

Parts Selected by Agilent for LRM/MVS Services: Quality Criteria and Performance Testing

Introduction

High-Quality Maintenance Parts for Confident, Reliable Chromatography

Agilent's Multi-Vendor Service (MVS) provides the same top-quality maintenance, repair, and compliance services for non-Agilent chromatography instruments as we provide for comparable Agilent instruments. MVS is available as either a standalone service or as a core component of a larger Lab Resource Management (LRM) solution. In addition to multi-vendor repair and maintenance services, Agilent LRM contracts typically also include laboratory-wide service management, a dedicated onsite engineer with a limited onsite parts cache, and asset and service reporting capabilities. Delivering the highest quality service is paramount, and ensuring that all the parts we use live up to Agilent's rigorous standards is a key component to our quality solutions.

All non-original equipment manufacturer (OEM) parts selected by Agilent, such as seals, pistons, inline filters, sample syringes and needles, and detector lamps, meet our rigorous specifications (among the most stringent in the industry). These parts are tested to ensure that they unerringly adhere to Agilent quality specifications and perform exactly as expected for reliable service delivery. All parts selected by Agilent have the same 90-day warranty as Agilent parts for Agilent instruments.

To make sure that we can respond to customer needs quickly, we stock an expanding number of maintenance and repair parts to support other manufacturers' instrumentation (more than \$1.6 million in over 1,300 different items), including genuine maintenance and repair parts from OEMs as well as maintenance parts produced for Agilent by our chosen vendors.

Note: Parts selected by Agilent are available only with LRM and MVS contract agreements. They cannot be purchased separately.

Stringent Vendor Selection

We use strict requirements when choosing vendors to produce parts that meet our quality expectations. Selected vendors must pass requirements including, but not limited to:

- An outstanding reputation in the industry for high-quality parts and responsiveness to concerns or problems
- In business for at least 10 years. Most of our chosen vendors have been in business much longer than this
- Passing our business audit, proving financial stability
- Passing our quality management system audit, proving the effectiveness of their quality control processes
- A physical inspection of their manufacturing facilities
- A verifiable record of shipping parts on time

Operational Performance Testing

An essential part of our non-OEM vendor selection process is testing potential parts under typical operating conditions. For our tests, we install candidate parts on OEM laboratory systems in our



Agilent Multi-Vendor Service MVS Facility and evaluate performance using Agilent Enterprise Edition operational qualification procedures. Enterprise Edition works across the entire laboratory and is compatible with chromatography instruments from various vendors.

We also perform other functional tests, including those listed in Table 1.

Test Results

All parts selected by Agilent must pass Agilent minimum acceptable standards, must perform at

least as well as OEM parts, and must have a history of reliability. Piston seals, which are among the most frequently replaced parts, are a good example. Piston seals selected by Agilent (shown in Figure 1 along with an OEM piston seal) meet all acceptance criteria and perform at least as well as OEM piston seals in pump flow rate tests (Figure 2).

 Table 1.
 Instruments with Parts Selected by Agilent Must Pass Agilent's Minimum Acceptable Test Limits for an Operational System (Commonly, they perform better than the specification.)

Tests for parts selected by Agilent Flow rate accuracy	Preventive maintenance parts evaluated Piston seals, pistons, check valves, inline filters	$\begin{array}{l} \mbox{Minimum Agilent acceptable test limit} \\ \leq 5.0\% \end{array}$
Flow rate precision	Piston seals, pistons, check valves, inline filters	$\leq 0.5\%$
Pressure/leak tests	Seals, inline filters	Variable (depends on system)
Injection precision	Injector seals, sample needle, sample syringe	\leq 2.0% RSD (area)
Injection carryover	Injector seals, sample needle, sample syringe	\leq 1.0% RSD (area)
Detector noise	Detector lamp	≤ 0.1 mAu
Detector drift	Detector lamp	\leq 10 mAu/hr
Lamp intensity	Detector lamp	\leq 50% during lamp life



Figure 1. The OEM piston seal (left) and the piston seal selected by Agilent (right) are virtually identical in appearance and performance.



Figure 2. Parts selected by Agilent and OEM parts perform almost identically, with essentially the same accuracy and precision.

Deuterium lamps for HPLC systems are among the most costly parts to replace, which makes the quality of the lamp particularly important. Figure 3 graphs test results of lamps selected by Agilent and OEM lamps over nearly 2,000 hours. Lamp data averaged in this graph show that OEM and lamps selected by Agilent exhibit very similar performance.



Figure 3. Both lamps exceed 50 percent output, the industry-standard minimum intensity limit, after more than 1,800 hours.

Maintaining Quality Standards

An internal feedback process identifies quickly if any parts selected by Agilent are not meeting quality standards. Agilent field service engineers report problems or failures to the Agilent support team. If multiple reports of problems are encountered with the same part, new tests at Agilent laboratories verify the quality issue. We then follow up with the vendor to identify the source of the failure and resolve the defect, and concurrently send a service note to all Agilent field representatives with an interim solution until the corrected and requalified parts are available.

Parts Selected by Agilent for Waters and Shimadzu Systems

Parts selected by Agilent are available for the following Waters and Shimadzu systems:

Waters

2690/2695 Alliance Systems 500/600 Series Pumps 717 Series Samplers 486/996/2487/2996 Detectors

Shimadzu

LC-10A/10AVP Series Pumps SIL-10A/10AVP Series Samplers SPD-10A/M10 Series Detectors

Conclusions

Non-OEM parts selected by Agilent must meet the same quality standards established for Agilent parts. Our first concern is to ensure that the chromatography systems that we maintain are reliable and perform as expected. The maintenance parts we select for LRM and MVS contracts have passed demanding vendor selection and testing processes, ensuring that they have virtually the same quality and performance as OEM parts.

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