



ParaFlow™ and IsoFlow™

Absorption Liquid Chillers

Useful Conversion Formulas

To convert °C (Centigrade) to °F (Fahrenheit) or °F to °C:

$$^{\circ}\text{C} = \frac{^{\circ}\text{F} + 40}{1.8} - 40 \quad ^{\circ}\text{F} = (^{\circ}\text{C} + 40) \times 1.8 - 40$$

1 atm (atmosphere at sea level) = 14.696 psia = 0 psig = 760 mmHg = 29.92 in Hg

1 mm Hg = 1000 microns = 0.3937 inch Hg = .01934 psi

1 in Hg = 25.4 mm Hg = .491 psi

1 psi = 2.036 in Hg = 51.7 mm Hg = 2.31 ft H₂O

1 ft H₂O = .433 psi

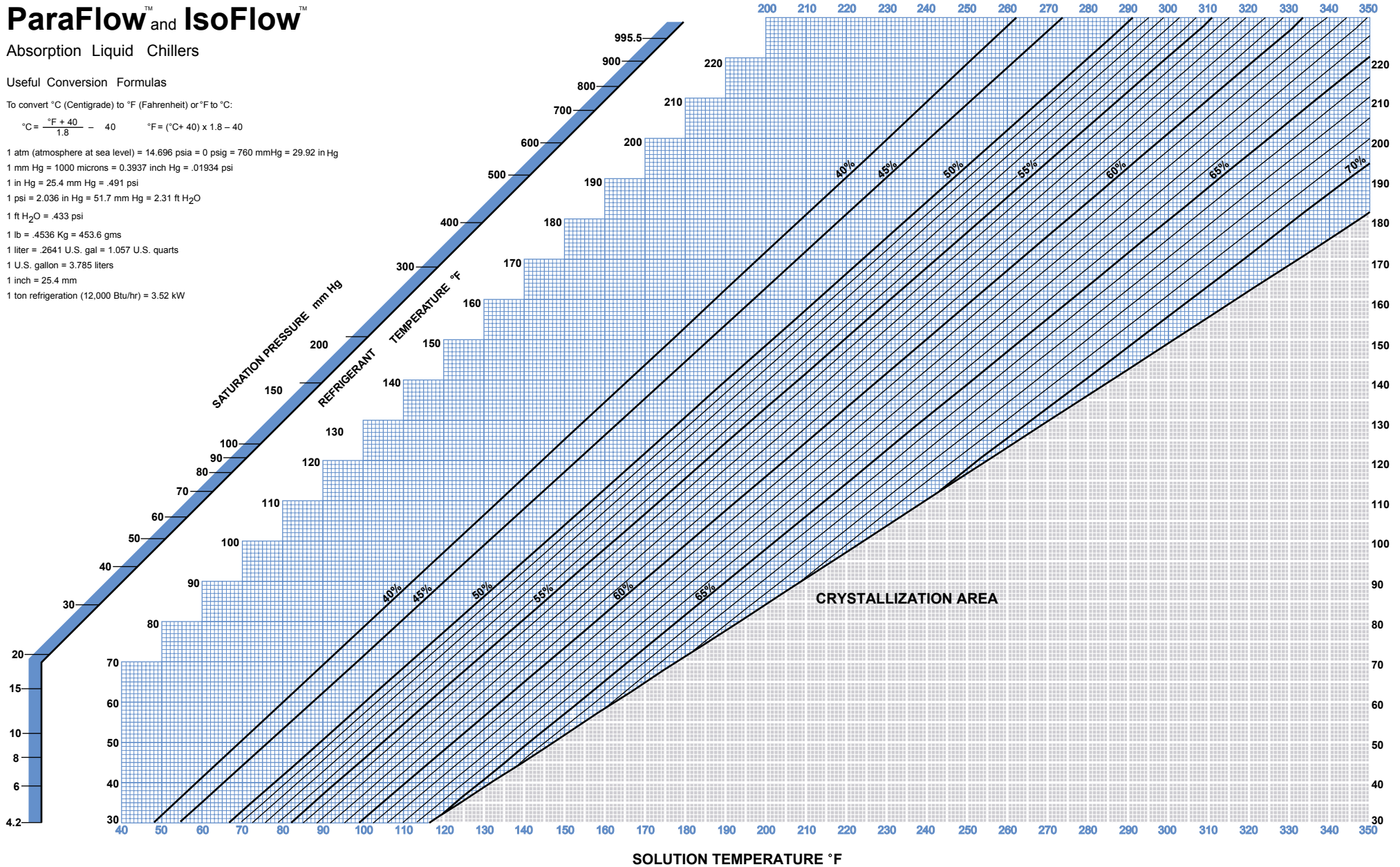
1 lb = .4536 Kg = 453.6 gms

1 liter = .2641 U.S. gal = 1.057 U.S. quarts

1 U.S. gallon = 3.785 liters

1 inch = 25.4 mm

1 ton refrigeration (12,000 Btu/hr) = 3.52 kW



