

# AMOLEA™ 1224yd

## Features

AMOLEA™ 1224yd is a non-flammable Hydrochlorofluoroolefin consisting of single component HCFO-1224yd (Z), and satisfies all requirements of next-generation refrigerants. It's a low GWP refrigerant that can be used as an alternative to R245fa or R123 applications.

- GWP: <1\*. ODP: Almost Zero\*
- Non-flammable, low toxicity (LC<sub>50</sub> > 213,100ppm. AEL=1,000ppm. RCL=60,000ppm)
- Provides thermal stability equivalent to HFC, and better thermal stability than HFO or other HCFO.
- Good compatibility with lubricants, metals, plastics, and elastomers.
- Its physical properties are similar to those of R245fa.
- First company in Japan to approve ASHRAE certification as a single component refrigerant. **(R-1224yd (Z))**

**Application** Centrifugal chiller, Heat pumps system, Binary generators, Urethane foaming processes, etc.

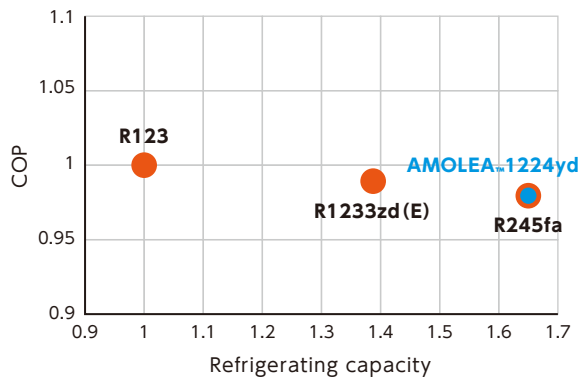
## Physical properties

		R123	R245fa	AMOLEA™ 1224yd	R1233zd (E)	R514A
Molecular weight	[g/mol]	152.9	134.0	148.5	130.5	140
Normal boiling point	[°C]	28	15	15	19	29
Vapor pressure (25°C)	[kPa]	91	149	149	130	87
Critical temperature	[°C]	183.7	153.9	155.5	166.6	178
Critical pressure	[MPa]	3.66	3.65	3.34	3.62	3.52
GWP (ITH=100) AR5 IPCC 5th Report	[CO <sub>2</sub> =1]	79	858	0.88 *	1	2
ODP	[R11=1]	0.02	0	0.00023 *	0.00024	0
Atmospheric lifetime	[-]	1.3 years	7.7 years	20 days *	26 days	22 days
AEL	[ppm]	50	300	1,000	800	320
ASHRAE SSPC34 safety category		B1	B1	A1	A1	B1

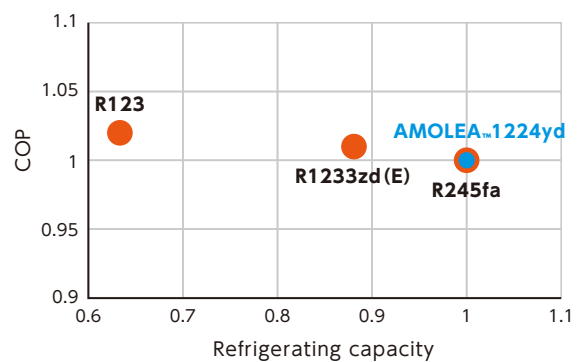
## Theoretical refrigerating cycle

Conditions: Evaporation temperature: 7°C, Condensation temperature: 40°C, Degrees of superheating: 5°C, Degrees of supercooling: 5°C

(1) Relative to R123

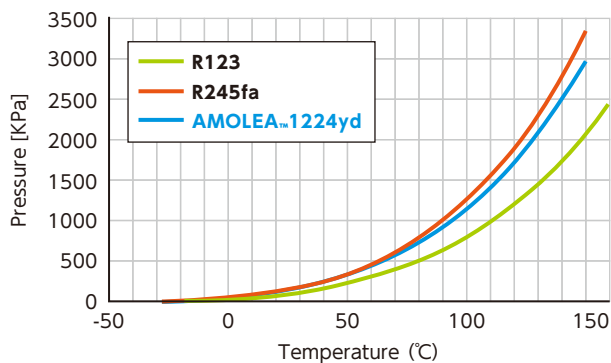


(2) Relative to R245fa



## Saturated vapor pressure

AMOLEA™ 1224yd's saturated vapor pressure is roughly equivalent to that of R245fa. As such, refrigerants can be replaced without making changes to the equipment's design pressure.



## Lubricants

AMOLEA™ 1224yd is mutually soluble with refrigeration oils, such as POE, that are used with HFC refrigerants at arbitrary temperatures, and also with naphthenic oils that are used with HCFC refrigerants within the range of operating temperatures of many types of equipment.

Provides relatively good performance with any of these lubricants even with concomitant moisture or air, and can be used with existing lubricants that are currently being used.

Additives such as stabilizers, anti-abrasion agents and the like may be required depending on the operating conditions. We recommend that you check with your lubricant manufacturer.

Lubricants		POE	Naphthenic mineral oil	Alkyl benzene oil
R1224yd mutual miscibility	Low temperature	<-40°C	-16°C	<-40°C
	High temperature	>40°C	>40°C	>40°C

## Thermal stability

Refrigerant	R123	R245fa	AMOLEA™ 1224yd
Test temperature	175°C		
Test time	14 days		
Refrigerant acid content [ppm, as HF]	Unmeasurable due to excessive degradation	<1	<1
Degree of metal corrosion [mg/dm <sup>2</sup> /day]	SS	Significant decomposition	<5
	Cu		<5
	Al		<5
	Mg	N.D.	<5
	Ni		<5
	Zn		<5
SUS304	<5	<5	

## Plastics, elastomers

While the effects the AMOLEA™ 1224yd has on elastomers are equivalent to or less than those of R123 and equivalent to those of R245fa, degradation may occur due to elution in some materials. Plastics and elastomers may exhibit dissimilar properties depending on the mix ratio, types and amounts of additives used, and processing conditions. The effects of concomitant materials, such as lubricants, must also be taken into account.

Therefore, we recommend our users that plastics and elastomer compatibilities should be evaluated at the conditions of use before the actual application.

# AGC Inc.

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