



Polaris[®]

Next Gen_MDx

Polaris[®] LAMP

Product Performance and Benchmark Analysis



NZYtech
genes & enzymes

Polaris®: Setting the Benchmark in Diagnostic Excellence.

NZYtech, with its established expertise in enzyme development and IVD kit production, proudly introduces Polaris® - a disruptive series of cutting-edge diagnostic enzymes, master mixes and reagents.

Features of Polaris® LAMP category:

- **Regulatory Compliance** – Fully adheres to international quality standards, including ISO 9001 and ISO 13485.
- **Rigorous Manufacturing and Validation** – State-of-the-art manufacturing protocols and stringent quality control measures ensure exceptional reliability and accuracy.
- **Unmatched Purity and Stability** – Polaris® sets the benchmark for purity and extreme stability, ensuring consistent performance in the most demanding diagnostic applications.
- **Superior Diagnostic Performance** – Engineered to deliver fast, reliable, accurate results across a wide range of molecular diagnostic assays (including with inhibitors).
- **Lyophilizable products** – Almost all Polaris® LAMP category products are ready to be freeze-dried for superior stability in storage and shipping.
- **Functional Packaging** – Optimized packaging solutions designed for demanding laboratory environments, ensuring ease of use and preservation of product integrity.
- **High stability for Easy Shipping** – Polaris® LAMP products are designed with superior stability, allowing for reliable shipping at room temperature or with blue ice, ensuring product integrity during transit.
- **Comprehensive Customer Support** – A dedicated support team is available to assist with IVDR compliance and seamless product integration.

Polaris® LAMP Enzymes and Additives

The Polaris® LAMP line of products empowers users to fine-tune their protocols for maximal efficiency and effectiveness whilst simultaneously ensuring versatility due to the multiple enzyme formats and other reagents made available:

- Polaris® Glycerol-free BstY Polymerase 80 U/μL
- Polaris® BstY Polymerase 8 U/μL
- Polaris® Lyo BstY Polymerase 40 kU
- Polaris® Glycerol-free RT-LAMP Reverse Transcriptase 1 kU/μL

Polaris® LAMP Enzymes and Additives deliver unmatched consistency and reliability across diverse biological matrices, making them essential for adaptable and high-performance diagnostics. They enable rapid results, offer resistance to inhibitors, and excel in LAMP or RT-LAMP diagnostics at elevated temperatures.

Features of Polaris® LAMP Enzymes:

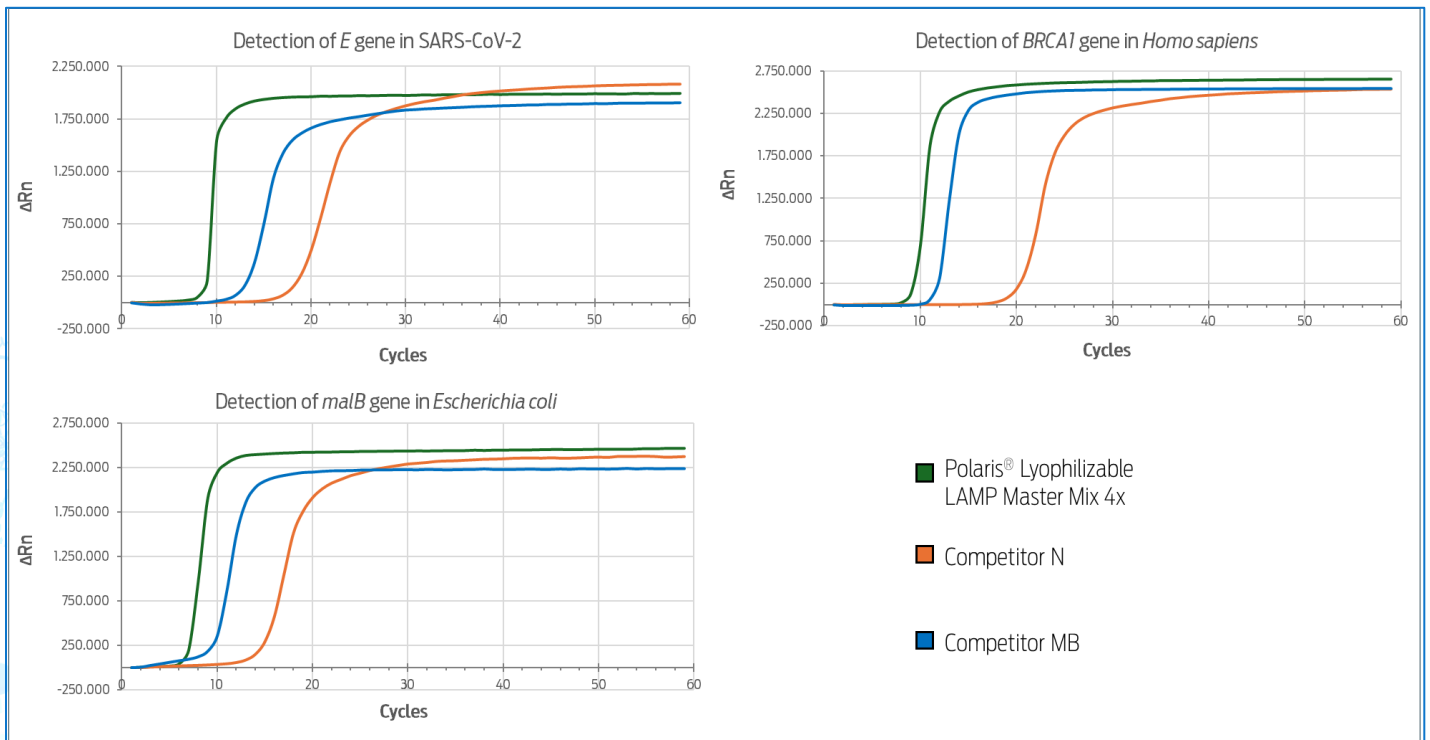
- **Optimized for LAMP** – Polaris® BstY Polymerase and RT-LAMP Reverse Transcriptase are specifically engineered for superior performance in loop-mediated isothermal amplification (LAMP) assays.
- **Strand-Displacing DNA Polymerase** – Polaris® BstY Polymerase offers potent 5'→3' DNA polymerase activity with robust strand-displacement capabilities, without 5'→3' exonuclease activity.
- **High-Temperature Stability** – Polaris® LAMP enzymes exhibit optimal activity at 68-69 °C, outperforming traditional enzymes with reliable function at 65-70 °C, reducing non-specific amplifications and enhancing assay specificity.
- **Inhibitor Resistance** – Engineered for exceptional resistance to common inhibitors found in various biological samples, ensuring reliable results across challenging sample types.
- **Rapid Reaction Kinetics** – Both enzymes offer fast performance, with cDNA synthesis in under one minute, ideal for high-speed RT-LAMP diagnostics without sacrificing specificity or sensitivity.
- **Robust and Versatile** – Designed for demanding diagnostic applications, these enzymes deliver consistent results across diverse biological matrices and reaction conditions.