SPECIFIC GRAVITY - CONCENTRATION TABLES AQUEOUS LiBr SOLUTIONS

Refrigerant Table (%LiBr by Weight) Temperature °F

| S.G. | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1.00 | — | — | — | — | — | — | 0.08 | 0.18 | 0.28 | 0.37 | 0.47 | 0.57 | 0.67 |
| 1.01 | 0.98 | 1.08 | 1.17 | 1.27 | 1.37 | 1.47 | 1.56 | 1.66 | 1.76 | 1.85 | 1.95 | 2.05 | 2.15 |
| 1.02 | 2.43 | 2.52 | 2.62 | 2.72 | 2.82 | 2.91 | 3.01 | 3.11 | 3.20 | 3.30 | 3.40 | 3.50 | 3.59 |
| 1.03 | 3.84 | 3.94 | 4.03 | 4.13 | 4.23 | 4.33 | 4.42 | 4.52 | 4.62 | 4.72 | 4.81 | 4.91 | 5.01 |
| 1.04 | 5.22 | 5.32 | 5.42 | 5.51 | 5.61 | 5.71 | 5.81 | 5.90 | 6.00 | 6.10 | 6.19 | 6.29 | 6.39 |
| 1.05 | 6.57 | 6.67 | 6.77 | 6.87 | 6.96 | 7.06 | 7.16 | 7.26 | 7.35 | 7.45 | 7.55 | 7.64 | 7.74 |

