



**PEGASUS**<sup>®</sup>

**SIMAX**<sup>®</sup>

**BOROSILICATE  
TUBING AND ROD**



## INTRODUCTION

PEGASUS® with the brand SIMAX® are committed to providing the absolute best quality, most diverse and extensive offering of 3.3 Borosilicate Glass in the industry.

Since our last printed catalogue we have added 61 NEW sizes to our standard offering. This catalogue and our warehouse have over 330 standard sizes awaiting your order. If there are sizes or shapes you can't find as a standard offering contact us and we'll make it or resize to meet your needs.

With values aimed at prompt, professional, and responsive service for fulfillment of catalogue standard items or custom queries PEGASUS® and our distributors aim to be your source for Borosilicate Glass products.



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## TUBING

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**STANDARD TUBING**



Code Number	d1 (mm)	d1 +/- (mm)	t (mm)	t +/- (mm)	ID (mm)	Approx. Case (pcs)	Approx. Case (lbs)
246 040 080	4	0.15	0.8	0.04	2.4	400	23.76
246 050 080	5	0.15	0.8	0.04	3.4	256	19.80
246 060 100	6	0.15	1.0	0.04	4.0	170	19.80
246 060 150	6	0.15	1.5	0.10	3.0	170	26.62
246 063 120	6.35	0.18	1.2	0.08	4.0	170	22.00
246 070 100	7	0.15	1.0	0.04	5.0	121	16.72
246 070 150	7	0.15	1.5	0.10	4.0	121	23.10
246 080 100	8	0.15	1.0	0.04	6.0	100	16.28
246 080 150	8	0.15	1.5	0.10	5.0	100	22.44
246 080 200	8	0.25	2.0	0.15	4.0	100	27.70
246 090 100	9	0.15	1.0	0.04	7.0	81	14.96
246 090 150	9	0.15	1.5	0.10	6.0	81	21.12
246 095 200	9.53	0.25	2.0	0.20	5.5	81	22.66
246 100 100	10	0.15	1.0	0.04	8.0	64	13.42
246 100 150	10	0.15	1.5	0.10	7.0	64	18.92
246 100 220	10	0.15	2.2	0.15	5.6	64	25.30
246 110 100	11	0.20	1.0	0.04	9.0	121	27.94
246 110 150	11	0.20	1.5	0.10	8.0	121	40.04
246 110 220	11	0.20	2.2	0.15	6.6	50	22.44
246 120 100	12	0.20	1.0	0.04	10.0	100	25.52
246 120 150	12	0.20	1.5	0.10	9.0	100	36.52
246 120 220	12	0.20	2.2	0.15	7.6	49	24.42
246 127 160	12.7	0.30	1.6	0.20	9.5	81	33.22
246 127 240	12.7	0.25	2.4	0.20	7.9	81	48.62
246 130 100	13	0.20	1.0	0.04	11.0	81	22.44
246 130 150	13	0.20	1.5	0.10	10.0	81	32.34
246 130 220	13	0.20	2.2	0.15	8.6	81	44.66
246 140 100	14	0.20	1.0	0.04	12.0	64	19.36
246 140 150	14	0.20	1.5	0.10	11.0	64	27.72
246 140 220	14	0.20	2.2	0.15	9.6	64	38.50
246 150 120	15	0.20	1.2	0.05	12.6	49	18.70
246 150 180	15	0.20	1.8	0.10	11.4	49	27.06
246 150 250	15	0.20	2.5	0.15	10.0	49	35.42
246 159 240	15.9	0.25	2.4	0.20	11.1	49	36.74
246 160 120	16	0.20	1.2	0.05	13.6	49	20.24
246 160 180	16	0.20	1.8	0.10	12.4	49	29.04
246 160 250	16	0.20	2.5	0.15	11.0	49	38.28
246 170 120	17	0.20	1.2	0.05	14.6	36	15.84
246 170 180	17	0.20	1.8	0.10	13.4	36	22.88
246 170 250	17	0.20	2.5	0.15	12.0	36	30.14
246 180 120	18	0.20	1.2	0.05	15.6	36	16.72
246 180 180	18	0.20	1.8	0.10	14.4	36	24.20
246 180 250	18	0.20	2.5	0.15	13.0	36	32.34
246 190 120	19	0.20	1.2	0.05	16.6	64	31.46
246 190 180	19	0.20	1.8	0.10	15.4	64	45.76

**NEW!**

**NEW!**

Can't find the size you're looking for? Call us and we'll make it for you! \* Minimums may apply.

**STANDARD TUBING**



Code Number	d1 (mm)	d1 +/- (mm)	t (mm)	t +/- (mm)	ID (mm)	Approx. Case (pcs)	Approx. Case (lbs)
246 190 250	19	0.20	2.5	0.15	14.0	36	34.32
246 190 320		0.25	3.2	0.30	12.6	36	42.02
246 200 120	20	0.25	1.2	0.05	17.6	49	25.52
246 200 180		0.25	1.8	0.10	16.4	49	37.18
246 200 250		0.25	2.5	0.15	15.0	49	49.50
246 220 120	22	0.25	1.2	0.05	19.6	36	20.68
246 220 150		0.30	1.5	0.10	19.0	36	25.52
246 220 180		0.25	1.8	0.10	18.4	36	30.36
246 220 250		0.25	2.5	0.15	17.0	36	40.48
246 220 300		0.30	3.0	0.30	16.0	36	47.52
246 222 320	22.2	0.30	3.2	0.25	15.8	36	51.04
246 240 120	24	0.25	1.2	0.05	21.6	36	22.88
246 240 180		0.25	1.8	0.10	20.4	36	33.22
246 240 250		0.25	2.5	0.15	19.0	36	44.66
246 250 150	25	0.30	1.5	0.10	22.0	25	29.26
246 254 240	25.4	0.30	2.4	0.20	20.6	25	31.90
246 254 400		0.30	4.0	0.30	17.4	25	49.50
246 260 140	26	0.25	1.4	0.05	23.2	36	28.60
246 260 200		0.25	2.0	0.10	22.0	36	39.82
246 260 280		0.25	2.8	0.15	20.4	36	54.12
246 280 140	28	0.25	1.4	0.05	25.2	25	21.56
246 280 150		0.30	1.5	0.15	25.0	25	23.10
246 280 200		0.25	2.0	0.10	24.0	25	30.14
246 280 280		0.25	2.8	0.15	22.4	25	40.70
246 300 140	30	0.40	1.4	0.10	27.2	36	33.44
246 300 200		0.40	2.0	0.15	26.0	36	46.64
246 300 280		0.40	2.8	0.20	24.4	25	44.00
246 317 240	31.7	0.60	2.4	0.20	26.9	16	25.96
246 317 400		0.60	4.0	0.40	23.7	16	40.92
246 320 140	32	0.40	1.4	0.10	29.2	25	24.86
246 320 180		0.60	1.8	0.10	28.4	25	31.46
246 320 200		0.40	2.0	0.15	28.0	25	34.76
246 320 280		0.40	2.8	0.20	26.4	25	47.30
246 330 400	33	0.40	4.0	0.40	25.0	16	42.90
246 340 140	34	0.40	1.4	0.10	31.2	16	16.94
246 340 200		0.40	2.0	0.15	30.0	16	23.76
246 340 280		0.40	2.8	0.20	28.4	16	32.34
246 350 200	35	0.60	2.0	0.20	31.0	16	24.42
246 360 140	36	0.45	1.4	0.10	33.2	16	17.82
246 360 200		0.45	2.0	0.15	32.0	16	25.08
246 360 280		0.45	2.8	0.20	30.4	16	34.32
246 380 140	38	0.45	1.4	0.10	35.2	16	18.92
246 380 200		0.45	2.0	0.15	34.0	16	26.62
246 380 280		0.45	2.8	0.20	32.4	16	36.52
246 381 240		38.1	0.60	2.4	0.20	33.3	16



