

Ensure Optimal Instrument Performance with Genuine Agilent Long-life Deuterium Lamps

Comparing long-life deuterium lamps from Agilent and other vendors

Technical Overview

Introduction

When conducting HPLC/UV analysis, the UV lamp is a critical part that can have a tremendous impact on chromatographic performance, including signal intensity, Signal-to-noise (S/N), baseline drift, and so on. These parameters directly affect detection limits, sample quantitation, and impurity identification. In addition, long life time and reliability of UV lamps is significant in reducing system downtime and costs. Therefore, choosing the right lamp that best fits your detector is crucial to ensure instrument performance and improve lab efficiency.

While lamps from other vendors are available for your Agilent detectors, Agilent is the unique manufacturer with knowledge of the proprietary optical and electronic design characteristics of Agilent detectors. Thus, genuine Agilent lamps offer many exclusive features that other lamps do not.



Agilent Technologies

Optimum performance by unique design

With a deep understanding of the instruments, and rigorous analysis of product specifications, Agilent continues to improve lamp design to optimize performance.

Higher initial intensity

To achieve the maximum light intensity, Agilent lamps are aligned precisely to fit the optical configuration of the detector. Imperfect alignment can cause loss of detected energy.

Figure 1 compares the lamp intensity spectra of Agilent and other lamps (average of five of each type). It is evident that Agilent lamps deliver higher intensity across the whole wavelength range from 190 to 330 nm, especially in the lower wavelength range. As illustrated in Figure 2, Agilent lamps enable up to 60% higher intensity from 190 to 220 nm compared to lamps from other vendors.

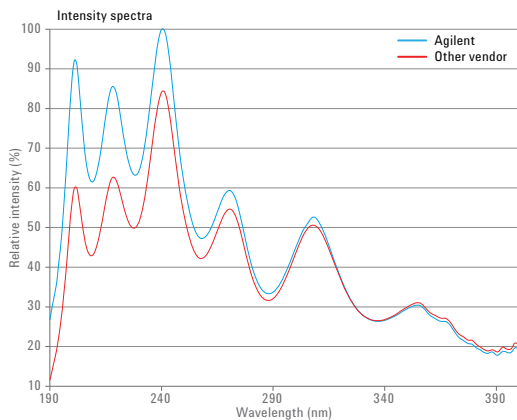


Figure 1. Intensity spectra of Agilent and other lamps (average of five lamps of each type).

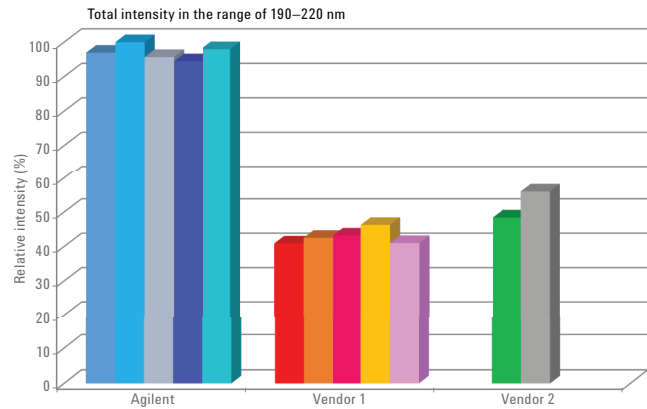


Figure 2. Total intensity in the wavelength range of 190 to 220 nm for five Agilent lamps, five lamps from vendor 1, and two lamps from vendor 2. Different colors indicate different test specimens.

Sufficient lamp initial intensity is not only crucial for long lamp life time, but also critical for higher S/N, which directly affects the detection limit and sensitivity of analysis.

Higher S/N

In addition to lamp intensity, the design of the lamp also has a significant impact on S/N. Compared to lamps from other manufacturers, the much narrower aperture of Agilent deuterium lamps provides decreased noise and lower limits of detection, which can extend detection capabilities and improve qualification at trace levels (Figure 3).

