مبدلهای حرارتی پوسته ولوله

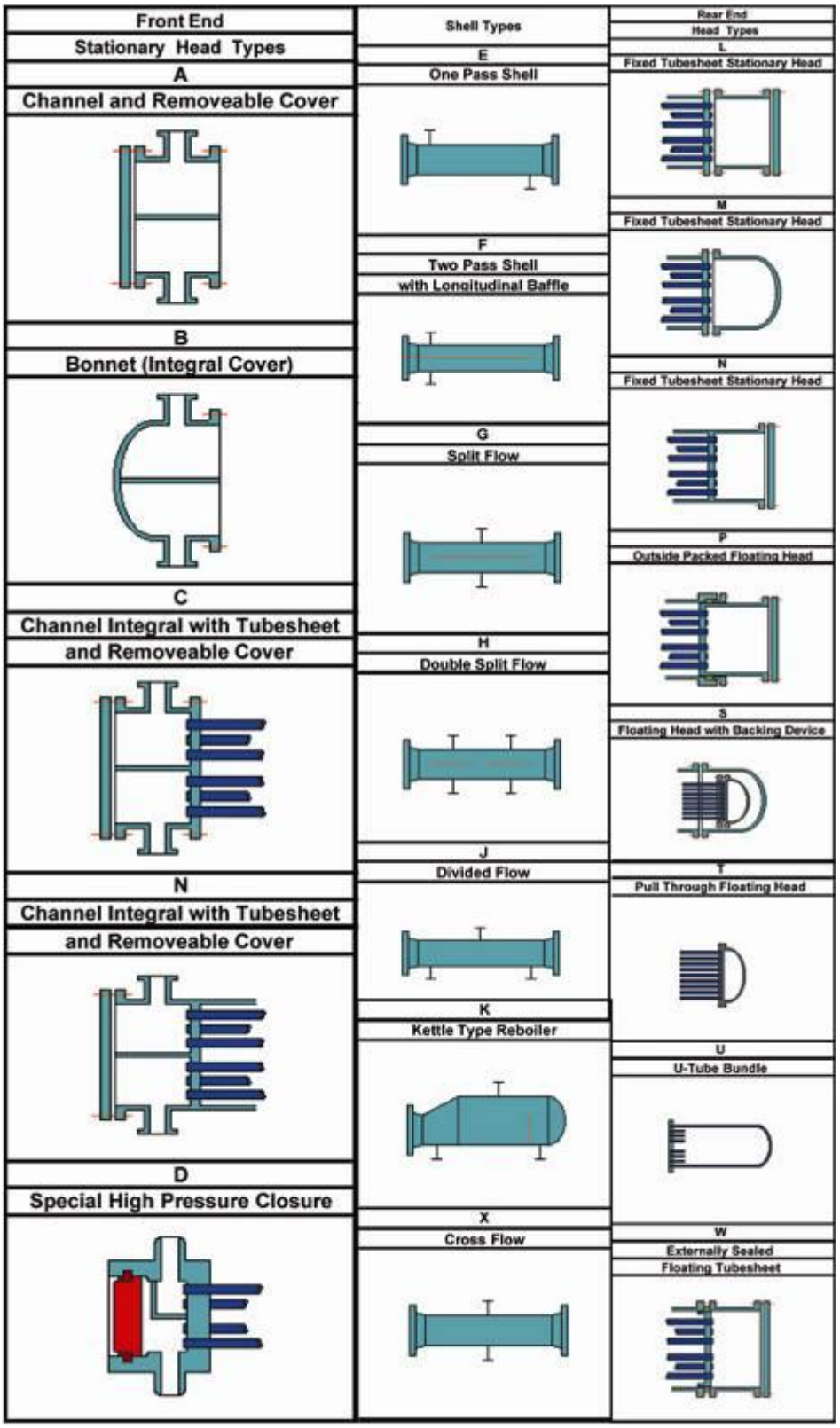
به کلیه دستگاههایی که باعث انتقال حرارت از یک سیال به سیال دیگر می شود مبدل حرارتی گفته مـی شـود. بنابراین می توان ازآنها جهت گرمایش, سرمایش و یاتبدیل فـاز انـواع روغنهـا ، اسـیدها، آب وگازهـای مختلـف استفاده نمود. مبدلهای حرارتی پوسته و لوله پرکاربردترین نوع دستگاههای انتقال حرارت در صنعت می‌باشند . برتری این دستگاه نسبت به دیگر انواع مبدلهای حرارتی نظیر صفحه لوله در روش تعمیر آسان آن می‌باشد.

مبدل حرارتی خنک کننده روغن

جنس مبدلهای حرارتی پوسته و لوله برحسب نوع سیال وخورندگی سیال جاری درآن مـی باشـد.معمـولاً بدنـه ازنوع کربن استیل، استنلس استیل و یابرنج بوده و تیوبهای داخلی آن معمولاً ازجنس مـس، اسـتنلس اسـتیل، کربن استیل، برنج و... می باشند. طریقه کارکرد آن به اینصورت است که انرژی و گرما از سیال گـرم بـه دیـواره تیوبها (لوله‌های داخل) منتقل شده واز طرف دیگر این حرارت به سیال سرد انتقال می‌یابد.

ساختمان مبدلهای حرارتی از سه قسمت سر جلویی، پوسته، وسرعقبی، که هرکدام ازآنها برحسب مورد استفاده

آن انواع دارای مختلفی هستند دسته بندی می‌شوند که در جدول زیر نشان داده شده‌اند.



اساس انتخاب نوع مبدل برحسب نوع دو سیال جاری درآن, و اساس محاسبه آن طبق دبی، دمای ورودی، دمای خروجی و فشار نوع سیال گرم وپیدا شدن سطح حرارتی مطلوب می‌باشد.

طریقه محاسبه مبدلهای بخار به آب (طرح SU)

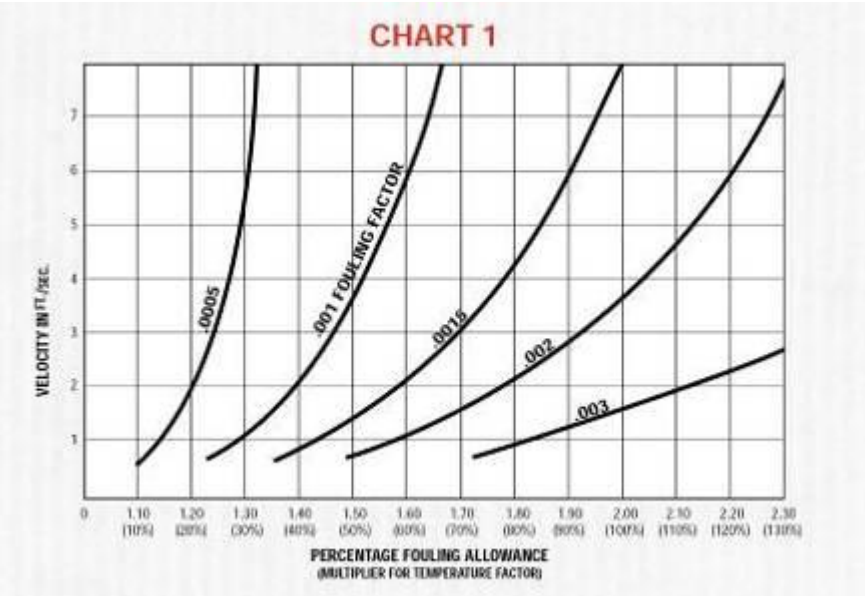
۱-ابتدا با دانستن دمای ورودی و خروجی آب مصرفی (مثلا ۱۴۰-۴۰ درجه فارنهایت) و فشار بخار داخل پوسته (مثلا 15PSI)، از جدول شماره۱ ضریب دمایی را پیدا می نماییم (29.5).

۲-در جدول۲ و در ستون دبی آب مصرفی (مثلا 35GPM)، ضریب دمایی بدست آمده را جستجو نموده تا مدل اولیه مبدل (SU64-4) و سرعت متوسط آب درون لوله (Avg. Tube Vel=5.1) پیدا شود.

۳- از نمودار شماره ۱ با دانستن سرعت متوسط پیدا شده وضریب رسوب مجاز (مثلا 0.005)، درصد رسوب مجاز (Percentage Fouling Allowance=1.28) راپیدا می کنیم.

۴-سپس درصد رسوب مجاز را در ضریب دمایی فوق ضرب می نماییم تا ضریب دمایی جدید بدست آید (1.28*29.5=37.8).

۵- با ضریب دمایی جدید به جدول شماره ۲ رجوع کرده ومدل نهایی (SU83-6) و افت فشار آنرا را بدست می آوریم (3.8ft).



