

R-437A (Freon™ MO49+)

Mélange zéotrope (19,5 % R-125 - 78,5 % R-134a -
1,4 % R-600 - 0,6 % R-601)

Masse molaire en g/mol	103,71
Température de fusion en °C	N/A
Point d'ébullition (sous 1,013 bar)	-32,33
Glissement de température sous 1,013 bar en K	4,27
Température critique en °C	96,3
Pression critique en bar absolu	40,87
Chaleur massique du liquide à + 25°C en kJ/kg.K	1,436
Chaleur massique de la vapeur (sous 1,013 bar) à + 25°C en kJ/kg.K	0,858
Rapport des capacités thermiques massiques (Cp/Cv) à + 25°C et sous 1,013 bar	1,116
Viscosité du liquide à + 25°C en centipoise (10 ⁻³ Pa.s)	0,183
Tension de surface à + 25°C en dyne par centimètre (10 ⁻³ N/m)	7,54
Classification NF-EN 378	A1
GWP (IPCC 4)	1805

◆ Principales applications

Le R-437A (ou Freon™ MO49+) est un mélange non azéotropique de type HFC, destiné à remplacer le R-12 (CFC), les mélanges HCFC à base de R-22 (R-409A, R-401A...) et le R-413A (HFC) dans le domaine du froid domestique, commercial et industriel. Il est utilisé en « drop-in » dans les installations existantes : transports réfrigérés, chambres froides positives ou négatives, cave réfrigérées, meubles et vitrines réfrigérés, réfrigérateurs domestiques, conditionnement d'air automobile. Ne pas utiliser sur des installations à évaporateur noyé ou dans des groupes centrifuges.

◆ Spécifications commerciales

Composition : 78,5 % R-134a (+1,5 %-0,7 %) 19,5 % R-125 (+0,5 % -1,8 %)
1,4 % R-600 (+0,1 %-0,2 %) 0,6 % R-601 (+0,1 %-0,2 %)
Pureté garantie : ≥ 99,5 % poids.
Test ion chlorure : négatif
Teneur en eau : ≤ 10 ppm poids.
Acidité (HCl) : ≤ 1 ppm poids.
Teneur en incondensables (phase gazeuse) : ≤ 1,5 % volume.
Résidus haute ébullition : ≤ 0,01 % volume.

◆ Huiles

Utiliser une huile minérale (MN), alkylbenzène (AB), ou polyolester (POE).
Pour la climatisation automobile, utiliser une polyalkylène glycol (PAG).
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-437A sont régis par le règlement Européen n° 517/2014. La récupération du R-437A est obligatoire au titre du règlement Européen n° 517/2014.

