Air-Dryable Direct DNA qPCR Plant

Designed for creating ambient-temperature stable assays from plant material without extraction

Air-Dryable™ Direct DNA qPCR Plant is a glycerol-free, inhibitor-tolerant master mix that contains optimized excipients compatible with air and oven drying. It is designed for the direct quantitation of DNA from plants.

The introduction of genetically modified organisms (GMO) in the last 20 or so years and the demand for more precise and reliable techniques to detect foreign (transgenic or pathogenic) DNA in edible plants, have been the driving force for the introduction of qPCR techniques in plant research. Direct amplification of DNA from plant samples is a fast and convenient technique which avoids the need for laborious, time-consuming, and expensive nucleic acid extractions prior to qPCR. However, obtaining consistency and sensitivity can be challenging, given the wide diversity in plant physiology. The composition and structure of the cell wall varies between plant species and is the main physical challenge to successful qPCR, however once the cell has been lysed, not only is the DNA available for amplification, but also all the metabolites and cell constituents are released and can also pose inhibition problems.

Air-Dryable™ Direct qPCR Plant is the first commercially available mix that combines the benefits of inhibitor-tolerance with air-drying, making it ideal for manufacturing room-temperature stable, highly sensitive and cost-effective plant assays. A single leaf punch can then be lysed in hot SDS lysis buffer, alkaline buffer or water and added directly onto the dried assay for the detection with very high sensitivity and reproducibility.

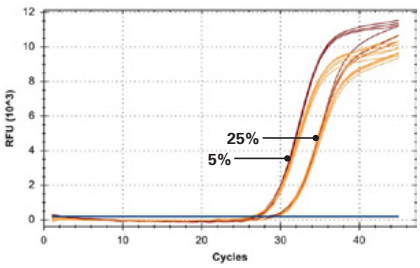
PRODUCT	CAT NO.	VOLUME	REACTIONS
Air-Dryable™ Direct DNA qPCR Plant, 4x	MDX116	5 mL	1,000 Rxn
		50 mL	10,000 Rxn

Product Highlights

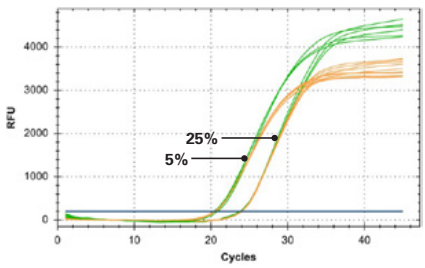
Suitable for direct DNA detection from plant lysates

High performance of both wet and dried formats of Air-Dryable™ Direct DNA qPCR Plant Mix using plant lysates prepared from various lysis buffers

A) Wet vs. Dry Mix - SDS lysis buffer



B) Wet vs. Dry Mix - Alkaline lysis buffer

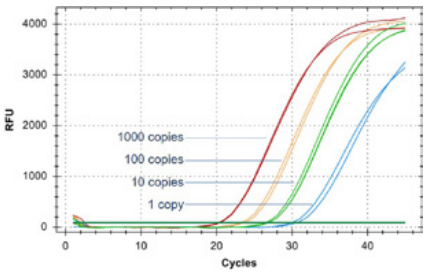


Detection of tomato *Hsp21* gene using Air-Dryable™ Direct DNA qPCR Plant Mix with 5% and 25% final reaction volume from tomato leaf lysates prepared in (A) SDS buffer (a single leaf punch heated at 95°C for 5 min in 26 µL 0.1% SDS), before (brown) and after (amber) air-drying and (B) alkaline buffer (a single leaf punch heated at 95 °C for 5 min in 20 µL 0.2M NaOH and neutralised with 6 µL 2M Tris-HCl, pH 7.5.), before (green) and after (amber) air-drying. The results illustrate the tolerance of the Air-Dryable™ Direct DNA qPCR Plant Mix to different lysis buffers even when dried before use.

