



TETRAFLUOROPROP-1-ENE (R-1234yf) REFRIGERANT

WSS-M17B21-A

1. SCOPE

The material defined by this specification is a liquefied flammable hydrofluoro-olefin (HFO) gas (2, 3, 3, 3-tetrafluoroprop-1-ene) refrigerant also referred to as R-1234yf or HFO-1234yf.

2. APPLICATION

This material is being released for use in automotive air conditioning applications. Generally, this will be the replacement refrigerant for HFC-134a in approved new systems. However, this is not for drop in use with systems already using HFC-134a under any circumstances.

2.1 LIMITATIONS

- For service fill, R-1234yf refrigerant should not be mixed with HFC-134a refrigerant.
- Critical solution temperature for compressor lubricants should be $>25^{\circ}\text{C}$. Testing for compatibility is recommended.
- Do not use R-1234yf with Fluorocarbon (FKM) rubber. Neoprene and HNBR are acceptable materials for use with R-1234yf refrigerant.
- R-1234yf refrigerant is a flammable gas. Follow precautions in the MSDS.

3. REQUIREMENTS

3.1 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A).

3.2 APPEARANCE

Clear, colorless liquid gas with a slight odor

3.3 LIQUID PHASE REQUIREMENTS

3.3.1	HFO-1234yf Gas Chromatography Method AHRI-700 or similar	99.5 wt% (w/w) min
3.3.2	HFO-1225ye Gas Chromatography Method AHRI-700 or similar	150 ppm (w/w) max
3.3.3	HFO-1234ze Gas Chromatography Method AHRI-700 or similar	1000 ppm (w/w) max
3.3.4	Unsaturated Volatile Impurities Gas Chromatography Method AHRI-700 or similar	40 ppm (w/w) max
3.3.5	Other Refrigerants Gas Chromatography Method AHRI-700 or similar	0.5 wt% (w/w) max

Date	Action	Revisions	Rev. 2
2015 08 17	Revised	See Summary of Revisions	A. Patti, G. Kowalski NA
2015 01 08	Revised	See Summary of Revisions	A. Patti, G. Kowalski NA
2012 08 23	Released		G. Kowalski, NA



3.3.6	Water Content AHRI 700 Method or similar	20 ppm (w/w) max
3.3.7	Chlorides (or Halides) AHRI 700 Method or similar	3 ppm (w/w) max
3.3.8	Acidity, as HCl AHRI 700 Method or similar	1 ppm (w/w) max
3.3.9	High Boiling Residue AHRI 700 Method or similar	100 ppm (v/v) max
3.3.10	Particulates/Solids	Pass

During the Boiling Range test, a measured amount of sample is evaporated from the Goetz bulb under controlled conditions. The particulates/solids shall be determined by visual examination of the empty Goetz bulb after the sample has evaporated completely. Presence of dirt, rust or other particulate contamination is reported as "fail".

3.4 VAPOR PHASE REQUIREMENTS

3.4.1	Non-Condensable gases in vapor phase (AHRI-700 or similar)	1.5 wt% (w/w) max
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3.5 SHIPPING AND CONTAINER INFORMATION

3.5.1	Markings R-1234yf, 2, 3, 3, 3 Tetrafluoroprop-1-ene DOT Label Flammable gas CAS number 754-12-1 Hazard class 2.1 (or per regulator guidance)
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4. GENERAL INFORMATION

The information given below is provided for clarification and assistance in meeting the requirements of this specification. Contact gmfs@ford.com for questions concerning Engineering Material Specifications.

4.1	BOILING POINT , at 760 mm Hg (ASTM D2879 or ASTM D1719)	-29.4°C
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4.2 REFERENCE STANDARDS

AHRI Standard 700-2014
Air-Conditioning, Heating, and Refrigeration Institute (AHRI)
2111 Wilson Blvd, Suite 500
Arlington, VA 22201
USA