

R-508B

Azeotropic blend (46 % R-23 - 54 % R-116)

Molecular weight (g/mol)	95.39
Melting point (°C)	N/A
Boiling point (at 1.013 bar)	-87.60
Temperature glide at 1.013 bar (K)	0.44
Critical temperature (°C)	11.2
Critical pressure (bar absolute)	37.72
Specific heat (liquid) at + 25°C (kJ/kg.K)	N/A
Specific heat (vapour) at 1.013 bar and + 25°C (kJ/kg.K)	0.757
Thermal capacity ratio (Cp/Cv) at + 25°C and 1.013 bar	1.136
Viscosity (liquid) at + 25°C in Centipoise (10 ⁻³ Pa.s)	N/A
Surface tension at + 25°C in dyne per centimetre (10 ⁻³ N/m)	N/A
Classification NF-EN 378	A1
GWP (IPCC 4)	13396

🔍 Main applications

R-508B is a HFC "near azeotropic" blend used for very low temperature refrigerating systems. It is used as a replacement for R-503.

🔍 Commercial specifications

Composition: (54 % R-116 - 46 % R-23) (± 2 %/± 2 %).

Purity: ≥ 99.5 % weight.

Water content: ≤ 10 ppm weight.

Acidity (HCl): ≤ 1 ppm weight.

Non-condensables (gas phase): ≤ 1.5 % volume.

High boiling residue: ≤ 0.01 % volume.

Chloride ion test: negative.

🔍 Oils

Use a polyol ester (POE) oil.

Check with **Climalife** regarding the viscosity of the oil selected for your application, and the miscibility with the fluid under consideration.

🔍 Regulation

The use of HFCs are restricted by the European Union Regulation n° 517/2014.

Recovery of halogenated refrigerants is compulsory as defined by the European regulation n° 517/2014.

(For their use, pay attention to the regulation of your country).

