Documentation

UV-DLP Printers available in markets (Outside India)-

- **LumiPocket -**
  - Printing area of 10cm diameter, 10cm tall. Printing materials- resin similar to PLA, ABS, Ceramic filled resin.
  - Best tested Projector (AcerP1500) and recommended resin (FuntToDo IB), the curing time per layer can be as low as 0.7sec with a printing area of 10x5cm.
  - With a ~320$ projector like the Optoma DX325 or the Acer x1240/60, curing time per layer is about 3-7 seconds.
  - Reliable and requires little maintenance (no disposable vats and expensive non-stick coating)- Projecting from above removed the need for a special vat and it will double its function of printing vat and resin container with its cover for storing the resin. We can have one for each type of resin and changing material on the printer is as simple as swapping the vats.
  - Cross platform software that takes care of everything (slicing and printing).
  - Supports the newest input technologies like **the Leap Motion**, and innovative device able to track your gestures and hands movements, providing a new way to explore and model 3d objects.
  - The software provided is retro-compatible with LumiFold, and also add support for **HoloDock,** a visualization device. The program also assists during the calibration of the projector.
  - Offers different resins- from a standard version (fast curing) to an industrial version (extra hard, castable resin)- Designed to cast the pieces in bronze, copper, tin or iron using 'Standard vacuum investment casting methods' and setting (With FunToDo Castable Resin).
  - Precision parts- IGUS miniature nuts and Misumi linear shafts
  - Available colors- Black & Red, since they offer the best quality and printing times.
  - Software compatible with windows, OsX and Linux

Technical specifications

LumiPocket

Technology	Stereolithography (DLP)
Printer Dimensions	8 x 8 x 28 cm
Build Volume	100 x 100 x 100 mm
Layer curing time	3000ms-8000ms
Resolution X, Y axis	50/100 microns (depending on the projector used)
Resolution Z	50/100 microns
Electronics	Arduino Micro
Resins tested	SpotGP, FunToDo

LumiKit

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Includes	Finishing tray, a set of tweezers, 2 scrapers, protective gloves and glasses.

- **LumiFold**

- **LittleDLPer (Created by Brad Hill)** - with a build volume of 60mm(X) x 40mm(Y) x 100mm(Z) (2.3" x 1.6" x 3.9"). According to the project's site, it takes about 2 minutes to print 1mm with a layer height of .05mm. So, "a 40mm tall object would take approximately 80 minutes to complete."

- **LittleRP (New version of LittleDLPer/LittleSLA)-** Focuses on smaller high quality prints, thus avoiding the requirement of complicated peeling mechanism. Laser cut materials and standard T-Slot extrusion means building your won from scratch, or simply modifying an existing LittleRP is an exercise you can take on yourself! Inexpensive quality stereo lithography prints are possible because of using high quality components such linear slides and integrated leadscrew steppers.

- **MoonRay-**
    o Uses proprietary UV light engine that runs much cooler and quieter than a typical projector engine, thus it lasts longer.
    o Auto-pilot operation- With automation support generation, we don't have to worry about building the support for the product. The support is done in only 1-2 minutes and we have more time left for decoration.
    o Aesthetic, honest and efficient design. Size- 15"x15"x20".
    o Comes fully assembled, making setup simple. There are no moving parts, no hinges, simply take the lid off and we are set.

Technical Specifications

Let's talk numbers.

Technology	UV Digital Light Processing (DLP)
Build Volume	5 x 3.2 x 9 in
Resolution	100 Microns X,Y / 20 Microns Z
Min Layer Thickness	20 - 100 Microns
Projector Life	50,000 Hours
Printing Speed	1 in/hr
Printing Material	UV Resin (Normal/Castable)
Curing Light Wavelength	405nm
Support	Automatic, Mesh
Operating System	Mac / Windows

20in

15in   15in

- **LemonCurry** (https://code.google.com/p/lemoncurry/wiki/main)
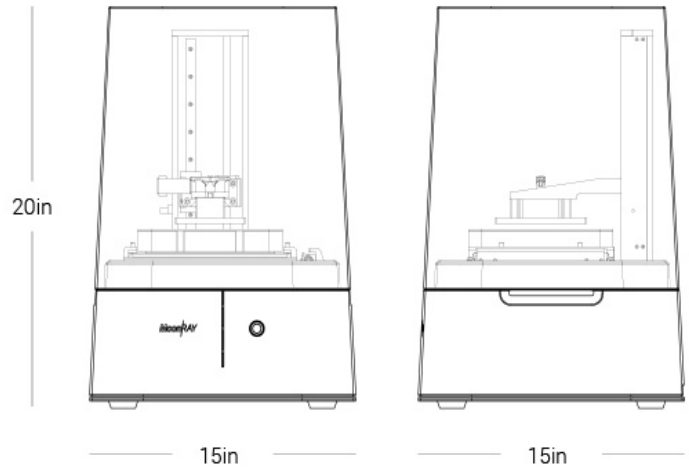
Lemon Curry Print Rate and Time Calculator

Input Values are in Black   Results are Shown in Blue

Layer Thickness	Exposure Time	Print Length Z-axis		Print Time	Print Rate
Microns	Seconds	mm		In minutes	mm/minute
1	0.2	50		166.667	0.3
10	0.2	50		16.667	3
100	0.2	50		1.667	30
1	1	50		833.333	0.06
10	1	50		83.333	0.6
100	1	50		8.333	6
1	2	50		1666.667	0.03
10	2	50		166.667	0.3
100	2	50		16.667	3
1	10	50		8333.333	0.006
10	10	50		833.333	0.06
100	10	50		83.333	0.6

- **Solus3D**

SOLUS Dimensions: **180x156x290mm**

Print Area at 25XY Resolution: **48x27x80mm**

Print Area at 41XY Resolution: **80x45x80mm**

Layer Thickness: **100 microns down to 5 microns**

- o Precision lead-screw with a professional-grade anti-backlash nu THK bearings, quartz optical path, and solid 15mm CNC'd aluminium build platform ensure print quality and ease of use.

- o Runs Creation Workshop software

Non-Sticky Surface

1. www.sciencedirect.com/science/article/pii/S0257897214007075
   A hydrophobic coating on glass surface was fabricated by application of **silicone oil lubricant and activated using a microwave atmospheric plasma jet**. Optimization of the treatment was done by variation of the working gas flow rates, input microwave power and plasma treatment time, based on contact angle measurement.

   In comparison with the untreated glass (**37.6º**), result show that at best discharge conditions of 600W microwave power, 5/0.5 LPM Ar/N2 flow rate and 10s treatment time, the plasma-treated glass obtained a water contact angle of **105.7º**. Surface energy of the glass also decreased from 45.06 mN/m for the untreated to 27.97 mN/m after plasma treatment. Atomic Force Microscopy (AFM) and Fourier Transform Infrared (FTIR) spectroscopy results suggest that increased RMS roughness and introduction of hydrophobic species may have been responsible for the hydrophobicity of the glass surface.

Modifications-

- Single strands instead of double
- Movable base stand & projector mounted on same side
- To demonstrate the printed part, the stand can be moved alongside. So the height is reduced considerably.
- Change the alignment of projector
- Preventing resin from getting solidified. Keep in protected environment (or we can cover up the design with transparent glass)