MICROSOLV

PEEK Column Uses in Chromatography - Tech Information

Date: 14-FEBRUARY-2026 Last Updated: 14-FEBRUARY-2026

ARE-Applied Research brand PEEK HPLC Column Hardware Uses

PEEK (polyether ether ketone) HPLC column hardware is widely chosen for applications where metal-free, bioinert chromatography is essential. Its chemical resistance and non-metallic construction make it especially valuable for analytes that would otherwise interact with stainless-steel hardware.

Primary Use: HPLC & LC-MS of Polar Hydrophilic Compounds

PEEK columns are commonly used in high-performance liquid chromatography (HPLC) and LC-MS workflows involving:

- Polar or hydrophilic analytes
- Biological molecules, including:
  - Proteins
  - Peptides
  - Bioactive compounds
  - Small organic molecules prone to interacting with stainless steel

These applications benefit from PEEK hardware because the absence of metal eliminates unwanted adsorption, catalytic activity, or peak shape distortion.

Metal-Sensitive Applications

Some compounds—particularly those containing functional groups with metal affinity—can bind or react with stainless steel.
PEEK hardware prevents:

- Carryover caused by metal surface interaction
- Peak broadening or tailing
- Analyte loss due to adsorption
- Redox-related degradation at steel interfaces

For these reasons, PEEK is the preferred choice when metal contact must be avoided entirely.

Use in Other Chromatographic Techniques

Although HPLC and LC-MS are the most common, PEEK column hardware is also utilized in other separation modes.

1. Ion Exchange Chromatography (IEC)

In IEC, the stationary phase operates based on ionic interactions. PEEK is advantageous when:

- The method must avoid stainless-steel frits or surfaces that could alter charge-based interactions
- The ionic species being separated are sensitive to trace metal contamination

Using PEEK ensures the integrity of charge-driven separations.

2. Size Exclusion Chromatography (SEC)

In SEC, molecules are separated by size and shape, not chemical interaction. PEEK columns are suitable when:

- Analytes are sensitive to metal contact
- Bioinert flow paths are required for proteins, aggregates, or polymers

SEC often benefits from PEEK because it maintains sample integrity and avoids metal-related artifacts.

Important Considerations

PEEK columns are not universally appropriate for all chromatographic techniques.
Before selecting PEEK hardware, consider:

- The chemical nature of the sample
- The solvents involved (only use solvents that are PEEK-compatible)
- The separation mechanism
- The pressure and temperature limits required by the method

While PEEK is versatile, its material limitations must align with the method's operational demands.

More Information

For detailed specifications and product options, see the:
ARE-Applied Research™ PEEK Column Hardware Information Page.

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