Westinghouse Electric Corporation
Industrial Micarta Division
Hampton, South Carolina 29924 U.S.A.

Standard Dimensions
Standard Tolerances

Micarta® Convolute Tubing

971

...ing Standards①

...ions ③ ...x.	Outside Diam. Min.	Outside Diam. Max.	Wall Thickness Min.	Wall Thickness Max.④ (For Inside Diameters as Indicated) 1/8-5/16	11/32-1/2	17/32-3/4	25/32-1	1 1/32-2	2 1/32-4 1/2	4 17/32-60	Tube Length⑤ Max. (For I.D. as Indicated) 1/8-15/64	1/4-31/64	1/2-1 3/8	1 1/2 Up	Tube Tolerances: Inside Diameter Tolerances⑥ (For Inside Diameters as Indicated) 1/8-23/32	3/4-1 15/16	2-4	4 1/8-12	12 1/8-18	18 1/8-24	24 1/8-60	Wall Thickness Tolerances⑦ Inside Diameter up to 4" (For Wall Thickness, as Indicated) 1/32-1/16	3/32-1/8	5/32-1/4	9/32-1/2	Outside Diameter Tolerances⑥⑧: Ground (For Outside Diameter as Indicated) 5/32-23/32	3/4-1 15/16	2-4	4 1/8-9	Turned (For Outside Diameter as Indicated) 9 1/8-18	18 1/8-24	24 1/8-68	Rough (For Wall Thickness as Indicated) To 3/4	25/32 to 1 1/2	1 17/32-3	Grade②
																																				Paper Base Micarta
	3/16	61 1/4	1/32	3/16	1/4	3/8	3/8	3/8	3/8	5/8	18-20	32-36	42-46	42-46	±.003	±.004	±.008	±.010	±.030	±.040	±.060	±.006	±.007	±.009	±.011	±.005	±.005	±.008	±.025	±.030	±.035	±.040	+.094	+.126	+.156	5A2, 51
	5/8	61 1/2	1/16	N. A.	1/4	1/4	1/4	1/4	1/2	3/4	N. A.	N. A.	32-36	32-36	±.003	±.004	±.008	±.010	±.030	±.040	±.060	N. A.	±.007	±.009	±.011	±.005	±.005	±.008	±.025	±.030	±.035	±.040	+.094	+.126	+.156	94
	5/8	61 1/4	1/16	3/16	1/4	3/8	3/8	3/8	3/8	5/8	N. A.	N. A.	42-46	42-46	±.003	±.004	±.008	±.010	±.030	±.040	±.060	N. A.	±.007	±.009	±.011	±.005	±.005	±.008	±.025	±.030	±.035	±.040	+.094	+.126	+.156	HY-290-2,HY-609,HY-1412
	3/16	61 1/4	1/32	3/16	1/4	3/8	3/8	3/8	3/8	5/8	18-20	32-36	42-46	42-46	±.003	±.004	±.008	±.010	±.030	±.040	±.060	±.006	±.007	±.009	±.011	±.005	±.005	±.008	±.025	±.030	±.035	±.040	+.094	+.126	+.156	HY-488
	3/16	61 1/4	1/32	3/16	1/4	3/8	3/8	3/8	3/8	5/8	18-20	32-36	32-36	32-36	±.003	±.004	±.008	±.010	±.030	±.040	±.060	±.006	±.007	±.009	±.011	±.005	±.005	±.008	±.025	±.030	±.035	±.040	+.094	+.126	+.156	5A3
	5/8	61 1/4	1/16	3/16	1/4	3/8	3/8	3/8	3/8	5/8	18-20	32-36	42-46	42-46	±.003	±.004	±.008	±.010	±.030	±.040	±.060	±.006	±.007	±.009	±.011	±.005	±.005	±.008	±.025	±.030	±.035	±.040	+.094	+.126	+.156	HY-1387
	1/4	61 1/4	1/16	3/16	1/4	3/8	3/8	1/2	1/2	5/8	18-20	32-36	42-46	42-46	±.003	±.004	±.008	±.010	±.030	±.040	±.060	±.006	±.007	±.009	±.011	±.005	±.005	±.008	±.025	±.030	±.035	±.040	+.094	+.126	+.156	20005
																																				Cloth Base Micarta
