“I have been working with the team at New Objective for many years now and consider them essential to my research efforts. Their PicoFrit Columns were of critical importance in the successful implementation of capillary HPLC-ESI/MS/MS in my laboratory.”

Susan T. Weintraub, Ph.D.
optimal sensitivity & reliability

PicoFrit® nanospray columns ensure the highest possible performance, combining powerful chemistries with a novel format that eliminates post-column loss. Designed and tested for applications that require optimal peak shape and ultimate sensitivity, these columns provide unsurpassed performance, reliability and ruggedness.

ideal for control & flexibility

IntegraFrit™ columns are the building blocks of your high performance analytical method. The exceptional flexibility, consistency and stability are the hallmark of these non-metal fritted columns, and allow the full potential of nanospray to be harnessed with the benefits of superior control and performance independent of your analysis platform.
The Ultimate LC-MS Proteomics Platform

Patented PicoFrit® columns combine the consistency and reliability of our PicoTip® emitters with the flexibility and control of a standard IntegraFrit™ column into a single, zero-dead-volume column. Spraying directly off of the outlet of the column, the PicoFrit format eliminates post column loss, increases sensitivity and provides the sharpest peaks. The integral frit in the tip provides a stable bed for a variety of chromatography media. This technology ensures consistent dispersion and less clog-inducing particle destruction, which keeps back pressures lower.

A chromatogram was obtained using a standard C18-packed PicoFrit column. The PicoFrit yields better peak shape with decreased peak width and higher sensitivity.

A chromatogram was obtained using a standard C18-packed column coupled to an emitter with a PEEK union.

PicoFrit Anatomy

A magnified view of the junction in the PicoFrit column where the chromatography bed meets the frit.

A magnified view of a PicoFrit column packed with 5 µm C18 media. The fritted tip keeps the media from packing too tightly into the taper, reducing clogging and keeping back pressures low. Column dimensions: 360 µm OD x 75 µm ID x 15 µm tip opening.

A magnified view of the fritted tip of the PicoFrit column (15 µm tip).
Clog-Resistant & Cost-Efficient

With no emitter to be attached, there’s no emitter to clog. The particulates that clog an emitter are generally introduced at the junction between the column and the emitter. The emitter of a PicoFrit® is the column, and therefore, far less likely to clog. The column bed itself protects the emitter taper from backing up with debris.

PicoFrit columns are more economical than a standard tip-column configuration. Save setup time with no emitters to connect and cut costs associated with fittings required for connection.

MULTI-PHASIC PICOFRIT COLUMNS

PicoFrit columns are the perfect format for biphasic and multi-dimensional analysis. Combining your preferred chemistry with SCX media in a single bed eliminates excesses of both swept- and dead-volumes.

FRITTED EMITTER

Unpacked PicoFrit columns are available with and without a standard conductive coating. Trim an empty PicoFrit to the specified size for your source to make a robust, fritted nanospray emitter. If you prefer to pack your own columns, these empty PicoFrit columns are shipped 50 cm in length, ready for your packing.

SENSITIVITY. SELECTIVITY. STABILITY.

A PicoFrit column (75 µm OD/15 µm tip) packed with 5 cm of HALO C18 2.7 µm produces exceptional peaks with no post-column loss in this BSA digest analysis. Flow rate: 300 nL/min.; back pressure 1,100 psi; Gradient: 2% B to 50% B over 29 min.

Base-peak chromatogram of β-casein digest evaluated using PicoFrit column containing 10 cm of ProteoPep™ II C18 5 µm in negative-ion mode with SF6 sheath gas

Same analysis as above without SF6 sheath gas
Consistency You Can Count On

Like PicoFrit® columns, IntegraFrit™ columns are fabricated from 360 μm OD, polyimide-coated, fused-silica tubing, but without a tip. The fritted end of the fused-silica column is polished flat to ensure a clean connection to your emitter of choice or to the inlet of a second column. Each IntegraFrit column has an integral high-porosity frit, behind which is the packed chromatography bed. The frit virtually eliminates peak tailing caused by other extra-column frits.