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

Caractéristiques thermodynamiques du R-437A - État saturé

Pression absolue P	LIQUIDE					VAPEUR					Chaleur latente Lv
	Temp. bulle t'	Vol. mass v'	Masse vol. p'	Enthalpie h'	Entropie s'	Temp. rosée t''	Vol. mass v''	Masse vol. p''	Enthalpie h''	Entropie s''	
(Bar)	(°C)	(dm ³ /kg)	(kg/dm ³)	(kJ/kg)	(kJ/kg-K)	(°C)	(m ³ /kg)	(kg/m ³)	(kJ/kg)	(kJ/kg-K)	(kJ/kg)
0,011	-100	0,639	1,565	74,194	0,430	-94,43	13,325	0,075	329,023	1,874	254,829
0,017	-95	0,645	1,551	80,347	0,465	-89,53	8,503	0,118	331,987	1,852	251,639
0,027	-90	0,651	1,537	86,471	0,499	-84,62	5,586	0,179	334,988	1,833	248,517
0,041	-85	0,657	1,523	92,577	0,531	-79,72	3,768	0,265	338,022	1,815	245,445
0,061	-80	0,663	1,509	98,677	0,563	-74,81	2,604	0,384	341,087	1,800	242,410
0,088	-75	0,669	1,495	104,779	0,595	-69,91	1,840	0,543	344,176	1,786	239,398
0,125	-70	0,675	1,481	110,891	0,625	-65,0	1,327	0,754	347,287	1,773	236,397
0,173	-65	0,682	1,467	117,018	0,655	-60,1	0,974	1,026	350,414	1,762	233,397
0,236	-60	0,688	1,453	123,166	0,684	-55,2	0,728	1,374	353,553	1,752	230,387
0,317	-55	0,695	1,438	129,339	0,713	-50,29	0,552	1,811	356,698	1,743	227,358
0,420	-50	0,702	1,424	135,542	0,741	-45,39	0,425	2,352	359,844	1,735	224,301
0,547	-45	0,710	1,409	141,779	0,768	-40,48	0,331	3,017	362,986	1,728	221,207
0,704	-40	0,717	1,395	148,052	0,795	-35,58	0,262	3,823	366,118	1,721	218,066
0,895	-35	0,725	1,380	154,367	0,822	-30,67	0,209	4,790	369,236	1,716	214,870
1,013	-32,33	0,729	1,372	157,761	0,836	-28,05	0,186	5,382	370,896	1,713	213,135
1,125	-30	0,733	1,365	160,725	0,849	-25,77	0,168	5,942	372,334	1,711	211,610
1,399	-25	0,741	1,350	167,130	0,874	-20,87	0,137	7,302	375,407	1,707	208,277
1,723	-20	0,750	1,334	173,587	0,900	-15,96	0,112	8,897	378,449	1,703	204,862
2,103	-15	0,759	1,318	180,098	0,926	-11,06	0,093	10,756	381,455	1,699	201,357
2,545	-10	0,768	1,302	186,668	0,951	-6,16	0,077	12,909	384,418	1,697	197,750
3,054	-5	0,778	1,286	193,300	0,975	-1,26	0,065	15,391	387,333	1,694	194,032
3,639	0	0,788	1,269	200,000	1,000	3,64	0,055	18,240	390,192	1,692	190,192
4,306	5	0,799	1,252	206,772	1,024	8,54	0,047	21,498	392,989	1,690	186,217
5,062	10	0,810	1,234	213,621	1,049	13,43	0,040	25,212	395,715	1,688	182,094
5,915	15	0,822	1,216	220,555	1,073	18,33	0,034	29,437	398,362	1,686	177,807
6,871	20	0,835	1,197	227,579	1,096	23,22	0,029	34,233	400,917	1,685	173,338
7,940	25	0,849	1,178	234,702	1,120	28,11	0,025	39,671	403,370	1,683	168,668
9,129	30	0,864	1,158	241,933	1,144	33,0	0,022	45,836	405,705	1,682	163,771
10,446	35	0,880	1,137	249,284	1,168	37,89	0,019	52,827	407,905	1,680	158,621
11,901	40	0,897	1,115	256,766	1,191	42,77	0,016	60,765	409,951	1,678	153,185
13,503	45	0,916	1,092	264,397	1,215	47,65	0,014	69,797	411,817	1,677	147,420
15,260	50	0,937	1,067	272,196	1,239	52,52	0,012	80,111	413,474	1,674	141,278
17,183	55	0,960	1,042	280,187	1,263	57,39	0,011	91,950	414,881	1,672	134,694
19,283	60	0,986	1,014	288,404	1,287	62,25	0,009	105,635	415,987	1,669	127,583
21,570	65	1,016	0,984	296,892	1,312	67,1	0,008	121,615	416,721	1,665	119,830
24,057	70	1,051	0,951	305,715	1,337	71,94	0,007	140,542	416,981	1,660	111,266
26,757	75	1,094	0,914	314,973	1,363	76,76	0,006	163,426	416,608	1,654	101,635
29,686	80	1,147	0,871	324,837	1,390	81,56	0,005	191,998	415,339	1,646	90,502
32,860	85	1,220	0,820	335,641	1,419	86,32	0,004	229,680	412,657	1,634	77,016
36,296	90	1,335	0,749	348,279	1,453	91,01	0,004	285,489	407,235	1,615	58,957

Caractéristiques thermodynamiques du R-437A - État vapeur surchauffée - Volume massique (dm³/kg)

