

Preparing your lab for a potential shutdown

Dealing with operating impacts from the COVID-19 Coronavirus

HPLC and LC/MS	March 24 and March 31
GC and GC/MS	March 25 and April 1
ICP-OES and ICP-MS	March 26 and April 2



Important general lab shut down information

Follow your SOP's – but here are some additional things to consider

- Document everything with extensive detail – Ask yourself: “Will I remember in 2 or 3 weeks?”
- Check expiration dates, shelf life, etc for all chemicals and supplies – factoring in the anticipated shutdown duration.
- Check all gases and gas clean filters.
- Check vacuum systems - pumps/oil.
- Do a lab clean-up! Clean out those drawers, dispose of old columns, properly discard old chemicals, etc.
- How stable is your electrical service (failures, spikes, etc.)? Should I power everything down?
- Are service providers allowed on-site? Or is there remote work they can do? Discuss this before any scheduled visit.
- Can any tasks be shifted remote or online (training, remote monitoring, data analysis)? Is your IT department aware of these and is bandwidth/VPN/remote access capable of handling this.
- Do you have the necessary supplies to restart and run for a month or more? Some vendors may not have stock because they were shutdown (or still shutdown) or there is a spike in demand from labs coming back online. Call your vendor NOW to check inventory/manufacturing of your critical supplies?
- If you resupply now, can your lab receive the materials? Is someone on-site?
- What is your anticipated sample load when coming back online? Backlog, urgent samples, etc.

Checklist for shutting down your LC & LC MS systems



Best Practices for Using an Agilent LC System

Technical Note

This technical note describes best practices for using an Agilent LC system.

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Check list before Flushing system

1st FLUSH YOUR COLUMN ACCORDING TO COLUMN MANUFACTURERS RECOMMENDATION

<https://www.agilent.com/cs/library/specifications/Public/820114-002.pdf> The guidelines for the Eclipse Plus C18 are found at this link.

<http://peaktales.libsyn.com/> is a link to podcasts about Agilent columns with flushing and storage recommendations

You can google your column/ contact the column manufacturer if you do not have the original paperwork with the column box.

2nd Remove your column from the instrument leaving the column the in the manufacturers recommended solvent storage conditions

3rd Remove your column from the system (do not forget to endcap the column)

4th Put Zero Dead Volume fitting in line in place of the column



Zero dead volume

Part Number :0100-0900



Chromatography Mode effects Washing Method

Place a zero dead volume fitting in line, so the flow cell and other lines are also flushed

Reverse phase method

- If using a nonvolatile buffer, flush that channel with pure H₂O
- Flush all channels with MeOH
- Flush all channels with IPA
- Leave system in IPA

Normal phase method

- Flush all channels with IPA (for seal life)
- Leave system in IPA for long term storage

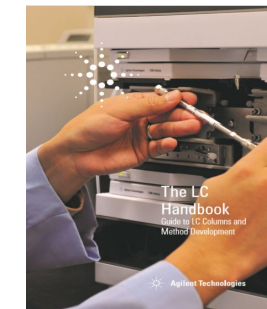
Ion Exchange Salt buffers

- Flush all channels with H₂O
- Flush with MeOH
- Flush with IPA

Solvent miscibility table

	Acetone	Acetonitrile (ACN)	n-Butyl Alcohol	Chloroform	Cyclohexane	Dichloromethane (DCM)	N,N-Dimethylformamide	Dimethyl Sulfoxide (DMSO)	1,4-Dioxane	Ethyl Acetate	Ethyl Alcohol	Ethyl Ether	Ethylene Dichloride	Heptane	Hexane	Iso-Octane	Isopropanol (IPA)	Methanol	Methyl t-Butyl Ether	Methyl Ethyl Ketone	Pentane	Tetrahydrofuran (THF)	Toluene	Water	o-Xylene	
Acetone																										
Acetonitrile (ACN)																										
n-Butyl Alcohol																										
Chloroform																										
Cyclohexane																										
Dichloromethane (DCM)																										
N,N-Dimethylformamide																										
Dimethyl Sulfoxide (DMSO)																										
1,4-Dioxane																										
Ethyl Acetate																										
Ethyl Alcohol																										
Ethyl Ether																										
Ethylene Dichloride																										
Heptane																										
Hexane																										
Iso-Octane																										
Isopropanol (IPA)																										
Methanol																										
Methyl t-butyl Ether																										
Methyl Ethyl Ketone																										
Pentane																										
Tetrahydrofuran (THF)																										
Toluene																										
Water																										
o-Xylene																										

