PERMEATION AND COMPATIBILITY TESTING OF PPQ RESIN BOTTLES CONTAINING 70% NITRIC ACID

Bottle	Resin	Storage Condition	Bottle Tare w/o Cap (grams)	Cap Wt. (grams)	Fill Net (grams)	12/22/06 Gross Wt. (grams)	6/22/07 Gross Wt. (grams)	Net Wt. Change	Appearance of Bottle and Liquid	Drop Test Results
A	Single Layer PPQ, 0.050" min. wall thickness	180 Days ≥ 64°F (18°C)	208	10	3,167	3,385	3,385	0	White/ Clear	Pass 1.42 m + 1.9 m + 5.23 m
B	Single Layer PPQ, 0.050" min. wall thickness	180 Days ≥ 64°F (18°C)	207	10	3,166	3,383	3,383	0	White/ Clear	Pass 1.42 m + 1.9 m + 5.23 m
C	Single Layer PPQ, 0.050" min. wall thickness	180 Days ≥ 64°F (18°C)	208	10	3,170	3,388	3,388	0	White/ Clear	Pass 1.42 m + 1.9 m + 5.23 m
D	Single Layer Equistar LR7340-01 HDPE, 0.050" min. wall thickness	180 Days ≥ 64°F (18°C)	207	10	3,167	3,384	3,384	0	Yellow/ Yellow	Fail 1.42 m
E	Single Layer Equistar LR7340-01 HDPE, 0.050" min. wall thickness	180 Days ≥ 64°F (18°C)	207	10	3,166	3,383	3,383	0	Yellow/ Yellow	Fail 1.42 m
F	Single Layer Equistar LR7340-01 HDPE, 0.050" min. wall thickness	180 Days ≥ 64°F (18°C)	207	10	3,170	3,387	3,387	0	Yellow/ Yellow	Fail 1.42 m

Test began on 12/22/06 and was concluded 06/22/07.

January 22, 2008/ Written by: Michael A. Dodd

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Preparation:

On 12/22/06, six PurePak 2.5 L bottles were prepared for testing; three were extrusion blow-molded with a proprietary HDPE we identify as PPQ Resin and three were extrusion blow molded with Lyondell Equistar LR7340-01 HDPE. All six bottles were tare weighed then filled with 7 pounds net (2.236 L) of 70% nitric acid. These six filled bottles were placed into temperature controlled storage at a temperature not less than 64 degrees F (18 degrees C) and maintained for 180 days. On 06/22/07, the six stored bottles were reweighed, emptied, rinsed, filled to 2.236 L with water and with filled container at ambient temperature, dropped onto concrete. For 70% nitric acid, having a specific gravity of 1.42, the Drop Test, as in accordance with Part 178.603(e)(2)(ii)((B) was performed from 1.42 meters (56 inches).

Results:

Bottles A, B & C: Each of the three PPQ Resin bottles, when individually dropped, bounced without failure. Visual examination of the dropped bottles revealed zero adverse effect to the bottles; no denting, cracking or deformation. No liquid escaped. Although not required by DOT, these same three bottles were additionally dropped from 1.9 meters (75 inches) with success and again from 5.23 meters (206 inches) with success. Through all three drop tests, all three bottles remained unaffected and allowed zero fugitive liquid emissions.

Bottles D, E & F: Each of the three LR7340-01 HDPE bottles, when dropped, broke into multiple pieces upon impact. All of the contained liquid escaped.

Test began on 12/22/06 and was concluded 06/22/07.

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