

PowerTrack SYBR Green Master Mix



Easy-to-use and flexible gene expression master mix for real-time PCR

Applied Biosystems™ PowerTrack™ SYBR Green Master Mix is a preformulated, optimized, universal 2X master mix for real-time PCR. Building on over 25 years of innovation and product excellence in qPCR, our PowerTrack SYBR Green Master Mix is designed for superior performance and ease of use with a two-color tracking dye system for the most common real-time PCR applications.

Features include:

- Built-in two-color tracking dye system where pipetting has occurred
- Broad primer T_m and primer concentration compatibility allows flexibility in qPCR reaction setup with minimal optimization
- Superior specificity and tight reproducibility in C_t values over a broad dynamic range improve data quality
- Compatible with Invitrogen™ SuperScript™ IV VILO™ Master Mix reverse transcription for fast, reproducible results
- Formulated with UNG and dUTP to prevent contamination of downstream reactions by carryover PCR products
- Broad instrument compatibility

Built-in visual indicator to aid in reaction setup

PowerTrack SYBR Green Master Mix is designed to provide ease in visualization of sample addition to the master mix. The master mix contains an inert blue dye and a separate, optional yellow sample buffer. The yellow sample buffer is added separately to indicate that sample has been added to the reaction, based on a visual color change of the reaction mix from blue to green. The benefit of using the tracking dye is to provide convenience via visualization of the color change chemistry and avoid errors that can occur due to pipetting mistakes. The yellow sample buffer is provided to aid in reaction setup for your own peace of mind but is not required to obtain superior results with PowerTrack SYBR Green Master Mix.

Formulated for maximum specificity and reproducibility

PowerTrack SYBR Green Master Mix uses an antibody-mediated hot-start mechanism to provide tight control over *Taq* enzyme activation and help prevent early activity of the polymerase at low temperatures that can lead to nonspecific amplification.

High specificity

In an evaluation of 24 different primer sets used with PowerTrack SYBR Green Master Mix, a single melt curve was obtained in 100% of reactions. In contrast, nonspecific amplification was observed for some of the same targets with several master mixes from other suppliers, as shown

by multiple peaks in the melt curves (Figure 1). Verification of primer specificity in SYBR Green reactions is essential to data quality and validity [1]. The high specificity enabled by PowerTrack SYBR Green Master Mix allows you to spend less time optimizing and redesigning primers to get high-quality data.

