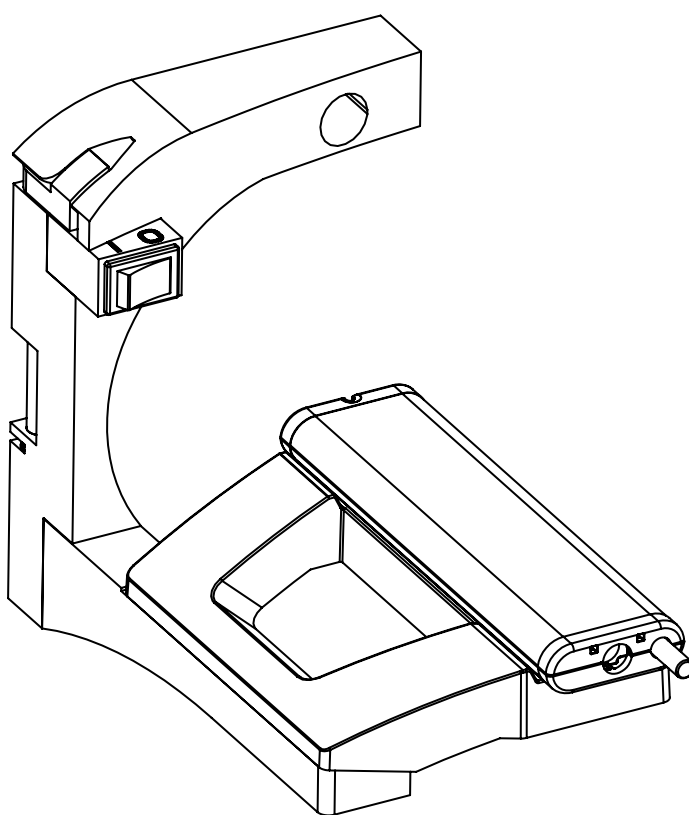




Starter Kit User Guide



NEW OBJECTIVE



2 Constitution Way
Woburn, MA 01801 USA
www.newobjective.com

888 220 2998 U.S. Sales
781 933 9560 Tel
781 933 9564 Fax



1 Introduction

New Objective has developed an integrated system for nanobore LC-MS that alleviates the need for specialized expertise in nano-scale separations. The novel design of the PicoChip combines the functionality of the nanospray emitter, nanobore separation column, high-voltage contact, and autosampler transfer line into a single consumable device. The comfortable design of the consumable package makes it exceptionally easy to handle and eliminates the risk of emitter or column breakage. A new high-voltage contact with every column change means consistent and stable spray ionization. Pre-assembly and testing of the assembled device in a production setting ensures results in the customer's lab.

The PicoChip Starter Kit includes everything you need to get started in the lab using PicoChip technology; the PicoChip source and two PicoChip columns. These instructions will help you install the source and PicoChip so you can be collecting data in a matter of minutes!

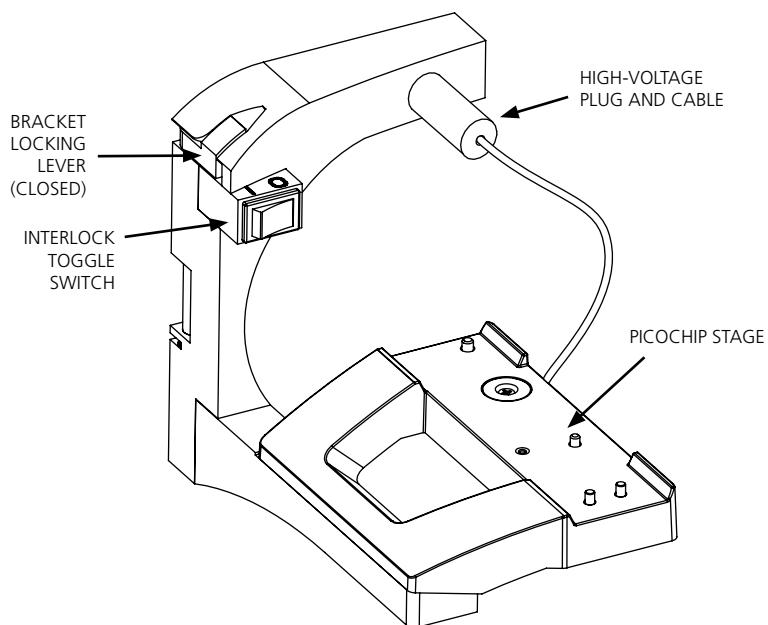
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2 PicoChip Starter Kit Components

