

TOLERANCES
SEAMLESS TUBING
OD & ID/CDSM 1026 As Drawn

OD Inches	Wall as %of OD	OD, Inches		ID, Inches	
		+	-	+	-
Up to 0.499	all	0.004	0.000	—	—
0.500 - 1.699	all	0.005	0.000	0.000	0.005
1.700 - 2.099	all	0.006	0.000	0.000	0.006
2.100 - 2.499	all	0.007	0.000	0.000	0.007
2.500 - 2.899	all	0.008	0.000	0.000	0.008
2.900 - 3.299	all	0.009	0.000	0.000	0.009
3.300 - 3.699	all	0.010	0.000	0.000	0.010
3.700 - 4.099	all	0.011	0.000	0.000	0.011
4.100 - 4.499	all	0.012	0.000	0.000	0.012
4.500 - 4.899	all	0.013	0.000	0.000	0.013
4.900 - 5.299	all	0.014	0.000	0.000	0.014
5.300 - 5.549	all	0.015	0.000	0.000	0.015
5.550 - 5.999	under 6	0.010	0.010	0.010	0.015
	6 to 7½	0.009	0.009	0.009	0.009
	over 7½	0.018	0.000	0.009	0.009
6.000 - 6.499	under 6	0.013	0.013	0.013	0.013
	6 to 7½	0.010	0.010	0.010	0.010
	over 7½	0.020	0.000	0.010	0.010
6.500 - 6.999	under 6	0.015	0.015	0.015	0.015
	6 to 7½	0.012	0.012	0.012	0.012
	over 7½	0.023	0.000	0.012	0.012
7.000 - 7.499	under 6	0.018	0.018	0.018	0.018
	6 to 7½	0.013	0.013	0.013	0.013
	over 7½	0.026	0.000	0.013	0.013
7.500 - 7.999	under 6	0.020	0.020	0.020	0.020
	6 to 7½	0.015	0.015	0.015	0.015
	over 7½	0.029	0.000	0.015	0.015
8.000 - 8.499	under 6	0.023	0.023	0.023	0.023
	6 to 7½	0.016	0.016	0.016	0.016
	over 7½	0.031	0.000	0.015	0.016
8.500 - 8.999	under 6	0.025	0.025	0.025	0.025
	6 to 7½	0.017	0.017	0.017	0.017
	over 7½	0.034	0.000	0.015	0.019
9.000 - 9.499	under 6	0.028	0.028	0.028	0.028
	6 to 7½	0.019	0.019	0.019	0.019
	over 7½	0.037	0.000	0.015	0.022
9.500 - 9.999	under 6	0.030	0.030	0.030	0.030
	6 to 7½	0.020	0.020	0.020	0.020
	over 7½	0.040	0.000	0.015	0.025
10.000 - 10.999	under 6	0.034	0.034	0.034	0.034
	6 to 7½	0.022	0.022	0.022	0.022
	over 7½	0.044	0.000	0.015	0.029
11.000 - 12.000	under 6	0.035	0.035	0.035	0.035
	6 to 7½	0.025	0.025	0.025	0.025
	over 7½	0.045	0.000	0.015	0.035

Many tubes with ID less than 50% of OD or with wall more than 25% of OD, or with wall over 1¼ in., or weighing more than 90 lb./ft. are difficult to draw over a mandrel. Therefore, the ID can vary over or under by an amount equal to 10% of the wall thickness.

For tubes with ID less than ½ in. (or less than ⅝ in. when the wall thickness is more than 20% of the OD), which are not commonly drawn over a mandrel the above footnote not applicable.

Tubing having a wall less than 3% of the OD cannot be straightened properly without a certain amount of distortion. Consequently such tubes, while having an average OD and ID within the tolerances shown in this table, require an ovality of tolerance of ½% over and under nominal outside diameter, in addition to the tolerances indicated in this table.

TOLERANCES

SEAMLESS TUBING

WALL/HFSM 1026

Wall Thickness as % of OD	% Over & Under Nominal			
	Outside Diameter			
	2.999" & less ¹	3.000 to 5.999"	6.000 to 10.750"	10.751 to 16.000" ²
Under 15	12.5	10.0	10.0	12.5
15 and over	10.0	7.5	10.0	12.5

¹Wall thickness tolerances may not be applicable to walls 0.199 in. and less.

²Wall thickness tolerances over 10.750 in. are producer tolerances.

WALL/CDSM 1026

Wall Thickness as % of OD	% Over & Under Nominal	
	thru 1.4999" ID	1.500" ID & up
25 and under	10.0	7.5
Over 25	12.5	10.0

OD/HFSM 1026

O.D. Tolerances over 10.750 in. are producer tolerances.

Outside Diameter Size Range, Inches	Outside Diameter Tolerance, Inches	
	Over	Under
Up to 2.999	0.020	0.020
3.000 - 4.499	0.025	0.025
4.500 - 5.999	0.031	0.031
6.000 - 7.499	0.037	0.037
7.500 - 8.999	0.045	0.045
9.000 - 10.750	0.050	0.050
10.750 - 13.000	0.080	0.080
14.000 - 14.375	0.093	0.093
15.000 - 16.000	0.093	0.093

HYDRAULIC FLUID LINE TUBING

When tubing is specified by outside diameter and inside diameter, the tolerances shown in the table below apply.

Nominal Outside Diameter, in.	OD Plus and Minus in.	ID Plus and Minus in.
Up to $\frac{3}{8}$, incl.	0.002	0.005
Over $\frac{3}{8}$ to $\frac{1}{2}$, incl.	0.0025	0.0025
Over $\frac{1}{2}$ to 2, incl.	0.003	0.003
Over 2 to 2 $\frac{1}{2}$, incl.	0.004	0.004
Over 2 $\frac{1}{2}$ to 3, incl.	0.005	0.005
Over 3 to 4, incl.	0.006	0.006

When tubing is specified by the outside diameter (or the inside diameter) and the nominal wall thickness, the above tolerances apply for the specified diameter and the wall thickness allowable variation is $\pm 10\%$ for tubes $\frac{3}{8}$ in. (9.525 mm) diameter and over, and $\pm 15\%$ for tubes under $\frac{3}{8}$ in. (9.525 mm) O.D.

Ry-Star 512 EXTRA Diameter & Wall

Size OD	OD Plus	OD Minus	ID Plus	ID Minus	Wall Thickness Plus and Minus
$\frac{1}{2}$ " to 1 $\frac{1}{2}$ "	.005	.000	.000	.005*	7%
1 $\frac{1}{2}$ " & over	.010	.000	.000	.010	7%

*A greater tolerance may be needed where the ID is less than $\frac{1}{2}$ "