

Agilent CrossLab Start Up Services

Agilent GCMS 5977B Series MSD Site Preparation Checklist

Thank you for purchasing an instrument from **Agilent Technologies**. CrossLab Start Up is focused on helping customers shorten the time it takes to start realizing the full value of their instrument investment.

Correct site preparation is the key first step in ensuring that your instruments and software systems operate reliably over an extended lifetime. This document is an **information guide and checklist** prepared for you that outlines the supplies, space, and utility requirements for your equipment.

Introduction

Customer Responsibilities

Make sure your site meets the following prior to the installation date using the checklist below. For details, see specific sections within this document, including:

- The necessary laboratory or bench space is available.
- The **environmental conditions for the lab** as well as laboratory gases, tubing.
- The **power requirements** related to the product (e.g. **number & location** of electrical outlets).
- The **required operating supplies** necessary for the product and installation.
- Please consult **Other/Special Requirements** section below for other product-specific information.
- If Agilent is delivering Installation and Introduction services, users of the instrument should be present throughout these services; otherwise, they will miss important operational, maintenance and safety information.
- When using hydrogen (H₂) as the carrier gas or fuel gas, be aware that hydrogen gas can flow into the GC oven and create an explosion hazard. Therefore, be sure that the supply is turned off until all connections are made and ensure that the inlet and detector column fittings are either connected to a column or capped at all times when hydrogen gas is supplied to the instrument.

Hydrogen is flammable. Leaks, when confined in an enclosed space, may create a fire or explosion hazard. In any application using hydrogen, leak test all connections, lines, and valves before operating the instrument. Always turn off the hydrogen supply at its source before working on the instrument.

Please refer to the Hydrogen Safety Guide which is shipped with the Instrument.

Note: checkout specifications are only performed by Agilent using helium carrier gas. Please have helium available at installation.

Customer Information

- If you have questions or problems in providing anything described as part of *Customer Responsibilities* above, please contact your local Agilent or partner support / service organization for assistance prior to delivery. In addition, Agilent and/or its partners reserve the right to reschedule the installation dependent upon the readiness of your laboratory.
- Should your site not be ready for whatever reasons, please contact Agilent as soon as possible to re-schedule any services that have been purchased.
- Other optional services such as additional training, operational qualification (OQ) and consultation for user-specific applications may also be provided at the time of installation when ordered with the system but should be contracted separately.

- Please refer to the other products (ie; GC, ALS, CTC, etc.) for site preparation requirements.
- A **GC Site Prep Training** course, GC-8890-1201e - Getting Prepared for Your New GC System, is available at no charge and included with the Agilent Learning Path series for the 5977B GC/MSD instrument. To register and complete the training, as well as see all the resources that are available as learning paths for your GC and GC/MS instrumentation, please visit *Agilent University* at <http://www.agilent.com/crosslab/university/> and scroll down to **Learning Paths** and select **View Learning Paths**.

Important Customer Web Links

- For more information about *Agilent Technologies services*, please visit our website using the following URL: <http://www.agilent.com/en-us/products/crosslab-instrument-services/service-repair>
- To access *Agilent University*, visit <http://www.agilent.com/crosslab/university/> to learn about training options, which include online, classroom and onsite delivery. A training specialist can work directly with you to help determine your best options.
- A useful *Agilent Resource Center* web page is available, which includes short videos on maintenance, quick lists of consumables for new instruments, and other valuable information. Check out the Resource Page here: <https://www.agilent.com/en-us/agilentresources>
- Need technical support, FAQs, supplies? – visit our *Support Home page* at <http://www.agilent.com/search/support>
- Get answers. Share insights. Build connections:
Join the *Agilent Community* at <https://community.agilent.com/welcome>

Site Preparation

5977 Series MSD



Dimensions and Weight

Identify the laboratory bench space before your system arrives based on the table below. Pay special attention to the total height and total weight requirements for all system components you have ordered and avoid bench space with overhanging shelves. Also pay special attention to the total weight of the modules you have ordered to ensure your laboratory bench can support this weight.

