



CLARITY™
BIOSOLUTIONS

Clarity BioSolutions For Synthetic DNA/RNA

Advance Your Oligonucleotide Work

From Sample Preparation to Analysis and Purification

 **phenomenex**®
...breaking with traditionSM



Optimized Oligonucleotide Purification and Analysis

Designed to efficiently and effectively purify or characterize synthetic oligonucleotides, the Clarity BioSolutions Sample Preparation and LC portfolio includes solutions for all aspects of the oligo purification process. From desalting and cleanup from biological samples to analytical and preparative LC analysis, Clarity BioSolutions will help advance your oligonucleotide analyses.

Guarantee

If analytical Clarity LC Products do not provide at least an equivalent separation as compared to a competing product of the same particle size, similar phase and dimensions, return the column with comparative data within 45 days for a FULL REFUND.

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Oligonucleotide Synthesis

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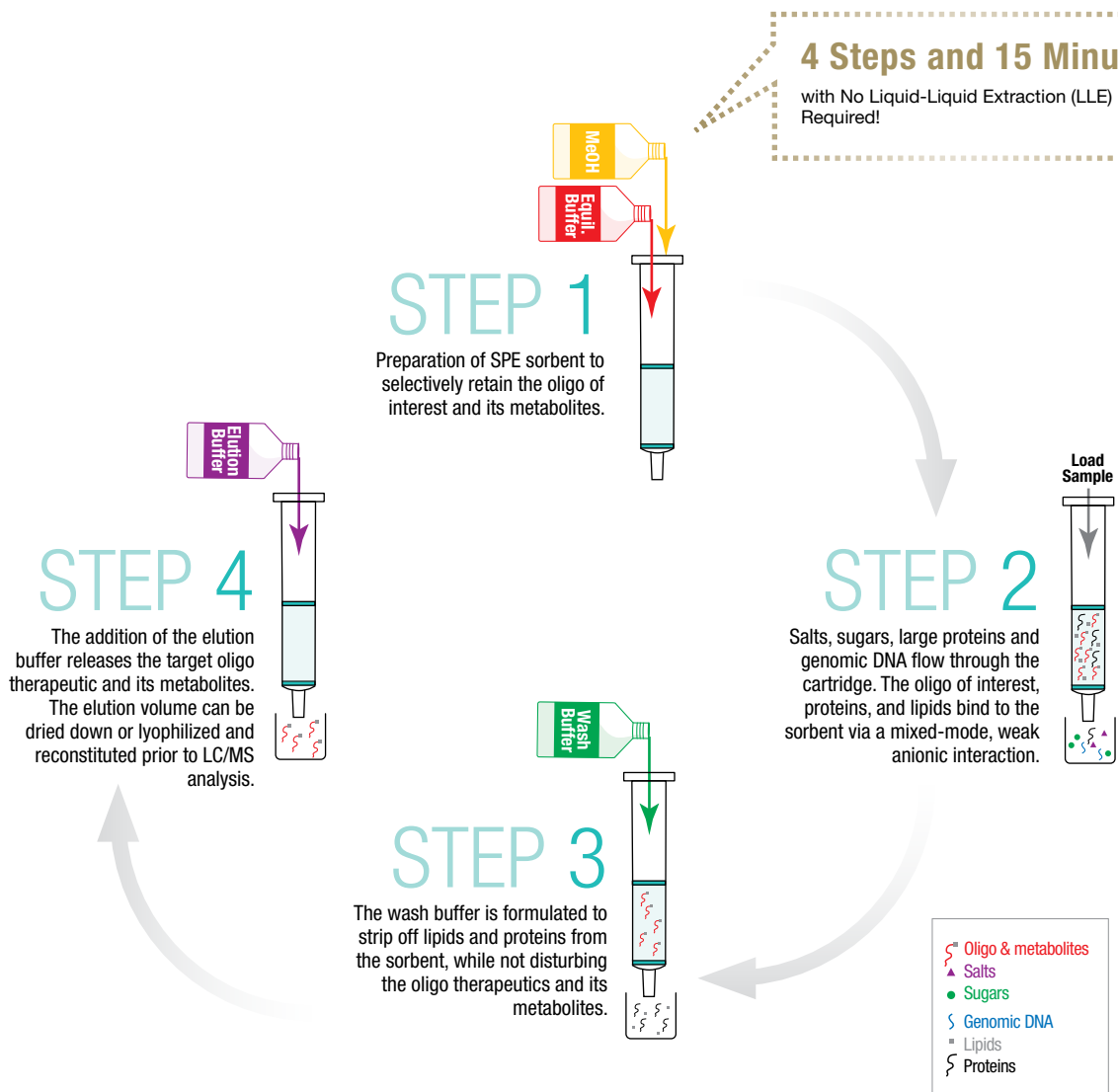
Sample Preparation

Clarity™ OTX™ Extraction Kits

Prior to LC/MS analysis, therapeutic oligonucleotides must be isolated from interferences such as salts, sugars, large proteins, and genomic DNA. Using a mixed-mode solid phase extraction (SPE) sorbent in conjunction with carefully formulated buffers, Clarity OTX consistently delivers greater than 80 % recoveries.

