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Nalgene Fluorinated Products

What is Fluorination?

Fluorination is a process in which a Nalgene® HDPE plastic container, and the complementary PP closure or other component are exposed to fluorine gas after molding under controlled temperature and pressure conditions. The fluorine substitutes with some hydrogen atoms in the polymer chain, creating a barrier and surface enhancement on the interior and exterior of the container and closure.

Fluorinated Product Benefits

- Improved barrier properties and reduced solvent absorption and permeation
- Enhanced long-term container performance
- Lower extractables
- Recyclable

Compliance with FDA Regulations

Nalgene fluorinated materials comply with the following requirements of the Food Additives Amendment of the U.S. Federal Food, Drug and Cosmetic Act.

- FLPE (fluorinated high-density polyethylene) 21 CFR 177.1520
- FLPP (fluorinated polypropylene) 21 CFR 177.1520

Cleaning

Wash product before using for the first time. To prevent scratching of the plastic, observe the following precautions:

- Use a warm, mild detergent solution
- DO NOT use brushes, abrasive cleanser or paper towels

If using a labware washing machine:

- DO NOT use a machine that is equipped with brushes
- In a machine with high-pressure water spray, place the containers in a basket and protect them with a screen or cover similar to that used in test tube baskets. (Nalgene autoclaving baskets (Cat. No. 6917) are recommended). Otherwise, the water pressure may cause the containers to tumble and scratch the fluorinated surfaces.
- If placed on spindles, always weight and cover the containers. If the spindles are made of uncoated metal, a section of PVC tubing (such as Nalgene 180; Cat. No. 8000) placed over them will cushion and protect the containers.
- Air dry if possible

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*Contact information contained within
this document may be incorrect.

Chemicals	FLPE (containers)	HDPE	FLPP (closure)
Acids, Dilute or weak	E	E	E
Acids, Strong and concentrated	E	E	G
Aliphatic alcohols	E	E	E
Aldehydes	G	G	G
Bases	E	E	E
Esters	E*	G	G
Hydrocarbons, Aliphatic	E*	G	G
Hydrocarbons, Aromatic	E*	G	N
Hydrocarbons, Halogenated	G*	F	F
Ketones	E*	G	G
Strong Oxidizers	F	F	F

FLPE - fluorinated high-density polyethylene

FLPP - fluorinated polypropylene

HDPE - high-density polyethylene -

*Increased HDPE chemical resistance due to fluorination

E = Excellent

G = Good

F = Fair

Temperature Limits

FLPE products withstand temperature limits from -100°C to +120°C

FLPP products withstand temperature limits from 0°C to +135°C

As with any plastic container, NEVER put fluorinated containers in a flame or on a hot plate.

Warning

Spigoted carboys not for use with flammable liquids.

References

To find out more about the fluorination process, visit:

http://www.fluoroseal.com/faq_perm.html

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