Thermodynamic properties of R-508B - Saturated state

Absolute pressure P (bar)	LIQUID					VAPOUR					Latent heat Lv (kJ/kg)
	Bubble point t' (°C)	Volume v' (dm ³ /kg)	Density ρ' (kg/dm ³)	Enthalpy h' (kJ/kg)	Entropy s' (kJ/kg.K)	Dew point t'' (°C)	Volume v'' (m ³ /kg)	Density ρ'' (kg/m ³)	Enthalpy h'' (kJ/kg)	Entropy s'' (kJ/kg.K)	
0.037	-130	0.588	1.701	44.396	0.256	-128.34	3.367	0.297	233.908	1.577	189.513
0.062	-125	0.595	1.681	49.403	0.291	-123.51	2.097	0.477	236.214	1.549	186.812
0.098	-120	0.602	1.662	54.435	0.324	-118.68	1.354	0.739	238.525	1.524	184.090
0.152	-115	0.609	1.642	59.498	0.357	-113.84	0.903	1.107	240.837	1.502	181.339
0.227	-110	0.616	1.622	64.593	0.388	-108.99	0.620	1.612	243.145	1.481	178.552
0.330	-105	0.624	1.602	69.726	0.419	-104.14	0.437	2.287	245.444	1.463	175.718
0.467	-100	0.632	1.582	74.900	0.450	-99.28	0.315	3.171	247.729	1.447	172.828
0.648	-95	0.641	1.561	80.120	0.479	-94.4	0.232	4.307	249.993	1.432	169.873
0.880	-90	0.649	1.540	85.389	0.508	-89.51	0.174	5.740	252.231	1.419	166.842
1.013	-87.6	0.654	1.530	87.935	0.522	-87.16	0.153	6.548	253.293	1.413	165.358
1.174	-85	0.659	1.518	90.714	0.537	-84.6	0.133	7.525	254.436	1.407	163.722
1.540	-80	0.668	1.497	96.098	0.565	-79.69	0.103	9.718	256.598	1.396	160.500
1.988	-75	0.678	1.474	101.549	0.593	-74.75	0.081	12.383	258.711	1.386	157.162
2.531	-70	0.689	1.451	107.071	0.620	-69.81	0.064	15.592	260.763	1.376	153.692
3.181	-65	0.701	1.427	112.672	0.647	-64.86	0.051	19.425	262.744	1.368	150.072
3.952	-60	0.713	1.403	118.360	0.674	-59.9	0.042	23.974	264.642	1.360	146.282
4.856	-55	0.726	1.378	124.143	0.700	-54.93	0.034	29.343	266.444	1.353	142.300
5.909	-50	0.740	1.352	130.032	0.727	-49.95	0.028	35.656	268.132	1.346	138.100
7.124	-45	0.755	1.325	136.038	0.753	-44.97	0.023	43.059	269.690	1.339	133.652
8.518	-40	0.772	1.296	142.176	0.779	-39.98	0.019	51.732	271.093	1.332	128.918
10.107	-35	0.790	1.266	148.462	0.805	-34.99	0.016	61.897	272.316	1.325	123.854
11.907	-30	0.810	1.234	154.918	0.831	-30.0	0.014	73.838	273.322	1.318	118.405
13.936	-25	0.833	1.201	161.571	0.858	-25.0	0.011	87.931	274.068	1.311	112.497
16.214	-20	0.859	1.164	168.460	0.885	-20.0	0.010	104.689	274.492	1.303	106.032
18.762	-15	0.889	1.124	175.635	0.912	-15.0	0.008	124.852	274.508	1.295	98.873
21.602	-10	0.926	1.080	183.177	0.940	-10.0	0.007	149.548	273.989	1.285	90.813
24.762	-5	0.971	1.030	191.215	0.969	-5.0	0.006	180.663	272.726	1.273	81.511
28.275	0	1.031	0.970	200.000	1.000	0.0	0.005	221.811	270.326	1.257	70.326
32.185	5	1.123	0.891	210.156	1.035	5.0	0.004	281.920	265.848	1.236	55.692
36.568	10	1.340	0.746	225.076	1.087	10.0	0.002	407.000	254.645	1.191	29.568

Thermodynamic properties of R-508B - (superheated vapour) - Volume (dm³/kg)

