

National Refrigerants, Inc.

Analytical Laboratory

661 Kenyon Avenue
Bridgeton, NJ 08302
Telephone (856) 455-2776
Fax (856) 455-4733

- Problems Found Action Required
- Normal Results No Action Needed

SL: 03

Refrigerant Analysis Report

Customer:	Johnson Controls	P.O. No.:	NRIHP
Address:	812 First State Blvd. Wilmington DE 19804	Refrigerant Type:	R-134a
Contact:	Kevin Fraze	Job Location:	DuPont Experimental E315
Telephone:	302-353-0315	System S/N:	MRP 626904
Fax:	kevin.m.fraze@jci.com	Sample ID#:	Chiller 7
		Lab. Reference:	171121-37
		Date Rec.:	11/21/17

Analysis

Sample Results

In-Service Limits

Identification	By Gas Chromatography	R-134a	
Moisture	parts per million by weight	20	120 Max.
High Boiling Residue	per cent by volume	0.05	2 Max.
Acidity	parts per million (as HCl)	<0.2	1 Max.
Non-Condensable Gas	per cent by volume	-	1.5 Max.
Chloride	pass/fail	Pass	pass
Purity	% by weight (Gas Chromatography)	99.95	99.5 Min.
Particulates	pass/fail	Pass	pass
Other			

(1) 20 ppm for R-11, 113, 123.

Comments: The high boiling residue (0.05%) is a clear light yellow oil. All other above test results show good quality in-service R-134a and indicate normal system performance. Trace organic impurities present are R-143a: 0.01% and R-22: 0.01%. Resample at next scheduled maintenance interval.

Laboratory Supervisor: Daniel K. Wright

Date: 11/27/2017

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Address:	812 First State Blvd. Wilmington DE 19804	Refrigerant Type:	R-134a
Contact:	Kevin Fraze	Job Location:	DuPont Experimental E315
Telephone:	302-353-0315	System S/N:	GACM 117 864
Fax:	kevin.m.fraze@jci.com	Sample ID#:	Chiller 8
		Lab. Reference:	171121-38
		Date Rec.:	11/21/17

Analysis

Sample Results

In-Service Limits

Identification	By Gas Chromatography	R-134a	
Moisture	parts per million by weight	13	120 Max.
High Boiling Residue	per cent by volume	0.40	2 Max.
Acidity	parts per million (as HCl)	<0.2	1 Max.
Non-Condensable Gas	per cent by volume	-	1.5 Max.
Chloride	pass/fail	Pass	pass
Purity	% by weight (Gas Chromatography)	99.95	99.5 Min.
Particulates	pass/fail	Pass	pass
Other			

(1) 20 ppm for R-11, 113, 123.

Comments: (50,207 hrs; 2,185 starts) The high boiling residue (0.40%) is a clear pale yellow oil. All other above test results show good quality in-service R-134a and indicate normal system performance. Trace organic impurities present are R-143a: 0.01%, R-152a: 0.01% and an unknown 0.01%. Resample at next scheduled maintenance interval.

Laboratory Supervisor: Daniel K. Wright Date: 11/27/2017

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Customer:	Johnson Controls	P.O. No.:	NRIHP
Address:	812 First State Blvd. Wilmington DE 19804	Refrigerant Type:	R-134a
Contact:	Kevin Fraze	Job Location:	DuPont Experimental E315
Telephone:	302-353-0315	System S/N:	GACM 127 698
Fax:	kevin.m.fraze@jci.com	Sample ID#:	Chiller 9
		Lab. Reference:	171121-39
		Date Rec.:	11/21/17

Analysis

Sample Results

In-Service Limits

Identification	By Gas Chromatography	R-134a	
Moisture	parts per million by weight	16	120 Max.
High Boiling Residue	per cent by volume	0.50	2 Max.
Acidity	parts per million (as HCl)	<0.2	1 Max.
Non-Condensable Gas	per cent by volume	-	1.5 Max.
Chloride	pass/fail	Pass	pass
Purity	% by weight (Gas Chromatography)	99.97	99.5 Min.
Particulates	pass/fail	Pass	pass

Other

(1) 20 ppm for R-11, 113, 123.

Comments: (46,624 hrs; 2,064 starts) The high boiling residue (0.50%) is a clear yellow oil. All other above test results show good quality in-service R-134a and indicate normal system performance. The only significant organic impurity present individually is R-143a: 0.01%. Resample at next scheduled maintenance interval.

Laboratory Supervisor: Daniel K. Wright

Date: 11/27/2017

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Contact:	Kevin Fraze	Job Location:	DuPont Experimental E315
Telephone:	302-353-0315	System S/N:	GACM 127 699
Fax:	kevin.m.fraze@jci.com	Sample ID#:	Chiller 10
		Lab. Reference:	171121-40
		Date Rec.:	11/21/17

Analysis

Sample Results

In-Service Limits

Identification	By Gas Chromatography	R-134a	
Moisture	parts per million by weight	6	120 Max.
High Boiling Residue	per cent by volume	0.20	2 Max.
Acidity	parts per million (as HCl)	<0.2	1 Max.
Non-Condensable Gas	per cent by volume	-	1.5 Max.
Chloride	pass/fail	Pass	pass
Purity	% by weight (Gas Chromatography)	99.97	99.5 Min.
Particulates	pass/fail	Pass	pass
Other			

(1) 20 ppm for R-11, 113, 123.

Comments: (40,002 hrs; 1,351 starts) The high boiling residue (0.20%) is a clear pale yellow oil. All other above test results show good quality in-service R-134a and indicate normal system performance. The only significant organic impurity present individually is R-143a: 0.01%. Resample at next scheduled maintenance interval.

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