



Oligo Scale of Synthesis and Typical Yield

Scale	Crude Desalted			RPC Purified**			Gel Purified		
	20 mer oligo* Typical yield			30 mer oligo* Typical yield			50 mer oligo* Typical yield		
	A ₂₆₀ Units	nmols	mg	A ₂₆₀ Units	nmols	mg	A ₂₆₀ Units	nmols	mg
50 nmol	8-10	30+	0.2-0.3	4-5	12+	0.1-0.16	NR* [1-2]	NR* [2-4]	NR* [0.03-0.06]
200 nmol	20-25	80+	0.6-0.8	8-12	24+	0.26-0.4	4-6	8+	0.13-0.2
1 μmol	100-120	400+	3-4	40-50	30+	1.3-1.6	20-25	40+	0.6-0.8
Purity & Yield	Purity is greater than 80% depending on oligo sequence and structure. Refer to coupling efficiency table for oligo length dependent purity and yield. No further purification required for PCR and sequencing applications. Gel purification recommended for oligos above 50 mer and all applications involving cloning and mutagenesis.			Purity 85% to 95% depending on oligo sequence and structure. Yield and purity will be lower for sequences with high GC content. Not recommended for oligos longer than 35 mer. **RPC is reverse phase purification using a cartridge; a substitute for HPLC.			Purity 98% to ~100% depending on oligo sequence and structure. Yield will gradually decrease as length of oligo increases. Palindromes, hairpins and high GC content oligos and oligos containing stretches of 3 or more G's induces strong secondary structure and base stacking thus decreasing purity and yield. NR* Not Recommended		

*Yield of 30 μg/A₂₆₀ unit for oligos is calculated for an ~equimolar base composition. Long stretches of a single base or homopolymers will have variable yields. Example for homopolymeric 50 mer: A(50) = ~20/A₂₆₀ Unit; G(50) = ~28/A₂₆₀ Unit; T(50) = ~35/A₂₆₀ Unit and C(50) = ~39/A₂₆₀ Unit.

Unmodified DNA Oligo Synthesis*

Scale of Synthesis	Catalog No.	Price (\$)
50 nmol	26-6400-05	0.90
200 nmol	26-6400-02	2.00
1 μmol	26-6400-01	3.75
2 μmol	26-6400-03	6.50
10 μmol	26-6400-10	32.00
15 μmol	26-6400-15	38.00

*minimum charge for 15 mer applies. Please visit www.genelink.com for current list prices. Call for institutional discount pricing structure.

Same Day Oligo*

Design your oligos today and use them tomorrow morning! Investigators who just can not wait order our rush service (order by 12 noon EST). We ship the same day for next early morning delivery in the US and 72 hours for most international destinations.

* Turn-around time stated is for unmodified oligos. Please inquire about purified and modified oligos

Purification

Product	Catalog No.	Scale of Synthesis Price (\$)/ purification					
		50 nmol	200 nmol	1 μmol	2 μmol	10 μmol	15 μmol
Gel Purification	26-6400-XX	75.00	75.00	150.00	280.00	1500.00	1800.00
Reverse Phase Cartridge	26-6400-XX	30.00	30.00	90.00	170.00	750.00	900.00

Synthesis of Long Oligos

Synthesis of long oligos up to 250 mer requires greater than 99.5% coupling efficiency. This can only be attained by using reagents of exacting specifications, optimized protocols and state-of-the-art instruments. Gene Link has perfected and maintains these standards. *You are invited to compare.*

PCR and sequencing reactions are very robust and can tolerate up to 50% failure/truncated sequence oligos.

However, you are clearly taking a chance by using long oligos synthesized at anything below 99.5% coupling efficiency. See the coupling efficiency table and graph.

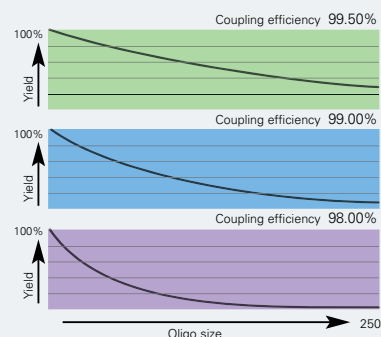
Gene Link specializes in long oligos. Our description of a long oligo is 180 mer to 250 mer. *You are invited to compare.*

Purification

Crude oligo is the total yield after chemical synthesis; this contains the full-length product as well as all truncated n-1 sequences. For example, at 99% coupling efficiency the crude yield of a 70 mer is ~50% full-length and ~50% truncated sequences. Gel purification is strongly recommended for all oligos above 50 mer.

Coupling Efficiency and Full Length Oligo Yield

Oligo Size	99.50%	99.00%	98.00%
20	90.916	82.617	68.123
40	82.243	67.573	45.48
60	74.398	55.268	30.363
80	67.301	45.204	20.27
100	60.881	36.973	13.533
120	55.074	30.24	9.034
140	49.821	24.734	6.031
160	45.068	20.23	4.027
180	40.769	16.546	2.688
200	36.88	13.533	1.795
220	33.36	11.07	1.19
240	30.18	9.05	0.8
250	28.7	8.19	0.65



PCR and sequencing reactions are very robust and can tolerate up to 50% failure/truncated sequence oligos. However, you are clearly taking a chance by using long oligos synthesized at anything below 99.5% coupling efficiency.