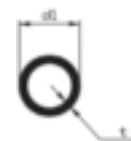
**STANDARD TUBING**



Code Number	d1 (mm)	d1 +/- (mm)	t (mm)	t +/- (mm)	ID (mm)	Approx. Case (pcs)	Approx. Case (lbs)
246 381 400	38.1	0.60	4.0	0.40	30.1	16	50.38
246 400 160		0.60	1.6	0.10	36.8	16	22.66
246 400 230	40	0.60	2.3	0.20	35.4	16	32.12
246 400 320		0.60	3.2	0.30	33.6	16	43.56
246 410 200	41	0.80	2.0	0.20	37.0	16	28.82
246 420 160		0.60	1.6	0.10	38.8	16	23.98
246 420 230	42	0.60	2.3	0.20	37.4	16	33.88
246 420 320		0.60	3.2	0.30	35.6	16	45.98
246 440 160		0.60	1.6	0.10	40.8	16	25.08
246 440 230	44	0.60	2.3	0.20	39.4	16	35.42
246 440 320		0.60	3.2	0.30	37.6	16	48.40
246 440 480		0.80	4.8	0.40	34.4	9	39.16
246 444 400	44.4	0.90	4.0	0.40	36.4	16	59.84
246 450 200	45	0.80	2.0	0.20	41.0	16	31.90
246 450 480		0.80	4.8	0.40	35.4	9	44.88 <b>NEW!</b>
246 460 160		0.70	1.6	0.10	42.8	16	26.40
246 460 230	46	0.70	2.3	0.20	41.4	16	37.18
246 460 320		0.70	3.2	0.30	39.6	16	50.60
246 460 480		0.80	4.8	0.40	36.4	9	41.14
246 480 160		0.70	1.6	0.10	44.8	9	15.40
246 480 230	48	0.70	2.3	0.20	43.4	9	21.78
246 480 320		0.70	3.2	0.30	41.6	9	29.92
246 500 180		0.70	1.8	0.15	46.4	12	23.98
246 500 250		0.70	2.5	0.20	45.0	12	33.00
246 500 350	50	0.70	3.5	0.30	43.0	9	33.88
246 500 500		0.70	5.0	0.40	40.0	9	46.86
246 500 700		0.70	7.0	0.70	36.0	9	41.80
246 508 320	50.8	1.00	3.2	0.30	44.4	9	31.68
246 508 480		0.90	4.8	0.40	41.2	9	45.98 <b>NEW!</b>
246 510 200	51	1.00	2.0	0.20	47.0	12	27.28
246 520 180		0.80	1.8	0.15	48.4	12	25.08
246 520 250	52	0.80	2.5	0.20	47.0	12	34.32
246 520 350		0.80	3.5	0.30	45.0	9	35.42
246 540 180		0.80	1.8	0.15	50.4	9	19.58
246 540 250	54	0.80	2.5	0.20	49.0	9	26.84
246 540 350		0.80	3.5	0.30	47.0	9	36.74
246 550 500	55	0.80	5.0	0.40	45.0	9	51.92 <b>NEW!</b>
246 560 180		0.80	1.8	0.15	52.4	12	27.06
246 560 250	56	0.80	2.5	0.20	51.0	12	37.18
246 560 350		0.80	3.5	0.30	49.0	9	38.28
246 570 240	57	1.00	2.4	0.30	52.2	4	12.10
246 571 320	57.1	1.00	3.2	0.30	50.7	4	16.06
246 571 480		1.00	4.8	0.45	47.5	4	23.32 <b>NEW!</b>
246 580 180	58	0.80	1.8	0.15	54.4	12	28.16
246 580 250		0.80	2.5	0.20	53.0	12	38.50

Can't find the size you're looking for? Call us and we'll make it for you! \* Minimums may apply.

## STANDARD TUBING



Code Number	d1 (mm)	d1 +/- (mm)	t (mm)	t +/- (mm)	ID (mm)	Approx. Case (pcs)	Approx. Case (lbs)	
246 580 350	58	0.80	3.5	0.30	51.0	4	17.60	
246 600 220		0.90	2.2	0.20	55.6	12	35.20	
246 600 320		0.90	3.2	0.25	53.6	12	50.38	
246 600 420		60	0.90	4.2	0.40	51.6	4	21.78
246 600 500			0.90	5.0	0.40	50.0	4	25.52
246 600 700			0.90	7.0	0.60	46.0	4	34.32
246 600 900		0.90	9.0	0.80	42.0	4	42.46	
246 640 240	64	1.20	2.4	0.25	59.2	4	13.64	
246 650 220	65	0.90	2.2	0.20	60.6	8	25.52	
246 650 320		0.90	3.2	0.25	58.6	8	36.52	
246 650 420		0.90	4.2	0.40	56.6	8	47.30	
246 650 500		0.90	5.0	0.40	55.0	4	27.72	
246 700 220	70	1.00	2.2	0.20	65.6	8	27.50	
246 700 320		1.00	3.2	0.25	63.6	8	39.60	
246 700 420		1.00	4.2	0.40	61.6	8	51.04	
246 700 500		1.00	5.0	0.40	60.0	4	30.14	
246 700 700		1.00	7.0	0.65	56.0	4	40.70	
246 700 900		1.00	9.0	0.80	52.0	4	50.82	
246 750 220	75	1.00	2.2	0.20	70.6	4	14.74	
246 750 240		1.20	2.4	0.20	70.2	4	16.06	
246 750 320		1.00	3.2	0.25	68.6	4	21.34	
246 750 420		1.00	4.2	0.40	66.6	4	27.50	
246 750 500		1.00	5.0	0.40	65.0	4	32.34	
246 800 250		80	1.30	2.5	0.20	75.0	4	17.82
246 800 350	1.30		3.5	0.30	73.0	4	24.86	
246 800 500	1.30		5.0	0.50	70.0	4	34.76	
246 800 700	1.30		7.0	0.80	66.0	4	47.30	
246 800 900	1.30		9.0	0.90	62.0	3	44.22	
246 850 250	85	1.30	2.5	0.20	80.0	4	19.14	
246 850 350		1.30	3.5	0.30	78.0	4	26.40	
246 850 500		1.30	5.0	0.50	75.0	4	36.96	
246 900 250	90	1.30	2.5	0.20	85.0	4	20.24	
246 900 350		1.30	3.5	0.30	83.0	4	27.94	
246 900 500		1.30	5.0	0.50	80.0	4	39.38	
246 900 700		1.30	7.0	0.70	76.0	4	53.90	
246 950 250	95	1.50	2.5	0.20	90.0	4	21.34	
246 950 350		1.50	3.5	0.30	88.0	4	29.70	
246 950 500		1.50	5.0	0.50	85.0	4	41.58	
248 000 250	100	1.50	2.5	0.20	95.0	3	16.94	
248 000 350		1.50	3.5	0.30	93.0	3	23.32	
248 000 500		1.50	5.0	0.50	90.0	3	33.00	
248 000 700		1.50	7.0	0.70	86.0	3	45.32	
248 050 300	105	1.70	3.0	0.30	99.0	3	21.12	
248 050 500		1.70	5.0	0.50	95.0	3	34.76	
248 100 300	110	1.70	3.0	0.30	104.0	3	22.22	