	3/16	68	1/32	5/16	3/4	1 1/4	1 1/2	1 3/4	3 1/2	4	18-20	32-36	42-46	42-46	±.003	±.004	±.008	±.010	±.030	±.040	±.060	±.008	±.009	±.011	±.013	±.005	±.005	±.008	±.025	±.030	±.035	±.040	+.126	+.156	+.186	76, 5A1, 20007, HY-1928
	3/4	68	1/8	N. A.	N. A.	1 1/2	2	2 1/4	3 1/2	4	N. A.	N. A.	42-46	42-46	±.003	±.004	±.008	±.010	±.030	±.040	±.060	N. A.	N. A.	±.020	±.020	N. A.	±.005	±.008	±.025	±.030	±.035	±.040	+.126	+.156	+.186	79, HY-375, HY-1755
	3/16	64 1/4	1/32	5/16	1/2	1	1 1/2	1 3/4	2 1/4	2 1/8	18-20	32-36	42-46	42-46	±.003	±.004	±.008	±.010	±.030	±.040	±.060	±.008	±.009	±.011	±.013	±.005	±.005	±.008	±.025	±.030	±.035	±.040	+.126	+.156	+.186	97
	3/4	62 1/2	1/8	N. A.	N. A.	3/8	1/2	1	1 1/4	1 1/2	N. A.	N. A.	32-36	32-36	±.003	±.005	±.008	±.015	±.030	±.040	±.060	N. A.	N. A.	±.020	±.020	N. A.	±.005	±.008	±.025	±.030	±.035	±.040	+.126	+.156	+.186	93, HY-1760, HY-1766
																																				Glass Base Micarta
	5/8	62	1/16	N. A.	N. A.	1/4	3/8	1/2	3/4	1	N. A.	32-36	42-46	42-46	±.003	±.004	±.008	±.010	±.030	±.040	±.060	N. A.	±.009	±.011	±.013	±.005	±.005	±.008	±.025	±.030	±.035	±.040	+.126	+.156	+.186	HY-180, HY-180-1
	19/32	62	1/32	N. A.	1/8	3/16	1/4	1/2	3/4	1	18-20	32-36	42-46	42-46	±.003	±.004	±.008	±.010	±.030	±.040	±.060	±.008	±.009	±.011	±.013	±.005	±.005	±.008	±.025	±.030	±.035	±.040	+.126	+.156	+.186	HY-512
	5/16	61 1/2	1/32	N. A.	5/16	3/8	1/2	3/4	3/4	3/4	18-20	32-36	42-46	42-46	±.003	±.004	±.008	±.010	±.030	±.040	±.060	±.008	±.009	±.011	±.013	±.005	±.005	±.008	±.025	±.030	±.035	±.040	+.126	+.156	+.186	5A4
	1 1/8	61 1/2	1/16	N. A.	N. A.	3/8	1/2	3/4	3/4	3/4	N. A.	N. A.	32-36	42-46	±.003	±.004	±.008	±.010	±.030	±.040	±.060	N. A.	±.009	±.011	±.013	±.005	±.005	±.008	±.025	±.030	±.035	±.040	+.126	+.156	+.186	HY-689, HY-1216
	3/16	61 1/2	1/32	1/16	1/8	3/16	1/4	1/2	3/4	3/4	18-20	32-36	32-36	32-36	±.003	±.004	±.008	±.010	±.030	±.040	±.060	±.008	±.009	±.011	±.013	±.005	±.005	±.008	±.025	±.030	±.035	±.040	+.126	+.156	+.186	HY-278
	5/8	61 1/2	1/16	N. A.	N. A.	1/4	1/4	1/4	1/4	3/4	N. A.	N. A.	32-36	32-36	±.003	±.004	±.008	±.010	±.030	±.040	±.060	N. A.	±.009	±.011	±.013	±.005	±.005	±.008	±.025	±.030	±.035	±.040	+.126	+.156	+.186	20000-2, HY-2067
	3/16	61 1/2	1/32	1/16	1/8	3/16	1/4	1/4	1/4	3/4	18-20	32-36	32-36	32-36	±.003	±.004	±.008	±.010	±.030	±.040	±.060	±.008	±.009	±.011	±.013	±.005	±.005	±.008	±.025	±.030	±.035	±.040	+.126	+.156	+.186	HY-1293
	5/8	61 1/2	1/16	1/16	1/8	1/4	3/8	1/2	1/2	3/4	N. A.	N. A.	32-36	32-36	±.003	±.004	±.008	±.010	±.030	±.040	±.060	N. A.	±.009	±.011	±.013	±.005	±.005	±.008	±.025	±.030	±.035	±.040	+.126	+.156	+.186	HY-1806

