Difference Between Waters-Type Fittings and Standard 10-32 Fittings in HPLC - HPLC Primer

Date: 2-MARCH-2024 Last Updated: 19-FEBRUARY-2026

Overview

Waters-type fittings and standard 10-32 fittings are both widely used in HPLC systems, yet they differ in design, seat geometry, and compatibility with instrument ports.

These differences impact sealing performance, tubing engagement, and whether a given fitting style can be interchanged safely. Understanding how each fitting works ensures leak-free, low-dead-volume chromatographic connections.

What Are Waters-Type Fittings?

Design Characteristics

- Waters-type fittings use a unique concave seat geometry, engineered specifically for Waters brand HPLC instruments and components.
- The internal geometry is designed to mate with Waters-style column end fittings, often incorporating a coned or chamfered sealing surface.
- They may require specific ferrule shapes that match the Waters port design.

Performance Notes

- Waters fittings ensure:
    - Proper tube centering
    - Optimal sealing against Waters-designed port geometry
    - Minimized dead volume in matching Waters hardware

Compatibility

- Waters-type fittings cannot always be substituted with generic 10-32 fittings because the seat angles and sealing surfaces differ.
- Using a mismatched fitting can result in:
    - Leaks
    - Poor peak shape
    - Ferrule deformation
    - Damage to the receiving port

What Are Standard 10-32 Fittings?

Design Characteristics

- Standard 10-32 fittings use a universal 10-32 UNF thread and a coned (typically 60°) seat common across many HPLC systems.
- Compatible with a broad range of:
  - Columns
  - Unions
  - Adapters
  - Valves and detectors
  - Instrument brands that follow standard coned-port geometry

Performance Notes

- Provide excellent sealing when paired with correctly matched ferrules and coned ports.
- Offer greater interchangeability than Waters-type fittings.

Key Differences Between Waters-Type & Standard 10-32 Fittings

Threading

- Both use 10-32 threads, but the seat geometry is different.

Port Geometry

- Waters: Concave or specialized seat design.
- Standard 10-32: Conventional coned seat.

Ferrule Compatibility

- Waters fittings require Waters-compatible ferrules.
- Standard 10-32 fittings use generic ferrules sized for 1/16" OD tubing.

Interchangeability

- Waters fittings should not be used in standard 10-32 coned ports.
- Standard 10-32 fittings should not be used in Waters-type ports.

Result of Mismatch

- Poor sealing
- Increased dead volume
- Leaks
- Damage to the column’s receiving port
- Misalignment of tubing inside the fluidic channel

When to Use Each Fitting Type

Use Waters-Type Fittings When

- Connecting to Waters columns or components designed for this seat geometry
- Ensuring the tightest seal with Waters-engineered hardware
- Replacing original fittings on Waters instruments

Use Standard 10-32 Fittings When

- Working with instruments or columns from Agilent, Shimadzu, Thermo, and other brands using standard coned-port designs
- Building general HPLC systems with high interchangeability
- Connecting tubing to unions, tees, and adapters with standard 10-32 ports

Click *HERE* for information about these adapters that allow you to use standard fittings with Waters Columns or instruments.

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