

FORANE® 1233ZD

REFRIGERANTS

Excellent Choice for Centrifugal Chillers

LOW ENVIRONMENTAL IMPACT

HIGH ENERGY EFFICIENCY

SAFETY IN USE



ARKEMA
INNOVATIVE CHEMISTRY

FORANE® 1233ZD REFRIGERANT

The Efficient Choice for Chillers

Efficiency comparison



Forane® 1233zd refrigerant offers an excellent balance of refrigerant properties for use in centrifugal chillers, along with high efficiency, low environmental impact, and non-flammability.

Sustainability:

- Low Global Warming Potential >99.9% reduction versus 134a
- Non-Ozone Depleting Substance
- Non-Volatile Organic Compound
- EPA SNAP Approved

Safety in Use

- ASHRAE Class A1
Non-Flammable
Lowest level of toxicity
- Low Pressure

Versatility

- Can use with typical lubricants
- Mineral Oil, POE, and PVE



Properties of Forane® 1233zd		
ASHRAE Designation	R-1233zd(E)	
ASHRAE Classification	A1	
Chemical Name	trans-1-chloro-3,3,3-trifluoroprop-1-ene	
Formula	CF ₃ CH=CHCl (E)	
CAS No.	102687-65-0	
Molecular Weight (g/mol)	130.5	
GWP (100yr)*	1	
Flammability Limit (vol %) LFL / UFL (by ASHRAE 34 @ 20 °C)	None / None	
	SI Units	English Units
Boiling Point	18.3 °C	69.4 °F
Critical Temperature	167.3 °C	333.1 °F
Critical Pressure (bar/psig)	36.6 bar	516 psig
Vapor Pressure @ 20 °C	1.08 bar	1.0 psig
Liquid Density @ 20 °C	1.27 g/mm ³	79.3 lb/ft ³

Arkema has patented the use of Forane® 1233zd, high purity *trans*-1-chloro-3,3,3-trifluoropropene, for use in centrifugal chillers and related applications, including:

US Pat. Nos. 9,404,678; 9,222,705; 8,703,690; 8,454,853
 China Pat. No. China granted ZL200980000523.3
 South Korea Pat. No. 101088644

* GWP (Global Warming Potential) by IPCC AR5

Please consult Arkema's disclaimer regarding the use of Arkema's products on <http://www.arkema.com/en/products/product-safety/disclaimer/index.html>

Forane® is a registered trademark of Arkema

© 2016 Arkema Inc. All rights reserved

forane.com

ARKEMA
 INNOVATIVE CHEMISTRY

Arkema Inc.
 900 First Avenue
 King of Prussia, PA 19406
 USA
 Tel.: (+1) 610-205-7000

Headquarters: Arkema France
 420, rue d'Estienne d'Orves
 92705 Colombes Cedex – France
 Tel.: +33 (0)1 49 00 80 80
 Fax: +33 (0)1 49 00 83 96
arkema.com