

## R-236fa

1,1,1,3,3,3 - HEXAFLUOROPROPANE  $CF_3-CH_2-CF_3$

Masse molaire en g/mol .....	152,04
Température de fusion en °C .....	N/A
Point d'ébullition (sous 1,013 bar) .....	-1,49
Glissement de température sous 1,013 bar en K .....	0
Température critique en °C .....	124,9
Pression critique en bar absolu .....	32,00
Chaleur massique du liquide à + 25°C en kJ/kg.K .....	1,238
Chaleur massique de la vapeur (sous 1,013 bar) à + 25°C en kJ/kg.K .....	0,838
Rapport des capacités thermiques massiques (Cp/Cv) à + 25°C et sous 1,013 bar .....	1,084
Viscosité du liquide à + 25°C en centipoise ( $10^{-3}$ Pa.s) .....	0,285
Tension de surface à + 25°C en dyne par centimètre ( $10^{-3}$ N/m) .....	9,59
Classification NF-EN 378 .....	A1
GWP (IPCC 4) .....	9810

### ◆ Principales applications

Le R-236fa est un hydrofluorocarbone (HFC) utilisé principalement dans des systèmes de climatisation en remplacement du R-114 et du R-124, par exemple dans les refroidisseurs d'eau de la marine.

Il peut également être utilisé pour la climatisation des ponts roulants. Aujourd'hui, le R-1234ze pourra être étudié en remplacement en installation neuve dans certaines applications.

### ◆ Spécifications commerciales

Pureté garantie :  $\geq 99,5$  % poids.

Teneur en eau :  $\leq 10$  ppm poids.

Teneur en incondensables (phase gazeuse) :  $\leq 1,5$  % volume.

Test ion chlorure : négatif.

Résidus haute ébullition :  $\leq 0,01$  % volume.

Acidité (HCl) :  $\leq 1$  ppm poids.

### ◆ Huiles

Utiliser une huile polyolester (POE).

Vérifier auprès de **Climalife** la viscosité de l'huile retenue en fonction de l'application et la miscibilité avec le fluide considéré.

### ◆ Réglementation

L'usage et la mise en œuvre du R-236fa sont régis par le règlement Européen n° 517/2014.

La récupération du R-236fa est obligatoire au titre du règlement Européen n° 517/2014.

(Se reporter à la réglementation en vigueur du pays concerné).

