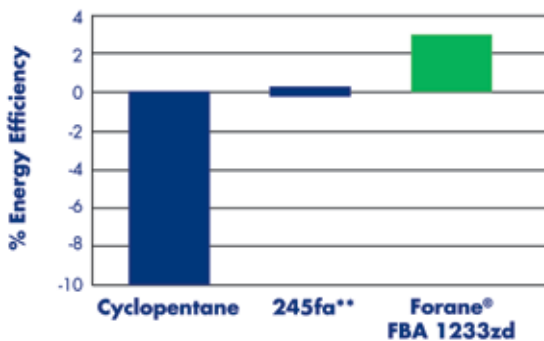


FORANE[®] FBA 1233zd BLOWING AGENT HAS IT ALL...

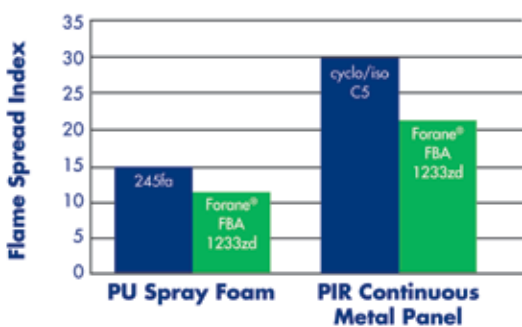
% Energy Efficiency Improvement in Household Refrigerators



*Cyclopentane vs 245fa from AHAM trials
**Commercial trials, unoptimized foam system with Forane[®] FBA 1233zd vs. HFC 245fa

Fire Performance*

Forane[®] FBA 1233zd may allow for lower levels of flame retardants.



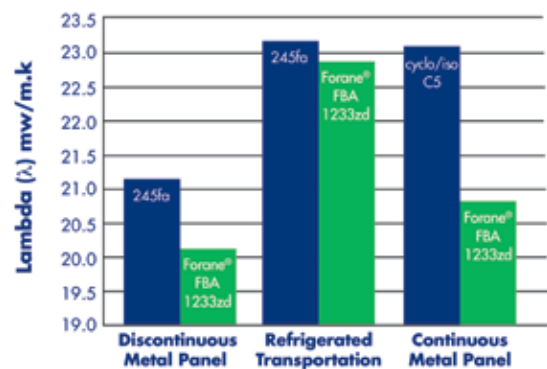
*Spray Foam tested under ASTM E84 guidelines. Continuous Metal Panel burn tested under controlled lab conditions. These tests should not be used to predict burn behavior under actual fire conditions.

Forane[®] FBA 1233zd is Non-Flammable.

- ❖ Thermal Performance
- ❖ Environmental Performance
- ❖ Safety Performance
- ❖ Cost Performance

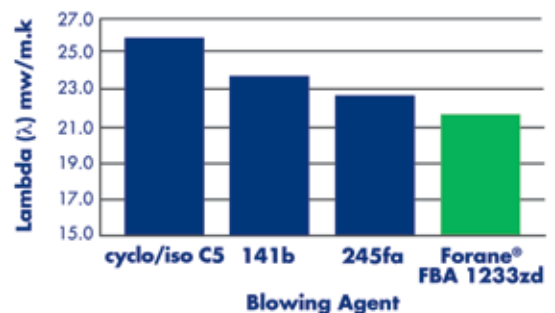
Lambda (λ) for Cold Chain Applications*

Forane[®] FBA 1233zd blowing agent provided excellent insulation values at low temperatures critical to all cold chain applications.



*Tested @ 75°F Mean Test Temperature

Typical Lambda (λ) of Pour-in-Place Foam 2.5cm thick sample



Forane[®] FBA 1233zd has low Global Warming Potential (GWP of 1), a 99.9% reduction vs. currently-used HFC's.

Arkema has granted patents on 1233zd use in Foam and Heat Transfer applications throughout the world.

FORANE[®] FBA 1233zd BLOWING AGENT

BENEFITS THAT
COVER YOUR
NEEDS...

❖ Thermal Performance

- Improved energy efficiency in refrigerators and freezers
- High insulation value for critical cold chain and spray foam applications



❖ Low Environmental Impact

- Low global warming potential (GWP = 1)*, a 99.9% reduction vs. currently-used HFC's
- Non-ozone depleting
- VOC exempt. 1233zd is not a volatile organic compound

❖ Safety Performance

- Non-flammable
- Low vapor pressure

❖ Cost and Ease of Use

- Utilizes existing processing equipment and commercially-available raw materials
- Easy to use in liquid form



*IPCC 5th Assessment Report WG1. Jan. 2014

Arkema has granted patents on 1233zd use in Foam and Heat Transfer applications throughout the world.

Forane[®] is a registered trademark of Arkema
© 2017 Arkema Inc. All rights reserved.