Table 13. Solvent miscibility



<https://www.agilent.com/cs/library/primers/Public/LC-Handbook-Complete-2.pdf>

Shutdown check list for my LC MSD

To vent or not to vent that is the question

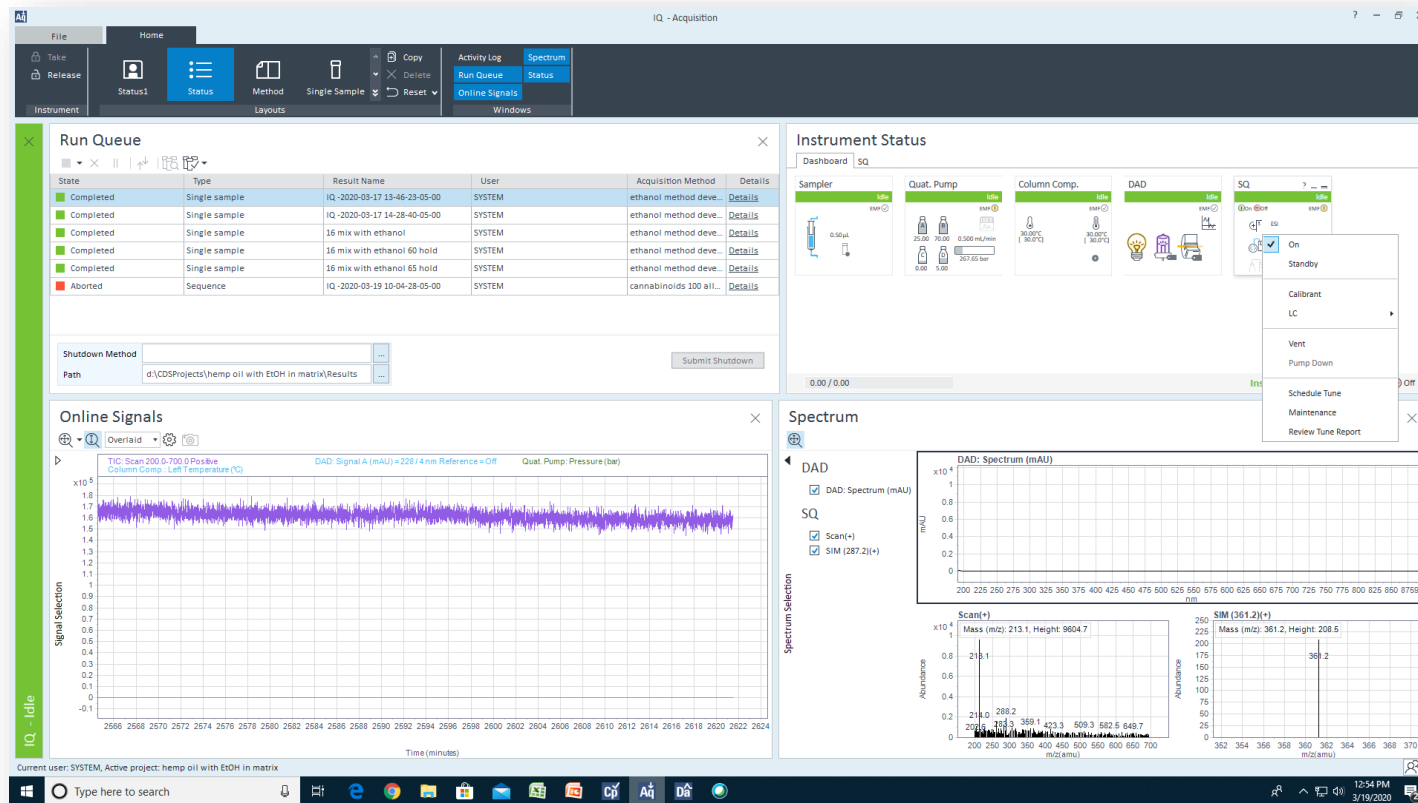
Standby

- The drying gas will lower to 3 L/min.
- The LC MSD Quad will stay a 100 °C.
- The Gas temperatures will be lowered.
- Nebulizer pressure is lowered.
- Capillary current stays on
- Rough pumps stay on so the system remains under vacuum

Vent

- Turn **off** the solvent flow of the HPLC
- If equipped with a ballast valve check that the ballast valve on the rough pump is **closed**
- From the data analysis program vent the system.
- When you vent the system, the components are turned off and the rough pump turns off.
- The next slides have more detail on how to vent

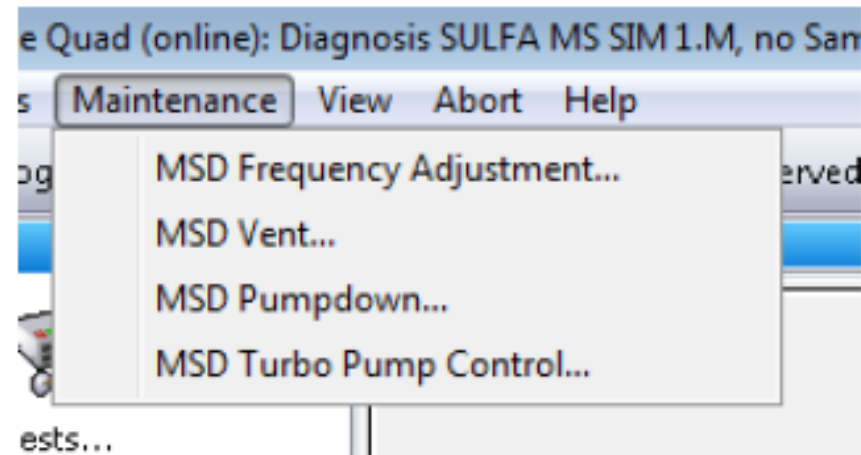
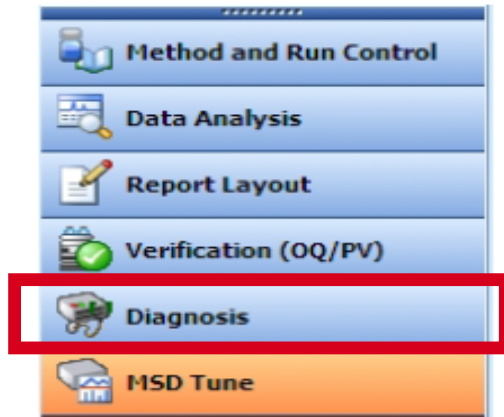
Venting or Standby the single quad in OL CDS



- I. Vent the system by right clicking on the SQ in the instrument status screen.
- II. Cap the capillary as shown in later slide.

OL CDS CHEMSTATION Edition C Version

The ChemStation Edition program is organized into views. Each view allows you to do a specific set of tasks. The menus and toolbars change with each view.



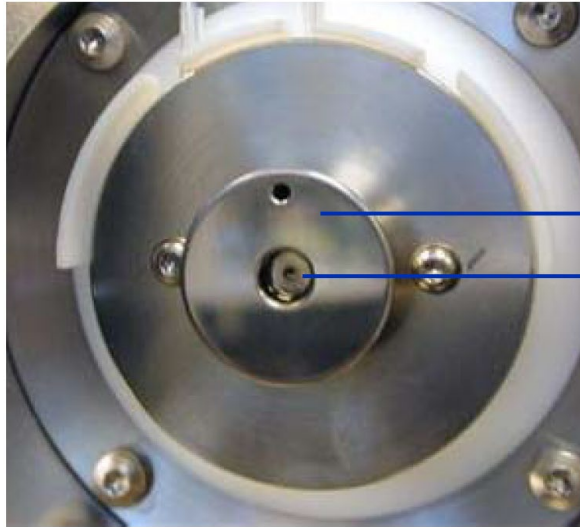
- I. Vent the system by right clicking on the MSD VENT in the instrument Diagnosis screen.
- II. Let the system cool.
- III. Cap the capillary as shown in later slide.

CAUTION

Do not vent the instrument by simply turning off the power button on the MS. Doing so will cause excessive wear on the turbomolecular pump.



Capping the Capillary



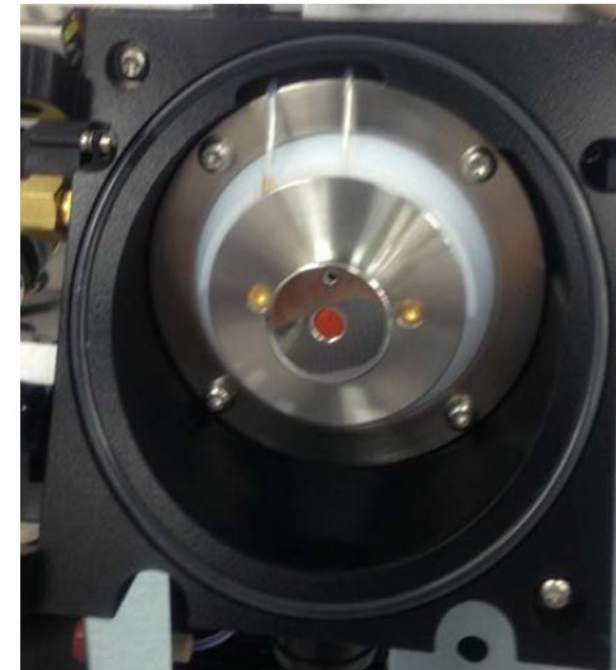
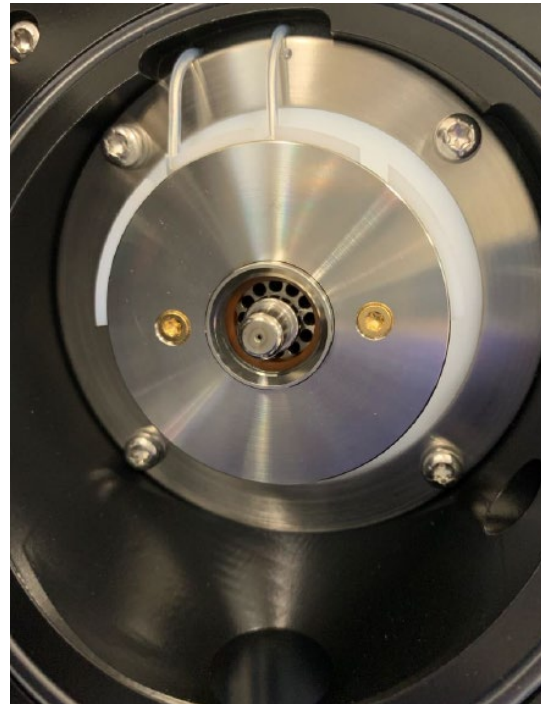
Standard spray shield