## Caractéristiques thermodynamiques du R-236fa - État saturé

Pression absolue	LIQUIDE					VAPEUR					Chaleur latente
	Temp. bulle	Vol. mass	Masse vol.	Enthalpie	Entropie	Temp. rosée	Vol. mass	Masse vol.	Enthalpie	Entropie	
P	t'	v'	p'	h'	s'	t''	v''	p''	h''	s''	Lv
(Bar)	(°C)	(dm <sup>3</sup> /kg)	(kg/dm <sup>3</sup> )	(kJ/kg)	(kJ/kg-K)	(°C)	(m <sup>3</sup> /kg)	(kg/m <sup>3</sup> )	(kJ/kg)	(kJ/kg-K)	(kJ/kg)
0,002	-90	0,589	1,699	94,457	0,532	-90,0	41,718	0,024	297,761	1,642	203,304
0,004	-85	0,593	1,685	100,403	0,564	-85,0	25,067	0,040	300,948	1,629	200,545
0,007	-80	0,598	1,672	106,315	0,595	-80,0	15,577	0,064	304,168	1,619	197,853
0,011	-75	0,603	1,658	112,196	0,625	-75,0	9,982	0,100	307,420	1,610	195,224
0,017	-70	0,608	1,644	118,053	0,654	-70,0	6,578	0,152	310,702	1,602	192,649
0,026	-65	0,613	1,631	123,891	0,682	-65,0	4,447	0,225	314,014	1,596	190,123
0,038	-60	0,619	1,617	129,715	0,710	-60,0	3,078	0,325	317,353	1,590	187,638
0,055	-55	0,624	1,603	135,530	0,737	-55,0	2,177	0,459	320,718	1,586	185,188
0,077	-50	0,629	1,589	141,339	0,763	-50,0	1,570	0,637	324,106	1,582	182,767
0,107	-45	0,635	1,575	147,147	0,789	-45,0	1,153	0,867	327,514	1,579	180,367
0,146	-40	0,641	1,561	152,959	0,814	-40,0	0,861	1,162	330,940	1,577	177,982
0,197	-35	0,647	1,546	158,777	0,839	-35,0	0,653	1,532	334,381	1,576	175,604
0,260	-30	0,653	1,532	164,606	0,863	-30,0	0,502	1,992	337,835	1,575	173,229
0,340	-25	0,659	1,517	170,449	0,887	-25,0	0,391	2,557	341,297	1,575	170,848
0,438	-20	0,666	1,502	176,310	0,910	-20,0	0,308	3,244	344,765	1,576	168,455
0,557	-15	0,672	1,487	182,193	0,933	-15,0	0,246	4,069	348,237	1,576	166,044
0,701	-10	0,679	1,472	188,099	0,956	-10,0	0,198	5,053	351,708	1,577	163,609
0,873	-5	0,686	1,457	194,034	0,978	-5,0	0,161	6,216	355,176	1,579	161,142
1,013	-1,49	0,692	1,446	198,214	0,993	-1,49	0,140	7,151	357,604	1,580	159,390
1,078	0	0,694	1,441	200,000	1,000	0,0	0,132	7,582	358,637	1,581	158,637
1,317	5	0,701	1,426	206,000	1,022	5,0	0,109	9,175	362,088	1,583	156,088
1,597	10	0,709	1,410	212,038	1,043	10,0	0,091	11,021	365,526	1,585	153,487
1,921	15	0,718	1,393	218,117	1,064	15,0	0,076	13,150	368,945	1,588	150,828
2,294	20	0,726	1,377	224,241	1,085	20,0	0,064	15,593	372,344	1,591	148,103
2,719	25	0,735	1,360	230,413	1,106	25,0	0,054	18,387	375,715	1,593	145,303
3,204	30	0,745	1,342	236,636	1,127	30,0	0,046	21,570	379,055	1,596	142,419
3,751	35	0,755	1,325	242,916	1,147	35,0	0,040	25,186	382,357	1,600	139,441
4,367	40	0,765	1,307	249,257	1,167	40,0	0,034	29,284	385,615	1,603	136,358
5,057	45	0,777	1,288	255,663	1,187	45,0	0,029	33,922	388,820	1,606	133,157
5,827	50	0,788	1,269	262,139	1,207	50,0	0,026	39,163	391,964	1,609	129,825
6,683	55	0,801	1,249	268,693	1,227	55,0	0,022	45,083	395,038	1,612	126,345
7,630	60	0,814	1,228	275,331	1,247	60,0	0,019	51,770	398,030	1,616	122,699
8,676	65	0,829	1,207	282,061	1,267	65,0	0,017	59,331	400,929	1,619	118,868
9,826	70	0,844	1,184	288,893	1,287	70,0	0,015	67,894	403,718	1,621	114,825
11,088	75	0,862	1,161	295,839	1,307	75,0	0,013	77,618	406,380	1,624	110,541
12,470	80	0,880	1,136	302,914	1,326	80,0	0,011	88,706	408,890	1,627	105,976
13,978	85	0,901	1,109	310,136	1,346	85	0,010	101,418	411,217	1,629	101,080
15,623	90	0,925	1,081	317,532	1,366	90,0	0,009	116,107	413,319	1,630	95,788
17,413	95	0,952	1,050	325,135	1,387	95,0	0,008	133,263	415,140	1,631	90,005
19,358	100	0,984	1,016	332,998	1,407	100	0,007	153,608	416,595	1,632	83,597
21,471	105	1,022	0,978	341,199	1,429	105,0	0,006	178,274	417,566	1,631	76,357
23,765	110	1,071	0,934	349,874	1,451	110,0	0,005	209,221	417,805	1,628	67,931
26,258	115	1,138	0,879	359,293	1,475	115,0	0,004	250,420	416,915	1,623	57,622
28,974	120	1,245	0,803	370,188	1,502	120,0	0,003	312,738	413,758	1,613	43,570