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⑦ Plus or minus tolerance from average wall thickness of individual tube. Wall thickness measured at any point in the wall of any one tube of a given size must fall within the tolerances given. This provides a means of measuring both the tolerance in the wall thickness and the deviation from concentricity. If a tubing order is placed as O.D. and I.D., nominal wall is determined for purpose of determining concentricity requirement. Deviation from concentricity is then determined by using twice the wall thickness tolerance as TIR on wall at any one section of tube. Tolerances for tubes with I.D. over four inches and/or a wall thickness over 1/2 inch are available on request.

⑧ Ground finish is standard up to 9" O.D. Rough finish is standard over 9" O.D. and tolerance is plus only. A turned finish may be specified at premium prices. Tolerance of rough finish depends on wall thickness. Oil, wax or varnish finish are also available at premium prices. Turned finish is generally unavailable on tubes larger than 25" O.D. due to equipment limitations.

⑧ HY-180, HY-180-1 and HY-512 that are under 1/2" I.D. and 1/16" wall thickness will be made filament wound rather than convolute.

N.A. Not available.

Mandrel Sizes Available

(Table continued on page 2.1)

Mandrel Diam., In.	Mandrel Lgth., In.①	Number Available	Mandrel Diam., In.	Mandrel Lgth., In.	Number Available	Mandrel Diam., In.	Mandrel Lgth., In.	Number Available	Mandrel Diam., In.	Mandrel Lgth., In.	Number Available
1/8	22	48	49/64	50, 100	15, 2	1 19/32	50	20	2 17/32	50	7
.129	22	35	25/32	50, 100	30, 20	1 39/64	50	14	2 35/64	50	1
.140	22	89	.790	50	3	1.617	50	7	2 9/16	50	30
.147	22	75	51/64	50	10	1 5/8	50, 100	50, 12	2 19/32	50	3
5/32	22	82	.807	50	6	1 41/64	50, 100	20, 1	2 39/64	50	2
11/64	22	50	.809	50	10	1 21/32	50	16	2 5/8	50	10
3/16	22, 38	75, 39	.810	50	36	1 43/64	50, 100	7, 2	2 41/64	50	1
.191	22	41	13/16	50, 100	90, 1	1 11/16	50, 100	11, 4	2 21/32	50	5
.194	22	77	.822	50	30	1 45/64	50	6	2 11/16	50	23
13/64	22, 38	7, 54	53/64	50	22	1 23/32	50	11	2 45/64	50	4
7/32	22	70	27/32	50	34	1 47/64	50	4	2 23/32	50	1
15/64	38	7	55/64	50	36	1 3/4	50, 100	16, 6	2 3/4	50	10
.246	38	22	7/8	50, 100	36, 37	1 49/64	50	41	2 49/64	50	7
1/4	22, 38	15, 25	.879	50	1	1 25/32	50	11	2 25/32	50	10
.257	22	70	57/64	50	23	1 51/64	50	7	2 51/64	50	3
17/64	22, 38	33, 50	29/32	50	65	1 13/16	50	22	2.805	50	1
9/32	22, 38	15, 45	59/64	50	9	1 53/64	50	6	2 13/16	50	6