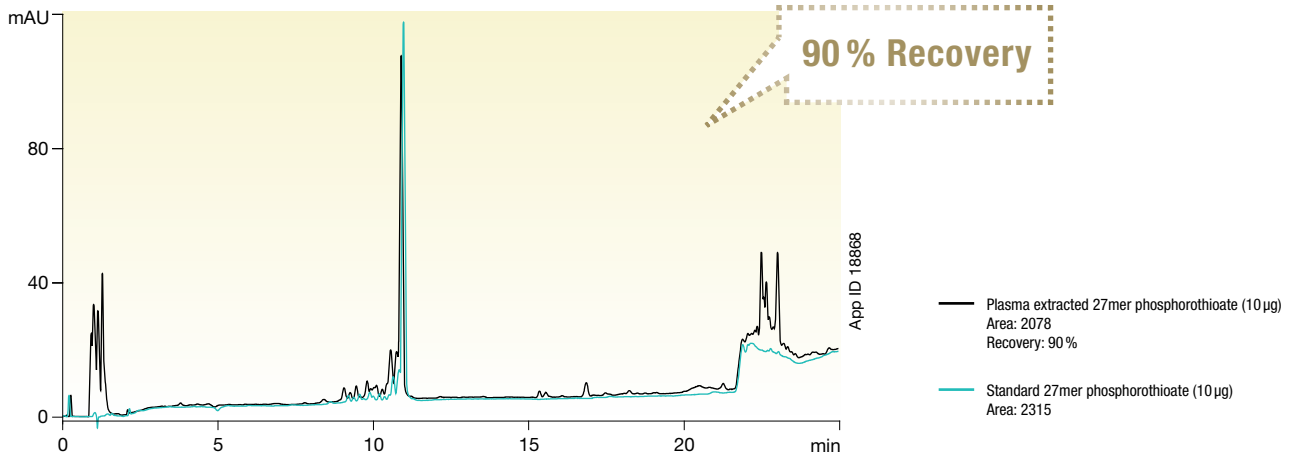
Designed for Throughput

4 Steps and 15 Minutes,
with No Liquid-Liquid Extraction (LLE)
Required!



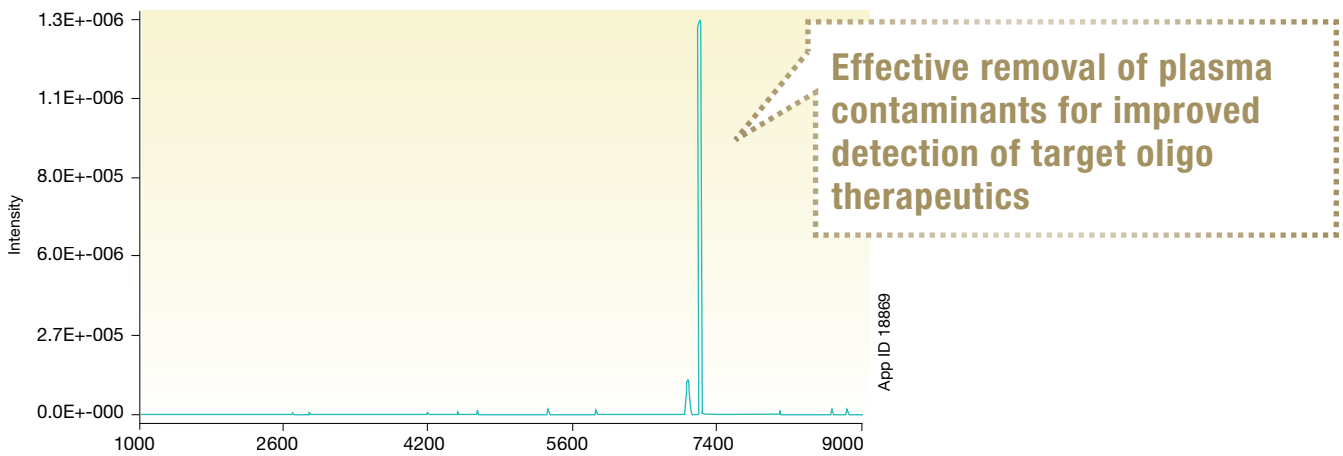
Effective Recoveries

UV Recovery Data



Eliminate MS Interfering Compounds

MS Recovery Data

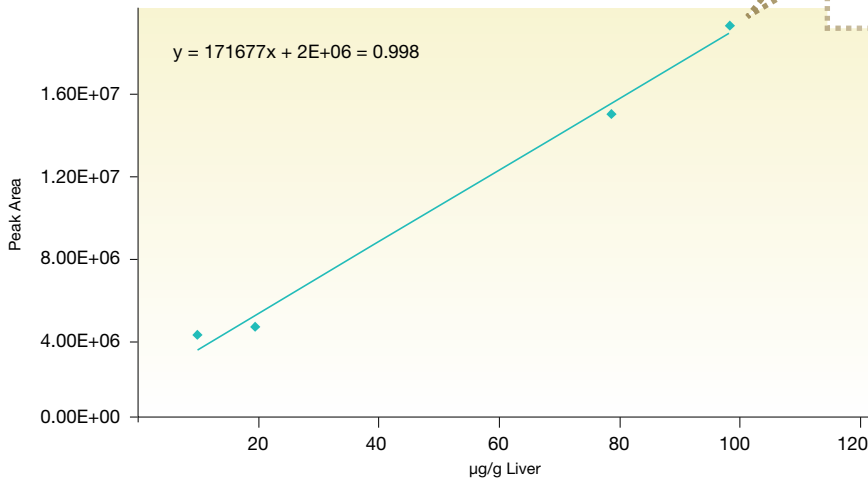


Sample Preparation

Clarity™ OTX™ Extraction Kits

Excellent Linearity

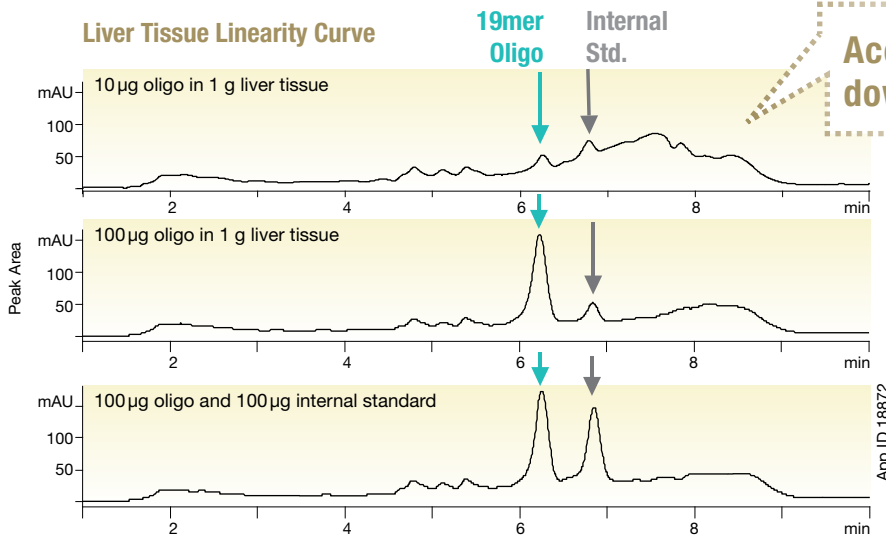
Liver Tissue Linearity Curve



Accurate, reliable results from 10 µg to 100 µg

Detect Low Dosage Levels

Liver Tissue Linearity Curve



Accurately detect down to 10 µg

App ID 18872

Ordering Information

Choose from 96-well plates or cartridges and stock up on 1L quantities of buffers.

Part No.	Description		Unit	Price
KS0-8494	Clarity OTX Starter Kit-Tubes	Includes: 100 mg/3 mL cartridges (x50) Lysis-loading buffer (60 mL) Equilibration buffer (250 mL) Wash buffer (350 mL) Elution buffer (60 mL)	ea	
KS0-9253	Clarity OTX Starter Kit-96-Well Plate	100 mg/ 96-well plate (x1) Lysis-loading buffer (60 mL) Equilibration buffer (250 mL) Wash buffer (350 mL) Elution buffer (60 mL)	ea	
8E-S103-EGA	Clarity OTX Well Plate	100 mg/ well	1/box	
8B-S103-EBJ	Clarity OTX Cartridge	100 mg/3 mL	50/box	
AL0-8579	Clarity OTX Lysis-Loading Buffer V2.0	1 L	ea	

“
**Flexible Formats
 Give it a Try**
 Take Clarity™ OTX™ for a test run with a starter kit which includes either a 96-well plate or 50 cartridges and all of the buffers you will need!
 ”



Easily Process Samples with the Presston™ 100 Positive Pressure Manifold

Presston 100 Positive Pressure Manifold		
Part No.	Description	Price
AH0-9334	Presston 100 Positive Pressure Manifold, 96-Well Plate	
AH0-9342	Presston 100 Positive Pressure Manifold, 1 mL Tube Complete Assembly	
AH0-9347	Presston 100 Positive Pressure Manifold, 3 mL Tube Complete Assembly	
AH0-9343	Presston 100 Positive Pressure Manifold, 6 mL Tube Complete Assembly	

Presston 100 Tube Adapter Kits (for AH0-9334)		
Part No.	Description	Price
AH0-9344	1 mL Tube Adapter Kit	
AH0-9345	3 mL Tube Adapter Kit	
AH0-9346	6 mL Tube Adapter Kit	



“

WARRANTY Phenomenex warrants that for a period of 12 months following delivery, the Presston 100 Positive Pressure Manifold you have purchased will perform in accordance with the published specifications and will be free from defects in materials or workmanship. In the event that the Presston 100 Positive Pressure Manifold does not meet this warranty, Phenomenex will repair or replace defective parts.

Please visit www.phenomenex.com/Presston for complete warranty information.