Solution Tables Temperature °F

| S.G. | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1.350 | 37.27 | 37.5 | 37.75 | 37.98 | 38.21 | 38.44 | 38.67 | 38.90 | 39.13 | 39.35 | 39.58 | 39.80 | 40.02 | 40.24 | 40.46 | 40.68 | 40.90 | 41.11 | 41.33 |
| 1.360 | 38.03 | 38.26 | 38.50 | 38.73 | 38.96 | 39.19 | 39.42 | 39.64 | 39.87 | 40.09 | 40.31 | 40.53 | 40.75 | 40.97 | 41.19 | 41.41 | 41.62 | 41.83 | 42.05 |
| 1.370 | 38.78 | 39.01 | 39.24 | 39.47 | 39.70 | 39.93 | 40.15 | 40.38 | 40.60 | 40.82 | 41.04 | 41.26 | 41.48 | 41.69 | 41.91 | 42.12 | 42.34 | 42.55 | 42.76 |
| 1.380 | 39.52 | 39.75 | 39.98 | 40.20 | 40.43 | 40.66 | 40.88 | 41.10 | 41.32 | 41.54 | 41.76 | 41.98 | 42.20 | 42.41 | 42.62 | 42.83 | 43.04 | 43.25 | 43.46 |
| 1.390 | 40.25 | 40.48 | 40.70 | 40.93 | 41.16 | 41.38 | 41.60 | 41.82 | 42.04 | 42.26 | 42.48 | 42.69 | 42.90 | 43.12 | 43.33 | 43.54 | 43.75 | 43.95 | 44.16 |
| 1.400 | 40.97 | 41.20 | 41.42 | 41.65 | 41.87 | 42.09 | 42.31 | 42.53 | 42.75 | 42.97 | 43.18 | 43.39 | 43.61 | 43.82 | 44.03 | 44.23 | 44.44 | 44.64 | 44.85 |
| 1.410 | 41.69 | 41.91 | 42.14 | 42.36 | 42.58 | 42.80 | 43.02 | 43.24 | 43.45 | 43.67 | 43.88 | 44.09 | 44.30 | 44.51 | 44.72 | 44.92 | 45.12 | 45.33 | 45.53 |
| 1.420 | 42.39 | 42.62 | 42.84 | 43.06 | 43.28 | 43.50 | 43.72 | 43.93 | 44.15 | 44.36 | 44.57 | 44.78 | 44.99 | 45.19 | 45.40 | 45.60 | 45.80 | 46.00 | 46.20 |
| 1.430 | 43.10 | 43.32 | 43.54 | 43.76 | 43.98 | 44.19 | 44.41 | 44.62 | 44.83 | 45.04 | 45.25 | 45.46 | 45.67 | 45.87 | 46.07 | 46.27 | 46.47 | 46.67 | 46.87 |
| 1.440 | 43.79 | 44.01 | 44.23 | 44.45 | 44.66 | 44.88 | 45.09 | 45.30 | 45.51 | 45.72 | 45.93 | 46.13 | 46.34 | 46.54 | 46.74 | 46.94 | 47.14 | 47.33 | 47.53 |
| 1.450 | 44.47 | 44.69 | 44.91 | 45.13 | 45.34 | 45.55 | 45.76 | 45.97 | 46.18 | 46.39 | 46.59 | 46.80 | 47.00 | 47.20 | 47.40 | 47.60 | 47.79 | 47.99 | 48.18 |
| 1.460 | 45.15 | 45.37 | 45.58 | 45.80 | 46.01 | 46.22 | 46.43 | 46.6 | 46.85 | 47.05 | 47.25 | 47.46 | 47.66 | 47.85 | 48.05 | 48.25 | 48.44 | 48.63 | 48.82 |
| 1.470 | 45.82 | 46.03 | 46.25 | 46.46 | 46.67 | 46.88 | 47.09 | 47.30 | 47.50 | 47.70 | 47.91 | 48.11 | 48.30 | 48.50 | 48.70 | 48.89 | 49.08 | 49.27 | 49.46 |
| 1.480 | 46.48 | 46.69 | 46.91 | 47.12 | 47.33 | 47.54 | 47.74 | 47.95 | 48.15 | 48.35 | 48.55 | 48.75 | 48.94 | 49.14 | 49.33 | 49.52 | 49.71 | 49.90 | 50.09 |
| 1.490 | 47.13 | 47.35 | 47.56 | 47.77 | 47.97 | 48.18 | 48.38 | 48.59 | 48.79 | 48.99 | 49.19 | 49.38 | 49.58 | 49.77 | 49.96 | 50.15 | 50.34 | 50.53 | 50.71 |
| 1.500 | 47.78 | 47.99 | 48.20 | 48.41 | 48.61 | 48.82 | 49.02 | 49.22 | 49.42 | 49.62 | 49.82 | 50.01 | 50.20 | 50.39 | 50.58 | 50.77 | 50.96 | 51.14 | 51.33 |