### Caractéristiques thermodynamiques du R-236fa - État vapeur surchauffée - Entropie (kJ/kg.K)

Tempér. à satur. °C	Pression rosée bar	Surchauffe (°C)																				
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
-90	0,002	1,642	1,659	1,676	1,693	1,709	1,725	1,741	1,757	1,773	1,789	1,804	1,819	1,834	1,849	1,864	1,879	1,893	1,908	1,922	1,936	1,950
-85	0,004	1,629	1,646	1,663	1,680	1,696	1,712	1,728	1,744	1,759	1,775	1,790	1,805	1,820	1,835	1,849	1,864	1,878	1,893	1,907	1,921	1,935
-80	0,007	1,619	1,636	1,652	1,668	1,685	1,700	1,716	1,732	1,747	1,762	1,777	1,792	1,807	1,822	1,836	1,851	1,865	1,879	1,893	1,907	1,921
-75	0,011	1,610	1,626	1,643	1,659	1,675	1,690	1,706	1,721	1,737	1,752	1,767	1,782	1,797	1,811	1,825	1,839	1,854	1,868	1,882	1,896	1,909
-70	0,017	1,602	1,618	1,635	1,650	1,666	1,682	1,697	1,712	1,727	1,742	1,757	1,772	1,786	1,801	1,815	1,829	1,844	1,858	1,871	1,885	1,899
-65	0,026	1,596	1,612	1,628	1,643	1,659	1,674	1,690	1,705	1,720	1,734	1,749	1,764	1,778	1,792	1,807	1,821	1,835	1,849	1,862	1,876	1,890
-60	0,038	1,590	1,606	1,622	1,637	1,653	1,668	1,683	1,698	1,713	1,728	1,742	1,757	1,771	1,785	1,799	1,813	1,827	1,841	1,855	1,868	1,882
-55	0,055	1,586	1,602	1,617	1,633	1,648	1,663	1,678	1,693	1,707	1,722	1,736	1,751	1,765	1,779	1,793	1,807	1,821	1,835	1,848	1,862	1,875
-50	0,077	1,582	1,598	1,613	1,629	1,644	1,659	1,674	1,688	1,703	1,717	1,732	1,746	1,760	1,774	1,788	1,802	1,815	1,829	1,843	1,856	1,869
-45	0,107	1,579	1,595	1,610	1,625	1,640	1,655	1,670	1,685	1,699	1,713	1,728	1,742	1,756	1,770	1,784	1,797	1,811	1,825	1,838	1,851	1,865
-40	0,146	1,577	1,593	1,608	1,623	1,638	1,653	1,667	1,682	1,696	1,710	1,725	1,739	1,753	1,766	1,780	1,794	1,807	1,821	1,834	1,847	1,861
-35	0,197	1,576	1,591	1,606	1,621	1,636	1,651	1,665	1,680	1,694	1,708	1,722	1,736	1,750	1,764	1,777	1,791	1,804	1,818	1,831	1,844	1,858
-30	0,260	1,575	1,591	1,606	1,620	1,635	1,650	1,664	1,678	1,693	1,707	1,721	1,734	1,748	1,762	1,775	1,789	1,802	1,816	1,829	1,842	1,855
-25	0,340	1,575	1,590	1,605	1,620	1,634	1,649	1,663	1,677	1,692	1,706	1,719	1,733	1,747	1,761	1,774	1,788	1,801	1,814	1,827	1,840	1,853
-20	0,438	1,576	1,590	1,605	1,620	1,634	1,649	1,663	1,677	1,691	1,705	1,719	1,733	1,746	1,760	1,773	1,787	1,800	1,813	1,826	1,839	1,852
-15	0,557	1,576	1,591	1,606	1,620	1,635	1,649	1,663	1,677	1,691	1,705	1,719	1,733	1,746	1,760	1,773	1,786	1,800	1,813	1,826	1,839	1,852
-10	0,701	1,577	1,592	1,607	1,621	1,636	1,650	1,664	1,678	1,692	1,706	1,720	1,733	1,747	1,760	1,773	1,787	1,800	1,813	1,826	1,839	1,852
-5	0,873	1,579	1,594	1,608	1,623	1,637	1,651	1,665	1,679	1,693	1,707	1,720	1,734	1,747	1,761	1,774	1,787	1,800	1,813	1,826	1,839	1,852
-1,49	1,013	1,580	1,595	1,609	1,624	1,638	1,652	1,666	1,680	1,694	1,708	1,721	1,735	1,748	1,762	1,775	1,788	1,801	1,814	1,827	1,840	1,853
0	1,078	1,581	1,595	1,610	1,624	1,639	1,653	1,667	1,681	1,695	1,708	1,722	1,735	1,749	1,762	1,775	1,788	1,801	1,814	1,827	1,840	1,853
5	1,317	1,583	1,598	1,612	1,626	1,641	1,655	1,669	1,683	1,696	1,710	1,724	1,737	1,750	1,764	1,777	1,790	1,803	1,816	1,829	1,841	1,854