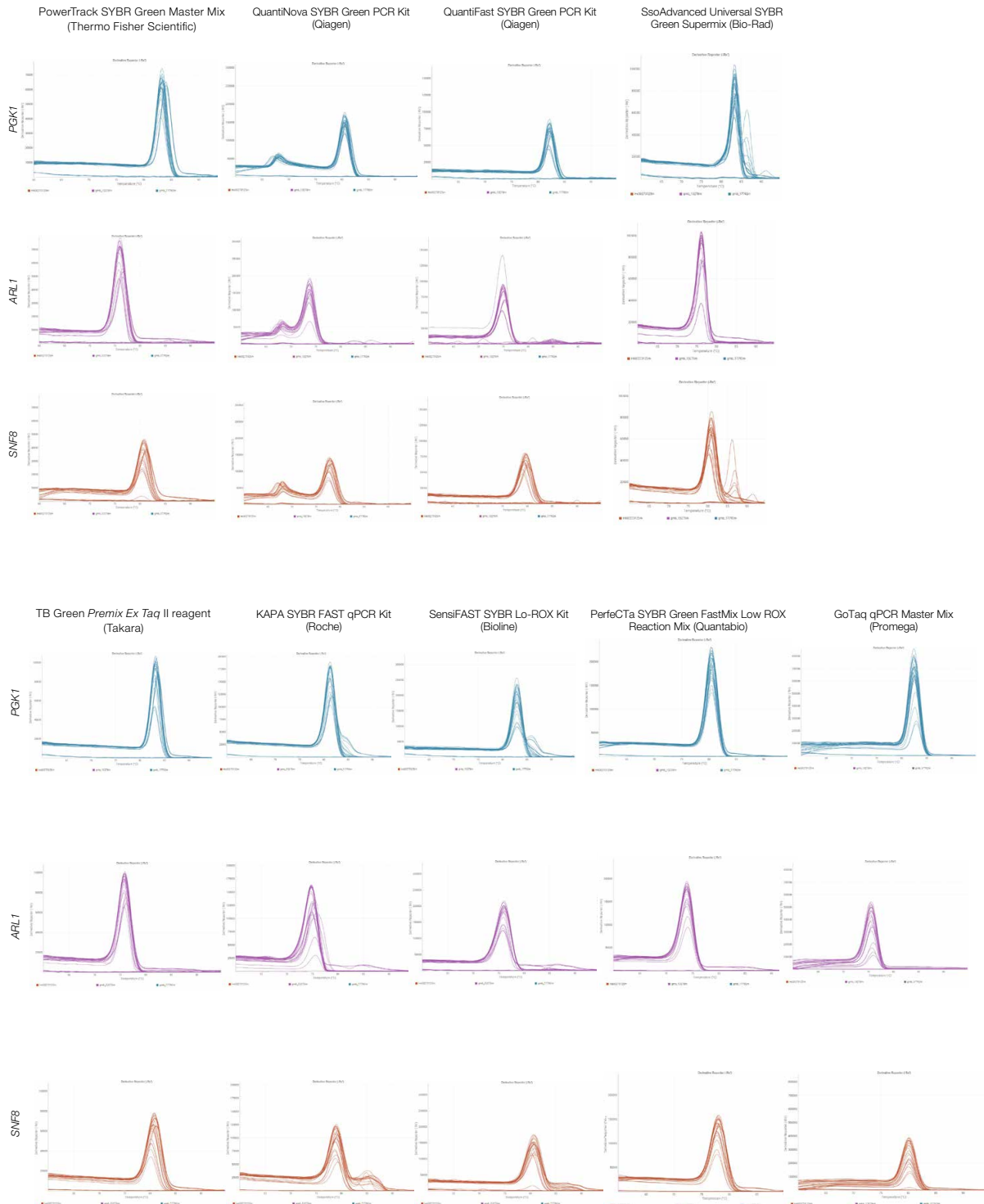


Figure 1. Target specificity. Real-time PCR was performed using universal human reference (UHR) cDNA and primers targeting *PGK1* (phosphoglycerate kinase 1), *ARL1* (ADP-ribosylation factor-like protein 1), and *SNF8* (vacuolar-sorting protein). Reactions (10 μ L) were run in quadruplicate using the indicated master mixes on the Applied Biosystems™ QuantStudio™ 5 Real-Time PCR System. Several master mixes from other suppliers show a second peak in the melt curve analysis attributed to amplification of nonspecific product.

PowerTrack SYBR Green Master Mix powers through traditionally difficult targets

Amplification curves were obtained for *PGK1* over a 6-log dilution series of UHR cDNA. PowerTrack SYBR Green Master Mix delivers accurate results over a wide dynamic range of concentrations as shown by tight curves between replicates and superior PCR efficiency (Figure 2).*

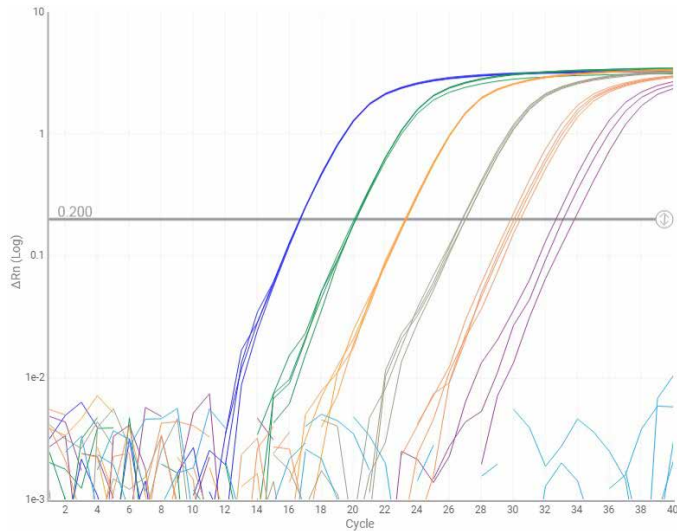


Figure 2. Linear dynamic range. PowerTrack SYBR Green Master Mix enables reliable results across a range of cDNA concentrations. Amplification curves were obtained for *PGK1* over a dilution series (10 ng to 100 fg and no template control (NTC)) of UHR cDNA. Reactions were run in quadruplicate on the QuantStudio 5 Real-Time PCR System using 60°C as the annealing T_m for primers.

Excellent reproducibility

Reproducibility is another important measure of data quality in real-time PCR, and reproducibility is often affected at low template concentrations, where the effects of variability are exacerbated. However, PowerTrack SYBR Green Master Mix demonstrated excellent reproducibility over a wide dynamic range with a variety of targets and reverse transcription (RT) kits tested (Figure 3). Tighter reproducibility allows for greater statistical significance when analyzing low-abundance transcripts and smaller fold changes.