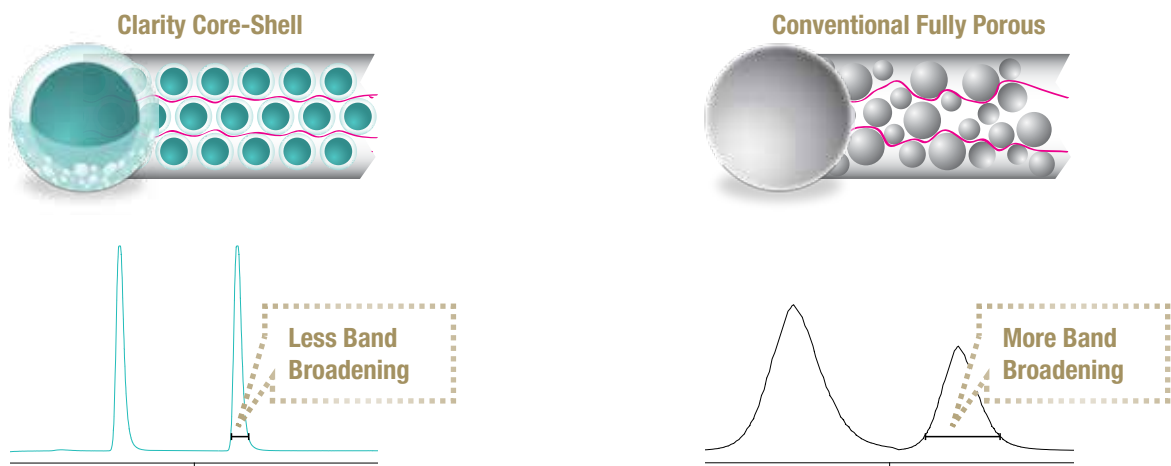
LC/MS Analysis

Clarity™ Oligo-XT

An increased need for TK and PK/PD studies for oligo therapeutics has led to an increase in LC/MS/MS analysis because of the specificity, sensitivity, and shorter method development times as compared to ligand binding assays or ELISA. Because sensitivity is of the utmost importance, it is crucial to select an LC column that provides both separation and high efficiencies to ensure accurate results.

The Core-Shell Advantage

Unlike traditional fully porous oligo columns, Clarity Oligo-XT relies on the power of core-shell technology to provide extremely high efficiencies for both low and high oligo concentrations. Because the Clarity Oligo-XT particle is not fully porous, analytes spend less time diffusing into and out of the pores as they travel through the column, resulting in less band broadening for higher peak efficiencies.



Fully Porous	Clarity Core-Shell	Average Efficiency Gain with Clarity*
5 μm	5 μm	90 % Higher
3 μm	2.6 μm	85 % Higher

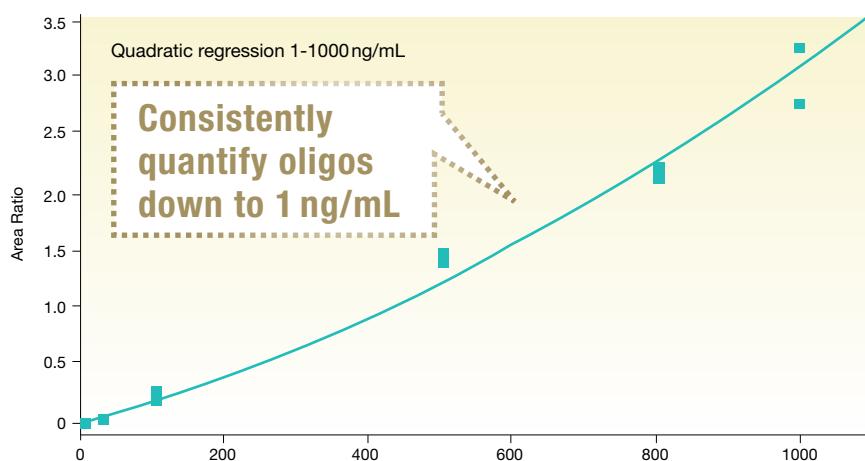
Fully Porous	Clarity Core-Shell	Average Efficiency Gain with Clarity*
1.7 μm	1.7 μm	20 % Higher

* May not be representative of all applications



Sensitive, Reliable Analysis

Calibration curve of BNA in mini pig liver homogenate



LC/MS/MS Conditions

Column: Clarity™ 5 µm Oligo-XT
Dimensions: 50 x 2.1 mm
Part No.: 00B-4745-AN
HPLC system: Shimadzu® Nexera® X2 UHPLC
Mobile Phase: A: 1.0% HFIP & 0.1% DIEA with 10 µM EDTA in Methanol
 B: 1.0% HFIP & 0.1% DIEA with 10 µM EDTA in Methanol Water (50:50 v/v)
Gradient:

Time (min)	B %
0.5	30
2.5	60
3.0	100
3.5	100
4.0	30
5.0	30

Flow Rate: 500 µL/min
Inj. Volume: 10 µL
Temperature: 40 °C
Detection: Thermo Q Exactive™ Hybrid Quadrupole-Orbitrap™ Mass Spectrometer, HESI, negative polarity

Ordering Information

1.7 µm Minibore Columns (mm)			SecurityGuard™ ULTRA Cartridges†
Phase	50 x 2.1	100 x 2.1	3/pk
Oligo-XT	00B-4747-AN	00D-4747-AN	AJO-9515 for 2.1 mm ID

2.6 µm Minibore and Analytical Columns (mm)				SecurityGuard ULTRA Cartridges†		
Phase	50 x 2.1	100 x 2.1	50 x 4.6	100 x 4.6	3/pk	3/pk
Oligo-XT	00B-4746-AN	00D-4746-AN	00B-4746-E0	00D-4746-E0	AJO-9515 for 2.1 mm ID	AJO-9514 for 4.6 mm ID

5 µm Minibore and Analytical Columns (mm)			SecurityGuard ULTRA Cartridges†	
Phase	50 x 2.1	150 x 4.6	3/pk	3/pk
Oligo-XT	00B-4745-AN	00F-4745-E0	AJO-9515 for 2.1 mm ID	AJO-9514 for 4.6 mm ID

5 µm Semi-Preparative Columns (mm)				SecurityGuard SemiPrep Cartridges*
Phase	50 x 10.0	100 x 10.0	150 x 10.0	3/pk
Oligo-XT	00B-4745-N0	00D-4745-N0	00F-4745-N0	AJO-9516 for 10 mm ID

5 µm Axia™ Packed Preparative Columns (mm)					SecurityGuard PREP Cartridges**	SecurityGuard PREP Cartridges***
Phase	100 x 21.2	150 x 21.2	250 x 21.2	150 x 30	/ea	/ea
Oligo-XT	00D-4745-P0-AX	00F-4745-P0-AX	00G-4745-P0-AX	00F-4745-U0-AX	AJO-9517 for 21.2 mm ID	AJO-9518 for 30 mm ID

† SecurityGuard ULTRA Cartridges require holder, Part No.: AJO-9000

* SemiPrep SecurityGuard Cartridges require holder, Part No.: AJO-9281

** PREP SecurityGuard Cartridges require holder, Part No.: AJO-8223

*** PREP SecurityGuard Cartridges require holder, Part No.: AJO-8277

Sample Preparation: DMT On (Trityl On)

Clarity™ QSP™

The DNA and RNA synthesis process results in a solution that contains target oligos as well as impurities and failure sequences. Target oligos must then be isolated and purified for further analysis. Using a Quick, Simple, and Pure (QSP) protocol, Clarity QSP produces greater than 90% recoveries of target oligos in less than 20 minutes.

