

Agilent Fully Demountable ICP-OES Torch

Simplifies maintenance while offering greater flexibility



Putting off torch maintenance because it feels time-consuming?

Our commitment to innovative, user-focused design continues with the fully demountable torch for the 5000 Series ICP-OES. The torch features a removable tube-set and injector that simplifies routine maintenance and enables fast changeover between applications and diverse sample matrices.

Why remove the entire torch when only the injector needs to be changed? The removable injector allows analysts to quickly switch between applications or perform cleaning without the time and complexity typically associated with torch maintenance.

Many competitive demountable torches rely on complicated mounting systems that make injector removal, replacement, and torch cleaning hazardous, difficult, and time-consuming.

The Agilent fully demountable torch eliminates these challenges, simplifying maintenance while maintaining reliable performance. Available for Agilent 5000 Series ICP-OES instruments, this design provides:

- **Flexibility:** A variety of tube-set and injector materials and sizes to handle difficult and diverse applications without loss of sensitivity or added complexity.
- **Greater productivity:** Tool-free installation simplifies injector maintenance without removing the torch from the instrument.
- **No manual optimization:** No need for manual adjustment or optimization, providing consistent results before and after injector replacement regardless of number of analytes.
- **Ease of maintenance:** Removable injector provides quick change-over without the need for diagrams or multiple O-rings and seals.

Want a closer look at torch assembly and disassembly?

Watch the [quick demo video](#) to see how simple it really is.



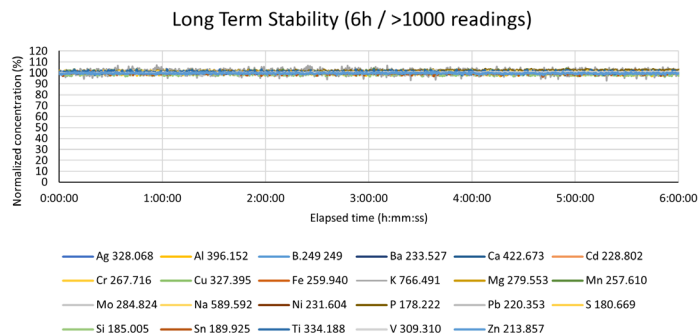
Agilent fully demountable torch

The Agilent fully demountable torch features a simple, user-friendly design that allows the tube-set and injector to be easily removed for cleaning or replaced for different applications. The injector can be removed and replaced quickly—even without removing the torch from the instrument.

Explore now

Above: Agilent fully demountable torch shown disassembled. It can be fitted with either a quartz or alumina (inert) injector, and a quartz or ceramic outer tube-set.

Fully demountable ICP-OES torch improves laboratory workflows



We measured a used lubricant oil sample, taken from a Caterpillar wheel loader, using an Agilent 5900 SVDV ICP-OES equipped with AVS7 and the fully demountable torch and an alumina (inert) 1.4mm injector for semi-volatile applications. The robustness was proved by analyzing the used oil sample >1,000 times continuously over 6 hours, using Y as an internal standard.

The vertical torch configuration and 1.4 mm id alumina injector ensured excellent stability with < 10% variation over all the results and long-term precision < 3% RSD for all 23 analytes measured. There was no sign of carbon build-up on the alumina injector during that period, confirming that maintenance requirements are less than competitive brands.

Reduce unplanned downtime with the ceramic outer tube-set and injector

Quartz tube-sets and injectors are widely used for routine ICP-OES applications because they are economical and deliver excellent performance with most matrices. Samples that include hydrofluoric (HF) acid, require use of an inert injector as quartz is not compatible. Samples that are chemically aggressive, rich in alkali metals, high in total dissolved solids (TDS), or involve organic solvents that emit high intensity UV radiation, can rapidly degrade quartz components due to devitrification and solarization.

As quartz degrades, the outer tube of the torch and tip of the injector become brittle, losing their smooth, polished surface. This surface roughening promotes more rapid build up of carbon from organic solvents or salts from high TDS samples, increasing the frequency of injector blockages—resulting in shorter analysis times, more frequent cleaning, and increased unplanned downtime. With continued use and greater degradation, the quartz components must be replaced, further increasing operating costs.

