Agilent 7820MSD Series
G3175A (G7020A), G3176A (G7021A)

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Site Preparation Specification for GCMS system

Purpose of Procedure
Your site must meet this specification or set of requirements to assure a successful and timely installation of your 7820MSD Series Mass Selective Detector (MSD). This checklist is designed to prevent delays during installation, familiarization, and the initial use of the MSD system in your application. This checklist outlines the space and utility requirements for a 7820MSD. It also recommends tools and consumables that may help you get started. Use it along with the 5975 Series Site Preparation Manual.

Note:

The 7820MSD Diffusion pump will refer to the G3175A which is used in G7020A.
The 7820MSD Standard Turbo pump will refer to the G3176A which is used in G7021A.

Customer Responsibilities
Make sure your site meets this specification, including: the necessary space, electric outlets, gases, tubing, operating supplies, consumables and other usage dependent items such as columns, vials, syringes and solvents required for the successful installation of instruments and systems. If Agilent is delivering installation and familiarization services, users of the instrument should be present throughout these services; otherwise, they will miss important operational, maintenance and safety information.

Important Information
If you need assistance, please contact your local Agilent Technologies office. Assistance with this checklist and with user specific applications is available and will be contracted separately.

Dimensions and Weight

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Select the laboratory bench space before your system arrives. Pay special attention to the total height requirements. Avoid bench space with overhanging shelves.
Allow at least 20 cm clearance between back of GC and wall to dissipate air.

5975 Series MSDs	Height	Width	Depth	Weight
Diffusion Pump	40.8 cm 16 in	29.8 cm 11.75 in	54 cm 21.25 in	39 kg 85 lb
Standard Turbo Pump	40.8 cm 16 in	29.8 cm 11.75 in	54 cm 21.25 in	39 kg 85 lb
GCs Series	**Height**	**Width**	**Depth**	**Weight**
7820	54 cm 21.3 in	49.5 cm 19.4 in	54 cm 21.3 in	50 kg 112 lb

A simple system that includes a GC, an automatic liquid sampler, and a computer would require about 153 cm or 5 feet of bench space, add an addition 41cm for a LaserJet printer (195cm or about 6.5 feet); access to the MSD could require moving the instrument so an additional (30cm or 1 foot) should be available. A total of 244 cm or 8 feet of bench space should be available for a full GCMS system. Some repairs to the MSD or to the GC will require access to the back of the instrument.

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Please note: the length of the vacuum hose is 130cm or about 4.24 feet from the high vacuum pump to the foreline pump, while the length of the foreline pump power cord is 2M or about 6.6 feet.

The use of a Dry foreline pump requires the exhaust to be plumbed to an exhaust hood or exhaust line. During the installation and familiarization it is okay to use the silencer, but while running samples other than the installation checkout sample it is recommended the exhaust of the pump goes to an exhaust hood or exhaust line.

Power Consumption

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The number and type of electrical outlets depends on the size and complexity of your system. The MSD power consumption and requirements depends on the country the unit is shipping to. The electrical outlet for the unit should have a dedicated ground.

Product		Line voltage	Frequency	Current Rating (amps)	Maximum continuous power consumption	Outlets Requried
5975 Series MSD		120VAC (-10% / + 5%)	50/60 Hz ±5%	15A	1100VA (400VA for foreline pump only)	1
		220-240VAC (-10% / + 5%)	50/60 Hz ±5%	15A	1100VA (400VA for foreline pump only)	1
		200VAC (-10% / + 5%)	50/60 Hz ±5%	15A	1100VA (400VA for foreline pump only)	1
ChemStation PC system (monitor, CPU, printer)		120VAC (-10% / + 5%)	50/60 Hz ±5%	15A	1000VA	3 to 5
		200-240VAC (-10% / + 5%)	50/60 Hz ±5%	15A	1000VA	3 to 5
7820	Standard Oven	100 VAC single phase (-10% / + 10%)	48-63 Hz	12.5	1500 VA	1
		120/200/220/230/240V (2)(3) single phase (-10% / + 10%)	48-63 Hz	15.9/9.6/9.3/9.3/ 9.2	2250 VA	1

Notes

1. Americas 120V requires 20 amp dedicated line. Americas 240V requires 15 amp dedicated line.
2. Power line conditioners should not be used with 7820 GCs.