Special notes:

- This does not include the automated sampling devices which could be used on the system.
- Please note: the length of the vacuum hose is 130 cm or about 4.24 feet from the high vacuum pump to the foreline pump, while the length of the foreline pump power cord is 2 m or about 6.5 feet. For optimal vacuum performance, the lengths cannot be increased.
- A table must be large enough to support the mainframe and the size of the base.
- The dimensions and weight of the instrument needs to be placed on a laboratory bench that is at least 54 cm (21.5 inches) deep. The instrument requires a space of at least 40.0 cm (16 inches) on both sides, and approximately 30 cm (~ 12 inches) at the rear for the circulation of air, vacuum pump hose, and room for electrical connections.

- If the bench is to support a complete Agilent 5977 Series GC/MS system make sure that the bench is designed to carry the total weight of all the components.

Description	Weight		Height		Depth		Width	
	kg	lbs	cm	in	cm	in	cm	in
GC/MS – Diffusion Pump	39	85	41	16	54	21.3	30	11.8
GC/MS – Turbo Pump	41	90	41	16	54	21.3	30	11.8
GC/MS – Turbo Pump CI	46	100	41	16	54	21.3	30	11.8
GC/MS Shipping Container Size	54.5	120	64	25.2	55.9	22.0	89.7	35.3
Pfeiffer DUO 2.5 – Foreline Pump	10.5	23.2	20.2	8	33.6	13.3	12.7	5
IDP3 – Dry Pump	9.5	21	18.1	7.1	35.9	14.1	12.7	5
MVP-070-3	16.4	36.2	19.8	7.8	32.5	12.8	23.8	9.4
MVP-070-3C	14.3	31.5	19.8	7.8	32.5	12.8	24.2	9.5
GC	Please refer to the GC Site Preparation documentation							
Workstation PC system (monitor, CPU, printer)	50	112	54	21.3	54	21.3	54	21.3



Environmental Conditions

Operating your instrument within the recommended temperature ranges insures optimum instrument performance and lifetime.

Special notes:

- Performance can be affected by sources of heat & cold, e.g. direct sunlight, heating/cooling from air conditioning outlets, drafts and/or vibrations.
- The site's ambient temperature conditions must be stable for optimum performance of the system's modules as specified in the "Environmental Specifications" section of the Site Preparation Manual. Temperature changes of less than 3°C from calibration temperature are required to achieve best possible baseline stability. Higher variations will result in higher signal drift and wandering of the baseline.
- The bench or supporting surface must be vibration free.
- The following table may help you calculate the additional BTUs of heat dissipation from this new equipment. Maximums represent the heat given off when heated zones are set for maximum temperatures.

Description	Operating temperature range °C (°F)	Operating humidity range (%)	Heat dissipation (BTU)
5977 Series GC/MS	15 to 35 °C (59 to 95 °F)	20% – 80%	3000 BTU / hour including GC/MSD interface
GC	Please refer to the GC Site Preparation documentation		



Exhaust Venting Requirements

The 5977 Series GC/MS System foreline pump exhaust is recommended to be vented outside of the laboratory environment. Exhaust vent system should not be part of an environmental control system that recirculates air inside of a building. Exhaust venting requirements need to comply with all local environmental and safety codes. If the exhaust is non-toxic then an oil mist filter should be used on the foreline pump exhaust.

- An oil mist filter is provided. A 3/8" male NPT to barb fitting (G3170-80006) and 20' of 1/2" tubing (G3170-60100) are available from Agilent.com
- The foreline pump exhaust should not be shared with exhaust tubing from another instrument. Separate 1/8 inch hose barbs are required to connect the tubing to the exhaust vent.



Power Consumption

Special notes:

- If a computer system is supplied with your instrument, be sure to account for those electrical outlets.