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
-100	0,006	23088,058	23758,835	24428,950	25098,576	25767,832	26436,804	27105,554	27774,129	28442,561	29110,879	29779,100	30447,242	31115,316	31783,332	32451,298	33119,221	33787,105	34454,957	35122,778	35790,575	36458,344
-95	0,010	14069,183	14467,355	14865,034	15262,341	15659,364	16056,164	16452,788	16849,270	17245,637	17641,907	18038,098	18434,221	18830,286	19226,301	19622,272	20018,206	20414,105	20809,975	21205,819	21601,639	21997,437
-90	0,017	8868,418	9113,256	9357,719	9601,894	9845,847	10089,622	10333,256	10576,772	10820,194	11063,534	11306,807	11550,022	11793,187	12036,309	12279,392	12522,442	12765,461	13008,455	13251,424	13494,373	13737,302
-85	0,026	5764,004	5919,474	6074,652	6229,605	6384,380	6539,011	6693,526	6847,944	7002,282	7156,552	7310,764	7464,925	7619,043	7773,123	7927,169	8081,185	8235,175	8389,141	8543,085	8697,011	8850,918
-80	0,040	3851,920	3953,900	4055,029	4156,288	4257,402	4358,398	4459,298	4560,116	4660,866	4761,558	4862,199	4962,797	5063,356	5163,882	5264,377	5364,846	5465,292	5565,715	5666,120	5766,507	5866,879
-75	0,060	2640,078	2708,388	2776,512	2844,488	2912,346	2980,105	3047,782	3115,391	3182,940	3250,440	3317,895	3385,312	3452,695	3520,048	3587,374	3654,676	3721,957	3789,219	3856,463	3923,692	3990,906
-70	0,087	1851,698	1898,573	1945,555	1992,435	2039,115	2085,712	2132,339	2178,707	2225,123	2271,496	2317,830	2364,130	2410,400	2456,643	2502,862	2549,060	2595,238	2641,399	2687,543	2733,674	2779,791
-65	0,125	1326,367	1359,537	1392,579	1425,518	1458,372	1491,155	1523,878	1556,549	1589,176	1621,767	1654,317	1686,839	1719,335	1751,807	1784,258	1816,688	1849,102	1881,499	1913,881	1946,251	1978,608
-60	0,174	968,522	992,411	1016,190	1039,881	1063,499	1087,055	1110,559	1134,017	1157,436	1180,820	1204,173	1227,500	1250,802	1274,082	1297,343	1320,586	1343,813	1367,025	1390,224	1413,411	1436,587
-55	0,239	719,772	737,323	754,779	772,158	789,472	806,733	823,948	841,122	858,261	875,369	892,450	909,506	926,540	943,554	960,551	977,531	994,497	1011,450	1028,390	1045,319	1062,237
-50	0,323	543,594	556,729	569,782	582,767	595,695	608,575	621,414	634,217	646,989	659,732	672,451	685,148	697,824	710,483	723,125	735,752	748,366	760,968	773,559	786,139	798,709
-45	0,429	416,639	426,643	436,573	446,442	456,261	466,037	475,776	485,482	495,160	504,813	514,443	524,052	533,644	543,219	552,779	562,326	571,860	581,383	590,895	600,398	609,892
-40	0,561	323,682	331,425	339,102	346,724	354,301	361,839	369,344	376,819	384,269	391,695	399,101	406,488	413,858	421,213	428,555	435,884	443,201	450,508	457,805	465,093	472,374
-35	0,725	254,601	260,687	266,712	272,688	278,623	284,523	290,392	296,234	302,052	307,849	313,628	319,389	325,135	330,866	336,585	342,293	347,990	353,677	359,355	365,024	370,687
-30	0,924	202,553	207,405	212,202	216,954	221,668	226,350	231,004	235,633	240,240	244,828	249,398	253,952	258,492	263,019	267,535	272,039	276,534	281,019	285,496	289,965	294,424
-28,05	1,013	185,815	190,274	194,680	199,041	203,366	207,660	211,927	216,169	220,391	224,593	228,779	232,949	237,105	241,249	245,381	249,502	253,614	257,718	261,813	265,900	269,981
-25	1,165	162,835	166,756	170,627	174,456	178,250	182,014	185,752	189,467	193,162	196,839	200,500	204,146	207,779	211,400	215,010	218,610	222,200	225,782	229,356	232,923	236,483
-20	1,453	132,162	135,372	138,535	141,659	144,750	147,814	150,854	153,872	156,872	159,855	162,822	165,776	168,718	171,648	174,568	177,479	180,381	183,275	186,161	189,041	191,915
