



SUBCOOLING

Procedure:

- Use gauges to determine the pressure at the condenser coil outlet, and a thermometer to get the actual temperature at the same point.
- Use the Bubble column to get the Subcooling = Bubble Temperature - Actual Temperature

Example: Find the amount of subcooling on a system using Solstice N40 (R-448A) when the liquid line temperature reads 75°F and the liquid line pressure is 196 psig.

40 psig yields ~ 16°F

(using Bubble temp)

Degree of Subcooling = 85°F - 75°F = 10°F



SUPERHEAT

Procedure:

- Use gauges to determine the pressure at the evaporator coil outlet, and a thermometer to get the actual temperature at the same point.
- Get the Dew temperature from the "Dew" column
- Superheat = Actual Temperature - Dew Temperature

Example: Find the superheat on a system which uses Solstice® N40 (R-448A) when the pressure at the evaporator outlet reads 40 psig and your surface thermometer reads 26°F

40 psig yields ~ 16°F (using dew point)

Degree of Superheat = 26°F - 16°F = 10°F

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PT CHART FOR SOLSTICE® N40

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SOLSTICE® N40 (R-448A)

PRESSURE BASED PT CHART

Pressure (psig)	Temperature			Pressure (psig)	Temperature		
	°F				°F		
	Avg	Bubble	Dew		Avg	Bubble	Dew
0.0	-45.5	-51.0	-39.9	46.0	16.0	10.8	21.2
1.0	-43.0	-48.6	-37.5	49.0	18.4	13.2	23.7
2.0	-40.7	-46.2	-35.2	52.0	20.8	15.6	26.0
3.0	-38.5	-44.0	-32.9	55.0	23.1	17.9	28.3
4.0	-36.3	-41.9	-30.8	59.0	26.1	20.9	31.2
5.0	-34.3	-39.8	-28.8	63.0	28.9	23.8	34.0
6.0	-32.3	-37.8	-26.9	67.0	31.6	26.5	36.7
7.0	-30.5	-35.9	-25.0	83.0	41.6	36.5	46.6
8.0	-28.6	-34.1	-23.2	101.0	51.4	46.5	56.3
9.0	-26.9	-32.4	-21.4	121.0	61.1	56.2	65.9
10.0	-25.2	-30.6	-19.7	142.0	70.1	65.4	74.9
11.0	-23.5	-29.0	-18.1	154.0	74.9	70.2	79.6
12.0	-21.9	-27.4	-16.5	167.0	79.8	75.1	84.4
13.0	-20.4	-25.8	-15.0	181.0	84.8	80.2	89.3
14.0	-18.9	-24.3	-13.5	196.0	89.8	85.3	94.3
16.0	-16.0	-21.4	-10.6	212.0	94.9	90.5	99.3
18.0	-13.2	-18.6	-7.8	229.0	100.0	95.7	104.3
20.0	-10.6	-16.0	-5.2	246.0	104.9	100.7	109.1
22.0	-8.1	-13.5	-2.7	264.0	109.8	105.6	113.9
24.0	-5.7	-11.0	-0.3	284.0	115.0	110.9	119.0
26.0	-3.4	-8.7	2.0	304.0	119.9	115.9	123.8
28.0	-1.1	-6.5	4.2	325.0	124.8	121.0	128.6
29.0	-0.1	-5.4	5.3	348.0	129.9	126.2	133.6
31.0	2.1	-3.3	7.4	349.0	130.1	126.4	133.8
34.0	5.1	-0.2	10.4	372.0	135.0	131.4	138.5
37.0	8.0	2.7	13.3	397.0	140.0	136.6	143.4
40.0	10.8	5.5	16.0	423.0	145.0	141.8	148.3
43.0	13.4	8.2	18.7	450.0	150.0	146.9	153.0

Charge Calculation

Product	ASHRAE Number	Refrigerant Type	Refrigerant Class	Lubricant Used*	Liquid Density (lbs/ft ³)** at 80°F
Solstice N40	R-448A	Blend	HFO/HFC	POE	68
Genetron® 22	R-22	Single Component	HCFC	MO	73.9
Genetron 404A	R-404A	Blend HFC	HFC	POE	64.7
Genetron AZ-50®	R-507	Azeotrope HFC	HFC	POE	64.9
Genetron 408A	R-408A	Blend HCFC	HCFC	AB	65.7
Genetron HP80	R-402A	Blend HCFC	HCFC	AB	71

* POE = polyol ester, MO = mineral oil, AB = Alkylbenzene ** Divide by 7.48 to convert to lbs/gal.

† U.S. production stopped Dec. 31, 1995.

When retrofitting a system with a new refrigerant, use this formula to determine amount needed:
 Pounds of new refrigerant = $\frac{\text{Pounds of original refrigerant} \times \text{density of new refrigerant (at 80°F)}}{\text{density of original refrigerant (at 80°F)}}$

EXAMPLE

If you were using 1,000 pounds of R-22, you'll need about 920 pounds of R-448A, as follows:

$$\text{Pounds of R-448A} = \frac{1,000 \times 68.0}{73.9} = \frac{68,000}{73.9} = 920$$



Scan to learn more about our new PT Chart.



Scan to learn more about calculating Glide.