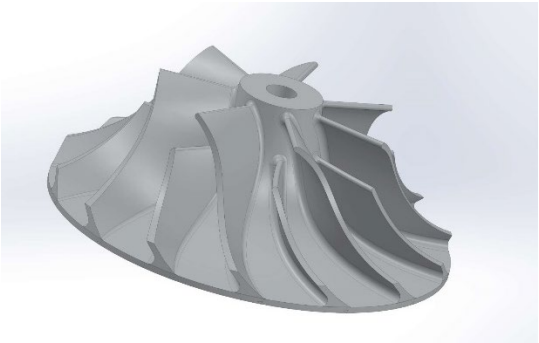
JMS Filament Dryer test – wet and dry filament

To verify and demonstrate the efficiency of the device, we ran a test using the worst-case scenario: the filament spool sitting in water, then passed through the dryer prior to insertion into the extruder gear. Prior to start printing, we allowed 24h soaking time of the filament spool. We wanted to use a full 1kg spool, but it had a strong tendency to float; we had to settle for half the spool and anchor the support to the bottom with 2lb of aluminum bars.

The CAD model used is a 67mm radial compressor wheel. This part has mostly thin 3D curved surfaces. It would show any weaknesses and flaws in the quality and conditioning of the consumables, as well as in the setup and the ability of the printer to tackle this job.

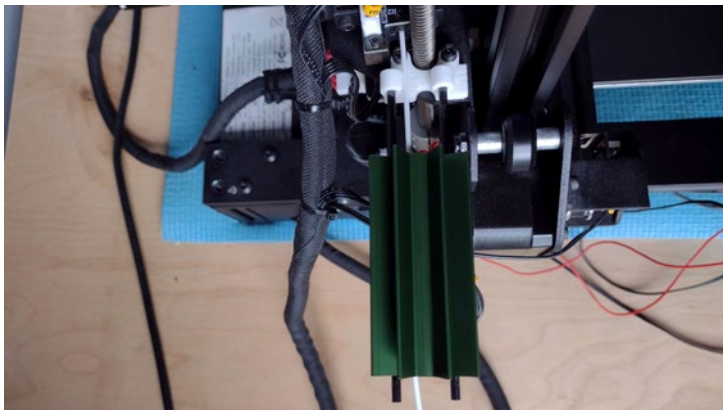


The time necessary to complete the job was approx. 3.5 hours. This was long enough to gauge if the whole process was consistent. The filament chosen was ABS, for its known affinity to absorb moisture and first layer adhesion difficulties.

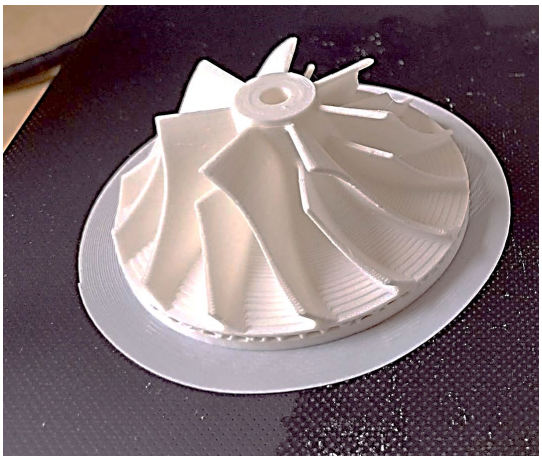
The test with dryer

3D print machine**: LONGER LK5 PRO**
Slicer**: CURA 4.8**
Material: **INLAND ABS 1.75mm, 220 - 260°C**
Settings:

- Nozzle: 0.4 mm, standard quality - 0.2mm
- Nozzle temperature: 250°C
- Print bed temperature: 100°C
- Dryer temperature setting: 96°C
- Print time: 3.5 hrs