نمودار شماره ۱

TABLE 1-CLEAN TUBE TEMPERATURE FACTORS

		SATURATED STEAM PRESSURE IN PSI GAUGE @ SEA LEVEL (SEE NOTE1)											
Temp. in ºF	**Temp. out ºF**	**0p.s.i**	**2p.s.i**	**5p.s.i**	**10p.s.i**	**15p.s.i**	**20p.s.i**	**30p.s.i**	**40p.s.i**	**50p.s.i**	**75p.s.i**	**100p.s.i**	**125p.s.i**
	60	6.5	6.3	6.1	5.9	5.6	5.2	5.0	4.8	4.7	4.2	4.0	3.5
	80	13.4	12.5	12.2	11.0	10.5	10.0	9.0	8.8	8.1	7.9	7.5	6.9
	100	21.2	19.8	19.0	17.5	16.5	15.5	14.2	13.1	12.2	11.1	10.4	10.1
40º	**120**	29.4	27.0	26.2	24.5	22.5	21.5	19.5	18.5	17.5	15.7	14.5	14.0
	140	39.2	36.0	34.5	31.5	29.5	27.5	25.0	23.5	22.0	19.8	18.8	17.4
	160	51.9	48.0	44.5	40.0	37.0	35.0	31.0	29.0	27.2	24.0	22.7	21.0
	180	71.5	65.5	58.8	51.5	47.0	44.0	38.0	35.5	33.5	29.8	27.0	25.0
	70	6.6	6.4	6.2	6.0	6.7	5.3	5.1	4.9	4.7	4.3	4.1	3.5
	90	13.9	13.0	12.4	11.5	10.8	10.3	9.5	8.9	8.4	8.0	7.6	7.0
	110	21.6	20.6	19.3	17.8	16.8	15.7	14.5	13.6	12.9	11.4	10.7	10.2
50º	**130**	30.6	29.0	27.1	25.0	23.0	22.0	19.7	18.6	17.7	15.8	14.7	14.1
	150	41.8	39.3	36.2	32.4	30.1	28.3	25.6	24.0	22.5	20.1	18.9	17.6
	170	57.1	53.0	48.0	42.5	38.8	36.2	32.2	30.0	28.1	25.0	23.1	21.5
	190	84.0	74.5	65.2	55.5	50.0	46.0	40.0	38.0	35.0	32.0	28.0	26.0
	80	6.8	6.5	6.2	6.0	5.7	5.4	5.1	5.0	4.8	4.3	4.2	3.5
	100	14.3	13.2	12.6	12.0	11.3	10.6	10.0	9.0	8.7	8.0	7.7	7.0
	120	22.6	21.5	20.0	19.0	17.5	16.0	15.0	14.1	13.1	12.2	11.1	10.2
60º	**140**	32.4	30.0	28.3	26.0	24.0	22.5	20.0	18.8	18.0	15.8	15.0	14.1
	160	45.5	42.5	38.8	34.5	32.0	30.0	26.1	25.0	23.1	20.5	19.0	17.8
	180	65.0	58.5	52.8	45.0	42.0	39.5	33.5	31.7	29.5	25.8	23.8	22.0
	200	104.0	89.0	74.6	64.0	56.0	50.0	43.0	39.0	37.0	32.0	29.0	26.0
	100	7.5	7.0	6.7	6.4	6.0	5.7	5.2	5.1	4.9	4.4	4.3	3.6
	120	15.6	14.8	13.7	12.5	12.0	11.0	10.1	9.3	8.9	8.1	7.9	7.1
80º	**140**	25.7	23.5	22.4	20.0	18.5	17.0	15.5	14.5	13.6	12.4	11.3	10.5
	160	38.8	36.0	33.0	29.0	26.5	25.0	21.5	20.0	19.0	17.0	15.5	14.4
	180	58.0	52.5	46.7	40.0	36.5	34.0	29.5	27.0	25.2	22.0	20.0	18.8
	200	96.5	81.5	68.0	56.0	49.0	45.0	38.5	35.0	32.5	28.0	25.5	23.2
	120	8.5	8.0	7.5	7.0	6.2	5.9	5.3	5.2	5.0	4.5	4.4	3.6
	130	12.0	11.0	10.0	9.5	9.0	8.0	7.0	6.5	6.0	5.5	5.2	5.0
100º	**140**	18.5	17.5	15.9	14.0	13.0	12.2	10.6	10.0	9.2	8.2	8.1	7.3
	160	31.5	28.5	26.3	23.0	21.0	19.5	17.0	16.0	15.0	13.0	12.0	11.1
	180	50.3	46.0	40.0	34.5	31.0	28.5	24.5	22.5	21.0	18.2	16.5	15.2
	200	88.0	74.0	61.1	49.0	43.0	39.5	33.5	30.0	28.0	23.7	21.5	19.5
	120	4.0	3.8	3.5	3.3	3.0	2.7	2.5	2.3	2.1	2.0	1.8	1.5
	130	9.5	9.0	8.0	7.5	6.7	6.4	5.6	5.3	5.1	4.6	4.5	3.6
	140	14.8	13.0	12.2	11.0	10.0	9.0	8.5	7.5	7.0	6.5	6.0	5.4
	150	21.4	19.0	18.0	15.0	14.0	13.0	12.5	10.5	9.5	9.0	8.0	7.4
110º	**160**	28.0	26.0	23.0	20.0	18.0	17.0	15.0	13.0	12.5	11.7	9.8	9.0
	170	35.2	30.2	28.5	25.5	22.5	21.0	18.0	16.8	15.0	14.1	12.5	11.3
	180	47.5	43.0	38.0	32.0	28.0	25.5	23.0	21.0	19.5	16.8	15.0	13.7
	190	62.0	53.0	45.0	36.2	33.0	30.0	26.0	23.0	22.0	19.0	17.0	15.5
	200	85.0	71.0	57.5	46.0	41.0	36.5	31.0	27.5	25.5	21.5	20.0	18.8
	130	4.9	4.4	4.1	3.9	3.6	3.4	3.0	2.5	2.3	2.1	2.0	1.9
	140	10.1	9.2	8.5	7.8	7.0	6.7	6.0	5.4	5.1	4.6	4.5	3.7
	150	15.4	15.0	13.5	13.0	11.2	10.0	8.5	8.1	7.5	6.6	6.2	5.5
120º	**160**	23.0	21.0	18.9	16.2	14.0	13.5	12.0	11.0	10.5	9.1	8.5	7.5
	170	31.5	28.0	25.0	22.0	19.5	18.0	15.2	14.5	13.0	12.0	10.5	9.5
	180	41.7	37.0	32.5	27.5	24.5	22.5	19.0	17.5	16.1	13.8	12.9	11.7
	190	56.0	51.5	42.0	34.0	31.0	27.5	23.0	21.5	19.2	17.5	15.0	13.7
	200	78.8	66.0	53.3	42.5	37.0	33.0	28.0	25.0	23.0	19.5	17.5	16.2
	140	5.5	5.0	4.6	4.0	3.7	3.5	3.3	2.6	2.4	2.3	2.0	1.9
	150	10.9	10.6	9.4	8.4	7.5	6.9	6.1	5.7	5.1	4.6	4.5	3.7
	160	18.5	17.0	15.0	14.0	12.0	11.0	9.5	8.6	7.8	6.8	6.4	5.8
130º	**170**	27.0	24.0	21.0	18.5	16.0	15.0	13.0	11.5	10.8	9.3	8.6	7.8
	180	39.0	34.0	29.0	26.0	21.0	20.0	16.3	15.0	13.6	12.5	10.8	9.8
	190	53.0	45.0	38.0	32.0	27.5	25.0	21.0	19.0	17.0	14.8	13.2	12.2
	200	75.0	68.0	52.0	40.0	35.0	30.0	25.0	23.0	21.0	18.5	16.0	14.5
	150	6.2	5.5	5.1	4.2	3.8	3.6	3.5	2.8	2.6	2.4	2.1	2.0
	160	12.7	12.0	10.3	9.0	8.0	7.2	6.3	6.0	5.2	4.7	4.6	3.7
	170	21.0	19.0	16.5	14.5	12.5	11.5	10.0	9.0	8.0	7.0	6.5	6.0
140º	**180**	31.4	27.5	23.8	20.0	17.2	16.0	13.5	12.0	11.1	9.5	8.7	8.0
	190	46.0	39.0	32.5	30.0	23.0	21.0	17.5	15.5	14.2	13.0	11.0	10.0
	200	68.6	56.5	44.8	36.0	30.5	27.0	22.0	20.0	18.0	15.2	13.5	12.6
	210		86.0	62.0	47.0	39.2	32.5	28.0	24.0	22.5	19.5	16.5	15.0
	220			95.3	60.0	52.5	42.0	33.0	29.5	26.5	22.0	19.5	17.8
	160	7.0	6.5	5.8	5.0	4.0	3.8	3.5	3.2	3.0	2.6	2.4	2.0
	170	14.8	12.8	11.0	10.0	8.0	7.5	6.5	6.0	5.7	5.0	4.8	4.2
	180	25.0	22.5	19.0	15.5	13.8	11.8	10.8	9.2	8.8	7.0	6.7	6.2
150º	**190**	40.0	33.0	28.0	22.5	19.0	17.2	14.8	13.0	11.5	10.6	9.0	8.2
	200	52.0	51.0	39.0	30.0	26.5	23.0	18.5	17.0	15.8	13.0	11.8	10.5
	210		80.0	58.0	42.0	35.0	30.0	24.0	22.0	19.5	17.0	14.5	13.5
	220				58.0	42.5	39.0	31.0	27.0	23.5	21.0	17.5	16.0

TABLE 1 CLEAN TUBE TEMPERATURE FACTORS (Continued)

		SATURATED STEAM PRESSURE IN PSI GAUGE @ SEA LEVEL (SEE NOTE1)											
Temp. in °F	**Temp. out °F**	**0p.s.i**	**2p.s.i**	**5p.s.i**	**10p.s.i**	**15p.s.i**	**20p.s.i**	**30p.s.i**	**40p.s.i**	**50p.s.i**	**75p.s.i**	**100p.s.i**	**125p.s.i**
160°	**170**	8.3	7.2	6.3	5.8	4.5	4.2	3.9	3.2	3.1	2.7	2.5	2.1
	180	18.5	16.0	13.6	11.0	9.5	8.5	7.5	6.5	6.2	5.1	5.0	4.2
	190	32.4	27.5	22.5	19.7	15.3	13.7	11.3	10.1	9.3	7.9	6.9	6.5
	200	56.3	44.0	34.4	26.0	22.0	19.5	16.0	14.2	13.0	11.0	9.7	8.7
	210		73.0	51.0	37.5	31.0	26.5	22.0	19.0	17.5	14.5	12.5	11.5
	220			84.0	53.0	42.0	31.0	28.0	24.0	22.0	18.5	15.5	13.5
170°	**180**	10.0	9.0	8.0	6.0	5.5	5.0	4.2	3.5	3.2	3.0	2.8	2.2
	190	24.0	20.0	15.5	12.7	11.0	10.0	8.0	7.0	6.5	5.5	5.2	4.5
	200	47.0	36.5	28.0	21.0	17.7	15.2	12.8	11.0	10.5	8.6	8.0	7.0
	210		66.0	43.5	31.0	25.5	21.5	17.5	15.0	13.8	11.5	10.0	9.0
	220			77.0	46.5	38.0	31.0	25.0	21.5	18.5	16.0	13.5	12.0
180°	**190**	14.0	11.3	9.2	7.0	6.0	5.3	4.4	3.7	3.3	3.1	3.0	2.3
	200	36.6	27.8	20.6	15.0	12.5	11.0	9.0	8.0	7.0	6.0	5.5	4.7
	210	102.	57.5	37.5	25.0	21.0	17.5	14.2	12.2	11.0	9.0	8.0	7.3
	220	0		70.0	41.5	32.0	27.5	21.0	18.0	15.5	13.0	11.0	9.5
190°	**200**	22.4	16.2	11.5	8.5	7.0	6.1	5.0	4.2	3.5	3.2	3.1	2.5
	210	87.5	45.5	28.2	18.5	15.0	12.5	9.7	8.6	7.8	6.3	5.8	5.0
	220			60.0	33.0	25.0	20.0	15.5	13.0	11.7	9.5	8.1	7.5
	230				61.0	34.0	31.0	23.0	19.0	16.5	13.5	11.5	10.5
200°	**210**	64.8	26.0	16.5	10.5	8.0	7.0	5.2	4.7	3.9	3.4	3.2	2.7
	220			48.5	24.8	18.0	15.0	11.0	9.1	8.2	6.6	6.0	5.1
	230				49.0	32.5	25.5	17.8	14.8	13.0	10.2	9.1	8.0
	240					62.0	42.0	26.0	23.0	21.0	15.5	12.5	11.0
210°	**220**			32.0	14.5	10.2	8.2	6.5	5.0	4.5	3.5	3.4	2.9
	230				39.0	24.5	18.5	13.0	10.5	9.2	7.2	6.2	5.3
	240					48.5	33.3	21.5	17.1	14.8	11.1	9.5	8.3
	250						63.0	45.0	26.0	22.0	17.5	13.0	11.5
220°	**230**				24.5	14.2	10.4	7.0	5.5	5.0	3.8	3.5	3.1
	240					38.0	25.0	15.2	12.4	10.4	8.0	6.5	5.7
	250						53.0	28.0	21.0	17.0	13.5	10.0	9.0
	260							47.0	32.0	25.0	19.5	14.5	12.5
	270								48.0	36.0	25.0	20.0	17.5
230°	**240**					27.0	15.0	9.0	7.0	5.5	5.0	3.5	3.0
	250						43.0	22.0	15.5	12.5	9.5	7.0	6.0
	260							39.0	26.0	20.0	14.5	11.5	10.0
	270								42.5	32.5	23.0	16.0	13.0
	280								76.0	45.0	30.0	22.5	17.0
240°	**250**						27.5	12.0	8.0	6.0	4.0	3.0	2.0
	260							30.0	19.0	14.0	9.5	7.5	6.5
	270								35.0	23.5	17.0	12.5	9.5
	280								67.0	39.0	25.0	17.0	14.2
	290									67.0	37.0	23.0	19.0
250°	**260**							18.5	11.0	7.5	5.0	4.0	3.0
	270							61.0	27.5	18.5	12.5	8.5	7.0
	280								60.0	32.0	21.0	14.0	10.0
	290									60.0	32.0	20.0	17.0
	300										48.0	28.0	23.0