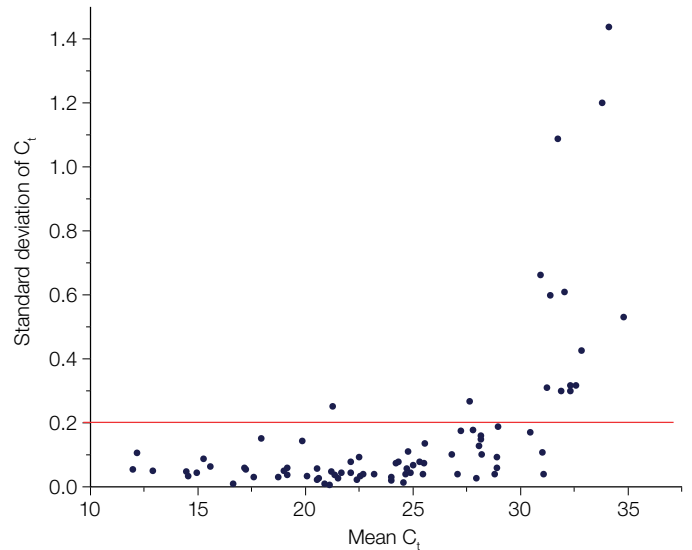


Figure 3. Reproducibility of data. PowerTrack SYBR Green Master Mix shows reproducibility over a wide dynamic range. Six assays (*PGK1*, *ARL1*, *SNF8*, *DF*, *GAPDH*, and *Corf1*) were run in quadruplicate with UHR cDNA generated from four different RT kits (SuperScript IV VILO Master Mix, Applied Biosystems™ High-Capacity RNA-to-cDNA Kit, iScript™ cDNA Synthesis Kit, and QuantiTect™ RT Kit) run with a 6-fold dilution series and 400 nM primer concentration. Assays were performed on the QuantStudio 5 Real-Time PCR System.

* Besides the master mix, other assay conditions and reagent concentrations may affect dynamic range; individual results may vary.

Broad instrument compatibility

PowerTrack SYBR Green Master Mix can be used in either standard or fast cycling mode and is compatible with all Applied Biosystems™ real-time PCR instruments. It is also compatible with the Bio-Rad CFX96™, CFX384™, and iQ™5 instruments, as well as the Roche LightCycler™ 480 and Agilent Mx3005P™ instruments.

Why ROX dye matters

ROX™ dye is an inert reference dye used in RT-qPCR, often added to a master mix. It is effective in normalizing fluorescence across all samples. ROX dye removes fluorescence variations, such as those caused by bubbles in the reactions. Applied Biosystems™ master mixes contain a proprietary ROX dye, specifically formulated for a wide range of PCR instruments and for compatibility with a wide range of differing instrument light sources and filter sets. Most other manufacturers use a ROX dye that contains

only a single excitation peak. These manufacturers may require a ROX dye to be spiked into the reaction at a concentration appropriate to the instrument. Alternatively, they may require selection of either a “low ROX” or “high ROX” master mix, depending on the concentration.

Heat-labile UNG for carryover contamination control

Contamination is a major concern in labs that routinely run PCR due to the potential for false-positive results. The inclusion of UNG and dUTP in the PowerTrack SYBR Green Master Mix allows any previously amplified PCR products to be degraded and helps prevent contamination of subsequent qPCR reactions.

Reference

1. Bustin SA, Benes V, Garson JA et al. (2009) The MIQE guidelines: minimum information for publication of quantitative real-time PCR experiments. *Clin Chem* 55:611–622.

Ordering information

| Product | Quantity | Cat. No. |
|---|-----------------|----------|
| PowerTrack SYBR Green Master Mix, Mini Pack (1 mL) | 100 reactions | A46012 |
| PowerTrack SYBR Green Master Mix, 1-Pack (1 x 5 mL) | 500 reactions | A46109 |
| PowerTrack SYBR Green Master Mix, 2-Pack (2 x 5 mL) | 1,000 reactions | A46110 |
| PowerTrack SYBR Green Master Mix, 5-Pack (5 x 5 mL) | 2,500 reactions | A46111 |
| PowerTrack SYBR Green Master Mix, 10-Pack (10 x 5 mL) | 5,000 reactions | A46112 |
| PowerTrack SYBR Green Master Mix, Bulk Pack (1 x 50 mL) | 5,000 reactions | A46113 |

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