Sat. Temp. °C	Sat. Pressure bar	Superheat (°C)																				
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
-130	0.031	3996.710	4139.547	4281.806	4423.846	4565.177	4706.476	4847.597	4988.580	5129.453	5270.239	5410.954	5551.611	5692.219	5832.787	5973.320	6113.825	6254.304	6394.761	6535.199	6675.621	6816.028
-125	0.053	2416.393	2500.537	2584.249	2667.643	2750.801	2833.777	2916.612	2999.337	3081.974	3164.538	3247.044	3329.502	3411.918	3494.301	3576.653	3658.981	3741.287	3823.573	3905.843	3988.099	4070.341
-120	0.087	1521.062	1572.837	1624.282	1675.482	1726.495	1777.364	1828.121	1878.787	1929.381	1979.915	2030.400	2080.844	2131.253	2181.633	2231.987	2282.320	2332.633	2382.930	2433.211	2483.480	2533.737
-115	0.137	992.684	1025.828	1058.713	1091.405	1123.947	1156.374	1188.708	1220.967	1253.167	1285.316	1317.424	1349.496	1381.539	1413.556	1445.551	1477.527	1509.486	1541.430	1573.361	1605.281	1637.190
-110	0.209	669.116	691.109	712.897	734.528	756.037	777.452	798.789	820.065	841.289	862.471	883.618	904.734	925.824	946.892	967.940	988.972	1009.988	1030.992	1051.983	1072.964	1093.936
-105	0.309	464.242	479.322	494.235	509.019	523.703	538.307	552.847	567.334	581.777	596.184	610.561	624.910	639.237	653.545	667.835	682.110	696.371	710.621	724.860	739.090	753.311
-100	0.445	330.537	341.191	351.706	362.114	372.438	382.693	392.894	403.050	413.168	423.255	433.314	443.350	453.367	463.365	473.349	483.319	493.276	503.224	513.161	523.090	533.011
-95	0.623	240.847	248.583	256.202	263.729	271.185	278.582	285.932	293.243	300.521	307.771	314.997	322.203	329.391	336.563	343.721	350.868	358.003	365.129	372.246	379.355	386.456
-90	0.855	179.158	184.918	190.577	196.157	201.675	207.143	212.569	217.961	223.324	228.662	233.978	239.277	244.559	249.827	255.083	260.328	265.563	270.789	276.007	281.218	286.422
-87.16	1.013	152.707	157.629	162.458	167.214	171.912	176.564	181.177	185.758	190.311	194.842	199.352	203.846	208.324	212.788	217.241	221.684	226.117	230.541	234.959	239.369	243.772
-85	1.148	135.748	140.136	144.436	148.668	152.845	156.977	161.073	165.139	169.178	173.195	177.194	181.175	185.142	189.097	193.040	196.973	200.897	204.813	208.721	212.623	216.518
-80	1.514	104.555	107.970	111.307	114.583	117.811	120.999	124.154	127.282	130.387	133.471	136.539	139.591	142.630	145.657	148.674	151.682	154.682	157.673	160.659	163.637	166.611
-75	1.963	81.711	84.421	87.061	89.646	92.188	94.694	97.171	99.623	102.053	104.465	106.862	109.244	111.615	113.975	116.325	118.667	121.001	123.328	125.649	127.964	130.273
