

## Wrench Flats are Not Available on PEEK Columns - Tech Information

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### Why PEEK HPLC Columns Do Not Have Wrench Flats

MICROSOLV's ARE-Applied Research brand All-PEEK™ HPLC column hardware is intentionally designed without wrench flats, and this is not an oversight. Instead, it is a critical engineering decision made to ensure the column's structural integrity and pressure-handling capability.

Machining wrench flats into the PEEK column body would physically weaken the polymer tube, causing a measurable and significant reduction in pressure tolerance—specifically, a decrease of roughly 100 bar.

Because PEEK is a high-performance polymer rather than a metal, its mechanical strength depends on maintaining a uniform cylindrical geometry. Removing material to machine flats introduces stress points that can compromise the tube's ability to withstand packing pressures and routine operating pressures used in HPLC.

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### Why Removing Material Weakens the Column

#### 1. Loss of Wall Thickness

Machining wrench flats cuts into the outer surface of the PEEK tube. For a polymer column designed to distribute pressure evenly across its full circumference, any thinning of the wall can become a structural weak spot.

#### 2. Reduced Maximum Pressure Rating

The article states that machining flats reduces the pressure capability by about 100 bar, which is unacceptable for maintaining performance margins in HPLC use.

#### 3. Increased Risk of Deformation

Unlike stainless steel, PEEK can deform under localized stress. Introducing flats encourages users to apply wrenches or excessive torque, which can permanently distort the tubing or damage the threads.

#### 4. Maintaining Optimal Column Efficiency

A structurally compromised tube may affect:

- Bed stability
- Flow uniformity
- Long-term reproducibility

For these reasons, leaving the tube perfectly cylindrical gives the best mechanical and chromatographic performance.

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## How to Properly Handle ARE-Applied Research brand All-PEEK™ Columns

Since wrench flats are intentionally omitted:

- Use hand-tightening only for end fittings and connections.
- Ensure all fittings are thoroughly cleaned of any silica powder before installation.
- Avoid metal tools, which can gouge or twist PEEK components.
- If additional grip is needed, use soft-jaw polymer pliers designed for delicate lab hardware.

This ensures that the column maintains its full, intended pressure rating and mechanical strength.

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## Conclusion

PEEK columns do not have wrench flats for a simple reason:

Creating flats could weaken the column and reduce the maximum pressure rating by approximately 100 bar, undermining both safety and chromatographic performance.

Our design keeps the hardware structurally sound, reliable, and capable of delivering maximum efficiency during HPLC operation.

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