




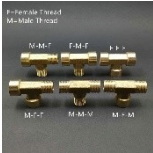










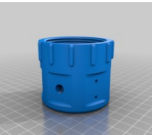
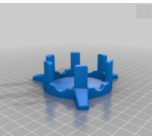
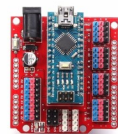



Procedure for manufacturing a standard tubular test cell.

T33 Water Filter Cartridge Housing.		Example
Waterproof cable gland M8*1.5.		Example
Optional Nylon Pneumatic Blanking Plug 4mm Hose Tube Push Fit Connector Air Line		Example
MPX5500DP PACKAGING SIP 6 pressure sensor.		Example
6*4mm polyurethane pneumatic hose .		Example
Various 1/4" BSP Thread Tee Type 3 Way Brass Pipe Fitting		Example
Brass Hex Bushing Reducer Pipe Fitting 1/8" → 1/4"		Example
4mm Long Hose Barb x 1/4" Male BSP Thread Brass Barbed Pipe Fitting		Example
0~30psi 0~2bar 40 Diameter Fuel Air Compressor Low Pressure Meter.		Example

1/4" mini brass ball valve BSP male to female.		Example
1/4" 8KG BSP Air Compressor Safety Release Valve Pressure Relief.		Example
DS18B20 Stainless steel package Waterproof (These will have to be adapted to improve waterproofing see below)		Example
Heat shrink tube		
4mm Banana Plugs Socket Connector		Example
Thread sealant		Example
Teflon tape		
Epoxy resin.		
Stainless steel tube 304L or 316L: Outer tube 16x2mm or 14x1mm ; 100mm length. Inner tube or rod ext diameter 10mm ; 110mm length. The goal is to get a 1 mm gap between outer and inner tube.		
T33 cell : Bottom, Stand and cap spacer https://www.thingiverse.com/thing:4781212 The bottom and the tubes cap spacer have been designed for 16x2mm outer tube and 10mm inner tube. Ask for different dimensions.		
		

			
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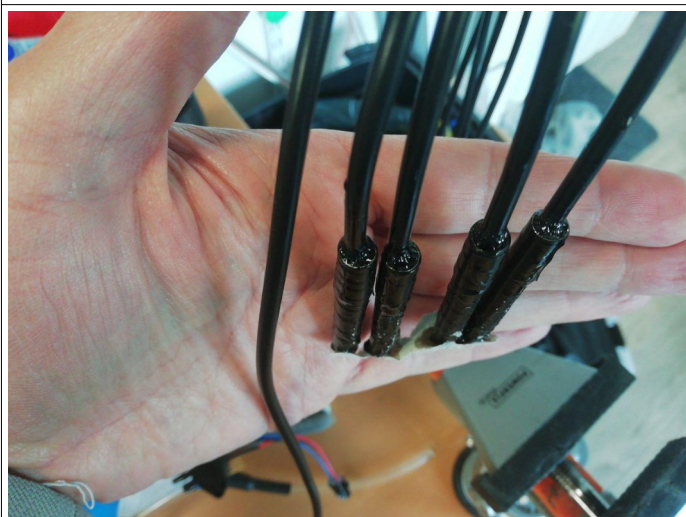
Arduino nano/uno and expansion shield		
ADAotp (Analog Data Acquisition of the poor) https://github.com/scarou/ADAotp		

Sealing of the DS18B20 temperature sensor:

The DS18B20 must be sealed with epoxy resin otherwise, the water will leak through the cable due to the pressure inside the cell chamber.



1- Remove the heat shrink tube protection.



2 - Protect the stainless tube with masking tape and pour the tube with epoxy resin.



3 -Once dry, remove the masking tape.



4 – In order to keep it clean replace the heat shrink tube.



5 – The DS18B20 is now ready to be used in a pressurized vessel.

