

TEMP: 225 ± 10C			PHASE 1				PHASE 2				PHASE 3	PHASE 4			PHASE 5	PHASE 6	
Pipe Details (e _n = Wall Thickness)			Bead Up Pressure (BAR)			Minimum Bead up Size	Heat Soak See Note <i>b</i>			Maximum Heater Removal Time	Maximum Pressure Up Time	Weld Pressure (BAR)			Minimum Cool Time Under Pressure (See Note <i>c</i>)	Additional Cool Time out of Machine (See Note <i>d</i>)	
			ADD DRAG (see note <i>a</i>)				0 - DRAG ONLY					ADD DRAG					
			P1			t1	P2	t2			t3	t4	P3			t5 / P3	
D _n	SDR	e _n	Min	Tgt	Max	mm	BAR	Min	Tgt	Max			Min	Tgt	Max		
90	41	2.2	1	1	1	1	0 - DRAG ONLY	0m 26s	0m 30s	0m 33s	5s	5.7s	1	1	1	0h 5m	<i>d</i>
	33	2.7	1	1	1	1		0m 33s	0m 37s	0m 41s	5s	5.7s	1	1	1	0h 6m	<i>d</i>
	26	3.5	1	1	1	1		0m 42s	0m 47s	0m 52s	5s	5.7s	1	1	1	0h 6m	<i>d</i>
	21	4.3	1	1	1	1		0m 51s	0m 58s	1m 4s	5s	5.7s	1	1	1	0h 7m	<i>d</i>
	17	5.3	1	1	1	2		1m 4s	1m 11s	1m 19s	6s	5.7s	1	1	1	0h 8m	<i>d</i>
	13.6	6.6	1	1	2	2		1m 19s	1m 29s	1m 39s	6s	5.7s	1	1	2	0h 10m	<i>d</i>
	11	8.2	2	2	2	2		1m 38s	1m 50s	2m 3s	8s	5.7s	2	2	2	0h 11m	<i>d</i>
	9	10.0	2	2	2	2		2m 0s	2m 15s	2m 30s	8s	5.7s	2	2	2	0h 13m	<i>d</i>
	7.4	12.2	2	3	3	2		2m 26s	2m 44s	3m 2s	10s	5.7s	2	3	3	0h 15m	<i>d</i>
110	41	2.7	1	1	1	1	0 - DRAG ONLY	0m 32s	0m 36s	0m 40s	5s	6.3s	1	1	1	0h 6m	<i>d</i>
	33	3.3	1	1	1	1		0m 40s	0m 45s	0m 50s	5s	6.3s	1	1	1	0h 6m	<i>d</i>
	26	4.2	1	1	1	1		0m 51s	0m 57s	1m 3s	5s	6.3s	1	1	1	0h 7m	<i>d</i>
	21	5.2	1	1	2	2		1m 3s	1m 11s	1m 19s	6s	6.3s	1	1	2	0h 8m	<i>d</i>
	17	6.5	2	2	2	2		1m 18s	1m 27s	1m 37s	6s	6.3s	2	2	2	0h 9m	<i>d</i>
	13.6	8.1	2	2	2	2		1m 37s	1m 49s	2m 1s	8s	6.3s	2	2	2	0h 11m	<i>d</i>
	11	10.0	2	3	3	2		2m 0s	2m 15s	2m 30s	8s	6.3s	2	3	3	0h 13m	<i>d</i>
	9	12.2	3	3	4	2		2m 27s	2m 45s	3m 3s	10s	6.3s	3	3	4	0h 15m	<i>d</i>
	7.4	14.9	3	4	4	2		2m 58s	3m 21s	3m 43s	10s	6.3s	3	4	4	0h 18m	<i>d</i>
125	41	3.0	1	1	1	1	0 - DRAG ONLY	0m 37s	0m 41s	0m 46s	5s	6.8s	1	1	1	0h 6m	<i>d</i>
