CG-1 running cost calculation

Health Warning – The information in this document is based on data recorded over 3 months printing a variety of model types on three CG-1's printing 24 hours a day 5 days a week.

This document details first the average consumables cost, then the average printed layer cost. Using both these figures allows us to calculate an estimated price per model. By using this approach to cost modelling the main driver of a models cost is the time it takes to print.

Consumables cost

At CleanGreen3D we print a variety of models, of different colours, shapes and sizes. This gives us a great insight into the average consumables cost of running a CG-1 printer.

The below table shows estimated monthly running cost (we will look at the costing of individual models later in this document). The table assumes the printer is in use 24 hours a day 5 days a week.

Estimated Monthly Running

Consumable	Quantity	€	£	$
Paper - roll 256 meters	2.5	€68.75	£ 60.50	$ 83.19
Colour Ink - cartridge	3	€165.00	£ 145.20	$ 199.65
Black Ink - cartridge	1	€55.00	£ 48.40	$ 66.55
Glue - 1 litre	0.33	€8.25	£ 7.26	$ 9.98
Blade	0.33	€8.33	£ 7.33	$ 10.08
Electricity - kw hour	42.00	€10.13	£ 8.92	$ 12.26
	Total	**€315.47**	**£277.61**	**$381.72**

Model cost

To measure precisely the many variables that contribute to the costing of an individual model is difficult. The main contributing factors are consumables, paper, glue and ink. 3D models are sliced into layers, by the Orange Slicing software. The most efficient way to calculate the cost of a model is to multiply the number of layers by an average price per layer. The above table shows the average monthly consumables cost of running a printer 24 hours a day 5 days a week. The average time to print one colour layer is 4 minutes. The below table calculates the average number of layers that can be printed in a month. By dividing one by the other we calculate the average price per layer.

5X24hr Operation Model

	Mono	Colour
Minutes available per week	7200	7200
Avg Minutes / Layer Built	3	4
Layers per week	2400	1800
Efficiency	90%	90%
Delivered layers per week	2160	1620
Layers per month	9000	6750
Cost per layer	**€ 0.01**	**€ 0.05**

Notes

1. Monthly consumption is estimated based on our experience in our printer lab with 3 printers over 6 months working 5X24hr.

2. You could improve cost performance by multi loading models, but this might impact efficiency if you're waiting for a full load before printing.