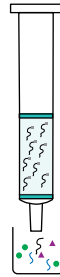
It's Quick, Simple, and Pure (QSP)

Pre-treatment

Trityl-on oligo sample preparation. Mix equal volume of loading buffer with cleavage/deprotection solution

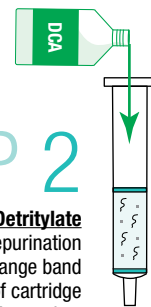
STEP 1

Load crude oligo cocktail
All trityl-off impurities flow directly through; no wash required.



STEP 2

Detritylate
Less than 2% depurination observed. A faint orange band will appear at top half of cartridge indicating DMT retention.



> 90% recoveries in under 20 minutes!

STEP 3

Elute target oligo
pH buffered solutions used to maintain safe pH for oligo; select elution buffer based on downstream requirements.

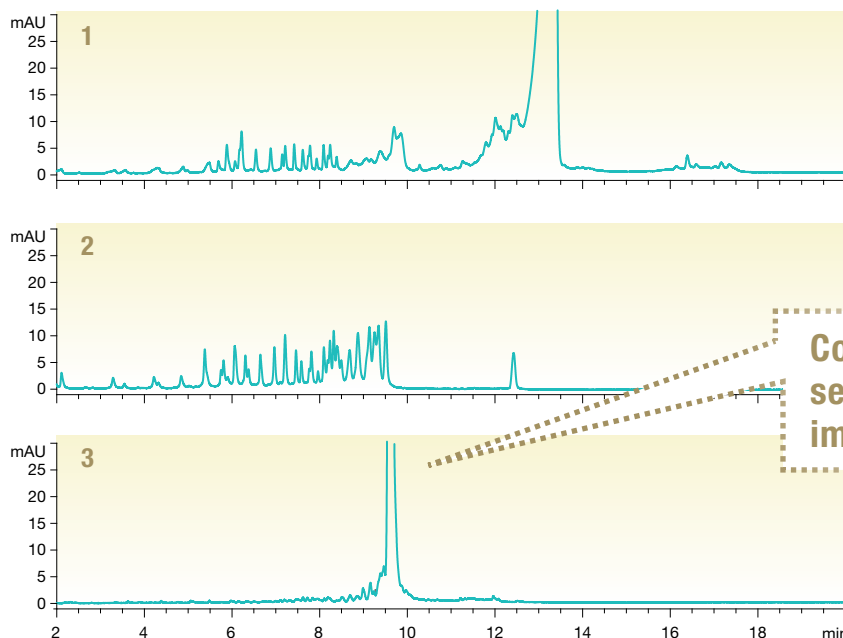


- ⌋ Full Length Trityl-On Oligo
- ▲ Impurity
- N-1 Sequence
- ⌋ Detritylated Failure Sequences
- Trityl Group
- ⌋ Full Length Target Oligo

“ Request Technical Note TN-0015 Comparing Performance of High-Throughput, Trityl-on RNA/DNA Purification Products to see the benefits of using Clarity QSP over other trityl-on solutions. ”

Guaranteed Complete Discrimination between Full-Length Trityl-On Sequences and Impurities

High-Throughput DNA Purification



Sequence:
GTGGATCTGCGCACTTCAGGCTCCTGGGCT
Synthesis Scale: 200 nmole
Format: 96-Well Plate (50 mg / well)

1. Crude Trityl-on
2. Load fraction
3. Detritylated final elution

Concentrated, full-length sequence that is free of impurities

App ID 16406

Crude Trityl-on	Load Fraction	Detritylated Final Elution	Recovery	Purity (Peak area)
28.3	5.3	20.8	90.3%	92%

Ordering Information

Part No.	Description	Unit	Price
Formats			
8E-S102-DGB	Clarity QSP Well Plate	50 mg/well	1/box
8B-S102-UBJ	Clarity QSP Cartridge	60 mg/3 mL	50/box
8B-S102-SBJ	Clarity QSP Cartridge	150 mg/3 mL	50/box
8B-S042-LFF	Clarity QSP Cartridge	5 g/60 mL	16/box
Buffers*			
ALO-8280	Clarity QSP DNA Loading Buffer	1 L	ea
ALO-8282	Clarity QSP RNA-TBDMS Loading Buffer	1 L	ea

* RNA-TOM loading buffer available upon request

Easily Process Samples with the Presston 100 Positive Pressure Manifold

Presston™ 100 Positive Pressure Manifold		
Part No.	Description	Price
AH0-9334	Presston 100 Positive Pressure Manifold, 96-Well Plate	
AH0-9342	Presston 100 Positive Pressure Manifold, 1 mL Tube Complete Assembly	
AH0-9347	Presston 100 Positive Pressure Manifold, 3 mL Tube Complete Assembly	
AH0-9343	Presston 100 Positive Pressure Manifold, 6 mL Tube Complete Assembly	



Presston 100 Tube Adapter Kits (for AH0-9334)		
Part No.	Description	Price
AH0-9344	1 mL Tube Adapter Kit	
AH0-9345	3 mL Tube Adapter Kit	
AH0-9346	6 mL Tube Adapter Kit	



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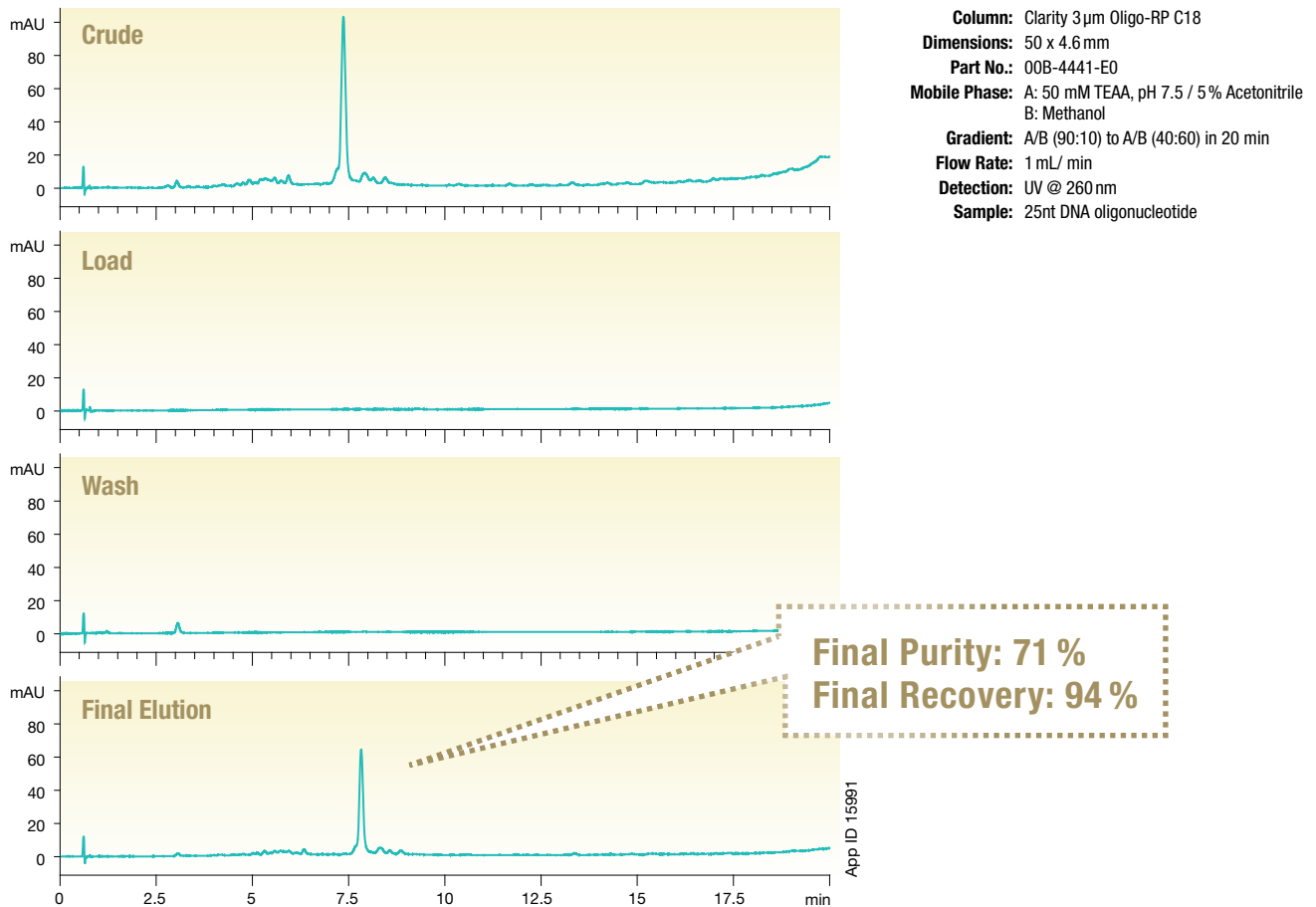