| 1.510 | 48.42 | 48.63 | 48.84 | 49.04 | 49.25 | 49.45 | 49.65 | 49.85 | 50.05 | 50.24 | 50.44 | 50.63 | 50.82 | 51.01 | 51.20 | 51.38 | 51.57 | 51.75 | 51.93 |
| 1.520 | 49.05 | 49.26 | 49.46 | 49.67 | 49.87 | 50.07 | 50.27 | 50.47 | 50.66 | 50.86 | 51.05 | 51.24 | 51.43 | 51.62 | 51.80 | 51.99 | 52.17 | 52.35 | 52.53 |
| 1.530 | 49.67 | 49.88 | 50.08 | 50.28 | 50.49 | 50.68 | 50.88 | 51.08 | 51.27 | 51.46 | 51.66 | 51.84 | 52.03 | 52.22 | 52.40 | 52.59 | 52.77 | 52.95 | 53.12 |
| 1.540 | 50.29 | 50.49 | 50.69 | 50.89 | 51.09 | 51.29 | 51.49 | 51.68 | 51.87 | 52.06 | 52.25 | 52.44 | 52.63 | 52.81 | 52.99 | 53.18 | 53.36 | 53.53 | 53.71 |
| 1.550 | 50.89 | 51.10 | 51.30 | 51.50 | 51.69 | 51.89 | 52.08 | 52.28 | 52.47 | 52.66 | 52.84 | 53.03 | 53.21 | 53.40 | 53.58 | 53.76 | 53.94 | 54.11 | 54.29 |
| 1.560 | 51.49 | 51.69 | 51.89 | 52.09 | 52.29 | 52.48 | 52.67 | 52.86 | 53.05 | 53.24 | 53.43 | 53.61 | 53.79 | 53.97 | 54.15 | 54.33 | 54.51 | 54.68 | 54.86 |
| 1.570 | 52.09 | 52.28 | 52.48 | 52.68 | 52.87 | 53.06 | 53.25 | 53.44 | 53.6 | 53.82 | 54.00 | 54.18 | 54.37 | 54.55 | 54.72 | 54.90 | 55.07 | 55.25 | 55.42 |
| 1.580 | 52.67 | 52.87 | 53.06 | 53.26 | 53.45 | 53.64 | 53.83 | 54.02 | 54.20 | 54.39 | 54.57 | 54.75 | 54.93 | 55.11 | 55.28 | 55.46 | 55.63 | 55.80 | 55.97 |
| 1.590 | 53.25 | 53.44 | 53.64 | 53.83 | 54.02 | 54.21 | 54.39 | 54.58 | 54.77 | 54.95 | 55.13 | 55.31 | 55.49 | 55.66 | 55.84 | 56.01 | 56.18 | 56.35 | 56.52 |
| 1.600 | 53.81 | 54.01 | 54.20 | 54.39 | 54.58 | 54.77 | 54.95 | 55.14 | 55.32 | 55.50 | 55.68 | 55.86 | 56.04 | 56.21 | 56.38 | 56.55 | 56.72 | 56.89 | 57.06 |
| 1.610 | 54.37 | 54.57 | 54.76 | 54.95 | 55.13 | 55.32 | 55.50 | 55.69 | 55.87 | 56.05 | 56.23 | 56.40 | 56.58 | 56.75 | 56.92 | 57.09 | 57.26 | 57.43 | 57.59 |
| 1.620 | 54.93 | 55.12 | 55.31 | 55.49 | 55.68 | 55.86 | 56.05 | 56.23 | 56.41 | 56.59 | 56.76 | 56.94 | 57.11 | 57.28 | 57.45 | 57.62 | 57.79 | 57.95 | 58.12 |
| 1.630 | 55.47 | 55.66 | 55.85 | 56.03 | 56.22 | 56.40 | 56.58 | 56.76 | 56.94 | 57.12 | 57.29 | 57.46 | 57.64 | 57.81 | 57.97 | 58.14 | 58.31 | 58.47 | 58.63 |
| 1.640 | 56.01 | 56.20 | 56.38 | 56.57 | 56.75 | 56.93 | 57.11 | 57.29 | 57.46 | 57.64 | 57.81 | 57.98 | 58.15 | 58.32 | 58.49 | 58.66 | 58.82 | 58.98 | 59.14 |
| 1.650 | 56.54 | 56.72 | 56.91 | 57.09 | 57.27 | 57.45 | 57.63 | 57.81 | 57.98 | 58.15 | 58.33 | 58.50 | 58.67 | 58.83 | 59.00 | 59.16 | 59.32 | 59.49 | 59.65 |
| 1.660 | 57.06 | 57.25 | 57.43 | 57.61 | 57.79 | 57.97 | 58.14 | 58.32 | 58.49 | 58.66 | 58.83 | 59.00 | 59.17 | 59.33 | 59.50 | 59.66 | 59.82 | 59.98 | 60.14 |
