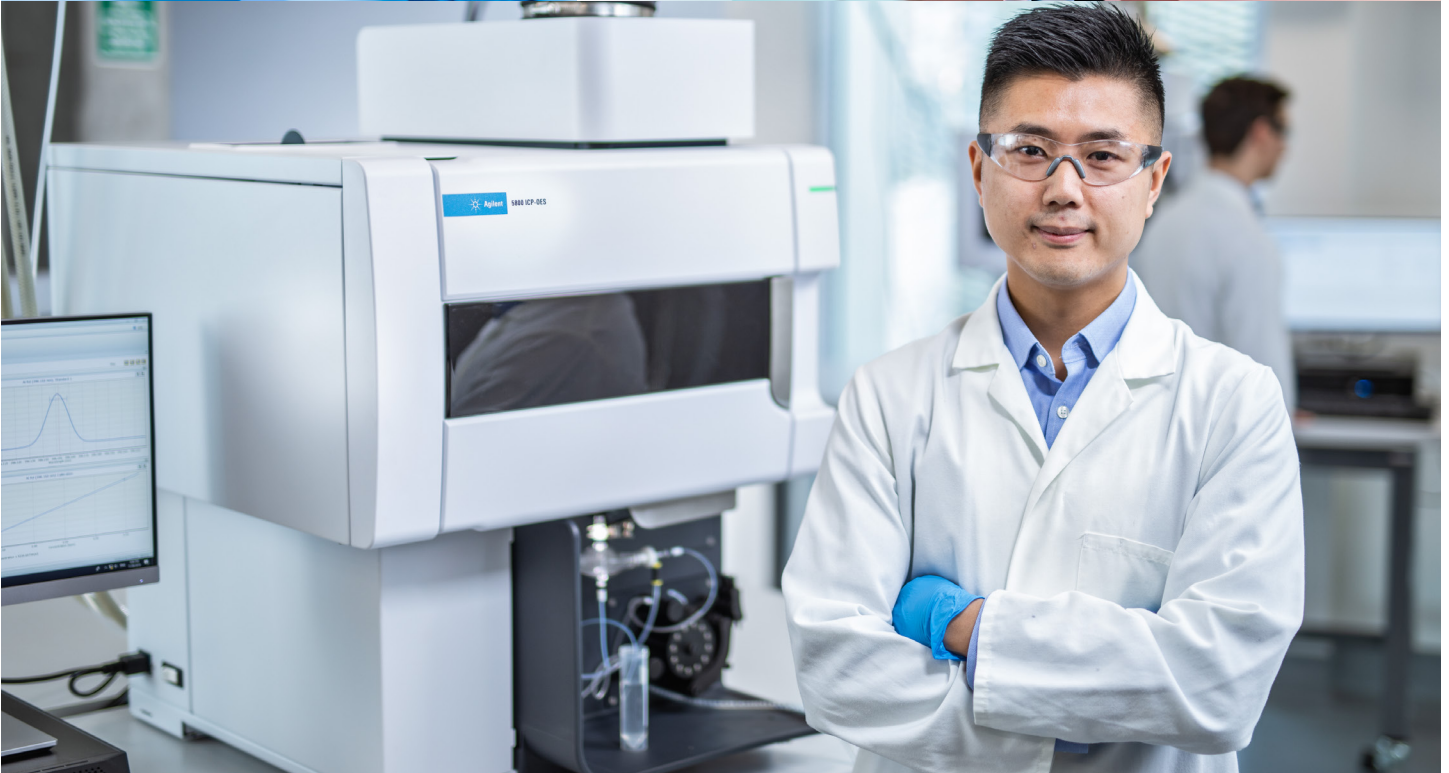


# Recommended ICP-OES Consumables, Standard Solutions, and Tools for the Lithium Battery Industry



# Lithium battery industry consumables workflow

In the upstream and midstream of the lithium-ion battery industry chain, the quality control of raw materials and products requires the testing of anode and cathode materials, electrolytes, diaphragms and other materials by means of instrumental analysis for suppliers of the raw materials, battery manufacturers, and emerging industries such as the electric vehicle power battery sector. In the midstream of the lithium-ion battery industry chain, the research and development of product and safety performance also requires the use of analytical instruments to carry out physical and chemical analysis of each part of the battery.