Sample Preparation: DMT Off (Trityl off)

Clarity™ RP-Desalting™

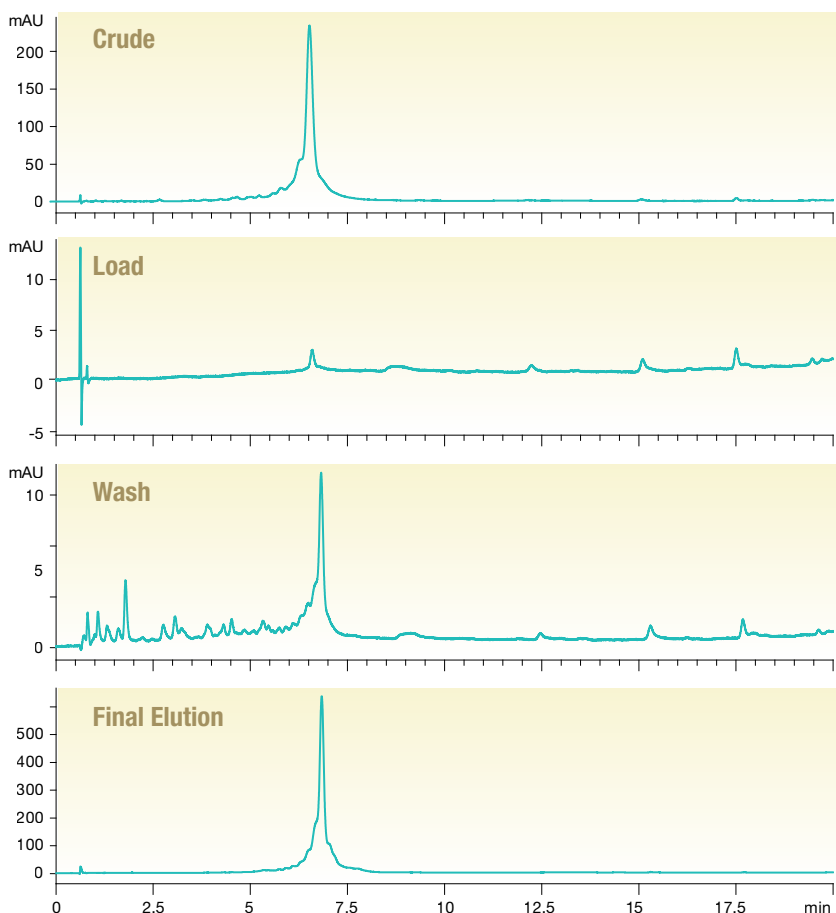
Trityl-off synthetic oligo synthesis mixtures must undergo a desalting process to remove salts and buffers that are not amenable to LC/MS analysis. Clarity RP-Desalting tubes and 96-well plates provide a high capacity, fast and effective desalting solution that results in greater than 70 % purity and 80 % recovery of trityl-off synthetic oligos.

Desalting of Dye-Labeled DNA



A quencher-labeled sample of DNA (25nt) with the sequence FAMTTGACTTAGACTTAGA-CTTAGTTT was desalted using Clarity RP-Desalting tubes in the 200 mg/3 mL format. Collection fractions were then analyzed for purity and recovery using the above protocol.

Desalt Crude DNA



App ID 16022

Column: Clarity™ 3 μm Oligo-RP C18
Dimensions: 50 x 4.6 mm
Part No.: 00B-4441-E0
Mobile Phase: A: 50 mM TEAA, pH 7.5 / 5% Acetonitrile
 B: Methanol
Gradient: A/B (90:10) to A/B (40:60) in 20 min
Flow Rate: 1 mL/min
Detection: UV @ 260 nm
Sample: 40nt DNA

Ordering Information

Tubes	200 mg/3 mL*	500 mg/3 mL**
Phase	50/box	50/box
C18	8B-S041-FBJ	8B-S041-HBJ

96-Well Plates*			
Part No.	Description	Unit	Price
8E-S041-SGA	Clarity RP Desalting 150 mg/well	ea	

* For 200 μmole synthesis

** For 1 μmole synthesis

Easily Process Samples with the Presston™ 100 Positive Pressure Manifold

Presston 100 Positive Pressure Manifold		
Part No.	Description	Price
AH0-9334	Presston 100 Positive Pressure Manifold, 96-Well Plate	
AH0-9342	Presston 100 Positive Pressure Manifold, 1 mL Tube Complete Assembly	
AH0-9347	Presston 100 Positive Pressure Manifold, 3 mL Tube Complete Assembly	
AH0-9343	Presston 100 Positive Pressure Manifold, 6 mL Tube Complete Assembly	

Presston 100 Tube Adapter Kits (for AH0-9334)		
Part No.	Description	Price
AH0-9344	1 mL Tube Adapter Kit	
AH0-9345	3 mL Tube Adapter Kit	
AH0-9346	6 mL Tube Adapter Kit	



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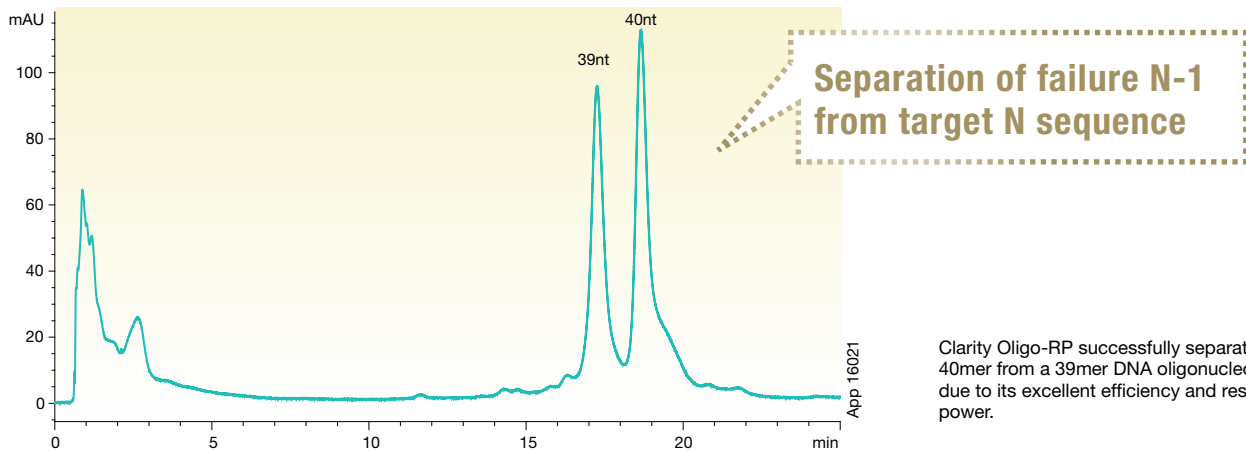


Analytical LC

Clarity™ Oligo-RP™

Clarity Oligo-RP columns have been specifically designed for the reversed phase purification of oligonucleotides with balanced hydrophobicity and polar selectivity. Available in 3, 5, and 10 µm particles, Clarity Oligo-RP allows for high capacity analysis and purification of oligos.

