

R-404A

Zeotropic blend (52 % R-143a - 44 % R-125 - 4 % R-134a)

Molecular weight (g/mol)	97.60
Melting point (°C)	N/A
Boiling point (at 1.013 bar)	-46.23
Temperature glide at 1.013 bar (K)	0.75
Critical temperature (°C)	72.0
Critical pressure (bar absolute)	37.29
Specific heat (liquid) at + 25°C (kJ/kg.K)	1.542
Specific heat (vapour) at 1.013 bar and + 25°C (kJ/kg.K)	0.877
Thermal capacity ratio (Cp/Cv) at + 25°C and 1.013 bar	1.118
Viscosity (liquid) at + 25°C in Centipoise (10 ⁻³ Pa.s)	0.128
Surface tension at + 25°C in dyne per centimetre (10 ⁻³ N/m)	4.49
Classification NF-EN 378	A1
GWP (IPCC 4)	3922

🔍 Main applications

R-404A is a "near azeotropic" HFC replacement blend, specially developed for commercial, industrial and transport refrigeration. R-404A was mainly used in new refrigeration units in supermarkets, refrigerated storage rooms, food refrigerating systems, cold cabinets for the storage of refrigerated food and for refrigerated vehicles.

R-448A and R-407F are simple alternatives to R-404A in direct expansion systems.

🔍 Commercial specifications

Composition: (52 % R-143a - 44 % R-125 - 4 % R-134a) (±1 % / ±2 % / ±2 %).

Purity: ≥ 99.5 % weight.

Water content: ≤ 10 ppm weight.

Chloride ion test: negative.

Acidity (HCl): ≤ 1 ppm weight.

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

High boiling residue: ≤ 0.01 % volume.

🔍 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-404A - 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)	
0.143	-80	0.711	1.407	97.807	0.561	-78.97	1.143	0.875	319.791	1.708	221.984
0.201	-75	0.718	1.392	103.881	0.592	-74.02	0.831	1.203	322.813	1.695	218.932
0.277	-70	0.726	1.378	109.968	0.622	-69.07	0.616	1.623	325.846	1.683	215.879
0.374	-65	0.734	1.363	116.076	0.652	-64.11	0.464	2.153	328.885	1.673	212.809
0.498	-60	0.742	1.348	122.212	0.681	-59.15	0.355	2.813	331.924	1.664	209.712
0.652	-55	0.750	1.333	128.383	0.710	-54.19	0.276	3.624	334.957	1.655	206.574
0.842	-50	0.759	1.318	134.593	0.738	-49.22	0.217	4.608	337.978	1.648	203.385
1.013	-46.23	0.766	1.306	139.308	0.759	-45.48	0.182	5.481	340.246	1.643	200.938
1.074	-45	0.768	1.302	140.847	0.765	-44.26	0.173	5.792	340.981	1.642	200.134
1.353	-40	0.777	1.287	147.152	0.793	-39.29	0.139	7.202	343.960	1.636	196.808
1.685	-35	0.787	1.271	153.511	0.819	-34.32	0.113	8.868	346.909	1.631	193.398
2.078	-30	0.797	1.255	159.930	0.846	-29.34	0.092	10.824	349.820	1.626	189.890
2.537	-25	0.807	1.239	166.413	0.872	-24.37	0.076	13.105	352.688	1.622	186.275
3.071	-20	0.818	1.222	172.966	0.898	-19.4	0.063	15.752	355.504	1.619	182.537
3.686	-15	0.830	1.205	179.595	0.924	-14.42	0.053	18.807	358.260	1.615	178.665
4.391	-10	0.842	1.187	186.305	0.949	-9.44	0.045	22.323	360.948	1.613	174.642
5.194	-5	0.856	1.169	193.105	0.975	-4.47	0.038	26.355	363.557	1.610	170.452
6.102	0	0.870	1.150	200.000	1.000	0.51	0.032	30.969	366.075	1.608	166.075
7.125	5	0.884	1.131	207.001	1.025	5.49	0.028	36.243	368.487	1.605	161.486
8.271	10	0.901	1.110	214.117	1.050	10.47	0.024	42.266	370.777	1.603	156.659
9.550	15	0.918	1.089	221.362	1.075	15.45	0.020	49.148	372.924	1.601	151.562
10.972	20	0.937	1.067	228.749	1.100	20.43	0.018	57.023	374.904	1.598	146.155
12.546	25	0.958	1.044	236.297	1.125	25.4	0.015	66.055	376.691	1.596	140.394
14.283	30	0.981	1.019	244.029	1.150	30.38	0.013	76.458	378.249	1.593	134.220
16.195	35	1.007	0.993	251.974	1.176	35.36	0.011	88.510	379.533	1.589	127.558
18.294	40	1.037	0.965	260.172	1.201	40.34	0.010	102.591	380.482	1.585	120.311
20.593	45	1.071	0.934	268.677	1.227	45.31	0.008	119.244	381.012	1.580	112.335
23.106	50	1.112	0.899	277.573	1.254	50.28	0.007	139.291	380.993	1.574	103.420
25.851	55	1.163	0.860	286.992	1.282	55.25	0.006	164.092	380.212	1.566	93.220
28.849	60	1.230	0.813	297.181	1.312	60.22	0.005	196.197	378.278	1.555	81.097
32.126	65	1.328	0.753	308.712	1.345	65.18	0.004	241.607	374.283	1.539	65.572
35.725	70	1.526	0.655	323.957	1.388	70.11	0.003	324.822	364.663	1.507	40.706