As a global leader in analytical technology, Agilent has accumulated experience and data in the field of lithium-ion battery material testing. Whether in raw material testing or scientific research work, accurate and effective tolerance accessories are matched to the different needs of the sample introduction system to meet the durability and data quality requirements of different users. At the same time, Agilent also offers a one-stop supply of standard solutions, general consumables, and consumables for the whole production process.



## Agilent 5000 Series ICP-OES sample introduction system supplies

Application	Part number	Description
Raw materials and anode materials  Lithium carbonate, lithium hydroxide, lithium sulfate  Inert high TDS nebulizer and ceramic DV torch for high lithium salt-tolerant sample	<a href="#">3710034400</a>	Pump tube, PVC, white/white
	<a href="#">3710034600</a>	Pump tube, PVC, blue/blue
	<a href="#">G8020-69001</a>	V-groove, inert high TDS nebulizer
	<a href="#">G8020-68102</a>	Double-pass glass cyclonic spray chamber
	<a href="#">G8020-68025</a>	Fully demountable ceramic DV torch w/ ceramic outer tube. <i>Injector not included</i>
	<a href="#">G8020-47005</a>	Injector, 1.8 mm id alumina (inert)
	<a href="#">G8020-47004</a>	Injector, optional 2.4 mm id alumina (inert) for increased salt (TDS) handling
	<a href="#">G8020-68027</a>	DV ceramic outer tube-set replacement
	<a href="#">1610132400</a>	Y-Piece for online addition of internal standard/ionization buffer
	<a href="#">3710068300</a>	Pump Tube, PVC, orange/green

Application		Part number	Description
Lithium fluoride	Inert sample introduction system and ceramic DV torch for HF and high salt-tolerant sample introduction system	<a href="#">3710034800</a>	Pump tube, PVC SolvaFlex, black/black
		<a href="#">3710035200</a>	Pump tube, PVC SolvaFlex, grey/grey
		<a href="#">G8020-69001</a>	V-groove, inert high TDS nebulizer
		<a href="#">G8014-68002</a>	Inert cyclonic spray chamber
		<a href="#">G8020-68025</a>	Fully demountable ceramic DV torch w/ ceramic outer tube. <i>Injector not included</i>
		<a href="#">G8020-47005</a>	Injector, 1.8 mm id alumina (inert)
		<a href="#">G8020-47004</a>	Injector, optional 2.4 mm id alumina (inert) for increased salt (TDS) handling
		<a href="#">G8020-68027</a>	DV ceramic outer tube-set replacement
		<a href="#">1610132400</a>	Y-Piece for online addition of internal standard/ionization buffer
		<a href="#">3710068000</a>	Pump Tube, SolvaFlex, orange/green, flared ends
		Cathode materials	Standard sample introduction system
<a href="#">3710034600</a>	Pump tube, PVC, blue/blue		
<a href="#">G8010-60255</a>	U-series Seaspray concentric glass nebulizer		
<a href="#">G8020-68102</a>	Double-pass glass cyclonic spray chamber		
<a href="#">G8010-60236</a>	Semi-demountable quartz torch with 1.8 mm id injector		
<a href="#">G8020-68027</a>	DV ceramic outer tube-set replacement		
<a href="#">G8010-60263</a>	Replacement DV quartz outer tube-set		
<a href="#">1610132400</a>	Y-Piece for online addition of internal standard/ionization buffer		
<a href="#">3710068300</a>	Pump Tube, PVC, orange/green		
Lithium hexafluorophosphate electrolyte	Organic solution-tolerant pump tube and inert sample introduction system. Can directly analyze organic samples containing HF	<a href="#">3710068100</a>	Pump tube, PVC SolvaFlex, orange/green, flared ends
		<a href="#">3710035200</a>	Pump Tube, PVC SolvaFlex, grey/grey
		<a href="#">G8010-60293</a>	Inert OneNeb Series 2 nebulizer
		<a href="#">G8014-68002</a>	Inert cyclonic spray chamber
		<a href="#">G8020-68025</a>	Fully demountable ceramic DV torch w/ ceramic outer tube. <i>Injector not included</i>
		<a href="#">G8020-47003</a>	Injector, 1.4 mm id alumina (inert)
		<a href="#">G8020-47002</a>	Injector, optional 0.8 mm id alumina (inert) for reduced plasma load
		<a href="#">G8020-68027</a>	DV ceramic outer tube-set replacement
		<a href="#">1610132400</a>	Y-Piece for online addition of internal standard/ionization buffer
N-Methylpyrrolidone (NMP)	Organic sample introduction system	<a href="#">3710044200</a>	Pump tube, Marprene, white/white
		<a href="#">3710044400</a>	Pump tube, Marprene, blue/blue
		<a href="#">G8010-60270</a>	Conical glass concentric nebulizer, only for organic use
		<a href="#">G8020-68102</a>	Double-pass glass cyclonic spray chamber
		<a href="#">G8020-68002</a>	Fully demountable torch for organic solvents with 1.4 mm id injector, outer tube and injector can be replaced separately
		<a href="#">G8020-60806</a>	Injector replacement, 1.4 mm id quartz
		<a href="#">G8020-47003</a>	Injector optional 1.4 mm id alumina (inert), for increased robustness
		<a href="#">G8014-60022</a>	Replacement DV high-purity quartz outer tube for use with organic samples
		<a href="#">G8020-68027</a>	DV ceramic outer tube-set, optional, for longer-life
		<a href="#">3710035700</a>	Drain tube (connecting the drain pump tube to the waste tank), aldehydes and ketones-tolerant, 1 m per piece. <i>Recommended quantity: 2 m (order two of 3710035700)</i>

