



ENDURUS[®]
HPLC & UHPLC Columns

**FORCE SCIENTIFIC INC.
USA**



“QUALITY OF CONTINUING FOR A LONG TIME”



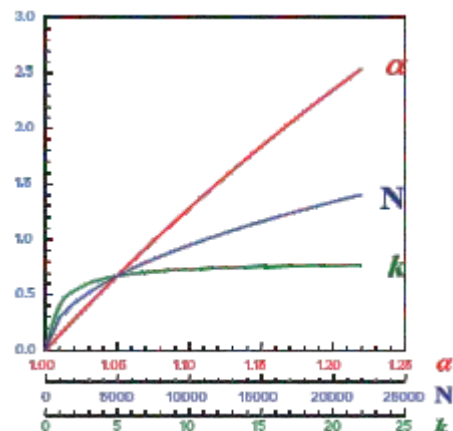
UNIQUE SELECTIVITY | HIGH PERFORMANCE | EXCELLENT VALUE

Resolution, Selectivity and Why they matter

The goal of most chromatographic analysis is understanding sample composition and the successful separation of sample components. Resolving peaks of interest in mixtures is the most common task for chromatography. Baseline separation is achieved with a resolution 1.5, although for better reproducibility of a chromatographic method a resolution (R_s) of 1.8-2.0 is desirable.

Efficiency Selectivity Retention

$$R_s = \frac{\sqrt{N}}{4} \cdot \frac{\alpha - 1}{\alpha} \cdot \frac{K}{1 + K}$$



R_s = Resolution between two adjacent peak

N = Efficiency expressed in terms of theoretical plate

α = Selectivity – ratio of retention factor of two adjacent peak

k = Capacity factor

Selectivity (α) is the Key to Resolution (R_s) & Efficiency (N) Boosts Performance

Key separation mechanism - Endurus® HPLC Columns

Phase	Hydrophobic	Hydrophobic Retention	Hydrophilic	Extremely Hydrophilic	Acidic	Basic	IEX	Pi - Pi
Endurus C18 (Classic)	+++	+++	+++	++	++	++	x	x
Endurus HP C18	++++	++++	+	+	+++	+++	x	x
Endurus C18-Polar	+++	+++	++	++	++	++	+	x
Endurus C18-EPS	++	++	+++	+++	++	++	x	++
Endurus C18-AQ	+	+	++++	++++	+	+	x	++
Endurus C18-Tri Alpha (Classic)	+++	+++	+++	++	+++	+++	x	x
Endurus C18-Tri Alpha	++++	++++	+	+	++++	++++	x	x
Endurus C18-Tri Alpha-P	++	++	++++	++++	+	+	+	x
Endurus C8-HL	+++	+++	+	+	+	++	x	x
Endurus C8-EPS	+	+	+++	+++	+	+	x	++
Endurus C4-HL	++	++	+	+	+	++	x	x
Endurus Phenyl-Hexyl	+++	+++	+	+	++	++	x	+++
Endurus Phenyl	+++	+++	+	+	++	++	x	+++
Endurus Cyano (NP & RP)	++	++	++	+	+	+	x	++
Endurus Cyano HS	+++	+++	+	+	++	++	x	++
Endurus Amino	+	x	+++	++	x	+++	x	++
Endurus HILIC	+	+	++++	++++	++	++	+++	++

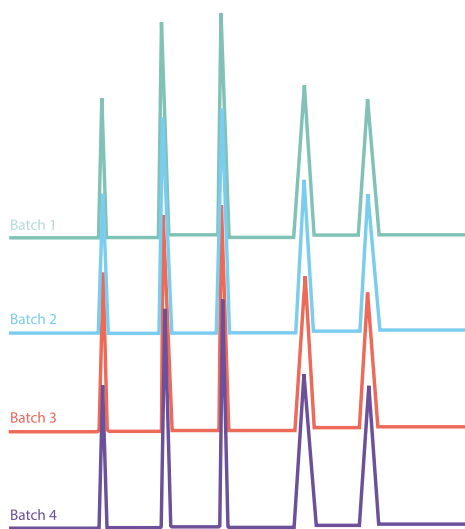
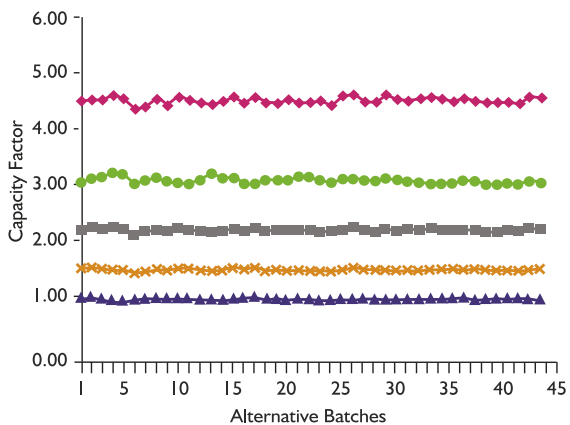
Excellent Reproducibility

