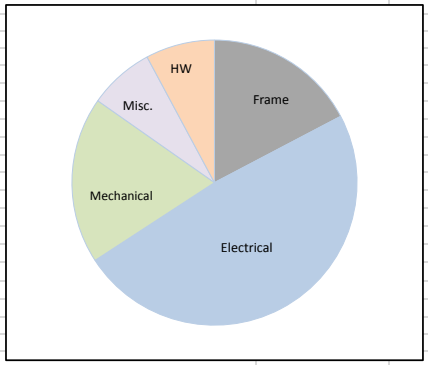
	Item	Source	Qty.	Unit Cost	Ext. Cost	Link	Comments	Additional Comments
Frame	V Slot Extrusion	Open Builds Store					Frame sized for 200x300mm bed and 325mm print height	OpenBuilds occasionally has free shipping promos
	- 20x20x1500mm	Open Builds Store	2	$15.00	$30.00	V Slot Linear Rail		
	- 20x40x1500mm	Open Builds Store	2	$19.50	$39.00	V Slot Linear Rail		
	- 20x40x1000mm	Open Builds Store	2	$13.00	$26.00	V Slot Linear Rail		
Electrical	E3D v6 Hot End 1.75 w/ Bowden extras	Filastruder	1	$78.89	$78.89	1.75 E3D v6 w/bowden extras	E3Dv6 with bowden tube and coupling	For half the cost, E3D v6 lite would work well for PLA, PETG, ABS (any plastic below 245c)
	Nema 17 Stepper Motor	AutomationDirect	5	$11.26	$56.30	Stepper Motor		
	Ramps 1.4 Kit	Ebay	1	$32.00	$32.00	Ramps 1.4 kit		
	Heated Bed	Ebay	1	$24.00	$24.00	PCB Heated Bed	200mmx300mm (~8"x~12") 12v	This heated bed works for 60C but it has difficulty maintaining 100C. Consider alternative if printing ABS.
	Endstop 3 pack, v1.2	Ebay	1	$4.49	$4.49	Endstop Pack	3 pack	Alternate link - Faster shipping but more expensive
	XH2.54 Connector Kit	Ebay	1	$2.00	$2.00	XH2.54 4 Pin Connectors	To plug into the three endstop jacks	Requires a crimping tool, or careful soldering of wire to each pin
	100k 3950 Thermistor for bed	Ebay	1	$1.00	$1.00	Single 3950 Thermistor	For heated bed temperature	Alternate link - Faster shipping but more expensive
	Alternate fan for E3Dv6 heatsink	Digi-key	1			30mm Fan	Optional, Alternate quieter fan for the E3D V6 heatsink	
	40mm cooling fans	Amazon	2	$2.04	$4.08	40mm fan	Ducted print fan and Ramps board cooling	
	12V/30A Power Supply	Amazon	1	$19.98	$19.98	Power Supply		
	Solid State DC Relay	Amazon	1	$11.58	$11.58	SSR DC DC Relay	Don't confuse with the SS AC relay, they look similar, read the label	
	2.54mm Connector kit	Amazon	1	$10.00	$10.00	2.54 Connector Pins	For 1, 2, 3, 4 pin connections to Ramps board headers	Requires a crimping tool, or careful soldering of wire to each pin
	Wire	Amazon	1	$10.00	$10.00	Wire Kit Example	22awg wire for motors, endstops, fans, thermistors.	14awg wire for heated bed and Ramps supply
	Receptacle/Switch for 120v power	Amazon	1	$4.05	$4.05	IEC320 Male Jack with Switch	Optional, also needs a 5A fuse	5A Fuse
	12v 5050 LED Strip ~45"	Amazon	1	$8.00	$8.00	5m 5050 LED Strip	Optional	Optional controller w/ remote, LED strip can also be connected directly to 12v supply
Mechanical	V-Slot Mini V Wheel	Open Builds Store	20	$0.90	$18.00	Mini V Wheel	Select the 20pk for a price break	
	Mini V Wheel Precision Shim	Open Builds Store	20	$0.20	$4.00	Precision Shims	Alternate option is to use printed shims	
	MR105ZZ 5mmx10mmx4mm bearings	Ebay	40	$0.38	$15.00	Wheel Bearings 10pk	Need 40, order 4x 10pk	