Versatile Reliability

Coupling columns of the same or different resin materials is often employed in complex proteomic digest analysis. Despite enhanced separation, multidimensional columns are costly, and initiate post-column through dead-volume introduction. Using transparent, true zero-dead-volume PicoClear™ unions in conjunction with IntegraFrit columns, flush connections can easily be achieved, and rapid swap-out of column materials is made possible. Data collected (left) using bench-top assembled columns demonstrate negligible resolution loss.

Angiotensin chromatographic data collected with each of 3 column-union configurations: A) a single 30 cm C18 PicoFrit column, B) a 20 cm C18 IntegraFrit Column + a 10 cm C18 PicoFrit column, and C) two 10 cm C18 IntegraFrit columns + a 10 cm C18 PicoFrit column. In all cases, a zero-dead-volume PicoClear union was used. Injection: 0.25 ng total peptide; Flow rate: 300 nL/min.; Gradient: 2% - 50% B over 70 min.

A 10 cm PicoFrit column is connected to a 20 cm IntegraFrit column using a PicoClear union with no extra volume added. The connected columns perform as well as the original 30 cm length intact column.

PicoClear U.S. and Foreign Patents Pending
Like PicoFrit® columns, IntegraFrit™ columns are available without media, fritted and ready to be packed in your lab. But IntegraFrits can be used in a number of ways. Use an unpacked IntegraFrit with a PicoClear™ union to make a visible, metal-free inline filter.

A Self-Pack IntegraFrit is plumbed into the inlet side of a PicoClear union at any point in the flow path. The visible connection can be observed during analysis for particulate accumulation and can be invaluable in for troubleshooting.

IntegraFrit sample traps combined with Upchurch Scientific® fittings are a perfect combination for concentrating and separating samples for mass spectrometry. Integrated with a titanium inlet frit in the cartridge, the IntegraFrit sample trap column features a non-metal outlet frit in 360 µm OD fused-silica tubing. IntegraFrit sample trap columns can be packed with any of our outstanding chemistries.

For more information on PicoClear connectors, visit our website at www.newobjective.com
Make your old mass spectrometer a high-performance mass spectrometer

Using the PicoFrit® format means that even a 12-year-old LCQ Deca™ mass spectrometer, coupled to a direct-flow nanobore LC, can produce femtomole-sensitivity.

**UHPLC Performance in a PicoFrit™ Package**

PicoFrit columns are the perfect format for fast-gradient chromatography. Packed with any of our sub-3 µm particle sorbents, PicoFrit columns deliver ultra-high-performance results.

**HALO® 2.7 µm**

BSA digest
20 fmol
300 nL/min.

Selected Ion Current
741.3 m/z

Full scan MS
Average 11 scans
RT:19.14–19.19
NL:1.39E7

PicoFrit column (75 µm ID x 15 µm tip) packed with 10 cm of 2.7 µm particle HALO C18; 20 fmol; 13 min. gradient to 50% B at 300 nL/min.; Temp. 25ºC; Pressure: 2,100 psi.

**PROTEOPEP™ III 1.8 µm**

BSA digest
300 fmol
300 nL/min.

Selected Ion Current
778.9 m/z

Full scan MS
Average 18 scans
RT: 20.63–20.71
NL: 2.6E8

PicoFrit column (75 µm ID x 15 µm tip) packed with 10 cm of 1.8 µm particle ProteoPep III C18; 100 fmol; 20 min. gradient to 50% B at 300 nL/min.; Temp. 25ºC; Pressure 3,800 psi

**HALO® 2.7 µm**

BSA digest
100 fmol
300 nL/min.

Selected Ion Current
741 m/z

Full scan MS
Average 4 scans
RT:19.28–19.29
NL:9.62E7

PicoFrit column (75 µm ID x 15 µm tip) packed with 10 cm of 2.7 µm particle HALO C18; 100 fmol; 13 min. gradient to 50% B at 300 nL/min.; Temp. 25ºC; Pressure: 2,100 psi.

**UHPLC Performance**

PicoFrit™ columns are the perfect format for fast-gradient chromatography. Packed with any of our sub-3 µm particle sorbents, PicoFrit™ columns deliver ultra-high-performance results.
New Objective Premier Media

Select the chemistry for your PicoFrit® and IntegraFrit™ columns that will best suit your application. We have a wide range of sorbent options including our own premier ProteoPep™ brand media.