| 1.670 | 57.58 | 57.76 | 57.94 | 58.12 | 58.29 | 58.47 | 58.65 | 58.82 | 58.99 | 59.16 | 59.33 | 59.50 | 59.66 | 59.83 | 59.99 | 60.15 | 60.31 | 60.47 | 60.63 |
| 1.680 | 58.08 | 58.26 | 58.44 | 58.62 | 58.79 | 58.97 | 59.14 | 59.31 | 59.48 | 59.65 | 59.82 | 59.99 | 60.15 | 60.31 | 60.48 | 60.64 | 60.79 | 60.95 | 61.11 |
| 1.690 | 58.58 | 58.76 | 58.94 | 59.11 | 59.29 | 59.46 | 59.63 | 59.80 | 59.97 | 60.14 | 60.30 | 60.47 | 60.63 | 60.79 | 60.95 | 61.11 | 61.27 | 61.43 | 61.58 |
| 1.700 | 59.07 | 59.25 | 59.42 | 59.60 | 59.77 | 59.94 | 60.11 | 60.28 | 60.45 | 60.61 | 60.78 | 60.94 | 61.10 | 61.26 | 61.42 | 61.58 | 61.74 | 61.89 | 62.05 |
| 1.710 | 59.55 | 59.73 | 59.90 | 60.08 | 60.25 | 60.42 | 60.59 | 60.75 | 60.92 | 61.08 | 61.25 | 61.41 | 61.57 | 61.73 | 61.89 | 62.04 | 62.20 | 62.35 | 62.50 |
| 1.720 | | 60.20 | 60.38 | 60.55 | 60.72 | 60.88 | 61.05 | 61.22 | 61.38 | 61.54 | 61.71 | 61.87 | 62.03 | 62.18 | 62.34 | 62.50 | 62.65 | 62.80 | 62.95 |
| 1.730 | | 60.67 | 60.84 | 61.01 | 61.18 | 61.34 | 61.51 | 61.67 | 61.84 | 62.00 | 62.16 | 62.32 | 62.48 | 62.63 | 62.79 | 62.94 | 63.09 | 63.25 | 63.40 |
| 1.740 | | 61.13 | 61.30 | 61.46 | 61.63 | 61.80 | 61.96 | 62.12 | 62.28 | 62.44 | 62.60 | 62.76 | 62.92 | 63.07 | 63.23 | 63.38 | 63.53 | 63.68 | 63.83 |
| 1.750 | | | 61.74 | 61.91 | 62.08 | 62.24 | 62.40 | 62.56 | 62.72 | 62.88 | 63.04 | 63.20 | 63.35 | 63.51 | 63.66 | 63.81 | 63.96 | 64.11 | 64.26 |
| 1.760 | | | | 62.35 | 62.51 | 62.68 | 62.84 | 63.00 | 63.16 | 63.31 | 63.47 | 63.62 | 63.78 | 63.93 | 64.08 | 64.23 | 64.38 | 64.53 | 64.68 |
| 1.770 | | | | 62.78 | 62.94 | 63.10 | 63.26 | 63.42 | 63.58 | 63.74 | 63.89 | 64.04 | 64.20 | 64.35 | 64.50 | 64.65 | 64.80 | 64.95 | 65.09 |
| 1.780 | | | | | 63.37 | 63.52 | 63.68 | 63.84 | 64.00 | 64.15 | 64.30 | 64.46 | 64.61 | 64.76 | 64.91 | 65.06 | 65.21 | 65.35 | 65.50 |
| 1.790 | | | | | 63.78 | 63.94 | 64.09 | 64.25 | 64.40 | 64.56 | 64.71 | 64.86 | 65.01 | 65.16 | 65.31 | 65.46 | 65.60 | 65.75 | 65.89 |
| 1.800 | | | | | | 64.34 | 64.50 | 64.65 | 64.81 | 64.96 | 65.11 | 65.26 | 65.41 | 65.56 | 65.70 | 65.85 | 66.00 | 66.14 | 66.28 |
| 1.810 | | | | | | | 64.89 | 65.05 | 65.20 | 65.35 | 65.50 | 65.65 | 65.80 | 65.94 | 66.09 | 66.24 | 66.38 | 66.52 | 66.67 |
| 1.820 | | | | | | | | 65.43 | 65.58 | 65.73 | 65.88 | 66.03 | 66.18 | 66.32 | 66.47 | 66.61 | 66.76 | 66.90 | 67.04 |
| 1.830 | | | | | | | | | 65.96 | 66.11 | 66.26 | 66.41 | 66.55 | 66.70 | 66.84 | 66.98 | 67.13 | 67.27 | 67.41 |
| 1.840 | | | | | | | | | | 66.48 | 66.63 | 66.77 | 66.92 | 67.06 | 67.20 | 67.35 | 67.49 | 67.63 | 67.77 |
| 1.850 | | | | | | | | | | | 66.99 | 67.13 | 67.27 | 67.42 | 67.56 | 67.70 | 67.84 | 67.98 | 68.12 |

CRYSTALLIZATION AREA