TABLE 2-4" DIAMETER "SU" CAPACITY

"SU" Number	G.P.M.HEATEDINTUBES											
	2	**4**	**6**	**8**	**10**	**15**	**17**	**20**	**25**	**30**	**34**	
SU42-4	34	28	21	18	15	11	10					
						1.0	1.2					
SU43-4	50	44	36	31	27	21	19					
			1.0	2.0	3.0	7.0	8.0					
SU44-4	70	60	51	44	40	29	27					
			1.2	2.2	3.5	8.0	9.0					
SU45-4	90	78	65	56	50	37	33					
			1.4	2.5	9.0	9.0	11					
SU46-4		92	77	67	60	45	40					
			1.5	2.8	4.5	10.0	13					
SU47-4			92	79	70	53	48					
			1.7	3.0	5.0	11.0	15					
Avg.Tubevel. 4"—4-Pass	.9ft/sec	1.8	2.7	3.5	4.4	6.6	7.5					
SU42-2		16	13	12	11	9	8	6	5	4	3	
								1.1	1.4	1.8	2.2	
SU43-2		26	22	20	18	15	13	1	10	9	8	
								1.4	1.9	2.5	3.0	
SU44-2		34	31	28	25	21	19	17	15	13	11	
							1.0	1.7	2.4	3.2	3.8	
SU45-2		45	40	37	33	28	25	21	19	17	15	
							1.2	2.0	2.9	3.9	4.6	
SU46-2		55	49	45	40	34	31	26	24	20	17	
							1.4	2.3	3.4	4.6	5.4	
SU47-2		65	58	53	48	40	37	31	28	24	21	
							1.6	2.6	3.9	5.3	6.2	
Avg.Tub vel. 4"—2-Pass		.9ft./sec	1.3	1.8	2.2	3.3	3.8	4.4	5.5	6.6	7.5	

TABLE 2-6" DIAMETER "SU" CAPACITY

"SU" Number	G.P.M. HEATED IN TUBES															
	2	3	4	5	10	15	20	25	30	35	40	50	60	70	80	90
SU62-6		53	49	47	36	29	24	21	17							
					1.2	2.2	3.4	4.8	6.3							
SU63-6		84	77	73	53	44	36	31	25							
					1.6	2.9	4.5	6.6	8.6							
SU64-6				98	73	56	47	41	34							
					1.9	3.6	5.7	8.3	10.9							
SU65-6					92	72	60	51	42							
					2.4	4.3	6.9	10.1	13.2							
SU66-6						87	71	61	50							
						5.0	8.0	11.8	15.6							
SU67-6							84	72	59							
							9.2	13.6	17.9							
SU68-6							95	82	67							
							10.3	15.3	20.3							
Avg. Tube vel. 6"—6-Pass	.5ft./ sec.	.8	1.1	1.3	2.7	4.0	5.4	6.7	8.0							
SU62-4				37	31	26	22	18	16	14	13	10				
							1.0	1.5	2.0	2.7	3.4	4.1				
SU63-4				58	47	39	33	27	24	21	19	15				
							1.6	2.2	2.9	3.6	4.6	5.6				
SU64-4				78	63	53	44	37	32	29	26	21				
							1.7	2.9	3.8	4.7	6.1	7.5				
SU65-4				98	79	65	55	47	40	35	32	27				
						1.1	2.4	3.6	4.5	5.6	7.3	9.0				
SU66-4					95	78	66	56	48	43	38	30				
						1.6	2.8	3.9	5.4	6.8	8.7	9.8				
SU67-4							78	65	56	49	44	36				
							3.3	4.5	6.0	8.3	10.3	12.3				
SU68-4							88	75	64	56	50	40				
							3.5	5.0	7.0	9.2	11.5	14.5				
Avg. Tube vel. 6"—4-Pass				.8ft./ sec.	1.4	2.8	2.9	3.7	4.4	5.1	5.9	7.3			*	*
SU62-2					19	17	15	13	12	11	10	9	8	7	6	5
														1.1	1.3	1.5
SU63-2					30	26	24	22	20	18	16	14	12	10	9	8
												1.0	1.3	1.7	2.1	2.5
SU64-2					40	35	32	29	26	24	22	19	16	14	12	10
												1.2	1.9	2.1	2.8	3.5
SU65-2					50	45	40	36	33	30	27	23	20	18	16	14
											1.0	1.6	2.1	2.5	3.5	4.5
SU66-2							48	43	39	35	33	28	24	21	19	17
										1.0	1.3	2.0	2.4	2.9	4.2	5.5
SU67-2									46	42	38	33	29	25	22	19
										1.1	1.5	2.1	3.0	3.5	4.9	6.3
SU68-2											44	38	32	28	25	22
											1.7	2.6	3.3	4.3	5.6	6.9
Avg. Tube vel. 6"—2-Pass					.8ft./ sec.	1.1	1.4	1.8	2.2	2.6	2.9	3.7	4.4	5.1	5.9	6.6

TABLE 2-8" DIAMETER "SU" CAPACITY

"SU" Number	G.P.M. HEATED IN TUBES																		
	4	6	8	10	15	20	25	30	35	40	50	60	70	80	100	120	140	160	
SU82-6		51	48	46	40	36	32	29	26	24	20	16							
						1.2	1.7	2.2	2.8	3.4	4.8	6.3							
SU83-6		78	74	70	61	54	48	43	39	35	30	25							
					1.0	1.6	2.3	2.9	3.8	4.5	6.6	8.6							
SU84-6			96	92	81	72	65	58	52	47	39	32							
					1.2	1.9	2.8	3.6	4.8	5.7	8.3	10.9							
SU85-6						93	83	72	65	61	49	41							
						2.4	3.4	4.3	5.7	6.9	10.1	13.2							

"SU" Number	G.P.M. HEATED IN TUBES																		
	4	6	8	10	15	20	25	30	35	40	50	60	70	80	100	120	140	160	180
SU86-6							96	86	78	71	60	51							
							3.9	5.0	6.7	8.0	11.8	15.6							
SU87-6								100	91	83	69	59							
								5.7	7.6	9.2	13.6	17.9							
SU88-6										94	80	69							
										10.3	15.3	20.3							
SU89-6											89	76							
											17.1	22.6							
Avg.Tube vel. 8"–6-Pass	.52ft./ sec.	.78	1.04	1.3	2.0	2.7	3.4	4.0	4.7	5.4	6.7	8.0		*					
SU82-4				38	34	30	27	25	23	21	18	15	13	12					
										1.0	1.5	2.2	2.8	3.6					
SU83-4				58	50	45	40	37	34	31	26	23	20	18					
									1.1	1.5	2.1	2.9	3.7	5.0					
SU84-4				77	68	61	55	50	46	42	36	31	27	24					
							1.0	1.1	1.6	1.8	2.6	3.7	5.0	6.4					
SU85-4				100	88	78	71	64	58	53	44	38	34	31					
							1.1	1.4	1.6	2.1	3.7	4.9	5.9	7.8					
SU86-4						95	85	77	70	64	55	47	41	37					
							1.3	1.6	2.0	2.6	4.2	5.4	7.4	9.2					
SU87-4							100	91	82	75	64	55	48	43					
								1.7	2.6	3.0	4.4	6.5	8.1	10.6					
SU88-4									.93	86	73	63	55	48					
									2.9	3.4	5.0	7.0	8.9	12.0					
SU89-4										98	83	71	62	54					
										3.6	5.5	7.8	10.5	13.4					
Avg. Tube vel. 8"–4-Pass				.8ft./ sec	1.2	1.6	2.0	2.4	2.8	3.2	4.0	4.8	5.6	6.4					*
SU82-2						19	18	17	16	15	13	12	11	10	9	8	7	6	5
																	1.1	1.4	1.7
SU83-2						29	27	25	24	22	20	18	16	15	13	12	10	9	8
																1.3	1.6	2.1	2.6
SU84-2						39	36	34	31	30	27	25	22	20	18	15	14	12	11
															1.2	1.6	2.1	2.8	3.5
SU85-2						48	45	42	39	38	34	31	28	25	22	19	17	15	13
														1.1	1.5	2.1	2.7	3.2	3.7
SU86-2									48	46	41	37	34	31	26	23	20	18	16
													1.0	1.2	1.8	2.4	3.2	3.9	4.6
SU87-2												44	40	37	31	27	24	21	18
													1.2	1.3	2.1	2.9	3.6	4.5	5.4
SU88-2														42	36	31	27	24	21
														1.4	2.4	3.2	4.1	5.3	6.5
SU89-2														48	40	35	30	27	24
														1.6	2.7	3.8	4.7	5.9	7.0
Avg. Tube vel. 8"–2-Pass						.8ft./ sec.	1.0	1.2	1.4	1.6	2.0	2.4	2.8	3.2	4.0	4.8	5.6	6.4	7.2

