applied biosystems® by life technologies™

TaqMan® VIC® or FAM™ labeled MGB endogenous controls ship ambient with reduced carbon footprint

Life Technologies continues to find ways to minimize the environmental impact of shipping our products, including reducing packaging and energy use through ambient shipping, rather than cold, when technically feasible. In 2009, Life Technologies performed extensive stability and performance testing to assess three classes of TaqMan® Assays (TaqMan® Gene Expression Assays, TaqMan® MicroRNA Assays, and TaqMan® SNP Genotyping Assays) after subjecting them to simulated summer ambient shipping conditions [1]. That study assessed products with a wide range of chemical, sequence, and structural motifs and found that in all cases, TaqMan® Assays maintained their quality and functionality after simulated ambient shipping conditions. By implementing ambient shipping for TaqMan® Assays, Life Technologies eliminated the need for expanded polystyrene (EPS) coolers and dry ice and reduced fuel consumption and greenhouse gas emissions during transport thereby reducing the annual total carbon footprint associated with those products by more than 200 tons (CO_2-equivalents)[1].

Through an extension of the 2009 study, Life Technologies has determined that several of the TaqMan® Endogenous Controls also qualify for ambient shipping (see Table 1 for a complete list of products). Both the TaqMan® Assays and the TaqMan® Endogenous Controls identified below are comprised of a set of two unlabeled oligonucleotide primers and a minor-groove-binding (MGB) probe labeled with a fluorescent dye (FAM™ or VIC®). The principle difference between the TaqMan® Assays and TaqMan® Endogenous Controls is in the particular sequences of the oligonucleotides, which had been determined previously to not affect thermal stability.

Based on the data from the previous TaqMan® Assay stability study and its applicability to the identified Endogenous Controls, Life Technologies can now ship the TaqMan® Endogenous Controls (Table 1) at ambient conditions. This will eliminate the need for EPS coolers and reduce the additional weight from the dry ice. This change will reduce the environmental impact of our cold-chain distribution by 12.5 tons of CO_2 equivalents [2,3]. Eliminating the EPS coolers makes our packaging more universally recyclable, which in turn eliminates 720 kg (3,162 ft^3) of waste from landfills.

References

1. TaqMan® Assays shipped at ambient temperature reduce environmental impact and retain their quality and stability: 0-090071 0410, Life Technologies, 2010. www.lifetechnologies.com/ecotaqman
2. Data derived from U.S. EPA, climate leaders, greenhouse gas inventory protocol core module guidance (optional emissions from commuting, business travel and product transport)
3. Data derived from Bousted, I, Eco-profiles of the European Plastics Industry POLYSTYRENE (Expandable)(EPS). PlasticsEurope, June 2006.

Table 1: TaqMan® Endogenous controls qualified for ambient shipping.

Part number	Gene symbol	Gene name	Reporter dye	Quencher
4333760T	18S	18S ribosomal RNA	FAM™	MGB
4333760F			FAM™	MGB
4352930E			FAM™	MGB
4319413E			VIC®	MGB
4333762T	ACTB	Beta actin	FAM™	MGB
4333762F			FAM™	MGB
4352935E			FAM™	MGB
4326315E			VIC®	MGB
4333766T	B2M	Beta-2-microglobulin	FAM™	MGB
4333766F			FAM™	MGB
4326319E			VIC®	MGB
4333764T	GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	FAM™	MGB
4333764F			FAM™	MGB
4352934E			FAM™	MGB
4326317E			VIC®	MGB
4333767T	GUSB	Beta glucuronidase	FAM™	MGB
4333767F			FAM™	MGB
4326320E			VIC®	MGB
4333768T	HPRT1	Hypoxanthine-phosporibosyl transferase 1	FAM™	MGB
4333768F			FAM™	MGB
4326321E			VIC®	MGB
4333765T	PGK1	Phosphoglycerate kinase 1	FAM™	MGB
4333765F			FAM™	MGB
4326318E			VIC®	MGB
4333763T	PPIA	Cyclophilin A	FAM™	MGB
4333763F			FAM™	MGB
4326316E			VIC®	MGB
4333761T	RPLP0	Ribosomal protein, large, P0	FAM™	MGB
4333761F			FAM™	MGB
4326314E			VIC®	MGB
4333769T	TBP	TATA-box binding protein	FAM™	MGB
4333769F			FAM™	MGB
4326322E			VIC®	MGB
4333770T	TFRC	Transferrin receptor (p90 CD71)	FAM™	MGB
4333770F			FAM™	MGB
4326323E			VIC®	MGB
4352933E	ACTB	Beta actin	FAM™	MGB
4352341E			VIC®	MGB
4352932E	GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	FAM™	MGB
4352339E			VIC®	MGB
4352931E	ACTB	Beta actin	FAM™	MGB
4352340E			VIC®	MGB
4352936E	GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	FAM™	MGB
4352338E			VIC®	MGB

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