Heat Dissipation

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The following table may help you calculate the additional BTU's of heat dissipation from this new equipment. Maximums represent the heat given off when heated zones are set for maximum temperatures.

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Oven type	7820A series	5975C series
Standard oven ramp	7681 BTU / hour maximum	3000 BTU / hr including GC/MSD interface
100V Power option	5120 BTU / hour maximum	3000 BTU / hr including GC/MSD interface

Environmental Conditions

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Operating the GCMS within the recommended ranges insures optimum instrument performance and lifetime. Instrument needs space for proper convection of heat and ventilation. Performance can be affected by sources of heat and cold from heating, air conditioning systems, or drafts.

Product	Conditions	Operating temp range	Operating humidity range	Maximum altitude
7820A Series	Standard oven ramp	5 to 45 °C	5% - 90%	3,100 m
	Storage	-20 to 65 °C	0% - 90%	
5975 Series	Operation	15 to 35 °C (59 to 95 °F)	40% - 80%	4,615.38 m *
	Storage	-20 to 70 °C (-4 to 158 °F)	0% - 95%	

* 7,500 feet (2.3 Km) for the 5975C VL MSD

Gas Supply

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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 appropriate sized adapter to end with a1/8-inch Swagelok female connector. (The URL of SwagLok's web site is http://www.swagelock.com to help assist is finding connectors.)

The following table lists minimum and maximum pressures in psi for inlets and detectors measured at the bulkhead fitting at the back of the 7890, 6890 and 6850 Series GCs.

7890 Series Inlets and Detectors

	FID	NPD	TCD	ECD	FPD	S/splitless 100 psi	On-column	Purged packed	PTV
Hydrogen	35-100	35-100			45-100				

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	FID	NPD	TCD	ECD	FPD	S/splitless 100 psi	On-column	Purged packed	PTV
Air	55-100	55-100			100-120				
Make up	55-100	55-100	55-100	55-100	55-100				
Reference			55-100						
Carrier max						120	120	120	120
Carrier min						20 psi above pressure used in method			

Conversions: 1 psi = 6.8947 kPa = 0.068947 Bar = 0.068 ATM

Notes

1. If you have not requested option 305, you must supply pre-cleaned, 1/8-inch copper tubing and a variety of 1/8-inch Swagelok® fittings to connect the GC to inlet and detector gas supplies.
2. Cyrogenic cooling with Liquid N2 requires 1/4-inch insulated copper tubing.
3. Cyrogenic cooling with Liquid CO2 requires 1/8-inch heavy-walled, stainless steel tubing.
4. Valve actuation requires a separate pressurized, dry air at 55 psi.
5. Never use liquid thread sealer to connect fittings. Never use chlorinated solvents to clean tubing or fittings.

5975 Series Gas Flow Limitations

Feature	**G3175A**	**G3176A**
High vac pump	Diffusion Pump	Standard turbo
Optimal gas flow ml/min (a)	1.0	1.0
Maximum recommended gas flow, ml/min	2.0	2.0
Maximum gas flow, ml/min (b)	2.4	2.4
Max column id	0.32mm (30m)	0.32mm (30m)

a Total gas flow into the MSD: column flow plus reagent gas flow (if applicable)
b Expect degradation of spectral performance and sensitivity

5975 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)

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.

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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.

The following table lists gases for capillary columns.