TABLE 2-10" DIAMETER "SU" CAPACITY

"SU" Number	G.P.M. HEATED IN TUBES																					
	10	15	20	25	30	35	40	50	60	70	80	90	100	120	140	160	180	200	225	250	275	300
SU102-6	50	45	41	39	35	32	30	26	23	21	19											
					1.0	1.3	1.5	2.0	2.7	3.4	4.2											
SU103-6	75	70	64	60	56	52	48	43	37	35	31											
					1.3	1.6	1.9	2.7	3.5	4.5	5.7											
SU104-6	100	93	86	80	75	69	64	56	50	45	41											
				1.1	1.6	1.9	2.4	3.3	4.4	5.6	7.2											
SU105-6				96	90	84	79	70	63	58	52											
				1.3	1.8	2.3	2.8	4.0	5.3	6.7	8.7											
SU106-6								85	75	68	63											
								4.6	6.1	7.9	10.2											
SU107-6								97	88	79	73											
								5.2	7.0	9.0	11.7											
SU108-6									100	90	82											
									7.9	10.1	12.2											
SU109-6										100	92											
										11.3	14.7											
SU1010-6											100											
											15.2											
Avg. Tube vel. 10"–6-Pass				2.2ft. / sec	2.7	3.1	3.5	4.4	5.3	6.2	7.0											
SU102-4				32	30	28	26	23	21	19	17	15	14	12	10							
											1.1	1.4	1.7	2.4	3.2							
SU103-4				51	48	45	42	38	34	31	28	26	24	20	17							
									1.0	1.3	1.6	2.0	2.4	3.4	4.4							
SU104-4				69	64	60	56	50	45	41	37	34	32	27	24							
									1.2	1.7	2.1	2.6	3.1	4.3	5.6							
SU105-4				88	81	75	71	63	57	51	47	43	40	34	30							
								1.0	1.5	2.0	2.5	3.1	3.8	5.2	6.8							
SU106-4				100	96	90	84	75	67	61	56	52	48	41	36							
								1.3	1.8	2.4	3.0	3.6	4.5	6.1	8.0							
SU107-4							100	89	79	72	65	60	56	48	42							
							1.0	1.5	2.1	2.7	3.4	4.2	5.2	7.1	9.3							
SU108-4								100	92	84	76	70	64	53	47							
								1.6	2.3	3.0	3.9	4.9	5.9	8.1	10.5							
SU109-4										93	85	77	71	61	53							
										3.3	4.3	5.5	6.5	9.0	11.7							
SU110-4											95	87	80	67	58							
											4.8	6.0	7.1	10.0	12.8							
Avg. Tube vel. 10"–4-Pass					1.5ft. / sec	1.7	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0	7.0							
SU102-2								17	16	15	14	13	12	11	10	9	8.5	8	7	6.5	6.2	6
																					1.0	1.2
SU103-2								26	24	23	21	20	19	18	16	14	13	12	11	10	9.5	9
																			1.2	1.4	1.6	1.8
SU104-2								35	33	31	29	27	26	24	22	20	18	16	15	13.5	12.5	11.5
																	1.1	1.2	1.5	1.9	2.1	2.5
SU105-2								45	41	39	37	34	33	30	27	25	22	21	19	17.5	16	15
																1.1	1.3	1.5	1.9	2.4	2.8	3.2
SU106-2											45	42	40	36	32	30	27	25	23	21	19	18
															1.0	1.3	1.6	2.0	2.3	2.8	3.2	3.8
SU107-2													45	41	38	34	32	29	27	25	23	21
															1.2	1.5	1.8	2.3	2.6	3.3	3.8	4.4
SU108-2															43	39	37	34	31	28	26	24
															1.3	1.6	2.0	2.5	2.9	3.8	4.4	5.0
SU109-2																44	41	38	35	32	29	27
																1.9	2.4	2.9	3.4	4.3	4.8	5.6
SU1010-2																49	45	42	39	36	33	31
																2.1	2.6	3.2	3.6	4.7	5.4	6.2
Avg. Tube vel. 10"–2-Pass								1.3ft. / sec	1.5	1.8	2.1	2.3	2.6	3.1	3.6	4.1	4.6	5.1	5.7	6.4	7.1	7.7

TABLE 2-12" DIAMETER "SU" CAPACITY

"SU" Number	G.P.M. HEATED IN TUBES																					
	25	30	40	50	60	70	80	90	100	110	120	130	140	160	180	200	225	250	300	350	400	450
SU123-6	80	76	65	56	50	45	41	37	34	31	28	26	24									
				1.4	2.0	2.5	3.1	3.6	4.5	5.2	5.9	6.7	7.7									
SU124-6		100	87	76	68	60	54	50	47	43	40	37	35									
			1.0	1.8	2.5	3.1	3.9	4.4	5.6	6.5	7.5	8.5	9.7									
SU125-6				95	83	74	68	62	58	53	50	47	44									
				2.1	2.9	3.7	4.6	5.3	6.8	7.8	9.0	9.2	11.8									
SU126-6					100	91	83	77	72	66	62	57	53									
					3.4	4.3	5.4	6.2	7.9	9.2	10.6	12.0	13.8									
SU127-6							97	89	83	77	72	67	62									
							6.1	7.1	9.0	10.5	12.2	13.8	15.9									
SU128-6								100	94	87	81	76	72									
								8.1	10.2	11.8	13.7	15.5	18.0									
SU129-6										96	90	84	80									
										13.2	15.3	17.3	20.0									
SU1210-6											98	92	87									
											16.8	19.1	22.1									
Avg. Tube Vel. 12"—Pass_6	1.3ft./sec	1.6	2.1	2.6	3.2	3.7	4.2	4.7	5.3	5.8	6.3	6.9	7.4									
SU123-4	62	58	51	46	42	38	35	33	30	28	26	24	22	20	18	17						
								1.0	1.2	1.5	1.7	2.0	2.3	2.9	3.5	4.4						
SU124-4	86	80	69	62	57	52	48	45	42	39	36	34	32	28	25	23						
								1.3	1.7	2.0	2.2	2.5	3.0	3.7	4.6	5.6						
SU125-4	100	95	85	78	71	66	61	56	52	49	45	42	40	35	32	29						
						1.0	1.3	1.7	2.0	2.3	2.6	3.1	3.7	4.5	5.3	6.8						
SU126-4				95	87	80	75	69	64	60	56	52	49	43	39	35						
					1.0	1.4	1.6	2.0	2.4	2.8	3.1	3.7	4.3	5.4	6.4	8.0						
SU127-4					100	92	86	80	74	69	64	60	57	50	45	41						
						1.5	1.8	2.2	2.7	3.1	3.5	4.3	4.9	6.1	7.2	9.3						
SU128-4							96	90	84	79	77	70	65	58	51	46						
							2.1	2.4	3.1	3.6	3.8	4.9	5.4	7.0	8.3	10.5						
SU129-4									96	90	84	79	74	65	58	52						
									3.3	4.0	4.4	5.4	6.3	7.7	9.2	11.7						
SU1210-4										100	94	88	82	72	64	57						
										4.5	4.9	6.0	7.0	8.1	10.2	12.9						
Avg. Tube vel. 12"—4-Pass	1 ft./sec	1.1	1.5	1.75	2.1	2.5	2.8	3.1	3.5	3.8	4.1	4.3	4.8	5.5	6.1	7.0				*	*	*
SU123-2				29	28	26	25	24	23	22	21	20	19	18	17	16	15	13	12	10	9	8
																			1.0	1.3	1.6	2.0
SU124-2				39	37	35	33	31.5	30	29	28	27	26	24	22	21	19.5	18	16	14	12	11
																		1.0	1.3	1.7	2.1	2.6
SU125-2				49	47	44	42	40	39	37	36	34	33	30	28	27	25	23	20	18	16	14
																		1.2	1.6	2.2	2.7	3.3
SU126-2									47	45	43	41	40	37	35	32	30	28	24	21	19	17
																	1.1	1.5	2.0	2.6	3.2	3.9
SU127-2														43	40	38	36	33	28	25	22	20
															1.0	1.2	1.4	1.6	2.3	3.1	3.8	4.7
SU128-2															47	44	41	38	33	29	26	23
															1.1	1.3	1.5	1.9	2.6	3.6	4.3	5.3
SU129-2																50	46	43	37	32	29	26
																1.4	1.6	2.2	3.0	4.1	4.9	6.0
SU1210-2																		47	41	35	32	29
																		2.4	3.2	4.4	5.4	6.7
Avg. Tube vel. 12"—2-Pass					1 ft. sec.	1.2	1.3	1.5	1.7	1.8	1.9	2.1	2.3	2.6	3.0	3.3	3.7	4.2	5.0	5.8	6.7	7.5

TABLE 2-14" DIAMETER "SU" CAPACITY

"SU" Number	G.P.M. HEATED IN TUBES																	
	50	60	70	80	90	100	110	120	130	140	150	160	180	200	225	250	275	300
* SU143-6	65	58	53	49	45	41	38	35	33	31	28	27	24					
			1.2	1.5	1.8	2.2	2.6	3.0	3.5	4.0	4.5	5.0	6.2					
* SU144-6	87	78	71	65	60	55	51	48	46	43	40	38	35					
		1.2	1.6	2.0	2.5	3.0	3.5	4.1	4.7	5.4	6.1	6.8	8.4					
* SU145-6		97	89	80	74	68	64	60	56	53	50	48	43					
		1.5	2.0	2.5	3.1	3.8	4.5	5.2	6.0	6.8	7.7	8.7	10.7					
* SU146-6				97	90	83	79	74	70	66	62	59	52					
				3.1	3.8	4.6	5.4	6.3	7.3	8.3	9.3	10.5	12.9					
* SU147-6						97	91	86	81	77	72	69	61					
						5.3	6.3	7.3	8.5	9.6	10.4	12.2	15.0					
* SU148-6								97	92	87	81	78	71					
								8.4	9.7	11.1	12.5	14.0	18.0					
* SU149-6										96	90	87	79					
										12.5	14.1	15.9	20.0					
* SU1410-6											99	95	86					
											15.8	17.7	22.0					
Avg. Tube vel. 14"—6-Pass	2.1	2.5	2.95	3.35	3.75	4.20	4.6	5.0	5.5	5.9	6.5	7.0	7.5					
SU143-4	50	47	44	41	39	37	35	33	31	30	28	27	25	23	20	18	17	15
								1.0	1.2	1.3	1.5	1.6	2.0	2.4	2.9	3.4	4.0	4.9
SU144-4	67	63	59	55	52	50	47	44	42	40	38	36	33	30	27	24	22	20
								1.2	1.3	1.6	1.9	2.1	2.5	3.1	3.7	4.3	5.0	6.3
SU145-4	86	80	76	71	67	63	60	56	54	51	48	46	41	38	34	30	27	24
							1.0	1.5	1.7	2.0	2.3	2.5	3.1	3.8	4.0	5.3	6.3	7.7
SU146-4	100	95	90	85	80	75	71	68	64	61	58	55	50	45	40	36	32	29
					1.0	1.4	1.6	1.8	2.0	2.3	2.5	3.0	3.7	4.9	5.5	6.3	7.8	9.0
SU147-4				100	95	90	85	81	77	73	69	65	60	54	48	43	38	35
				1.0	1.2	1.5	1.8	2.0	2.2	2.5	3.0	3.4	4.2	5.2	6.0	7.2	9.2	10.4
SU148-4						100	96	92	88	83	79	75	68	61	55	48	43	39
						1.6	1.9	2.1	2.5	3.1	3.5	3.9	4.9	5.9	6.8	8.1	10.1	11.0
SU149-4										100	89	84	76	68	60	54	48	43
										3.1	3.2	4.2	5.3	6.5	8.0	9.2	11.0	13.2
SU1410-4											98	92	85	75	68	60	53	49
											3.6	4.7	6.0	7.1	8.6	10.2	12.0	14.5
Avg. Tube vel. 14"—4-Pass	1.25	1.5	1.75	2.0	2.25	2.5	2.75	3.0	3.25	3.50	3.75	4.0	4.5	5.0	5.6	6.2	6.9	7.5

