Cogent TYPE-C Column Equivalence with Standard Type-B Columns Discussion - Tech Information

Date: 18-JULY-2013 Last Updated: 5-FEBRUARY-2026

Are Cogent TYPE-C™ Columns Equivalent Substitutes for Standard Type-B Silica HPLC Columns?

When users transition from traditional type-B silica–based HPLC columns to Cogent TYPE-C™ silica columns, the natural question is whether there is a direct, one-to-one column equivalent within the Cogent product line. The original MicroSolv article makes it clear that:

Cogent TYPE-C™ columns are not sold as direct equivalents to any standard type-B silica column.

This expanded explanation will help customers understand *why* no direct equivalency exists and what this means in practical chromatographic terms.

1. Why No Direct Equivalency Exists

Although many column manufacturers use familiar phase names such as *C18*, *C8*, *Phenyl*, etc., each chromatographic material behaves uniquely. We emphasize that:

- **Stationary phase labels do not tell the full story**—two different “C18” columns from different manufacturers can behave dramatically differently, depending on surface chemistry, bonding density, end-capping, metal content, particle manufacturing method, and silica type.
- **TYPE-C™ silica has fundamentally different surface chemistry** than type-B silica because it is based on *silicon hydride (Si–H)* , not silanol-rich silica. This structural difference produces unique retention behavior in both reversed-phase and aqueous normal phase modes.

For these reasons, MICROSOLV maintains the position that TYPE-C™ columns are unique tools—not drop-in replacements for type-B columns.

2. What “Not Equivalent” Does *Not* Mean

Although TYPE-C™ columns are not marketed as one-to-one substitutes, this does **not** imply incompatibility.

In fact:

- TYPE-C™ columns can match or exceed the performance of type-B columns once the method is properly optimized.
- For many analytes, retention may appear similar, but for others, retention and selectivity can differ substantially.

- TYPE-C™ columns can often improve peak shape, reduce ionic interactions, and broaden method development capability thanks to their hybrid retention mechanism.

MICROSOLV believes that, with proper method adjustments, their columns often perform *equally well or better* than type-B silica columns.

3. Understanding the Unique Performance of TYPE-C™ Columns

TYPE-C™ silica exhibits several distinctive characteristics:

A. Reduced Surface Silanols

The hydride-based surface has extremely low silanol activity, greatly improving:

- Peak symmetry for basic compounds
- Reproducibility for polar analytes
- Compatibility with LC-MS

B. Dual-Mode Retention (RP + ANP)

TYPE-C™ columns can operate in:

- Traditional reversed-phase mode, and
- Aqueous Normal Phase (ANP) mode, where retention of highly polar compounds is dramatically improved.

Type-B silica does *not* support strong ANP behavior without specialized bonding.

C. Less Need for Ion-Pairing Reagents

Because of their surface properties, TYPE-C™ columns often allow users to avoid mobile-phase additives that interfere with MS.

4. What This Means for Method Development

Rather than looking for a “TYPE-C version” of a type-B column, customers should approach method transfer with the mindset of **optimizing selectivity, pH, and organic solvent composition**.

MICROSOLV recommends:

- Starting from the *intent* of the original method rather than attempting direct substitution.
- Adjusting organic percentage, buffer concentration, or temperature as needed.
- Leveraging ANP retention if the sample contains polar or ionizable analytes.

For complex samples, switching to TYPE-C™ columns often **improves resolution**, particularly for analytes that struggle on conventional type-B silica.

5. When to Choose TYPE-C™ Columns

Customers may benefit from replacing type-B silica columns with TYPE-C™ columns when:

- Analytes are highly polar, zwitterionic, or ionizable.

- Peak tailing occurs due to silanol interactions.
- LC-MS compatibility and low background are essential.
- Method robustness and reproducibility across batches matter.
- Reversed-phase selectivity is insufficient.
- Dual-mode (RP + ANP) capability expands separation options.

In all these cases, TYPE-C™ columns offer a **unique performance advantage**, even though they are not labeled as “equivalent substitutes.”

COGENT HPLC Columns™

MicroSolv Technology Corporation
9158 Industrial Blvd. NE, Leland, NC 28451
Tel: (732) 380-8900
Fax: (910) 769-9435
Email: customers@mtc-usa.com
Website: www.mtc-usa.com