

Maximum Pressure Value for Ferrules - HPLC Primer

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Overview

Ferrules are designed to secure tubing inside HPLC fittings by creating a mechanical grip and seal. Because their function depends on multiple interacting mechanical and material factors, MICROSOLV states that there is no single definitive maximum pressure rating for ferrules.

Instead, their performance varies based on how they are used and what they are securing.

Simple Answer: Maximum Pressures Cannot Be Specified

Ferrule Performance Depends on Several Factors and *We try to explain that maximum pressure varies because:*

- Tubing type matters.
 - Hard tubing (such as stainless steel) provides a stronger, more stable grip.
 - Soft tubing (such as PEEK or other polymers) may slip under high pressure.
 - Installation force affects the seal.
- Tightening the nut harder increases grip and improves pressure resistance.
- Over-tightening can deform or damage the ferrule, reducing performance.
- System configuration varies.
- Back pressure generated by different tubing lengths, solvents, temperatures, and flow rates will influence the ferrule's ability to hold.

Result

Because all these factors vary from user to user, a universal maximum pressure rating cannot be stated.

General Guidance When Using Ferrules

Best Practices

- Match ferrule material to the tubing type.
- Avoid overtightening—this can permanently deform softer ferrules.
- Always confirm that the weakest component in your system is rated for your intended pressure.
- Test connections under controlled conditions when operating near upper system limits.

Performance Expectations

- A properly tightened ferrule on hard stainless-steel tubing can support significantly higher pressures than the same ferrule used on softer polymeric tubing.
- The ferrule-tubing interface—not the ferrule alone—is what ultimately determines the pressure limit.

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