Coupling Efficiency

Chemical DNA synthesis comprises of multiple reactions to complete a cycle of the appropriate base coupling. Thus the use of reagents of exacting specifications, state-of-the-art instruments and optimized software driven protocols are necessary to maintain the highest possible

coupling efficiency. This becomes enormously important when synthesizing a long oligo. Coupling efficiency of 99% or 98% seems very good but on closer examination the yield is almost half for a 40 mer! See the coupling efficiency table.

Long Oligo Scale of Synthesis and Typical Yield

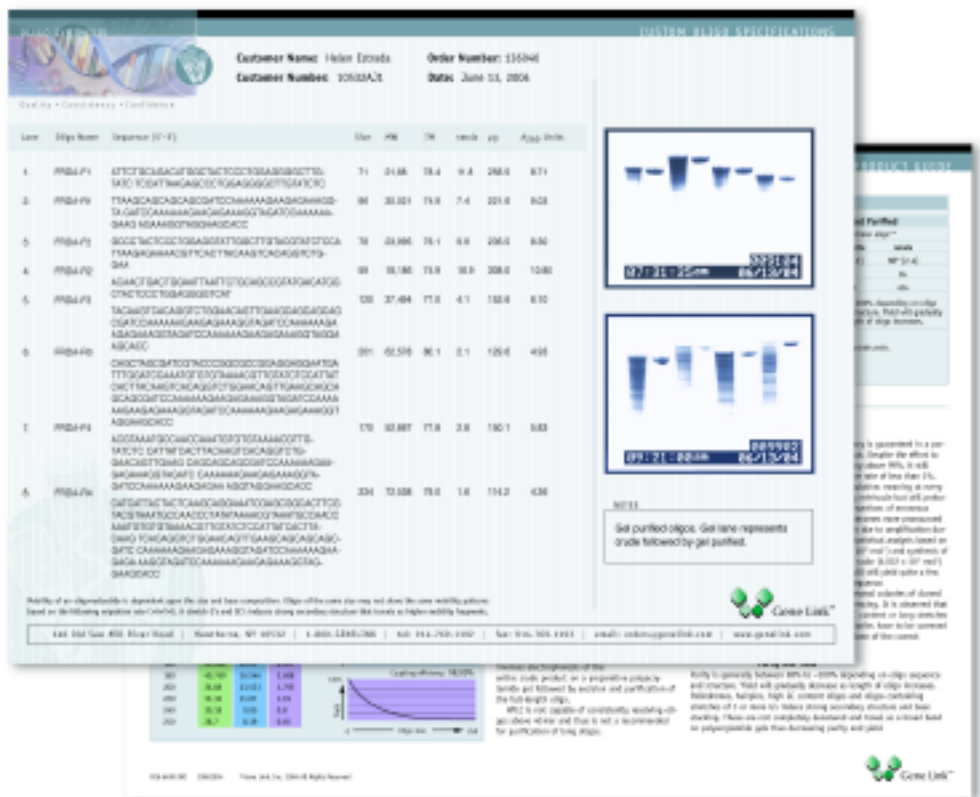
Gel Purified 150 mer oligo typical yield			
Scale	A ₂₆₀ Units	nmols	mg
1 μmol	4–6	4+	0.13–0.2
2 μmol	8–12	8+	0.26–0.8

Purity & Yield 98% to ~100% depending on oligo sequence and structure.

Yield will gradually decrease as length of oligo increases. Palindromes, hairpins and high GC content oligos and oligos containing stretches of 3 or more G's induces strong secondary structure and base stacking thus decreasing purity and yield.

Oligo Size and Purification Recommendations

Scale	Synthesis Scale	Recommended Purification
1-49 mer	50 nmol	No purification required. Purification dependent upon desired application.
50-99 mer	200 nmol	Gel purification
100-199 mer	1 μmol	Gel purification
200-250 mer	2 μmol	Gel purification



The screenshot displays the 'CUSTOM OLIGO SPECIFICATIONS' page on the Gene Link website. It includes a table with columns for Lane, Oligo Name, Sequence (5'-3'), Size, MW, %G, %C, %A, %T, and App. Info. Several oligos are listed with their sequences and properties. To the right of the table are two gel electrophoresis images showing the results of oligo synthesis and purification. A 'NOTE' box states: 'Gel purified oligos: Gel lane represents crude followed by gel purified.' The website footer contains contact information for Gene Link, including phone numbers and website addresses.

Purity and Yield

Gel purified oligo purity is generally between 98% to ~99.9% depending on oligo sequence and structure. Yield will gradually decrease as oligo length increases. Palindromes, hairpins, high GC content oligos and oligos containing stretches of 3 or more G's induce strong secondary structure and base stacking. These are not completely denatured and travel as broad bands on a polyacrylamide gel thus decreasing purity and yield.

Unmodified DNA Oligo Synthesis*

Scale of Synthesis	Price (\$)/base
200 nmol scale	2.00
1 µmol scale	3.75
2 µmol scale	6.50

*minimum charge for 15 mer applies. Please visit www.genelink.com for current list prices. Call for institutional discount pricing structure.

Purification

All Gene Link oligos shorter than 40 mer usually do not require any further purification if the application is for PCR or sequencing. Gene Link recommends purification of oligos longer than 50 mer and all oligos destined to be cloned.

Product	Scale of Synthesis Price (\$)/purification					
	50 nmol	200 nmol	1 µmol	2 µmol	10 µmol	15 µmol
Gel Purification	75.00	75.00	150.00	280.00	1500.00	1800.00