Endurus Silica's exceptional consistency is the foundation of Endurus column performance. Stringent quality control standards produce unmatched batch-to-batch reproducibility. Column packing technology minimized column-to-column variation ensure high efficiency, excellent peak symmetry and extremely low operating pressure.

Capacity Factors for Endurus HP C18 Columns

◆ Biphenyl	■ Toluene	▲ N-butylbenzoic acid
● Amitriptyline	× Nitrobenzene	

Consistent batch-to-batch capacity for acidic, basic & neutral compounds

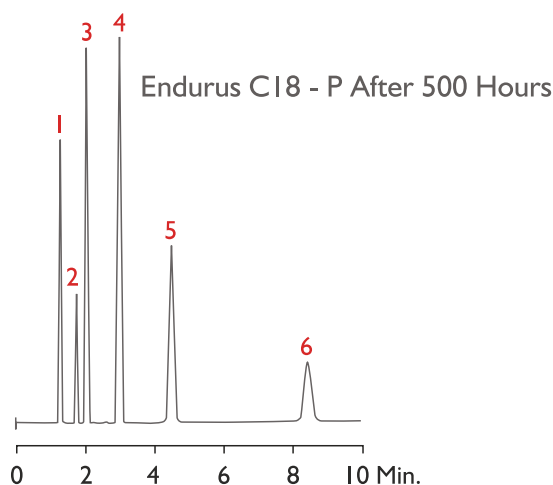
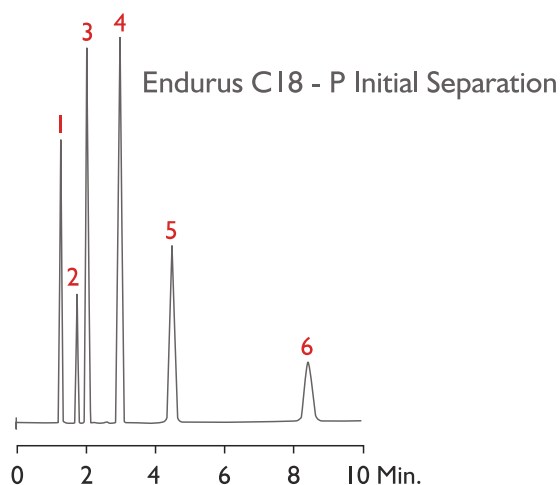


Test Conditions: Endurus C18 (250 x 4.6 mm, 5 μm), Eluent: CH₃CN - 0.05M KH₂PO₄, pH 3.2 (60:40), Flow rate: 1 ml/min, Detection: 254 nm

Phase stability at low pH and high temperature

Endurus Columns tolerate highly acidic conditions (pH 1.5, 60°C) for more than 500 hours without losing performance.

Performance Remains Stable, Even After 500+ Hours Under Extreme Conditions (pH 1.5, 60°C)



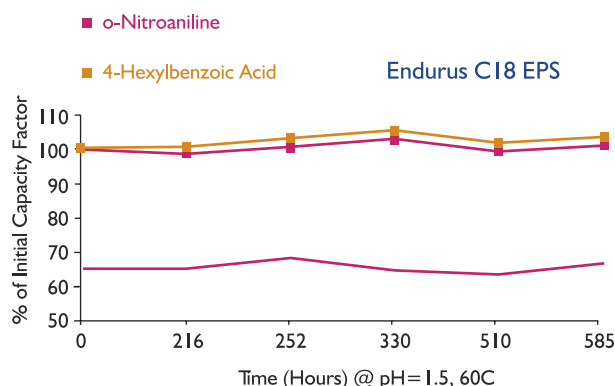
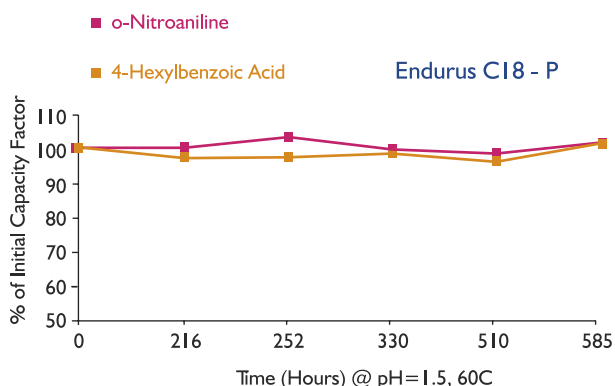
1. Uracil,
2. Phenol,
3. O-nitroanilin,
4. Toluene,
5. 4-Hydroxybenzoic acid,
6. 4-Octylbenzoic acid