The finished part

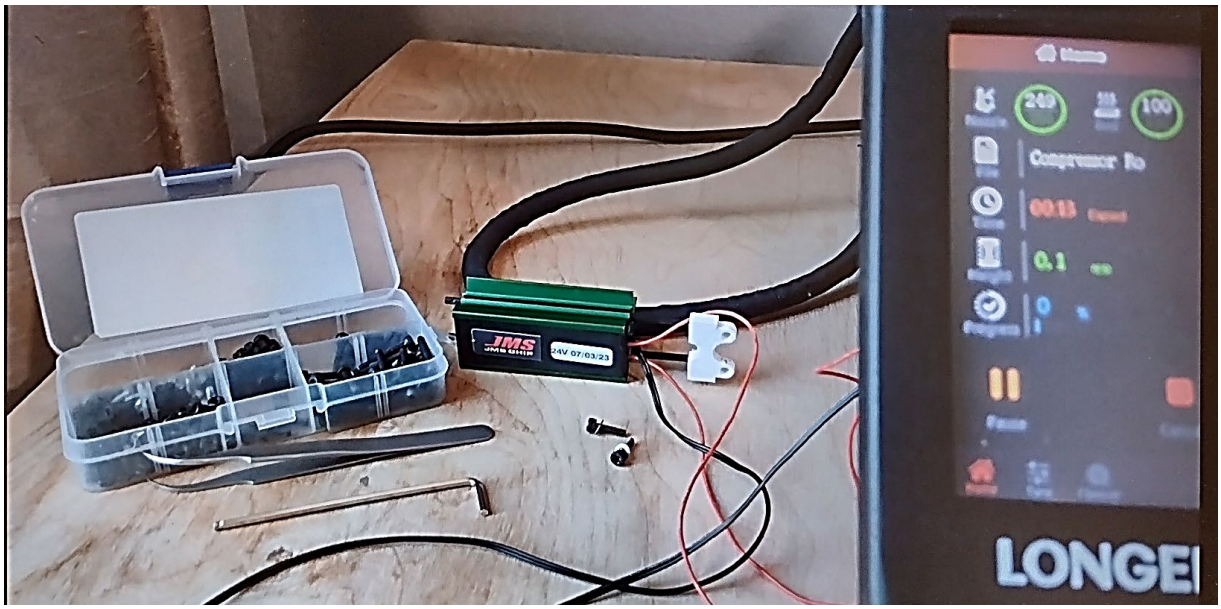


Off the print

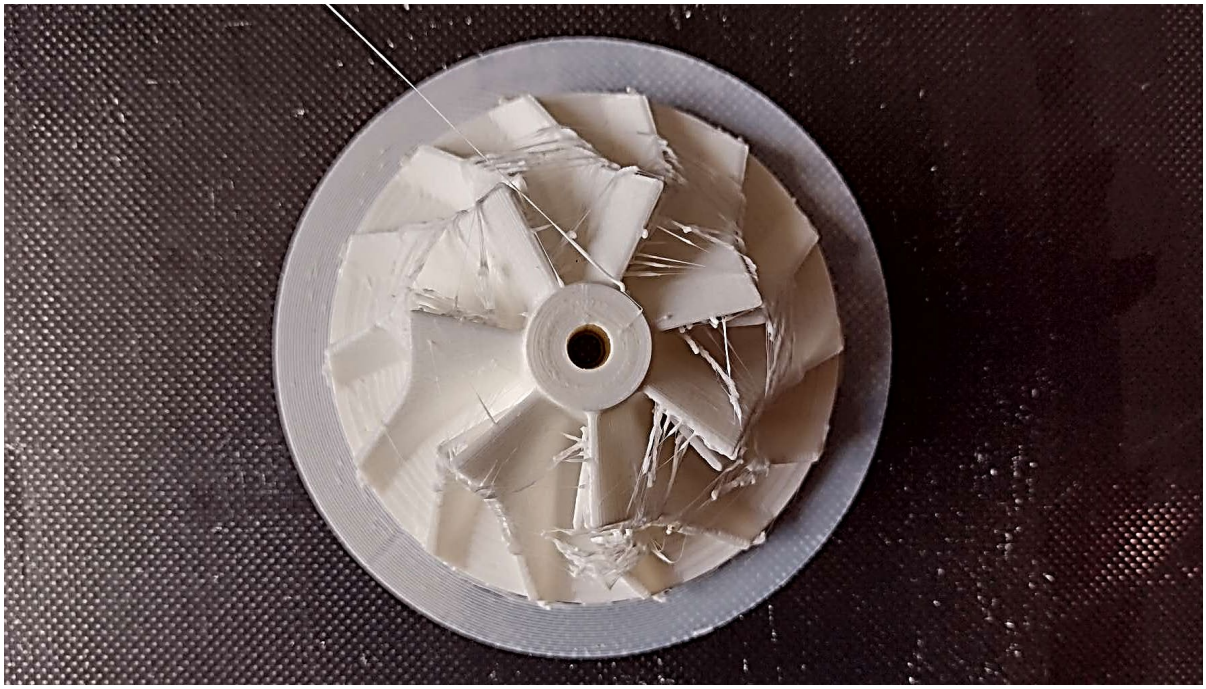
Cleaned and support removed

The test with dryer removed

