

Xpert Fast Probe (uni) Blue

#GE32.0100 | #GE32.5100 | #GE32.2501
(for research only)

Product:

Xpert Fast Probe (uni) Blue 2X mastermix contains all components, except primers and template, for the amplification and detection of DNA in qPCR® based on a wide range of probe-based technologies, including Taqman®, Molecular Beacons® and Scorpion probes®. It consists of the combination of a highly efficient enzyme with a novel low inhibitory technology, which prevents the formation of primer-dimers, thus allowing for extremely high sensitivity and specificity. Xpert Fast Probe (uni) Blue can be used to quantify virtually any DNA target, including extremely low-copy number targets, with minimal effort and optimization. Xpert Fast Probe (uni) Blue 2X mastermix is supplied with a separate vial of ROX reference dye, so it can be used with most^{*)} real-time PCR instruments.

This Mastermix includes an inert dye (Blue) as visual aid for pipetting. The dye does not inhibit qPCR but may impact the intensity of some fluorescent probes.

^{*)}*Xpert Fast Probe (uni) can be used with equipment requiring no ROX, low ROX or high ROX.*

Quantity:

#GE032.0100 comprises 1x1ml of Xpert Fast Probe (uni) Blue 2X Mastermix,
#GE032.5100 comprises 5x1ml of Xpert Fast Probe (uni) Blue 2X Mastermix
#GE032.2501 comprises 25x1ml of Xpert Fast Probe(uni) Blue 2X Mastermix.
One ml of mastermix is sufficient for 100 rxns of 20µl. Each vial is supplied with a vial containing 100X ROX (50µM).

Contents:

Product	GE32.0100	GE32.5100	GE32.2501
Xpert Fast Probe 2X Mastermix (uni) Blue	1 ml	5x 1ml	25x 1ml
100X ROX (50µM) reference dye	150µl	5x 150µl	25x 150µl

Applications:

Absolute quantification, Gene expression analysis, Multiplex or singleplex PCR, Low-copy number target gene detection. Diagnostic real-time PCR.

Properties:

High Efficiency in multiplex reactions
High Efficiency in GC/AT-rich templates
Early Ct values – Rapid extension rate
Extreme sensitivity – increased limit of detection
Allows for standard and fast cycling

Storage:

-20°C for at least 1 year.

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Prior to use:

Depending on your equipment, prior to use for the first time, add 2µl ("LowROX") or 20µl ("HighROX") of the 100X ROX reference dye to the mastermix and vortex briefly. If your instrument is "No ROX", then you should use the mastermix as is, thus without addition of ROX. Once ROX has been added, the mastermix can be used directly or stored at -20°C for up to 1 year. If you are not sure whether your instrument is "No ROX", "LowROX" or "HighROX", you can find a list at our website. If the equipment is not listed, please feel free to contact us.

When handling Xpert Fast Probe (uni) Blue, minimize exposure to direct light, as exposure for an extended period of time might result in loss of signal intensity. Always certify that the product has been fully thawed and mixed well before use.

Basic Protocol

1. Mix for each qPCR reaction:

Component	Volume	Final Conc.
Xpert Fast Probe 2X Mastermix (uni) Blue with ROX [†]	10 µl	1X
Forward primer (5 pmol/µl)	<2 µl	100-400nM
Reverse primer (5 pmol/µl)	<2 µl	100-400nM
Probe (10µM)	0.2-0.8µl	100-400nM
Template DNA ^{**}	<6 µl	**) ^{**}
PCR –grade water	up to 20 µl	

[†]ROX as required; see section: "Prior to Use". ^{**) <1µg genomic DNA or <100 ng cDNA (see optimization).}

In order to minimize risk of contamination, reagent loss and improve pipetting accuracy, we recommend to prepare a mastermix for multiple samples (N), always including a negative control for the detection of possible contaminants, by mixing all components (N+1), except template DNA, dividing the mixture equally into each tube and then add template DNA or PCR grade water in case of the control to the individual PCR tubes or wells of a PCR plate.

2. Set-up qPCR cycling (if applicable, select fast mode on the instrument):

Nº cycles	Temp	Time
1x	95°C	2-3min
40x	95°C	5 sec
	60-65°C ^{**}	20-30sec*
Dissociation / Melt Analysis	according to manufacturer's guidelines	

After an initial cycle of 2-3 min at 95°C (Enzyme activation and denaturation of template DNA (including removal of all secondary DNA structures such as hairpins): choose 2 min for cDNA and 3 min for complex targets), cycle 40 times for 5 seconds at 95°C, and 20-30 seconds at 60°C-65°C for annealing/extension. Acquire data on the appropriate channel.

^{*}Select the shortest time possible but not less than 20 sec and do not exceed 30 seconds

^{**) In case of 3-step cycling, anneal at optimal annealing temperature for 20 sec and minimum time necessary at 72°C for data acquisition (according to manufacturer's guidelines).}

Optimization

Template

For efficient qPCR, under fast cycling conditions, it is recommended to amplify DNA fragments ranging from 80-200bp. The shorter the amplicon, the faster the reaction can be cycled. Amplicons should not exceed 400bp. High concentrations of template may inhibit PCR, result in non-specific primer binding, increase background fluorescence, and/or reduce linearity of standard curves. Results may be improved by using less template, and it is recommended to try a serial dilution to find the best concentration. It should be taken into consideration that the key factor is target copy number and not the total amount of DNA. E.g.: 1µg of human genomic DNA might contain some 200.000 copies, whereas the same amount of bacterial DNA might contain 200 million copies. For small molecules, such as cDNA, 1pg should result in a Ct around 20, whereas in order to obtain Ct of around 20 for human genomic DNA some 50 ng would be required. If copy numbers are really low (<100), primers are more likely to form primer dimers.

Primers and Probes

Primer design and purification is of the utmost importance, especially in case of low-copy number target detection, as to minimize non-specific amplification with resulting loss of sensitivity. Primers should have melting temperatures of approximately 60°C. To optimize results, use the lowest primer concentration that does not compromise the reaction efficiency (50-400nM). When using Taqman® probes, design probe close to 5'-primer and avoid terminal guanosine residues.

MgCl₂

The Mg²⁺-concentration of the Xpert Fast Probe (uni) 2X Mastermix has already been optimized, and it is not likely that the neither reaction efficiency nor specificity will be improved by adding additional MgCl₂.

ROX

The reference dye ROX compensates for variations in fluorescence detection that are unrelated to the PCR reaction. The fluorescence level of ROX provides a stable baseline during cycling against which PCR-related fluorescence signals are normalized. Thus, differences between samples due to variations in reaction volumes caused by pipetting are adjusted. As the dye does not inhibit the PCR reaction and has a completely different emission spectrum, it does not interfere with qPCR on any equipment.