

PRINT ESTIMATION

Tutorial_V4 - Updated: 13,0600,1489,1629(SP6)





With 3DXpert, it is possible to get an estimation of cost and time at any stage during the design, also before slicing is executed.

On screen real-time material and time estimation are displayed as you work, values dynamically updating as you add material, supports and lattices.

In this exercise, you will learn how to setup the Print Estimation based on your printer and other requirements.

	Left mouse button name is " <i>pick</i> "
Notice/	Middle mouse button name is " <i>Exit</i> "
Remember	Right mouse button name is "Click"

Disclaimer:

The parameters used in this guide are fictive and serve for training purposes only. These should not be regarded as recommended settings for actual printing estimation.

- 1. Unpack the file 'Print Estimation.ctf'
 - a. Select File>>Unpack and select the file 'Print Estimation.ctf'



b. Select Unpack

🗐 CimZip - I	Print Estim	ation.ctf			
File Action	s Edit H	Help			
New	🗁 Open	Save	Add	Un Nack	Delete
Name 🔺		Туре		Unpac	k
Exercis	se1.elt	Assemb	ly File	13,0600	,1489,1616
	ld_05.elt	Part File	;	13,0600	,1489,1616
Tray.e	lt	Part File	;	13,0600	,1489,1616



c. Set the destination and select ok



- 2. Load the project Exercise 1.elt
- 3. In this project we already defined the printer and the supports and did the calculation



Edit Printer	
Printer My Printer Edit Printer Parameters	
Material CLI-Generic • Min. Overhang Angle 50.	







Select Print Estimation Estimation

The following dialog shows the material volume, which is required to produce the part, the supports, the lattice or any other printable, the time to produce these volumes and the cost. While volumes are calculated by the system, the time is calculated based on predefined build rates. These are therefore, estimations.

Part 1 – Types of Print Estimation

Volume Based Calculation

Some of the data is colored red; this indicates that the values are estimated. The values for Time are calculated based on published build rates of the printer.

Note: You can manually change the printing rates as we will see later on this document.

]			
Material (cm ³)	Time (hh:mm:ss)	Cost (USD)	
81.96		737.65	
17.79		160.08	
2.08		18.72	
	04:47:33		
		43.13	
101.83	04:47:33	959.59	
3,594.45			
		Create Report	
	Material (cm ⁹) 81.96 17.79 2.08 101.83 3,594.45	Material (cm²) Time (hh:mm:ss) 81.96 Time (hh:mm:ss) 17.79 2.08 04:47:33 04:47:33 101.83 04:47:33	Material (cm²) Time (hh:mm:ss) Cost (USD) 81.96 737.65 17.79 160.08 2.08 18.72 04:47:33 43.13 101.83 04:47:33 3,594.45 5

Entering Print Estimation the following message pops up



This message will not show up after we enter build rates values.





Scanpath Based Calculation

This option is available if a scan path exists in the file. Meaning, we already calculated the slicing and this resulted in a full scan path. In this case the estimation can be more accurate.

Note:

This option disabled here, since the slicing calculation of 3DXpert for SOLIDWORKS results in the outer boundary of the model (C0 contours).

Let's see what are the parameters that are displayed in this dialog:

Parts - Indicates the volume of all bodies that are printed (not including supports or lattices) the time it will take to print them, and the material cost.

Supports - Indicates the volume of all supports, the time it will take to print them, and the material cost.

Lattices - Indicates the volume of all lattices, the time it will take to print them, and the material cost.

Between Layers - Indicates the accumulated time of recoating (between layers time X amount of layers)

Machine Time - Indicates the cost of the machine time (machine time cost per hour X total time).

Total - Indicates the sums of all three columns.