A Highly Selective Analysis



Clarity Oligo-RP successfully separates a 40mer from a 39mer DNA oligonucleotide due to its excellent efficiency and resolving power.

- Column:** Clarity 3 µm Oligo-RP C18
- Dimensions:** 50 x 4.6 mm
- Part No.:** 00B-4441-E0
- Mobile Phase:** A: 50 mM TEAA pH 7.5
B: Methanol
- Gradient:** 10% to 45% B in 30 minutes
- Flow Rate:** 1 mL/min
- Detection:** UV @ 260 nm
- Sample:** 1. 40nt DNA with sequence
CTTCTGAACAGTTGATCTATG-
CACTTCAGACTTATGATCA (2.5 µg)
- 2. 39nt DNA with sequence
TTCTGAACAGTTGATCTATGCAC-
TTCAGACTTATGATCA (2.5 µg)

Ordering Information

Phase	Minibore Columns (mm)		SecurityGuard™ Cartridges (mm)	
	50 x 2.0	100 x 2.0	150 x 2.0	4 x 2.0*
3 µm Oligo-RP C18	00B-4441-B0	00D-4441-B0	00F-4441-B0	AJO-8134 /10pk
5 µm Oligo-RP C18	—	—	00F-4442-B0	AJO-8134 /10pk

for ID: 2.0-3.0 mm

Phase	Analytical Columns (mm)			SecurityGuard™ Cartridges (mm)	
	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	4 x 3.0*
3 µm Oligo-RP C18	00B-4441-E0	00D-4441-E0	00F-4441-E0	—	AJO-8135 /10pk
5 µm Oligo-RP C18	00B-4442-E0	—	00F-4442-E0	00G-4442-E0	AJO-8135 /10pk

for ID: 3.2-8.0 mm

* SecurityGuard Analytical Cartridges require universal holder, Part No.: KJO-4282

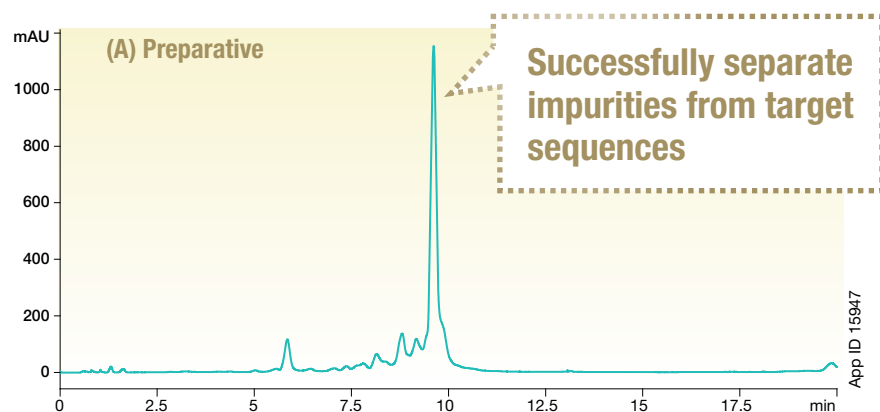
Purification

Clarity™ Oligo-RP™

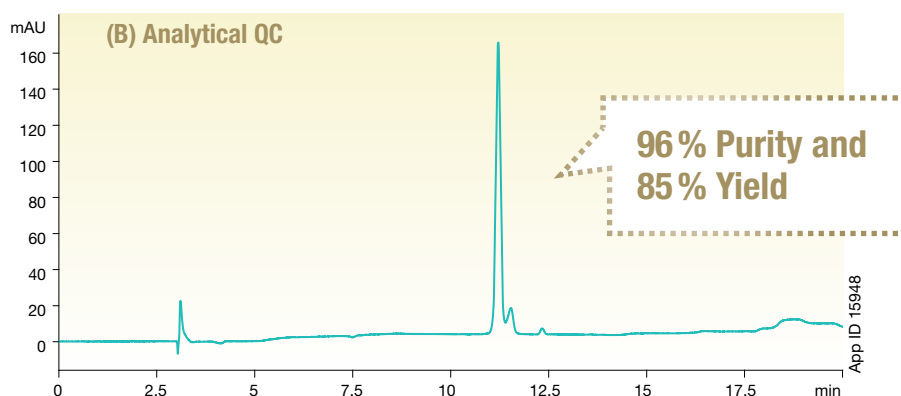
Clarity Oligo-RP columns allow for high loadability and deliver high recovery and purity, from HPLC to Preparative Purification.

Easily Scale from HPLC to Preparative Purification

DNA Purification



Column: Clarity 3µm Oligo-RP C18
Dimensions: A: 50 x 10.0mm
 B: 50 x 4.6mm
Part No.: A: 00B-4441-N0
 B: 00B-4441-E0
Mobile Phase: A: 50 mM TEAA pH 7.5/ 5% Acetonitrile
 B: Methanol
Gradient: 10% to 60% B in 20 minutes
Flow Rate: A: 4.7 mL/ min
 B: 1.0 mL/ min
Detection: UV @ 260 nm
Sample: 20nt DNA



Ordering Information

Phase	Semi-Prep Columns (mm)			SecurityGuard Cartridges (mm)	
	50 x 10.0	100 x 10.0	150 x 10.0	250 x 10.0	10 x 10 [†]
3µm Oligo-RP C18	00B-4441-N0	—	—	—	/3pk AJ0-8136
5µm Oligo-RP C18	00B-4442-N0	00D-4442-N0	00F-4442-N0	00G-4442-N0	/3pk AJ0-8136
10µm Oligo-RP C18	—	—	00F-4445-N0	00G-4445-N0	/3pk AJ0-8136

for ID: 9-16 mm

Phase	Prep and Axia™ Packed Preparative Columns (mm)					SecurityGuard Cartridges (mm)	
	100 x 21.2	150 x 21.2	250 x 21.2	150 x 30	250 x 50	15 x 21.2 ^{**}	15 x 30.0 [†]
5µm Oligo-RP C18	00D-4442-P0-AX	—	00G-4442-P0-AX	—	—	/ea AJ0-8210	/ea AJ0-8310
10µm Oligo-RP C18	—	00F-4445-P0-AX	00G-4445-P0-AX	00F-4445-U0-AX	00G-4445-V0-AX	/ea AJ0-8210	/ea AJ0-8310