Description	Line voltage & Frequency (V, Hz)	Maximum Power Consumption (VA)
5977 GC/MS	120 VAC (-10% / +5%) 50/60 Hz ± 5%	1100 VA (700 VA, foreline pump only)
	200 VAC (-10% / +5%) 50/60 Hz ± 5%	
	220 – 240 VAC (-10% / +5%) 50/60 Hz ± 5%	
Acquisition PC system (monitor, PC, printer)	120 VAC (-10% / +5%) 50/60 Hz ± 5%	1000 VA
	200 – 240 VAC (-10% / +5%) 50/60 Hz ± 5%	1000 VA

- Use correct power cord

Part Number	Line Voltage Power Cords MSD/CPU/Monitor/Printer C13
8120-1369	Power cord, Australia/NZ, C13, 10 amp
8120-1689	Power Cord, Europe, C13, 10 amp
8120-2104	Power Cord, Switzerland, C13, 10 amp
8120-3997	Power Cord, DK/Greenland, C13, 10 amp
8120-4211	Power Cord, India/S Africa, C13, 10 amp
8120-5182	Power Cord, Israel, C13, 10 amp
8120-1378	Power Cord C13 125V 10A 5-15P 498G US
8120-6869	Power Cord, Argentina, C13 250V 10A RA/3
8120-6978	Power Cord, Chile, C13, 10 amp
8120-8705	Power Cord, GB/HK/SG/MY, C13, 10 amp
8121-0723	Power Cord, China, C13, 10 A, 250V
8121-1226	Power Cord, Europe + S Korea C13, 10A, 250V
G2025-60189	Power Cord, 200V Japan, 16 amp
8121-1809	Power Cord, Brazil, C13, 250V max
8121-1638	Power cord - Cambodia
8120-0674	Power cord – Thailand and Philippines

Part Number	Line Voltage Power Cords MSD/CPU/Monitor/Printer C7
8120-6313	Power Cord, US, C7, 125V,2.5A, 1-15P Plug
8120-8336	Power Cord, Japan, 2- wire, C7,125V,7A
8120-8337	Power Cord, Australia, 2 wire
8120-8340	Power Cord, Europlug, C7, 250V max, 2.5A
8120-8346	Power Cord, China, 2 wire
8120-8420	Power Cord Korea
8120-8421	Power Cord India / South Africa
8120-8452	Power Cord South America
8120-8719	Power Cord, UK
8120-8367	Power-Cord OPT-950 2-COND 1.8-M-LG



Required Operating Supplies

Special notes:

- For information on Agilent consumables, accessories, and laboratory operating supplies, please visit: <https://www.agilent.com/en/products>

Item Description (including dimensions etc)	Vendor/Part Number (if applicable)	Recommended Quantity
Analytical Table	www.onepointesolutions.com	1
H-31" D-36" W-72"	www.ChemTops.com	
Quiet Cover for foreline pumps, coasters		
Computer Table	www.onepointesolutions.com	1
H-31" D-36" W-36"	www.ChemTops.com	
Monitor support rack and Keyboard rack, coasters		
Table is just large enough to hold GC/MS and GC.	Mass Spec Bench, G3215A	1



Other / Special Requirements

Gases are supplied by tanks, internal distribution system, or gas generators. Tank supplies require two staged, pressure regulation.

To connect tubing to the supply, it must have one 1/8-inch Swagelok female connector for each gas.

Make sure that your regulator has the appropriately sized adapter to end with a 1/8-inch Swagelok female connector. (The URL of Swagelok's web site is <http://www.swagelock.com> to help assist is finding connectors.) Recommended that two (2) step regulators be used with 1/8" size outlets.

- Purity specification given is the minimum acceptable purity. Major contaminants can be water, oxygen, or air.
- Pre-cleaned 1/8" copper tubing and 1/8-inch Swagelok® fittings are supplied as part of the ship kit to connect the collision cell gas to the collision cell inlet fitting.
- Never use liquid thread sealer to connect fittings. Teflon tape is only required on NPT threaded fittings and should never be used on Swagelok style fittings.

