

## Silicone Rubber Purity Used in Septa for Autosampler Vial Septa - Tech Information

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Understanding the purity and curing chemistry of silicone rubber used in autosampler vial septa is essential for selecting the right septum for LC, GC, and LC-MS workflows. Differences in curing methods can significantly impact extractables, pH stability, and chemical compatibility—particularly in highly sensitive analytical applications.

### Why Silicone Purity Matters

Silicone rubber is the primary structural component of most modern vial septa. The way this silicone is manufactured—specifically how it is cured—directly affects its cleanliness, residual impurities, and suitability for various chromatographic techniques.

### Two Main Silicone Curing Methods

Silicone rubber must be cross-linked (cured) to achieve the mechanical and sealing properties required for autosampler vial caps. The two industry-standard curing methods differ significantly in purity output:

#### 1. Addition Cure (Platinum-Catalyzed)

- Uses vinyl functional groups, oligomers, and silicon hydride groups with platinum catalyst.
- Produces no new impurities during curing.
- More expensive but ideal for applications where extractables must be minimized, such as LC-MS.

#### 2. Free Radical Cure (Peroxide / Vulcanization)

- Uses organic peroxides at high heat to cross-link silicone.
- Introduces some residual impurities (extractables), including possible pH-altering byproducts.
- Commonly used in traditional HPLC and GC septa.

### Which MICROSOLV Septa Use Each Process

- AQ™ and AQR™ septa (Advanced Quality) → Platinum-cured, best choice for LC-MS and low-extractable applications.
- Bonded septa (silicone fused to cap) → Peroxide-cured, widely used and reliable for HPLC and GC.

### PTFE Liners Minimize Sample Contact

To reduce interaction between the sample and silicone rubber, all MICROSOLV septa incorporate a PTFE liner bonded to the silicone.

However, each needle puncture increases the possibility of sample contact with the underlying silicone, which can increase extractables over time.

### **Extractables Comparison (Typical Examples)**

The article provides estimated values for common extractables associated with each curing process:

<b>Extractables</b>	<b>Platinum Cured</b>	<b>Peroxide Cured</b>
Possible pH Changes	0	-2.3
Carbon (TOC)	2.63 ug/g	62.73ug/g
Residue	13.3 mg/g	10.51 mg/g
Siloxanes	10,241 ug/g	3,837 ug/g

[Click HERE for Autosampler Vial Cap Ordering Information.](#)

# **AUTOSAMPLER**

## **VIALS AND CAPS**

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