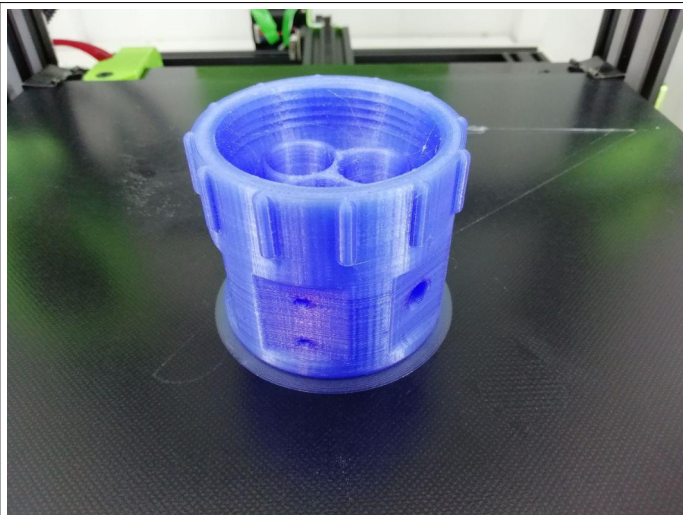
T33 Bottom waterproofing:

In order to resist to the pressure and avoiding leaks, the bottom need to be filled with epoxy.

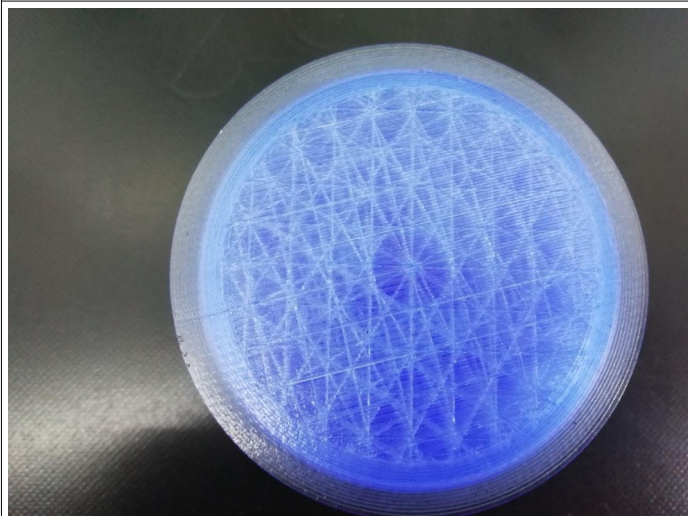
The printing wall thickness needs to be 5 walls in order to get a strong threaded part.

It needs only one 1st layer because it will be removed later. (But at least 1 layer for bed adhesion purpose).

To improve bed adhesion, print with an additional skirt.



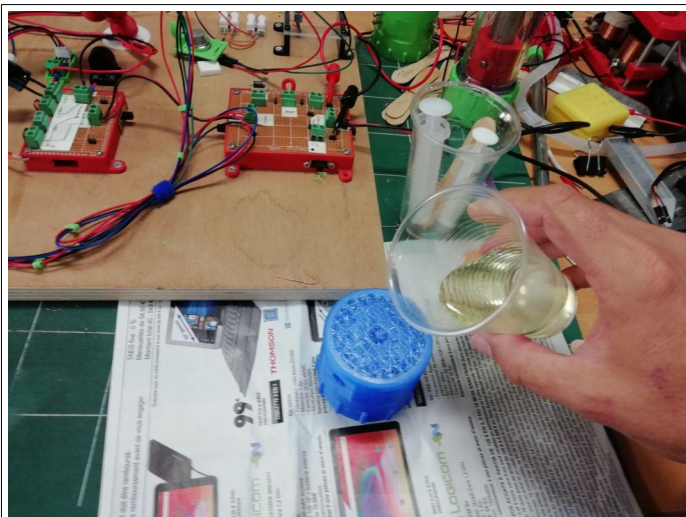
1 - Print the bottom.