Bulk material available upon request. for ID: 18-29 mm 30-49 mm

[†] SemiPrep SecurityGuard Cartridges require holder, Part No.: AJ0-9281

^{**} PREP SecurityGuard Cartridges require holder, Part No.: AJ0-8223

• PREP SecurityGuard Cartridges require holder, Part No.: AJ0-8277

Reversed Phase LC

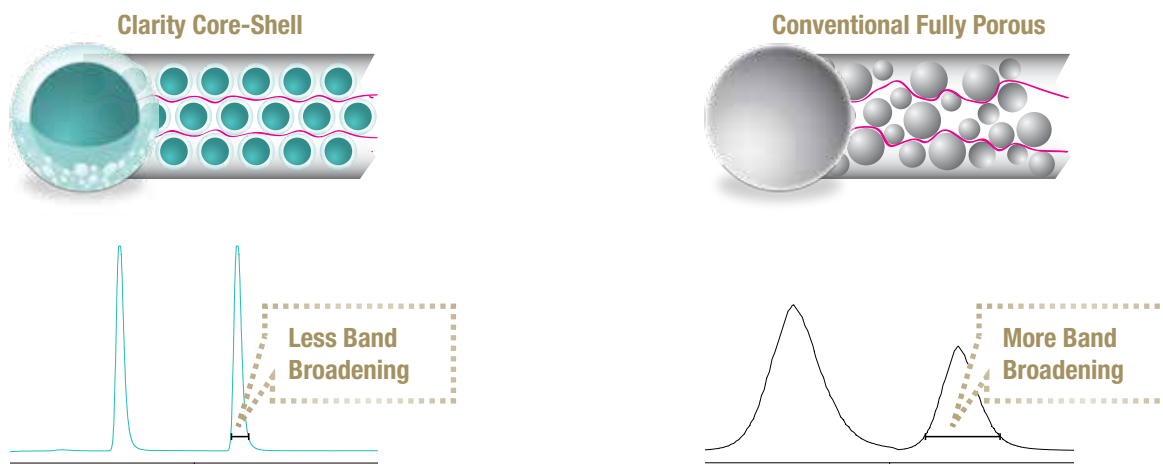
Clarity™ Oligo-XT

Analyte Characterization

Clarity Oligo-XT columns have the selectivity and efficiency required for demanding oligonucleotide methods, including separation of n-1 sequences. The particle and stationary phase have also been optimized to withstand the high temperature and harsh solvents required for oligo analysis.

The Core-Shell Advantage

Unlike traditional fully porous oligo columns, Clarity Oligo-XT relies on the power of core-shell technology to provide extremely high efficiencies for both low and high oligo concentrations. Because the Clarity Oligo-XT particle is not fully porous, analytes spend less time diffusing into and out of the pores as they travel through the column, resulting in less band broadening for higher peak efficiencies.



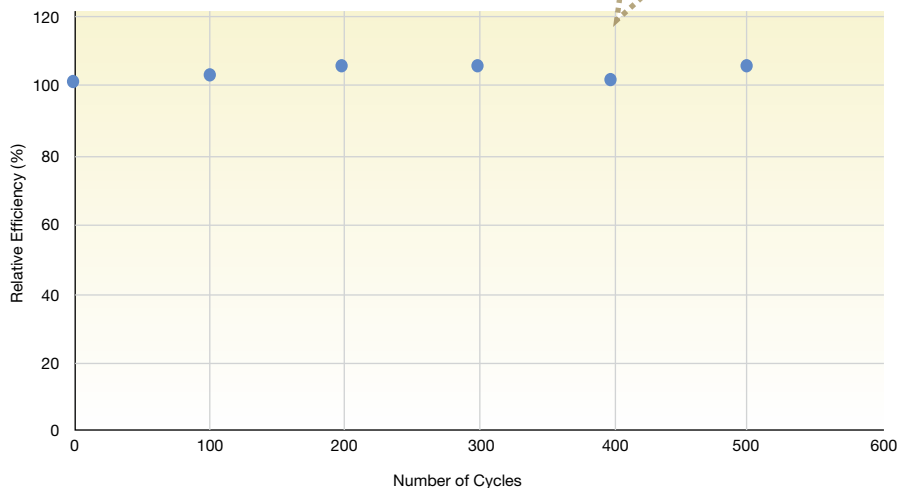
Fully Porous	Clarity Core-Shell	Average Efficiency Gain with Clarity*
5 μm	5 μm	90 % Higher
3 μm	2.6 μm	85 % Higher

Fully Porous	Clarity Core-Shell	Average Efficiency Gain with Clarity*
1.7 μm	1.7 μm	20 % Higher

* May not be representative of all applications



Reliable Results



Achieve Consistently High Efficiencies

Column: Clarity™ 2.6 µm Oligo-XT
Dimensions: 50 x 2.1 mm
Part No.: 00B-4746-AN
Guard Cartridge: AJ0-9515
Guard Holder: AJ0-9000
Mobile Phase: A: H₂O + 50 mM HFIP + 5 mM DIEA (pH 8.7)
 B: ACN + 50 mM HFIP + 5 mM DIEA
Gradient:

Time (min)	% B
0.0	55
5.0	55
6.0	5
11.0	5
11.5	55
16.5	55

Flow Rate: 0.3 mL/min
Temperature: 60° C
Detection: UV @ 254 nm
Sample: Reversed Phase PTM 2 (50 % dilution in Water)

Ordering Information

1.7 µm Minibore Columns (mm)			SecurityGuard™ ULTRA Cartridges†
Phase	50 x 2.1	100 x 2.1	3/pk
Oligo-XT	00B-4747-AN	00D-4747-AN	AJ0-9515 for 2.1 mm ID

2.6 µm Minibore and Analytical Columns (mm)					SecurityGuard ULTRA Cartridges†	
Phase	50 x 2.1	100 x 2.1	50 x 4.6	100 x 4.6	3/pk	3/pk
Oligo-XT	00B-4746-AN	00D-4746-AN	00B-4746-E0	00D-4746-E0	AJ0-9515 for 2.1 mm ID	AJ0-9514 for 4.6 mm ID

5 µm Minibore and Analytical Columns (mm)			SecurityGuard ULTRA Cartridges†	
Phase	50 x 2.1	150 x 4.6	3/pk	3/pk
Oligo-XT	00B-4745-AN	00F-4745-E0	AJ0-9515 for 2.1 mm ID	AJ0-9514 for 4.6 mm ID

5 µm Semi-Preparative Columns (mm)				SecurityGuard SemiPrep Cartridges*
Phase	50 x 10.0	100 x 10.0	150 x 10.0	3/pk
Oligo-XT	00B-4745-N0	00D-4745-N0	00F-4745-N0	AJ0-9516 for 10 mm ID

5 µm Axia™ Packed Preparative Columns (mm)					SecurityGuard PREP Cartridges**	SecurityGuard PREP Cartridges***
Phase	100 x 21.2	150 x 21.2	250 x 21.2	150 x 30	/ea	/ea
Oligo-XT	00D-4745-P0-AX	00F-4745-P0-AX	00G-4745-P0-AX	00F-4745-U0-AX	AJ0-9517 for 21.2 mm ID	AJ0-9518 for 30 mm ID

