



Refrigerant 1,1,1,2-Tetrafluoroethane, HFC-134a

1 Scope

1.1 Material Description. This specification covers the overall requirements for 1,1,1,2-tetrafluoroethane refrigerant (also known as Hydrofluorocarbon (HFC) - HFC-134a or R134a) used in General Motors (GM) mobile air conditioning systems.

1.2 Symbols. Not applicable.

1.3 Applicability. As a refrigerant in automotive air conditioners.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

ANSI/ASHRAE 34	ASTM D2109	ASTM D2879	SAE J2776
ANSI/ASHRAE 97	ASTM D2111	ASTM E1064	

2.2 GM Standards/Specifications.

GMW14270

2.3 Additional References.

Safety and Industrial Hygiene (S&IH) Technical Standard (TS), S&IH TS 3.4-160-02 (available at www.gmsupplypower.covisint.com)

3 Requirements

3.1 Requirements on Delivery.

3.1.1 Chemical Requirements. Refrigerants approved and supplied to this specification shall have the chemical property values conforming to the established limits shown in Tables 1 and 2. No sample for testing and approval to this specification shall be taken until the contents of the container have been mixed to ensure uniformity of the liquid phase and equilibrium with the gas phase.

3.1.2 Mechanical Requirements. Not applicable.

3.1.3 Physical Requirements. Refrigerants approved and supplied to this specification shall have no flash point and shall meet the physical performance requirements shown in Table 3.

Table 1: Liquid Phase Contaminants (Maximum Limits)

Contaminants	Test Method	Units	Value
Water Content	ASTM E1064	ppm ^{Note 1}	10 maximum.
Acidity	Neutralization ^{Note 2}	ppm ^{Note 1}	1 maximum
Halides	Specific ion electrode or potentiometric titration ^{Note 2}	ppm ^{Note 1}	< 0.1
Other Refrigerants	Gas Chromatography ^{Note 3}	ppm ^{Note 1}	1960
Total Unsaturates	Gas Chromatography ^{Note 3}	ppm ^{Note 1}	40
Non-volatile residue	Gas Chromatography ^{Note 3}	ppm ^{Note 1} v/v	100

Note 1: Parts per million (ppm) shall mean parts per million by mass (e.g., microgram per gram).

Note 2: Alternate analytical procedure for acidity and halides. Acidity and halides may be determined together via Aqueous Conductivity as Hydrochloric acid, ppm.

Note 3: These organic impurities must be identified and must not be harmful to mobile air-conditioning systems as judged by ANSI/ASHRAE 97 Sealed Tube Testing in the presence of iron, copper, aluminum and GM approved HFC-134a lubricant.

Table 2: Vapor Phase Contaminants (Maximum Limit)

Properties	Test Method	Units	Value
Non-condensable Gases	Gas Chromatography	Volume %	1.5

Table 3: Physical Performance Requirements

Properties	Test Method	Units	Value
Appearance	Visual		Clear, colorless, liquefied gas
Purity: As HFC-134a As HFC-134a + HFC-134	Gas Chromatography	% by weight	99.7 (minimum) 99.8 (minimum)
Boiling Point (at 760 mm Hg) Reference only	ASTM D2879	°C	-26.2
High boiling residues	ASTM D2109	% by volume	0.01 maximum
Density at 25 °C	ASTM D2111	kg/dm ³	1.19 to 1.21

3.1.4 Additional Requirements.

3.1.4.1 Label Requirements. Containers of material supplied to this specification shall, for ready identification of contents, prominently display the refrigerant number 134a (ANSI/ASHRAE 34) and other labeling requirements as outlined in SAE J2776.

3.2 Processing Requirements. Not applicable.

3.3 Performance Requirements. GM reserves the right to require any additional tests that may be deemed necessary to ensure satisfactory vehicle component performance with candidate refrigerants submitted for approval.

3.4 Requirements on Other Stages During Life Cycle. Not applicable.

4 Manufacturing Process

Not applicable.