Powder Volume - Indicates the total volume of powder required for this print. See formula below





Part 2 – Estimation Parameters

5. Select 'Estimation Parameters'



6. The following dialog pops up:

Estimation Parameters					
Currency	Currency USD 👻				
Material: CLI-Generic					
Material Cost	9.00	US	D per cm³		
Machine: My Printer					
Default Layer Thickness	30	.00	μm		
General Printing Rate	0	.00	mm³ per sec.		
Part Printing Rate	C	0.00	mm³ per sec.		
Support Printing Rat	e (0.00	mm³ per sec.		
Lattice Printing Rate	0	0.00	mm³ per sec.		
Machine Time Cost	9	9.00	USD per hour		
Time between Layers		9	sec.		
Present on 3DXpert pro	ojects :				
Printer Name					
Material Name					
Mat	erial	Tim	e 📃 Cost		
✓ Parts					
V Supports					
V Lattices					
Machine Time					





Currency - Select a currency from a drop down list

Currency USD - US Dollar Material: CLI-Generic GBP - British Pound Material Cost AUD - Australian Dollar Material Cost AUD - Australian Dollar SGD - Singapore Dollar Machine: MP Printer AFD - Emirati Dirham ARD - Canadian Dollar SGD - Singapore Dollar Machine: MP Printer AFD - Emirati Dirham AFD - Emirati Dirham AFD - Angolan Kwanza AFS - Argentine Peso Part Printing Rate AFS - Argentine Peso Part Printing Rate BAM - Bosnian Convertible BD - Barbadian or Bajan D Lattice Printing Rate BTD - Bangladeshi Taka BD - Barbadian Dollar Ime between Layers BND - Bruncian Dollar Printer Name BD - Barbanian Dollar BY - Botswana Pula Waterial Name Waterial Name <th>Estimation Parameters</th> <th></th>	Estimation Parameters	
Currency USD - US Dollar Material: CLI-Generic BUR - Euro GBP - British Pound Material Cost AUD - Australian Dollar CAD - Canadian Dollar GAD - Canadian Dollar SGD - Singapore Dollar AED - Emirati Dirham Machine: MY Printer AED - Emirati Dirham AFN - Afghan Afghani ALL - Albanian Lek AMD - Armenian Dram ANG - Dutch Guilder AOA - Angolan Kwanza ARS - Argentine Peso Part Printing Rate AMG - Aubanian Convertible BBD - Barbadian or Bajan D Lattice Printing Rate BOT - Bangladeshi Taka BGN - Bulgarian Lev BHD - Bahraini Dollar Machine Time Cost BF - Burundian Franc BMD - Bruncian Dollar BON - Bulgarian Lev Machine Time Cost BFL - Brazilian Real VP Present on 3DXpert proport BRL - Brazilian Real VP netrs BD - Bahamian Dollar W Material Name BYN - Belarusian Ruble V VP narts V Material V Time Cost V Parts Supports Machine Time Machine Time Machine Time		
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Material Cost INR - Indian Rupee AUD - Australian Dollar CAD - Canadian Dollar SGD - Singapore Dollar SGD - Singapore Dollar Machine: My Printer AED - Emirati Dirham AED - Finirati Dirham AEN - Afghan Afghani ALL - Albanian Lek Default Layer Thickness AMD - Armenian Dram ANG - Dutch Guilder General Printing Rate AOA - Angolan Kwanza ARS - Aruban or Dutch Gu AZN - Azerbaijani New Mar Support Printing Rate AWG - Aruban or Dutch Gu AZN - Azerbaijani New Mar Support Printing Rate BDT - Bangladeshi Taka BGN - Bulgarian Lev BHD - Bahraini Dinar BHF - Burundian Franc BMD - Bernudian Dollar BND - Bernudian Dollar BND - Bernudian Dollar Time between Layers BND - Bernudian Dollar BSD - Bahamian Dollar Printer Name BYN - Belarusian Ruble INN - Belarusian Ruble Image: Material Name BYN - Belarusian Ruble Image: Ruble -	Material: CLI-Generic	GBP - British Pound
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Between Layers Machine Time Total	Lattices	
Machine Time ✓ Total ■	Between Layers	
🔽 Total 🖬 🗐	Machine Time	
🖬 _A	📝 Total	
•••• -••		

The Parameters:

Material - This value is shown for reference. The material is set through the 'Edit Printer' dialog Material Cost – The cost is based on volume (per cm³)

Machine – This value is shown for reference. The machine is set through the Edit Printer dialog **Default Layer Thickness** – The default value is **30** μ m. This default value is inhertited from the default as set in Edit Printer >>Edit Printer Parameters

General, Part, Support and Lattice Printing Rate - values defined in mm³ per sec.