	33	3.8	1	1	1	1		0m 45s	0m 51s	0m 57s	5s	6.8s	1	1	1	0h 7m	<i>d</i>
	26	4.8	1	2	2	1		0m 58s	1m 5s	1m 12s	6s	6.8s	1	2	2	0h 8m	<i>d</i>
	21	6.0	2	2	2	2		1m 11s	1m 20s	1m 29s	6s	6.8s	2	2	2	0h 9m	<i>d</i>
	17	7.4	2	2	3	2		1m 28s	1m 39s	1m 50s	8s	6.8s	2	2	3	0h 10m	<i>d</i>
	13.6	9.2	3	3	3	2		1m 50s	2m 4s	2m 18s	8s	6.8s	3	3	3	0h 12m	<i>d</i>
	11	11.4	3	3	4	2		2m 16s	2m 33s	2m 50s	8s	6.8s	3	3	4	0h 14m	<i>d</i>
	9	13.9	4	4	5	2		2m 47s	3m 8s	3m 28s	10s	6.8s	4	4	5	0h 17m	<i>d</i>
	7.4	16.9	4	5	5	3		3m 23s	3m 48s	4m 13s	10s	6.8s	4	5	5	0h 20m	<i>d</i>
140	41	3.4	1	1	1	1	0 - DRAG ONLY	0m 41s	0m 46s	0m 51s	5s	7.2s	1	1	1	0h 6m	<i>d</i>
	33	4.2	1	2	2	1		0m 51s	0m 57s	1m 4s	5s	7.2s	1	2	2	0h 7m	<i>d</i>
	26	5.4	2	2	2	2		1m 5s	1m 13s	1m 21s	6s	7.2s	2	2	2	0h 8m	<i>d</i>
	21	6.7	2	2	3	2		1m 20s	1m 30s	1m 40s	6s	7.2s	2	2	3	0h 10m	<i>d</i>
	17	8.2	3	3	3	2		1m 39s	1m 51s	2m 4s	8s	7.2s	3	3	3	0h 11m	<i>d</i>
	13.6	10.3	3	4	4	2		2m 4s	2m 19s	2m 34s	8s	7.2s	3	4	4	0h 13m	<i>d</i>
	11	12.7	4	4	5	2		2m 33s	2m 52s	3m 11s	10s	7.2s	4	4	5	0h 16m	<i>d</i>
	9	15.6	5	5	6	3		3m 7s	3m 30s	3m 53s	10s	7.2s	5	5	6	0h 19m	<i>d</i>
	7.4	18.9	5	6	7	3		3m 47s	4m 15s	4m 44s	10s	7.2s	5	6	7	0h 16m	<i>d</i>

TEMP: 225 ± 10C			PHASE 1				PHASE 2				PHASE 3	PHASE 4			PHASE 5	PHASE 6	
Pipe Details (e _n = Wall Thickness)			Bead Up Pressure (BAR)			Minimum Bead up Size	Heat Soak See Note <i>b</i>			Maximum Heater Removal Time	Maximum Pressure Up Time	Weld Pressure (BAR)			Minimum Cool Time Under Pressure (See Note <i>c</i>)	Additional Cool Time out of Machine (See Note <i>d</i>)	
			ADD DRAG (see note <i>a</i>)				0 - DRAG ONLY					ADD DRAG					
			P1			t1	P2	t2			t3	t4	P3			t5 / P3	
D _n	SDR	e _n	Min	Tgt	Max	mm	BAR	Min	Tgt	Max			Min	Tgt	Max		
160	41	3.9	1	2	2	1	0 - DRAG ONLY	0m 47s	0m 53s	0m 59s	5s	7.8s	1	2	2	0h 7m	<i>d</i>
	33	4.8	2	2	2	1		0m 58s	1m 5s	1m 13s	6s	7.8s	2	2	2	0h 8m	<i>d</i>