10	1,597	1,585	1,600	1,614	1,629	1,643	1,657	1,671	1,685	1,698	1,712	1,726	1,739	1,752	1,765	1,779	1,792	1,805	1,818	1,830	1,843	1,856
15	1,921	1,588	1,602	1,617	1,631	1,645	1,659	1,673	1,687	1,701	1,714	1,728	1,741	1,754	1,768	1,781	1,794	1,807	1,820	1,832	1,845	1,858
20	2,294	1,591	1,605	1,620	1,634	1,648	1,662	1,676	1,690	1,703	1,717	1,730	1,744	1,757	1,770	1,783	1,796	1,809	1,822	1,835	1,847	1,860
25	2,719	1,593	1,608	1,623	1,637	1,651	1,665	1,679	1,693	1,706	1,720	1,733	1,747	1,760	1,773	1,786	1,799	1,812	1,825	1,837	1,850	1,863
30	3,204	1,596	1,611	1,626	1,640	1,654	1,668	1,682	1,696	1,709	1,723	1,736	1,750	1,763	1,776	1,789	1,802	1,815	1,827	1,840	1,853	1,865
35	3,751	1,600	1,614	1,629	1,643	1,657	1,671	1,685	1,699	1,713	1,726	1,739	1,753	1,766	1,779	1,792	1,805	1,818	1,831	1,843	1,856	1,868
40	4,367	1,603	1,618	1,632	1,647	1,661	1,675	1,689	1,702	1,716	1,729	1,743	1,756	1,769	1,782	1,795	1,808	1,821	1,834	1,846	1,859	1,872
45	5,057	1,606	1,621	1,636	1,650	1,664	1,678	1,692	1,706	1,720	1,733	1,746	1,760	1,773	1,786	1,799	1,812	1,825	1,837	1,850	1,863	1,875
50	5,827	1,609	1,624	1,639	1,653	1,667	1,682	1,696	1,710	1,723	1,737	1,750	1,763	1,776	1,790	1,803	1,816	1,828	1,841	1,854	1,866	1,879
55	6,683	1,612	1,628	1,642	1,657	1,671	1,685	1,699	1,713	1,727	1,740	1,754	1,767	1,780	1,793	1,806	1,819	1,832	1,845	1,857	1,870	1,882
60	7,630	1,616	1,631	1,646	1,660	1,675	1,689	1,703	1,717	1,731	1,744	1,758	1,771	1,784	1,797	1,810	1,823	1,836	1,849	1,861	1,874	1,886
65	8,676	1,619	1,634	1,649	1,664	1,679	1,693	1,707	1,721	1,735	1,748	1,762	1,775	1,788	1,801	1,814	1,827	1,840	1,853	1,865	1,878	1,890
70	9,826	1,621	1,637	1,653	1,668	1,682	1,697	1,711	1,725	1,739	1,752	1,766	1,779	1,792	1,805	1,818	1,831	1,844	1,857	1,869	1,882	1,894
75	11,088	1,624	1,640	1,656	1,671	1,686	1,700	1,715	1,729	1,742	1,756	1,770	1,783	1,796	1,809	1,823	1,835	1,848	1,861	1,874	1,886	1,899
80	12,470	1,627	1,643	1,659	1,674	1,689	1,704	1,718	1,733	1,746	1,760	1,774	1,787	1,801	1,814	1,827	1,840	1,853	1,865	1,878	1,891	1,903
85	13,978	1,629	1,646	1,662	1,678	1,693	1,708	1,722	1,736	1,750	1,764	1,778	1,791	1,805	1,818	1,831	1,844	1,857	1,870	1,882	1,895	1,907
90	15,623	1,630	1,648	1,665	1,681	1,696	1,711	1,726	1,740	1,754	1,768	1,782	1,796	1,809	1,822	1,835	1,848	1,861	1,874	1,887	1,899	1,912
95	17,413	1,631	1,650	1,667	1,684	1,699	1,715	1,729	1,744	1,758	1,772	1,786	1,800	1,813	1,826	1,840	1,853	1,866	1,878	1,891	1,904	1,916
100	19,358	1,632	1,651	1,669	1,686	1,702	1,718	1,733	1,748	1,762	1,776	1,790	1,804	1,817	1,831	1,844	1,857	1,870	1,883	1,896	1,908	1,921
105	21,471	1,631	1,652	1,671	1,689	1,705	1,721	1,736	1,751	1,766	1,780	1,794	1,808	1,822	1,835	1,848	1,861	1,874	1,887	1,900	1,913	1,925
110	23,765	1,628	1,652	1,672	1,691	1,708	1,724	1,740	1,755	1,769	1,784	1,798	1,812	1,826	1,839	1,853	1,866	1,879	1,892	1,905	1,917	1,930
115	26,258	1,623	1,652	1,673	1,692	1,710	1,727	1,743	1,758	1,773	1,788	1,802	1,816	1,830	1,843	1,857	1,870	1,883	1,896	1,909	1,922	1,935
120	28,974	1,613	1,650	1,673	1,694	1,712	1,729	1,745	1,761	1,776	1,791	1,806	1,820	1,834	1,847	1,861	1,874	1,887	1,901	1,913	1,926	1,939