Polaris® Glycerol-free RT-LAMP Reverse Transcriptase contains proprietary reverse transcriptase enzymes, which are protected under intellectual property laws. Patent pending submitted by NZYtech.

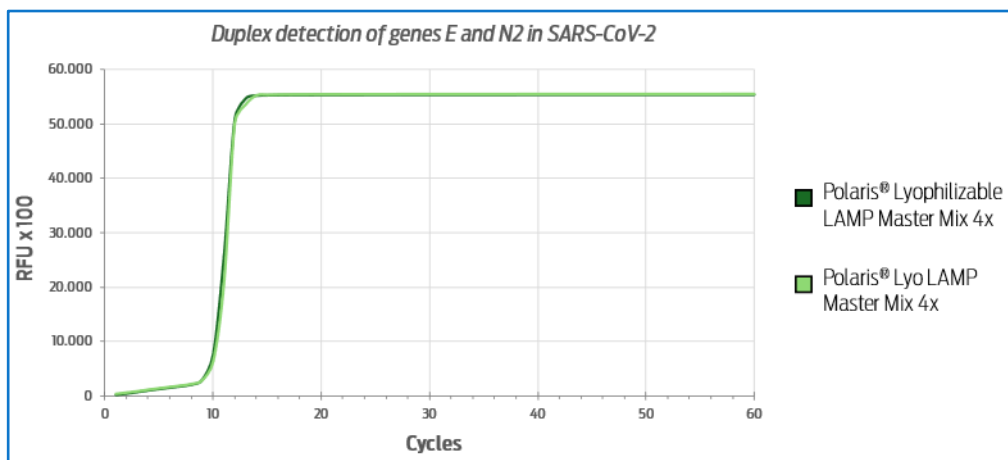
Polaris® LAMP Master Mixes

Faster, robust and versatile.

Assays performed using 10^7 copies of template DNA from various biological matrices (viral, bacterial, and mammalian) demonstrated that the Polaris® Lyophilizable LAMP Master Mix 4x consistently delivers faster and robust time-to-result at high template loads compared to the two leading competitors.



No loss of activity was observed when the Polaris® Lyophilizable LAMP Master Mix 4x was lyophilized (leading to the Polaris® Lyo LAMP Master Mix 4x) and the experiment repeated with 10^5 copies of template per reaction, demonstrating equivalent performance between the lyophilized and liquid formulations.

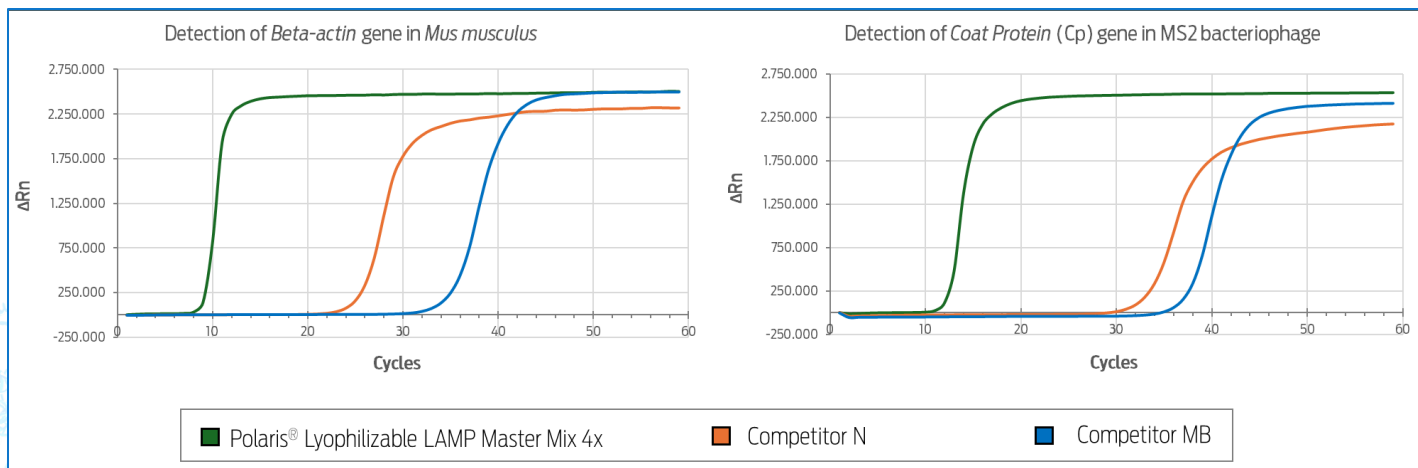


Note: Each cycle has a duration of 30 seconds.

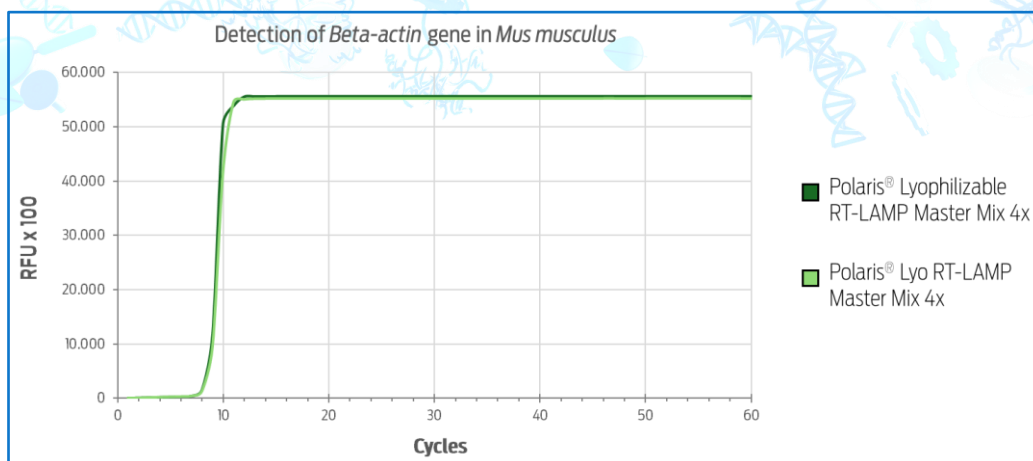
Polaris® RT-LAMP Master Mixes

Faster, robust and versatile.