Thermodynamic properties of R-404A - (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
-80	0.133	1224.686	1258.080	1291.323	1324.433	1357.426	1390.317	1423.122	1455.850	1488.513	1521.119	1553.675	1586.188	1618.664	1651.107	1683.521	1715.909	1748.274	1780.619	1812.946	1845.257	1877.553
-75	0.188	884.114	907.894	931.550	955.096	978.544	1001.907	1025.196	1048.420	1071.588	1094.707	1117.783	1140.822	1163.828	1186.804	1209.755	1232.683	1255.591	1278.480	1301.354	1324.212	1347.058
-70	0.261	650.955	668.270	685.480	702.597	719.632	736.594	753.494	770.337	787.132	803.885	820.599	837.281	853.934	870.561	887.165	903.749	920.315	936.864	953.399	969.920	986.430
-65	0.355	487.920	500.788	513.567	526.266	538.895	551.462	563.973	576.437	588.858	601.242	613.592	625.914	638.210	650.483	662.735	674.969	687.187	699.390	711.579	723.757	735.924
-60	0.475	371.691	381.438	391.107	400.708	410.246	419.731	429.168	438.563	447.920	457.245	466.540	475.809	485.055	494.281	503.488	512.679	521.854	531.017	540.167	549.307	558.436
-55	0.625	287.346	294.861	302.307	309.692	317.023	324.306	331.547	338.751	345.922	353.063	360.178	367.270	374.341	381.394	388.430	395.451	402.458	409.454	416.438	423.412	430.377
-50	0.810	225.131	231.022	236.850	242.623	248.349	254.032	259.678	265.290	270.873	276.429	281.962	287.473	292.966	298.443	303.904	309.351	314.786	320.210	325.624	331.029	336.425
-45.48	1.013	182.439	187.228	191.959	196.641	201.279	205.878	210.443	214.978	219.486	223.970	228.432	232.875	237.301	241.712	246.109	250.493	254.865	259.227	263.580	267.924	272.261
-45	1.036	178.546	183.234	187.866	192.449	196.989	201.490	205.957	210.394	214.805	219.192	223.557	227.904	232.233	236.547	240.848	245.135	249.412	253.678	257.935	262.183	266.424
-40	1.310	143.175	146.962	150.696	154.385	158.035	161.650	165.235	168.792	172.324	175.835	179.327	182.801	186.260	189.705	193.137	196.557	199.967	203.367	206.759	210.143	213.520
-35	1.636	115.973	119.073	122.124	125.134	128.107	131.049	133.962	136.850	139.716	142.563	145.391	148.203	151.002	153.787	156.560	159.323	162.076	164.820	167.556	170.285	173.007
-30	2.022	94.802	97.373	99.898	102.384	104.836	107.259	109.656	112.030	114.383	116.718	119.036	121.340	123.630	125.909	128.176	130.434	132.682	134.923	137.155	139.381	141.601
-25	2.475	78.143	80.301	82.415	84.493	86.539	88.558	90.553	92.526	94.480	96.417	98.338	100.246	102.142	104.026	105.900	107.765	109.622	111.471	113.312	115.148	116.977
-20	3.002	64.897	66.730	68.521	70.277	72.003	73.704	75.381	77.039	78.679	80.303	81.912	83.509	85.094	86.669	88.234	89.790	91.338	92.880	94.414	95.943	97.465