**NEW!**

**NEW!**

**STANDARD TUBING**



Code Number	d1 (mm)	d1 +/- (mm)	t (mm)	t +/- (mm)	ID (mm)	Approx. Case (pcs)	Approx. Case (lbs)
248 100 500	110	1.70	5.0	0.50	100.0	3	36.52
248 100 700		1.70	7.0	0.80	96.0	3	50.16
248 150 300	115	1.70	3.0	0.30	109.0	3	23.32
248 150 500		1.70	5.0	0.50	105.0	3	38.06
248 200 300	120	1.70	3.0	0.40	114.0	3	24.42
248 200 500		1.70	5.0	0.60	110.0	3	39.82
248 250 300	125	1.70	3.0	0.40	119.0	3	25.30
248 250 500		1.70	5.0	0.50	115.0	3	41.58
248 300 300	130	1.80	3.0	0.50	124.0	2	17.60
248 300 500		1.80	5.0	0.60	120.0	2	28.82
248 350 300	135	1.80	3.0	0.50	129.0	2	18.26
248 350 500		1.80	5.0	0.60	125.0	2	30.14
248 400 300	140	1.90	3.0	0.50	134.0	2	18.92
248 400 500		1.90	5.0	0.60	130.0	2	31.24
248 450 300	145	1.90	3.0	0.50	139.0	2	19.80
248 450 500		1.90	5.0	0.60	135.0	2	32.34
248 500 300	150	2.00	3.0	0.50	144.0	1	10.12
248 500 500		2.00	5.0	0.60	140.0	1	16.72
248 500 700		2.00	7.0	0.90	136.0	1	23.32
248 550 500	155	2.00	5.0	0.70	145.0	1	17.38
248 600 500	160	2.00	5.0	0.70	150.0	1	17.82
248 600 700		2.00	7.0	1.00	146.0	1	24.86
248 650 500	165	2.00	5.0	0.70	155.0	1	18.48
248 700 500	170	2.00	5.0	0.70	160.0	1	19.14
248 700 700		2.00	7.0	1.00	156.0	1	26.40
248 780 410	178	2.20	4.1	1.00	169.8	1	16.00
248 800 500	180	2.20	5.0	0.70	170.0	1	20.24
248 800 700		2.20	7.0	1.00	166.0	1	28.16

**NEW!**

**NEW!**

**NEW!**

**NEW!**

**NEW!**

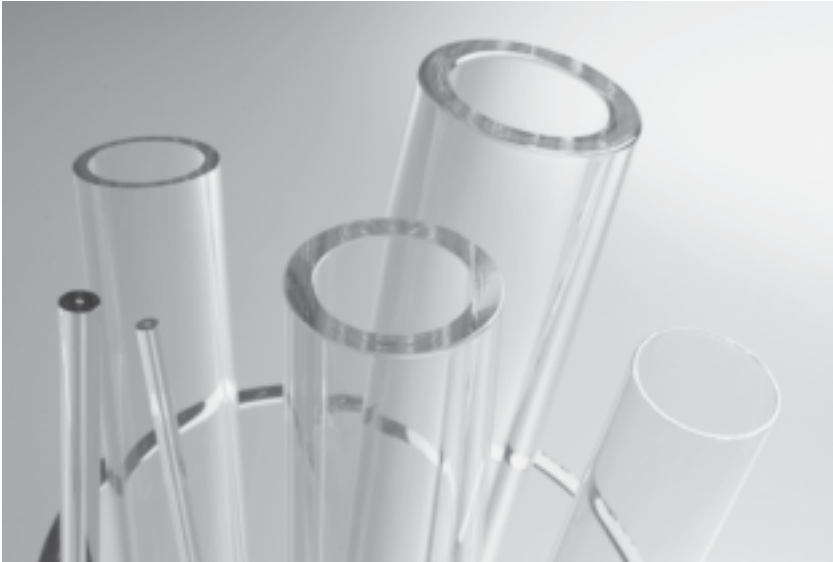
**NEW!**

**NEW!**

**NEW!**

**NEW!**

Can't find the size you're looking for? Call us and we'll make it for you! \* Minimums may apply.



## RED & AMBER TUBING



Code Number	Wall Type	Color Type	Outside Diameter d1 (mm)	Wall Thickness t (mm)	Pieces per Case
266 120 100	Standard	Amber	12	1	36
267 120 100	Standard	Red		1	36
266 120 150	Medium	Amber		1.5	36
267 120 150	Medium	Red		1.5	36
266 250 150	Standard	Amber	25	1.5	30
267 250 150	Standard	Red		1.5	30
266 254 240	Medium	Amber	25.4	2.4	30
267 254 240	Medium	Red		2.4	30
266 254 400	Heavy	Amber		4	30
267 254 400	Heavy	Red		4	30
266 500 180	Standard	Amber	50	1.8	9
267 500 180	Standard	Red		1.8	9
266 500 350	Medium	Amber		3.5	9
267 500 350	Medium	Red		3.5	9
266 500 500	Heavy	Amber		5	9
267 500 500	Heavy	Red		5	9

## RED & AMBER SCALLOP



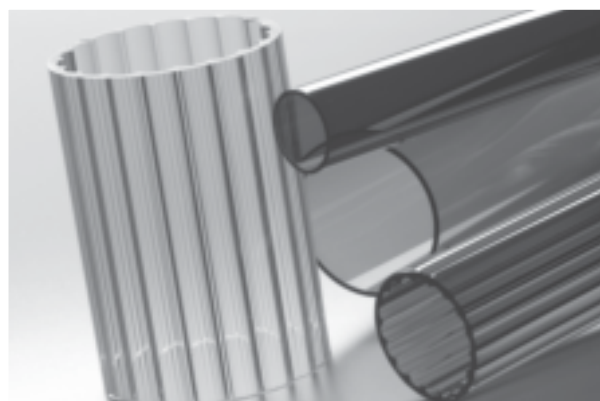
Code Number	Wall Type	Color Type	Outside Diameter d1 (mm)	Wall Thickness t (mm)	Pieces per Case
266 889 150	Scallop	Amber	15	1	36
267 889 150	Scallop	Red		1	36
266 889 261	Scallop	Amber	26	1.5	30
267 889 261	Scallop	Red		1.5	30
266 889 502	Scallop	Amber	50	2.5	9
267 889 502	Scallop	Red		2.5	9

12-50mm O.D. Red and Amber Tubing is 500mm +/- 5mm with trimmed and glazed ends

**New and Improved ID coated**  
Made Exclusively with

**SIMAX**<sup>®</sup>  
BOROSILICATE GLASS 3.3

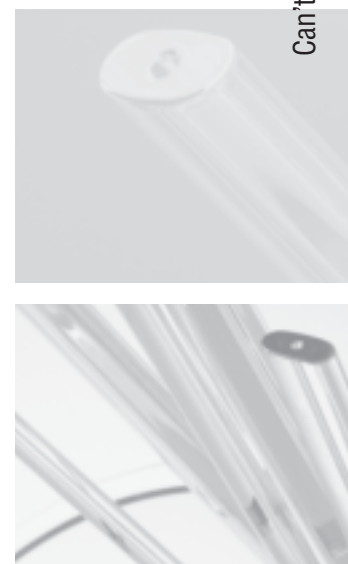
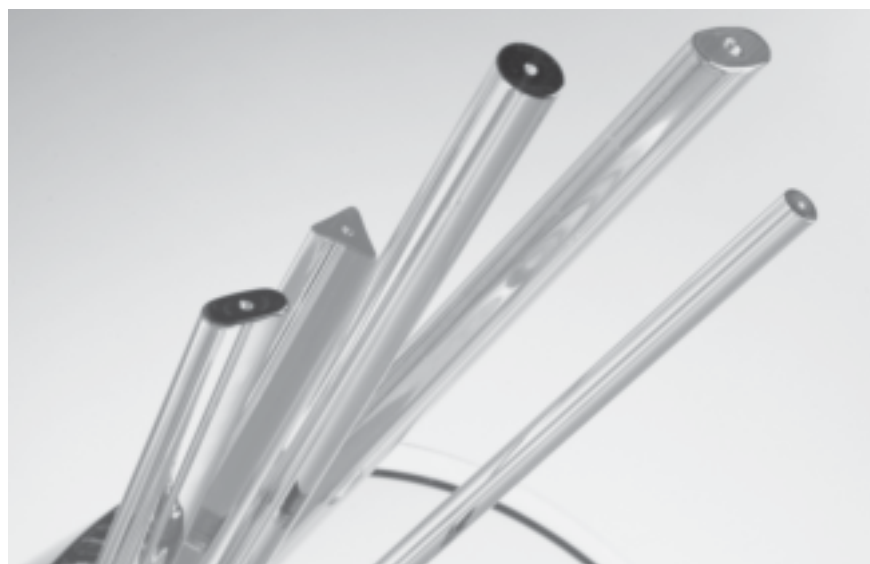
Contact Pegasus for the Authorized Dealer Near you



## CAPILLARY TUBING

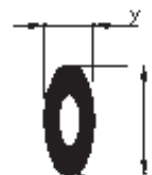


Code Number	d1 (mm)	d1 +/- (mm)	d2 (mm)	d2 +/- (mm)	Approx. Case (pcs)	Approx. Case (lbs)
261 050 526	5	0.20	0.5	0.08	256	36.52
261 051 026		0.20	1.0	0.08	256	35.42
261 051 526		0.20	1.5	0.1	256	33.88
261 061 026	6	0.20	1.0	0.08	170	34.32
261 061 526		0.20	1.5	0.1	170	33.22
261 062 026		0.20	2.0	0.1	170	31.46
261 062 526		0.20	2.5	0.1	170	29.26
261 071 526		0.25	1.5	0.1	122	33.00
261 072 026	7	0.25	2.0	0.1	122	31.68
261 072 526		0.25	2.5	0.1	122	30.14
261 081 026	8	0.25	1.0	0.08	100	36.52
261 081 526		0.25	1.5	0.1	100	35.64
261 082 026		0.25	2.0	0.1	100	34.76
261 082 526		0.25	2.5	0.1	100	33.44
261 083 026		0.25	3.0	0.1	100	31.68
261 083 526		0.25	3.5	0.1	100	29.92
261 091 526		9	0.25	1.5	0.1	81
261 092 026	0.25		2.0	0.1	81	36.08
261 092 526	0.25		2.5	0.1	81	34.98
261 093 026	0.25		3.0	0.1	81	33.66
261 093 526	0.25		3.5	0.1	81	32.34
261 101 526	10	0.25	1.5	0.1	64	36.08
261 102 026		0.25	2.0	0.1	64	35.42
261 102 526		0.25	2.5	0.1	64	34.54
261 103 026		0.25	3.0	0.1	64	33.66
261 103 526		0.25	3.5	0.1	64	32.56



Can't find the size you're looking for? Call us and we'll make it for you! \* Minimums may apply.

## FLAT CAPILLARY TUBING



Code Number	x (mm)	x +/- (mm)	y (mm)	y +/- (mm)	Approx. Case (pcs)	Approx. Case (lbs)
261 145 501	14.5	0.50	3.5	0.5	68	33.00
261 146 301	14	0.50	6.3	0.5	60	32.56
261 188 001	18	0.50	8.0	0.5	64	33.44

## TRIANGULAR CAPILLARY TUBING



Code Number	x (mm)	x +/- (mm)	d (mm)	Approx. Case (pcs)	Approx. Case (lbs)
261 710 305	7	0.40	1-1.5	175	30.8
261 710 304	8	0.40	1-1.5	100	22.4
261 710 303	9	0.40	1-1.5	80	22.9
261 710 302	10	0.40	1-1.5	64	23.3
261 710 301	11	0.50	1-1.5	75	32.8

**DAISY TUBING**

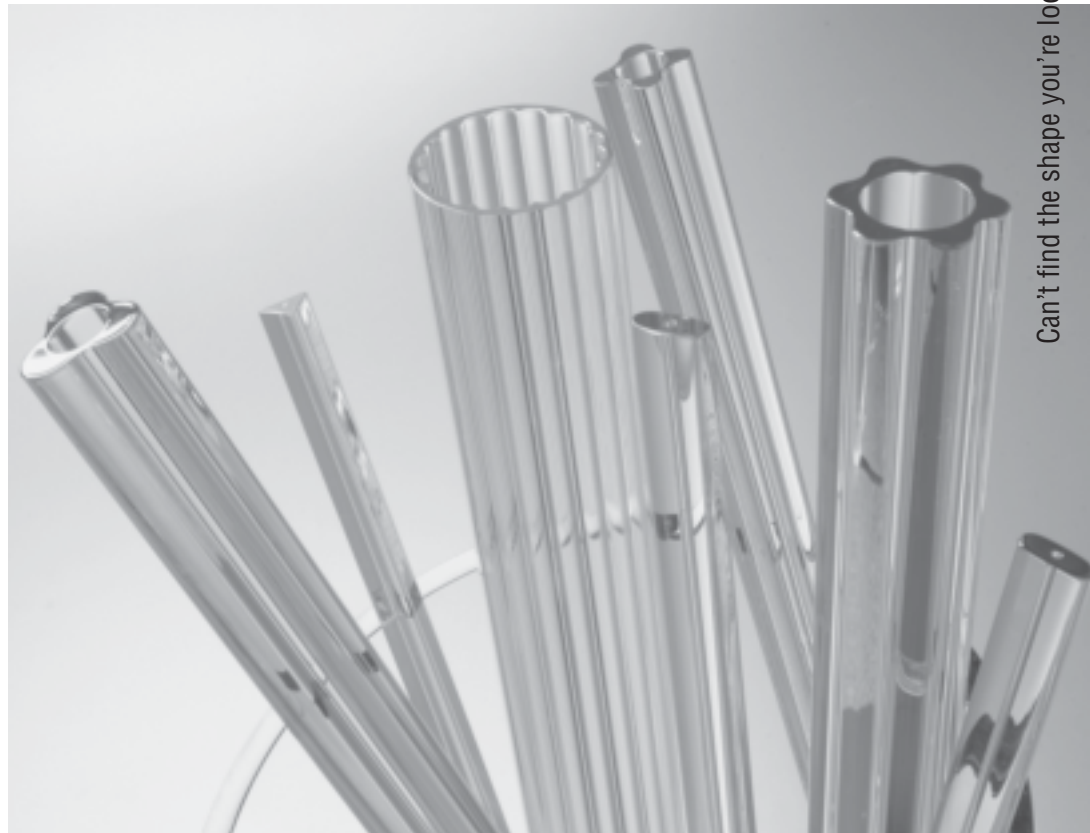


Code Number	x (mm)	x +/- (mm)	y (mm)	y +/- (mm)	Approx. Case (pcs)	Approx. Case (lbs)
246 888 101	9	0.5	4.0	0.5	168	46.20
246 888 102	10	0.5	4.5	0.5	100	42.46
246 888 104	12	0.5	5.3	0.5	90	48.40
246 888 107	15	0.5	6.5	0.5	49	36.74
246 888 108	16	0.5	7.1	0.5	49	42.46
246 888 109	17	0.5	7.0	0.5	36	36.52
246 888 110	18	0.5	7.8	0.5	36	37.84
246 888 111	19	0.5	8.5	0.5	36	43.12
246 888 112	20	0.5	8.2	0.5	36	49.72
246 888 113	22	0.5	11.5	0.5	36	50.38
246 888 114	24	0.5	12.0	0.5	25	43.56
246 888 116	28	0.6	17.5	0.5	16	32.34
246 888 117	30	0.6	18.0	0.5	16	36.74
246 888 118	32	0.6	19.0	0.5	16	36.52
246 888 153	40	1.5	24.0	1.5	9	36.52

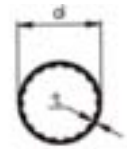
**NEW!**  
**NEW!**  
**NEW!**

**NEW!**

Can't find the shape you're looking for? Call us and we'll make it for you! \* Minimums may apply.



## SCALLOP TUBING



Code Number	x (mm)	x +/- (mm)	y (mm)	y +/- (mm)	Approx. Case (pcs)	Approx. Case (lbs)
246 889 111	11	0.40	1.0	0.15	114	33.88
246 889 150	15	0.40	1.0	0.15	49	19.36
246 889 221	22	0.50	1.0	0.15	36	22.44
246 889 261	26	0.50	1.5	0.15	36	36.96
246 889 301	30	0.80	2.0	0.2	36	55.66
246 889 402	40	1.50	2.0	0.3	16	34.76
246 889 502	50	1.50	2.5	0.3	12	40.04
246 889 003	60	0.50	2.3	0.3	12	46.86
246 889 004	70	0.50	2.8	0.3	8	44.00
246 889 005	80	1.80	3.2	0.4	4	30.14
246 889 006	100	1.80	3.0	0.4	3	27.72



## IRIS TUBING



	Code Number	x (mm)	x +/- (mm)	y (mm)	y +/- (mm)	Approx. Case (pcs)	Approx. Case (lbs)
Shaded	246 888 050	15	1	7	0.5	74	50.38
Clear	246 888 051	19	1	9.5	1	36	44.44
Shaded	246 888 056	24	1	10.5	1	25	48.18

Can't find the shape you're looking for? **Call us and we'll make it for you!** \* Minimums may apply.



## ROD

**STANDARD ROD** ..... 16

### **PROFILE ROD**

FLAT ..... 17

RECTANGULAR ..... 17

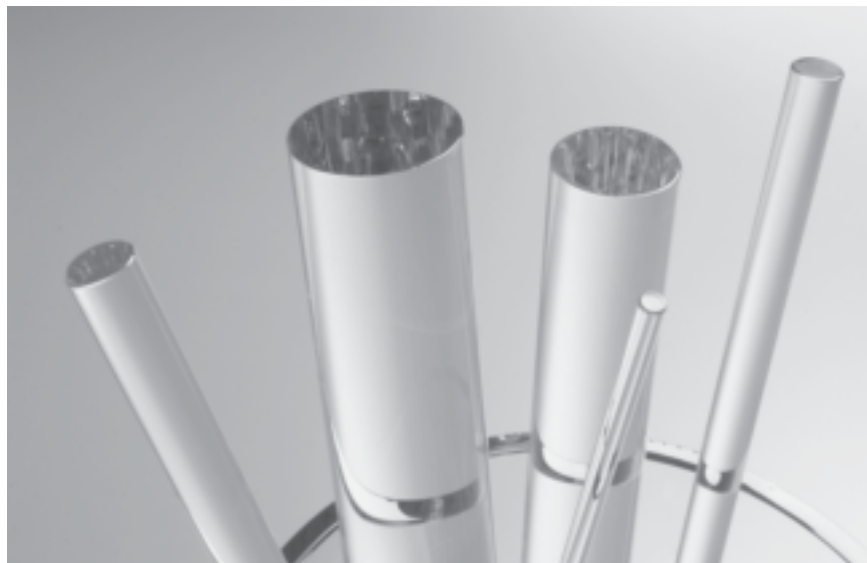
HALF ..... 18

TRIANGULAR ..... 18

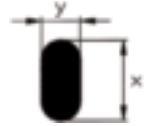
## STANDARD ROD



Code Number	d1 (mm)	d1 +/- (mm)	Approx. Case (pcs)	Approx. Case (lbs)
271 030 000	3	0.15	700	36.96
271 040 000	4	0.15	400	36.96
271 050 000	5	0.15	256	37.18
271 060 000	6	0.15	170	35.64
271 070 000	7	0.15	121	34.32
271 080 000	8	0.25	100	36.96
271 090 000	9	0.25	81	38.06
271 100 000	10	0.25	64	36.96
271 110 000	11	0.25	50	34.98
271 120 000	12	0.25	49	40.70
271 127 000	12.7	0.40	30	27.94 <b>NEW!</b>
271 130 000	13	0.35	36	35.20
271 140 000	14	0.35	25	28.38
271 150 000	15	0.35	25	32.56
271 159 000	15.9	0.50	16	23.32 <b>NEW!</b>
271 160 000	16	0.35	16	23.76
271 180 000	18	0.45	16	29.92
271 190 000	19	0.50	16	33.44 <b>NEW!</b>
271 200 000	20	0.45	16	36.96
271 220 000	22	0.50	9	25.08
271 240 000	24	0.50	9	29.92
271 254 000	25.4	0.60	9	33.66
271 260 000	26	0.60	9	35.20
271 280 000	28	0.90	4	18.04
271 300 000	30	0.90	4	20.90
271 317 000	31.7	1.70	4	23.32
271 381 000	38.1	1.70	4	33.66
271 440 000	44	2.00	4	44.66