-70	2.508	64.687	66.876	69.003	71.079	73.117	75.121	77.098	79.053	80.988	82.907	84.811	86.702	88.582	90.452	92.314	94.167	96.013	97.853	99.687	101.515	103.339
-65	3.161	51.796	53.595	55.337	57.033	58.692	60.321	61.925	63.508	65.074	66.623	68.160	69.684	71.198	72.703	74.199	75.688	77.171	78.647	80.118	81.583	83.044
-60	3.934	41.891	43.395	44.843	46.250	47.622	48.965	50.286	51.587	52.872	54.141	55.399	56.645	57.881	59.109	60.329	61.542	62.749	63.950	65.146	66.337	67.523
-55	4.842	34.179	35.454	36.678	37.860	39.011	40.135	41.238	42.321	43.390	44.444	45.487	46.519	47.542	48.557	49.564	50.565	51.560	52.549	53.534	54.514	55.490
-50	5.898	28.099	29.197	30.245	31.253	32.231	33.184	34.116	35.031	35.930	36.817	37.692	38.557	39.414	40.263	41.105	41.940	42.770	43.595	44.415	45.231	46.043
-45	7.116	23.251	24.210	25.119	25.991	26.833	27.651	28.448	29.229	29.995	30.749	31.492	32.226	32.951	33.669	34.381	35.086	35.786	36.481	37.172	37.858	38.541
-40	8.513	19.343	20.193	20.993	21.756	22.490	23.199	23.890	24.564	25.224	25.872	26.510	27.138	27.759	28.373	28.980	29.581	30.178	30.769	31.357	31.940	32.520
-35	10.104	16.161	16.926	17.639	18.315	18.962	19.585	20.189	20.777	21.351	21.914	22.467	23.011	23.547	24.077	24.600	25.118	25.630	26.139	26.643	27.143	27.640
-30	11.905	13.545	14.243	14.888	15.494	16.070	16.623	17.157	17.675	18.180	18.673	19.157	19.632	20.100	20.561	21.016	21.465	21.910	22.350	22.787	23.220	23.649
-25	13.936	11.373	12.021	12.612	13.162	13.681	14.177	14.653	15.114	15.562	15.998	16.425	16.844	17.255	17.659	18.058	18.452	18.841	19.225	19.606	19.983	20.357
-20	16.214	9.552	10.165	10.714	11.219	11.692	12.141	12.570	12.983	13.384	13.773	14.153	14.524	14.889	15.247	15.599	15.946	16.289	16.627	16.962	17.293	17.621
-15	18.761	8.010	8.602	9.119	9.589	10.024	10.434	10.824	11.198	11.559	11.909	12.249	12.582	12.907	13.225	13.539	13.847	14.151	14.451	14.747	15.040	15.330
-10	21.601	6.687	7.274	7.770	8.212	8.617	8.995	9.352	9.693	10.020	10.337	10.644	10.943	11.235	11.521	11.802	12.077	12.348	12.615	12.879	13.139	13.397
-5	24.760	5.536	6.138	6.621	7.042	7.421	7.773	8.102	8.415	8.715	9.003	9.281	9.552	9.816	10.074	10.326	10.574	10.817	11.056	11.292	11.525	11.755
0	28.272	4.509	5.156	5.636	6.041	6.400	6.729	7.035	7.324	7.599	7.863	8.117	8.364	8.603	8.837	9.065	9.288	9.508	9.723	9.936	10.145	10.351
5	32.182	3.548	4.301	4.787	5.180	5.523	5.832	6.118	6.386	6.639	6.882	7.115	7.340	7.558	7.771	7.978	8.181	8.379	8.574	8.766	8.955	9.140
10	36.567	2.457	3.548	4.048	4.433	4.760	5.052	5.320	5.569	5.804	6.027	6.241	6.448	6.647	6.841	7.030	7.214	7.394	7.571	7.744	7.915	8.083