Capillary cap

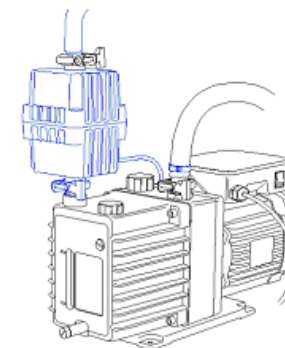
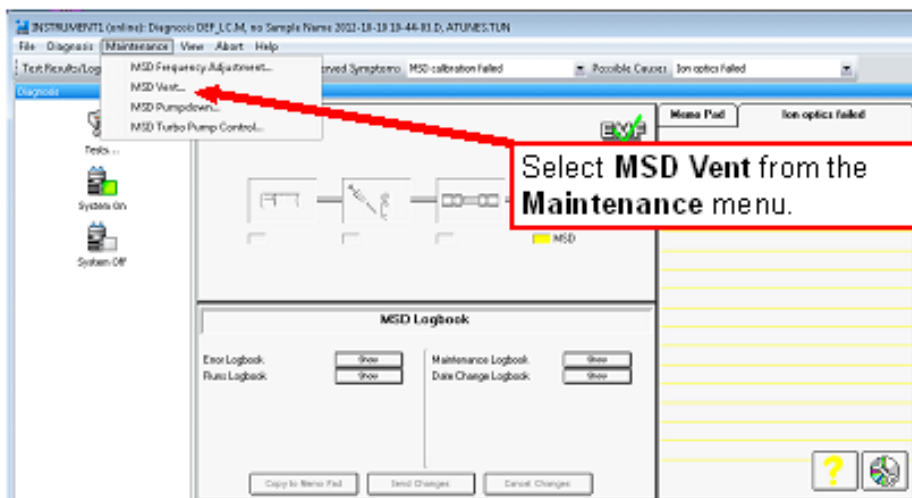


Multimode spray shield

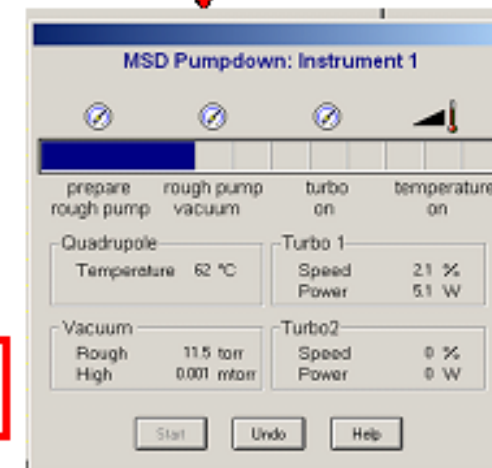
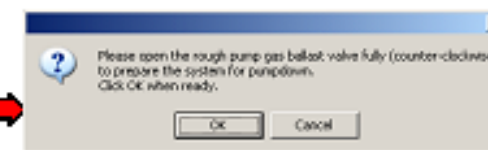
- I. Let the instrument cool
- II. Remove the spray shield (it may look different depending on the source)
- III. Remove the Cap (store in safe location)
- IV. Add a **Thick Rubber** GC septum over the capillary
- V. Replace the spray shield this is a ESI source



Venting the LC MS single quad from B and A version software



- I. Go to the Diagnostic Screen
- II. Select MSD Vent from Maintenance mode
- III. Select start from the status window
- IV. Turn the ballast valve on the Pump (you will be reminded)
- V. The instrument status will show in the screen
- VI. Then power off after vented
- VII. Cap the capillary as shown in previous slide.



Shutdown Procedures for Agilent QTOF Products

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Hello From Florida...



Three Scenarios' For Long Term Shutdown of QTOF's

1. Laboratories with **Uninterrupted N2 Gas Source** and want to keep system on:
 - a) Turn LC Modules to Standby (green to yellow)
 - b) From QTOF Source Methods Parameter Tab **Reduce Drying Gas Temp to 150°C** and reduce the Drying Gas Flow Rate to **10 L/min for 6550** Systems and to **5 L/min for all other systems**
 2. Laboratories with **Uninterrupted N2 Gas Source** (Nitrogen Generator) Put **Standby**:
 - a) Turn LC modules to Standby (green to yellow)
 - b) Turn QTOF to Standby mode (from QTOF Tab) green to yellow
 3. For Laboratories with **Interrupted N2 Gas Source** (e.g. dewars): Recommend **Venting** system using the procedure outlined on following slides (6546 QTOF At the end)
- Future Webinar will emphasize best practices in restarting systems.
 - Agilent Community and Links to Resources: We are still here to help!

Option One: System On with Lower Drying Gas Temp and Flow

6230TOF

6530, 6545, 6545XT, 6546, 6560 QTOF

6550 QTOF Higher Gas Flow Rate

General	Source	Acquisition	Ref Mass	Chromatogram
Dual AJS ESI (Seg)				
Gas Temp	150	°C	150	°C
Drying Gas	5	l/min	5.0	l/min
Nebulizer	35	psi	35	psi
Sheath Gas Temp	350	°C	351	°C
Sheath Gas Flow	10	l/min	10.1	l/min

General	Source	Acquisition	Ref Mass	Chromatogram
Dual AJS ESI (Seg)				
Gas Temp	150	°C	151	°C
Drying Gas	10	l/min	10.0	l/min
Nebulizer	35	psi	35	psi
Sheath Gas Temp	350	°C	352	°C
Sheath Gas Flow	10	l/min	10.0	l/min

Option TWO: STANDBY MODE

From Instrument Panel QTOF Module Right Click Select Standby

The screenshot displays the instrument control interface. On the left, the DAD module is shown in 'Idle' mode. In the center, the Q-TOF module is shown in 'Standby' mode. A context menu is open over the Q-TOF module, listing various options: On, Standby (selected), Calibrant, LC, Vent, Pump Down, APPI UV Lamp, and Reset Ion Source. The status bar at the bottom indicates 'Instrument Standby'.

Parameter
Q-TOF: Not Re
Q-TOF: Rough
Q-TOF: Quad V
Q-TOF: TOF V
Q-TOF: Vaporiz
Q-TOF: Gas Te

Upon Selecting Standby Source Conditions Automatically Lowered

The screenshot displays the software interface for the 1290 LC system, specifically the 'Q-TOF' method configuration. The 'Source' tab is active, showing parameters for 'Dual AJS ESI (Seg)' and 'MS TOF (Expt)'. The 'Dual AJS ESI (Seg)' section includes fields for Gas Temp (150 °C), Drying Gas (12 l/min), Nebulizer (35 psi), Sheath Gas Temp (350 °C), and Sheath Gas Flow (12 l/min). The 'MS TOF (Expt)' section includes Fragmentor (145 V), Skimmer (45 V), and Oct 1 RF Vpp (750 V). The 'Dual AJS ESI (Expt)' section includes VCap (3500 V), Capillary (0.068 µA), Nozzle Voltage (Expt) (1000 V), and Chamber (0.29 µA). Two blue arrows point from the title to the 'Drying Gas' and 'Nebulizer' fields, indicating they have been lowered.