**FLAT ROD**



Code Number	x (mm)	x +/- (mm)	y (mm)	y +/- (mm)	Approx. Case (pcs)	Approx. Case (lbs)
271 063 228	6	0.50	3.2	0.50	280	32.12
271 084 228	8	0.50	4.2	0.50	160	33.44
271 105 328	10	0.50	5.3	0.50	104	33.66
271 115 028	11	0.50	5.0	0.50	105	35.86
271 115 828	11	0.50	5.8	0.50	91	35.20
271 125 428	12	0.50	5.4	0.50	84	33.66
271 126 428	12	0.50	6.4	0.50	72	33.44
271 135 828	13	0.50	5.8	0.50	78	36.52
271 136 928	13	0.50	6.9	0.50	66	35.64
271 146 328	14	0.50	6.3	0.50	60	33.00
271 156 728	15	0.50	6.7	0.50	55	34.76
271 167 128	16	0.50	7.1	0.50	50	35.64
271 177 528	17	0.50	7.5	0.50	40	32.12
271 188 028	18	0.50	8.0	0.50	40	35.86
271 208 028	20	0.60	8.0	0.50	40	35.86
271 381 128	38.1	1.00	9.8	0.50	12	29.04



**RECTANGULAR ROD**



Code Number	x (mm)	x +/- (mm)	y (mm)	y +/- (mm)	Approx. Case (pcs)	Approx. Case (lbs)
272 040 501	4	0.50	5.4	0.50	280	43.8
272 050 601	5	0.50	6.7	0.50	180	43.1
272 060 801	6	0.50	8.0	0.50	130	43.8
272 070 801	7	0.50	9.4	0.50	90	41.8
272 081 001	8	0.50	10.8	0.50	70	42.9
272 091 201	9	0.50	12.0	0.50	54	39.4
272 101 301	10	0.50	13.2	0.50	48	43.6
272 111 401	11	0.50	14.6	0.50	35	38.9
272 121 601	12	0.50	16.0	0.50	30	40.0



Can't find the size you're looking for? Call us and we'll make it for you! \* Minimums may apply.

**HALF ROD** 



Code Number	d1 (mm)	d1 +/- (mm)	Approx. Case (pcs)	Approx. Case (lbs)
271 750 801	8	0.30	150	26.40
271 750 901	9	0.30	130	28.38
271 750 001	10	0.40	100	27.94
271 751 101	11	0.40	90	30.36
271 751 201	12	0.40	70	27.50
271 751 301	13	0.40	60	27.50
271 751 401	14	0.40	50	27.50
271 751 501	15	0.40	45	28.60
271 751 601	16	0.40	42	28.82

**TRIANGULAR ROD** 



Code Number	x (mm)	x +/- (mm)	Approx. Case (pcs)	Approx. Case (lbs)
271 710 306	6	0.40	180	24.86
271 710 305	7	0.40	130	24.64
271 710 304	8	0.40	100	24.42
271 710 303	9	0.40	80	24.86
271 710 302	10	0.40	64	25.08
271 710 301	11	0.50	55	25.96



## **SIMAX® INFORMATION**

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## **SIMAX® GLASS**

SIMAX® is a low expansion borosilicate glass substantially insoluble in water, exhibits outstanding resistance to a very wide variety of chemicals and is nonflammable. SIMAX® was pioneered by the respected Czech researcher Dr. M. B. Volf, author of the worldwide known "TECHNICAL GLASS" encyclopedia. SIMAX® today, because of its properties, finds application in many and various fields of engineering, scientific, technical and artistic uses.

## **BENEFITS**

SIMAX® products are well known due to their stability, ease of working and high resistance to thermal shock. The low coefficient of thermal expansion allows SIMAX® to be used at higher temperatures and to resist greater thermal shock conditions. Coupled with the very high degree of resistance to the corrosive effects of most chemicals, SIMAX® makes an excellent choice as material of construction for products requiring higher temperatures, chemical resistance, product purity, non permeability and transparency. Compared with other materials of construction SIMAX® is an excellent choice. Details of the physical and chemical properties are listed in the following pages.

Over 330 Standard products are offered in a wide variety of tubing, capillary, profile tubing, rod and profile rod, all manufactured to demanding tolerances and glass quality.

## **QUALITY**

As with all Kavalier products, SIMAX® tubing, capillary and rod are manufactured utilizing the most up to date and advanced technologies. SIMAX® borosilicate glass 3.3 products comply with the most current international standards i.e. ISO 3585, CSN ISO 3585, ASTM E438 TYPE 1, class A. All of Kavalier's manufacturing phases are controlled electronically and through a stringent Quality Management System standards are monitored and maintained.

SIMAX® glass has been awarded a TÜV CERT Certificate in compliance with EN ISO 9001:2000.

Quality specifications have been described on the following pages in the Chapter "Technical Parameters".

## **SECONDARY PROCESSING**

SIMAX® tubing, capillary and rod are used in a wide variety of applications. The principal applications are laboratory ware and apparatus; chemical plant applications such as piping, pilot scale and production unit operations.

SIMAX® borosilicate 3.3 glass has found uses in large and small chemical facilities, waste treatment plants, components in instrumentation and control devices and in biotechnology applications. Examples of industrial uses include items such as heat exchangers, explosion proof lamp housings and flow meters. Other items of art manufacture range from sconces, decorative objects to richly decorative glasses and varieties of wine goblets.

**PHYSICAL DATA**

Mean linear and thermal coefficient of expansion $\alpha$ (20°C; 300°C) according to ISO 7991	$3.3 \cdot 10^{-6} \text{ K}^{-1}$
Transformation temperature $T_g$	525°C
Glass temperature at 1013 (upper annealing temperature)	560°C
Viscosity $\eta$ in dPa . s: 107,6 (softening temperature)	825°C
Viscosity $\eta$ in dPa . s: 104,0 (working range)	1,260°C
Highest short-term admissible working range	500°C
Density $\rho$ at 20°C	2.23 g/cm <sup>3</sup>
Modulus of elasticity E (Young's modulus)	64 103 MPa
Poisson's ratio $\mu$	0.20
Thermal conductivity $\lambda$ (20 to 100°C)	1.2 W.m <sup>-1</sup> .K <sup>-1</sup>
Temperature for specific electric resistance 108 $\Omega$ .cm (DIN 52326) tk100	250°C
Logarithm of electric bulk resistivity ( $\Omega$ . cm) at 250°C	8
Logarithm of electric bulk resistivity ( $\Omega$ . cm) at 350°C	6.5
Dielectric properties (1 MHz, 25°C)	
Dielectric constant $\epsilon$	4.6
Loss factor $\tan \delta$	$37 \cdot 10^{-4}$
Refractive index ( $\lambda = 587.6 \text{ nm}$ ) nd	1,473
Photo elastic constant (DIN 52314) K	$4.0 \cdot 10^{-6} \text{ mm}^2 \cdot \text{N}^{-1}$

**CHEMICAL COMPOSITION**

<b>SiO<sub>2</sub></b>	<b>B<sub>2</sub> O<sub>3</sub></b>	<b>Na<sub>2</sub>O + K<sub>2</sub>O</b>	<b>Al<sub>2</sub>O<sub>3</sub></b>
80.6	13	4	2.4

**CHEMICAL DURABILITY**

Class of Resistance to Water Effects (ISO 719)	HGB 1
Class of Resistance to Acid Effects (ISO 1776 a DIN 12116)	Class S1
Class of Resistance to Various Kinds of Hydroxides (ISO 695)	Class A2

SIMAX® borosilicate glass 3.3 is highly resistant to water effects, neutral and acid solutions, heavy acids and their mixtures, to chlorine, bromine, iodine and organic compounds. Even long-term effects at temperatures above 100°C, SIMAX® borosilicate glass 3.3 outperforms most metals and other permeable materials.