### Radial view (RV) setup guidance

For RV ICP-OES systems, use the fully demountable RV ceramic torch ([G8020-68026](#), *injector not included*) or upgrade your semi- or fully demountable torch with the RV ceramic outer tube-set ([G8020-68028](#)) for longer-life and optimized performance.

## Standard solutions

	Element	Concentration/substrate	Size	Part number
Standard solutions	Li	1000 µg/mL, 5% HNO <sub>3</sub>	100 mL	<a href="#">5190-8289</a>
	Ni	1000 µg/mL, 5% HNO <sub>3</sub>	100 mL	<a href="#">5190-8298</a>
	Co	1000 µg/mL, 5% HNO <sub>3</sub>	100 mL	<a href="#">5190-8277</a>
	Mn	1000 µg/mL, 5% HNO <sub>3</sub>	100 mL	<a href="#">5190-8293</a>
	Fe	1000 µg/mL, 5% HNO <sub>3</sub>	100 mL	<a href="#">5190-8285</a>
	S	1000 µg/mL, H <sub>2</sub> O	100 mL	<a href="#">5190-8529</a>
	P	1000 µg/mL, 5% HNO <sub>3</sub>	100 mL	<a href="#">5190-8499</a>
	Hg	1000 µg/mL, 5% HNO <sub>3</sub>	100 mL	<a href="#">5190-8295</a>
	Mixed standard solution Quality control standard, QCSTD-27	100 mg/L, 5% HNO <sub>3</sub> , tr. HF	100 mL	<a href="#">5190-9418</a>

**Note:** Mixed standard QCSTD-27 contains: Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Si, Ag, Sr, Na, Tl, Ti, V and Zn

## General ICP-OES supplies

Name	Part number	Recommended service life
Nebulizer cleaner for glass concentric nebulizers	<a href="#">G3266-80020</a>	36 months
Cleaning wire for V-groove inert high TDS nebulizer	<a href="#">5005-0451</a>	
Torch cleaning stand	<a href="#">G8010-68021</a>	36 months
Torch storage stand	<a href="#">G8010-67000</a>	36 months
Wavelength calibration solution	<a href="#">6610030100</a>	18 months
Argon gas inlet filter	<a href="#">G8010-60136</a>	6–12 months
Replacement inlet cooling air filter for 5100/5110 ICP-OES systems	<a href="#">G8000-68002</a>	12 months
Replacement air inlet filter for 5800/5900 ICP-OES systems	<a href="#">G8020-68016</a>	12 months
Waste container kit with charcoal filter, 10 L capacity	<a href="#">5005-0437</a>	
InfinityLab Stay Safe charcoal filter with time strip, 58 gram	<a href="#">5043-1193</a>	6 months
Rinse bottle kit with venting valve, 6 L capacity	<a href="#">5005-0435</a>	
InfinityLab Stay Safe venting valve with time strip, for rinse bottle kit	<a href="#">5005-1190</a>	6 months

## Need further guidance?

If you would like additional advice combined with tips and tricks to help ensure you are able to achieve the best performance, refer to the [ICP-OES Resource Hub](#).

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