.292	22, 38	14, 11	15/16	50	65	1 27/32	50	16	2 53/64	50	2
19/64	22, 38	18, 20	61/64	50, 100	7, 10	1 55/64	50	7	2 7/8	50, 100	25, 1
5/16	38	84	31/32	50	12	1 7/8	50, 100	26, 4	2 57/64	50	3
.319	38	18	63/64	50	19	1 57/64	50	7	2 29/32	50	3
.324	38	44	1.0	50, 100	34, 8	1 29/32	50, 100	18, 2	2 59/64	50	1
21/64	38	76	1.010	50	15	1 59/64	50	4	2 15/16	50	2
11/32	38	35	1 1/64	50, 100	21, 2	1 15/16	50	20	2 61/64	50	1
23/64	38	45	1 1/32	50, 100	20, 3	1 61/64	50	5	2 31/32	50	1
3/8	38	40	1 3/64	50	11	1 31/32	50	9	3.0	50	7
.380	38	103	1 1/16	50, 100	20, 5	1 63/64	50	6	3 1/32	50	1
.385	38	10	1 5/64	50, 100	14, 2	2.0	50, 100	9, 7	3 1/16	50	6
25/64	38	50	1 3/32	50, 100	16, 1	2 1/64	50	6	3 3/32	50	2
13/32	38	30	1 7/64	50	10	2 1/32	50, 100	22, 2	3 7/64	50	2
.412	38	4	1 1/8	50, 100	117, 4	2 3/64	50	1	3 1/8	50	7
.414	38	15	1 9/64	50	22	2 1/16	50	4	3 5/32	50	2
27/64	38	45	1 5/32	50	117	2 5/64	50	1	3 3/16	50	5
7/16	38, 50	50, 12	1 11/64	50, 100	8, 1	2 3/32	50, 100	3, 7	3 15/64	50	3
.448	38	2	1 3/16	50, 100	134, 3	2 7/64	50	2	3 1/4	50, 100	10, 1
29/64	38	69	1 13/64	50	4	2 1/8	50, 100	11, 4	3 17/64	50	1
15/32	38	46	1 7/32	50	14	2 9/64	50	11	3 9/32	50	5
31/64	38	65	1 15/64	50	2	2 5/32	50	2	3 19/64	50	1
1/2	38, 50	9, 55	1 1/4	50, 100	75, 6	2 11/64	50	4	3 5/16	50	1
.507	38	18	1 17/64	50, 100	13, 2	2 3/16	50	8	3 11/32	50	1
33/64	38, 50	55, 25	1 9/32	50, 100	18, 4	2 13/64	50	3	3 23/64	50	4
17/32	38, 50	17, 25	1 19/64	50	12	2 7/32	50, 100	6, 1	3 3/8	50	14
35/64	50	15	1 5/16	50, 100	16, 10	2 15/64	50	1	3 13/32	50	1
9/16	38, 50, 100	15, 25, 4	1 21/64	50	6	2 1/4	50	5	3 27/64	50	1
37/64	38, 50	30, 7	1 11/32	50	19	2 9/32	50	5	3 7/16	50	157
19/32	38	6	1 23/64	50	15	2 19/64	50	1	3 15/32	50	1
39/64	38, 50	22, 28	1 3/8	50, 100	75, 3	2 5/16	50	8	3 1/2	50, 100	35, 2
5/8	50, 100	25, 9	1 25/64	50	15	2 21/64	50	2	3 17/32	50	4
.632	50	16	1 13/32	50	28	2 11/32	50, 100	2, 2	3 9/16	50	8
.637	50	3	1 27/64	50	2	2 23/64	50	1	3 37/64	50	1
41/64	50	36	1 7/16	50	28	2 3/8	50, 100	8, 2	3 19/32	50	1
21/32	38, 50	24, 50	1 29/64	50	15	2 25/64	50	4	3 5/8	50	5
43/64	50	7	1 15/32	50	15	2 13/32	50	7	3 21/32	50	8
11/16	50	37	1 31/64	50	12	2 27/64	50	1	3 43/64	50	1
.695	50, 100	11, 3	1 1/2	50, 100	31, 3	2 7/16	50	7	3 11/16	50	93
45/64	50	37	1 33/64	50	15	2 29/64	50	2	3 3/4	50	5
23/32	50	42	1 17/32	50, 100	22, 2	2 31/64	50	6	3 3/4	137②	1
47/64	50	22	1 35/64	50	4	2.49	285②	1	3 25/32	50	2
3/4	50, 100	22, 21	1 9/16	50, 100	22, 5	2 1/2	50, 100	11, 4	3 13/16	50	4
.754	50	2	1 37/64	50, 100	6, 2	2 33/64	50	5	3 53/64	50	1

① Where more than one mandrel length is shown, number of each length is shown, respectively, in the next column.

② Special mandrel for filament winding only.

Mandrel Sizes Available, Continued

Mandrel Diam., In.	Mandrel Lgth., In.①	Number Available	Mandrel Diam., In.	Mandrel Lgth., In.	Number Available	Mandrel Diam., In.	Mandrel Lgth., In.	Number Available	Mandrel Diam., In.	Mandrel Lgth., In.
3 7/8	50	24	5 7/16	65	3	7 3/8	65	4	10 3/16	55
3 29/32	50	1	5 29/64	65	1	7 13/32	55	1	10 13/64	65
3.916	50	1	5 15/32	55	1	7 7/16	65	2	10 1/4	65
3 15/16	50	3	5 1/2	55, 65, 75	1, 2, 2	7 15/32	55	1	10 3/8	55
3 31/32	50	4	5 23/64	55	1	7 31/64	65	1	10 7/16	55
4.0	50	11	5 17/32	55, 65	2, 1	7 1/2	65	1	10 1/2	55, 65, 75
4.0	175②	1	5 9/16	55	1	7 9/16	65	2	10 5/8	55, 65
4 1/64	50	3	5 19/32	55	4	7 5/8	65	2	10 11/16	65
4 1/32	50	3	5 39/64	55	1	7 11/16	65	1	10 3/4	55, 75
4 1/16	50	3	5 5/8	65	61	7 3/4	65, 75	4, 1	10 13/16	65
4 1/8	50	9	5.630	65	10	7 49/64	55	1	10 7/8	55, 65
4 5/32	50	1	5 43/64	55	1	7 13/16	65	2	11.0	55
4 13/64	50	1	5 11/16	55	1	7 53/64	65	1	11 3/16	75
4.230	75	12	5 45/64	55	1	7 27/32	55	1	11 1/4	65
4 1/4	50	4	5 23/32	65	1	7 7/8	55, 65	1, 2	11 3/8	55
4 9/32	50	1	5 3/4	55	3	7 57/64	55	1	11 1/2	65
4 5/16	50	6	5 25/32	55	1	7 29/32	65	1	11 9/16	65
4 3/8	50	4	5 13/16	55	1	7.944	65	2	11 5/8	55
4 7/16	50	6	5 7/8	55	1	8.0	55, 65	1, 6	11 11/16	65
4 15/32	50	1	5 57/64	55	1	8 1/16	65	1	11 13/16	65
4 1/2	55	5	5.9125	65, 75	2, 1	8 1/8	65	1	11 3/4	55
4 1/2	100	14	5 59/64	55	1	8 3/16	75	2	11.969	55, 65
4 17/32	65	5	5 15/16	55	1	8 1/4	65	4	12.0	65, 75
4.550	69	1	5.9445	65	1	8 5/16	55	1	12 1/16	55
4 9/16	65	7	5 61/64	55	1	8 3/8	55, 65	1, 1	12 1/8	55
4 5/8	65	3	5.989	65	1	8 7/16	65	2	12 1/4	65
4 43/64	55	1	6.0	55, 65, 75	2, 1, 2	8 1/2	65	1	12 5/16	55
4 11/16	55	1	6.073	65	10	8 5/8	65	1	12 7/16	44
4 45/64	65	2	6 3/32	55	1	8 21/32	55	1	12 1/2	55