Benefits of an inert, alumina injector

Replacing the quartz injector with a robust alumina (ceramic) injector provides greater resistance to devitrification and maintains its integrity, especially at the tip, even after repeated use and cleaning cycles. While salt or carbon build up can still occur during analysis, residue can be easily removed with routine cleaning, leaving the injector intact and maintaining consistent performance. This ensures longer injector lifetime and reduced maintenance compared to quartz injectors.



Example 1: Demonstrated lifetime improvement achieved with an alumina injector used for the determination of wear metals in oil samples. Having completed the same analysis and five cleaning cycles, the quartz injector (left) has degraded whilst the alumina injector (right) is still in excellent condition.

Benefits of a ceramic outer tube-set

Replacing the quartz outer tube-set with a robust, ceramic outer tube-set significantly improves resistance to chemical attack and devitrification when analyzing demanding matrices. The ceramic outer tube-set provides greater long term durability, delivering extended service life compared to quartz and reducing the frequency of maintenance and replacement.

The ceramic outer tube-set is particularly well suited for high matrix applications, such as samples rich in alkali metals, including Lithium-ion battery materials, fusion digests, brines, HF digests, and other chemically aggressive matrices where quartz rapidly degrades.



Example 2: During the analysis of 1.5% Li, Na, Cs in 5% HNO₃ solution, the quartz (left) shows significant devitrification after just 24 hours of analysis, whilst the ceramic outer tube-set (right) demonstrates its robustness with no obvious degradation after more than 900 hours of analysis.

A combined, robust sample introduction solution

Using a ceramic outer tube-set together with an inert, alumina injector creates a robust torch for any analysis via ICP-OES. This combination minimizes component degradation, extends service life, and reduces the need for frequent cleaning or replacement. The result is higher instrument uptime, simplified maintenance, and more consistent analytical performance when working with challenging sample matrices.

Injector selection tips and guidance

- For long term stable analysis of organic solvents a narrower id injector, such as the 0.8 mm id for volatiles or 1.4 mm id for semi-volatiles, is recommended to help reduce the sample loading on the plasma and reduce excessive carbon build-up.
- For conventional analysis of aqueous/acidic samples, the 1.8 mm id quartz injector is ideal
- For complex matrices that have high levels of total dissolved solids or larger particulates, a wider bore 2.4 mm id injector is required to reduce the chance of injector blockage.
- For matrices that are rich in alkali metals, including Li-battery materials, or hydrofluoric (HF) acid digests, an inert alumina injector is required to ensure chemical compatibility and best resistance to devitrification.

Learn more about injectors [here](#).

Tube-set selection tips and guidance

- For conventional analysis of aqueous/acidic samples, the standard quartz tube-set is the most economical choice and compatible with most aqueous applications.
- For volatile and semi-volatile organics, the 'organic' high-purity quartz outer tube-set will provide resistance to web-cracking caused by the deep UV emitted from organic samples.
- For matrices that have high levels of total dissolved solids (TDS), or are rich in alkali metals, including Li-ion battery materials, and fusion digests, the ceramic tube-set will provide longer life and best resistance to devitrification.

Learn more about tube-sets [here](#).

Where there is a choice between a quartz and a ceramic/alumina tube-set and injector, quartz is the most economical, while the ceramic/alumina tube-sets and injectors will provide longer life and easier cleaning with most matrices.

Learn more about ICP-OES consumables, standard solutions, and tools for lithium battery applications