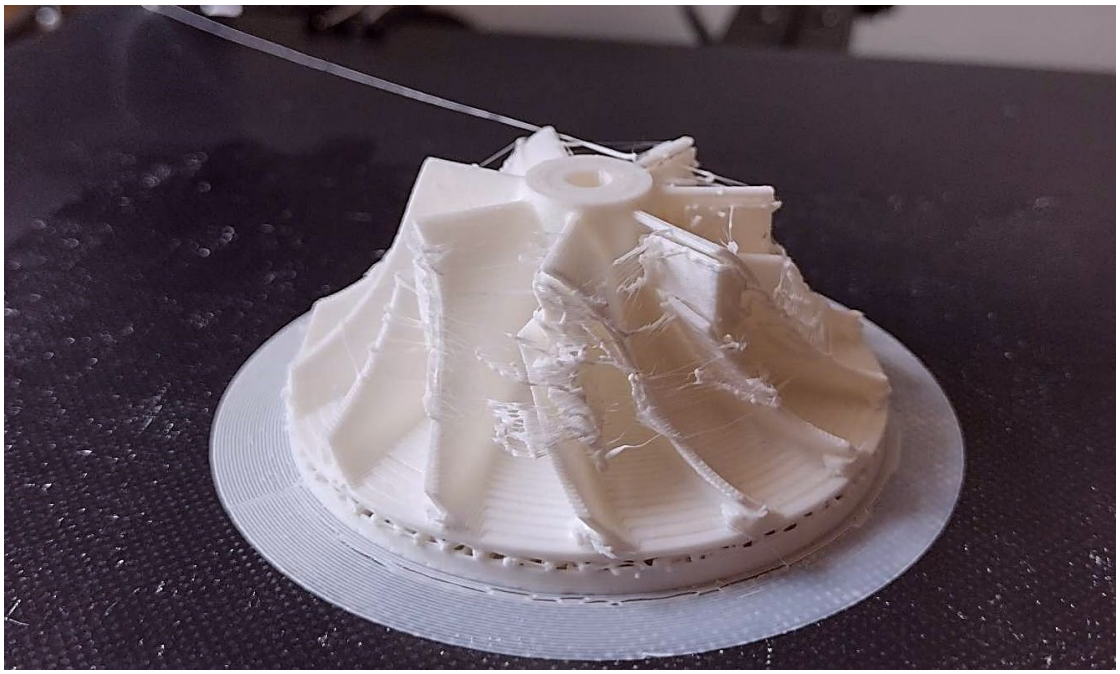
We printed the same part again, with the same settings and same material; this time the drying was device removed, but the filament spool remained submerged.