Thermodynamic properties of R-508B - (superheated vapour) - Enthalpy (kJ/kg)

Sat. Temp. °C	Sat. Pressure bar	Superheat (°C)																				
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
-130	0.031	233.120	235.688	238.282	240.908	243.569	246.267	249.003	251.778	254.593	257.449	260.346	263.283	266.262	269.281	272.342	275.444	278.587	281.771	284.996	288.262	291.568
-125	0.053	235.503	238.130	240.781	243.461	246.174	248.922	251.706	254.529	257.392	260.293	263.236	266.218	269.241	272.305	275.409	278.555	281.741	284.967	288.235	291.542	294.891
-120	0.087	237.892	240.583	243.293	246.029	248.795	251.595	254.430	257.303	260.213	263.162	266.151	269.179	272.247	275.356	278.505	281.694	284.923	288.193	291.503	294.853	298.243
-115	0.137	240.283	243.039	245.812	248.606	251.429	254.283	257.170	260.093	263.053	266.050	269.086	272.162	275.276	278.430	281.624	284.857	288.131	291.444	294.797	298.190	301.623
-110	0.209	242.667	245.494	248.331	251.187	254.068	256.978	259.920	262.895	265.906	268.953	272.038	275.161	278.323	281.524	284.763	288.042	291.360	294.718	298.115	301.551	305.026
-105	0.309	245.038	247.939	250.845	253.766	256.708	259.676	262.674	265.703	268.767	271.866	275.001	278.173	281.383	284.631	287.918	291.243	294.607	298.009	301.450	304.930	308.449
-100	0.445	247.391	250.369	253.347	256.335	259.341	262.370	265.426	268.512	271.631	274.783	277.970	281.193	284.452	287.749	291.083	294.456	297.866	301.314	304.800	308.325	311.888
-95	0.623	249.716	252.777	255.830	258.889	261.962	265.055	268.172	271.317	274.492	277.699	280.939	284.214	287.525	290.872	294.255	297.676	301.133	304.628	308.161	311.731	315.338
-90	0.855	252.008	255.155	258.289	261.422	264.565	267.724	270.905	274.110	277.344	280.608	283.904	287.233	290.596	293.994	297.428	300.898	304.404	307.947	311.526	315.143	318.796
-87.16	1.013	253.293	256.491	259.671	262.849	266.033	269.231	272.449	275.690	278.958	282.256	285.584	288.944	292.338	295.766	299.230	302.728	306.262	309.833	313.439	317.082	320.762
-85	1.148	254.260	257.498	260.715	263.927	267.143	270.372	273.618	276.888	280.182	283.506	286.859	290.243	293.661	297.112	300.598	304.118	307.674	311.266	314.894	318.557	322.257
-80	1.514	256.462	259.797	263.103	266.397	269.690	272.992	276.308	279.643	283.001	286.386	289.798	293.241	296.714	300.220	303.759	307.332	310.939	314.581	318.258	321.970	325.717
-75	1.963	258.607	262.045	265.445	268.826	272.200	275.578	278.966	282.371	285.795	289.244	292.718	296.220	299.752	303.314	306.908	310.535	314.194	317.887	321.615	325.376	329.172
-70	2.508	260.686	264.234	267.734	271.206	274.666	278.124	281.588	285.065	288.559	292.073	295.612	299.176	302.767	306.388	310.039	313.721	317.435	321.181	324.960	328.772	332.617