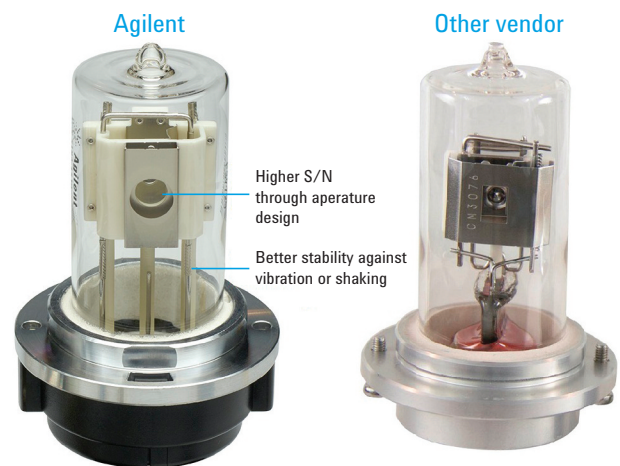


Figure 3. Difference of inner design of Agilent and third-party lamps.

Superior signal stability and shorter stabilization time after ignition

The perfect alignment of Agilent lamps also contributes to better signal stability and reduced stabilization time after ignition. Figure 4 shows tracking signals of five Agilent lamps and five lamps from other vendors (A) over 20 hours, and (B) in the first 50 minutes after ignition. The lamps from other vendors required a longer time to stabilize, and their signals vary more widely than the Agilent lamps.

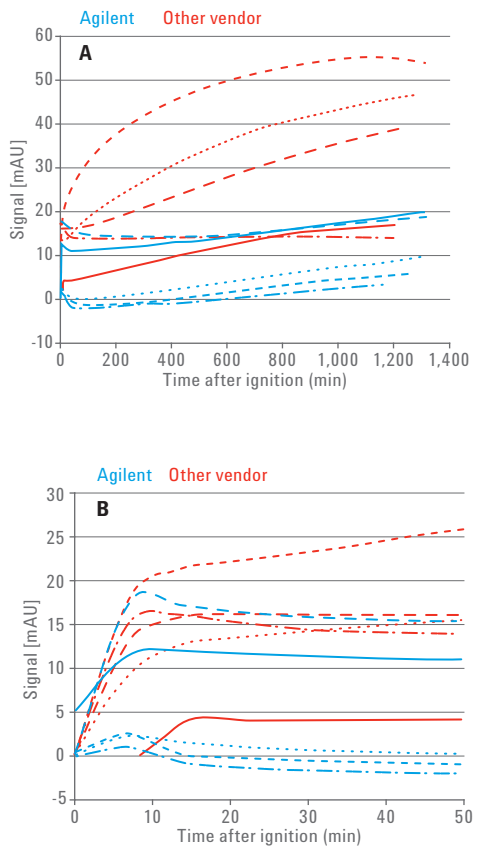


Figure 4. Tracking lamp signals after ignition.
A) 0 to 20 hours after ignition.
B) 0 to 50 minutes after ignition.

UV emission safety and usability by differentiated cap design

In comparison with lamps from other vendors, Agilent lamps have a bulky cap design (Figure 5) that blocks light emission and protects operators from exposure to UV light. In addition, the cap can be used as a handle to simplify installation and de-installation of the lamp. The cap design also yields better temperature stability, which contributes to better signal stability, space and density of the spring coils.

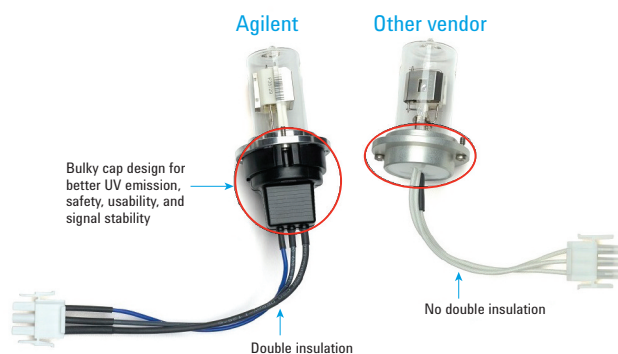


Figure 5. Differences in cable and cap design between Agilent and third-party lamps.

