cells</li> <li>• bendable felty fabrics</li> </ul>

**Design rules:** print less walls/shells and less filling%, to shorten rinsing time

**Please be clement with me, I don't give further support or other help. It's an experimental filament for science and other intelligent users. Use social communities to change your experiences.**

**POROLAY - by Kai Parthy 2014**

### **Rinsing with water:**

- carefully rinsing with water (best warm) is the key for good results,
- latest after 1 day you will clearly see the effect of changing in stability,
- after 3 days all soluable PVA component may rinsed out (if you did proper)
- stirr and
- change water from time to time
- if available, use an ultrasonic cleaner
- optimal cleaning effect with using a house-hold spin-dryer (removes remaining water)
- multiple times: fresh water > wait > spin-dryer > fresh water > wait > spin-dryer
- remaining PVA feels little sticky like sugar-sirup between fingers
- remove all PVA,
- if not, your object will not be soft as desired (PVA is a hard component)

**Best printing results you get with dry filament !  
In doubt dry filament in oven at max. 100°C/212F for 4-5 hours.**