Test Conditions:
Endurus C18-P (150 X 4.6 mm, 5 μm),
Eluent: CH₃CN - 0.05M KH₂PO₄,
pH 3.2 (65:35),
Flow rate: 1 ml/min,
Detection: 254 nm

Column Capacity and Selectivity

Endurus Columns do more than just withstand low-pH and high-temperature conditions; they deliver constant capacity and selectivity.

Capacity factors are stable throughout the study



Endurus® HPLC Columns Specifications

Phase	Pore Size (Å)	Particle Size (µm)	Surface Area (m ² /g)	Carbon Load (%)	Endcapped	Ph Range	Aq Compatible	USP Listing
Endurus C18 (Classic)	100	3, 4, 5	330	18	Yes	2 - 9	80%	L1
Endurus HP C18	100	3, 4, 5	330	18	Yes	2 - 10	-	L1
Endurus C18-Polar	100	3, 4, 5	330	18	60%	2 - 8	100%	L1
Endurus C18-EPS	100	3, 4, 5	330	14	Yes	2 - 8	100%	L1
Endurus C18-AQ	100	3, 4, 5	330	11	Yes	2 - 8	100%	L1
Endurus C18-Tri Alpha (Classic)	100	3, 4, 5	330	19	Yes	2 - 10	80%	L1
Endurus C18-Tri Alpha	100	3, 4, 5	330	19	Yes	2 - 10	-	L1
Endurus C18-Tri Alpha-P	100	3, 4, 5	330	19	40%	3 - 8	100%	L1
Endurus C8-HL	100	3, 4, 5	330	10	Yes	2 - 8	-	L7
Endurus C8-EPS	100	3, 4, 5	330	9	Yes	2 - 8	100%	L7
Endurus C4-HL	100	3, 4, 5	330	8	Yes	2 - 8	-	L26
Endurus Phenyl-Hexyl	100	3, 4, 5	330	14	Yes	2 - 8	-	L11
Endurus Phenyl	100	3, 4, 5	330	12	Yes	2 - 8	-	L11
Endurus Cyano	100	3, 4, 5	330	7	Yes	2 - 8	-	L10
Endurus Cyano HS	100	3, 4, 5	330	7	Yes	2 - 8	-	L10
Endurus Amino	100	3, 4, 5	330	4	No	2 - 8	-	L8
Endurus HILIC	100	3, 4, 5	330	8	No	2 - 10	Only up to 30%	L3

ID	Length					
	50mm	75mm	100mm	125mm	150mm	250mm
4.6mm	NDR-M*P*-5046	NDR-M*P*-7546	NDR-M*P*-10046	NDR-M*P*-12546	NDR-M*P*-15046	NDR-M*P*-25046
4.0mm	NDR-M*P*-5040	NDR-M*P*-7540	NDR-M*P*-10040	NDR-M*P*-12540	NDR-M*P*-15040	NDR-M*P*-25040
3.0mm	NDR-M*P*-5030	NDR-M*P*-7530	NDR-M*P*-10030	NDR-M*P*-12530	NDR-M*P*-15030	NDR-M*P*-25030

1) For optimum column lifetime, a pH range of 2-8 is recommended.

2) To increase column lifetime at higher pH, organic buffers, low buffer concentrations, high % Organic solvent and low temperatures must be considered.

M* - Available Micron Size is 3.0u, 3.5u, 4u, 5u & 10u

P* - Available Phases are C18, C18-Polar, C18-EPS, C18 AQ, C18-Tri Alpha, C18-Tri Alpha-P, C8-HL, C8-AQ, C4-HL, (As Above) Columns upto 300mm are available. 2.1mm ID is also available other non standard dimensions are also available.

Please feel free to ask for our competitive prices.

Endurus HPLC Columns are available through our international distributor network:

YOUR LOCAL DISTRIBUTOR

FORCE SCIENTIFIC INC. - 10413 Dominion Village Dr, Charlotte, NC - 28269 - 7919. | Tel : (408) 674 - 6561

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