-15	1,793	108,212	110,871	113,487	116,066	118,614	121,137	123,637	126,118	128,580	131,028	133,460	135,881	138,289	140,687	143,075	145,455	147,826	150,189	152,546	154,897	157,241
-10	2,193	89,316	91,544	93,732	95,885	98,009	100,109	102,188	104,249	106,293	108,322	110,337	112,341	114,334	116,316	118,290	120,255	122,213	124,163	126,107	128,045	129,978
-5	2,659	74,262	76,151	78,000	79,816	81,606	83,372	85,119	86,848	88,561	90,261	91,947	93,623	95,288	96,943	98,590	100,230	101,861	103,486	105,105	106,719	108,327
0	3,198	62,161	63,778	65,357	66,905	68,428	69,928	71,410	72,875	74,325	75,762	77,187	78,601	80,005	81,400	82,788	84,167	85,540	86,906	88,267	89,622	90,972
5	3,816	52,350	53,748	55,110	56,442	57,750	59,037	60,305	61,558	62,796	64,022	65,237	66,441	67,636	68,822	70,000	71,172	72,336	73,495	74,648	75,796	76,939
10	4,522	44,331	45,552	46,738	47,895	49,029	50,142	51,238	52,318	53,385	54,440	55,482	56,518	57,543	58,559	59,569	60,571	61,568	62,558	63,544	64,524	65,499
15	5,324	37,728	38,804	39,846	40,860	41,851	42,823	43,777	44,711	45,644	46,558	47,463	48,358	49,244	50,123	50,994	51,859	52,718	53,571	54,419	55,263	56,102
20	6,229	32,251	33,208	34,132	35,029	35,902	36,757	37,595	38,419	39,230	40,030	40,820	41,600	42,372	43,137	43,895	44,646	45,392	46,132	46,868	47,599	48,325
25	7,246	27,677	28,537	29,363	30,162	30,939	31,697	32,439	33,167	33,882	34,586	35,281	35,968	36,644	37,314	37,977	38,635	39,287	39,934	40,576	41,213	41,847
30	8,384	23,833	24,612	25,357	26,072	26,772	27,449	28,110	28,758	29,393	30,018	30,632	31,239	31,837	32,429	33,014	33,593	34,166	34,735	35,299	35,859	36,415
35	9,652	20,581	21,294	21,972	22,623	23,251	23,861	24,455	25,035	25,603	26,161	26,709	27,249	27,781	28,306	28,825	29,338	29,846	30,349	30,848	31,342	31,833
40	11,058	17,814	18,473	19,095	19,690	20,261	20,814	21,351	21,874	22,386	22,887	23,379	23,862	24,337	24,807	25,270	25,727	26,180	26,627	27,071	27,510	27,946
45	12,614	15,445	16,060	16,636	17,184	17,707	18,212	18,701	19,176	19,639	20,092	20,536	20,971	21,399	21,821	22,236	22,646	23,052	23,452	23,849	24,241	24,630
50	14,330	13,405	13,985	14,524	15,032	15,515	15,979	16,427	16,861	17,283	17,695	18,098	18,492	18,879	19,260	19,635	20,005	20,369	20,730	21,086	21,438	21,787
55	16,217	11,638	12,191	12,699	13,175	13,624	14,054	14,467	14,866	15,252	15,629	15,996	16,356	16,708	17,053	17,393	17,728	18,058	18,384	18,705	19,023	19,338
60	18,287	10,097	10,632	11,116	11,564	11,986	12,386	12,769	13,137	13,494	13,840	14,177	14,506	14,827	15,143	15,453	15,757	16,057	16,353	16,644	16,932	17,217
65	20,554	8,744	9,268	9,735	10,161	10,559	10,934	11,292	11,634	11,964	12,284	12,594	12,897	13,192	13,481	13,765	14,043	14,317	14,586	14,852	15,114	15,373
70	23,033	7,545	8,070	8,524	8,934	9,312	9,666	10,001	10,321	10,628	10,925	11,212	11,492	11,764	12,030	12,290	12,546	12,797	13,043	13,286	13,525	13,762
75	25,743	6,472	7,009	7,457	7,854	8,216	8,552	8,868	9,169	9,456	9,733	10,000	10,259	10,511	10,757	10,997	11,232	11,463	11,689	11,912	12,131	12,348
80	28,704	5,498	6,063	6,513	6,901	7,249	7,570	7,870	8,153	8,423	8,682	8,931	9,172	9,406	9,634	9,856	10,073	10,286	10,495	10,702	10,902	11,100
85	31,948	4,589	5,214	5,671	6,054	6,392	6,699	6,985	7,253	7,507	7,750	7,983	8,208	8,426	8,638	8,844	9,045	9,242	9,435	9,624	9,810	9,993
90	35,525	3,693	4,439	4,913	5,294	5,624	5,920	6,193	6,447	6,688	6,916	7,135	7,345	7,549	7,746	7,938	8,125	8,307	8,486	8,661	8,833	9,001

