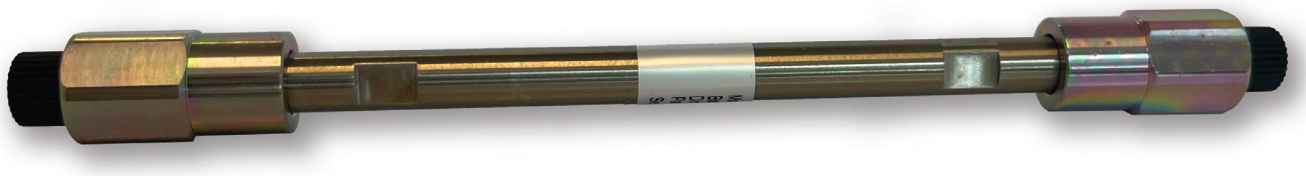
Dursan versus PEEK

Solving the limitations of PEEK for optimized HPLC analysis

An inert flow path is mandatory in modern HPLC analysis in order to manage the complex and reactive samples commonly usued in today's fast-paced analytical world. Modern LC systems feature an array of materials including costly alloys and polymers like PEEK to achieve inertness, but these materials come with their own set of limitations.

Dursan® is a coating for stainless steel that provides equal or better inertness than PEEK along with the robustness of stainless steel. Dursan is a simple and cost-effective solution for parts requiring inert properties throughout the lab.

Material	Dursan-coated Stainless Steel	PEEK
Thermal Stability	450° C	148° C
Solvent Performance	No swelling	Swells with THF, Acetone, and more
Corrosion Resistance	Resistant to most known HPLC solvents	Incompatible with some acids, halides, chlorides, and buffers
Delamination Issues	Molecularly bound and will not flake off	Lined tubing can experience delamination issues
Mechanical Strength	Limited only by the base material	Begins to flex at 3000 to 5000 PSI
Work-ability	Precision coating does not significantly alter dimensions	Inconsistent machining can disrupt flow and shift retention times

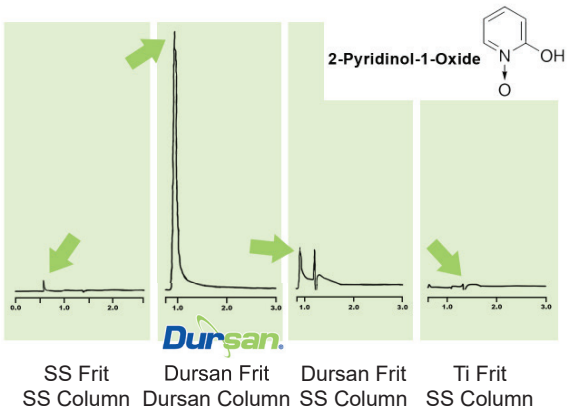


The problem with PEEK:

- **Pressure rating** - PEEK columns are known to have pressure limitations around 3000 to 5000 PSI. As HPLC analysis advances, pressures will continue to increase leaving PEEK totally ineffective.
- **Supply chain** - The cost of PEEK columns have increased dramatically, no longer allowing it to be the cost effective solution for inert flow paths.
- **Unreliable machining** - Due to the nature of machining PEEK, internal diameters are inconsistent, which can disrupt flows and shift retention times.

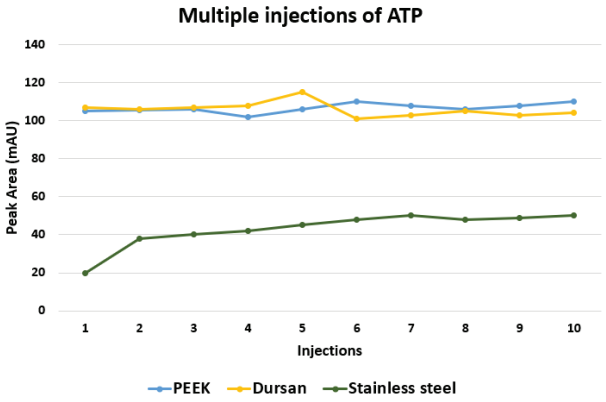
Dursan for HPLC

Comparing SilcoTek Coatings and Other Common Materials



Metal-free HPLC for Better Analysis

- 2-pyridinol-1-oxide is a very powerful metal chelating agent.
- The chromatograms show definite loss of signal due to metal interactions in the separation.
  - This shows the interaction between the column wall and the analyte, proving a need for column coating as this interaction is significant.



Dursan Performs like PEEK

- ATP will interact with any metal in the flow path. Dursan-coated stainless steel shows the same level of metal-free performance as a polymer like PEEK.
- Dursan is not susceptible to flexing, delamination, or temperature constraints, like PEEK, in more challenging conditions.

Dursan® Properties

Coating Structure:	Functionalized silica-like coating (a-SiO_X:CH_Y)
Deposition Process:	Thermal chemical vapor deposition (not plasma-enhanced)
Maximum Temperature:	Max for functionalization: 450° C (oxidative) 500° C (inert)
Substrate:	Compatibility: Stainless steel, exotic alloys, ceramics Size: Typical parts up to 80” (203 cm), contact us for larger jobs Geometry: Any shape, including complex geometries
Typical Thickness:	400 - 1600 nm (Thinner on small bore tubing and frits)
Hydrophobicity:	≥ 81°
Allowable pH Exposure:	0-14