Parameter	Value	Unit
Gas Temp	150	°C
Drying Gas	12	l/min
Nebulizer	35	psi
Sheath Gas Temp	350	°C
Sheath Gas Flow	12	l/min
Gas Temp	226	°C
Drying Gas	3.0	l/min
Nebulizer	15	psi
Sheath Gas Temp	126	°C
Sheath Gas Flow	3.0	l/min
Fragmentor	145	V
Skimmer	45	V
Oct 1 RF Vpp	750	V
VCap	3500	V
Capillary	0.068	µA
Nozzle Voltage (Expt)	1000	V
Chamber	0.29	µA

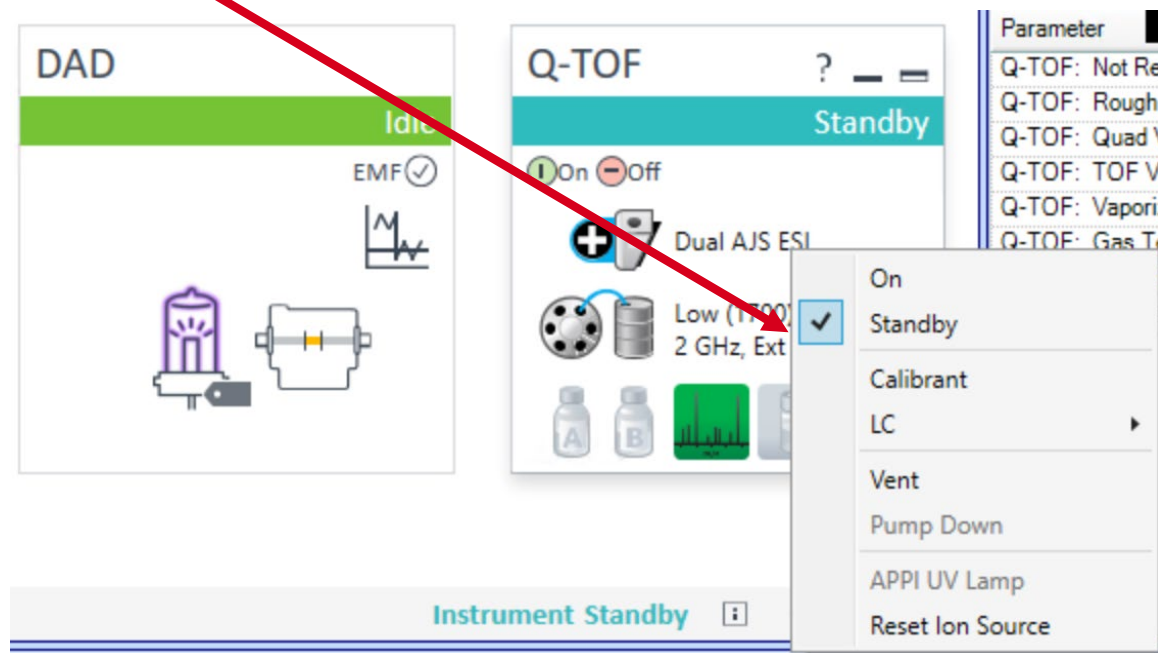
Drying Gas and Sheath Gas Temperatures Also Lowered.. But Still Hot

Option Three: Shutdown/Vent 6530, 6545, 6545XT, 6550, 6560 (NOT 6546) Step-by-Step Procedure on Following Slides

1. Place system into Standby
2. Wait 30 minutes for source to cool off.
3. Select Vent in MS Tab of QTOF
4. Wait 30 minutes after starting vent
5. Check vacuum in MS actuals screen
6. Run SmartCard shutdown script
7. Go to main power switch on QTOF and switch to OFF.
8. After vent is complete, Source should be COLD. Remove spray shield, place Thick GC rubber septum inside spray shield and place back onto system.
9. Turn off the power to the PC and monitors
10. Turn down pressure on N2 Gas valve to off
11. Disconnect the nitrogen line between the valve and the filters
12. Cap the nitrogen tube going to the filters with a Swagelok cap
13. Unplug the power cords from the system

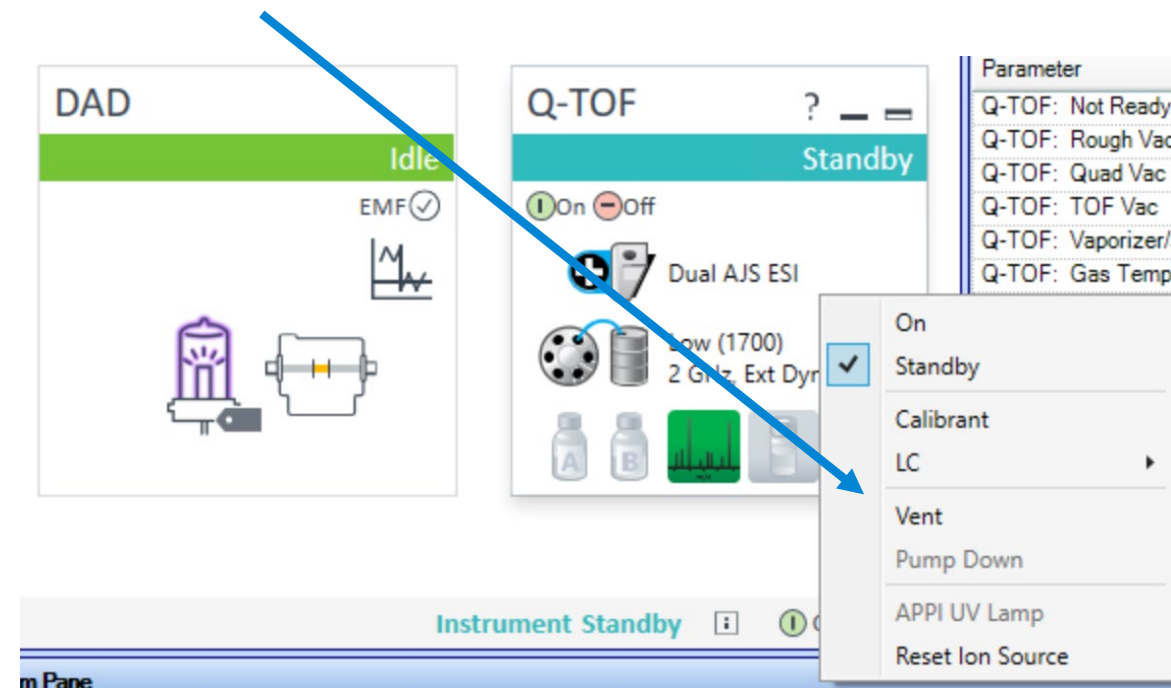
Q(TOF) Shutdown Procedure (6230, 6530, 6545, 6545XT, 6550, 6560)