Caractéristiques thermodynamiques du R-437A - État vapeur surchauffée - Enthalpie (kJ/kg)

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
-100	0,006	325,704	328,733	331,812	334,941	338,120	341,349	344,629	347,959	351,339	354,768	358,247	361,776	365,352	368,978	372,651	376,373	380,142	383,958	387,822	391,732	395,689
-95	0,010	328,680	331,767	334,903	338,087	341,320	344,603	347,936	351,318	354,750	358,230	361,760	365,338	368,964	372,639	376,361	380,131	383,948	387,812	391,723	395,680	399,683
-90	0,017	331,698	334,844	338,036	341,276	344,564	347,900	351,286	354,720	358,203	361,735	365,313	368,943	372,619	376,343	380,114	383,932	387,797	391,708	395,666	399,670	403,720
-85	0,026	334,755	337,959	341,208	344,504	347,847	351,238	354,677	358,163	361,698	365,281	368,911	372,590	376,315	380,088	383,907	387,774	391,687	395,646	399,651	403,701	407,797
-80	0,040	337,847	341,110	344,417	347,769	351,168	354,613	358,105	361,644	365,231	368,865	372,547	376,275	380,050	383,872	387,740	391,655	395,616	399,622	403,674	407,772	411,915
-75	0,060	340,974	344,293	347,659	351,068	354,522	358,022	361,568	365,161	368,800	372,485	376,218	379,996	383,821	387,693	391,610	395,573	399,582	403,636	407,736	411,880	416,069
-70	0,087	344,119	347,503	350,928	354,395	357,906	361,462	365,062	368,700	372,400	376,138	379,922	383,751	387,627	391,548	395,514	399,526	403,583	407,685	411,832	416,023	420,259
-65	0,125	347,290	350,737	354,222	357,748	361,316	364,928	368,584	372,284	376,030	379,820	383,656	387,537	391,463	395,434	399,450	403,511	407,617	411,765	415,962	420,200	424,482
-60	0,174	350,478	353,989	357,536	361,122	364,748	368,417	372,130	375,885	379,685	383,529	387,417	391,350	395,327	399,349	403,415	407,525	411,680	415,878	420,120	424,406	428,736
-55	0,239	353,678	357,254	360,864	364,512	368,198	371,926	375,695	379,507	383,361	387,260	391,201	395,187	399,216	403,289	407,405	411,565	415,769	420,017	424,307	428,641	433,018
-50	0,323	356,884	360,528	364,203	367,913	371,661	375,448	379,276	383,145	387,056	391,009	395,005	399,044	403,126	407,250	411,418	415,629	419,883	424,179	428,519	432,901	437,326
-45	0,429	360,091	363,805	367,547	371,322	375,133	378,981	382,869	386,796	390,765	394,774	398,825	402,918	407,053	411,231	415,451	419,713	424,017	428,363	432,752	437,183	441,656
-40	0,561	363,294	367,080	370,892	374,734	378,609	382,520	386,469	390,456	394,483	398,550	402,658	406,806	410,995	415,226	419,499	423,813	428,168	432,565	437,004	441,484	446,006
-35	0,725	366,486	370,348	374,231	378,142	382,085	386,061	390,072	394,121	398,208	402,334	406,498	410,703	414,948	419,234	423,560	427,927	432,334	436,783	441,272	445,802	450,373
-30	0,924	369,663	373,603	377,562	381,544	385,555	389,598	393,675	397,786	401,935	406,120	410,344	414,607	418,908	423,249	427,630	432,051	436,512	441,012	445,552	450,133	454,754
-28,05	1,013	370,896	374,868	378,856	382,867	386,905	390,975	395,077	399,214	403,387	407,596	411,843	416,129	420,453	424,816	429,218	433,660	438,141	442,662	447,223	451,824	456,464
-25	1,165	372,819	376,841	380,877	384,934	389,016	393,128	397,271	401,448	405,660	409,907	414,191	418,513	422,872	427,270	431,706	436,181	440,696	445,249	449,842	454,474	459,146
-20	1,453	375,948	380,056	384,173	388,307	392,463	396,646	400,858	405,102	409,379	413,689	418,035	422,417	426,836	431,292	435,785	440,316	444,885	449,493	454,139	458,823	463,546
-15	1,793	379,044	383,242	387,444	391,658	395,891	400,148	404,432	408,744	413,088	417,464	421,873	426,317	430,796	435,311	439,863	444,454	449,076	453,730	458,436	463,176	467,952
-10	2,193	382,101	386,394	390,684	394,983	399,296	403,629	407,986	412,370	416,783	421,226	425,703	430,208	434,750	439,326	443,936	448,583	453,265	457,984	462,739	467,531	472,359