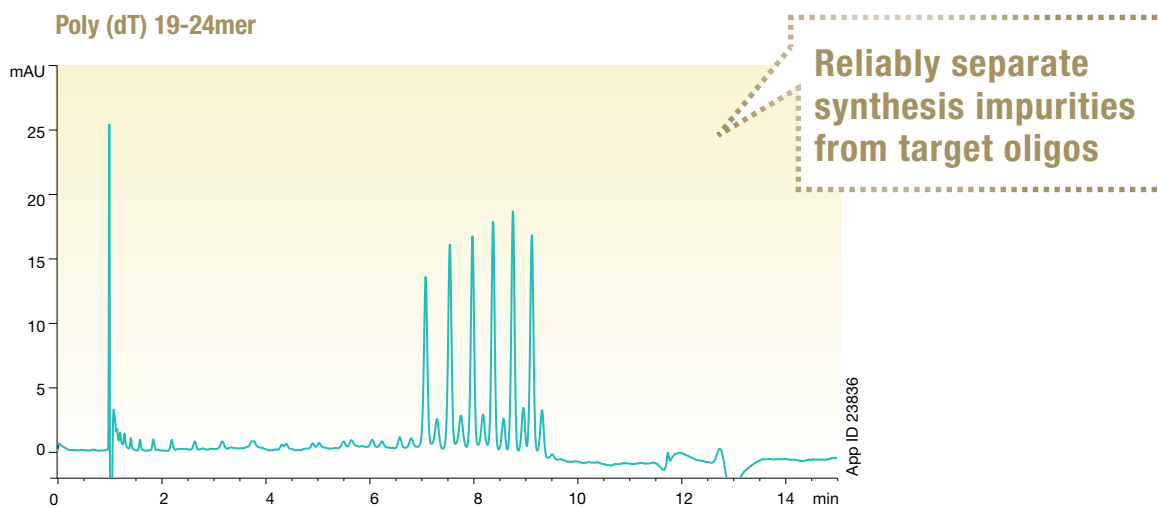
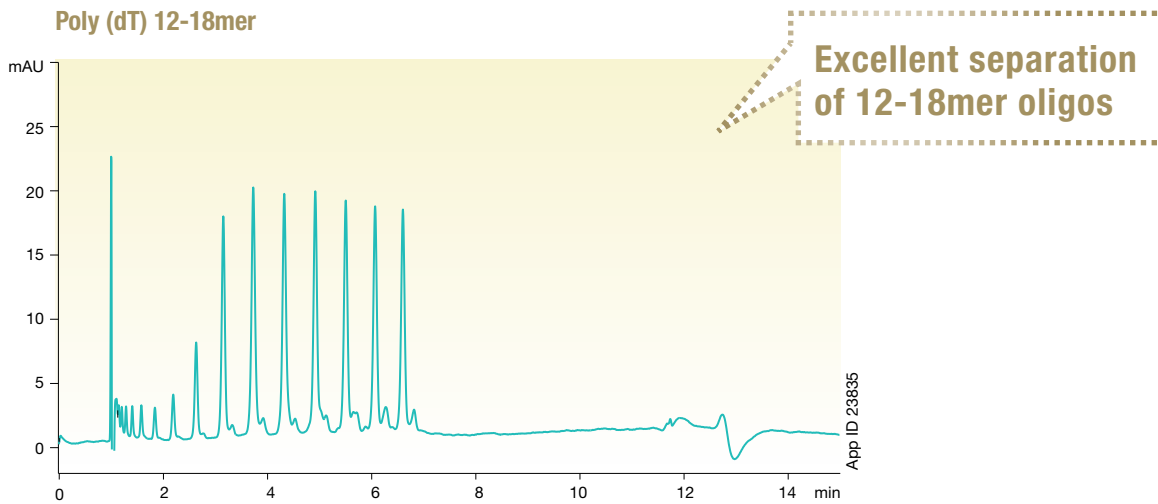
† SecurityGuard ULTRA Cartridges require holder, Part No.: AJ0-9000
 * SemiPrep SecurityGuard Cartridges require holder, Part No.: AJ0-9281
 ** PREP SecurityGuard Cartridges require holder, Part No.: AJ0-8223
 *** PREP SecurityGuard Cartridges require holder, Part No.: AJ0-8277

Ion-Exchange LC

Clarity™ Oligo-SAX

The characterization of synthetic oligos is important in the drug development process, and one common technique used is strong anion-exchange liquid chromatography. This high resolution technique is preferred when extensive characterization (i.e. LC/MS) is not necessary. Another valuable benefit is that n-1 failure sequences can still be separated without the use of an ion pair reagent. Clarity Oligo-SAX strong anion-exchange columns allow analysts to reliably characterize a variety of different sized synthetic oligos while providing excellent separation of oligos and synthesis impurities.

A Sensitive Separation

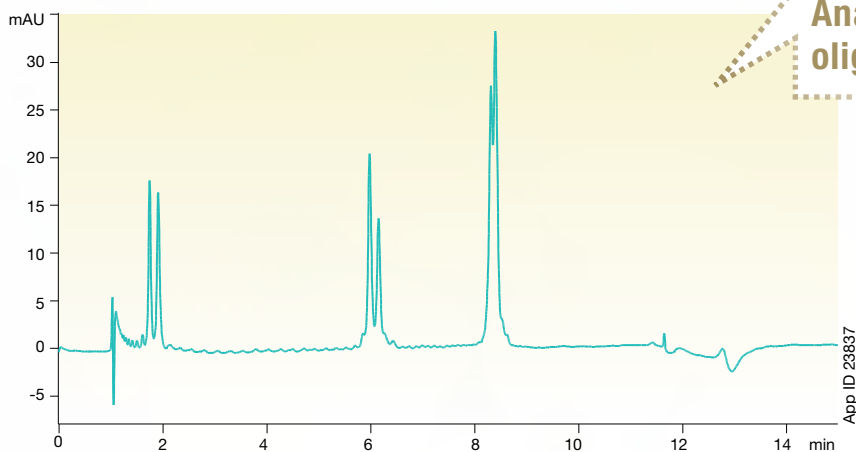


Column: Clarity 5 µm Oligo-SAX
Dimensions: 250 x 4.6 mm
Part No.: 00G-4749-E0
Mobile Phase: See Table
Flow Rate: 1.6 mL/min
Temperature: 30 °C
LC System: Agilent® 1200
Detection: UV-Vis @ 260 nm

Oligo Type	Mobile Phase A	Mobile Phase B	Gradient Program
Poly (dT) 12-18mer	20 mM Tris, pH 8.0	20 mM Tris + 1.25 M NaCl, pH 8.0	32-46.6% in 10 min
Poly (dT) 19-24mer	20 mM Tris, pH 8.0	20 mM Tris + 1.25 M NaCl, pH 8.0	32-46.6% in 10 min
Poly (dT) 19/20mer, 39/40mer, 59/60mer	20 mM Tris, pH 8.0		

Go Beyond Traditional Oligo Analysis

Poly (dT) 19/20mer, 39/40mer, 59/60mer



Ordering Information

Analytical Columns (mm)				
Phase	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6
5µm Oligo-SAX	00B-4749-E0	00D-4749-E0	00F-4749-E0	00G-4749-E0



We're Here to Help on Live Chat!

- Request a Method
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- Training and On-Site Support
- Do-it-Yourself Web Tools
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Advance Your Oligonucleotide Work

From Sample Preparation to Analysis and Purification

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Axia column and packing technology is patented by Phenomenex. U.S. Patent No. 7,674,383

Clarity Oligo-XT is patented by Phenomenex. U.S. Patent No. 7,563,367 and 8,658,038 and foreign counterparts.

Clarity OTX and QSP are patented by Phenomenex. U.S. Patent No. 7,119,145.

SecurityGuard is patented by Phenomenex. U.S. Patent No. 6,162,362

CAUTION: this patent only applies to the analytical-sized guard cartridge holder, and does not apply to SemiPrep, PREP, or ULTRA holders, or to any cartridges.

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