"SU" Number	G.P.M. HEATED IN TUBES																			
	100	110	120	130	140	150	160	180	200	225	250	275	300	325	350	400	450	500	550	600
SU143-2	25	24.5	24	23.5	23	22.5	22	21	20	19	18	17	16	15	14	13	11	10	9	8
	33	32	31.5	30.5	30	29	28	27	26	24.5	23	22	21	19.5	18.5	17	1.2	1.4	1.6	1.8
SU144-2	42	40.5	39.5	38	37	36	35	33	32	30	28	27	25	24	22.5	1.0	15	13.5	12	11
	50	48	46	45	43.5	42	41	39	37	35	33	31.5	30	28.5	1.2	20	1.6	1.9	2.3	2.5
SU145-2								45	43	40	38	36.5	1.0	1.2	27	1.5	18.5	16.5	15	13.5
									49	46	1.0	1.2	34	32.5	1.5	24.5	1.9	2.4	2.7	3.2
SU146-2											43	41	1.3	1.4	31	1.8	22	20	18.5	17
											1.1	1.3	39	37	1.7	28	2.3	2.8	3.3	3.8
SU147-2											50	47	1.5	1.6	35	2.0	26	23.5	21.5	20
											1.2	1.4	43.5	41.5	1.8	32	2.6	3.3	3.8	4.3
SU148-2												52	1.7	1.9	39	2.5	29	26.5	24	22
												1.6	49	46	2.2	35	2.9	3.8	4.3	4.9
SU149-2													1.8	2.1	43	2.9	32	29	26.5	24
															2.4	39	3.3	4.3	4.9	5.6
SU1410-2																3.1	35	32	29	27
																	3.8	4.7	5.4	6.2
Avg. Tube vel. 14"—2-pass	1.25	1.4	1.5	1.6	1.8	1.9	2.0	2.25	2.5	2.8	3.1	3.4	3.75	4.0	4.4	5.0	5.6	6.2	6.9	7.5

TABLE 2-16" DIAMETER "SU" CAPACITY

"SU" Number	G.P.M. HEATED IN TUBES																												
	50	70	80	90	100	110	120	130	140	150	160	180	200	225	250	275	300	325	350	375	400	450	500	550	600	650	700	750	800
* SU163-6	76	62	58	54	51	47	44	42	39	37	35	32	28	25	23														
				1.1	1.3	1.6	1.8	2.1	2.4	2.7	3.0	3.7	4.5	5.5	6.6														
* SU164-6	100	85	78	73	68	63	59	56	53	50	48	44	40	36	33														
			1.2	1.5	1.8	2.1	2.5	2.8	3.2	3.7	4.1	5.0	6.1	7.5	9.0														
* SU165-6			97	91	84	78	73	69	66	62	60	55	50	46	42														
			1.5	1.9	2.3	2.7	3.1	3.6	4.1	4.6	5.2	6.4	7.7	4.5	11.4														
* SU166-6					100	95	89	85	81	77	74	68	62	56	51														
					2.7	3.2	3.8	4.3	4.9	5.6	6.3	7.7	9.2	11.5	13.8														
* SU167-6								99	94	89	86	79	72	65	59														
								5.1	5.8	6.5	7.3	9.0	10.9	13.4	16.2														
* SU168-6										100	97	89	81	74	69														
										7.4	8.4	10.4	12.5	15.4	18.6														
* SU169-6												99	90	83	77														
												11.7	14.1	17.4	21.0														
* SU1610-6													99	90	84														
													15.7	19.4	23.3														
Avg. Tube vel. 16"—6-Pass	1.6	2.2	2.5	2.8	3.2	3.5	3.8	4.0	4.5	4.7	5.0	5.7	6.3	7.0	7.9			*	*	*	*								
SU163-4	54	49.5	48	46	44	42.5	41	39	38	36	35	32	30	27	24.5	22	20	18.5	17	15.5	14								
											1.0	1.3	1.5	1.8	2.3	2.5	3.0	3.5	4.2	4.4	4.9								
SU164-4	72	69	67	64	59	57	55	53	51	49	47	44	40	36.5	33	30	27	25	22.5	21.5	19								
									1.0	1.1	1.2	1.6	1.9	2.3	2.9	3.2	4.1	4.4	5.0	5.7	6.3								
SU165-4	92	85	81	78	75	72	69	66	63.5	61	58.5	54	50	45	41	37.5	34.5	31.5	29	27	25								
									1.0	1.3	1.5	1.9	2.3	2.7	3.6	3.9	4.6	5.3	6.5	6.9	7.7								
SU166-4		96	92.5	90	86	83	80	77	74	71.5	69	64	59.5	54	49.5	44.5	42	38.5	35	32.5	30								
						1.0	1.2	1.4	1.5	1.6	1.8	2.3	2.8	3.3	4.2	4.6	5.8	6.3	7.2	8.1	9.0								
SU167-4					100	96	93	89.5	86	83	80	74	69	62.5	57	52.5	48	44	41	37.5	35								
					1.0	1.1	1.3	1.5	1.7	1.9	2.1	2.7	3.1	3.7	4.6	5.4	6.7	7.3	8.8	9.4	10.1								
SU168-4								100	97	94	91	86	78	71	65	60	55	50.5	46.5	43.5	40								
								1.6	1.9	2.0	2.2	2.8	3.7	4.4	5.4	6.3	7.7	8.2	9.8	10.6	11.8								
SU169-4											100	94	87	80	73.5	67.5	62	57.5	53	49.5	46								
											2.4	3.0	3.9	5.0	6.0	6.9	8.4	9.2	10.7	12.0	13.2								
SU1610-4													97.5	89.5	81.5	75	69.5	64.5	59	55	51								
													4.2	5.6	6.6	7.8	9.3	10.2	12.0	13.2	14.5								
Avg. Tube vel. 16"—4-Pass	1ft./ sec	1.4	1.6	1.8	1.9	2.1	2.3	2.5	2.7	2.8	3.0	3.4	3.8	4.3	4.8	5.3	5.7	6.2	6.7	7.1	7.6								
SU163-2					26	25	24.5	24	23.5	23	22.5	21.5	20.5	19.5	18.5	17.5	17	16	15	14.5	14	13	12	11	10	9.5	8.5	8	7
																								1.0	1.2	1.3	1.5	1.7	1.9
SU164-2					36	35	34	33	32	31.5	30.5	29	28	26.5	25	24	23	21.5	20.5	19.5	19	17	16	14.5	13.5	12.5	11.5	11	10
																						1.0	1.2	1.4	1.6	1.8	2.1	2.3	2.5
SU165-2					46	44.5	43.5	42	41	40	39	37	35	33.5	31.5	30	29	28.5	26	25	24	22	20	18.5	17	16	14.5	13.5	12.5
																						1.2	1.4	1.7	2.0	2.3	2.7	2.9	3.2
SU166-2													42	39.5	37.5	35.5	34	32.5	31	29.5	28	26	24	22	20.5	19	17.5	16	15
																					1.0	1.5	1.8	2.1	2.4	2.7	3.0	3.5	3.9
SU167-2													51	47.5	45	42.5	40	38.5	36.5	35	33	30.5	28	26	24	22	20	18.5	17
																		1.0	1.1	1.3	1.4	1.7	2.0	2.4	2.8	3.2	3.7	4.0	4.5
SU168-2																	46	43.5	41.5	39.5	38	35	32	30	27.5	25.5	23.5	21.5	20
																		1.0	1.2	1.4	1.5	1.9	2.3	2.7	3.2	3.7	4.3	4.7	5.1
SU169-2																					43	39.5	36	33	31	29	26.5	24.5	23
																					1.7	2.2	2.6	3.1	3.6	4.2	4.7	5.3	5.7
SU1610-2																					48	44	40	37	34	31.5	29	27	25
																					1.9	2.4	2.9	3.4	3.9	4.6	5.2	5.8	6.3
Avg. Tube vel. 16"—2-Pass					.9ft./ sec.	1.0	1.1	1.2	1.3	1.4	1.5	1.7	1.8	2.0	2.3	2.5	2.7	3.0	3.2	3.5	3.7	4.2	4.6	5.0	5.4	5.9	6.4	6.8	7.4