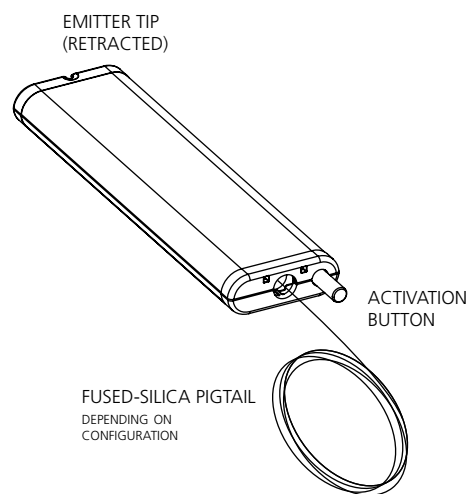
The components included in your PicoChip Starter Kit will vary depending on the configuration ordered. Kits can be ordered with PicoChip columns configured to meet your specific needs with pre-cut fused-silica pigtails, or nanoViper®-ready PicoChips. All kits include:

- (1) PicoChip source compatible with Thermo Ion Max-enabled mass spectrometers, such as LTQ, Orbitrap (including Q Exactive) and TSQ instruments
- (2) PCH7515-105H354 PicoChip columns: 75 μm ID \times 15 μm tip ID \times 105 mm ReproSil-PUR 3 μm 120 \AA C18 AQ*
- (1) nanoViper connection tool (in nanoViper-ready kits)
- (1) Vial of PicoSure Standard, 8-Peptide Mixture, equimolar, 100pmol

2.1 PicoChip Source & PicoChip Column Components



SOURCE
Figure 1



PICOCHIP COLUMN
Figure 2

3 Getting Started with PicoChip

3.1 Install PicoChip source

With the bracket locking lever open, install the PicoChip source onto the instrument.



Figure 3: Installing the PicoChip source onto the instrument

Close the bracket locking lever to secure the source onto the instrument. See Figure 4A (bracket open) and 4B (bracket closed).

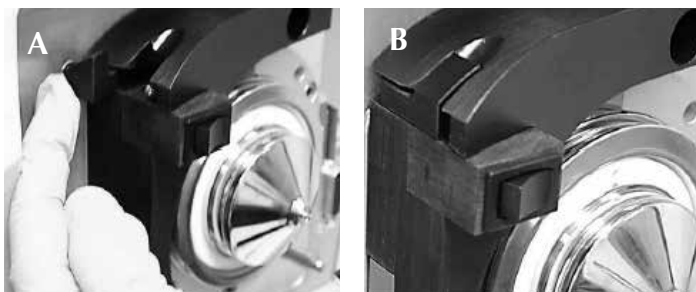


Figure 4: A) Closing the locking bracket; and B) Bracket closed

Remove the protective cover from the high voltage plug and install the high voltage plug into the voltage receptacle of the mass spectrometer using the receptacle opening on the PicoChip source. See Figures 5A, 5B and 5C.



Figure 5: A) Remove the cover from the high-voltage cable; B) Cover removed; C) insert into voltage receptacle on source



3.2 Installing PicoChip onto PicoChip Source

Place PicoChip onto magnetic stage of PicoChip source. The magnets on the chip provide automatic and precise alignment with the magnets on the magnetic stage.



Figure 6: Placing the PicoChip on the stage

3.3 Connecting the Transfer Line

Connect the PicoChip transfer line to your LC system.



Figure 7: Connecting PicoChip pigtail to LC transfer line using an in-line filter (Upchurch p/n: M-538)

