

SPS/APC Cloud Chamber Bill of Materials

Item	Quantity	Cost / unit	Sub-Cost	System	Description	Link
Projector Cart	1	\$109.99	\$109.99	Project Chassis / Enclosure	Project components mounted to this	http://www.officedepot.com/a/products/370302H-Wilson-Height-Adjustable-Plastic-Cart/
Peristaltic Pump	1	\$28.99	\$28.99	Alcohol Return	Pumps condensed alcohol back to heaters	http://www.amazon.com/Adafruit-Industries-1150-Peristaltic-Liquid/dp/B00HXZPEG/ref=sr_1_2?ie=UTF8&qid=1422501424&sr=8-2&keywords=peristaltic+pump
3/16" silicone tubing, (10ft)	1	\$22.74	\$22.74	Alcohol Return	Tubing for return system. Fits into pump	http://www.amazon.com/I-D-O-Silicone-Tubing-500F/dp/B00DGZ8LKc/ref=sr_1_6?ie=UTF8&qid=1422501533&sr=8-6&keywords=3%2F16%22+silicone+tubing
Arduino Uno Rev3	1	\$24.95	\$24.95	Thermal Gradient	Implements thermal control algorithms	http://www.adafruit.com/products/50
Arduino LCD Display	1	\$19.95	\$19.95	Thermal Gradient	Allows for human interfacing with thermal controller	http://www.adafruit.com/products/772
Thermocouple breakout board	3	\$14.95	\$44.85	Thermal Gradient	K Type interface. One for each thermal zone	http://www.adafruit.com/product/289
Thermocouple (K Type)	3	\$9.95	\$29.85	Thermal Gradient	K Type. One for each evap tray and cooling plate	http://www.adafruit.com/products/270?&main_page=product_info&Path=35&products_id=270
Peltier + Heatsink	6	\$34.95	\$209.70	Thermal Gradient	Condenses alcohol vapor / establishes thermal gradient	http://www.adafruit.com/product/1335
12VDC (@20A) Source	2	\$24.97	\$49.94	Lighting System / TEC power	powers LED lighting, other 12V systems. One is for Peltiers, one's for heating elements	http://www.amazon.com/Regulated-Switching-Power-Supply-Silver/dp/B007KG0ZYI/ref=sr_1_17?ie=electronics&ie=UTF8&qid=1423316569&sr=1-17&keywords=12v+regulated+power+supply
LED Strip Lighting (5m)	1	\$8.45	\$8.45	Lighting System	Illuminates area for easier viewing	http://www.amazon.com/Triangle-Bulbs-Waterproof-Strip-3528-IP65-White-60L/dp/B005EH4LH8/ref=sr_1_1?ie=UTF8&qid=1422503086&sr=8-1&keywords=LED+strip&pebp=1422503086&ssasin=B005EH4LH8
Power Strip	1	\$10.99	\$10.99	Power Distribution	120VAC mains supply	http://www.amazon.com/Trip-Lite-LT1P606-Protector-Outlet/dp/B00004I0N1/ref=sr_1_4?ie=UTF8&qid=1422558107&sr=8-4&keywords=power+strip
120mm Fans (2 pack)	1	\$20.99	\$20.99	Thermal Gradient / System cooling	Large fans to inspire airflow through the Peltier area. Greater dT	http://www.amazon.com/Corsair-AF120-Quiet-High-Airflow/dp/B006F6SJOJ/ref=sr_1_6?ie=UTF8&qid=1423316736&sr=8-6&keywords=computer+fan
Glass 5.5 Gal Tank	1	\$12.12	\$12.12	Project Chassis / Enclosure	Forms the viewing area for the cloud chamber	http://www.amazon.com/Aquarium-Tank-Glass-5-1-Gal/dp/B005V0D7O0/ref=sr_1_7?ie=UTF8&qid=142331728&sr=8-7&keywords=glass+tank&product-description-frame
Heating Elements (10pk)	1	\$7.36	\$7.36	Thermal Gradient	Soldering iron heaters, 30W apiece	http://www.amazon.com/Replacement-Electric-Welder-Heating-Element/dp/B00E0KHULI/ref=sr_1_8?ie=hi&ie=UTF8&qid=1423318454&sr=1-8&keywords=solder+iron+heating+element
Glass Cutter	1	\$8.79	\$8.79	tools	Glass tank needs to have holes cut in the bottom to install components.	http://www.amazon.com/Strip-and-Circle-Glass-Cutter/dp/B00355T8JQ/ref=sr_1_23?ie=arts+crafts&ie=UTF8&qid=1423319050&sr=1-23
		Subtotal:		\$608.74		
Unaccounted Parts:						
Heating Trays	2		\$0.00	Thermal Gradient	Holds alcohol in contact with heating elements. Could just be a food pan of some sort?	
Cooling Plate/tray	1		\$0.00	Thermal Gradient	TECs thermally connected here. Collects condensation. Cookie tray?	
2kV (@5mA) Source	1		\$0.00	Clearing Field	Clears vapor / thins trails	
Misc Hardware	1	\$100.00	\$100.00	misc	Fittings/screws/paneling/wires/switches	
Electronic Components	1	\$150.00	\$150.00	misc	Relays/ MOSFETs/ bridge rectifier / misc electronic components	
		Total:		\$908.74		