TABLE 2-18" DIAMETER "SU" CAPACITY

"SU" Number	G.P.M. HEATED IN TUBES																												
	100	110	120	130	140	150	160	180	200	225	250	275	300	325	350	375	400	450	500	550	600	650	700	750	800	850	900	950	1000
* SU183-6	59	56	53	51	49	46	44	40	37	33	30	27	25	23															
		1.0	1.1	1.3	1.5	1.7	1.9	2.3	2.8	3.4	4.1	4.9	5.7	6.5															
* SU184-6	80	76	72	69	65	62	59	54	50	46	42	39	36	34															
	1.1	1.3	1.5	1.7	2.0	2.3	2.5	3.1	3.7	4.6	5.6	6.6	7.7	8.9															
* SU185-6	100	94	89	84	80	76	72	67	62	57	52	49	45	42															
	1.4	1.6	1.9	2.2	2.5	2.9	3.2	3.9	4.8	5.7	7.1	8.4	9.8	11.2															
* SU186-6				101	96	92	89	82	77	70	65	60	55	51															
				2.7	3.1	3.5	3.9	4.8	5.7	7.1	8.5	10.1	11.8	13.6															
* SU187-6								96	89	82	76	70	64	60															
								5.6	6.7	8.3	10.0	11.8	13.8	15.9															
* SU188-6									100	92	85	79	74	69															
									7.7	9.5	11.5	13.6	15.8	18.3															
* SU189-6											94	88	82	77															
											12.9	15.3	17.9	20.6															
* SU1810-6												96	90	84															
												17.1	20.0	23.0															
Avg. Tube vel. 18"—6-Pass	2.4ft /sec	2.7	2.9	3.2	3.4	3.6	3.9	4.3	4.8	5.4	6.0	6.6	7.2	7.8 *	*	*	*	*	*										
SU183-4	54	51	49	47.5	45.5	43.5	42	39	36	32.5	30.5	28.5	26	23	21	20	19	17	16										
										1.0	1.5	1.7	2.0	2.3	2.8	3.0	3.3	4.3	4.9										
SU184-4	67	63	61	58	56	54	52	48.5	46	41	39	37	34	30	28.5	27.5	25	23	21										
								1.0	1.2	1.6	1.8	2.0	2.6	3.1	3.3	3.6	4.2	5.1	6.2										
SU185-4	80	75	73	69.5	67	65	62	58	55	49.5	47	44	41	37	35	33.5	31	28.5	26										
						1.0	1.1	1.3	1.5	1.9	2.3	2.6	3.1	3.7	4.0	4.9	5.2	6.6	7.6										
SU186-4	95	90	88	85	82	80	77	72	67	61	57	53.5	50	45	43.5	41	38	35.5	33										
					1.0	1.1	1.2	1.5	1.8	2.3	2.7	3.0	3.7	4.4	4.7	5.4	6.1	7.6	8.9										
SU187-4				96	94	91	87	82	78	71.5	67	62.5	58	54.5	51	48	45	41	38										
				1.0	1.1	1.3	1.4	1.7	2.2	2.6	3.1	3.6	4.3	5.0	5.4	6.4	7.0	8.5	10.3										
SU188-4								97	91	82	76	71	66	61	58	55	52	47.5	44										
								1.8	2.3	3.0	3.6	3.9	4.8	5.8	6.5	7.2	7.9	9.7	11.6										
SU189-4										95	86	79	73.5	69	64.5	61	58	53.5	50										
										3.0	3.8	4.5	5.4	6.1	7.2	8.3	8.9	10.8	12.9										
SU1810-4												93	85	78	73	69	65	59	55										
												5.3	5.8	7.0	8.0	8.9	9.8	12.1	14.3										
Avg. Tube vel. 18"—4-Pass	1.5ft. /sec	1.7	1.8	2.0	2.1	2.2	2.4	2.8	3.0	3.3	3.7	4.2	4.5	5.0	5.3	5.7	6.0	6.7	7.5					*	*	*	*	*	*
SU183-2									25	23.5	23	22	21	20.5	19.5	18.5	18	16.5	15	14.5	13.5	12.5	12	11.5	11.2	10.8	10.5	10.2	10
																							1.1	1.2	1.4	1.5	1.7	1.8	2.0
SU184-2									32	30	28.5	27	26	25	23.5	23	22	20.5	19	18	17	16	16.5	14.5	14	13.5	13	12.5	12
																				1.0	1.1	1.2	1.5	1.7	1.9	2.0	2.2	2.5	2.7
SU185-2									39	37	35	33.5	32	30	29	28	27	25	24	22	21	20	19	18	17	16.5	16	15.5	15
																			1.0	1.2	1.4	1.6	1.8	1.9	2.3	2.5	2.8	3.1	3.4
SU186-2									46	43.5	41	39	37	35	33.5	32.5	31.5	29.5	27.5	25.5	24.5	23	22	21	20	19.5	19	18.5	18
																		1.0	1.2	1.5	1.7	1.8	2.2	2.5	2.8	3.0	3.4	3.7	4.0
SU187-2													42	40.5	39	37.5	36	33.5	31.5	29.5	28	26.5	25.5	24.5	23.5	22.5	22	21	20.5
																		1.1	1.4	1.7	2.0	2.2	2.6	2.9	3.3	3.5	4.0	4.4	4.7
SU188-2													48	46	44	42	41	38	36	33.5	32	30.5	29	28	27	26	25	24.5	24
																	1.0	1.3	1.5	1.8	2.2	2.5	2.9	3.2	3.7	3.9	4.6	4.9	5.4
SU189-2																	46	42.5	40	37.5	36	34	32	31	30	29	28	27.5	27
																	1.2	1.5	1.7	2.1	2.3	2.8	3.2	3.6	4.2	4.4	5.1	5.5	6.1
SU1810-2																			44	42	40	37.5	36	34.5	33	32	31	30	29
																			1.8	2.3	2.7	3.2	3.6	4.0	4.6	4.9	5.7	6.1	6.7
Avg. Tube vel. 18"—2-Pass									1.5ft./ Sec	1.7	1.9	2.1	2.3	2.5	2.6	2.8	3.0	3.3	3.7	4.1	4.4	4.8	5.2	5.6	6.0	6.3	6.7	7.1	7.4

TABLE 2-20" DIAMETER "SU" CAPACITY TABLE

"SU" Number	G.P.M. HEATED IN TUBES															
	100	120	130	140	150	160	180	200	225	250	275	300	325	350	375	400
* SU203-6	70	63	60	58	55	53	50	46	42	39	36	33	31	28	27	25
					1.0	1.1	1.4	1.7	2.0	2.5	2.9	3.4	3.9	4.4	5.0	5.6
* SU204-6	94	86	81	78	75	72	68	62	57	52	49	46	43	40	38	36
			1.0	1.2	1.4	1.5	1.9	2.2	2.8	3.3	4.0	4.6	5.3	6.1	6.9	7.7
* SU205-6			100	98	94	89	82	76	70	65	60	57	53	50	48	45
			1.3	1.5	1.7	1.9	2.4	2.8	3.5	4.2	5.0	5.8	6.7	7.7	8.7	9.7
* SU206-6							100	92	86	80	75	70	66	62	59	55
							2.9	3.4	4.2	5.1	6.0	7.0	8.1	9.3	10.5	11.7
* SU207-6									100	93	87	82	77	72	69	64
									5.0	6.0	7.1	8.3	9.5	10.0	12.3	14.0
* SU208-6											98	93	87	81	77	74
											8.1	9.5	11.0	12.5	14.0	16.0
* SU209-6													96	90	86	82
													12.3	14.0	15.4	18.0
* SU2010-6														99	94	90
														15.7	18.0	20.0
Avg. Tube vel. 20"—6-Pass	1.8ft./ sec	2.2	2.4	2.5	2.7	2.9	3.3	3.6	4.0	4.5	5.0	5.4	5.9	6.3	6.8	7.2

"SU" Number	G.P.M. HEATED IN TUBES																																					
	100	120	130	140	150	160	180	200	225	250	275	300	325	350	375	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400
SU203-4	49	46.5	45	44	43	42	40	38	35	33	31	29	27	25.5	24.5	22	20	17	15.5	13	11.5	10														
												1.1	1.3	1.5	1.7	2.0	2.4	3.0	3.4	3.8	4.5	5.1														
SU204-4	65	61	60	58	56.5	55.5	53	50	47	44	42	39	37	35	33	31	27.5	24	21.5	19	17.5	15														
										1.0	1.2	1.5	1.8	1.9	2.2	2.5	3.1	3.7	4.3	5.0	5.7	6.2														
SU205-4	83	77.5	76	74	72	70	66	63	59	56	53	50	46	44	42	39	35	31.5	28.5	26	23.5	21														
								1.0	1.2	1.3	1.5	1.8	2.2	2.4	2.6	3.0	3.7	5.0	5.3	6.0	7.0	7.9														
SU206-4		94	92	89	87	85	80	75	71	67	63	60	55.5	52.5	49.5	47	42	37.5	34	30	28	25.5														
								1.2	1.4	1.6	1.9	2.1	2.6	2.8	3.1	3.6	4.4	5.2	6.2	7.4	8.0	9.1														
SU207-4					97	95	91	87	82	78	74	70	65	62	59	55	49.5	44	40	36	32.5	29.5														
							1.0	1.2	1.5	1.8	2.0	2.5	3.0	3.2	3.5	3.7	5.1	6.0	7.1	7.7	9.7	10.6														
SU208-4							100	97	93	88	85	80	75	71.5	68	64.5	57.5	51.5	46.5	42	38	34														
							1.0	1.2	1.6	1.9	2.3	2.8	3.3	3.6	4.0	4.6	5.8	7.0	8.2	9.6	10.6	12.0														
SU209-4										98.5	95	90	85	81.5	78	74	66	60	53.5	48	43.5	39														
										2.0	2.6	3.4	3.7	4.1	4.6	5.0	6.4	7.8	9.0	10.6	12.0	13.5														
SU2010-4												100	95	90	87	82	73	66	59	53	48	43														
												3.4	3.7	4.5	4.9	5.7	7.1	8.5	10.0	11.8	13.6	15.0														
Avg. Tube vel. 20"—4-Pass	1.1ft./ sec.	1.3	1.4	1.5	1.6	1.8	2.0	2.2	2.5	2.8	3.1	3.4	3.7	4.0	4.2	4.5	5.0	5.6	6.1	6.6	7.1	7.8											*	*	*	*
SU203-2								25	24	23.5	22.5	22	21	20.5	20	19	18	17	16	15	14.5	14	13	12.5	11.5	11	10.5	10	9.5	9	8.5	8.2	8	7.5	7.2	7
																											1.1	1.2	1.2	1.3	1.5	1.6	1.7	1.8	1.9	2.0
SU204-2								33	31.5	30.5	30	29	28	27	26.5	26	24.5	23	21.5	20.5	19.5	18.5	18	17	16	15	14.5	14	13	12	11.5	11	10.5	10	9.5	9
																							1.0	1.1	1.2	1.3	1.5	1.6	1.7	1.8	2.0	2.1	2.2	2.4	2.6	2.7
SU205-2								44	42	40.5	39	37	36	35	33.5	32.0	30.5	29	27	26	24.5	23	22	21	19.5	18.5	17.7	17	16	15.5	14.5	14	13	12.5	12	11.5
																						1.0	1.1	1.3	1.4	1.6	1.8	1.9	2.0	2.2	2.4	2.5	2.7	3.0	3.2	3.4
SU206-2										47	45	44	42.5	41	39.5	38.5	36	34	32.5	31	29.5	28	26.5	25	24	23	22	21	20	19	18	17	16.5	15.5	15	14
																					1.1	1.2	1.5	1.6	1.8	1.9	2.1	2.2	2.6	2.7	2.9	3.0	3.3	3.6	3.8	4.0
SU207-2												50	48	46	44.5	43	41	38	36.5	35	33	31.5	30	28.5	27.5	26	25	24	22.5	21.5	20.5	20	19	18	17	16
																				1.2	1.3	1.4	1.7	1.8	2.1	2.3	2.5	2.6	2.8	3.2	3.4	3.5	4.0	4.2	4.5	4.7
SU208-2																50	47	44	42	40	37.5	36	34	32.5	31	29.5	28	27	25.5	24.5	23.5	22	21	20	19	18
																			1.1	1.3	1.5	1.6	1.9	2.1	2.4	2.6	2.8	3.0	3.2	3.6	3.8	3.9	4.3	4.8	5.1	5.4
SU209-2																		50	47.5	45	42.5	40.5	38.5	36.5	34.5	33	31.5	30	28.5	27	26	24.5	23.5	22.5	21	20
																		1.0	1.2	1.5	1.6	1.8	2.1	2.3	2.6	2.9	3.1	3.5	3.9	4.1	4.3	4.4	5.0	5.4	5.8	6.1
SU2010-2																				50	48	45.5	43	41	38.5	37	35	33	31.5	30	28.5	27	26	24.5	23.5	22
																				1.5	1.7	2.0	2.3	2.6	3.0	3.3	3.5	3.8	4.2	4.5	4.8	5.0	5.5	6.0	6.3	6.7
Avg. Tube vel. 20"—2-Pass								1.1ft./ sec.	1.2	1.4	1.6	1.7	1.8	1.9	2.1	2.2	2.4	2.7	3.0	3.3	3.6	3.8	4.1	4.4	4.6	4.9	5.2	5.5	5.7	5.9	6.2	6.5	6.7	7.0	7.3	7.6