Assays performed using 10^4 copies or 100 ng of template RNA from various biological matrices (viral and mammalian) demonstrated that the Polaris® Lyophilizable RT-LAMP Master Mix 4x consistently delivers faster and more robust time-to-result at moderately high template loads compared to the two leading competitors.



No loss of activity was observed when the Polaris® Lyophilizable RT-LAMP Master Mix 4x was lyophilized (leading to the Polaris® Lyo RT-LAMP Master Mix 4x) and the experiment repeated with 100 ng of mouse liver template RNA per reaction, demonstrating equivalent performance between the lyophilized and liquid formulations.

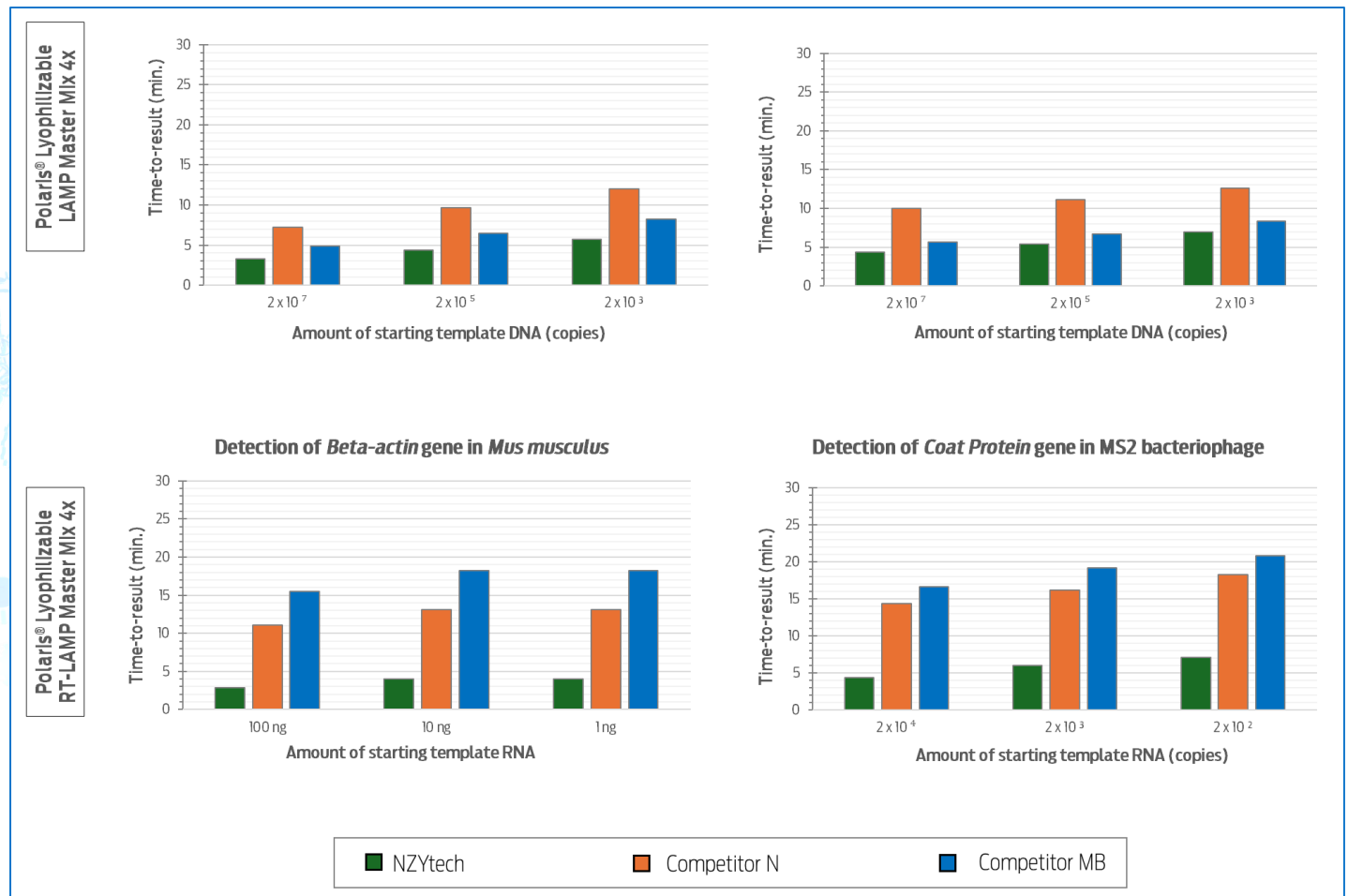


Note: Each cycle has a duration of 30 seconds.

Polaris® LAMP and RT-LAMP Master Mixes vs Competitors

Unsurpassable sensitivity and speed.