	26	6.2	2	3	3	2		1m 14s	1m 23s	1m 32s	6s	7.8s	2	3	3	0h 9m	<i>d</i>
	21	7.6	3	3	3	2		1m 31s	1m 43s	1m 54s	8s	7.8s	3	3	3	0h 11m	<i>d</i>
	17	9.4	3	4	4	2		1m 53s	2m 7s	2m 21s	8s	7.8s	3	4	4	0h 12m	<i>d</i>
	13.6	11.8	4	5	5	2		2m 21s	2m 39s	2m 56s	8s	7.8s	4	5	5	0h 15m	<i>d</i>
	11	14.5	5	6	6	2		2m 55s	3m 16s	3m 38s	10s	7.8s	5	6	6	0h 18m	<i>d</i>
	9	17.8	6	7	8	3		3m 33s	4m 0s	4m 27s	10s	7.8s	6	7	8	0h 21m	<i>d</i>
	7.4	21.6	7	8	9	3		4m 19s	4m 52s	5m 24s	12s	7.8s	7	8	9	0h 17m	<i>d</i>
180	41	4.4	2	2	2	1	0 - DRAG ONLY	0m 53s	0m 59s	1m 6s	5s	8.4s	2	2	2	0h 7m	<i>d</i>
	33	5.5	2	3	3	2		1m 5s	1m 14s	1m 22s	6s	8.4s	2	3	3	0h 8m	<i>d</i>
	26	6.9	3	3	4	2		1m 23s	1m 33s	1m 44s	6s	8.4s	3	3	4	0h 10m	<i>d</i>
	21	8.6	3	4	4	2		1m 43s	1m 56s	2m 9s	8s	8.4s	3	4	4	0h 12m	<i>d</i>
	17	10.6	4	5	5	2		2m 7s	2m 23s	2m 39s	8s	8.4s	4	5	5	0h 14m	<i>d</i>
	13.6	13.2	5	6	7	2		2m 39s	2m 59s	3m 19s	10s	8.4s	5	6	7	0h 16m	<i>d</i>
	11	16.4	6	7	8	3		3m 16s	3m 41s	4m 5s	10s	8.4s	6	7	8	0h 19m	<i>d</i>
	9	20.0	8	9	10	3		4m 0s	4m 30s	5m 0s	12s	8.4s	8	9	10	0h 17m	<i>d</i>
	7.4	24.3	9	10	11	3		4m 52s	5m 28s	6m 5s	12s	8.4s	9	10	11	0h 17m	<i>d</i>
200	41	4.9	2	3	3	1	0 - DRAG ONLY	0m 59s	1m 6s	1m 13s	6s	9s	2	3	3	0h 8m	<i>d</i>
	33	6.1	3	3	4	2		1m 13s	1m 22s	1m 31s	6s	9s	3	3	4	0h 9m	<i>d</i>
	26	7.7	3	4	4	2		1m 32s	1m 44s	1m 55s	8s	9s	3	4	4	0h 11m	<i>d</i>
	21	9.5	4	5	5	2		1m 54s	2m 9s	2m 23s	8s	9s	4	5	5	0h 13m	<i>d</i>
	17	11.8	5	6	7	2		2m 21s	2m 39s	2m 56s	8s	9s	5	6	7	0h 15m	<i>d</i>
	13.6	14.7	6	7	8	2		2m 56s	3m 19s	3m 41s	10s	9s	6	7	8	0h 18m	<i>d</i>
	11	18.2	8	9	10	3		3m 38s	4m 5s	4m 33s	10s	9s	8	9	10	0h 16m	<i>d</i>
	9	22.2	9	11	12	3		4m 27s	5m 0s	5m 33s	12s	9s	9	11	12	0h 17m	<i>d</i>
	7.4	27.0	11	12	14	4		5m 24s	6m 5s	6m 45s	16s	9s	11	12	14	0h 18m	<i>d</i>
225	41	5.5	3	3	4	2	0 - DRAG ONLY	1m 6s	1m 14s	1m 22s	6s	9.8s	3	3	4	0h 8m	<i>d</i>
	33	6.8	4	4	4	2		1m 22s	1m 32s	1m 42s	6s	9.8s	4	4	4	0h 10m	<i>d</i>