-5	2,659	385,113	389,506	393,890	398,275	402,672	407,085	411,518	415,976	420,460	424,974	429,514	434,088	438,693	443,331	448,003	452,709	457,449	462,225	467,037	471,884	476,767
0	3,198	388,074	392,572	397,063	401,551	406,014	410,510	415,024	419,558	424,115	428,699	433,311	437,951	442,622	447,324	452,058	456,826	461,626	466,460	471,329	476,232	481,171
5	3,816	390,976	395,586	400,170	404,744	409,318	413,901	418,497	423,110	427,745	432,403	437,086	441,796	446,534	451,302	456,100	460,930	465,791	470,686	475,613	480,574	485,569
10	4,522	393,812	398,540	403,233	407,909	412,579	417,252	421,934	426,630	431,344	436,078	440,835	445,617	450,425	455,261	460,125	465,016	469,943	474,899	479,886	484,905	489,958
15	5,324	396,571	401,427	406,235	411,018	415,789	420,557	425,330	430,112	434,909	439,723	444,556	449,414	454,292	459,197	464,129	469,089	474,078	479,096	484,145	489,224	494,336
20	6,229	399,245	404,237	409,169	414,067	418,944	423,812	428,679	433,552	438,435	443,331	448,244	453,177	458,131	463,108	468,110	473,137	478,192	483,275	488,387	493,528	498,699
25	7,246	401,821	406,961	412,027	417,046	422,036	427,010	431,977	436,945	441,917	446,900	451,896	456,908	461,938	466,990	472,063	477,161	482,284	487,433	492,609	497,813	503,046
30	8,384	404,285	409,587	414,797	419,948	425,059	430,146	435,218	440,285	445,352	450,424	455,506	460,601	465,711	470,839	475,987	481,157	486,349	491,566	496,809	502,078	507,374
35	9,652	406,622	412,003	417,273	422,464	428,005	433,211	438,396	443,567	448,733	453,900	459,071	464,252	469,445	474,652	479,877	485,121	490,386	495,673	500,984	506,319	511,680
40	11,058	408,810	414,193	420,037	425,855	432,066	438,200	441,503	446,786	452,056	457,322	462,587	467,857	473,136	478,426	483,730	489,051	494,390	499,750	505,130	510,534	515,961
45	12,614	410,827	416,741	422,800	428,098	433,631	439,104	444,534	449,934	455,315	460,684	466,044	471,412	476,780	482,156	487,543	492,943	498,359	503,793	509,246	514,720	520,215
50	14,330	412,644	418,825	424,784	430,992	436,292	441,914	447,480	453,006	458,504	463,983	469,450	474,912	480,373	485,839	491,311	496,794	502,290	507,800	513,328	518,874	524,440
55	16,217	414,224	420,720	426,932	432,951	438,835	444,620	450,333	455,994	461,616	467,211	472,782	478,352	483,911	489,470	495,030	500,600	506,178	511,768	517,373	522,993	528,631
60	18,287	415,216	422,394	428,900	435,160	441,247	447,211	453,084	458,889	464,644	470,362	476,053	481,727	487,389	493,045	498,699	504,357	510,020	515,693	521,377	527,074	532,787
65	20,554	416,544	423,808	430,662	437,196	443,513	449,674	455,721	461,682	467,580	473,429	479,243	485,030	490,800	496,558	502,310	508,060	513,813	519,571	525,343	531,114	536,904
70	23,033	417,942	424,910	432,184	439,038	445,614	451,995	458,232	464,364	470,414	476,404	482,348	488,256	494,139	500,005	505,858	511,706	517,551	523,397	529,249	535,108	540,977
75	25,743	418,832	425,630	433,424	440,656	447,529	454,155	460,604	466,920	473,137	479,277	485,359	491,396	497,399	503,377	509,338	515,286	521,228	527,167	533,107	539,052	545,003
80	28,704	418,875	425,874	434,330	442,014	449,230	456,134	462,816	469,336	475,732	482,035	488,265	494,439	500,569	506,666	512,739	518,794	524,836	530,872	536,904	542,938	548,974
85	31,948	413,597	425,503	434,829	443,063	450,681	457,900	464,844	471,587	478,181	484,659	491,048	497,368	503,634	509,857	516,048	522,215	528,363	534,500	540,629	546,755	552,880
90	35,525	408,794	424,293	434,803	443,721	451,814	459,398	466,638	473,631	480,441	487,112	493,674	500,152	506,563	512,921	519,238	525,523	531,784	538,027	544,258	550,481	556,700