-15	3.610	54.265	55.838	57.371	58.871	60.343	61.791	63.216	64.623	66.013	67.388	68.749	70.099	71.437	72.766	74.085	75.396	76.700	77.997	79.288	80.573	81.852
-10	4.308	45.652	47.018	48.344	49.639	50.906	52.150	53.373	54.579	55.768	56.943	58.105	59.256	60.396	61.527	62.650	63.765	64.872	65.974	67.069	68.159	69.243
-5	5.103	38.617	39.814	40.973	42.101	43.203	44.282	45.342	46.384	47.411	48.424	49.425	50.415	51.395	52.366	53.329	54.285	55.234	56.177	57.114	58.046	58.973
0	6.003	32.824	33.885	34.908	35.900	36.867	37.811	38.739	39.645	40.539	41.420	42.289	43.148	43.997	44.838	45.671	46.497	47.316	48.130	48.938	49.741	50.540
5	7.019	28.018	28.967	29.879	30.760	31.615	32.449	33.264	34.063	34.848	35.620	36.380	37.131	37.873	38.606	39.332	40.051	40.764	41.471	42.173	42.871	43.564
10	8.157	24.001	24.860	25.680	26.469	27.233	27.975	28.699	29.407	30.101	30.783	31.453	32.114	32.766	33.410	34.048	34.678	35.303	35.922	36.536	37.146	37.751
15	9.429	20.622	21.407	22.151	22.865	23.552	24.218	24.866	25.498	26.116	26.722	27.318	27.904	28.481	29.051	29.614	30.171	30.721	31.267	31.808	32.344	32.877
20	10.844	17.760	18.485	19.168	19.818	20.442	21.044	21.628	22.196	22.751	23.293	23.826	24.349	24.863	25.371	25.871	26.366	26.854	27.338	27.817	28.292	28.763
25	12.412	15.320	15.997	16.630	17.228	17.798	18.347	18.877	19.391	19.892	20.381	20.860	21.330	21.791	22.245	22.693	23.135	23.571	24.003	24.430	24.853	25.272
30	14.144	13.227	13.867	14.459	15.013	15.540	16.043	16.527	17.000	17.451	17.894	18.328	18.752	19.168	19.577	19.980	20.377	20.769	21.156	21.538	21.917	22.292
35	16.051	11.418	12.033	12.592	13.111	13.599	14.064	14.510	14.940	15.356	15.760	16.154	16.540	16.917	17.288	17.652	18.011	18.364	18.713	19.057	19.398	19.735
40	18.146	9.846	10.444	10.978	11.468	11.925	12.357	12.770	13.166	13.549	13.920	14.280	14.632	14.976	15.313	15.644	15.970	16.290	16.606	16.918	17.226	17.530
45	20.443	8.466	9.060	9.575	10.042	10.473	10.878	11.263	11.630	11.984	12.325	12.657	12.980	13.295	13.603	13.905	14.202	14.494	14.781	15.064	15.344	15.620
50	22.957	7.244	7.846	8.351	8.799	9.209	9.591	9.951	10.293	10.622	10.938	11.244	11.542	11.832	12.115	12.392	12.664	12.930	13.193	13.451	13.706	13.957
55	25.705	6.147	6.775	7.277	7.712	8.104	8.465	8.804	9.125	9.432	9.726	10.010	10.285	10.553	10.814	11.069	11.318	11.563	11.804	12.041	12.274	12.503
60	28.711	5.140	5.824	6.330	6.756	7.133	7.478	7.798	8.100	8.387	8.662	8.926	9.182	9.430	9.671	9.906	10.136	10.362	10.583	10.801	11.014	11.225
65	32.004	4.173	4.973	5.491	5.911	6.276	6.606	6.910	7.195	7.464	7.722	7.968	8.206	8.437	8.661	8.879	9.091	9.299	9.503	9.704	9.900	10.094
70	35.640	3.107	4.202	4.740	5.157	5.511	5.828	6.117	6.387	6.641	6.882	7.113	7.335	7.549	7.757	7.960	8.157	8.349	8.538	8.722	8.904	9.082