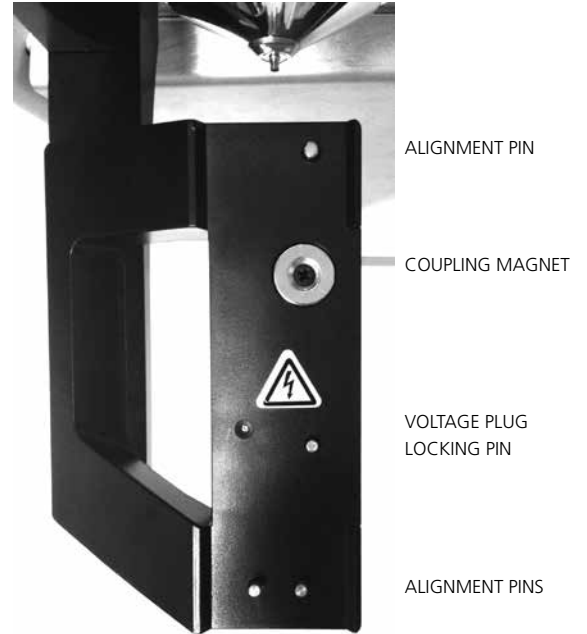


Figure 6A: The PicoChip stage

3.4 Voltage Engagement & Activation

Push in the activation button until it locks to expose the tip and activate the internal voltage connection.



Figure 8: Push in activation button until it locks in place to engage voltage and expose emitter for spraying

3.5 Engage Source Interlock

Close the interlock switch on the source. In LTQ Tune the software read back will change from 'Source is Open' to 'Instrument is in Standby' once the interlock switch has been closed.



Figure 9: Engage source interlock

3.6 Collect data!

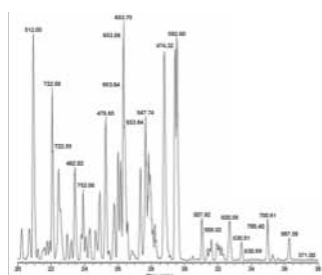


Figure 10: Base peak chromatogram for 300 fmol BSA digest collected on a PicoChip with the following dimensions: 75µm ID x 15µm tip x 105mm bed of ProteoPep II 5µm 300Å C18

3.7 Removing/Disengaging PicoChip

To disengage PicoChip, toggle off the source interlock, grasp the PicoChip column and lift from the stage.



Figure 11: To remove, gently lift PicoChip from the stage

4 Recommended Operating Conditions

For optimal results, use the following recommended flow rates and corresponding operating voltage ranges for PicoChip columns with 75 µm ID and 15 µm tip ID formats.

Mobile Phase Composition (%B)	Flow rate (nL/min.)	Recommended Spray Voltage (kV)
2	200	1.8 - 2.1
2	300	1.8 - 2.3
2	500	2.3 - 2.7
25	200	1.6 - 1.9
25	300	1.6 - 2.0
25	500	1.8 - 2.1



5 Product Specifications - PicoChip



5.1 PicoFrit column

Packed emitter manufactured from 360 μm OD fused silica tubing, 105 mm in length. The exact tubing ID, tip ID, packed bed length dimensions and stationary phase will be variable and as specified by the customer when ordering PicoChip. Please refer to the PicoChip product label for column dimensions and details (located on the bottom of the PicoChip).

5.2 High Voltage Liquid Junction

Valco 360 μm Nanovolume union, HPLC grade stainless steel (~7 nL swept volume) fitted with two PEEK nut/ferrule fittings

5.3 Transfer Line Tubing (if applicable)

Pre-cut fused silica tubing, 360 μm OD x 25 μm ID x 50 cm length. The inlet to the PicoChip column is pre-cut for a clean square connection to your LC system, but can be manually cleaved to a shorter length to accommodate your specific instrument configuration.

5.4 PicoChip Body

Manufactured from chemically inert and heat resistant nylon, the PicoChip body houses all of the components while protecting the emitter from damage until data is ready to be acquired.

5.5 High Voltage Pin

Integral gold high voltage contact pin for applying voltage to the high voltage liquid junction inside the chip body.

5.7 PicoChip Label (located on the bottom of the PicoChip)

The PicoChip label provides key information about the PicoChip.

1PCH7515-105H354-FS25 – PicoChip part number

1PCH – PicoChip (Gen1)

75 – 75 μm ID, tubing ID of column

15 – 15 μm ID tip size

105 – 105 mm bed length

H354 – media code for Reprosil-PUR C18 AQ 3 μm 120 \AA

FS25 – 25 μm ID, fused-silica tubing pigtail

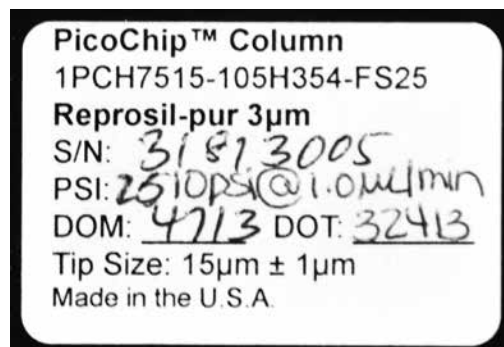
S/N - serial number of the PicoFrit column