Ordering information

Torch kits	Recommended use	Part number
Easy-fit fully demountable RV torch with 0.8 mm id tapered quartz injector. Includes a replaceable shorter (high purity quartz) outer tube-set for organic applications (no slot) for dedicated radial viewing.	Volatile organic solvents, e.g. gasoline	G8020-68001
Easy-fit fully demountable DV torch with 1.4 mm id tapered quartz injector. Includes a replaceable extended (high purity quartz) outer tube-set for organic applications with slot for radial viewing.	Semi-volatile organic solvents, e.g. kerosene, Jet A1, A-solv solvent	G8020-68002
Easy-fit fully demountable RV torch with 1.4mm id tapered quartz injector. Includes a replaceable shorter (high purity quartz) outer tube-set for organic applications (no slot) for dedicated radial viewing.	Semi-volatile organic solvents, e.g. kerosene, Jet A1, A-solv solvent	G8020-68007
Easy-fit fully demountable DV torch with 1.4 mm id alumina (inert) injector. Includes a replaceable extended (high purity quartz) outer tube-set for organic applications with slot for radial viewing.	Semi-volatile organic solvents e.g. kerosene, Jet A1, A-solv solvent; and hydrofluoric (HF) acid digests	G8020-68020
Easy-fit fully demountable DV inert torch with 1.8 mm id alumina (inert) injector. Includes a replaceable extended (standard quartz) outer tube-set with slot for radial viewing, plus a spare quartz outer tube-set.	Hydrofluoric (HF) acid digests and other aggressive acids	G8020-68003
Easy-fit fully demountable DV torch with 1.8 mm id tapered quartz injector. Includes a replaceable extended (standard quartz) outer tube-set with slot for radial viewing, plus a spare quartz outer tube-set.	Most sample types including aqueous/acidic digests	G8020-68005
Easy-fit fully demountable DV torch with 2.4 mm id tapered quartz injector. Includes a replaceable extended (standard quartz) outer tube-set with slot for radial viewing, plus a spare quartz outer tube-set.	High TDS samples	G8020-68004
Easy-fit fully demountable DV inert torch with 2.4 mm id alumina (inert) injector. Includes a replaceable extended (standard quartz) outer tube-set with slot for radial viewing, plus a spare quartz outer tube-set.	High TDS samples containing Hydrofluoric (HF) acid digests and other aggressive acids	G8020-68022
Easy-fit fully demountable ceramic DV torch, with a replaceable extended (ceramic) outer tube-set with slot for radial viewing. Compatible with quartz and alumina (inert) injectors. Injector not included.	Lithium-ion battery materials, high TDS samples rich in alkali metals (e.g. Li, Na, K, Ca, Cs), fusions and hydrofluoric (HF) acid digests	G8020-68025
Easy-fit fully demountable ceramic RV torch, with a replaceable shorter (ceramic) outer tube-set (no slot) for dedicated radial viewing. Compatible with quartz and alumina (inert) injectors. Injector not included.	Lithium-ion battery materials, high TDS samples rich in alkali metals (e.g. Li, Na, K, Ca, Cs), fusions and hydrofluoric (HF) acid digests	G8020-68026

Quartz injectors	Part number
Replacement 0.8 mm id tapered quartz injector	G8020-60805
Replacement 1.4 mm id tapered quartz injector	G8020-60806
Replacement 1.8 mm id tapered quartz injector	G8020-60807
Replacement 2.4 mm id tapered quartz injector	G8020-60808
Alumina injectors	Part number
Replacement 0.8 mm id alumina (inert) injector	G8020-47002
Replacement 1.4 mm id alumina (inert) injector	G8020-47003
Replacement 1.8 mm id alumina (inert) injector	G8020-47005
Replacement 2.4 mm id alumina (inert) injector	G8020-47004
Outer tube-sets – Includes intermediate tube (integrated into assembly) with top seal	Part number
Outer tube-set – DV configuration, for use with aqueous/acidic digests	G8010-60263
Outer tube-set – RV configuration, for use with aqueous/acidic digests	G8010-60264
Organics outer tube-set – DV configuration, for use with organic solvents	G8014-60022
Organics outer tube-set – RV configuration, for use with organic solvents	G8016-60000
Ceramic outer tube-set, inert – DV configuration, for use with high TDS, HF digests or Lithium-ion battery materials	G8020-68027
Ceramic outer tube-set, inert – RV configuration, for use with high TDS, HF digests or Lithium-ion battery materials	G8020-68028
Other parts	Part number
Top seal for 5000 Series fully and semi demountable torches, 3/pk	G8014-60023
Injector locking nut for fully demountable torch for 5000 Series ICP-OES	G8020-60810

To learn more about these fully demountable torches, visit:
www.agilent.com/chem/5100torches

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