	F623ZZ Flange Bearing 3x10x4mm	Ebay	16	$0.79	$12.58	Flanged Bearing	Need 16, order 2x 10pk	Alternate link - Faster shipping but more expensive.
	8mm lead Screw, 400 mm	Amazon	2	$13.23	$26.46	Lead Screw	Comes with nut	
	625ZZ Bearing	Amazon	1	$1.98	$1.98	625ZZ Bearing	For Extruder	
	5mm x 8mm Flex Coupling	Amazon	2	$2.50	$5.00	Flex Coupling	Order 2pk	
	Kit, 2 GT2 Pulley and 2m GT2 belt	Amazon	1	$9.59	$9.59	Pulleys and Belt	Comes with (2) GT2 16t Pulley and (1) 2m GT2 Belt	
	GT2 Belt, 2m	Amazon	1	$9.00	$9.00	GT2 Belt	Total of 2x2m belts needed	
	1.75mm MK8 drive pulley	Amazon	1	$2.29	$2.29	1.75mm MK8 Pulley		
Misc.	Spring Kit	Hardware Store	1	$2.00	$2.00	Spring Kit	Four bed leveling springs and one extruder tensioner spring	
	Glass to match heated bed	Hardware Store	1	$6.00	$6.00		Size to fit onto the heated bed PCB	
	Binder clips	Desk Drawer	8	$0.10	$0.80	Binder Clips	Raid your local office supply cabinet or desk drawer	
	Thermal adhesive	Amazon	1	$2.00	$2.00	For heatsinks, thermistors		
	Rubber Feet	Amazon	4	$0.50	$2.00	Rubber Feet	Need 4, ordered 5pk	
	Insulation for bottom of bed	Amazon	1	$2.00	$2.00	Corkboard	Optional, Attach corkboard to bottom of heatbed with JBweld	
	Wire Spiral Wrap, 3m	Amazon	1	$3.00	$3.00	Wiring Tube	Optional, For wire management	
	PLA Spool, 1kg	Amazon	1	$22.98	$22.98	Hatchbox 1.75mm Green	At least one spool is needed to print all parts	
Hardware	M3 Socket Bolt, 8mm	MrMetric	33	$0.07	$2.31	M3 x 8mm Bolt		
	M3 Socket Bolt, 10mm	MrMetric	9	$0.07	$0.63	M3 x 10mm Bolt		
	M3 Socket Bolt, 20mm	MrMetric	13	$0.11	$1.43	M3 x 20mm Bolt		
	M3 Socket Bolt, 25mm	MrMetric	15	$0.18	$2.70	M3 x 25mm Bolt		
	M3 Nut	MrMetric	32	$0.02	$0.64	M3 Nut		
	M3 Nyloc Nut	MrMetric	17	$0.02	$0.34	M3 Nylock Nut		
	M3 Washer	MrMetric	82	$0.03	$2.46	M3 Washer		
	M4 Bolt, 30mm	MrMetric	4	$0.14	$0.56	M4 x 30mm Bolt		
	M4 washer	MrMetric	4	$0.01	$0.04	M4 Washer		
	M5 Socket Bolt, 10mm	MrMetric	196	$0.08	$15.68	M5 x 10mm Bolt		
	M5 Socket Bolt, 12mm	MrMetric	1	$0.17	$0.17	M5 x 12mm Bolt		
	M5 Socket Bolt, 20mm	MrMetric	1	$0.14	$0.14	M5 x 20mm Bolt		
	M5 Socket Bolt, 40mm	MrMetric	22	$0.20	$4.40	M5 x 40mm Bolt		
	M5 Socket Bolt, 75mm	MrMetric	1	$0.46	$0.46	M5 x 75mm Bolt		
	M5 Nut	MrMetric	9	$0.03	$0.27	M5 Nut		
	M5 Nyloc Nut	MrMetric	14	$0.07	$0.98	M5 Nylock Nut		
	M5 Square Nut	MrMetric	185	$0.04	$7.40	M5 Square Nut	The equivalent amount of OpenBuilds T-nuts is $40.	Square nuts are used instead because they are much cheaper and function nearly the same.
	M5 Washer	MrMetric	205	$0.01	$2.05	M5 Washer		
	M5 Washer 15mm OD	MrMetric	2	$0.03	$0.06	M5 Washer 15mm OD		
	M5 Phillips Flathead Bolt, 8mm	MrMetric	2	$0.16	$0.32	M5 x 8mm Phillips Flathead	Optional, for printed cable chain ends	

