

FILMBOT HARDWARE COST ANALYSIS

<i>Components</i>	<i>Fabrication</i>	<i>Price</i>
Solenoid coils (copper wire)	Hand-wound.	7.2 € [1]
Solenoid coil core (S355J2 steel rod)	Cutting with a saw, smoothing with a file.	0.4 € [2]
NdFeB magnets	Direct purchasing.	1.2 € [3]
Film (plastic or paper)	Laser-cut or print and hand-cut.	0.2 € [4]
Needle	Heating and hot drawing, or 3D printing.	0.2 € [5]
3D-printed components	3D printing.	1 € [6]
Double-side tape	Hand-cut.	0.1 €
PCB with assembly	Direct purchasing.	13.5 € [7]
Joystick	Soldering.	4.2 € [8]
Microcontroller Mega 2560	Direct purchasing.	22.4 € [9]
Coil driver	Direct purchasing.	20 € [10]
12V power supply	Direct purchasing.	13.6 € [11]
Cables and connectors	Soldering.	11 € [12]
PT1000	Soldering.	7.6 € [13]
Total		102.6 €

Please refer paper “[FilMBot: A High-Speed Soft Parallel Robotic Micromanipulator](#)” and “[FilMBot: Towards 100-euro DIY-friendly high-speed robotic micromanipulator](#)” for detailed materials, components and fabrications.

Reference:

- [1] “RS PRO 0.25mm Enamelled Copper Wire, 30 AWG 1100m Reel | RS PRO,” RS Finland. Accessed: Apr. 10, 2025. [Online]. Available: <https://fi.rsdelivers.com/product/rs-pro/rs-pro-025mm-enamelled-copper-wire-30-awg-1100m/0357716>
- [2] “Warma vedetty pyörötanko 6mm 1,5m.” Accessed: Apr. 10, 2025. [Online]. Available: <https://www.puuido.fi/warma-vedetty-pyrotanko-6mm-1-5m>
- [3] W. AG, “Disc magnet self-adhesive 10 x 0,6 mm, Nickel-plated,” Supermagnete. Accessed: Apr. 10, 2025. [Online]. Available: https://www.supermagnete.fi/adhesive-magnets-neodymium/disc-magnet-self-adhesive-10mm-0.6mm_S-10-0.6-STIC
- [4] “muovitasku A4/120mic 2-sivua auki varilajitelma Polypropeeni 100kpl.” Accessed: Apr. 10, 2025. [Online]. Available: <https://kauppa.rckfinland.fi/130281-muovitasku-a4-120mic-2-sivua-auki-varilajitelma-polypropeeni-100kpl.html>
- [5] “200PCS Glass Capillary Tube Micro Hematocrit Tubing Melting Tube,” Fruugo. Accessed: Apr. 10, 2025. [Online]. Available: <https://www.fruugo.fi/200pcs-glass-capillary-tube-micro-hematocrit-tubing-melting-tube-multi-purpose-glass-tube-for-clinic-hospital-use-red/p-136337047-287521506?language=en>
- [6] “PLA 3D-filamentti Universal, 1,75 mm, 1 kg | Clas Ohlson.” Accessed: Apr. 10, 2025. [Online]. Available: <https://www.clasohlson.com/fi/PLA-3D-filamentti-Universal,-1,75-mm,-1-kg/p/38-7986-1>
- [7] “PCB Prototype & PCB Fabrication Manufacturer - JLCPCB.” Accessed: Apr. 10, 2025. [Online]. Available: <https://jlcpcb.com/>
- [8] “COM-09032,” DigiKey Electronics. Accessed: Apr. 10, 2025. [Online]. Available: <https://www.digikey.fi/en/products/detail/sparkfun-electronics/COM-09032/6823623>
- [9] “Arduino Mega 2560 R3 -yhteensopiva kehityskortti Mega2560 Ch340 | Fyndiq.” Accessed: Apr. 10, 2025. [Online]. Available: <https://fyndiq.fi/tuote/arduino-mega-2560-r3-yhteensopiva-kehityskortti-mega2560-ch340-5266901d7fc74811/>
- [10] “2pcs TB6612FNG Dual DC Stepper Motor Driver Module, Dual Driver Controller Board H Bridge for DC Step TB6612FNG Module : Amazon.de: Business, Industry & Science.” Accessed: Apr. 10, 2025. [Online]. Available: <https://www.amazon.de/TB6612FNG-Stepper-Driver-Module-Controller/dp/B09MN8F1SD/>
- [11] reichelt elektronik G. I. T. webmaster@reichelt.de, “V-TAC Desktop power supply, 60 W, 12 V, 5 A | Fixed-voltage power supply units at very favourable prices | reichelt elektronik.” Accessed: Apr. 10, 2025. [Online]. Available: https://www.reichelt.com/fi/en/shop/product/desktop_power_supply_60_w_12_v_5_a-215628
- [12] “Connectors, Interconnects | D-Sub, D-Shaped Connectors | D-Sub Connector Assemblies,” DigiKey Electronics. Accessed: Apr. 10, 2025. [Online]. Available: <https://www.digikey.fi/en/products/filter/d-sub-d-shaped-connectors/d-sub-connector-assemblies/439>
- [13] reichelt elektronik G. I. T. webmaster@reichelt.de, “YAGEO NEXENSOS Platinum temperature sensor, Cl. B, 1000 ohms | Temperature and moisture sensors at very favourable prices | reichelt elektronik.” Accessed: Apr. 10, 2025. [Online]. Available: https://www.reichelt.com/fi/en/shop/product/platinum_temperature_sensor_cl_b_1000_ohms-151238