TABLE 2-22" DIAMETER "SU" CAPACITY TABLE

"SU" Number	G.P.M. HEATED IN TUBES														
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
SU224-6		86	72	62	54	48	44	39	36						
			1.6	2.3	3.2	4.2	5.3	6.6	7.9						
SU225-6			91	76	67	60	54	49	45						
			2.0	2.9	4.1	5.3	6.8	8.3	10.1						
SU226-6				92	82	73	67	60	54						
				3.6	4.9	6.5	8.2	10.0	12.1						
SU227-6					95	86	78	70	63						
					5.8	7.6	9.6	11.8	14.3						
SU228-6						97	87	79	73						
						8.7	11.0	13.6	16.4						
SU229-6							97	88	81						
							12.4	15.3	18.5						
SU2210-6								96	88						
								17.1	21.0						
Avg. Tube vel. 22"—6-Pass		2.2ft./ sec.	2.9	3.7	4.4	5.1	5.9	6.6	7.3						
SU224-4		72	65	55	50	44	40	37	34	31	29	27	25	24	22
						1.2	1.5	1.9	2.3	2.7	3.2	3.6	4.1	4.7	5.3
SU225-4		90	80	68	62	55	51	46	43	39	36	34	31	30	28
					1.2	1.5	1.9	2.4	2.9	3.4	4.0	4.6	5.3	5.9	6.7
SU226-4			94	81	75	66	61	55	51	46	43	40	38	37	34
				1.0	1.4	1.9	2.4	2.9	3.5	4.1	4.8	5.6	6.4	7.2	8.0
SU227-4				96	87	78	72	65	60	55	51	48	45	43	40
				1.2	1.7	2.2	2.8	3.4	4.1	4.9	5.7	6.5	7.5	8.4	9.4
SU228-4					100	88	81	74	69	62	57	54	51	49	45
					1.9	2.5	3.2	3.9	4.7	5.6	6.5	7.5	8.6	9.7	10.8
SU229-4						99	91	83	78	70	65	61	58	55	52
						2.8	3.6	4.4	5.3	6.3	7.3	8.5	9.7	10.9	12.2
SU2210-4							100	92	86	78	72	68	64	61	57
							4.0	4.9	5.9	7.0	8.2	9.4	10.7	12.1	13.6
Avg. Tube vel. 22"—4-Pass		1.4ft./ sec.	1.8	2.3	2.7	3.2	3.6	4.1	4.5	5.0	5.5	5.9	6.4	6.8	7.3

"SU" Number	G.P.M. HEATED IN TUBES																														
	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
SU224-2	32	31	29	27	26	25	23	22	21.5	21	19.5	18.5	18	17	16		15		14		13		12		11.5		11		
													1.0	1.1	1.3		1.5		1.7		2.0		2.2		2.5		2.8		
SU225-2	40	38	36	35	33	32	29	28	27	26	25	24	23	22	20		19		18		16		15		14.5		14		
											1.0	1.1	1.2	1.4	1.6		1.9		2.2		2.5		2.8		3.1		3.5		
SU226-2	48	45	44	42	41	38	35	34	33	32	30	29	28	27	25		23		22		20		19		18		16		
									1.0	1.1	1.2	1.4	1.5	1.6	2.0		2.3		2.6		3.0		3.4		3.8		4.2		
SU227-2	56	52	50	48	46	44	40	39	38	37	35	33	32	31	29		27		25		23		22		21		19		
								1.0	1.2	1.3	1.5	1.6	1.8	1.9	2.3		2.7		3.1		3.5		4.0		4.4		5.0		
SU228-2	64	60	57	54	52	50	46	45	43	42	39	38	36	35	33		30		29		26		25		23		21		
							1.0	1.2	1.3	1.5	1.7	1.8	2.0	2.2	2.6		3.1		3.5		4.0		4.6		5.1		5.7		
SU229-2	72	68	65	62	59	56	52	50	48	47	44	42	41	39	37		34		32		30		28		26		24		
						1.0	1.2	1.3	1.5	1.7	1.9	2.1	2.3	2.5	3.0		3.5		4.0		4.5		5.1		5.8		6.4		
SU2210-2	81	75	71	68	65	62	58	56	54	52	49	47	45	44	41		38		36		33		31		29		27		
					1.0	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.8	3.3		3.9		4.4		5.1		5.7		6.4		7.2		
Avg. Tube vel. 22"—2-Pass	1.6ft./ sec.	1.8	2.0	2.2	2.4	2.6	2.9	3.1	3.3	3.5	3.7	4.0	4.2	4.4	4.8	5.1	5.3	5.5	5.7	5.9	6.2	6.4	6.6	6.8	7.0	7.3	7.5	7.7	7.9

TABLE 2-24" DIAMETER "SU" CAPACITY TABLE

"SU" Number	G.P.M. HEATED IN TUBES																														
	200	225	250	275	300	325	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
SU244-6	59	55	52	49	46	44	41	37	33	30	27	25																		
	1.1	1.3	1.6	1.9	2.2	2.5	2.9	3.7	4.5	5.4	6.4	7.5																		
SU245-6	80	75	70	66	62	58	55	50	46	42	39	36																		
	1.4	1.7	2.0	2.4	2.8	3.2	3.7	4.6	5.7	6.9	8.2	9.5																		
SU246-6	100	94	88	81	76	72	69	62	57	53	49	45																		
	1.6	2.0	2.4	2.9	3.4	3.9	4.4	5.6	6.9	8.4	9.9	11.5																		
SU247-6				98	92	88	84	77	71	65	60	55																		
				3.4	4.0	4.6	5.2	6.6	8.1	9.8	11.6	13.6																		
SU248-6							98	89	83	76	70	65																		
							6.0	7.9	9.3	11.3	13.3	15.6																		
SU249-6								100	93	85	79	74																		
								8.6	10.6	12.7	15.1	17.6																		
SU2410-6										95	88	82																		
										14.2	16.8	19.6																		
Avg. Tube vel. 24"—6-Pass	2.4ft./sec.	2.7	3.0	3.3	3.6	3.9	4.1	4.8	5.4	6.0	6.5	7.1																		
SU244-4	53	51	49	46	44	41	40	36	34	30	26	25	24.5	23	22	21	20	19	18	17										
								1.0	1.3	1.5	1.8	2.1	2.4	2.7	3.1	3.5	3.9	4.3	4.7	5.2										
SU245-4	68	66	63	60	57	54	52	47	44	40	37	34	32	30	29	27	26	24	23	22										
							1.0	1.3	1.6	1.9	2.3	2.7	3.1	3.5	4.0	4.4	4.9	5.5	6.0	6.5										
SU246-4	86	81	77	74	70	67	63	58	54	50	46	43	41	38	36	34	32	30	29	27										
						1.1	1.2	1.6	1.9	2.3	2.8	3.2	3.7	4.3	4.8	5.4	6.0	6.7	7.3	8.0										
SU247-4	100	96	92	87	83	79	76	70	64	59	55	51	48	45	43	40	39	37	35	33										
				1.0	1.1	1.3	1.5	1.9	2.3	2.8	3.3	3.8	4.4	5.0	5.7	6.4	7.1	7.8	8.6	9.4										
SU248-4					98	94	90	82	76	70	65	60	57	53	51	48	46	43	41	39										
					1.3	1.5	1.7	2.1	2.6	3.2	3.8	4.4	5.1	5.8	6.5	7.3	8.2	9.0	9.9	10.4										
SU249-4								94	87	80	74	69	65	60	58	54	52	49	47	44										
								2.4	3.0	3.6	4.3	5.0	5.7	6.5	7.4	8.3	9.2	10.2	11.2	12.2										
SU2410-4									97	90	83	78	73	68	65	61	58	55	53	50										
									3.3	4.0	4.8	5.6	6.4	7.3	8.2	9.2	10.3	11.4	12.5	13.6										
Avg. Tube vel. 24"—4-Pass	1.7ft./sec.	1.8	1.9	2.1	2.2	2.4	2.6	3.0	3.3	3.7	4.1	4.5	4.8	5.2	5.6	5.9	6.3	6.8	7.1	7.6										
SU244-2								27	26	25	24	23	22	21	19	18.5	18	17	16.5	16	15	14	13	12	11	10	9	8.5	8	7.5
																						1.0	1.1	1.3	1.5	1.7	1.8	2.0	2.3	2.5
SU245-2								33	32	31	29	27	26	25	24	23	22	21.5	21	20	19	18	17	16	15	14	13	12	11.5	11
																					1.1	1.3	1.5	1.7	1.9	2.1	2.4	2.6	2.9	3.2
SU246-2								42	40	38	36	35	33	32	31	29	28	27	26	25	24	22	21	19	18	17.5	16.5	15.5	15	14
																			1.0	1.1	1.3	1.6	1.8	2.0	2.3	2.6	2.9	3.2	3.5	3.8
SU247-2								50	48	45	44	42	41	38	37	35	34	33	32	31	29	27	25	24	22	21	20	19	18	17
																	1.0	1.1	1.2	1.3	1.6	1.8	2.1	2.4	2.7	3.0	3.4	3.7	4.1	4.5
SU248-2								58	55	52	50	48	46	44	42	40	39	38	37	35	33	31	29	27	26	25	23	22	21	20
																1.0	1.1	1.3	1.4	1.5	1.8	2.1	2.4	2.8	3.1	3.5	3.9	4.3	4.7	5.2
SU249-2								67	63	60	57	54	52	50	48	46	45	43	42	40	38	36	33	31	30	28	26.5	25	24	22
															1.0	1.2	1.3	1.4	1.6	1.7	2.0	2.4	2.7	3.1	3.5	4.0	4.4	4.9	5.4	5.9
SU2410-2								75	71	68	65	62	59	56	54	52	50	48	47	45	42	40	37	35	33	32	30	28	27	25
														1.0	1.2	1.3	1.4	1.6	1.8	1.9	2.3	2.7	3.1	3.5	3.9	4.4	4.9	5.4	6.0	6.6
Avg. Tube vel. 24"—2-Pass								1.5ft./sec.	1.7	1.8	2.0	2.2	2.4	2.6	2.8	2.9	3.1	3.3	3.5	3.7	4.0	4.3	4.7	5.1	5.4	5.8	6.2	6.5	6.8	7.3