Standby Mode



Wait 30 Minutes for Source to cool Down

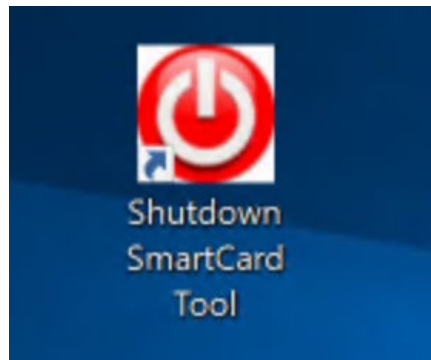
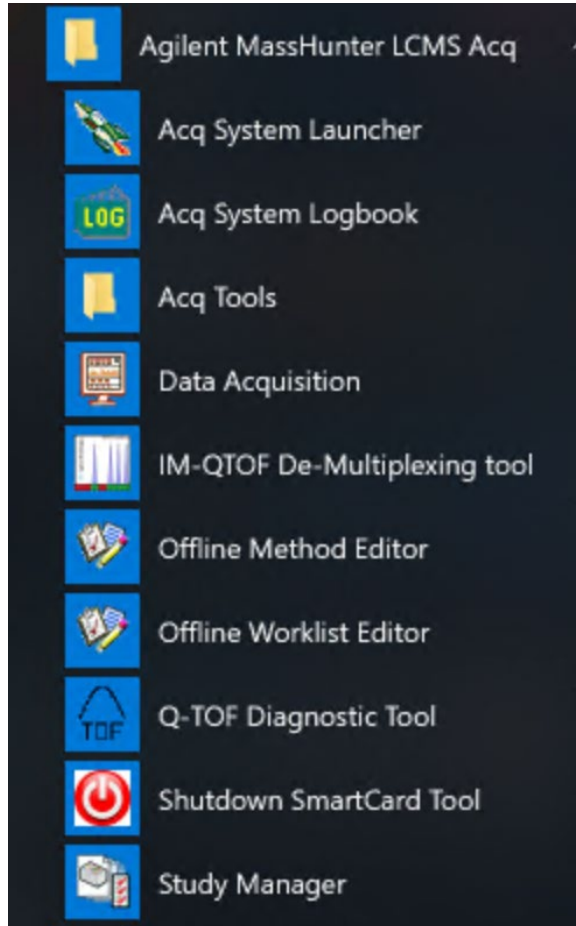
Select Vent:



Wait for Rough Pump Vacuum to reach 760 torr or 20 minutes

SmartCard Shutdown Procedure

Double Click on SmartCard Icon



Select Shutdown



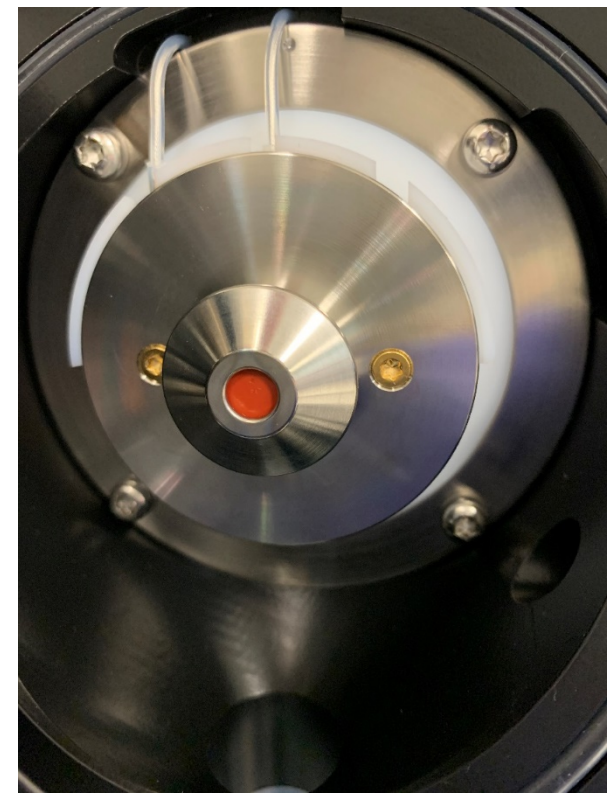
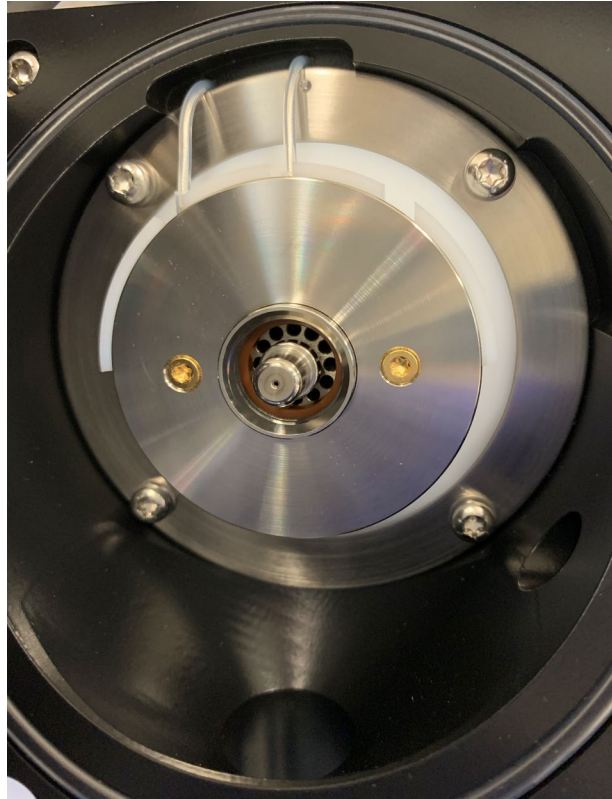
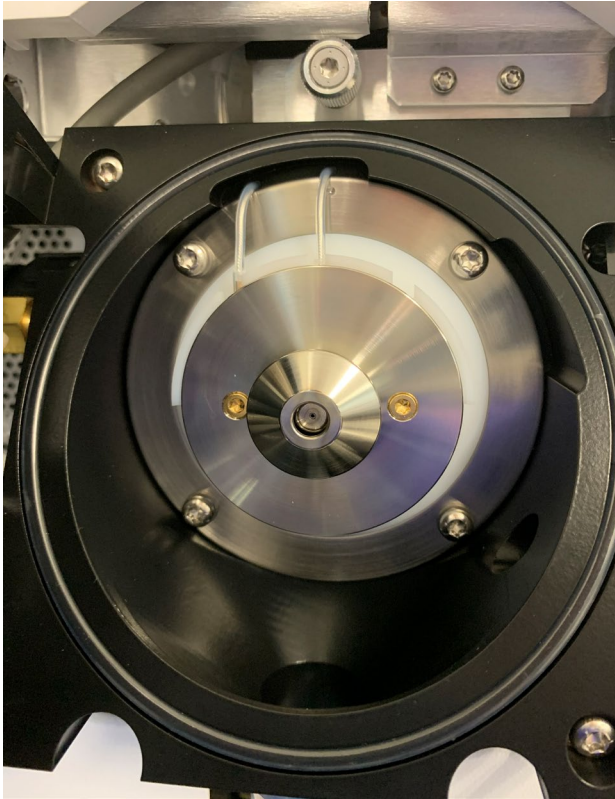
Press Power Button on Front of System After Doing Smart Card Shutdown

Powering Down MS System

- Go to main power switch on QTOF and switch to OFF.
- After vent is complete, Source should be COLD. Remove spray shield, place **Thick GC rubber septum** inside spray shield and place back onto system (see next slides)
- Turn off the power to the PC and monitors
- Turn nitrogen off at wall valve
- Disconnect the nitrogen line between the valve and the filters
- Cap the nitrogen tube going to the filters with a Swagelok cap
- Unplug the power cords from the system

Procedure To Keep MS Clean While Vented..

Remove Spray Shield and Cap on Capillary (do not twist)



Wait for source to be cool and wear gloves when removing spray shield and cap from source.