	26	8.7	4	5	6	2		1m 44s	1m 57s	2m 10s	8s	9.8s	4	5	6	0h 12m	<i>d</i>
	21	10.7	5	6	7	2		2m 9s	2m 25s	2m 41s	8s	9.8s	5	6	7	0h 14m	<i>d</i>
	17	13.2	7	7	8	2		2m 39s	2m 59s	3m 19s	10s	9.8s	7	7	8	0h 16m	<i>d</i>
	13.6	16.5	8	9	10	3		3m 19s	3m 43s	4m 8s	10s	9.8s	8	9	10	0h 20m	<i>d</i>
	11	20.5	10	11	12	3		4m 5s	4m 36s	5m 7s	12s	9.8s	10	11	12	0h 17m	<i>d</i>
	9	25.0	12	13	15	3		5m 0s	5m 38s	6m 15s	12s	9.8s	12	13	15	0h 18m	<i>d</i>
	7.4	30.4	14	16	18	4		6m 5s	6m 50s	7m 36s	16s	9.8s	14	16	18	0h 20m	<i>d</i>

TEMP: 225 ± 10C			PHASE 1				PHASE 2				PHASE 3	PHASE 4			PHASE 5	PHASE 6	
Pipe Details (e _n = Wall Thickness)			Bead Up Pressure (BAR)			Minimum Bead up Size	Heat Soak See Note <i>b</i>			Maximum Heater Removal Time	Maximum Pressure Up Time	Weld Pressure (BAR)			Minimum Cool Time Under Pressure (See Note <i>c</i>)	Additional Cool Time out of Machine (See Note <i>d</i>)	
			ADD DRAG (see note <i>a</i>)				0 - DRAG ONLY					ADD DRAG					
			P1			t1	P2	t2			t3	t4	P3			t5 / P3	
D _n	SDR	e _n	Min	Tgt	Max	mm	BAR	Min	Tgt	Max			Min	Tgt	Max		
250	41	6.1	4	4	4	2	0 - DRAG ONLY	1m 13s	1m 22s	1m 31s	6s	10.5s	4	4	4	0h 9m	<i>d</i>
	33	7.6	4	5	5	2		1m 31s	1m 42s	1m 54s	8s	10.5s	4	5	5	0h 11m	<i>d</i>
	26	9.6	5	6	7	2		1m 55s	2m 10s	2m 24s	8s	10.5s	5	6	7	0h 13m	<i>d</i>
	21	11.9	7	8	8	2		2m 23s	2m 41s	2m 59s	8s	10.5s	7	8	8	0h 15m	<i>d</i>
	17	14.7	8	9	10	2		2m 56s	3m 19s	3m 41s	10s	10.5s	8	9	10	0h 18m	<i>d</i>
	13.6	18.4	10	11	13	3		3m 41s	4m 8s	4m 36s	10s	10.5s	10	11	13	0h 16m	<i>d</i>
	11	22.7	12	14	15	3		4m 33s	5m 7s	5m 41s	12s	10.5s	12	14	15	0h 17m	<i>d</i>
	9	27.8	15	16	18	4		5m 33s	6m 15s	6m 57s	16s	10.5s	15	16	18	0h 19m	<i>d</i>
	7.4	33.8	17	19	22	4		6m 45s	7m 36s	8m 27s	16s	10.5s	17	19	22	0h 21m	<i>d</i>
280	41	6.8	4	5	6	2	0 - DRAG ONLY	1m 22s	1m 32s	1m 42s	6s	11.4s	4	5	6	0h 10m	<i>d</i>
	33	8.5	5	6	7	2		1m 42s	1m 55s	2m 7s	8s	11.4s	5	6	7	0h 11m	<i>d</i>