Thermodynamic properties of R-404A - (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
-80	0.133	319.163	322.555	325.987	329.462	332.979	336.540	340.146	343.797	347.493	351.236	355.025	358.861	362.744	366.673	370.649	374.672	378.742	382.858	387.020	391.228	395.482
-75	0.188	322.214	325.677	329.179	332.721	336.305	339.930	343.598	347.310	351.067	354.868	358.715	362.607	366.545	370.529	374.559	378.635	382.757	386.924	391.138	395.396	399.700
-70	0.261	325.275	328.811	332.384	335.996	339.646	343.337	347.069	350.843	354.660	358.522	362.427	366.376	370.371	374.410	378.494	382.624	386.799	391.018	395.283	399.592	403.946
-65	0.355	328.341	331.952	335.598	339.280	342.999	346.757	350.554	354.392	358.271	362.193	366.157	370.165	374.217	378.312	382.452	386.635	390.863	395.135	399.452	403.812	408.216
-60	0.475	331.405	335.094	338.815	342.569	346.359	350.185	354.049	357.952	361.894	365.878	369.903	373.970	378.079	382.232	386.427	390.666	394.948	399.273	403.641	408.053	412.508
-55	0.625	334.462	338.232	342.030	345.859	349.721	353.618	357.550	361.519	365.526	369.573	373.659	377.786	381.955	386.165	390.417	394.711	399.048	403.427	407.848	412.312	416.819
-50	0.810	337.507	341.360	345.239	349.145	353.081	357.050	361.052	365.089	369.162	373.273	377.422	381.611	385.839	390.108	394.418	398.768	403.160	407.594	412.069	416.586	421.144
-45.48	1.013	340.246	344.178	348.132	352.110	356.116	360.151	364.218	368.317	372.452	376.622	380.830	385.075	389.358	393.681	398.044	402.446	406.889	411.373	415.897	420.462	425.068
-45	1.036	340.533	344.474	348.435	352.421	356.434	360.477	364.550	368.657	372.798	376.975	381.188	385.439	389.729	394.057	398.425	402.834	407.282	411.771	416.300	420.870	425.481
-40	1.310	343.535	347.566	351.614	355.683	359.775	363.894	368.041	372.219	376.429	380.673	384.952	389.267	393.619	398.009	402.437	406.903	411.409	415.954	420.538	425.162	429.826
-35	1.636	346.505	350.633	354.771	358.925	363.099	367.296	371.519	375.771	380.052	384.365	388.711	393.091	397.507	401.959	406.447	410.973	415.537	420.139	424.779	429.458	434.176
-30	2.022	349.439	353.666	357.898	362.141	366.400	370.679	374.980	379.307	383.661	388.045	392.460	396.907	401.388	405.903	410.454	415.040	419.663	424.323	429.020	433.755	438.527
-25	2.475	352.327	356.660	360.991	365.327	369.674	374.037	378.419	382.824	387.253	391.710	396.195	400.711	405.258	409.838	414.452	419.101	423.784	428.503	433.258	438.049	442.877
-20	3.002	355.164	359.609	364.043	368.476	372.915	377.365	381.831	386.316	390.823	395.355	399.913	404.499	409.114	413.761	418.439	423.151	427.896	432.675	437.489	442.337	447.222
-15	3.610	357.942	362.505	367.048	371.582	376.117	380.658	385.211	389.780	394.367	398.975	403.608	408.266	412.952	417.666	422.411	427.187	431.995	436.835	441.709	446.617	451.558
-10	4.308	360.651	365.340	369.997	374.639	379.274	383.911	388.554	393.209	397.879	402.567	407.277	412.009	416.767	421.552	426.364	431.206	436.078	440.981	445.916	450.884	455.884