**Place Cap in Secure and Clean Location!
Remember to Reclose and Latch Source**

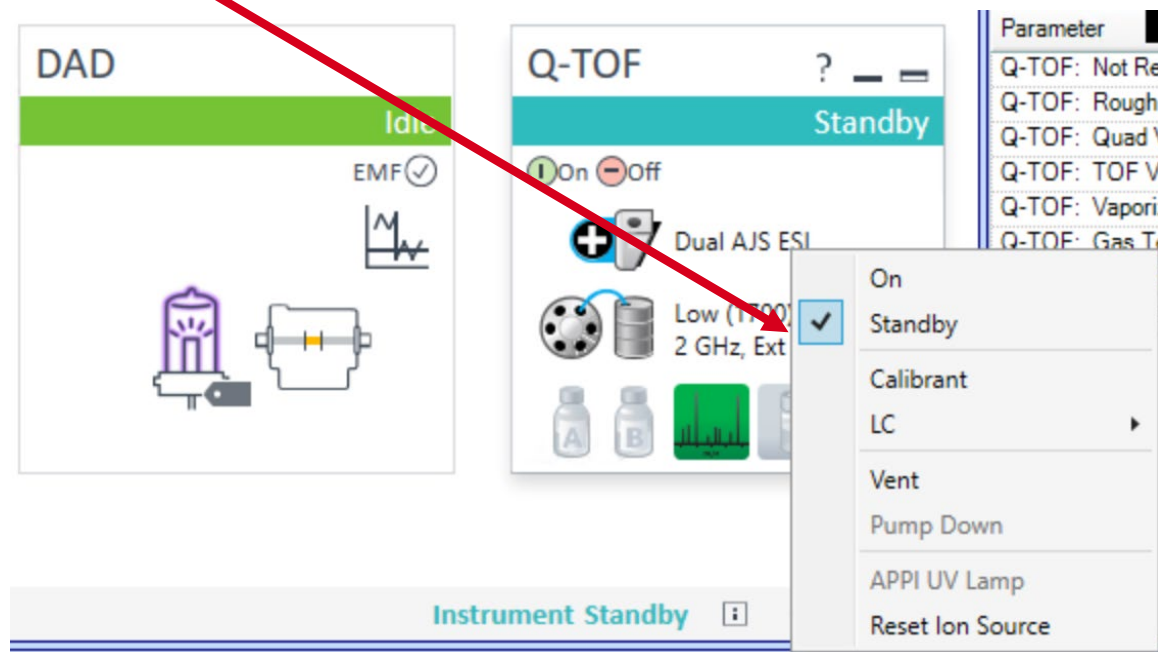
Shut Down Procedure for **6546 QTOF** has rough pump Isolation Valve

- Place instrument in standby mode
- **Turn Collision Cell Gas off**
- Remove spray shield and capillary cap
- **Install septum and secure with the spray shield**
- Vent the system and **wait for turbos to spin down** (~20-30 minutes)
- Verify that the rough vacuum goes down to < 200 mTorr
- Smart Card Shutdown Procedure
- Turn off the power (front power switch)
- Wait 5 seconds
- **Close the isolation valve on the rough pump**
- Turn off the nitrogen at the wall valve
- Disconnect the nitrogen line between the valve and the filters
- Cap the nitrogen tube going to the filters with a Swagelok cap
- Unplug the power cords from the system

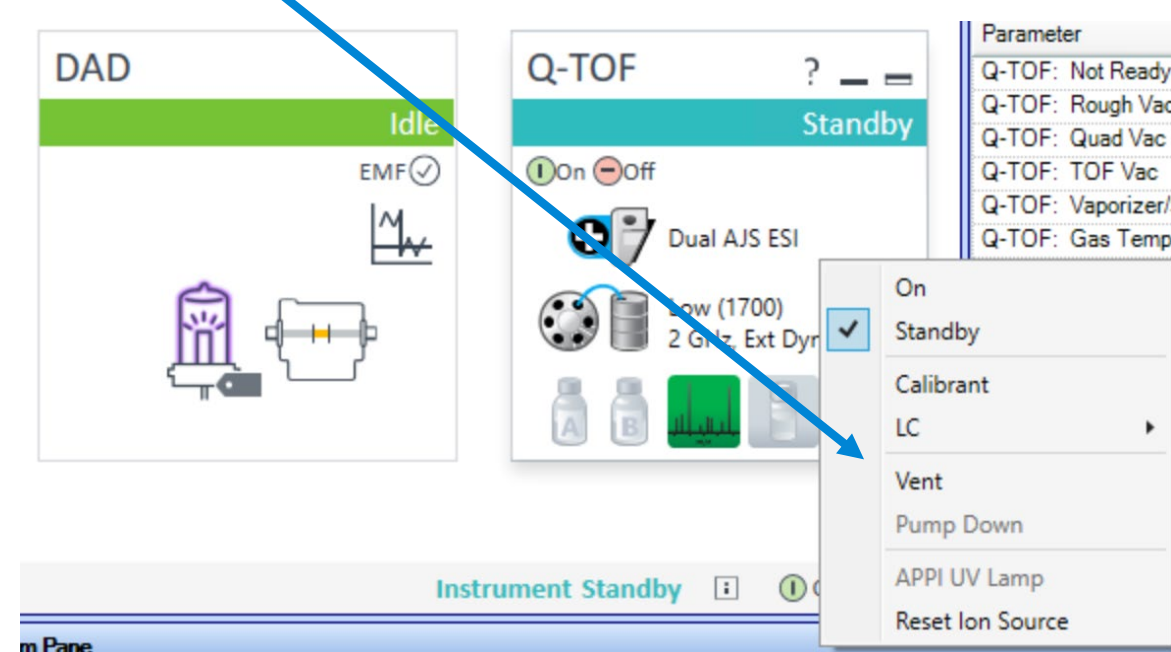
6546 QTOF Shutdown Procedure

1. Standby, 2. Turn off Collision Gas, 3. Cap Capillary, 4. Vent

Standby Mode



Select Vent:

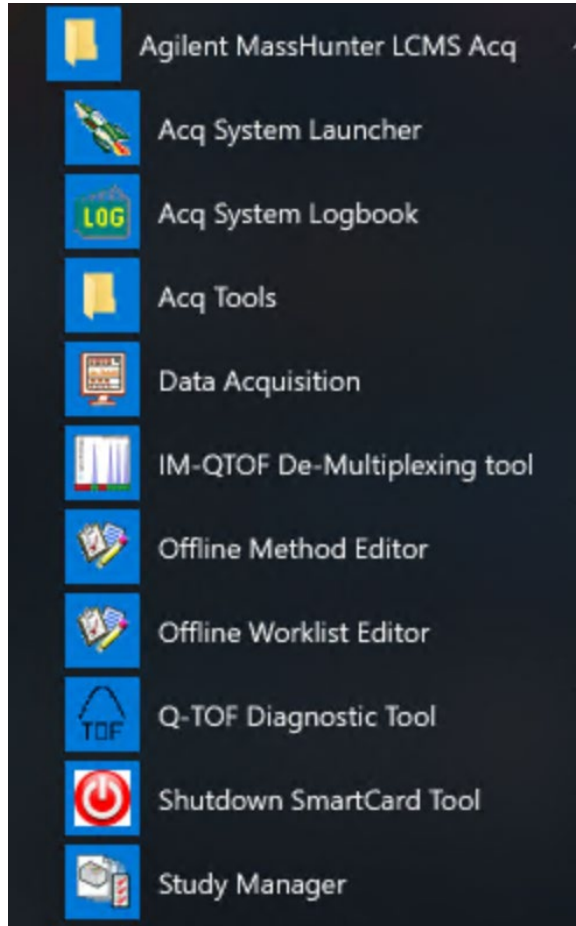


Turn off Collision Gas At Wall Valve:
Wait 30 Minutes for Source to cool Down

Wait for turbos to spin down 20/30 minutes
Verify vacuum goes down to < 200 mTorr

SmartCard Shutdown Procedure

Double Click on SmartCard Icon



Select Shutdown



Press Power Button on Front of System After Doing Smart Card Shutdown

Would Rather be Working..