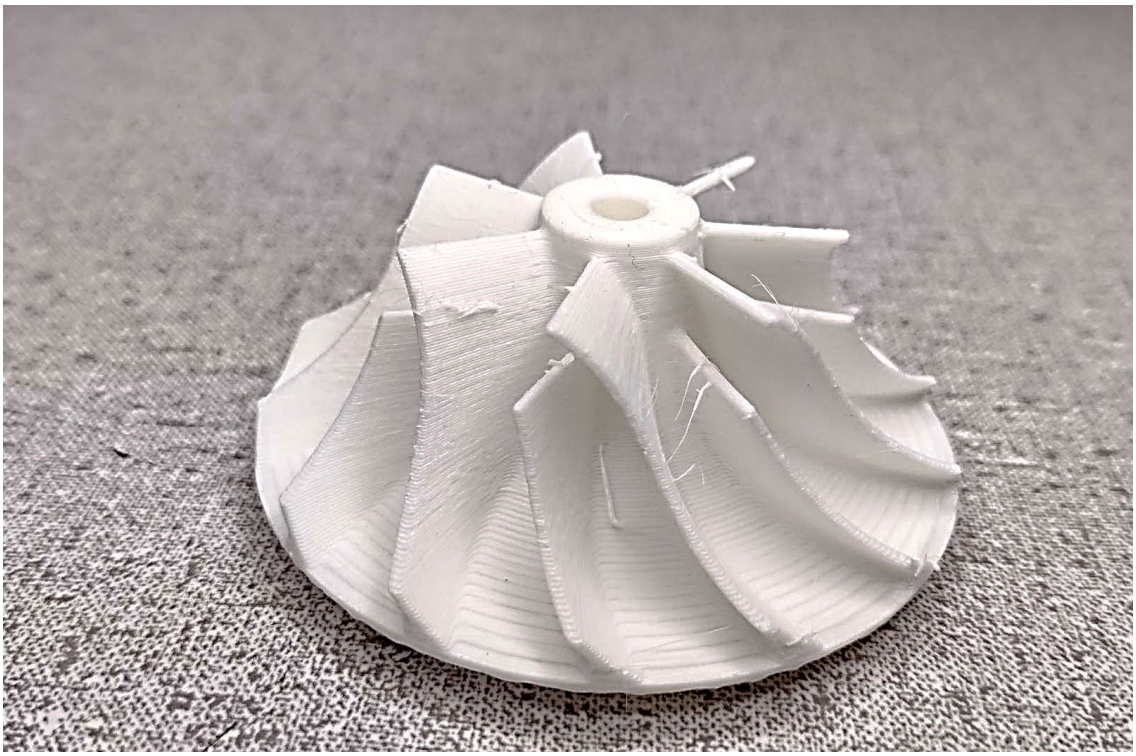
At the end of the print job, the part looked like this:



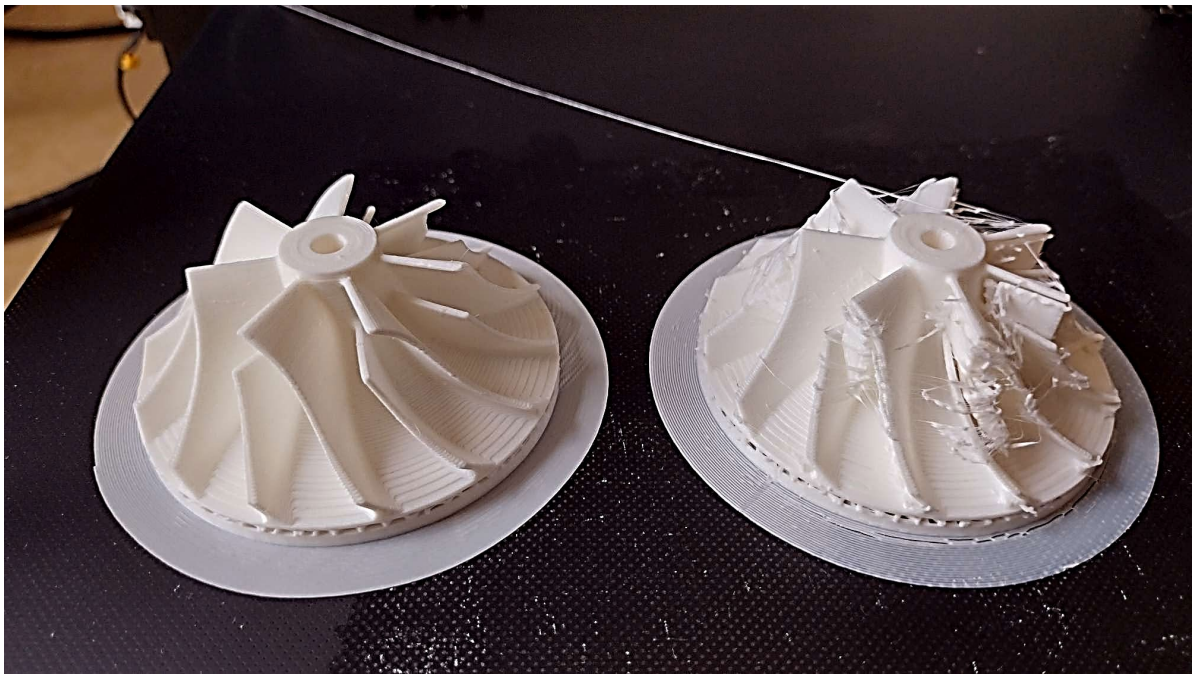
Here is another view:



The part after cleaning:

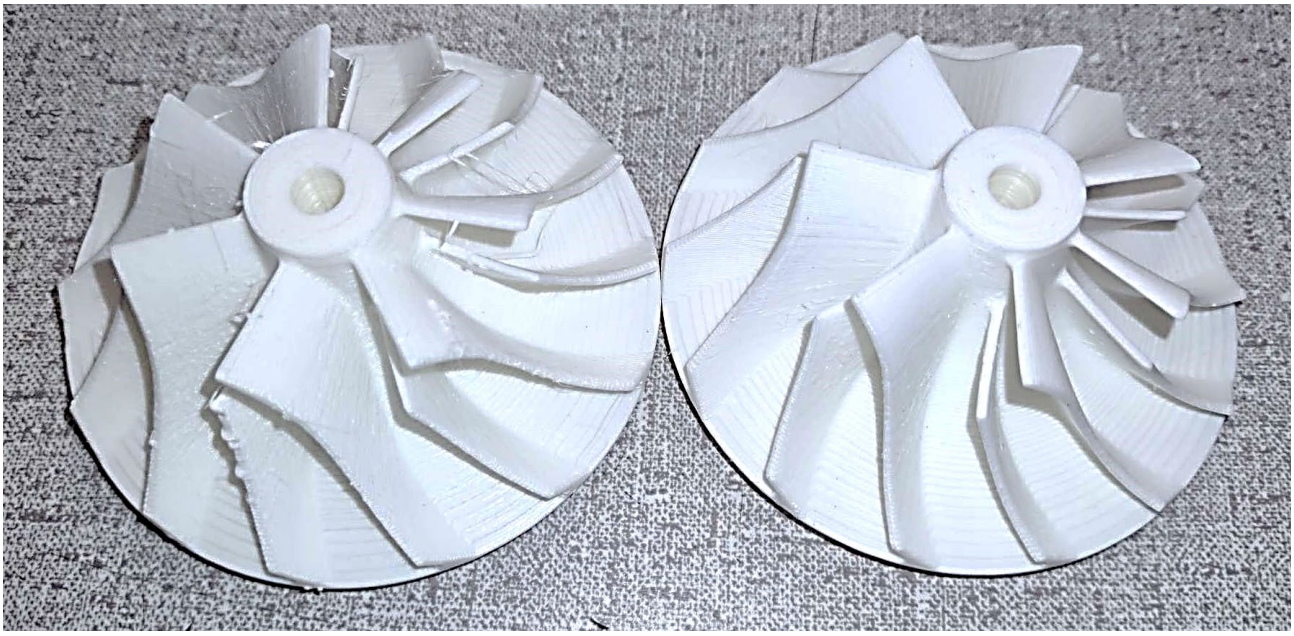


Comparison side by side, as printed:



With Dryer device Without Dryer device

Comparison side by side, both parts cleaned and support removed:

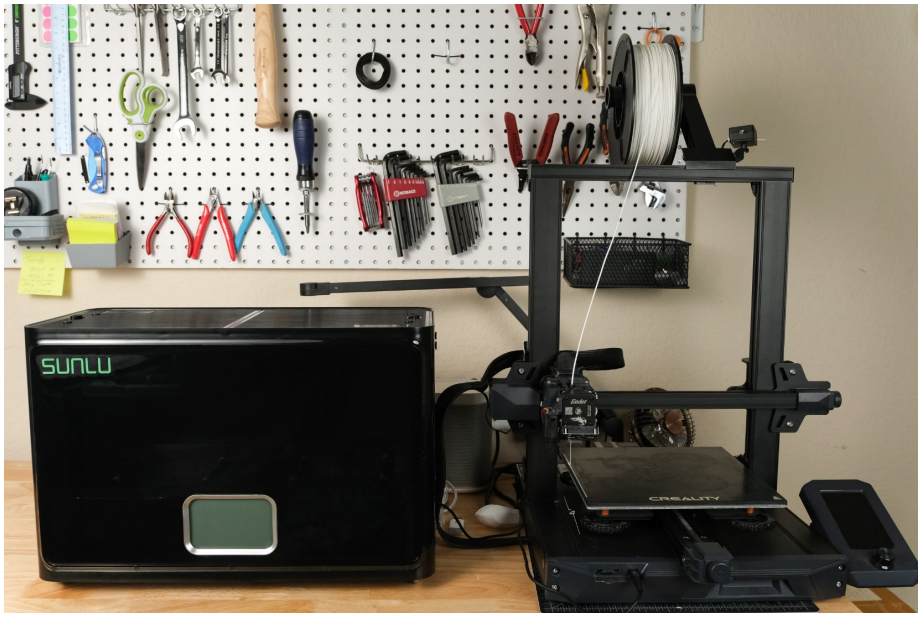


Without Dryer device With Dryer device

The difference in quality is clearly visible. Although both tests were abusive, with moisture beyond the average amount a filament spool would absorb in normal conditions, we were able to print a flawless model using our drying device.

Competition – example

Our competitors use mostly drying boxes. The main disadvantages are, in our view, the size, the power draw and (more important) the drying time: you will need to plan in advance your jobs anywhere from 5h to 3 - 4 days, as those dryers dehumidify one or more spools. Our product does it “on the fly” and it does it very well. We printed countless functional parts which required high strength and durability. Without this little “gizmo”, it would have been a lot more difficult.
Below, one of the latest filament dryers (not even released yet):



Sunlu FilaDryer S4

https://www.crealityexperts.com/sunlu-filadryer-s4-review

This is a large unit, at 18” wide, 8.75” deep, and 12” tall (457 x 222 x 305 mm). The maximum power draw of the machine is 433 W, but once the machine is heated up, it consumes power at a rate of 77 watts per hour.

Our product needs only 12W at 24V, is 100mm long, weights 56 grams (less than 2oz), runs on power from the 3D printers’ PS, and it is activated for the duration of the print job only.
Pictures below: