

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 (CO₂-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 CO₂ equivalents [2,3]. Eliminating the EPS coolers makes our packaging more universally recyclable, which in turn eliminates 720 kg (3,162 ft³) of waste from landfills.

References

1. TaqMan® Assays shipped at ambient temperature reduce environmental impact and retain their quality and stability: O-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-phosphoribosyl 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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