	Carrier	Preferred makeup	2nd choice	Detector, anode purge, or reference
ECD	Hydrogen Helium Nitrogen Argon/methane	Argon/methane Argon/methane Nitrogen Argon/methane	Nitrogen Nitrogen Argon/methane Nitrogen	Anode purge must be same as makeup
FID	Hydrogen Helium Nitrogen	Nitrogen Nitrogen Nitrogen	Helium Helium Helium	Hydrogen and air for detector
FPD	Hydrogen Helium Nitrogen Argon	Nitrogen Nitrogen Nitrogen Nitrogen		Hydrogen and air for detector
NPD	Helium Nitrogen	Nitrogen Nitrogen	Helium Helium	Hydrogen and air for detector
TCD	Hydrogen Helium Nitrogen	Must be same as carrier and reference	Must be same as carrier and reference	Reference must be same as carrier and makeup

5975 Series Carrier and Reagent Gases Purity

Carrier and reagent gas requirements	**Purity**	
Helium (Carrier)	99.9995%	hydrocarbon free
Hydrogen (Carrier)	99.9995%	SFC Grade

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

Other considerations

Exhaust Venting Requirements for the GCMS

For the MS vent external to building via ambient-pressure vent system, within 460 cm (15 ft) of both GC split vent and MSD foreline pump or vent to fume hood. Exhaust vent system is not part of environmental control system of building that recirculates air. Exhaust venting need to comply with all local environmental and safety codes.
For the GC with the deflector (outlet diameter 10cm – 4in) installed the exhaust is about 65 CuFt/min (1.840CuM/min), without deflector 99 CuFeet/min (2.8M3)

Basic Tools

Your GCMS 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.

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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.
¼-inch nut driver	FID jet replacement.
FID flow measuring insert	FID troubleshooting.
Column cutter	Column installation.
1/8-inch Tee, Swagelok, brass	Connect gas supplies
1/8-inch nuts & ferrules, Swagelok, brass	Connect gas supplies
Inlet septa appropriate for type	Injection port seal
Inlet insert or liner	Injection port
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
Cloths	Used to keep surfaces clean and parts clean
Gloves	Used to reduce contamination on parts GC and MS

MSD Maintenance supplies	
Description	**Part number**
Abrasive paper, 30 µm	5061-5896
Alumina powder 1kg sample	8660-0791
Cloths, clean (package of 300)	05980-60051
Cloths, cleaning (package of 300	9310-4828
Cotton swabs (package of 100)	5080-5400
Foreline pump oil, P3	6040-0621
Gloves, clean, large	8650-0030
Gloves, clean, small	8650-0029
Grease, Apiezon L, high vacuum	6040-0289
Ferrules	
Description	**Part number**
Blank, graphite-vespel	5181-3308
GC/MSD interface	
0.3-mm id, 85% Vespel 15% graphite, for 0.10-mm id columns	5062-3507
0.4-mm id, 85% Vespel 15% graphite, for 0.20-mm id and 0.25-mm id columns	5062-3508
0.5-mm id, 85% Vespel 15% graphite, for 0.32-mm id columns	5062-3506
0.8-mm id, 85% Vespel 15% graphite, for 0.53-mm id columns	5062-3538
Injection port	
0.27-mm id, 90% Vespel 10% graphite, for 0.10-mm id columns	5062-3518
0.37-mm id, 90% Vespel 10% graphite, for 0.20-mm id columns	5062-3516
0.40-mm id, 90% Vespel 10% graphite, for 0.25-mm id columns	5181-3323
0.47-mm id, 90% Vespel 10% graphite, for 0.32-mm id columns	5062-3514
0.74-mm id, 90% Vespel 10% graphite, for 0.53-mm id columns	5062-3512
Miscellaneous parts and samples	
Electron multiplier horn for the Triple Axis Detector	G3170-80103
Filament assembly (EI)	G2590-60053

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Foreline pump oil (1 liter)	6040-0621
Foreline exhaust oil mist trap	G1099-80039
Octafluoronapthalene (OFN), 1 pg/ul	5188-5348
Perfluorotributylamine (PFTBA), certified (10 gram)	8500-0656
Perfluorotributylamine (PFTBA) sample kit	05971-60571
PFHT	5188-5357
Sample, evaluation A, hydrocarbons	05970-60045