Time Between Layers - Presents the Recoating Time







7. Set the values as in the image below and select 'Save_Close'

Disclaimer:

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Estimation Decementary						
Estimation Parameters						
Currency	USD - US Do	ollar 👻				
Material: CLI-Generic						
Material Cost	6.00 U	SD per cm ³				
-						
Machine: My Printer						
Default Layer Thickness	30.00	μm				
General Printing Rate	1.00	mm ³ per sec.				
Part Printing Rate	2.00	mm³ per sec.				
Support Printing Rate	2.50	mm³ per sec.				
Lattice Printing Rate	0.80	mm³ per sec.				
Machine Time Cost	2.50	USD per hour				
Time between Layers	Time between Layers 2 sec.					
Present on 3DXpert proj	ects :					
Printer Name						
✓ Material Name						
√ Mate	rial 🛛 🗸 Tir	ne 🗸 Cost				
✓ Parts	✓ Parts					
✓ Supports						
✓ Lattices						
Between Layers						
Machine Time						
√ Total						
un Sta						

8. See that the costs and times changes accordingly

Print Estimation				5
Volume Based Calculation				
Scanpath Based Calculation				
	Material (cm*)	Time (hh:mm:ss)	Cost (USD)	
Parts	81.96	11:23:00	491.77	
Supports	17.79	01:58:34	106.72	
Lattices	2.08	00:43:19	12.48	
Between Layers		01:03:54		
Machine Time			37.87	
Total	101.83	15:08:49	648.84	
Powder Volume	3,594.45			
			S Create Report	÷

Present on 3DXpert projects:

If the checkbox is turned off – all other checkboxes below it keep their status but are disabled, and nothing is shown on the screen, and the **calculation** process stops.

The calculation process updates the on screen values whenever performing a geometrical change.

If nothing is presented on the screen – the calculation stops

Printer Name

Material Name

All 3 columns and 6 rows mentioned above





The volume and the resulting time and cost estimations are updated after every geometrical change

			L
Printer:	ProX DMP Training		
Material:	Ti6Al4VGrade5		
	Material (cm^3)	Time (hh:mm:ss)	Cost (USD)
Parts	67.86	07:46:05	491.77
Supports	7.32	00:11:12	106.72
Lattices	1.84	00:00:00	12.48
Total	101.83	09:01:09	646.17
		Temporari	y active Units: mm

Part 3 – Print Estimation Report

9. Select Create Report



10. Set the parameters as below and select ok

🛓 Print Estimation Rep	ort	×
Save as Type:	Excel Files (*.xlsx) -	
Template:	Print_Estimation_report_V	
Output File Name:	\\iltlv-2922-w7d\New Folder\New Folder\Exercise	2
🔽 Open Output File		
	✓	ix

11. A report with two sheets is opened

Raw Data

Description	Tag name 🔻	Value
Project Name	Project Name	Exercise1
Report Date	Modified	28-Jan-18
Comment	Comment	
Approved By	ApprovedBy	
Created By	CreatedBy	BenvenisteG
Revision	Revision	
Project units	Units	mm





Print Estimation 3DXpert [™]									
Print Estimation Report -				Volume Based Estimation -				Exercise1	
Printer Name: Material Name: Project name:	My Printe CLI-Gen Exercise	eric 1							
Material (cm^3) Part Material:	81.96		Time (hh:mm:ss) Part Time:	11:23:00	Cost (USD) Part Cost:	491.77			
Support Materia Lattice Material:	17.79 2.08		Support Time: Lattice Time:	01:58:34 00:43:19 01:02:54	Support Cost: Lattice Cost: Machine Time Cost:	106.72 12.48			
Total Materia	l: 101.83		Between Layers Time: Total Time:	15:08:49	Machine Time Lost: Total Cost:	648.84			
Sizes				General Parameter	rs				
Total Build Height (mm):		57.51		Currency:		USD			
Tray X (mm):		250		Material Cost per cm^3:		6			
IrayY(mm):		250		Layer Thickness:	ayer Thickness:				
Tray Z (mm):		400	General Printing		e (mm 3 per sec.):	1			
Powder Layer Height (mm):		U 2504 F		Part Printing Hate (m	im persec.):	2			
Powder Volume (cm ⁻³):		3534.5		Support Printing Hat	e (mm 3 per sec.):	2.5			
				Bosopting Time (r(mm o per sec.):	2			
				Machine Time Cost p	sec.j. per hour (USD):	2.5			

End of Exercise.