-5	5.103	363.281	368.104	372.884	377.639	382.380	387.116	391.854	396.599	401.355	406.126	410.915	415.725	420.556	425.413	430.295	435.204	440.142	445.109	450.107	455.135	460.195
0	6.003	365.820	370.788	375.700	380.575	385.428	390.269	395.106	399.945	404.791	409.648	414.519	419.407	424.316	429.246	434.199	439.178	444.183	449.216	454.278	459.368	464.488
5	7.019	368.255	373.381	378.433	383.437	388.410	393.362	398.304	403.241	408.181	413.127	418.083	423.054	428.041	433.047	438.074	443.124	448.199	453.299	458.425	463.579	468.762
10	8.157	370.567	375.867	381.075	386.218	391.319	396.389	401.441	406.483	411.520	416.559	421.604	426.659	431.728	436.812	441.915	447.039	452.184	457.353	462.547	467.766	473.012
15	9.429	372.737	378.234	383.612	388.908	394.146	399.343	404.512	409.663	414.803	419.939	425.076	430.220	435.373	440.538	445.720	450.918	456.137	461.377	466.639	471.925	477.236
20	10.844	374.742	380.463	386.032	391.496	396.883	402.216	407.509	412.775	418.024	423.261	428.495	433.730	438.971	444.221	449.483	454.760	460.053	465.366	470.699	476.053	481.430
25	12.412	376.554	382.535	388.320	393.969	399.520	404.999	410.426	415.814	422.177	426.521	431.856	437.187	442.519	447.856	453.202	458.559	463.930	469.317	474.723	480.148	485.593
30	14.144	378.138	384.427	390.460	396.316	402.046	407.684	413.253	418.773	424.256	429.713	435.154	440.585	446.012	451.439	456.872	462.312	467.764	473.228	478.708	484.206	489.721
35	16.051	379.450	386.112	392.431	398.521	404.449	410.260	415.983	421.643	427.254	432.831	438.383	443.919	449.445	454.967	460.490	466.016	471.551	477.095	482.652	488.224	493.811
40	18.146	380.430	387.553	394.210	400.566	406.715	412.716	418.607	424.416	430.165	435.868	441.538	447.184	452.814	458.435	464.051	469.667	475.288	480.915	486.551	492.199	497.861
45	20.443	380.993	388.708	395.769	402.433	408.830	415.040	421.114	427.085	432.980	438.818	444.612	450.374	456.113	461.837	467.551	473.261	478.970	484.683	490.401	496.129	501.867
50	22.957	381.012	389.519	397.075	404.097	410.776	417.219	423.492	429.640	435.693	441.673	447.599	453.484	459.338	465.170	470.986	476.793	482.594	488.395	494.199	500.008	505.825
55	25.705	380.276	389.909	398.087	405.533	412.534	419.237	425.730	432.069	438.291	444.426	450.492	456.506	462.481	468.426	474.349	480.257	486.155	492.048	497.940	503.833	509.731
60	28.711	378.397	389.774	398.753	406.707	414.079	421.076	427.812	434.359	440.765	447.063	453.279	459.431	465.533	471.597	477.633	483.646	489.645	495.633	501.616	507.597	513.580
65	32.004	374.482	388.973	399.008	407.577	415.379	422.707	429.712	436.488	443.093	449.569	455.945	462.243	468.481	474.670	480.823	486.948	493.052	499.140	505.218	511.290	517.360
70	35.640	365.041	387.277	398.737	408.059	416.366	424.071	431.379	438.408	445.232	451.901	458.450	464.906	471.288	477.612	483.890	490.132	496.347	502.540	508.719	514.886	521.047