	26	10.8	7	8	9	2		2m 9s	2m 25s	2m 42s	8s	11.4s	7	8	9	0h 14m	<i>d</i>
	21	13.3	8	9	11	2		2m 40s	3m 0s	3m 20s	10s	11.4s	8	9	11	0h 16m	<i>d</i>
	17	16.5	10	12	13	3		3m 18s	3m 42s	4m 7s	10s	11.4s	10	12	13	0h 19m	<i>d</i>
	13.6	20.6	13	14	16	3		4m 7s	4m 38s	5m 9s	12s	11.4s	13	14	16	0h 17m	<i>d</i>
	11	25.5	15	17	19	4		5m 5s	5m 44s	6m 22s	12s	11.4s	15	17	19	0h 18m	<i>d</i>
	9	31.1	18	21	23	4		6m 13s	7m 0s	7m 47s	16s	11.4s	18	21	23	0h 20m	<i>d</i>
	7.4	37.8	22	24	27	5		7m 34s	8m 31s	9m 28s	20s	11.4s	22	24	27	0h 24m	<i>d</i>
315	41	7.7	6	6	7	2	0 - DRAG ONLY	1m 32s	1m 44s	1m 55s	8s	12.5s	6	6	7	0h 11m	<i>d</i>
	33	9.5	7	8	9	2		1m 55s	2m 9s	2m 23s	8s	12.5s	7	8	9	0h 13m	<i>d</i>
	26	12.1	9	10	11	2		2m 25s	2m 44s	3m 2s	10s	12.5s	9	10	11	0h 15m	<i>d</i>
	21	15.0	11	12	13	2		3m 0s	3m 23s	3m 45s	10s	12.5s	11	12	13	0h 18m	<i>d</i>
	17	18.5	13	15	16	3		3m 42s	4m 10s	4m 38s	10s	12.5s	13	15	16	0h 16m	<i>d</i>
	13.6	23.2	16	18	20	3		4m 38s	5m 13s	5m 47s	12s	12.5s	16	18	20	0h 17m	<i>d</i>
	11	28.6	19	22	24	4		5m 44s	6m 27s	7m 10s	16s	12.5s	19	22	24	0h 19m	<i>d</i>
	9	35.0	23	26	29	4		7m 0s	7m 53s	8m 45s	16s	12.5s	23	26	29	0h 22m	<i>d</i>
	7.4	42.6	27	31	35	5		8m 31s	9m 35s	10m 39s	20s	12.5s	27	31	35	0h 27m	<i>d</i>
355	41	8.7	7	8	9	2	0 - DRAG ONLY	1m 44s	1m 57s	2m 10s	8s	13.7s	7	8	9	0h 12m	<i>d</i>
	33	10.8	9	10	11	2		2m 9s	2m 25s	2m 41s	8s	13.7s	9	10	11	0h 14m	<i>d</i>
	26	13.7	11	12	14	2		2m 44s	3m 4s	3m 25s	10s	13.7s	11	12	14	0h 17m	<i>d</i>
	21	16.9	13	15	17	3		3m 23s	3m 48s	4m 14s	10s	13.7s	13	15	17	0h 20m	<i>d</i>
	17	20.9	16	19	21	3		4m 11s	4m 42s	5m 13s	12s	13.7s	16	19	21	0h 17m	<i>d</i>
	13.6	26.1	20	23	26	4		5m 13s	5m 52s	6m 32s	16s	13.7s	20	23	26	0h 18m	<i>d</i>
	11	32.3	25	28	31	4		6m 27s	7m 16s	8m 4s	16s	13.7s	25	28	31	0h 20m	<i>d</i>
	9	39.4	29	33	37	5		7m 53s	8m 53s	9m 52s	20s	13.7s	29	33	37	0h 25m	<i>d</i>
	7.4	48.0	35	39	44	6		9m 36s	10m 48s	11m 60s	20s	13.7s	35	39	44	0h 32m	<i>d</i>