See sheet two for hardware detail

These are all ***minimum*** quantities, order extra if needed.



$95.00	Frame Total
$266.37	Electrical Parts Total
$103.90	Mechanical Parts Total
$40.78	Miscellaneous Parts Total
$43.04	Hardware Total
$549.09	**Grand Total**

	Qty	Type	Diameter	Length	Application Notes
Frame	196	Bolt	M5	10mm	See subtotal box ---------->
	182	Square Nut	M5		Less 14 for M5 tapped mounts
	179	Washer	M5		Less 17 for countersunk mounts
Wheel Axles	20	Bolt	M5	40mm	
	12	Nyloc Nut	M5		H Bar Ends and print carrraige
	8	Nut	M5		Z wheels
	24	Washer	M5		2 per axle, none on Z axles
Extruder	1	Bolt	M5	40mm	Spring Loaded Flange
	1	Bolt	M5	12mm	625zz Bearing Mount
	1	Nut	M5		Spring Loaded Flange
	1	Nylock Nut	M5		625zz Bearing Mount
	2	Washer	M5		Spring Loaded Flange
Cable Chain	2	Bolt, Phillips Flat	M5	8mm	Cable chain ends
	2	Square Nut	M5		
Spool Holder	1	Bolt	M5	75mm	Sized for 1kg spool
	1	Square Nut	M5		
	1	Nylock Nut	M5		
	2	Washer 15mm OD	M5		
Endstops	1	Bolt	M5	40mm	Z actuator
	1	Bolt	M5	20mm	Y actuator
	1	Bolt	M3	25mm	X actuator
	6	Bolt	M3	8mm	Endstop Mounting
	6	Nut	M3		
	10	Washer	M3		6 for X, 2 for Y, 2 for Z
Idler Bearings	8	Bolt	M3	25mm	
	4	Nyloc Nut	M3		H Bar End idlers
	4	Nut	M3		Rear XY idlers
	16	Washer	M3		For H Bar idlers/ in between flanged bearings
Print Carriage	6	Bolt	M3	8mm	Hot end clamp top, two tubing holders
	8	Bolt	M3	10mm	Belt Clamps
	2	Bolt	M3	25mm	Hot End Clamp bottom
	16	Nut	M3		
	16	Washer	M3		
Print bed	4	Bolt	M3	25mm	Bed leveling
	8	Bolt	M3	20mm	Lead Screw Nut Mounts
	4	Nut	M3		Bed leveling
	8	Nyloc Nut	M3		Lead Screw Nut Mount
	16	Washer	M3		Bed leveling, lead screw mounts
Motor Mounts	19	Bolt	M3	8mm	
	1	Bolt	M3	10mm	Extruder tensioner flange hole
	16	Washer	M3		Extruder motor bolts do not need washers
Print Fan	5	Bolt	M3	20mm	Fan to duct mounting, Fan Swivel
	2	Bolt	M3	8mm	Mount to print carriage
	2	Nut	M3		Mount to print carriage
	5	Nylock Nut	M3		Fan Mounting, Fan Swivel
	8	Washer	M3		
Power Supply	4	Bolt	M4	30mm	Power Supply Clamps
	4	Washer	M4		

Frame (Plastic bolted to Vslot)

50	3x3 Plates (5 Ea.)
28	Corner brackets (2 Ea.)
24	Rear XY Idlers (12 ea.)
20	X/Y Motor Mounts (10 Ea.)
12	Z guides (3 Ea.)
12	Heated Bed Brackets (3 Ea.)
10	Miscellaneous/ Future
8	Lead Screw Brackets (4 Ea.)
8	H Bar Ends (4 Ea.)
8	Z motor mounts (4 ea.)
6	End stop mounting (2 Ea.)
6	2x1 Plates (3 ea.)
2	Power Switch Mount
2	Extruder
196	***Subtotal***

Total Required Hardware Quantities

Qty	Type	Diameter	Length
33	Bolt	M3	8mm
9	Bolt	M3	10mm
13	Bolt	M3	20mm
15	Bolt	M3	25mm
32	Nut	M3	
17	Nyloc Nut	M3	
82	Washer	M3	
4	Bolt	M4	30mm
4	Washer	M4	
2	Bolt, Phillips Flat	M5	8mm
196	Bolt	M5	10mm
1	Bolt	M5	12mm
1	Bolt	M5	20mm
22	Bolt	M5	40mm
1	Bolt	M5	75mm
9	Nut	M5	
14	Nyloc Nut	M5	
185	Square Nut	M5	
205	Washer	M5	
2	Washer 15mm OD	M5	

These are all ***minimum*** quantities, order extra hardware if you like to have spares