PSI - PicoChip pressure recorded at 1 $\mu\text{L}/\text{min}$ 100% methanol

DOM – date of manufacture of the PicoChip

DOT – date PicoChip was pressure tested

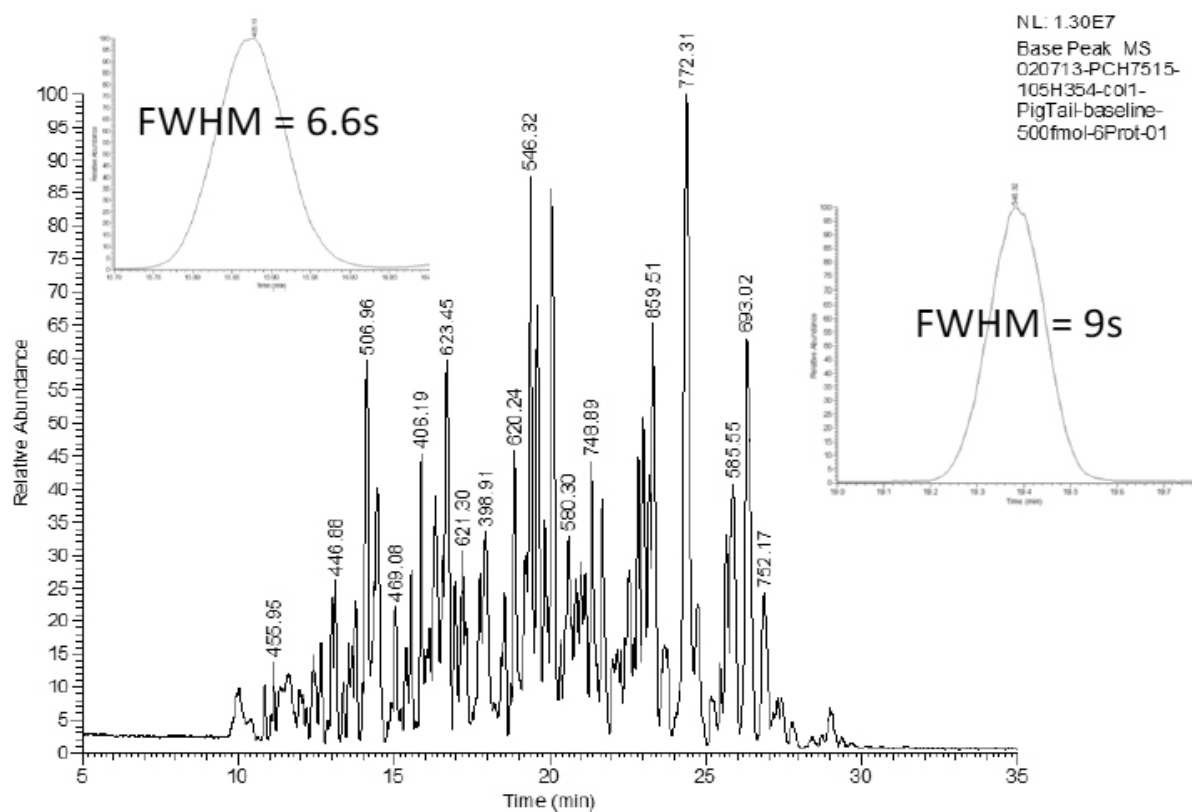
Tip Size - 15 \pm 1 μm – tip measurement specifications



PicoChip Peptide Separation Technology

H354 ReproSil-Pur C18 AQ 3 μm 120 Å

System Eksigent nanoLC•2D Ultra plus with Thermo LTQ
 Column PicoChip peptide separation technology, 75 μm x 15 μm tip x 105 mm
 Sample 50 fmol/μL Michrom 6 bovine tryptic digest equal molar mix
 Gradient 2-50% B in 30 min.
 Mobile Phase (A) 0.1% formic acid in 100% water (B) 0.1% formic acid in 100% acetonitrile
 Injection 1 μL direct injection
 Flow Rate 500 nL/min
 Pressure 1795 PSI at 500 nL/min 98% A/2% B



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