-65	3.161	262.689	266.355	269.961	273.531	277.081	280.623	284.167	287.720	291.286	294.870	298.475	302.103	305.757	309.438	313.148	316.887	320.657	324.457	328.289	332.153	336.050
-60	3.934	264.604	268.397	272.118	275.791	279.437	283.069	286.697	290.329	293.971	297.627	301.302	304.997	308.716	312.459	316.230	320.028	323.855	327.712	331.599	335.517	339.465
-55	4.842	266.418	270.351	274.194	277.979	281.727	285.454	289.171	292.886	296.608	300.340	304.087	307.852	311.638	315.447	319.281	323.140	327.027	330.941	334.885	338.857	342.860
-50	5.898	268.116	272.202	276.180	280.085	283.942	287.770	291.581	295.386	299.191	303.002	306.825	310.664	314.520	318.396	322.295	326.218	330.166	334.141	338.142	342.172	346.229
-45	7.116	269.680	273.937	278.062	282.098	286.074	290.010	293.921	297.819	301.713	305.609	309.512	313.426	317.356	321.303	325.270	329.258	333.270	337.307	341.368	345.456	349.571
-40	8.513	271.089	275.539	279.828	284.007	288.111	292.164	296.183	300.181	304.168	308.153	312.140	316.134	320.140	324.161	328.199	332.256	336.334	340.435	344.569	348.740	352.981
-35	10.104	272.314	276.987	281.461	285.799	290.044	294.223	298.358	302.463	306.550	310.628	314.704	318.783	322.870	326.967	331.079	335.208	339.355	343.522	347.710	351.921	356.155
-30	11.905	273.322	278.259	282.943	287.459	291.859	296.177	300.437	304.657	308.851	313.029	317.198	321.366	325.538	329.716	333.906	338.109	342.327	346.563	350.819	355.094	359.391
-25	13.936	274.068	279.320	284.251	288.971	293.544	298.014	302.410	306.755	311.063	315.348	319.617	323.879	328.140	332.403	336.674	340.955	345.248	349.556	353.881	358.224	362.586
-20	16.214	274.492	280.138	285.362	290.314	295.083	299.722	304.268	308.748	313.193	317.578	321.954	326.316	330.671	335.024	339.379	343.742	348.113	352.496	356.893	361.306	365.735
-15	18.761	274.508	280.664	286.243	291.468	296.459	301.287	305.998	310.626	315.191	319.712	324.202	328.670	333.125	337.572	342.017	346.465	350.918	355.379	359.851	364.336	368.836
-10	21.601	273.990	280.838	286.858	292.407	297.654	302.695	307.590	312.379	317.089	321.743	326.354	330.936	335.496	340.043	344.583	349.120	353.659	358.202	362.752	367.313	371.885
-5	24.760	272.727	280.577	287.163	293.102	298.647	303.929	309.029	313.995	318.864	323.661	328.403	333.100	337.778	342.431	347.070	351.702	356.330	360.958	365.591	370.230	374.878
0	28.272	270.329	279.775	287.105	293.520	299.413	304.971	310.299	315.462	320.504	325.455	330.338	335.170	339.963	344.727	349.472	354.205	358.925	363.643	368.361	373.082	377.808
5	32.182	265.853	278.281	286.618	293.618	299.921	305.795	311.379	316.760	321.991	327.111	332.145	337.115	342.036	346.920	351.776	356.611	361.433	366.245	371.053	375.860	380.668
10	36.567	254.650	275.873	285.596	293.323	300.111	306.347	312.222	317.846	323.286	328.589	333.789	338.910	343.968	348.980	353.954	358.902	363.828	368.741	373.643	378.540	383.435