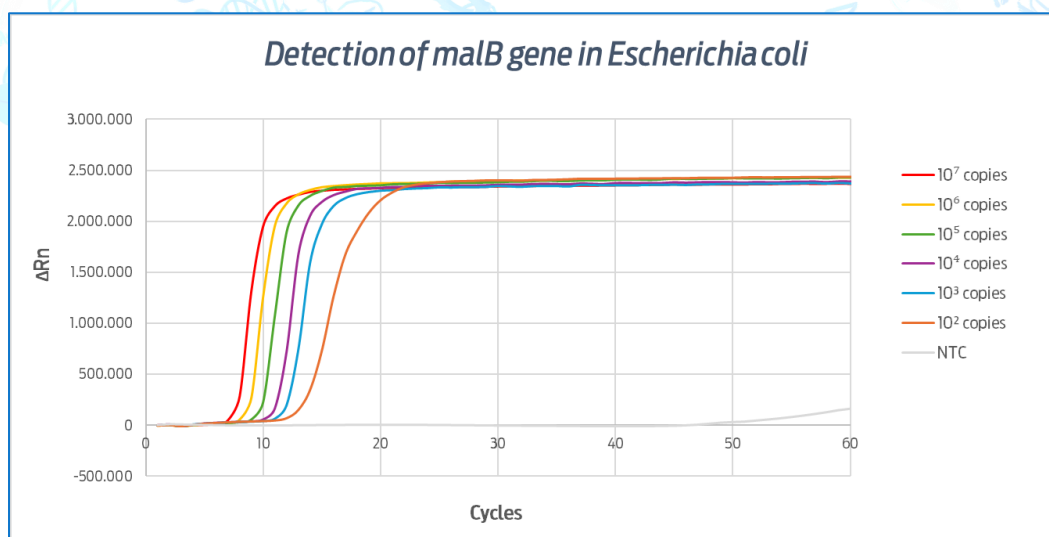
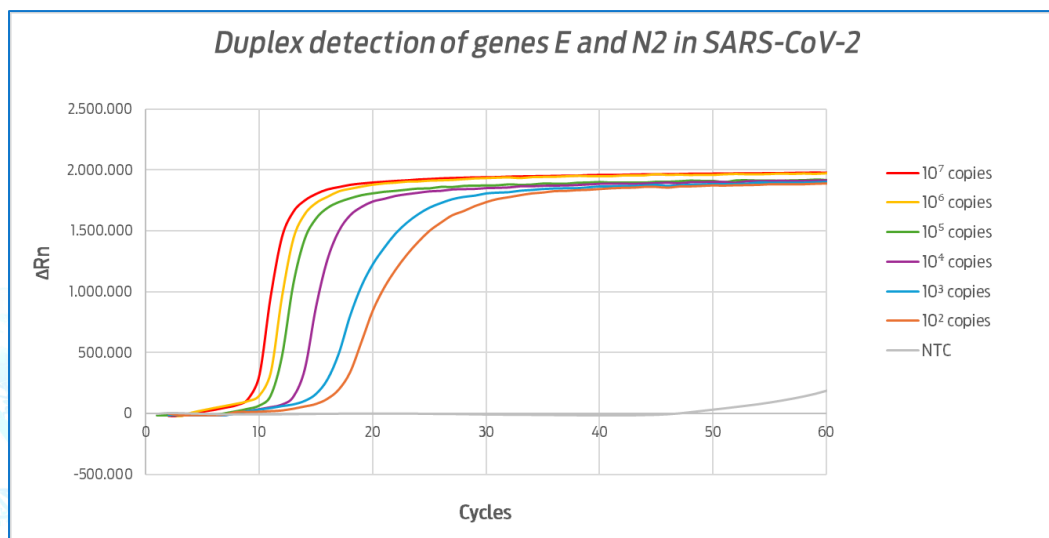
Benchmark comparisons with two leading brands demonstrate that NZYtech's Polaris® LAMP and RT-LAMP Master Mixes 4x consistently achieve faster time-to-result, regardless of the target or starting template quantity. With as few as 10^3 copies per reaction, both Master Mixes outperform competitors in sensitivity.



Polaris® BstY Polymerases

Fast and consistent isothermal amplification.

Assays performed with varying concentrations of template DNA (ranging from 10^7 to 10^2 copies) across different biological matrices (viral and bacterial) demonstrated that Polaris® BstY Polymerases consistently delivered fast time-to-result. In both cases, the time-to-result is dependent on the template concentration.

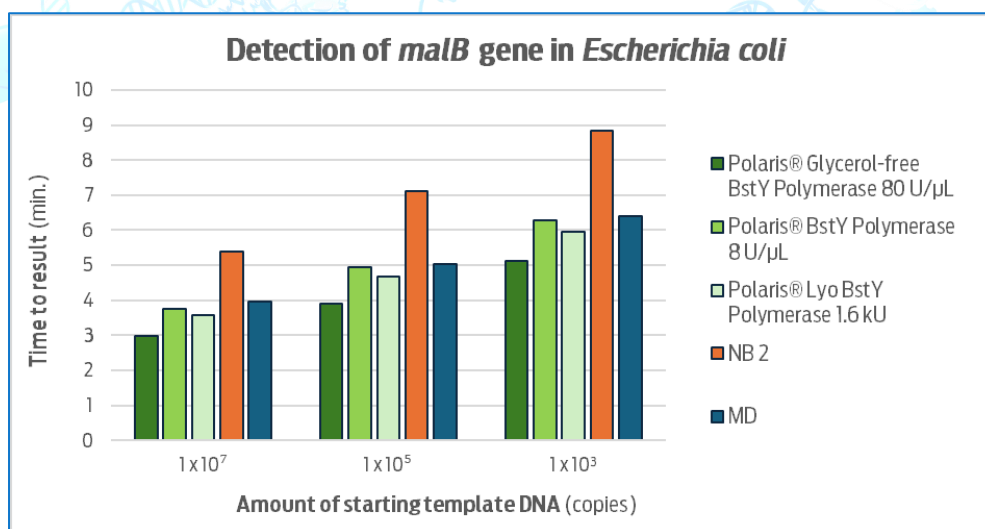
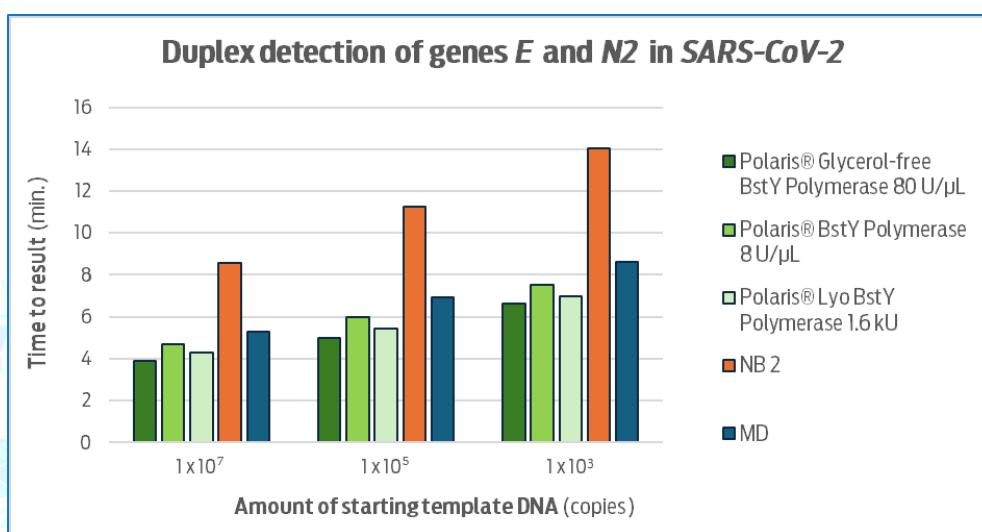


Note: Each cycle has a duration of 30 seconds. NTC=No Template Control.