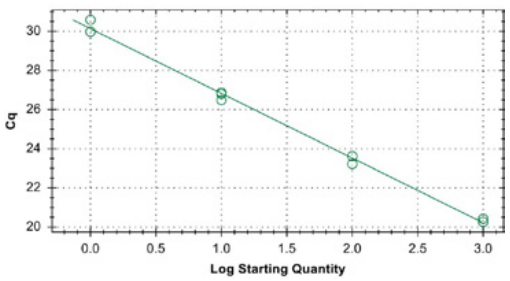
High sensitivity enables identification of low level contaminants

Detection down to 1 copy of Rice ATPe in tomato lysate with 100% reaction efficiency

A) Amplification plot

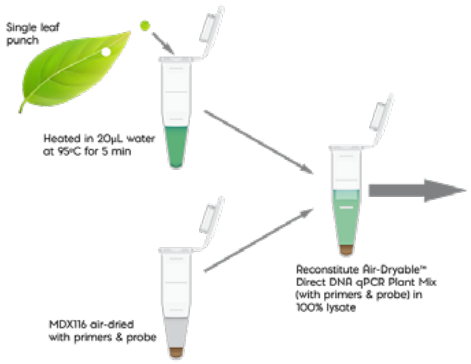


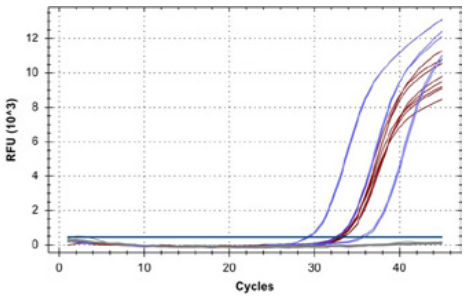
B) Standard curve



Air-Dryable™ Direct DNA qPCR Plant Mix was air dried with rice ATPe primers and probe. The dried material was reconstituted in 40% tomato leaf alkaline lysate containing 1,000 copies (brown), 100 copies (amber), 10 copies (green) and 1 copy (blue) genome equivalents per reaction of Rice gDNA. The results illustrate the sensitivity of the Air-Dryable™ Direct DNA qPCR Plant Mix to (A) detection down to 1 copy of Rice ATPe in tomato lysate with (B) 100% reaction efficiency.

Compatible with simple, direct workflows

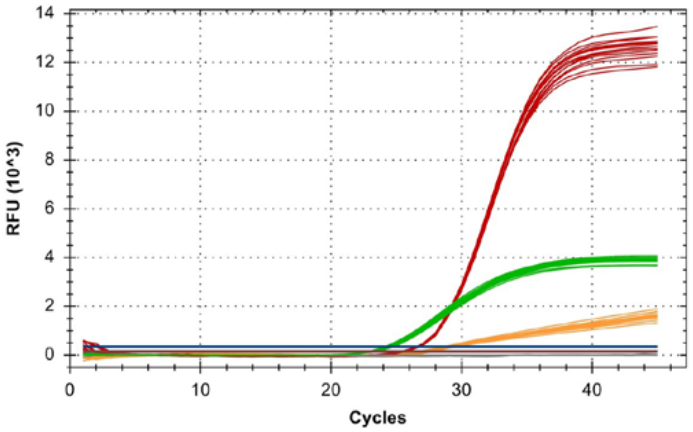




A single tomato leaf punch was added to 20 µL water and heated to 95 °C for 5 minutes. The total lysate was then added to Air-Dryable™ Direct DNA qPCR Plant mix that had been air-dried with ARF2 primers and probe. The traces from 8 individual leaf punches (brown) are shown overlaid with tomato gDNA standards (blue) for reference to show that approximately 84 genome equivalents per leaf punch were detected. The results illustrate the speed and reproducibility of the Air-Dryable™ Direct DNA qPCR Plant even with non-complex assays.

Robust mix delivers highly reproducible results in multiplex assays

Direct detection of Hsp21, rice ATPe and qPCR Extraction Control from 25% tomato leaf alkaline lysate



Rice ATPe gene (at 100 copies per reaction) and qPCR Extraction Control DNA (MDX027) was added to a 25% tomato leaf alkaline lysate and then added to Air-Dryable™ Direct DNA qPCR Plant mix with primers and probe to tomato Hsp21 gene (brown), rice ATPe (green) and qPCR Extraction Control (amber). The results show 12 replicated in this triplex reaction to illustrate the high reproducibility Air-Dryable™ Direct DNA qPCR Plant even in a multiplex reaction.

Ordering information:

USA
5171 Wilfong Road
Memphis, Tennessee 38134
Fax: +1 901-333-8223
Toll Free: +1 800 327 6299

Email: info@meridianlifescience.com
Orders: orders@meridianlifescience.com
www.MeridianLifeScience.com

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