QQQ 6420, 6430, 6470, 6495, Ultivo Shutdown Procedure

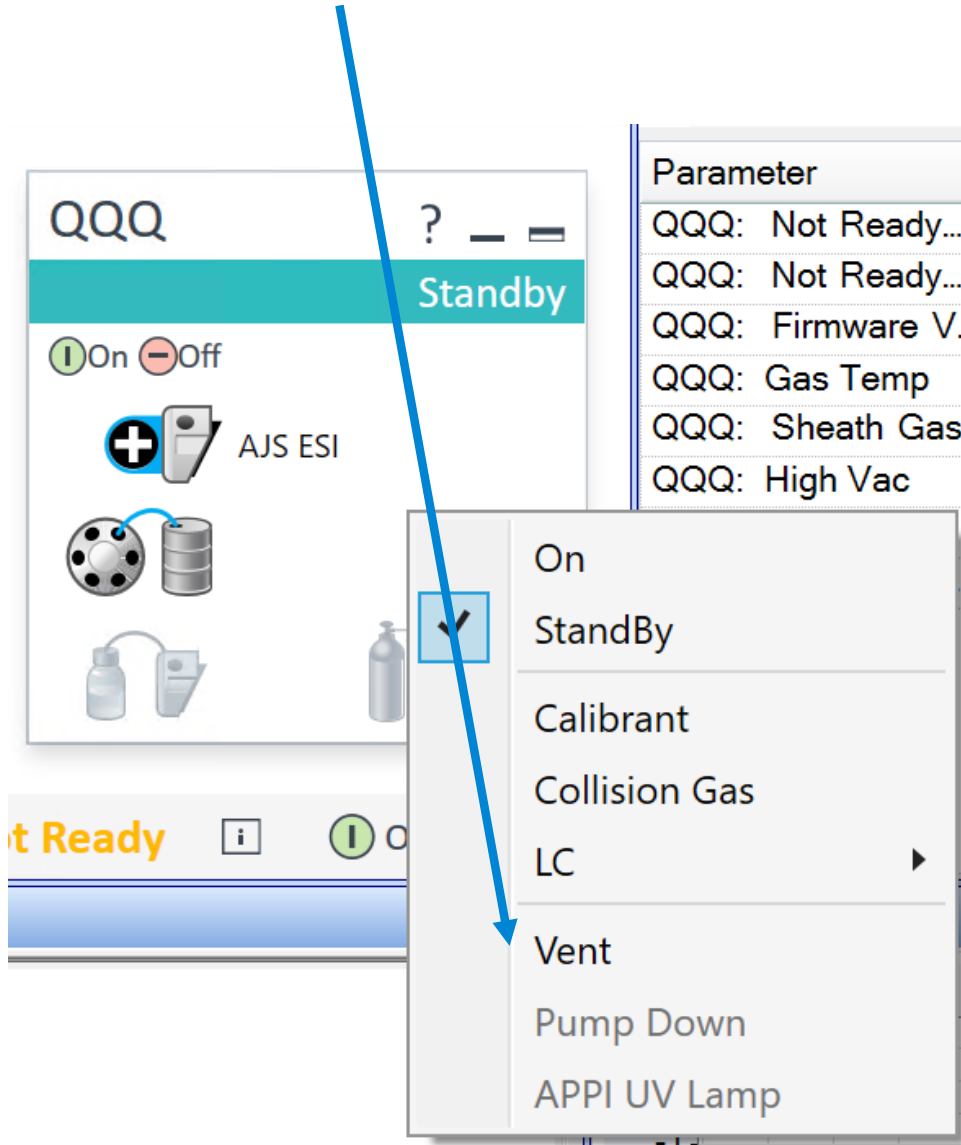
1. Turn OFF the solvent flow from LC:
 - If you have any analyte in the calibration delivery systems flush the system with pure solvent before you continue
2. Check that the ballast valve on the rough pump is closed (if applicable)
3. From the Data Acquisition program, in the Tune view or context, select “Vent” the system
 - These parts are turned OFF: Spray chamber high voltages, drying gas heater, nebulization flow, the detector and other lens voltages; sheath gas heater turned off for Jet Stream
 - The rough pump turns off when the turbo speed is below 20 percent
4. Press power switch on front of system to turn off
5. Turn off power to PC and monitors
6. Turn off the nitrogen at the wall valve
7. Disconnect the nitrogen line between the valve and the filters
8. Cap the nitrogen tube going to the filters with a Swagelok cap
9. Unplug the power cords from the system

Check that the ballast valve to the rough pump is closed (if applicable)
Right Click on QQQ Tab and then Uncheck Collision Gas to Turn off

The screenshot shows the QQQ control interface. At the top, the 'Standby' status is highlighted in teal. Below it, there are control buttons for 'On' (green) and 'Off' (red), and an 'AJS ESI' icon. A context menu is open over the 'Standby' button, listing several options: 'On', 'StandBy' (checked), 'Calibrant', 'Collision Gas' (checked), 'LC', 'Vent', 'Pump Down', and 'APPI UV Lamp'. A blue arrow points from the text above to the 'Collision Gas' option in the menu.

Parameter	Value
QQQ: Not Ready...	Turning on/off collision gas
QQQ: Not Ready...	Turning on/off collision gas
QQQ: Firmware V...	A.00.08.99
QQQ: Gas Temp	300 °C
QQQ: Sheath Gas...	125 °C
QQQ: High Vac	1.97E-4 Torr
QQQ: Rough Vac	1.81E+0 Torr
QQQ: Collision G...	off

Click on “Vent” To Start Venting the QQQ Watch Actuals for Pressure



Parameter	Value
QQQ: Not Ready...	Turning on/off collision gas
QQQ: Not Ready...	Turning on/off collision gas
QQQ: Firmware V...	A.00.08.99
QQQ: Gas Temp	300 °C
QQQ: Sheath Gas...	125 °C
QQQ: High Vac	1.97E-4 Torr
QQQ: Rough Vac	1.81E+0 Torr
QQQ: Collision G...	off

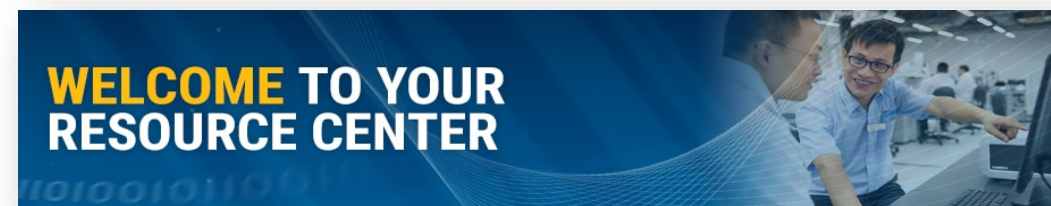
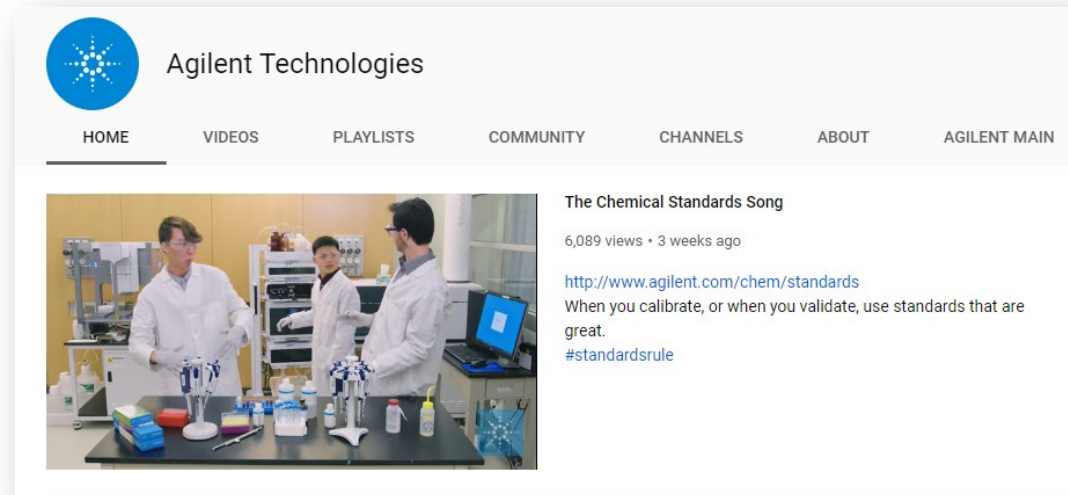
After System is Vented