Polaris® BstY Polymerases vs Competitors

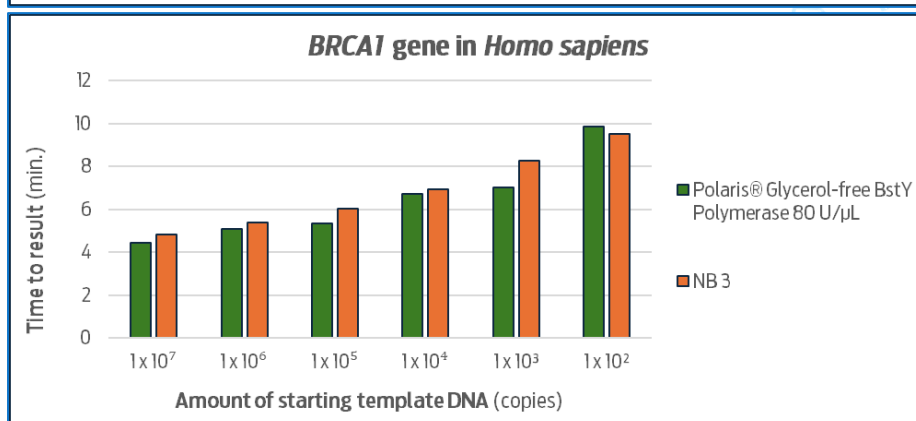
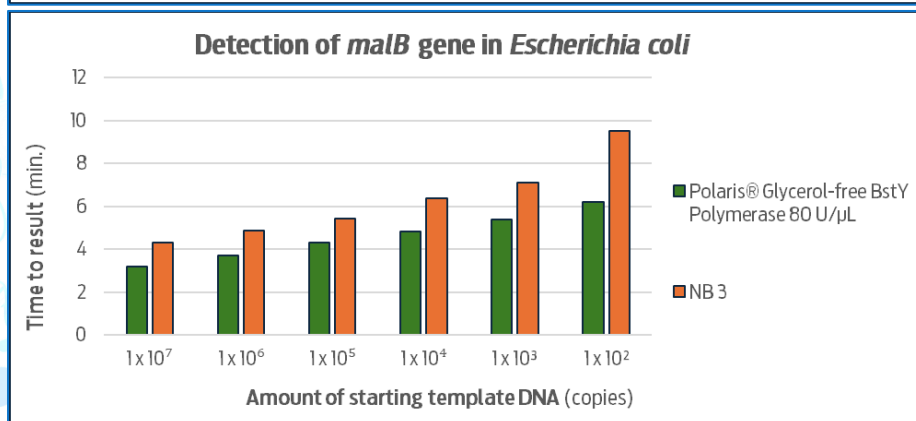
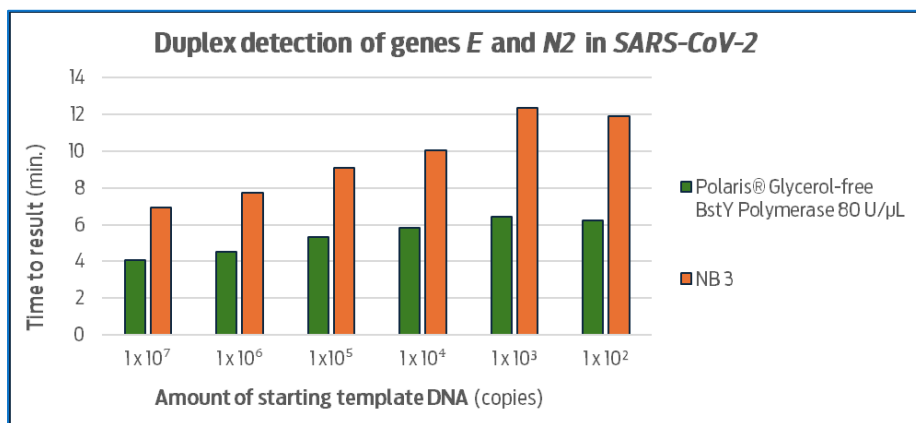
Faster time-to-result was observed across various BstY Polymerase formulations (Glycerol-free 80 U/μL, Glycerol 8 U/μL, and Lyophilized).

Benchmark comparisons with two market-leading brands show that NZYtech's Polaris® BstY Polymerases consistently deliver faster time-to-result, regardless of the enzyme format (Glycerol-free 80 U/μL, Glycerol 8 U/μL, and Lyophilized).



Polaris® Glycerol-free BstY Polymerase vs Competitor

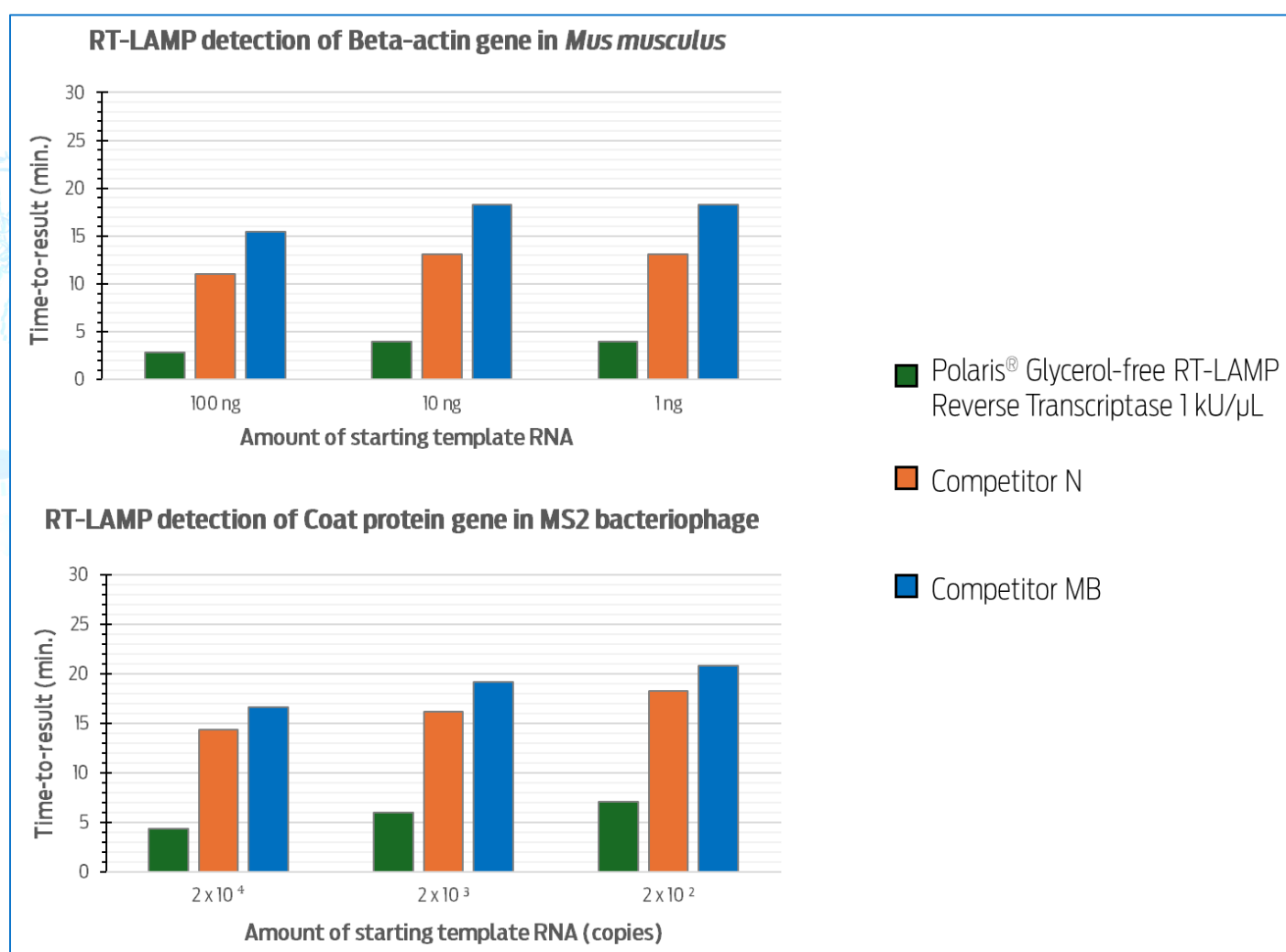
Shorter time-to-result across multiple starting template DNA concentrations (as low as 10^2 copies per reaction) and various biological matrices.