Thermodynamic properties of R-404A - (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
-80	0.133	1.711	1.729	1.746	1.763	1.779	1.796	1.812	1.828	1.844	1.860	1.876	1.892	1.907	1.922	1.938	1.953	1.968	1.983	1.998	2.012	2.027
-75	0.188	1.698	1.715	1.732	1.749	1.765	1.782	1.798	1.814	1.830	1.846	1.862	1.877	1.892	1.908	1.923	1.938	1.953	1.968	1.983	1.997	2.012
-70	0.261	1.685	1.703	1.720	1.736	1.753	1.769	1.785	1.801	1.817	1.833	1.849	1.864	1.879	1.895	1.910	1.925	1.940	1.954	1.969	1.984	1.998
-65	0.355	1.675	1.692	1.709	1.725	1.742	1.758	1.774	1.790	1.806	1.822	1.837	1.853	1.868	1.883	1.898	1.913	1.928	1.942	1.957	1.971	1.986
-60	0.475	1.665	1.682	1.699	1.716	1.732	1.748	1.764	1.780	1.796	1.812	1.827	1.842	1.858	1.873	1.888	1.902	1.917	1.932	1.946	1.961	1.975
-55	0.625	1.657	1.674	1.691	1.707	1.724	1.740	1.756	1.772	1.787	1.803	1.818	1.833	1.849	1.864	1.878	1.893	1.908	1.922	1.937	1.951	1.966
-50	0.810	1.649	1.666	1.683	1.700	1.716	1.732	1.748	1.764	1.779	1.795	1.810	1.825	1.841	1.855	1.870	1.885	1.900	1.914	1.929	1.943	1.957
-45.48	1.013	1.643	1.660	1.677	1.693	1.710	1.726	1.742	1.758	1.773	1.789	1.804	1.819	1.834	1.849	1.864	1.878	1.893	1.908	1.922	1.936	1.950
-45	1.036	1.642	1.660	1.676	1.693	1.709	1.725	1.741	1.757	1.773	1.788	1.803	1.819	1.834	1.848	1.863	1.878	1.892	1.907	1.921	1.935	1.950
-40	1.310	1.637	1.654	1.670	1.687	1.703	1.719	1.735	1.751	1.767	1.782	1.797	1.812	1.827	1.842	1.857	1.872	1.886	1.900	1.915	1.929	1.943
-35	1.636	1.631	1.648	1.665	1.682	1.698	1.714	1.730	1.746	1.761	1.777	1.792	1.807	1.822	1.837	1.852	1.866	1.881	1.895	1.909	1.923	1.937
-30	2.022	1.627	1.644	1.661	1.677	1.694	1.710	1.726	1.741	1.757	1.772	1.788	1.803	1.817	1.832	1.847	1.861	1.876	1.890	1.904	1.918	1.932
-25	2.475	1.623	1.640	1.657	1.674	1.690	1.706	1.722	1.738	1.753	1.768	1.784	1.799	1.814	1.828	1.843	1.857	1.872	1.886	1.900	1.914	1.928
-20	3.002	1.619	1.636	1.653	1.670	1.687	1.703	1.719	1.734	1.750	1.765	1.780	1.795	1.810	1.825	1.839	1.854	1.868	1.882	1.897	1.911	1.925
-15	3.610	1.616	1.633	1.650	1.667	1.684	1.700	1.716	1.731	1.747	1.762	1.777	1.792	1.807	1.822	1.837	1.851	1.865	1.880	1.894	1.908	1.922
-10	4.308	1.613	1.631	1.648	1.665	1.681	1.697	1.713	1.729	1.745	1.760	1.775	1.790	1.805	1.820	1.834	1.849	1.863	1.877	1.891	1.905	1.919
