

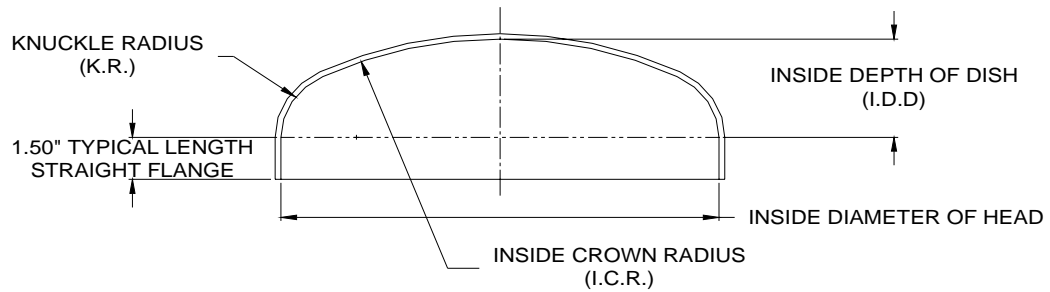


ELLIPTICAL HEAD BLANK DIMENSIONS

| I.D. | INSIDE DEPTH OF DISH (IN) | KNUCKLE RADIUS (IN) | INSIDE CROWN RADIUS (IN) |
|--------|---------------------------|---------------------|--------------------------|
| 6.00 | 1.500 | 1.036 | 5.427 |
| 8.00 | 2.000 | 1.382 | 7.236 |
| 10.00 | 2.500 | 1.727 | 9.045 |
| 12.00 | 3.000 | 2.072 | 10.854 |
| 14.00 | 3.500 | 2.418 | 12.663 |
| 16.00 | 4.000 | 2.763 | 14.472 |
| 18.00 | 4.500 | 3.109 | 16.281 |
| 20.00 | 5.000 | 3.454 | 18.090 |
| 22.00 | 5.500 | 3.799 | 19.899 |
| 24.00 | 6.000 | 4.145 | 21.708 |
| 26.00 | 6.500 | 4.490 | 23.517 |
| 28.00 | 7.000 | 4.836 | 25.326 |
| 30.00 | 7.500 | 5.181 | 27.135 |
| 32.00 | 8.000 | 5.526 | 28.944 |
| 34.00 | 8.500 | 5.872 | 30.753 |
| 36.00 | 9.000 | 6.217 | 32.562 |
| 38.00 | 9.500 | 6.563 | 34.371 |
| 40.00 | 10.000 | 6.908 | 36.180 |
| 42.00 | 10.500 | 7.253 | 37.989 |
| 44.00 | 11.000 | 7.599 | 39.798 |
| 46.00 | 11.500 | 7.944 | 41.607 |
| 48.00 | 12.000 | 8.290 | 43.416 |
| 50.00 | 12.500 | 8.635 | 45.225 |
| 52.00 | 13.000 | 8.980 | 47.034 |
| 54.00 | 13.500 | 9.326 | 48.843 |
| 56.00 | 14.000 | 9.671 | 50.652 |
| 58.00 | 14.500 | 10.017 | 52.461 |
| 60.00 | 15.000 | 10.362 | 54.270 |
| 62.00 | 15.500 | 10.707 | 56.079 |
| 64.00 | 16.000 | 11.053 | 57.888 |
| 66.00 | 16.500 | 11.398 | 59.697 |
| 68.00 | 17.000 | 11.744 | 61.506 |
| 70.00 | 17.500 | 12.089 | 63.315 |
| 72.00 | 18.000 | 12.434 | 65.124 |
| 74.00 | 18.500 | 12.780 | 66.933 |
| 76.00 | 19.000 | 13.125 | 68.742 |
| 78.00 | 19.500 | 13.471 | 70.551 |
| 80.00 | 20.000 | 13.816 | 72.360 |
| 82.00 | 20.500 | 14.161 | 74.169 |
| 84.00 | 21.000 | 14.507 | 75.978 |
| 86.00 | 21.500 | 14.852 | 77.787 |
| 88.00 | 22.000 | 15.198 | 79.596 |
| 90.00 | 22.500 | 15.543 | 81.405 |
| 92.00 | 23.000 | 15.888 | 83.214 |
| 94.00 | 23.500 | 16.234 | 85.023 |
| 96.00 | 24.000 | 16.579 | 86.832 |
| 98.00 | 24.500 | 16.925 | 88.641 |
| 100.00 | 25.000 | 17.270 | 90.450 |
| 102.00 | 25.500 | 17.615 | 92.259 |
| 104.00 | 26.000 | 17.961 | 94.068 |
| 106.00 | 26.500 | 18.306 | 95.877 |
| 108.00 | 27.000 | 18.652 | 97.686 |
| 110.00 | 27.500 | 18.997 | 99.495 |
| 112.00 | 28.000 | 19.342 | 101.304 |
| 114.00 | 28.500 | 19.688 | 103.113 |
| 116.00 | 29.000 | 20.033 | 104.922 |
| 118.00 | 29.500 | 20.379 | 106.731 |

ELLIPTICAL HEAD BLANK DIMENSIONS

| I.D. | INSIDE DEPTH OF DISH (IN) | NUCKLE RADIUS (IN) | INSIDE CROWN RADIUS (IN) |
|--------|---------------------------|--------------------|--------------------------|
| 120.00 | 30.000 | 20.724 | 108.540 |
| 122.00 | 30.500 | 21.069 | 110.349 |
| 124.00 | 31.000 | 21.415 | 112.158 |
| 126.00 | 31.500 | 21.760 | 113.967 |
| 128.00 | 32.000 | 22.106 | 115.776 |
| 130.00 | 32.500 | 22.451 | 117.585 |
| 132.00 | 33.000 | 22.796 | 119.394 |
| 134.00 | 33.500 | 23.142 | 121.203 |
| 136.00 | 34.000 | 23.487 | 123.012 |
| 138.00 | 34.500 | 23.833 | 124.821 |
| 140.00 | 35.000 | 24.178 | 126.630 |
| 142.00 | 35.500 | 24.523 | 128.439 |
| 144.00 | 36.000 | 24.869 | 130.248 |
| 150.00 | 37.500 | 25.905 | 135.675 |
| 156.00 | 39.000 | 26.941 | 141.102 |
| 162.00 | 40.500 | 27.977 | 146.529 |
| 168.00 | 42.000 | 29.014 | 151.956 |



$$\text{I.C.R} = .9045 \times \text{INSIDE DIAMETER}$$

$$\text{K.R.} = .1727 \times \text{INSIDE DIAMETER}$$

$$\text{I.D.D} = \text{INSIDE DIAMETER} / 4$$

$$\text{OVERALL HEIGHT OF HEAD} = \text{I.D.D.} + \text{STRAIGHT FLANGE} + \text{MATERIAL THICKNESS}$$