Polaris® Reverse Transcriptase for RT-LAMP vs Competitors

A **highly rapid and thermostable** Reverse Transcriptase with exceptional efficiency across a range of starting RNA concentrations in various matrices.

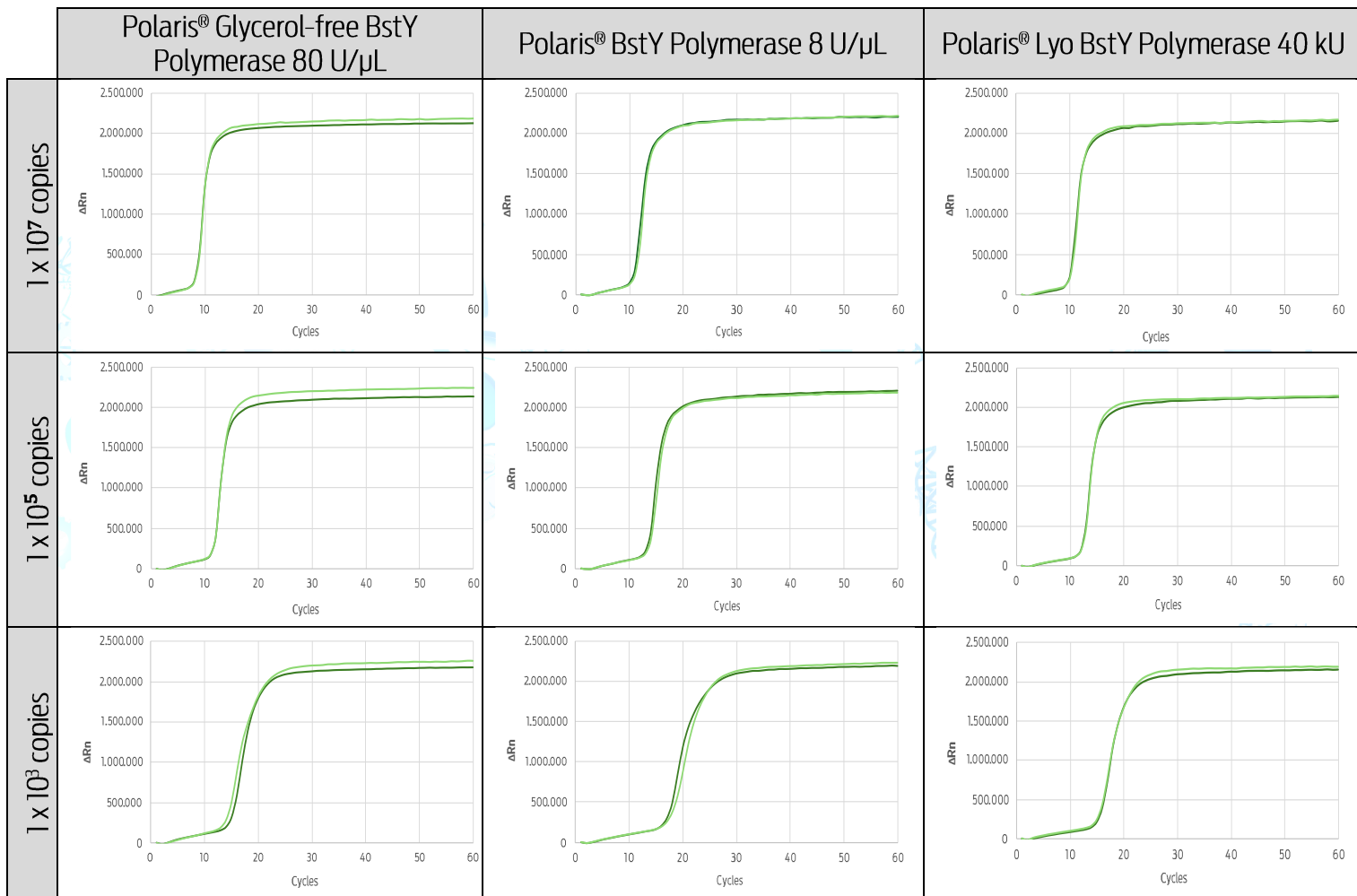
Polaris® Glycerol-free RT-LAMP Reverse Transcriptase 1 kU/μL was benchmarked against two leading reverse transcriptases in RT-LAMP assays for the detection of three RNA concentrations from two distinct biological matrices: the Beta-actin gene of *Mus musculus* and the Coat protein (cp) gene of the MS2 bacteriophage. Polaris® Glycerol-free RT-LAMP Reverse Transcriptase 1 kU/μL consistently provided the fastest RT-LAMP detection for both targets across all RNA concentrations tested.



Polaris® BstY Reaction Buffer 10x vs Polaris® Lyophilizable LAMP Buffer 6x

Versatile reaction buffers produce consistent amplification across multiple starting template DNA concentrations.

Although formulated to include cryoprotectors and additives to enable lyophilization, Polaris® Lyophilizable LAMP Buffer 6x delivers identical time-to-result compared to Polaris® BstY Reaction Buffer 10x across various starting concentrations of template DNA (SARS-CoV-2 genes E and N2).