Caractéristiques thermodynamiques du R-437A - 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
-100	0,006	1,902	1,919	1,936	1,953	1,970	1,986	2,002	2,019	2,035	2,051	2,066	2,082	2,097	2,113	2,128	2,143	2,158	2,173	2,188	2,203	2,217
-95	0,010	1,877	1,894	1,911	1,927	1,944	1,960	1,977	1,993	2,009	2,024	2,040	2,055	2,071	2,086	2,101	2,116	2,131	2,146	2,161	2,175	2,190
-90	0,017	1,854	1,871	1,888	1,905	1,921	1,937	1,953	1,969	1,985	2,001	2,016	2,032	2,047	2,062	2,077	2,092	2,107	2,122	2,136	2,151	2,165
-85	0,026	1,834	1,851	1,868	1,884	1,900	1,917	1,933	1,948	1,964	1,980	1,995	2,010	2,025	2,040	2,055	2,070	2,085	2,100	2,114	2,129	2,143
-80	0,040	1,816	1,833	1,850	1,866	1,882	1,898	1,914	1,929	1,945	1,960	1,975	1,991	2,006	2,021	2,036	2,051	2,065	2,080	2,094	2,108	2,123
-75	0,060	1,800	1,817	1,833	1,849	1,865	1,881	1,897	1,913	1,928	1,943	1,959	1,974	1,989	2,003	2,018	2,033	2,047	2,062	2,076	2,090	2,105
-70	0,087	1,786	1,802	1,819	1,835	1,851	1,866	1,882	1,897	1,913	1,928	1,943	1,958	1,973	1,988	2,002	2,017	2,031	2,046	2,060	2,074	2,088
-65	0,125	1,773	1,789	1,806	1,822	1,837	1,853	1,869	1,884	1,899	1,914	1,929	1,944	1,959	1,974	1,988	2,003	2,017	2,031	2,046	2,060	2,074
-60	0,174	1,762	1,778	1,794	1,810	1,826	1,841	1,857	1,872	1,887	1,902	1,917	1,932	1,946	1,961	1,976	1,990	2,004	2,018	2,033	2,047	2,060
-55	0,239	1,751	1,768	1,784	1,799	1,815	1,831	1,846	1,861	1,876	1,891	1,906	1,921	1,935	1,950	1,964	1,979	1,993	2,007	2,021	2,035	2,049
-50	0,323	1,742	1,758	1,774	1,790	1,806	1,821	1,836	1,851	1,866	1,881	1,896	1,911	1,925	1,940	1,954	1,968	1,983	1,997	2,011	2,024	2,038
-45	0,429	1,734	1,750	1,766	1,782	1,797	1,813	1,828	1,843	1,858	1,873	1,887	1,902	1,917	1,931	1,945	1,959	1,973	1,987	2,001	2,015	2,029
-40	0,561	1,727	1,743	1,759	1,775	1,790	1,805	1,821	1,836	1,850	1,865	1,880	1,894	1,909	1,923	1,937	1,951	1,965	1,979	1,993	2,007	2,021
-35	0,725	1,721	1,737	1,753	1,768	1,784	1,799	1,814	1,829	1,844	1,858	1,873	1,887	1,902	1,916	1,930	1,944	1,958	1,972	1,986	2,000	2,013
-30	0,924	1,715	1,731	1,747	1,763	1,778	1,793	1,808	1,823	1,838	1,853	1,867	1,882	1,896	1,910	1,924	1,938	1,952	1,966	1,980	1,993	2,007
-28,05	1,013	1,713	1,729	1,745	1,761	1,776	1,791	1,806	1,821	1,836	1,850	1,865	1,879	1,894	1,908	1,922	1,936	1,950	1,964	1,977	1,991	2,005
-25	1,165	1,710	1,726	1,742	1,758	1,773	1,788	1,803	1,818	1,833	1,847	1,862	1,876	1,891	1,905	1,919	1,933	1,947	1,960	1,974	1,988	2,001
-20	1,453	1,706	1,722	1,738	1,753	1,769	1,784	1,799	1,814	1,828	1,843	1,857	1,872	1,886	1,900	1,914	1,928	1,942	1,956	1,969	1,983	1,996
-15	1,793	1,702	1,718	1,734	1,750	1,765	1,780	1,795	1,810	1,825	1,839	1,854	1,868	1,882	1,896	1,910	1,924	1,938	1,952	1,965	1,979	1,992
-10	2,193	1,699	1,715	1,731	1,746	1,762	1,777	1,792	1,807	1,821	1,836	1,850	1,865	1,879	1,893	1,907	1,921	1,934	1,948	1,962	1,975	1,988