Due to water and acid effects SIMAX® glass releases only trace amounts of primarily mono-valent ions. A very thin, permeable siliceous gel layer forms on the surface of the glass which creates a barrier to further attack. The exceptions to SIMAX® glass chemical durability are the following chemicals to be avoided: hydrogen fluoride (any concentration), hot concentrated phosphoric acid and alkaline solutions. Alkaline solutions attack glass slowly at room temperatures but rate of attack increases with concentration and temperature.

**BURSTING STRENGTH**

Bursting strength (p) calculation with a known wall thickness (t) and a given outside diameter (D):

$$p = \frac{t \cdot 20 \cdot \frac{K}{S}}{D - t}$$

Wall thickness (t) calculation with a given bursting strength (p) and outside diameter (D):

$$t = \frac{p \cdot (D - t)}{20 \cdot \frac{K}{S}}$$

D = outside diameter in mm

t = wall thickness in mm

p = bursting strength in bar

K/S = allowable stress in N . mm<sup>2</sup>

SIMAX® borosilicate glass 3.3 allowable stress: K/S = 7 N . mm<sup>2</sup> according to CSN EN 1595 Standard: Pressure Vessels Made of Borosilicate Glass 3.3; General Principles for Construction, Manufacturing and Testing.

Bursting Strength (p) affects, among others, the following:

- thermal difference between the inside and outside walls
- surface quality
- end configuration
- compliance with installation requirements in accordance with pressure vessel regulations
- tube length

Upon request the manufacturer may perform a design calculation, where necessary.

**RESISTANCE TO TEMPERATURE VARIATIONS**

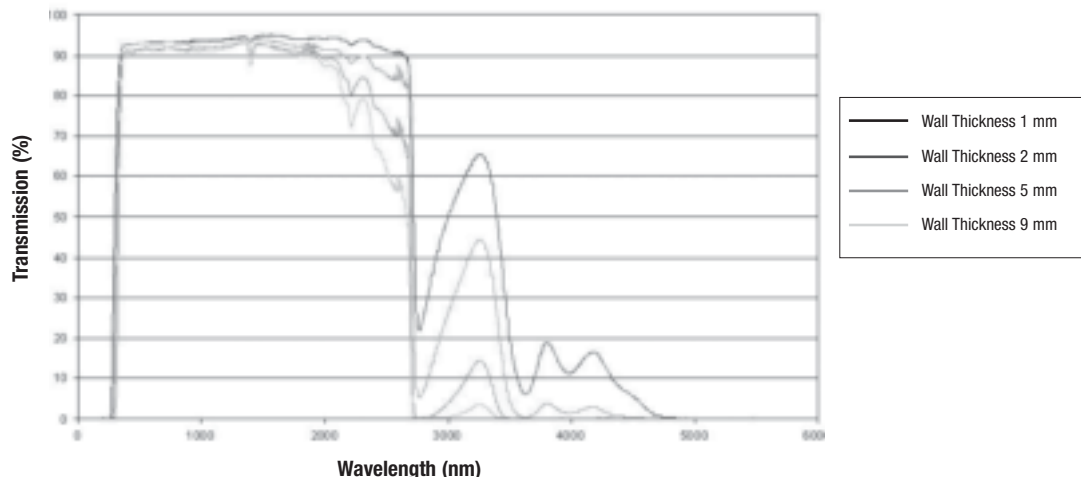
Resistance to temperature variations are according to ISO 718 which specifies the thermal difference between a hot test sample and a cold water bath (room temperature), where the first fractures appear on fifty percent of the samples following the samples being immediately immersed into the cold water bath.

Resistance to temperature variations of tubing, capillary and rod depends upon the wall thickness, surface condition, size and shape of the cooled surface, tensile stress and final working. Uneven flash heating or fast cooling may easily result in cracking due to resulting tensile stress. The recommendation is not to exceed a thermal difference of 120°C. Thicker walls reduce the preceding temperature differences. Examples for wall thickness and temperature variations are found in the following table. The values given in the table should be used with caution and are suggested as a guide as each item has its own differences.

Wall thickness in mm	Resistance to temperature variations in °K
1	303
3	175
5	136
7	115

Upon request the manufacturer may perform a design calculation, where necessary.

**LIGHT TRANSMITTANCE**



**INSTRUCTIONS FOR PROCESSING**

SIMAX® tubing, capillary and rod material properties guarantee a very good workability in glass forming and dividing, which is usual with technical glass. To remove temporary stress, which originates in processing, it is appropriate to warm the glass through to a temperature of 550°C and, to leave it at this temperature over a period up to a maximum 30 minutes; as a rule, in thin-walled products a fraction of this time would suffice. With regard to glass chemical durability the stabilization time should be as short as possible. For subsequent cooling down, the Annealing speeds have been recommended in the following table:

**ANNEALING**

Wall thickness in mm	Range of temperature		
	560 to 490°C	490 to 440°C	440 to 20°C
3	14°C/min	28°C/min	up to 447°C/min
6	3°C/min	6°C/min	up to 111°C/min
12	0.6°C/min	1.6°C/min	up to 28°C/min

In the event that it is necessary to cool the product down several times, the sum of all the soak times at 550°C should not exceed two hours. SIMAX® products may be fused without stress with borosilicate glasses of the same type, and processed and annealed at the same temperatures. SIMAX® tubing capillary and rod may be printed using silver- and copper-based diffusion colours and silk-screen-printing colours.

**LENGTH**

<b>Tubing</b>	1500 +10 mm / -0 mm		
<b>Capillary</b>	1500 ±10 mm		
<b>Rod</b>	a diameter of 3 to 6 mm		1500 ±20 mm
	a diameter of 7 to 16 mm		1500 ±10 mm
	diameter of 18 to 44 mm		1500 ±30 mm
<b>Non-circular assortment</b>	1500 ±20 mm		

Special lengths of tubing (depending on the outside diameter) may be ordered on request in lengths from 1000 to 7500 mm.

**OUT-OF-ROUNDNESS**

Out-of-roundness according to ISO 1101 is dependent on the outside diameter. The following limit values have been set as fixed:

<b>Tubing</b>		
Diameter < 180 mm	$s_{max}$	0.7 % of the outside diameter
<b>Capillary</b>		
Diameter < 10 mm	$s_{max}$	1.0 % of the outside diameter
<b>Rod</b>		
Diameter < 20 mm	$s_{max}$	1.0 % of the outside diameter
20 mm ≤ diameter ≤ 30	$s_{max}$	1.5 % of the outside diameter

**WALL THICKNESS VARIANCE**

The difference between the maximum and minimum wall thickness at an arbitrary point of a tube may not exceed 12 % of the wall nominal thickness.