Improved package design for safe transportation and storage

Agilent lamps are packed in boxes with special foam inserts to provide a better level of protection against damage or movement during transport and storage.



Figure 6. Agilent lamp packaging with special foam inserts ensures safe shipping and storage.

Precise machining and process control

Certified and traceable production process

Agilent lamps are manufactured in an ISO 9001-certified environment, and are fully traceable throughout every step of the multistep production process. Test equipment is regularly calibrated using optical standards certified by National Institute of Standards and Technology (NIST) or Physikalisch-Technische Bundesanstalt (PTB).

Automated manufacturing process for minimal deviation between lamps

To achieve consistent performance from different lamps, Agilent automates every manufacturing process to provide minimal tolerance between lamps:

- Automated cathode-coating process for better consistency in light emission and lifetime extension
- Uniform thickness and highest-quality material of lamp glass for consistent light spectra
- Optimized lamp shape for perfect interface with Agilent detector lamp housing

Rigorous testing on original Agilent instruments

Agilent lamps are extensively tested with Agilent detectors to ensure that they meet the tightest specifications and quality standards. Each lamp goes through quality assurance tests including alignment, light intensity, operating voltage, as well as noise and drift.

Double-insulated cable to meet stringent safety regulations

Agilent lamps use a double-insulated cable to protect users from potential electrical shock through exposed high-voltage wires (Figure 5).

Guaranteed long lifetime

The cathode coating process, specific to Agilent, leads to less intensity drop over time, and extends lamp life time by more than 50%. All Agilent long-life deuterium lamps are guaranteed to have a life time greater than 2,000 hours.

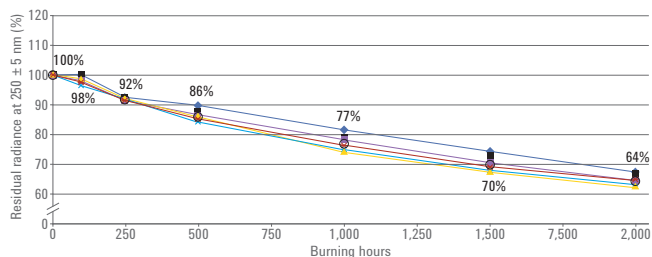


Figure 7. Signal degradation over time of five Agilent deuterium lamps. After 2,000 hours, all lamps showed more than 60% remaining energy, well above the specification for end of lifetime (50% remaining energy).

Chose Agilent lamps for value

For long-lasting, trouble-free chromatographic performance, always choose Agilent lamps for consistent operation and long-term value.

- Designed to provide optimal intensity, sensitivity, and stability
- Built to meet highest-quality standards and strictest safety regulation
- Rigorously tested for best lamp-to-lamp consistency
- Robust and long-lasting to lower your cost of ownership

Ordering information

Variable Wavelength Detector

Description	Part no.	Comments
Long-life deuterium lamp with RFID tag	G1314-60101	For G1314D/E/F and G7114B
Long-life deuterium lamp	G1314-60100	For G1314A/B/C, 1120 and 1220 Infinity LC with VWD

Diode Array Detector

Description	Part no.	Comments
Long-life deuterium lamp	5182-1530	For G1315A/B, G1365A/B
Long-life HiS deuterium lamp (8-pin) with RFID tag	5190-0917	For G4212A/B and G7117A/B
Long-life deuterium lamp with RFID tag	2140-0820	For G1315C/D, G1365C/D, and 1220 LC with DAD
Tungsten lamp	G1103-60001	For G1315A/B/C/D, G1365A/B/C/D

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