-5	5.103	1.610	1.628	1.645	1.662	1.679	1.695	1.711	1.727	1.743	1.758	1.773	1.788	1.803	1.818	1.832	1.847	1.861	1.875	1.889	1.903	1.917
0	6.003	1.608	1.626	1.643	1.660	1.677	1.693	1.710	1.725	1.741	1.756	1.772	1.787	1.801	1.816	1.831	1.845	1.859	1.873	1.887	1.901	1.915
5	7.019	1.605	1.624	1.641	1.659	1.675	1.692	1.708	1.724	1.740	1.755	1.770	1.785	1.800	1.815	1.829	1.844	1.858	1.872	1.886	1.900	1.914
10	8.157	1.603	1.622	1.640	1.657	1.674	1.691	1.707	1.723	1.739	1.754	1.769	1.784	1.799	1.814	1.828	1.843	1.857	1.871	1.885	1.899	1.913
15	9.429	1.601	1.620	1.638	1.656	1.673	1.689	1.706	1.722	1.738	1.753	1.769	1.784	1.799	1.813	1.828	1.842	1.857	1.871	1.885	1.899	1.912
20	10.844	1.598	1.618	1.636	1.654	1.672	1.688	1.705	1.721	1.737	1.753	1.768	1.783	1.798	1.813	1.827	1.842	1.856	1.870	1.884	1.898	1.912
25	12.412	1.596	1.616	1.635	1.653	1.670	1.688	1.704	1.720	1.736	1.752	1.768	1.783	1.798	1.813	1.827	1.842	1.856	1.870	1.884	1.898	1.912
30	14.144	1.593	1.613	1.633	1.651	1.669	1.687	1.703	1.720	1.736	1.752	1.767	1.783	1.798	1.812	1.827	1.842	1.856	1.870	1.884	1.898	1.912
35	16.051	1.590	1.611	1.631	1.650	1.668	1.686	1.703	1.719	1.736	1.752	1.767	1.783	1.798	1.813	1.827	1.842	1.856	1.870	1.884	1.898	1.912
40	18.146	1.586	1.608	1.629	1.648	1.667	1.685	1.702	1.719	1.735	1.751	1.767	1.783	1.798	1.813	1.827	1.842	1.856	1.871	1.885	1.899	1.912
45	20.443	1.581	1.605	1.626	1.647	1.666	1.684	1.701	1.718	1.735	1.751	1.767	1.783	1.798	1.813	1.828	1.842	1.857	1.871	1.885	1.899	1.913
50	22.957	1.575	1.601	1.624	1.645	1.664	1.683	1.701	1.718	1.735	1.751	1.767	1.783	1.798	1.813	1.828	1.843	1.857	1.872	1.886	1.900	1.914
55	25.705	1.567	1.596	1.620	1.642	1.662	1.681	1.700	1.717	1.734	1.751	1.767	1.783	1.798	1.814	1.828	1.843	1.858	1.872	1.886	1.900	1.914
60	28.711	1.556	1.590	1.616	1.639	1.660	1.680	1.699	1.716	1.734	1.751	1.767	1.783	1.798	1.814	1.829	1.844	1.858	1.873	1.887	1.901	1.915
65	32.004	1.540	1.582	1.611	1.636	1.658	1.678	1.697	1.715	1.733	1.750	1.767	1.783	1.798	1.814	1.829	1.844	1.859	1.873	1.887	1.902	1.915
70	35.640	1.508	1.573	1.605	1.631	1.654	1.676	1.695	1.714	1.732	1.749	1.766	1.782	1.798	1.814	1.829	1.844	1.859	1.873	1.888	1.902	1.916