



ENDOT INDUSTRIES, INC.

PIPE AND TUBING • DUCT AND INNERDUCT

BEND RADIUS CALCULATIONS FOR PIPE

The table below assumes a perfectly round pipe at ambient temperature of 73.4° F and summarizes recommended bend ratios for various SDR pipe operating at 73.4° F.

OD Controlled Pipe SDR	ID Controlled Pipe SIDR	Minimum Allowable Bend Radius Ratio @ 73.4° F
17.0	15.0	>27 times outside diameter
15.5		>27 times outside diameter
13.5	11.5	>25 times outside diameter
11.0	9.0	>25 times outside diameter
9.0	7.0	>20 times outside diameter

The above table includes a safety factor of 2:1. The bend radius is calculated as follows. For example, if a 4.50" diameter SDR 11 pipe was to be bent, the minimum bend radius is:

$$\begin{aligned} Ra &= Do > 25 \\ Ra &= Ra / Do * Do \\ Ra &= 25 * 4.5" \\ Ra &= 112.5" \text{ minimum Radius of Curvature} \end{aligned}$$

Ra = Radius

Do = Outside Diameter

Fittings: If Tees, Ells, Flanges, or socket fusion joints are located in the bend zone, the minimum bend radius of curvature should be increased to forty (40) times the outside diameter of the pipe.

Temperature Effect: While temperature does not significantly affect thick wall, low SDR pipes, thin-wall higher SDR pipes can be affected by the sun heating the top of the pipe while the underside of the pipe is cooler. With significant heating due to sun exposure it is advisable to increase the bends radius.

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