

TYPE-C Silica Is Made with High Purity Silica and Has a Low Metal Content - Tech Information

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Understanding TYPE-C™ Silica: High-Purity Silica with Low Metal Content for Superior Chromatography

Cogent TYPE-C™ silica-based HPLC columns are engineered to provide the physical advantages of high-purity Type-B silica while introducing a unique modification step that fundamentally changes their chromatographic behavior. These attributes deliver significant performance benefits across LC-MS and HPLC workflows, particularly for polar compounds and analytes sensitive to metal content.

This article explains the composition, manufacturing process, and functional advantages of TYPE-C™ silica.

High-Purity Type-B Silica Foundation

All Cogent TYPE-C™ columns start with high-purity, low-metal Type-B silica, which provides several key advantages:

- Reduced metal impurities → less unwanted interactions
- Lower surface reactivity → improved peak shape and reproducibility
- Greater chemical and pH stability compared to older Type-A silica

This ensures a clean, inert base material before further modification.

What Makes TYPE-C™ Silica Different?

TYPE-C™ silica undergoes a proprietary surface modification process that transforms it into silica hydride. This process replaces the typical surface silanol groups with Si-H (silicon-hydride) groups.

Why This Matters

- Silica hydride is far less polar than standard silica.
- It does not hold a layer of tightly bound water, unlike conventional silica surfaces.
- This results in:
 - More predictable retention
 - Less secondary interaction
 - Better compatibility with ANP (Aqueous Normal Phase), RP, and NP modes

The absence of a thick water layer is a defining characteristic of TYPE-C™ columns and a major contributor to their unique selectivity.

Final Stationary Phase: Silica Hydride + Functional Ligands

After hydride formation, TYPE-C™ silica is bonded with unique ligands to create different Cogent stationary phases (e.g., Bidentate C18™, Phenyl Hydride™, Diamond Hydride™).

These phases offer:

- Special selectivity not achievable with traditional silica
- Hybrid retention modes (RP + ANP)
- Consistent performance for polar and nonpolar analytes

The result is a stationary phase with both high purity and enhanced functionality.

Advantages of TYPE-C™ Silica Over Conventional Silica

✓ Low metal content

→ Reduces chelation issues and peak distortion, especially for acidic or metal-sensitive compounds.

✓ Hydrophobic surface

→ Minimizes water layer formation and improves reproducibility.

✓ Multiple retention mechanisms

→ Supports Aqueous Normal Phase (ANP), Reversed Phase (RP), and traditional Normal Phase (NP).

✓ Improved robustness

→ Better stability, cleaner baselines, and enhanced performance in LC-MS.

All these properties arise from the engineered silica hydride surface and high-purity materials used in manufacturing.

Conclusion

Cogent TYPE-C™ silica combines high-purity Type-B silica with hydride surface chemistry to produce a stationary phase that is low in metal content, hydrophobic, and exceptionally versatile.

Its unique structure supports multiple chromatographic modes and reduces unwanted interactions, making it ideal for modern LC-MS applications and advanced method development.