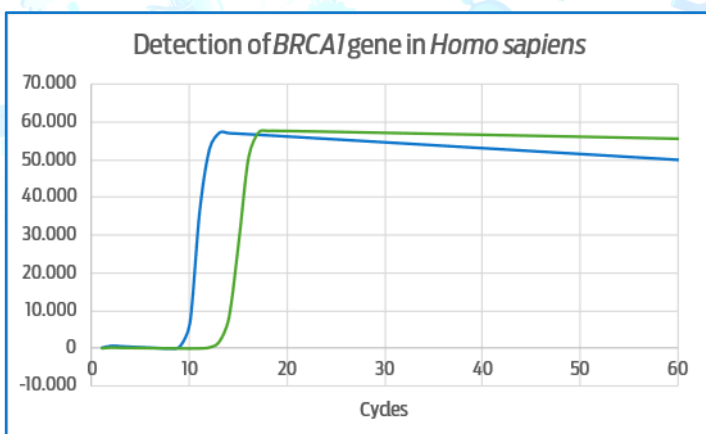
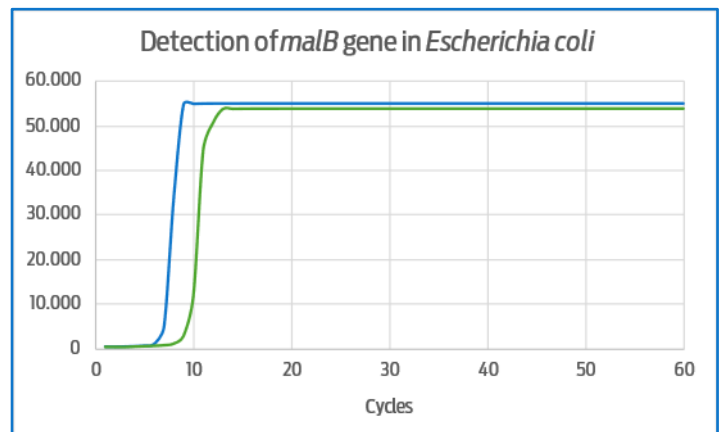
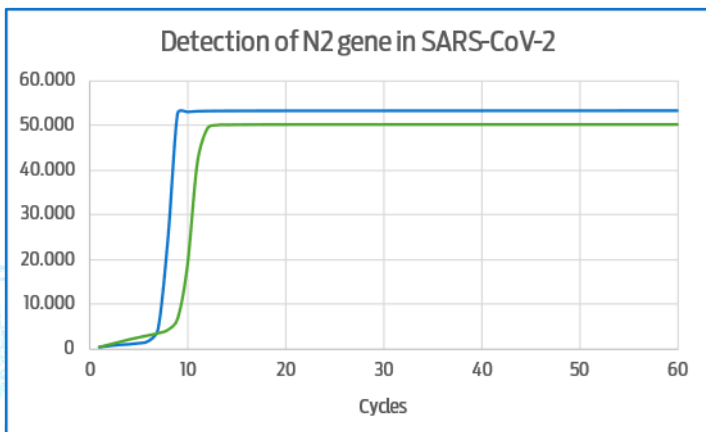
Note: Each cycle has a duration of 30 seconds

- Polaris® BstY Reaction Buffer 10x
- Polaris® Lyophilizable LAMP Buffer 6x

Polaris® Speedy LAMP Fluorescent Dye 25x

Accelerated LAMP assays without compromising **test accuracy or reliability.**

Polaris® Speedy LAMP Fluorescent Dye 25x accelerates LAMP assays delivering a shorter time-to-result compared to other intercalating dyes, such as NZY LAMP Fluorescent Dye 50x.

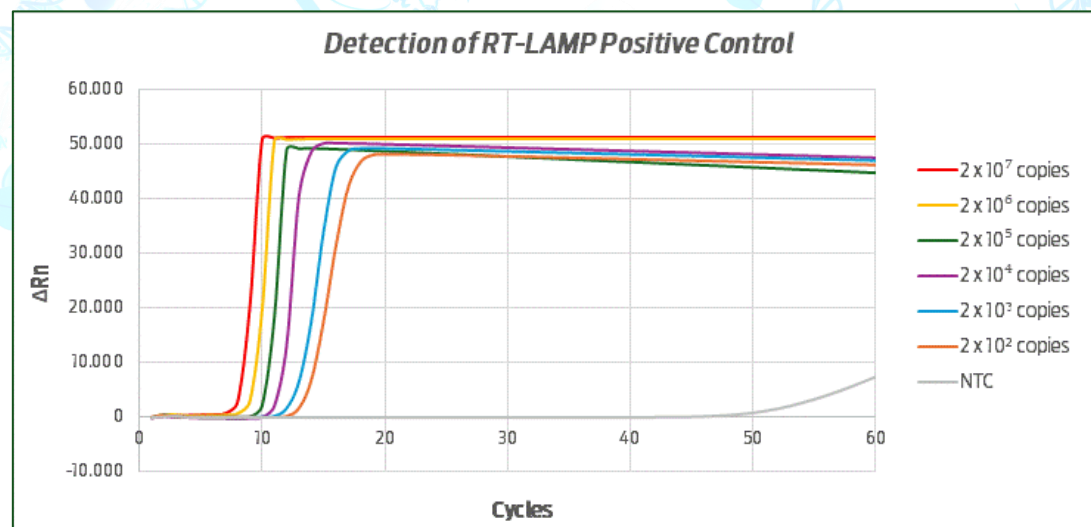
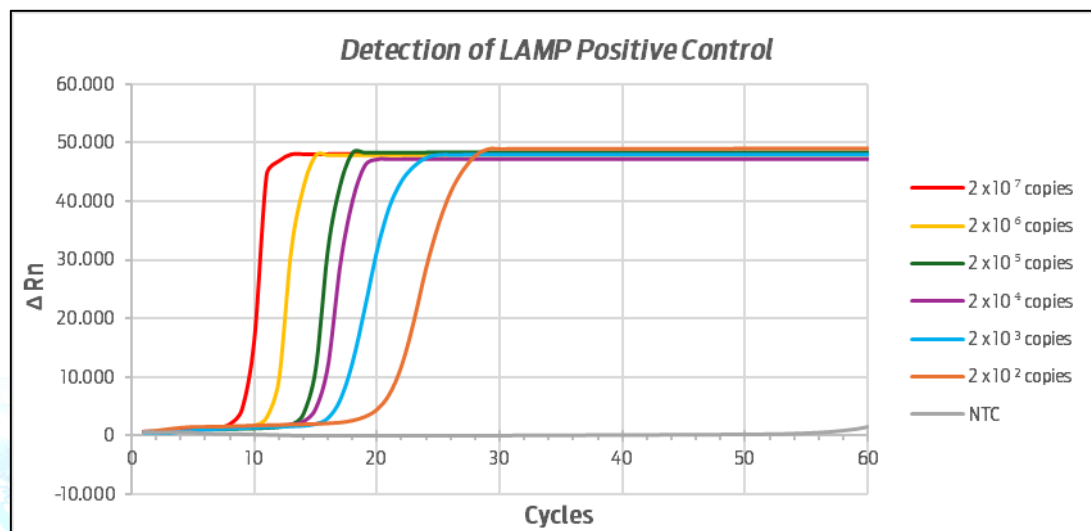


- Polaris® Speedy LAMP Fluorescent Dye 25x
- NZY LAMP Fluorescent Dye 50x

Note: Each cycle has a duration of 30 seconds.