NEW PROTEOPEP™ III

Introducing, ProteoPep™ III 1.8 high-performance media produces excellent analyses for acidic, basic, and neutral compounds. Double endcapping produces a highly deactivated stationary phase resulting in superior peak shape and high efficiency.

- C18, 80 Å
- pH range: 2-9
- Carbon load 10%
- Double encapped, USP L1
- Particle size: 1.8 µm
- Excellent for low-pH applications
- Fast, high-resolution results
- Low back pressures

PROTEOPEP™ II

Our premier in-house sorbent, ProteoPep™ II produces sharper peaks with less noise compared to original ProteoPep. ProteoPep II supplies improved bonding and peptide recovery, making it the ideal choice for peptide mapping, purification, and high-peptide runs.

- C18, 300 Å
- Carbon load 6%
- Encapped, USP L1
- Particle size: 5 µm
- Synthetic peptide purification
- Excellent for both hydrophobic and hydrophilic peptides
- Exceptional peak shape with trace (0.005%) or no TFA

PROTEOPEP™

The precursor to ProteoPep™ II, ProteoPep™ is our original proteomics workhorse, providing high resolution for a wide range of peptide and protein analyses.

- C18, 300 Å
- Carbon load: 6%
- Encapped, USP L1
- Particle size: 5 µm
- Excellent peak shape

STRONG CATION EXCHANGE

SCX columns provide high reliability for ion exchange separations of proteins, peptides, and other biomolecules. SCX chemistries are particularly effective when used as trapping columns or as the first phase in bi-phasic columns.

- SCX, 85Å
- Particle size: 5 µm

Don’t see the chemistry you need? Contact our technical support staff. We have additional chemistries available to meet your requirements. Or send us your chosen media and we’ll professionally pack nanobore columns to your specification. We will reserve the remainder of your sorbent lot exclusively for your future needs.

PicoFrit emitters and columns and IntegraFrit columns are manufactured under U.S. Patents 5,997,746, 6,190,559, and 6,395,183 and are sold for use under license of U.S. patent 5,572,023. Other patents pending.

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Outstanding Media Selections

INERTSIL ODS-3®

GL Sciences

Inertsil® is based on a purer, higher surface area silica which is specially manufactured to provide maximum bonded phase coverage. The result is excellent peak shapes using simple eluents while operating at low pressure.

- C18, 100 Å
- pH Range: 2-7.5
- Carbon load: 15%
- Encapped
- Predictable selectivity with low operating pressures
- Particle sizes: 3 µm, 5 µm

Visit our website for our complete list of available chemistries for all of your analytical needs: www.newobjective.com

TITANSPHERE®

GL Sciences

Consisting of spherical particles of titanium di-oxide, Titansphere® is used to selectively bind phosphorylated peptides from a peptide mixture. The phosphorylated peptides are then eluted from the column onto a reverse-phase HPLC column for further characterization or analyzed directly by MS.

- TiO2, 100 Å
- Particle size: 5 µm

Phosphopeptide sample from a β-casein tryptic digest using Titansphere TiO2

HALO® media is manufactured using Fused-Core® particle technology developed to deliver hyper-fast chromatographic separations. Fused-Core technology creates a 0.5 µm porous shell fused to a solid core particle enabling HALO columns to deliver over twice the separating power of a column packed with 5 µm particles while maintaining their resolving power at high flow rates. Shorter columns and higher flow rates can be used to achieve remarkably fast high-resolution separations.

- C8, C18, 90 Å
- pH Range: 2-9
- Max. pressure: 9,000 psi
- Maximized endcapping
- Densely bonded phase
- Ultra-pure, “Type B” silica
- Particle size: 2.7 µm
- RP-Amide and HILIC also available

Chromatograms from a HALO packed trap/PicoFrit column combination for 30 fmol and 300 fmol injections of BSA digest demonstrate high repeatability using a 25 min. linear gradient: 2%B to 50% B.

PicoFrit column packed with Scm of HALO; 0.05 ng peptide sample injected; flow rate: 300 nL/min., Gradient: 2% B to 50% B over 29 min.

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