**DEFLECTION**

**Tubing**

<b>According to ISO 1101 are as follows:</b>	
Outside diameter => 4 - < 6 mm	at maximum 4.0 mm / 1500 mm
Outside diameter => 6 - < 30 mm	at maximum 1.5 mm / 1000 mm
Outside diameter => 30 - < 100 mm	at maximum 2.0 mm / 1400 mm
Outside diameter => 100 - <= 180 mm	at maximum 2.5 mm / 1400 mm

**Rod & Capillary**

- Rod and Capillary are supplied with a deflection of at maximum 4 mm over 1,500 mm of the product length.

**Non-circular**

- Tubing with a deflection of a maximum 0.4 % of nominal length
- Rod and Capillary with a deflection of a maximum 0.6 % of nominal length

**STRESS**

**Tubing**

Outside diameter in mm	$\varnothing < 40$	$40 \leq \varnothing \leq 60$	$\varnothing > 60$
Internal stress over the tube length	3 MPa102.9 nm/cm	3.5 MPa120.05 nm/cm	2.5 MPa85.75 nm/cm
Internal stress at the edge	4 MPa137.2 nm/cm	3.5 MPa120.05 nm/cm	2.5 MPa85.75 nm/cm

**Rod**

Rods are delivered, as a standard, not annealed, in rods of a diameter of 18 up to and including 44 mm, which may be supplied as annealed by mutual consent.

**Non-circular**

Non-circular assortment - Profiled tubing, capillary and rod are delivered as not annealed.

**STONES AND STRIAE**

<b>Stones</b>	<b>Stones/ 1 kg of glass</b>
Size < 0.3 mm	permitted
Size => 0.3 - < 1.0 mm	max. 2
Size => 1.0 - <= 2.0 mm	max. 1
Size > 2.0 mm	prohibited
<b>Striae</b>	<b>Striae/ 1 kg of glass</b>
Size < 0.3 mm	permitted
Size => 0.3 - < 1.0 mm	max. 4
Size => 1.0 - <= 3.0 mm	max. 2
Size > 3.0 mm	prohibited

The grain size is considered as corresponding to stones or striae size.

**BUBBLES**

**Length**

Bubble length corresponds to the length of all bubbles => 20 mm.

Permitted length of bubbles is 0.8 m/10 m of a tube.

Bubbles < 20 mm: 20 pcs/1 kg of glass.

**Width**

Bubbles wider than 1 mm are prohibited in tubing with a diameter of  $\varnothing \leq 100$  mm.

Bubbles wider than 2 mm are prohibited in tubing with a diameter of  $\varnothing > 100$  mm.

**Note:** capillary bubble is a bubble drawn in the direction of the length of a product in the form of a capillary with a length greater than 2 mm.

**END FINISH AND PERPENDICULARITY**

**Tubing**

<b>Tubing</b>	<b>Tubing ends</b>	<b>End surfaces perpendicularity</b>
4 <= $\emptyset$ <= 5	non fire-polished	-
5 < $\emptyset$ <= 100	fire-polished	2.5
100 < $\emptyset$ <= 180	fire-polished	4.0

In fire-polishing the ends, wall thickness may undergo by 0.1 mm.

**Capillary, Rod & Non-circular**

Capillary and rod are supplied as non fire-polished. Non-circular assortment is supplied with non fire-polished ends, with the exception of Scallop tubing, which is supplied with fire-polished ends.

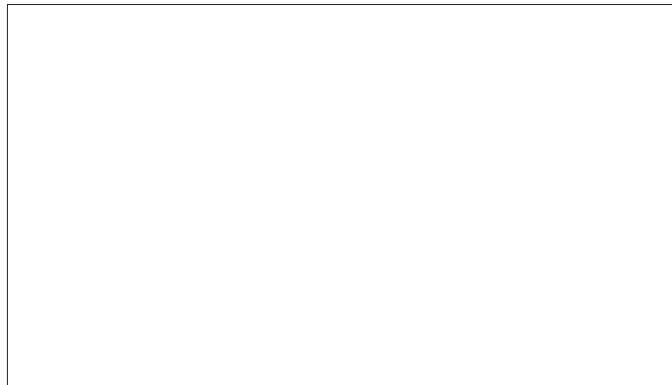
**PACKAGING**

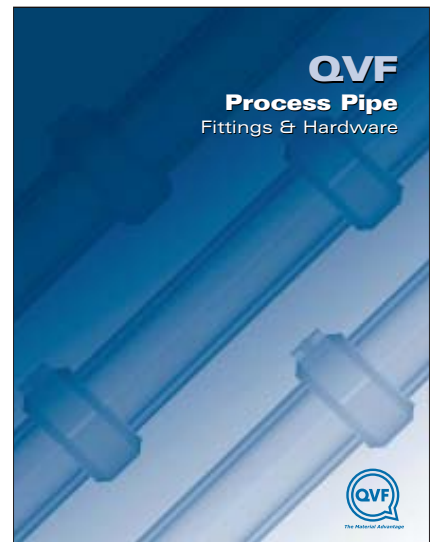
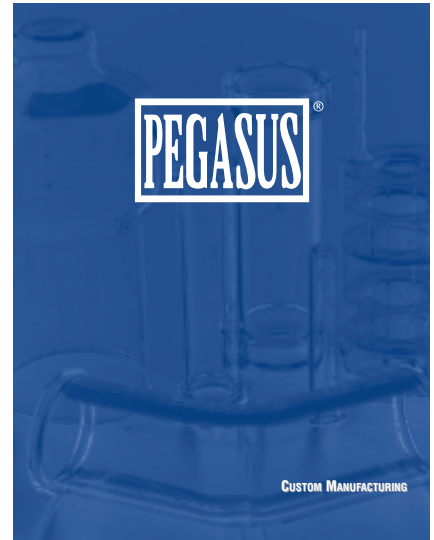
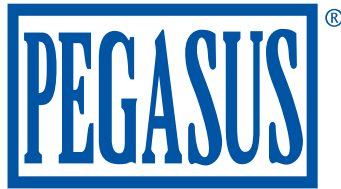
A case is our normal standard shipping unit or container. For smaller diameter tubing and rod, packaging is controlled by the minimum poundage indicated. The approximate number of pieces per package is calculated using an average weight per piece. For larger diameter tubing and rod, packaging is controlled by the minimum number of pieces indicated. The approximate weight per package is calculated using an average weight per piece.

## DISTRIBUTION

PEGASUS® sells the brand SIMAX® through an authorized dealer and resale network. Contact PEGASUS® for the local dealer nearest you.

Your local dealer:





**Canada** 211 Shearson Crescent, Cambridge Ontario N1T 1J5  
**U.S.A.** 59 E. Market Street, Ste. 122, Corning, NY 14830

[pegasus-glass.com](http://pegasus-glass.com)

**Canada / U.S.A.** Ph 800.315.0387 Fax 877.793.3335  
**International** Ph 519.620.7991 Fax 519.620.7992