5977 Series Gas Flow Guidelines

High Vacuum Pump	Diffusion Pump	Turbo	Turbo
Source	SS	SS/Inert/Extractor/CI	HES
Optimal gas flow mL/min (a)	1.0	1.0 to 2.0	0.8 to 1.4
Maximum recommended gas flow, mL/min	2.0	4.0	4.0
Maximum gas flow, mL/min (a,b,c)	2.4	6.5	6.5
Max column id	0.32 mm (30 m)	0.32 mm (30 m)	0.32 mm (30 m)

a Total gas flow into the MSD: column flow plus reagent gas flow, while acquiring data (if applicable).

b Expect degradation of spectral performance and sensitivity.

c Upper gas limit will vary based on gas type

5977 Series Carrier and Reagent Gases

Carrier and reagent gas requirements	Typical pressure range (psi)	Typical flow (mL/min)
Helium (required)	50 to 80	20 to 50 (column and split flow)
Hydrogen (optional) (a)	50 to 80	20 to 50 (column and split flow)
Methane reagent gas (required for CI operation)	15 to 25	1 to 2
Isobutane reagent gas (optional)	15 to 25	1 to 2
Ammonia reagent gas (optional)	5 to 8	1 to 2
Carbon dioxide reagent gas (optional)	15 to 20	1 to 2

a Hydrogen gas can be used for the carrier gas but specifications are based on Helium as the carrier gas and please observe all hydrogen gas safety cautions.



Gas Selection

Agilent recommends that carrier and detector gases be 99.9995% pure. Air needs to be zero grade or better. Agilent also recommends using traps to remove hydrocarbons, water, and oxygen.

5977 Series Carrier and Reagent Gases Purity.

Carrier and reagent gas requirements	Purity	Note
Helium (Carrier)	99.9995%	Hydrocarbon free
Hydrogen (Carrier)	99.9995%	SFC Grade
Methane reagent gas (required for CI operation)	99.999%	Research or SFC grade
Isobutane reagent gas (optional)	99.99%	Instrument grade
Ammonia reagent gas (optional)	99.9995%	Research or SFC grade
Carbon dioxide reagent gas (optional)	99.995%	Hydrocarbon free

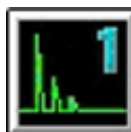
For both the GC and MSD it is recommend two (2) step regulators be used with 1/8" size outlets.



Remote Diagnostics

Easy access to diagnostic information and to the system operator helps our service engineers diagnose problems or share information. We recommend these features to help support your new system:

- A LAN connection for the Data Acquisition and Data Analysis PC is recommended to provide remote diagnostics capability for the 5977 GC/MS System.
- A phone line close to the instrument is strongly recommended for communication with the system operator.



Other Considerations

Basic Tools (provided)

Your GC/MS comes with a few basic tools and consumables depending on the specific inlet and detector that you ordered. Here is a general list which one will get with the instruments or should have on-hand.

Tool or consumable	Used for
Inlet wrench	Replacing inlet septa and liners.
T10 and T20 Torx wrenches	Remove tray. Remove covers to access EPC modules, traps, and possible leaks.
Column cutter	Column installation
1/8-inch Tee, Swagelok, brass	Connect gas supplies
1/8-inch nuts & ferrules, Swagelok, brass	Connect gas supplies
1.5 mm and 2.0 mm hex driver	Source maintenance (disassembly)
Tool bag	Used to hold GC and MS tools
Q-Tips	Used to clean source parts
Lint-free cloths	Used to keep surfaces clean and parts clean
Gloves	Used to reduce contamination on parts GC and MS

Basic Tools (recommended)

Description	Part number
MSD Maintenance supplies	
Abrasive paper, 30 µm	5061-5896
Alumina powder	393706201
Lint-free cloths, clean (package of 15)	05980-60051
Lint-free cloths, cleaning (package of 300)	9310-4828
Cotton swabs (package of 100)	5080-5400
Agilent AVF Platinum foreline pump oil, 1 quart	5191-5851
Gloves, clean, large	8650-0030

