

CERTIFICATE OF ANALYSIS
Pierce® LTQ ESI Positive Ion Calibration Solution, 10 mL
Product Number: 88322

Lot Number: 3212079

Expiration: June 20, 2026

Summary:

The Thermo Scientific Pierce LTQ ESI Positive Ion Calibration Solution is a ready-use-liquid formulation for the calibration of Thermo Scientific LTQ, LXQ and LCQ Fleet ion traps, Exactive, and LTQ Orbitrap series mass spectrometers. The only additional materials needed are a 500 microliter Hamilton syringe and liquid infusion line, both supplied with the instrument.

Important Product Information:

- For best results, flush the syringe and infusion line with 50 % methanol before use.
- No additives are required for the use of this calibration solution. Approximately 500 µL of solution are required for complete calibration

Storage:

Upon receipt store at room temperature.

Formulation:

Caffeine (200 µg), MRFA (10 µg), and Ultramark 1621 (0.001 %) in a solution of 50 % Acetonitrile/ 25 % Methanol/ 24 % Water/ 1 % Acetic Acid per 10 mL of solution.

Visual:

Clear, Colorless liquid

Components:	Specification	Results
Caffeine	Purity 98.5 – 101.0%	Conforms
Ultramark 1621	Purity ≥ 95.0%	Conforms
MRFA	Purity ≥ 98.0%	Conforms
Acetonitrile	Purity ≥ 99.9%	Conforms
Methanol	Purity ≥ 99.9%	Conforms
Acetic Acid	Purity ≥ 99.7%	Conforms
Water	LC-MS Grade	Conforms

Instruments:

LTQ series
 LTQ Orbitrap™ series
 LXQ™
 LCQ FLEET
 Exactive™

Related Thermo Scientific Products:

- 88321 Pierce Peptide Retention Time Calibration Mixture, 200 µL
- 88323 Pierce LTQ Velos ESI Positive Ion Calibration Solution, 10 mL
- 88324 Pierce ESI Negative Ion Calibration Solution, 10 mL
- 88325 Pierce Triple Quadrupole Calibration Solution, 10 mL

Additional information:

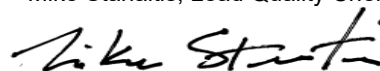
For MSDS please visit
www.thermoscientific.com/pierce

For calibration procedure use
 LTQ Series Getting Started Guide (97055-97073)
 LTQ Orbitrap XL™ Getting Started Tune Plus 2.5.5 (1225841)
 LCQ Fleet Getting Started Guide (97055-97062)
 Exactive Operating Manual (1249360)

Technical Support:

For Hardware related support call
 1-800-532-4752
 For Reagent support call
 1-800-874-3723

Publish Date: 23/Jun/2025
 Mike Stanaitis, Lead Quality Chemist



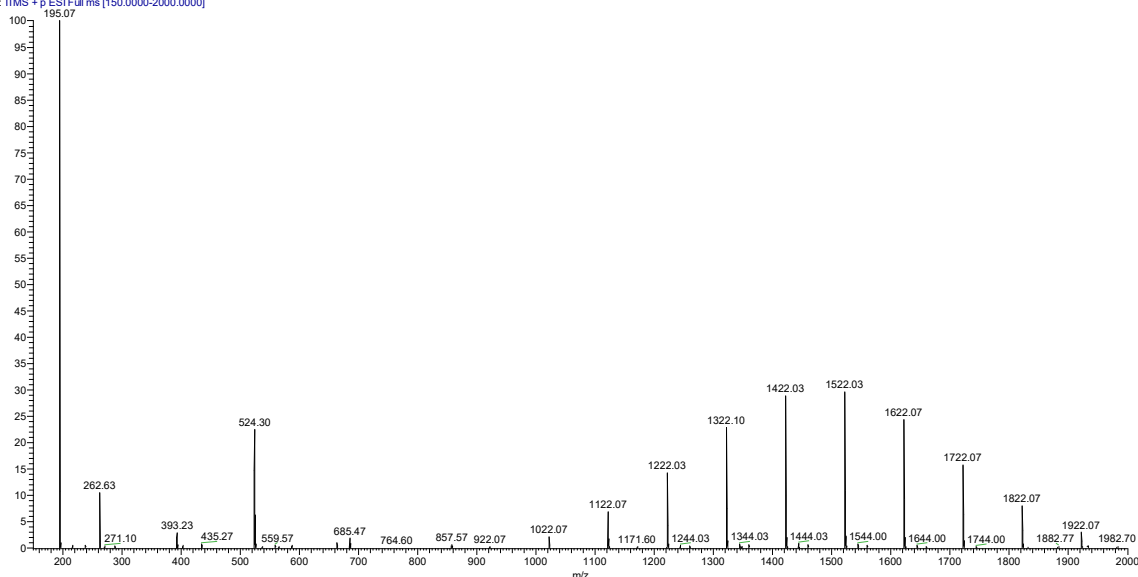
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CERTIFICATE OF ANALYSIS
Analysis:
Specification
Results

Relative Intensity (Ratio to the Reference Standard) 195 (Caffeine) 524 (MRFA) 1322 (Ultramark) 1422 (Ultramark) 1522 (Ultramark)	195 Ratio = 0.5 – 2.0 524 Ratio = 0.5 – 2.0 1322 Ratio = 0.3 – 2.0 1422 Ratio = 0.3 – 1.7 1522 Ratio = 0.3 – 1.7	195 Ratio = 1.0 524 Ratio = 1.4 1322 Ratio = 1.0 1422 Ratio = 1.1 1522 Ratio = 1.1
% Intensity (Relative to the 195 Peak) 524 (MRFA) 1322 (Ultramark) 1422 (Ultramark) 1522 (Ultramark)	524 = 2.5 – 50% 1322 = 15 – 80% 1422 = 15 – 85% 1522 = 15 – 85%	% Intensity (524 ion) = 22 % % Intensity (1322 ion) = 23 % % Intensity (1422 ion) = 23% % Intensity (1522 ion) = 30 %
Baseline Noise Ions (m/z) 195 (Caffeine) 524 (MRFA) 1322 (Ultramark) 1422 (Ultramark) 1522 (Ultramark)	No ions present in the Relative Intensity Spectra scan (+/-) 10 m/z at: 195: > 15% 524: > 15% 1322: > 15% 1422: > 15% 1522: > 15%	195 (+/- 10 m/z): No ions present > 15% 524 (+/- 10 m/z): No ions present > 15% 1322 (+/- 10 m/z): No ions present > 15% 1422 (+/- 10 m/z): No ions present > 15% 1522 (+/- 10 m/z): No ions present > 15%

23Jun2025_88322_3212079_Bulk #3-267 RT: 0.00-0.50 AV: 265 NL: 2.09E7
 T: ITMS + p ESI Full ms [150.0000-2000.0000]



Spectra were acquired on Thermo Scientific Orbitrap Eclipse.

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