
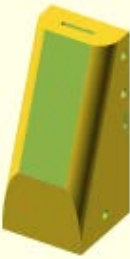
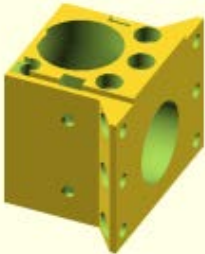
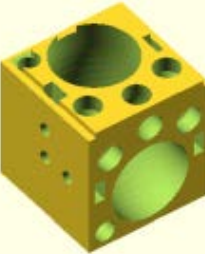
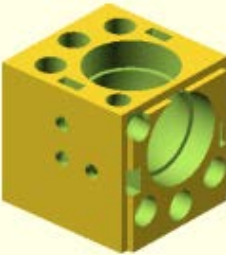
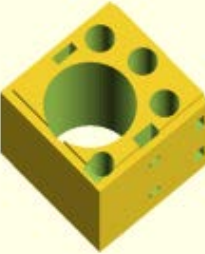








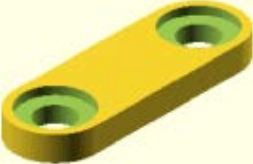











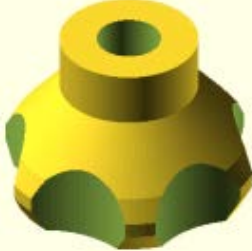

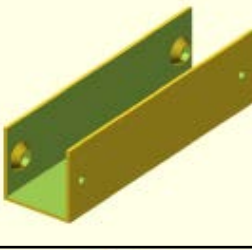


μCHILL Printed Parts List

.stl File(s)	Image ^[1]	Description	Print Time ^[2]	Filament usage ^[3]
coldhead_probedia_2mm coldhead_probedia_3mm		coldhead (2 or 3mm bore for thermocouple)	5h 30m	53g
coldhead_alt_probedia_2mm coldhead_alt_probedia_3mm		alternate coldhead (2 or 3mm bore for thermocouple)	4h 30m	49g
endcap_dewar_probedia_2mm endcap_dewar_probedia_3mm		endcap to connect to a Dewar lid (for vaporizer variants, 2 or 3mm bore for thermocouple inlet, 6mm bore for thermocouple guide tube)	3h 10m	32g
corner_down_probedia_2mm corner_down_probedia_3mm		90 degree corner down (2 or 3mm bore for thermocouple inlet, 6mm bore for thermocouple guide tube)	2h 30m	25g
corner_up		90 degree corner up (6mm bore for thermocouple guide tube)	2h 35m	27g
extender		straight extender for all connectors, tolerances adjusted such that all tubing can be pushed through, doubles as endcap in some setups	2h 30m	26g

.stl File(s)	Image ^[1]	Description	Print Time ^[2]	Filament usage ^[3]
stabilizer		optional part to stabilize tubing laterally or create support for aluminum profile on flat sides of connecting parts	16m	1g
connector_coldgas		cold gas inlet (for heat exchanger variants), consider printing with a brim for buildplate adhesion, 100% infill recommended for stability	42m	5g
connector_shieldflow		shroud gas inlet (can be connected at coldhead, extender or endcap), consider printing with a brim for buildplate adhesion, 100% infill recommended for stability	30m	1g
connector_combo		combined cold and shroud gas inlet (for heat exchanger variants), consider printing with a brim for buildplate adhesion, 100% infill recommended for stability	55m	7g
connector_combo_bypass20 connector_combo_bypass40 connector_combo_bypass60 connector_combo_bypass80 connector_combo_bypass100		combined cold and shroud gas inlet with built-in bypass to raise base temperature (20/40/60/80/100% of shroud inlet diameter), consider printing with a brim for buildplate adhesion, 100% infill recommended for stability	57m	7g
6mm2barb_long 8mm2barb_long		long 9mm hose barb to 6 or 8mm tube adapter for pushfit systems, consider printing with a brim for buildplate adhesion, 100% infill recommended for stability ^[4]	52m	3g