Description	Part number
Gloves, clean, small	8650-0029
IDP-3 Tip Seal Maintenance Kit (Tip Seal, Cloth, Scouring Pad, Swab, Gloves, Filter)	G7077-67018
Ferrules	
Blank, graphite-Vespel, long	5181-3308
GC/MS interface – Standard connectors	
0.3-mm id, 85% Vespel 15% graphite, long, for 0.10-mm id columns	5062-3507
0.4-mm id, 85% Vespel 15% graphite, long, for 0.20-mm id and 0.25-mm id columns	5062-3508
0.5-mm id, 85% Vespel 15% graphite, long, for 0.32-mm id columns	5062-3506
0.8-mm id, 85% Vespel 15% graphite, long, for 0.53-mm id columns	5062-3538
GC/MS interface – Finger Tight connectors	
0.4-mm id, 85% Vespel 15% graphite, for 0.10 to 0.25-mm id columns, short, 10/pk	5181-3323
0.5-mm id, 85% Vespel 15% graphite, for 0.32-mm id columns, short, 10/pk	5062-3514
0.8-mm id, 85% Vespel 15% graphite, for 0.45 to 0.53-mm id columns, short, 10/pk	5062-3512
Miscellaneous consumable parts and samples	
Filament assembly, EI	G7005-60053
Filament assembly, CI, 2 pk	G7005-80000
HES EI Filaments	G7002-60001
Foreline exhaust oil mist trap	G1099-80039
Octafluoronaphthalene (OFN), 1 pg/μL	5188-5348
Octafluoronaphthalene (OFN), 100 fg/μL	5188-5347
10 fg/μL OFN GC/MS Checkout std 3 x 1 mL	5190-0585
100 pg/μL Benzophenone in Isooctane	8500-5440
Perfluorotributylamine (PFTBA), certified (10 gram)	8500-0656
Perfluorotributylamine (PFTBA) sample kit	05971-60571
PFDTD, CI Calibrant	8500-8510
PFHT	5188-5357
Four-Compound GCMS Test Mix (may be used with First Run Assist)	05970-60045

Special Requirements

Equipment positioning on the bench.

Typical GC/MS System - 8890 GC, 5977 MSD, with computer and printer.

Use dedicated circuits for GC and MSD.

If bench backs up to wall, drill 1.5-in. hole for foreline pump hose.

78 cm (31-in.) (without heat deflector)

65 cm (26-in.) (with heat deflector)

Leave 30 cm (12-in.) open space for operational access

100 cm (40-in.) (with ALS)

80 cm (32-in.) (without ALS)

~2.35 m (7.7 ft.)

~44 cm (17.3-in.)

~86 cm (34-in.)

~56 cm (22-in.)

~56 cm (22-in.)

Place foreline pump on floor or on vibration reducing bench.

Total weight: ~123 kg (271 lb)
Maximum power consumption: ~5,050 VA (17,232 btu/hr)

Application	Gas*	Purity	Supply Pressure (psi)†	
Carrier	Helium	99.9995	50-80	
	Hydrogen	99.9995	50-80	
	Nitrogen	99.9995	50-80	
Detectors				
	TCD	Helium	99.9995	50-80
	FID, NPD, FPD, TCD	Hydrogen	99.9995	50-80
ECD, FID, FPD, NPD, TCD	Nitrogen	99.9995	50-80	
FID, NPD, FPD	Air	Zero grade	50-80	

* Use 1/8-in Swagelok gas connections
† 1 psi = 6.89 kPa

Cryo Cooling (Liquid)	Tubing	Supply Pressure (psi)*
CO ₂	1/8-inch stainless tubing	700-900
N ₂	1/4-inch insulated tubing	20-25

* 1 psi = 6.89 kPa