1. Press power switch on front of system to turn off
2. Turn off power to PC and monitors
3. Turn off the nitrogen at the wall valve
4. Disconnect the nitrogen line between the valve and the filters
5. Cap the nitrogen tube going to the filters with a Swagelok cap
6. Unplug the power cords from the system

Resources for Support

HPLC and LC columns support

- Collection of LC resources:
https://community.agilent.com/docs/DOC-1852-lc-insights-to-go#jive_content_id_LC_Troubleshooting
- LC Troubleshooting Poster:
<https://www.agilent.com/en/promotions/lc-troubleshooting>
- Agilent support resources:
<https://community.agilent.com/community/resources>
- Agilent University: <http://www.agilent.com/crosslab/university>
- Agilent resource center:
<http://www.agilent.com/chem/agilentresources>
- InfinityLab Supplies Catalog ([5991-8031EN](#))
- Your local FSE and Specialists
- Youtube – [Agilent Channel](#)



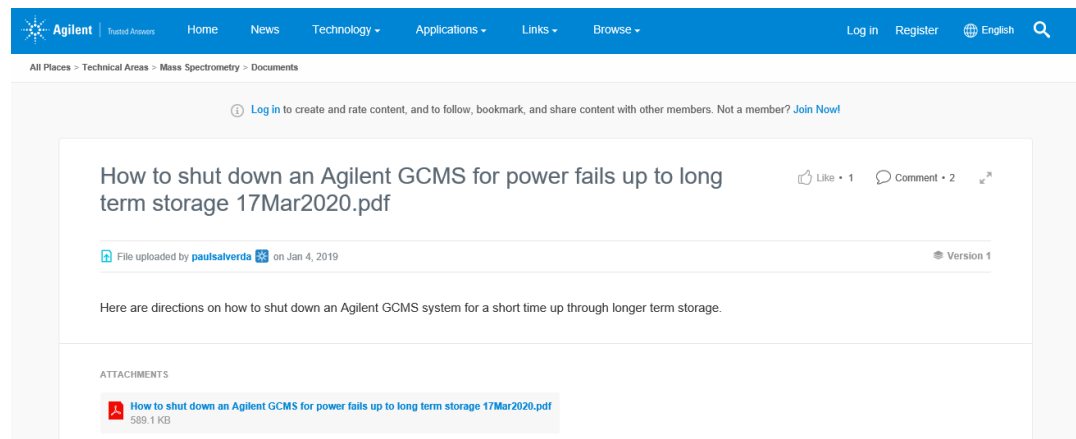
gc-column-support@agilent.com
lc-column-support@agilent.com
spp-support@agilent.com
spectro-supplies-support@agilent.com



Resources for Support

Detailed shutdown guides for GCMS on [Agilent Community](#)

Includes step-by-step procedure, part numbers, and additional info on preparing, moving, and storing systems.



<https://community.agilent.com/docs/DOC-5382-how-to-shut-down-an-agilent-gcms-for-power-fails-up-to-long-term-storagepdf>

Additional podcast resources

Peak Tales

A conversation about
HPLC and GC chromatography



[QUICK TIP #1 How to Store your HPLC Column](#)

Direct Download: http://traffic.libsyn.com/peaktales/QT1_Final.mp3

[QUICK TIP #2 How to Store your SEC Column](#)

Direct Download: http://traffic.libsyn.com/peaktales/QT2_Final.mp3

[QUICK TIP #3 How to Store your Ion Exchange Column](#)


Direct Download: http://traffic.libsyn.com/peaktales/QT3_Final.mp3

[QUICK TIP #4 How to Store your GC Column](#)

Direct Download: http://traffic.libsyn.com/peaktales/QT4_Final.mp3

Additional online e-seminars and educational material

Agilent Chromatography and Mass Spec Educational Webinar Series



<https://www.agilent.com/en/training-events/eseminars/832>

Becoming a Better Chromatographer

HPLC Educational Webinar Series



<https://www.agilent.com/en/training-events/eseminars/lc-lc-ms-column-e-seminars>

Becoming a Better Chromatographer

GC Educational Webinar Series



<https://www.agilent.com/en/training-events/eseminars/gc-gc-ms-webinars>

Whether you are away from your lab or are limiting access to your lab, Agilent can support you with remote, digital solutions.



Get individualized assistance. Our remote service engineers are available by **phone or video conference** to answer your questions – including support on compliance issues or performing risk assessments. [Contact us](#) or explore [online resources](#) to do-it-yourself.



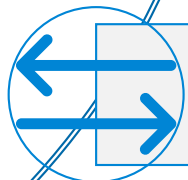
Connect, collaborate, and share insights. Quickly ask and find answers to your questions **live and online**. Build connections and access instrument resources in the [Agilent Community](#).



Learn at any time, any place, any pace. Explore hundreds of **online courses** - many of which are free - from [Agilent University](#). Use Learning Paths for guided resources on a specific instrument, or get ePass for unlimited access to all online content.



Check-in with your Agilent instruments remotely. Receive real-time status alerts with critical instrument information with [Smart Alerts](#) for your Agilent LC, GC and GC/MS instruments. The Remote Assist feature also provides priority response service for faster uptime. No professional installation needed!



Keep your lab up and running. With over 400 instrument modules in stock and ready to ship, utilize our [Instrument Exchange Services](#) to replace defective modules. Or if you need to retain your instrument, use the [Return to Agilent](#) Program to ship us your defective unit. **We'll repair it and return your instrument back to you.**

Contact Agilent Chemistries and Supplies Technical Support



1-800-227-9770 Option 3, Option 3:

Option 1 for GC/GCMS Columns and Supplies

Option 2 for LC/LCMS Columns and Supplies

Option 3 for Sample Preparation, Filtration and QuEChERS

Option 4 for Spectroscopy Supplies

Option 5 for Chemical Standards

800 Phone lines available 8-5 in all US time zones

[Phone Tree](#)
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[Assistance](#)



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In Summary



We at Agilent understand the restrictions and hardship many of you are going through because we're experiencing them as well

Given all that we are going through, Agilent remains a stable and continuing resource to meet and exceed your analytical measurement needs

We are open for business and here to help



Any questions?

All unanswered chat questions will be followed up post-event.
Slides will be distributed to the email address you registered with.



Agilent

Trusted Answers