

PCR AND qPCR RESEARCH PRODUCTS

High-quality products and services

The polymerase chain reaction (PCR) is a fundamental and widely used laboratory method. An enhancement of this method—qPCR, or quantitative PCR—measures the amplification of DNA in real time rather than at the end of cycling like conventional PCR does. Together, the technologies of PCR and qPCR have contributed to significant advances in research applications such as gene expression, genotyping, and cloning.

COUPLING EFFICIENCY

An important measure of quality for any oligo manufacturer is coupling efficiency, because this directly affects the amount of full-length product you receive. Our manufacturing processes result in high coupling efficiencies (**Figure 1**) to provide you with consistent quality. Our commitment to quality and consistency results in a reliable product that provides confidence in your research.

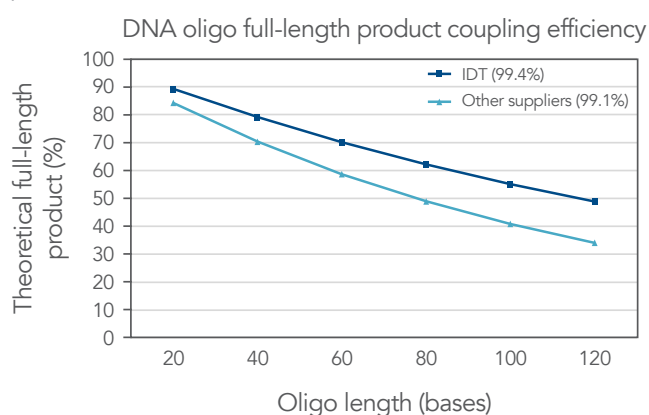


Figure 1. IDT proprietary platforms have a better coupling efficiency than other suppliers, which provides more full-length oligonucleotides in your order. Small increases in coupling efficiency ($\leq 1\%$) result in measurable increases in full-length product yield. The curves represent the theoretical yield for different lengths of oligos based on a coupling efficiency of 99.4% (IDT oligos, $n = 126$) and 99.1% (other suppliers, $n = 134$ from three different suppliers) using the formula, percent full length product = $(\text{eff})^{(n-1)} \times 100$ where eff = coupling efficiency (for example, 99.4% = 0.994) and $(n-1)$ is the number of coupling reactions needed to make an oligo of length n .

APPLICATIONS AND IDT PRODUCT SOLUTIONS

Gene expression

Gene expression is the conversion of genetic information from DNA into RNA, or protein. Differences and changes in gene expression are important measures for understanding biological systems, including during normal development and abnormal discoveries.

PrimeTime™ qPCR Probe Assays

PrimeTime qPCR Probe Assays contain fluorescently-labeled 5' nuclease probes designed to provide reliable gene expression data.



Flexible reporter options

Choose from 5' reporter and 3' quencher dye combinations



Low background

Multiplex confidently with double-quenched probes



Sequence transparency

Know the complete sequence for every primer and probe you order

Fluorophore and quencher combinations available

Choose from a wide range of reporter dye options for low background. PrimeTime qPCR Probes are available as ZEN™ or TAO™ double-quenched probes, known to reduce background fluorescence and improve signal to noise ratio.

5' reporter dye	3' quencher dye	Mini 100 reactions†	Std 500 reactions†	XL 2500 reactions†
FAM	ZEN/Iowa Black™ FQ*	•	•	•
FAM	TAMRA	—	•	•
SUN™	ZEN/Iowa Black FQ*	•	•	•
HEX	ZEN/Iowa Black FQ*	•	•	•
TET	ZEN/Iowa Black FQ*	—	•	•
Cy® 5 ^β	TAO/Iowa Black RQ*	•	•	•

* ZEN/Iowa Black FQ and TAO/Iowa Black RQ are double-quenched probes that yield reliable results.

† Based on 20 µL reactions.


β Cy is a registered trademarked product sold by Cytiva.

PrimeTime qPCR Primer Assays


PrimeTime qPCR Primer Assays comprise a primer pair designed and premixed for real-time PCR that uses intercalating dyes, such as SYBR® Green (Life Technologies, Inc.) or EvaGreen™ (Biotium). [Dyes not included] Create custom assays for any sequence from any species with our [PrimerQuest™ Tool](#).