-5	2,659	1,696	1,712	1,728	1,744	1,759	1,774	1,789	1,804	1,819	1,833	1,848	1,862	1,876	1,890	1,904	1,918	1,931	1,945	1,959	1,972	1,985
0	3,198	1,693	1,710	1,726	1,741	1,757	1,772	1,787	1,802	1,816	1,831	1,845	1,860	1,874	1,888	1,902	1,915	1,929	1,943	1,956	1,970	1,983
5	3,816	1,691	1,707	1,724	1,739	1,755	1,770	1,785	1,800	1,815	1,829	1,843	1,858	1,872	1,886	1,900	1,913	1,927	1,941	1,954	1,968	1,981
10	4,522	1,689	1,706	1,722	1,738	1,753	1,768	1,783	1,798	1,813	1,828	1,842	1,856	1,870	1,884	1,898	1,912	1,926	1,939	1,953	1,966	1,979
15	5,324	1,687	1,704	1,720	1,736	1,752	1,767	1,782	1,797	1,812	1,826	1,841	1,855	1,869	1,883	1,897	1,911	1,924	1,938	1,951	1,965	1,978
20	6,229	1,686	1,702	1,719	1,735	1,751	1,766	1,781	1,796	1,811	1,826	1,840	1,854	1,868	1,882	1,896	1,910	1,924	1,937	1,951	1,964	1,977
25	7,246	1,684	1,701	1,718	1,734	1,750	1,765	1,780	1,795	1,810	1,825	1,839	1,854	1,868	1,882	1,896	1,909	1,923	1,937	1,950	1,963	1,977
30	8,384	1,683	1,700	1,717	1,733	1,749	1,764	1,780	1,795	1,810	1,824	1,839	1,853	1,867	1,881	1,895	1,909	1,923	1,936	1,950	1,963	1,976
35	9,652	1,681	1,699	1,716	1,732	1,748	1,764	1,779	1,795	1,810	1,824	1,839	1,853	1,867	1,881	1,895	1,909	1,923	1,936	1,950	1,963	1,976
40	11,058	1,679	1,697	1,715	1,731	1,748	1,764	1,779	1,794	1,809	1,824	1,839	1,853	1,867	1,882	1,895	1,909	1,923	1,937	1,950	1,963	1,976
45	12,614	1,678	1,696	1,714	1,731	1,747	1,763	1,779	1,794	1,809	1,824	1,839	1,853	1,868	1,882	1,896	1,910	1,923	1,937	1,950	1,964	1,977
50	14,330	1,676	1,695	1,713	1,730	1,747	1,763	1,779	1,794	1,809	1,824	1,839	1,854	1,868	1,882	1,896	1,910	1,924	1,937	1,951	1,964	1,977
55	16,217	1,673	1,693	1,711	1,729	1,746	1,762	1,779	1,794	1,810	1,825	1,840	1,854	1,869	1,883	1,897	1,911	1,925	1,938	1,952	1,965	1,978
60	18,287	1,670	1,691	1,710	1,728	1,745	1,762	1,778	1,794	1,810	1,825	1,840	1,855	1,869	1,883	1,898	1,912	1,925	1,939	1,952	1,966	1,979
65	20,554	1,667	1,688	1,708	1,727	1,745	1,762	1,778	1,794	1,810	1,825	1,840	1,855	1,870	1,884	1,898	1,912	1,926	1,940	1,953	1,967	1,980
70	23,033	1,662	1,685	1,706	1,725	1,744	1,761	1,778	1,794	1,810	1,826	1,841	1,856	1,870	1,885	1,899	1,913	1,927	1,941	1,954	1,968	1,981
75	25,743	1,656	1,682	1,703	1,724	1,742	1,760	1,777	1,794	1,810	1,826	1,841	1,856	1,871	1,886	1,900	1,914	1,928	1,942	1,955	1,969	1,982
80	28,704	1,649	1,677	1,700	1,721	1,741	1,759	1,777	1,794	1,810	1,826	1,841	1,857	1,872	1,886	1,901	1,915	1,929	1,943	1,956	1,970	1,983
85	31,948	1,638	1,671	1,696	1,718	1,739	1,758	1,776	1,793	1,810	1,826	1,842	1,857	1,872	1,887	1,901	1,916	1,930	1,944	1,957	1,971	1,984
90	35,525	1,620	1,663	1,691	1,715	1,736	1,756	1,774	1,792	1,809	1,825	1,841	1,857	1,872	1,887	1,902	1,916	1,930	1,944	1,958	1,972	1,985