3. If you build a mix of Mono and Colour models the layer cost will improve.

4. Efficiency in operation assumes you lose 10% of available build time.

Example model prices

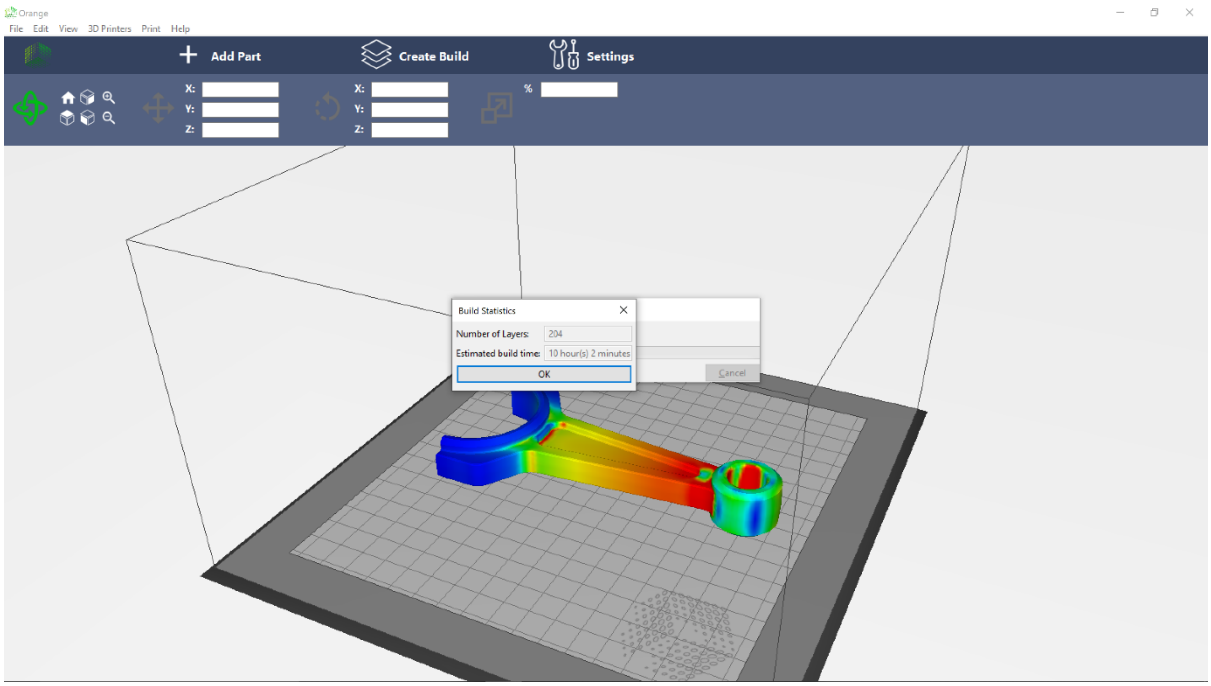
Conrod

Model dimensions 130.5mm x 66.7mm x 20mm (x,y,z)

204 layers

Estimated build time 10 hours 2min

Estimated cost €10.20



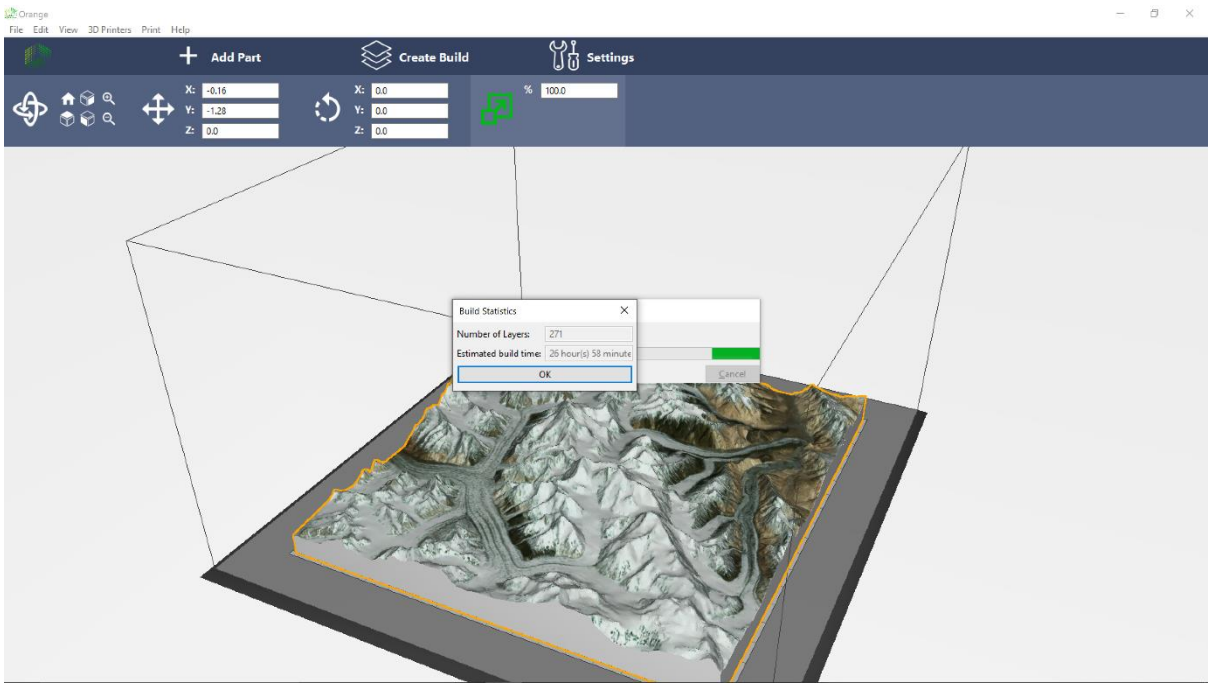
K2 Map

Model dimensions 164mm x 180mm x 22.1mm (x,y,z)

271 layers

Estimated build time 26 hours 58min

Estimated cost €13.55



Toad

Model dimensions 65.8mm x 73.2mm x 50mm (x,y,z)

505 layers

Estimated build time 18 hours 37min

Estimated cost €25.25