Thermodynamic properties of R-508B - (superheated vapour) - Entropy (kJ/kg.K)

Sat. Temp. °C	Sat. Pressure bar	Superheat (°C)																				
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
-130	0.031	1.588	1.605	1.623	1.639	1.656	1.672	1.688	1.704	1.720	1.735	1.750	1.765	1.780	1.795	1.809	1.824	1.838	1.852	1.866	1.880	1.894
-125	0.053	1.558	1.575	1.592	1.609	1.625	1.641	1.657	1.673	1.688	1.703	1.718	1.733	1.748	1.762	1.777	1.791	1.805	1.819	1.833	1.847	1.860
-120	0.087	1.531	1.548	1.565	1.581	1.598	1.614	1.629	1.645	1.660	1.675	1.690	1.705	1.719	1.734	1.748	1.762	1.776	1.790	1.804	1.817	1.831
-115	0.137	1.507	1.524	1.541	1.557	1.573	1.589	1.605	1.620	1.635	1.650	1.665	1.679	1.694	1.708	1.722	1.736	1.750	1.764	1.777	1.791	1.804
-110	0.209	1.485	1.502	1.519	1.535	1.551	1.567	1.582	1.598	1.613	1.627	1.642	1.657	1.671	1.685	1.699	1.713	1.727	1.741	1.754	1.768	1.781
-105	0.309	1.466	1.483	1.500	1.516	1.532	1.547	1.563	1.578	1.593	1.607	1.622	1.636	1.651	1.665	1.679	1.692	1.706	1.720	1.733	1.747	1.760
-100	0.445	1.449	1.466	1.483	1.499	1.514	1.530	1.545	1.560	1.575	1.590	1.604	1.618	1.632	1.646	1.660	1.674	1.688	1.701	1.715	1.728	1.741
-95	0.623	1.434	1.451	1.467	1.483	1.499	1.514	1.530	1.544	1.559	1.574	1.588	1.602	1.616	1.630	1.644	1.658	1.671	1.685	1.698	1.711	1.724
-90	0.855	1.420	1.437	1.453	1.469	1.485	1.500	1.516	1.530	1.545	1.560	1.574	1.588	1.602	1.616	1.629	1.643	1.656	1.670	1.683	1.696	1.709
-87.16	1.013	1.413	1.430	1.446	1.462	1.478	1.493	1.508	1.523	1.538	1.552	1.566	1.581	1.594	1.608	1.622	1.635	1.649	1.662	1.675	1.688	1.701
-85	1.148	1.408	1.425	1.441	1.457	1.473	1.488	1.503	1.518	1.532	1.547	1.561	1.575	1.589	1.603	1.616	1.630	1.643	1.657	1.670	1.683	1.696
-80	1.514	1.396	1.413	1.430	1.446	1.462	1.477	1.492	1.507	1.521	1.536	1.550	1.564	1.578	1.591	1.605	1.618	1.632	1.645	1.658	1.671	1.684
-75	1.963	1.386	1.403	1.420	1.436	1.451	1.467	1.482	1.497	1.511	1.525	1.540	1.554	1.567	1.581	1.595	1.608	1.621	1.634	1.647	1.660	1.673
-70	2.508	1.377	1.394	1.411	1.427	1.442	1.458	1.473	1.488	1.502	1.516	1.530	1.544	1.558	1.572	1.585	1.599	1.612	1.625	1.638	1.651	1.664
-65	3.161	1.368	1.386	1.402	1.418	1.434	1.450	1.465	1.479	1.494	1.508	1.522	1.536	1.550	1.564	1.577	1.590	1.604	1.617	1.630	1.642	1.655
-60	3.934	1.360	1.378	1.395	1.411	1.427	1.442	1.457	1.472	1.487	1.501	1.515	1.529	1.543	1.556	1.570	1.583	1.596	1.609	1.622	1.635	1.648
-55	4.842	1.353	1.371	1.388	1.404	1.420	1.435	1.451	1.465	1.480	1.494	1.508	1.522	1.536	1.550	1.563	1.576	1.589	1.602	1.615	1.628	1.641
-50	5.898	1.346	1.364	1.381	1.398	1.414	1.429	1.444	1.459	1.474	1.488	1.502	1.516	1.530	1.544	1.557	1.570	1.583	1.596	1.609	1.622	1.635
-45	7.116	1.339	1.357	1.375	1.391	1.408	1.423	1.439	1.454	1.468	1.483	1.497	1.511	1.525	1.538	1.552	1.565	1.578	1.591	1.604	1.617	1.629
-40	8.513	1.332	1.351	1.369	1.386	1.402	1.418	1.433	1.448	1.463	1.478	1.492	1.506	1.520	1.533	1.547	1.560	1.573	1.586	1.599	1.612	1.624
-35	10.104	1.325	1.345	1.363	1.380	1.397	1.413	1.428	1.444	1.458	1.473	1.487	1.501	1.515	1.529	1.542	1.555	1.569	1.582	1.594	1.607	1.620
-30	11.905	1.318	1.338	1.357	1.375	1.392	1.408	1.424	1.439	1.454	1.469	1.483	1.497	1.511	1.525	1.538	1.551	1.565	1.578	1.590	1.603	1.616
-25	13.936	1.311	1.332	1.351	1.370	1.387	1.403	1.419	1.435	1.450	1.465	1.479	1.493	1.507	1.521	1.534	1.548	1.561	1.574	1.587	1.600	1.612
-20	16.214	1.303	1.326	1.346	1.364	1.382	1.399	1.415	1.431	1.446	1.461	1.475	1.489	1.504	1.517	1.531	1.544	1.558	1.571	1.583	1.596	1.609
-15	18.761	1.295	1.318	1.339	1.359	1.377	1.394	1.411	1.426	1.442	1.457	1.472	1.486	1.500	1.514	1.528	1.541	1.554	1.567	1.580	1.593	1.606
-10	21.601	1.285	1.311	1.333	1.353	1.372	1.389	1.406	1.422	1.438	1.453	1.468	1.483	1.497	1.511	1.525	1.538	1.551	1.565	1.578	1.590	1.603
-5	24.760	1.273	1.302	1.326	1.347	1.366	1.384	1.402	1.418	1.434	1.450	1.465	1.479	1.494	1.508	1.522	1.535	1.549	1.562	1.575	1.588	1.600
0	28.272	1.257	1.292	1.318	1.340	1.361	1.379	1.397	1.414	1.430	1.446	1.461	1.476	1.491	1.505	1.519	1.532	1.546	1.559	1.572	1.585	1.598
5	32.182	1.236	1.280	1.309	1.333	1.354	1.374	1.392	1.410	1.426	1.442	1.458	1.473	1.487	1.502	1.516	1.529	1.543	1.556	1.570	1.583	1.595
10	36.567	1.191	1.265	1.299	1.325	1.348	1.368	1.387	1.405	1.422	1.438	1.454	1.469	1.484	1.498	1.513	1.526	1.540	1.554	1.567	1.580	1.593