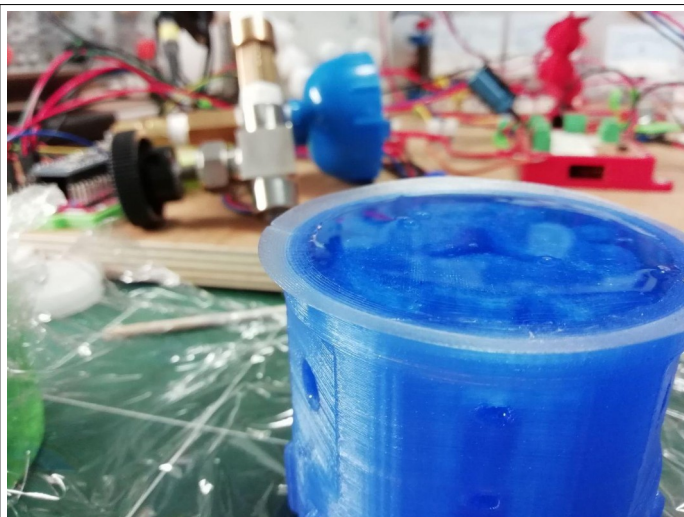
This type of infill is not necessary. Any kind of infill will allow epoxy to flow and pour the part.



2 – Remove the bottom layer.



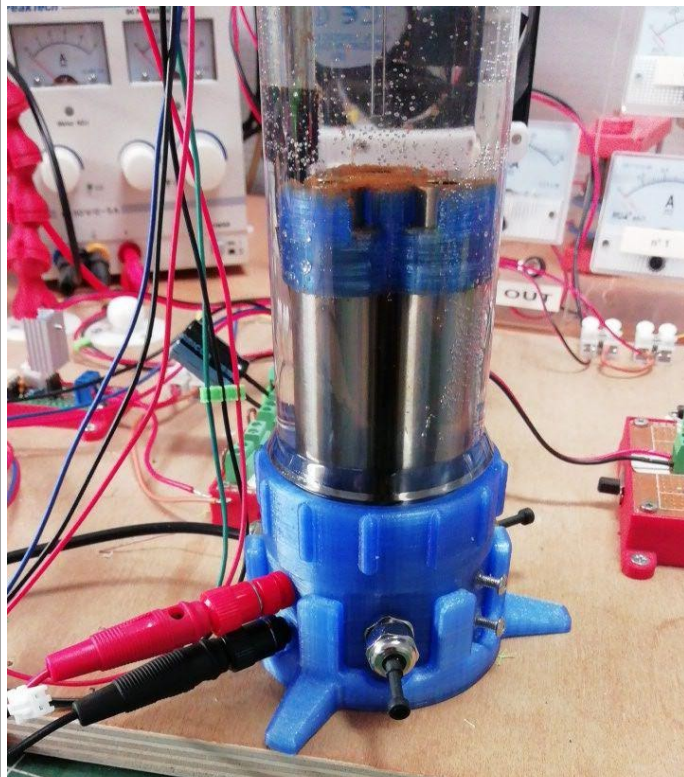
3 – Pour the cap with epoxy resin.



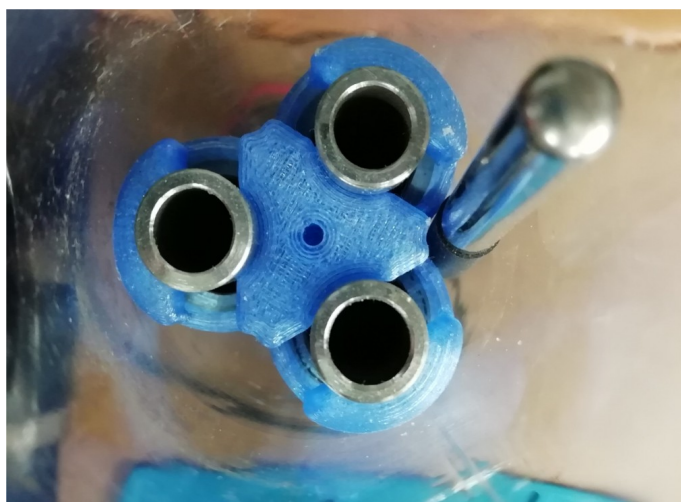
4 – Take care that the epoxy don't leak throw holes. In some cases, it will be useful to plug the orifices with silicone which will then be removed.



5 – Allow it to harden completely before attempting to use it.



6 – Install the different connections and fittings.



There's many way to connect each components, here is an example of the parts I used:

