

AmpliTaq Gold 360 and AmpliTaq 360 DNA Polymerases



Introduction

At Thermo Fisher Scientific, we're committed to designing our products with the environment in mind. This fact sheet provides the rationale behind the environmental claims that Applied Biosystems™ AmpliTaq Gold™ 360 and AmpliTaq™ 360 DNA Polymerases are now shipped in more responsible packaging, now that they ship at ambient temperatures rather than on gel ice.

In order to minimize the adverse environmental impact of packaging and shipping products on gel ice, we investigated the feasibility of shipping AmpliTaq Gold 360 and AmpliTaq 360 DNA Polymerases at ambient temperatures. We have found, through functional and analytical testing, that shipping the product at ambient temperatures provides the same product quality as shipping the product on gel ice—without impacting long-term stability. By eliminating the use of gel ice, we are decreasing packaging and refrigerant, thereby reducing carbon dioxide (CO₂) emissions generated from manufacturing EPS coolers and refrigerant, increasing freight density, and decreasing fuel consumption due to added refrigerant weight. It also reduces packaging waste in our customers' labs and reduces energy costs associated with refrigerated storage.

Product description

The AmpliTaq Gold 360 DNA Polymerase in the AmpliTaq Gold™ 360 Master Mix amplifies a wide range of DNA contexts. Heat activates AmpliTaq Gold 360 DNA Polymerase, resulting in highly specific, robust PCR amplification. The ionic strength and the pH of AmpliTaq Gold 360 Master Mix are optimized for use with the AmpliTaq Gold 360 DNA Polymerase enzyme.

Green feature

Responsibly packaged

We have been systematically evaluating novel ways to minimize the impact of shipping products on gel ice, and the carbon footprint generated by the distribution of these products. One way we can do this is to ship AmpliTaq Gold 360 and AmpliTaq 360 DNA Polymerases at a temperature consistent with their demonstrated stability. The adverse environmental impact of shipping products at reduced temperature is tremendous, with CO₂ emissions generated from manufacturing the coolers themselves and from the addition of refrigerant for transport.

The annual carbon footprint to manufacture EPS and convert it to coolers for our AmpliTaq products is approximately 8 tons per year. It takes nearly 5 barrels of crude oil equivalents and 12 MWh of power annually to make the almost 500 kg of EPS coolers needed to ship polymerase products from Thermo Fisher Scientific [1].

On an annual basis, over 8,000 pounds of gel ice are added to the coolers to ensure the product is delivered cold to our customers. The addition of gel ice increases the mass and required dimensions of each package. Multiplying the number of shipments by the average distance traveled per package and factoring in that most packages are shipped via air, the annual total carbon footprint for transporting AmpliTaq Gold 360 and AmpliTaq 360 DNA Polymerases is more than 8 tons (measured as CO₂ emissions) [2].

By shipping AmpliTaq products at ambient temperatures, we will help divert nearly 1,700 cubic feet of EPS waste from reaching our landfills and incinerators per year, and will reduce the total annual carbon footprint from transport and packaging by over 5 tons [2]. It also reduces packaging waste in our customers' labs and reduces energy costs associated with refrigerated storage.

Functional and stability testing demonstrated that AmpliTaq Gold 360 and AmpliTaq 360 DNA Polymerases exposed to simulated ambient shipping conditions had the same performance and long-term stability as the products shipped on gel ice.

References

1. Data produced using Compass™ Comparative Packaging Assessment online software tool (v1.1). design-compass.org
2. Reference data derived from US EPA, Climate Leaders, Greenhouse Gas Inventory Protocol Core Module Guidance (optional emissions from commuting, business travel, and product transport). <https://nepis.epa.gov/Exe/ZyPDF.cgi/P1001177.PDF?Dockey=P1001177.PDF>

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