

R-513A pressure–temperature chart

Opteon XP10 (R-1234yf/134a) — an azeotropic blend of R-1234yf and R-134a, 56 / 44 % by mass. Also written R513A. Bubble and dew pressures from −70 to 90 °C, every 2 K, in kPa gauge and bar gauge, computed with CoolProp.

SAFETY CLASS A1 Lower toxicity, no flame propagation	GWP, 100-YEAR 629 (AR4) · 673 (AR6) IPCC, summed from its composition	ODP 0 Montreal Protocol
BUBBLE POINT −29.42 °C At 101.325 kPa	DEW POINT −29.31 °C At 101.325 kPa	GLIDE 0.10 K Dew less bubble, at 101.325 kPa

BUBBLE · LIQUID					DEW · VAPOUR				
T (°C)	kPa g	bar g	kPa g	bar g	T (°C)	kPa g	bar g	kPa g	bar g
−70	−90.7	−0.91	−91.0	−0.91	10	349.4	3.49	349.3	3.49
−68	−89.1	−0.89	−89.4	−0.89	12	378.9	3.79	378.8	3.79
−66	−87.4	−0.87	−87.7	−0.88	14	409.9	4.10	409.8	4.10
−64	−85.5	−0.85	−85.8	−0.86	16	442.4	4.42	442.3	4.42
−62	−83.3	−0.83	−83.7	−0.84	18	476.4	4.76	476.4	4.76
−60	−81.0	−0.81	−81.3	−0.81	20	512.0	5.12	512.0	5.12
−58	−78.3	−0.78	−78.7	−0.79	22	549.3	5.49	549.2	5.49
−56	−75.4	−0.75	−75.8	−0.76	24	588.2	5.88	588.2	5.88
−54	−72.2	−0.72	−72.6	−0.73	26	628.8	6.29	628.8	6.29
−52	−68.7	−0.69	−69.2	−0.69	28	671.2	6.71	671.2	6.71
−50	−64.9	−0.65	−65.3	−0.65	30	715.4	7.15	715.4	7.15
−48	−60.7	−0.61	−61.2	−0.61	32	761.5	7.62	761.5	7.62
−46	−56.1	−0.56	−56.6	−0.57	34	809.5	8.10	809.5	8.10
−44	−51.2	−0.51	−51.6	−0.52	36	859.5	8.60	859.5	8.60
−42	−45.7	−0.46	−46.2	−0.46	38	911.5	9.12	911.5	9.12
−40	−39.9	−0.40	−40.3	−0.40	40	965.6	9.66	965.6	9.66
−38	−33.5	−0.34	−34.0	−0.34	42	1,021.9	10.22	1,021.8	10.22
−36	−26.6	−0.27	−27.1	−0.27	44	1,080.3	10.80	1,080.2	10.80
−34	−19.2	−0.19	−19.7	−0.20	46	1,141.0	11.41	1,140.9	11.41
−32	−11.2	−0.11	−11.7	−0.12	48	1,204.0	12.04	1,203.8	12.04
−30	−2.6	−0.03	−3.1	−0.03	50	1,269.3	12.69	1,269.1	12.69
−28	6.6	0.07	6.1	0.06	52	1,337.1	13.37	1,336.9	13.37
−26	16.5	0.16	16.0	0.16	54	1,407.4	14.07	1,407.1	14.07
−24	27.1	0.27	26.7	0.27	56	1,480.2	14.80	1,479.9	14.80
−22	38.4	0.38	38.0	0.38	58	1,555.6	15.56	1,555.3	15.55
−20	50.5	0.51	50.1	0.50	60	1,633.8	16.34	1,633.4	16.33
−18	63.4	0.63	63.0	0.63	62	1,714.7	17.15	1,714.2	17.14
−16	77.2	0.77	76.8	0.77	64	1,798.4	17.98	1,797.8	17.98
−14	91.8	0.92	91.4	0.91	66	1,885.0	18.85	1,884.4	18.84
−12	107.3	1.07	107.0	1.07	68	1,974.6	19.75	1,974.0	19.74
−10	123.8	1.24	123.4	1.23	70	2,067.3	20.67	2,066.6	20.67
−8	141.2	1.41	140.9	1.41	72	2,163.2	21.63	2,162.4	21.62
−6	159.7	1.60	159.4	1.59	74	2,262.3	22.62	2,261.4	22.61
−4	179.3	1.79	179.0	1.79	76	2,364.7	23.65	2,363.8	23.64
−2	199.9	2.00	199.7	2.00	78	2,470.7	24.71	2,469.7	24.70
0	221.7	2.22	221.5	2.22	80–82 °C: not solved by CoolProp — left out, not interpolated				
2	244.7	2.45	244.5	2.45	84	2,810.6	28.11	2,809.5	28.10
4	268.9	2.69	268.8	2.69	86	2,931.8	29.32	2,930.7	29.31
6	294.4	2.94	294.3	2.94	88	3,057.3	30.57	3,056.2	30.56
8	321.2	3.21	321.1	3.21	90	3,187.3	31.87	3,186.3	31.86

NOTES	Gauge pressure is absolute pressure less a standard atmosphere, 101.325 kPa; below it, gauge pressure is negative. Bubble: saturated liquid — read subcooling from it. Dew: saturated vapour — read superheat from it. CoolProp could not solve the bubble line at 80–82 °C and 92 °C. Those rows are left out, not interpolated.
SOURCES	Computed with CoolProp 7.2.1dev (HEOS backend, MIT licence), from published equations of state. Cite: Bell, I.H., Wronski, J., Quoilin, S., Lemort, V. (2014). Pure and pseudo-pure fluid thermophysical property evaluation and the open-source thermophysical property library CoolProp. Ind. Eng. Chem. Res. 53(6), 2498–2508. GWP, ODP, safety class and composition: UNEP RTOC 2018, DCCEEW (Australian Government), IPCC AR4 (2007), IPCC AR6 (2021), Montreal Protocol, ASHRAE refrigerant designations, GHG Protocol (2024).
ONLINE	kelvin.engineering/refrigerants/r-513a — this table in kPa absolute, and the P–h diagram kelvin.engineering/tools/superheat-subcooling?r=r-513a — superheat and subcooling calculator
VERIFY	These figures must be verified by a qualified professional before they're relied on.