PrimeTime master mixes


IDT offers several master mix options to help you achieve quality results under various experimental conditions. Our PrimeTime Gene Expression Master Mix is a two-step master mix designed to support probe-based qPCR assays. We also offer one-step master mixes for faster, more streamlined workflows: 1) PrimeTime One-Step RT-qPCR Master Mix and, 2) PrimeTime One-Step 4X Broad-Range Master Mix. The PrimeTime One-Step 4X Broad-Range Master Mix enables direct amplification from crude samples to help you efficiently move from sample collection to data analysis.




Achieve high efficiency qPCR with fast or standard cycling, singleplex or multiplex conditions



Obtain consistent results from overnight experiments with benchtop stability




Attain quality results at an affordable price




Inquire about license-free options

PrimeTime qPCR Probes


PrimeTime qPCR Probes are 5' nuclease probes, available with an assortment of reporter-dye combinations that generate reliable, high-quality gene expression analysis data with double- and single-quenched fluorescent hydrolysis probes.




Choose from a wide range of dyes and quenchers including several license-free combinations



Reduce costs and waste with convenient sizes, starting at 0.5 nmol



Successfully multiplex with ZEN or TAO Double-Quenched Probes for lower background fluorescence and increased endpoint signal



Begin your project sooner with rapid shipment on most probe offerings

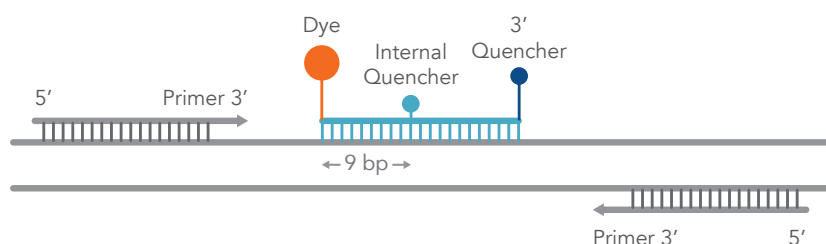


Figure 2. Schematic of a PrimeTime qPCR Probe Assay with a double-quenched probe that includes a dye, an internal quencher, and a 3' quencher.

GENOTYPING BY qPCR

Genotyping is the process of determining the differences in genetic complement by comparing a DNA sequence at specific positions to that of another sample or reference sequence. Sequence variations can then be used as markers in linkage and association studies to determine genes relevant to specific traits or find abnormalities.



Improve SNP discrimination
over traditional probe use



Use more affordable approach
for increasing hybridization
specificity



Adjust T_m with greater flexibility
compared to MGB™ Probes

Affinity Plus™ qPCR Probes

The Affinity Plus bases used in our qPCR probes include up to 6 locked nucleic acid monomers, heightening structural stability and leading to increased hybridization melt temperature (T_m).

Advantages include:

- A wide range of fluorophores to select from, including FAM, SUN, HEX, Cy 3, Cy 5, TEX, and TYE™ dyes
- An affordable approach to effectively increasing probe hybridization
- A way to make flexible T_m adjustments more easily than with MGB probes

Genotyping by digital PCR

Mini Affinity Plus qPCR Probes containing locked nucleic acids are well-suited for SNP genotyping, transcript variant identification, and target detection in challenging samples (FFPE tissue, biofluids). These are ideal for screening small sample sets, running on digital PCR platforms, or performing just a few reactions when finalizing probe designs.

Mini Affinity Plus qPCR Probes

5' Reporter dye(s)	Emission (nm)	Quencher(s)	Delivery amount
FAM	520		
SUN	554	Iowa Black FQ	0.5 nmol
HEX	555		
Cy5	668	Iowa Black RQ	

CUSTOM MANUFACTURING AND INTEGRATION SERVICES

We share your passion and commitment to create fast and accurate molecular tools to enhance your research for improved outcomes. Learn how IDT can partner with your team to help you successfully migrate from discovery to commercialization.



DISCOVERY RESEARCH

We'll collaborate with your product management and R&D teams as you navigate assay design and optimization, resolve licensing questions, and tackle technical setbacks.



DEVELOPMENT AND SCALE-UP

When you're ready to scale up manufacturing for commercialization, we'll provide your production team with the lot sizes and the packaging flexibility they need to build inventory.



MANUFACTURING TRANSPARENCY

We'll make sure your Quality Specialists have the kind of detailed insight they will need to ensure your product meets all required specifications.



COMMERCIALIZATION

When your procurement team brings your assay to market, a dedicated IDT account manager will ensure seamless order integration and flexible supply options.

> FOR MORE INFORMATION, VISIT WWW.IDTDNA.COM/qPCR-AND-PCR

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