NZY LAMP and RT-LAMP Positive Control Kits

NZYtech LAMP and RT-LAMP Positive Control Kits are essential tools for establishing and monitoring Loop-mediated isothermal AMPLification (LAMP) assays in a variety of scenarios.



Note: Each cycle has a duration of 30 seconds. NTC=No Template Control.

Unmatched Flexibility with Polaris® LAMP: Customize Your Master Mix

At NZYtech, we understand that each laboratory has unique diagnostic needs. To provide maximum flexibility, Polaris® LAMP not only offers pre-formulated, high-performance master mixes but also provides the option to source individual components. This allows diagnostic labs to customize their own formulations, building a tailored solution to meet specific assay requirements.

Sustainable Shipping with Room Temperature Stability

Polaris® LAMP products are designed for high stability, enabling most formulations to be shipped at room temperature and reducing the need for cold-chain packaging. This approach minimizes waste, reduces packaging, and promotes sustainable shipping, all while maintaining product integrity.

Master Mixes

Catalogue number	Product name	Number of reactions	Shipping Conditions
MD06801	Polaris® Lyophilizable LAMP Master Mix 4x	625 µL (100 rxns of 25 µL)	RT
MD06802	Polaris® Lyophilizable LAMP Master Mix 4x	25 mL (4k rxns of 25 µL)	RT
MD06961	Polaris® Lyo LAMP Master Mix 4x	for 660 uL (100 rxns)	RT
MD06962	Polaris® Lyo LAMP Master Mix 4x	For 25 x 660 uL (2500 rxns)	RT
MD06811	Polaris® Lyophilizable RT-LAMP Master Mix 4x	625 µL (100 rxns of 25 µL)	Blue Ice
MD06812	Polaris® Lyophilizable RT-LAMP Master Mix 4x	25 mL (4k rxns of 25 µL)	Blue Ice
MD06971	Polaris® Lyo RT-LAMP Master Mix 4x	For 660 uL (100 rxns)	RT
MD06972	Polaris® Lyo RT-LAMP Master Mix 4x	For 25 x 660 uL (2500 rxns)	RT
MD07941	Polaris® Colorimetric Lyophilizable LAMP Master Mix 4x	625 µL (100 rxns of 25 µL)	RT
MD07951	Polaris® Colorimetric Lyophilizable RT-LAMP Master Mix 4x	Coming soon	Coming soon

BstY Polymerases

Catalogue number	Product name	Number of reactions	Shipping Conditions
MD06771	Polaris® Glycerol-free BstY Polymerase 80 U/µL	1 mL (10k rxns of 25 µL)	RT
MD06772	Polaris® Glycerol-free BstY Polymerase 80 U/µL	5 x 20 µL (1k rxns of 25 µL)	RT
MD06781	Polaris® BstY Polymerase 8 U/µL	5 mL (5k rxns of 25 µL)	Blue Ice
MD06782	Polaris® BstY Polymerase 8 U/µL	5 x 200 µL (1k rxns of 25 µL)	Blue Ice
MD06791	Polaris® Lyo BstY Polymerase 40 kU	For 25 x 200 µL (5k rxns of 25 µL)	RT
MD06792	Polaris® Lyo BstY Polymerase 40 kU	For 5 x 200 µL (1k rxns of 25 µL)	RT

Reverse Transcriptase & RNase inhibitor

Catalogue number	Product name	Number of reactions	Shipping Conditions
MD07911	Polaris® Glycerol-free RT-LAMP Reverse Transcriptase 1 kU/μL	5 x 10 μL (1k rxns of 25 μL)	Blue Ice
MD07912	Polaris® Glycerol-free RT-LAMP Reverse Transcriptase 1 kU/μL	0.25 mL (5k rxns of 25 μL)	Blue Ice
MD06911	Polaris® Glycerol-free RNase Inhibitor Y 160 U/μL, IVD	1.25 mL (5 000 R)	RT
MD06912	Polaris® Glycerol-free RNase Inhibitor Y 160 U/μL, IVD	12.5 mL (50 000 R)	RT

Packs

Catalogue number	Product name	Number of reactions	Shipping Conditions
MD07711	Polaris® Lyophilizable LAMP Pack	200 rxns of 25 μL	RT
MD07721	Polaris® LAMP Pack	200 rxns of 25 μL	Blue Ice
MD07731	Polaris® Lyo LAMP Pack	200 rxns of 25 μL	RT
MD07921	Polaris® Lyophilizable RT-LAMP Pack	200 rxns of 25 μL	Blue Ice

Positive Control kits

Catalogue number	Product name	Number of reactions	Shipping Conditions
MB48001	NZY LAMP Positive Control Kit	50 rxns	Dry Ice
MB48101	NZY RT-LAMP Positive Control Kit	50 rxns	Dry Ice

Buffers

Catalogue number	Product name	Number of reactions	Shipping Conditions
MD06881	Polaris® BstY Reaction Buffer 10x	12.5 mL	RT
MD06882	Polaris® BstY Reaction Buffer 10x	2 x 12.5 mL	RT
MD06841	Polaris® Lyophilizable LAMP Buffer 6x	21 mL	RT
MD06842	Polaris® Lyophilizable LAMP Buffer 6x	2 x 21 mL	RT
MD06851	Polaris® Lyophilizable RT-LAMP Buffer 6x	21 mL	RT
MD06852	Polaris® Lyophilizable RT-LAMP Buffer 6x	2 x 21 mL	RT

Additives

Catalogue number	Product name	Number of reactions	Shipping Conditions
MD06891	Polaris® MgSO ₄ 100 mM	12.5 mL	RT
MD06892	Polaris® MgSO ₄ 100 mM	2 x 12.5 mL	RT
MD07561	Polaris® Speedy LAMP Fluorescent Dye 25x	50 μL (50 rxns of 25 μL)	RT
MD07562	Polaris® Speedy LAMP Fluorescent Dye 25x	200 μL (200 rxns of 25 μL)	RT
MB45401	NZY LAMP Fluorescent dye 50x	250 μL (500 rxns of 25 μL)	RT

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