.stl File(s)	Image ^[1]	Description	Print Time ^[2]	Filament usage ^[3]
6mm2barb_short 8mm2barb_short		short 9mm hose barb to 6 or 8mm tube adapter for pushfit systems, consider printing with a brim for buildplate adhesion, 100% infill recommended for stability ^[4]	33m	1g
clip_L		angled bracket to interconnect printed parts and / or aluminum profile (M4x6 screws)	12m	1g
clip_straight		straight bracket to interconnect printed parts and / or aluminum profile (M4x6 screws)	4m	1g
riser_5mm riser_10mm riser_15mm		parametric riser / spacer to bridge gap between coldhead and work surface (5/10/15mm provided), includes female dovetail slide rail, right-handed version ^[4]	1h 14m (10mm)	12g (10mm)
riser_5mm_mirrored riser_10mm_mirrored riser_15mm_mirrored		parametric riser / spacer to bridge gap between coldhead and work surface (5/10/15mm provided), includes female dovetail slide rail, left-handed version ^[4]	1h 14m (10mm)	12g (10mm)
dovetail		male dovetail slide rail (M4 screws)	21m	3g

.stl File(s)	Image ^[1]	Description	Print Time ^[2]	Filament usage ^[3]
pinholder_magnetdia_4mm pinholder_magnetdia_5mm pinholder_magnetdia_6mm		magnetic pin holder (4/5/6mm bore for magnet), can be attached with 2 M4x6 screws (fixed) or 1 M4x8 hex head screw and pinholder tool (hinged), right-handed version	20m	2g
pinholder_magnetdia_4mm_mirrored pinholder_magnetdia_5mm_mirrored pinholder_magnetdia_6mm_mirrored		magnetic pin holder (4/5/6mm bore for magnet), can be attached with 2 M4x6 screws (fixed) or 1 M4x8 hex head screw and pinholder tool (adjustable), left-handed version	20m	2g
pinholder_tool		lever to secure magnetic pin holder in desired position (use M4x8 hex head screw and M4 washer)	9m	1g
dewar_lid_125mm dewar_lid_170mm		parametric Dewar vessel lid, includes attachment points for M4 screws (slot in M4 hex nuts), bores are 8mm for pressure inlet and 25mm for cold gas outlet, 3mm grooves for flexible seal, 10% infill is sufficient ^[4]	6h 30m 10h 30m	68g 113g
dewar_rail_125mm dewar_rail_170mm		parametric bracket to attach accessories to Dewar lid (M4x20 screws), choose radius according to lid radius ^[4]	41m 52m	7g 9g
dewar_dispholder		simple generic bracket to attach thermocouple display to Dewar lid rail	33m	5g

.stl File(s)	Image ^[1]	Description	Print Time ^[2]	Filament usage ^[3]
valve_knob		knob for needle valve shown in manuscript	24m	4g
logo		the μ CHILL logo	3m	0.5g
u-profile_50mm u-profile_100mm u-profile_150mm u-profile_200mm u-profile_250mm		parametric printable 40x40x2 U profile with fittings for M4 screws & hex nuts, can be printed upright on smaller build plates ^[4]	1h 27m 6h 13m	14g 70g
tube_6x10mm to 6x260mm tube_8x10mm to 8x260mm tube_25x20mm to 25x270mm tube_cropped_25x70mm to 25x270mm		parametric printable tubing for cold gas, shroud gas / optional stabilizers and thermocouple guide tube, lengths adjusted to 50/100/150/200/250mm U profiles (see above) ^[4]	varies	varies
tube_cropped_25x70mm tube_cropped_25x120mm tube_cropped_25x170mm tube_cropped_25x220mm tube_cropped_25x270mm		parametric printable tubing for cold gas, pre-cropped for 90 degree corner up, lengths adjusted to 50/100/150/200/250mm U profiles (see above) ^[4]	varies	varies

[1] Orientation of .stl file as shown in picture (recommended for print).

[2] Approximation, print settings: 0.4 mm nozzle, 0.2 mm layer height, 3 perimeter lines, 4 top/bottom layers, 50 mm/sec, 20% infill (unless otherwise noted).

[3] Approximation, PLA filament, 20% infill.

[4] Custom version can be rendered using OpenSCAD (www.openscad.org). File „muCHILL_parametric.scad“ contains the code for this part and instructions to adjust parameters.