4 23/32	55	1	6 1/8	65	1	8 11/16	55	1	12 5/8	65
4.724	77	7	6 3/16	55, 65	2, 1	8 3/4	65	2	12 3/4	55
4 3/4	50, 55	27, 4	6 13/64	55	1	8 7/8	65	1	12 13/16	65
4 3/4	65, 75	4, 1	6 1/4	65, 75	1, 1	8 57/64	65	1	13.0	65
4 25/32	65	2	6 9/32	65	2	8.895	65, 75	2, 1	13.015	65
4 13/16	55	1	6 11/32	65	1	9.0	63	3	13 7/32	65
4 27/32	51	1	6 23/64	65	1	9 1/16	55, 65	1, 1	13 1/4	55
4 55/64	65	1	6 3/8	65	1	9 1/8	65	1	13.332	75
4 7/8	55	4	6 13/32	55	1	9 3/16	65	1	13 3/8	65
4.906	55, 65	1, 2	6 7/16	65	1	9 7/32	65	1	13 25/64	65
4 59/64	55	1	6 15/32	65	1	9 1/4	65	1	13 29/64	65
4 15/16	55	1	6 1/2	65, 75	2, 2	9.300	65	1	13 1/2	65
4 63/64	55	2	6 17/32	65	2	9 5/16	55	1	13.515	65
5.0	55, 65	1, 3	6 9/16	55	1	9 3/8	55	1	13 3/4	55, 75
5 1/64	55	1	6 5/8	55, 60	1, 1	9.445	75	1	13 7/8	55, 75
5 1/32	55	1	6 21/32	55, 65	1, 1	9 1/2	55, 65	1, 2	13 55/64	75
5 1/16	55	2	6 11/16	55	1	9 17/32	55	1	14.0	55, 65
5 5/64	65	1	6 23/32	55	1	9 9/16	55	1	14 1/8	65
5 3/32	65	2	6 3/4	65, 75	1, 1	9 5/8	55	1	14 1/4	55, 65
5 7/64	55	12	6 7/8	65	3	9 43/64	65	1	14 1/2	55, 65
5 1/8	55	1	6 7/8	175②	1	9 11/16	55	1	14 9/16	55
5.133	55	3	6 59/64	55	1	9 3/4	65	2	14 3/4	65
5 5/32	55	1	6 15/16	55	1	9 13/16	55	1	15.0	65
5 3/16	65	1	6.944	65	1	9 55/64	55	1	15 1/16	55
5 1/4	55, 65	3, 3	6 61/64	55	2	9.919	65	1	15 1/8	65
5 17/64	55, 63	1, 2	6 31/32	65	3	9 7/8	65	1	15 1/4	65
5 9/32	65	1	7.0	65, 90	1, 2	9 59/64	65	1	15 3/4	65
5 19/64	55	1	7 1/64	55	1	9 15/16	75	1	15 13/16	55
5 5/16	65	3	7 1/32	65	2	9.946	75	1	15 7/8	55
5 23/64	55	1	7 1/8	65	1	10	75	1	16.0	55
5 3/8	55, 65	1, 4	7 1/8	90②	1	10 1/64	75	1	16 3/16	55
5 25/64	65	1	7 5/32	55	1	10 1/32	65	1	16 3/8	55
5 13/32	55	1	7 1/4	65, 75	2, 1	10 1/16	55	2	16 1/2	65

① Where more than one mandrel length is shown, number of each length is shown, respectively, in the next column.

② Special mandrel for filament winding only.

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