TABLE 2-26" DIAMETER "SU" CAPACITY TABLE

"SU" Number	G.P.M. HEATED IN TUBES																																				
	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
SU264-6	57	52	47	42	38	35	32	29	27	25	23																										
	1.2	1.7	2.2	2.7	3.4	4.1	4.8	5.6	6.5	7.4	8.4																										
SU265-6	78	70	63	56	51	48	50	41	39	36	34																										
	1.5	2.1	2.7	3.5	4.3	5.2	6.1	7.1	8.2	9.4	10.6																										
SU266-6	97	87	77	70	64	60	55	52	49	46	43																										
	1.8	2.5	3.3	4.2	5.2	6.3	7.4	8.6	10.0	11.4	12.8																										
SU267-6			94	85	79	74	69	64	60	56	52																										
			3.9	5.0	6.1	7.4	8.7	10.2	11.7	13.3	15.1																										
SU268-6				100	92	86	80	75	70	65	60																										
				5.7	7.0	8.4	10.0	11.7	13.4	15.3	17.3																										
SU269-6						97	90	84	79	75	70																										
						9.5	11.3	13.2	15.2	17.3	19.6																										
SU2610-6							100	93	88	83	78																										
							12.6	14.7	16.9	19.3	21.8																										
Avg. Tube vel. 26"–6-Pass	2.6ft./Sec.	3.0	3.6	4.1	4.6	5.1	5.6	6.1	6.6	7.1	7.6																										
SU264-4	55	50	46	42	38	36	33	31	29	27	25	23	22	21	20	19		18		17																	
			57	52	1.0	1.2	1.4	1.6	1.9	2.1	2.4	2.7	3.0	3.4	3.7	4.0		4.8		5.6																	
SU265-4	70	62	70	1.0	48	44	41	39	36	34	33	30	24	28	26	25		23		22																	
			1.0	65	1.2	1.5	1.8	2.1	2.4	2.7	3.1	3.5	3.8	4.3	4.7	5.1		6.1		7.1																	
SU266-4	87	77	83	1.2	59	55	52	49	46	43	41	38	36	35	33	32		29		27																	
			1.1	78	1.5	1.8	2.2	2.5	2.9	3.3	3.7	4.2	4.7	5.2	5.7	6.2		7.4		8.6																	
SU267-4	100	90	98	1.4	71	66	62	58	55	52	49	46	44	41	40	38		35		33																	
			1.3	91	1.8	2.1	2.5	3.0	3.4	3.9	4.4	4.9	5.5	6.1	6.7	7.3		8.6		10.1																	
SU268-4				1.7	84	77	73	69	65	62	58	54	52	50	48	46		42		39																	
				2.0	2.5	2.9	3.4	3.9	4.5	5.0	5.6	6.3	7.0	7.7	8.4		9.9		11.6																	
SU269-4					96	88	83	78	74	69	66	61	58	56	53	51		47		44																	
					2.3	2.8	3.3	3.8	4.4	5.0	5.7	6.4	7.1	7.9	8.6	9.5		11.2		13.1																	
SU2610-4						99	93	88	83	78	74	69	66	63	60	58		53		50																	
						3.1	3.7	4.3	4.9	5.6	6.3	7.1	7.9	8.7	9.6	10.5		12.5		14.6																	
Avg. Tube vel. 26"—4-Pass	1.6ft./sec	1.9	2.3	2.6	2.9	3.2	3.6	3.9	4.2	4.5	4.9	5.2	5.5	5.8	6.1	6.5	6.8	7.1	7.5	7.6																	
SU264-2						27	26	25	24	23	22.5	21	20	19	18.5	18		17		16		15		14		13	12	11	10.5	10	9.5	9	8.5	8	8
																				20		19		1.0		1.2	1.3	1.5	1.6	1.8	1.9	2.1	2.3	2.5	2.7
SU265-2						32	31	29	28	27	26.5	26	25	24	23	22		21		1.0		1.1		18		17	16	15	14	13	12.5	12	11.5	11	11
																				25		24		1.3		1.5	1.7	1.8	2.0	2.2	2.5	2.7	2.9	3.1	3.4
SU266-2						40	39	37	36	35	34	33	32	30	29	28		26		1.2		1.4		22		21	20	19	18	17	16	15.5	15	14.5	14
																		1.0		31		29		1.6		1.8	2.0	2.2	2.5	2.7	3.0	3.2	3.5	3.8	4.1
SU267-2						48	47	45	44	42	40	39	38	36	35	34		32		1.4		1.6		27		26	24	23	22	21	20	19	18	17.5	17
																1.0		1.2		35		33		1.9		2.1	2.3	2.6	2.9	3.2	3.5	3.8	4.1	4.5	4.8
SU268-2						56	54	51	50	48	46	45	44	42	40	39		37		1.6		1.9		31		30	28	27	26	24	23	22	21	20.5	20
														1.0	1.1	1.2		1.4		40		38		2.1		2.4	2.7	3.0	3.3	3.7	4.0	4.4	4.7	5.1	5.5
SU269-2						64	62	58	57	54	53	51	50	47	46	45		42		1.8		2.1		36		34	32	30	29	28	26	25	24	23	22
													1.0	1.1	1.2	1.3		1.6		45		42		2.4		2.7	3.0	3.4	3.8	4.1	4.5	4.9	5.4	5.8	6.3
SU2610-2						72	70	66	65	62	60	57	56	53	51	50		47		2.0		2.4		40		38	36	34	33	31	30	28	27	26	25
												1.0	1.1	1.2	1.3	1.5		1.7						2.7		3.0	3.4	3.8	4.2	4.6	5.0	5.5	6.0	6.5	7.0
Avg. Tube vel. 26"—2-Pass		1.0ft./sec	1.1	1.3	1.4	1.6	1.7	1.9	2.0	2.2	2.4	2.5	2.7	2.8	3.0	3.1	3.3	3.5	3.6	3.8	3.9	4.1	4.3	4.4	4.6	4.7	5.0	5.4	5.7	6.0	6.3	6.6	6.9	7.2	7.6

TABLE 2-28" DIAMETER "SU" CAPACITY TABLE

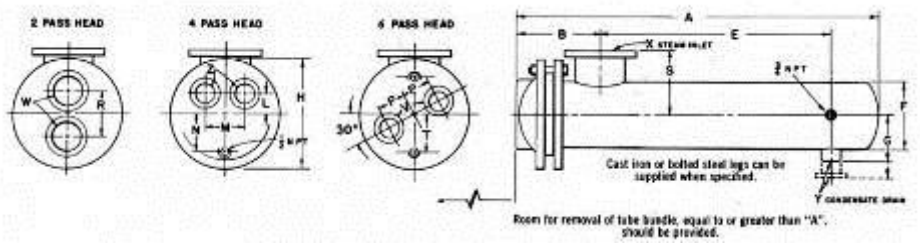
"SU" Number	G.P.M. HEATED IN TUBES															
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850
SU284-6					50 1.2	47 1.6	43 2.0	39 2.5	36 3.0	33 3.5	31 4.1	28 4.8	26 5.4	24 6.1	23 6.9	22 7.6
SU285-6					61 1.5	65 2.0	59 2.5	55 3.1	50 3.8	47 4.5	44 5.2	41 6.0	38 6.9	36 7.8	35 8.7	33 9.7
SU286-6					92 1.9	83 2.4	74 3.1	68 3.8	64 4.6	59 5.4	55 6.3	51 7.3	48 8.3	46 9.4	44 10.5	42 11.7
SU287-6							90 3.6	84 4.5	79 5.4	74 6.4	69 7.4	65 8.6	61 9.8	57 11.0	55 12.4	52 13.8
SU288-6									93 6.2	86 7.3	81 8.5	76 9.8	72 11.2	68 12.7	65 14.2	61 15.8
SU289-6											92 9.6	86 11.1	81 12.7	76 14.3	74 16.1	71 17.9
SU2810-6												96 12.4	91 14.1	86 16.0	82 17.9	79 19.9
Avg. Tube vel. 28"—6-Pass					2.6ft./ sec.	3.0	3.4	3.9	4.3	4.7	5.1	5.6	6.0	6.4	6.8	7.2

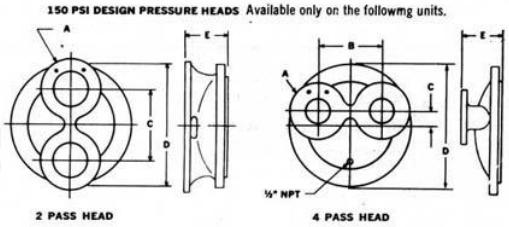
"SU" Number	G.P.M. HEATED IN TUBES																																		
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1300	1400	1500	1600	1700	1800	1900	2000	2200	2400	2600	2800
SU284-4					51	46	43	40	36	34 1.0	32 1.2	33 1.4	29 1.6	27 1.8	25 2.0	24 2.2	22 2.5	21 2.7	19 3.0		17 3.5		15 4.1	14 4.7	13 5.4											
SU285-4					66	58	55	50	46 1.1	44 1.3	40 1.5	39 1.7	37 2.0	34 2.2	33 2.5	31 2.8	29 3.1	28 3.4	27 3.7		24 4.4		22 5.2	20 6.0	19 6.8											
SU286-4					82	73	70	62 1.1	58 1.3	55 1.6	51 1.8	50 2.1	47 2.4	44 2.7	42 3.1	40 3.4	37 3.8	36 4.1	34 4.5		31 5.4		28 6.3	27 7.2	25 8.2											
SU287-4					96	86	83 1.1	76 1.3	71 1.6	67 1.8	62 2.2	61 2.5	57 2.8	53 3.2	51 3.6	48 4.0	45 4.4	43 4.9	41 5.3		38 6.3		35 7.4	33 8.5	31 9.7											
SU288-4							96 1.2	89 1.5	83 1.8	80 2.1	73 2.5	72 2.9	67 3.3	64 3.7	61 4.1	57 4.6	54 5.1	52 5.6	49 6.1		46 7.2		42 8.5	39 9.7	37 11.1											
SU289-4									96 2.0	92 2.4	84 2.8	82 3.2	77 3.7	72 4.1	69 4.7	66 5.2	62 5.7	59 6.3	56 6.9		52 8.2		48 9.5	45 11.0	42 12.5											
SU2810-4											95 3.1	92 3.6	87 4.1	82 4.6	79 5.2	75 5.8	70 6.4	67 7.0	63 7.7		59 9.1		55 10.6	51 12.3	48 14.0											
Avg. Tube vel. 28"—4-Pass			1.0ft./ sec.	1.4	1.6	1.9	2.2	2.4	2.7	3.0	3.2	3.5	3.8	4.0	4.3	4.6	4.9	5.1	5.4	5.7	5.9	6.2	6.5	7.0	7.5											
SU284-2											26	24	23	22	21	20.5	20	19	18		17		16	15	14	13	12	11.5	11	10	9.5	8.5	7.5	6.5	6
SU285-2											31	29	28	27	26	25	24.5	24	23		21		20	19	18 1.0	17 1.1	16 1.2	15 1.4	14.5 1.5	14 1.6	13 1.8	12 2.1	14	13 3.5	12 4.0
SU286-2											40	37	36	35	34	33	32	31	30		27		26	24 1.0	23 1.2	22 1.3	21 1.5	20 1.6	19 1.8	18 2.0	17 2.2	16 2.6	3.0	16.5 4.1	15 4.7
SU287-2											47	44	43	42	40	39	37	36	35		33		32 1.0	30 1.2	29 1.4	27 1.5	26 1.7	25 1.9	24 2.1	23 2.3	22 2.6	20 3.0	3.5 21	19.5 4.7	18 5.4
SU288-2											55	51	49	48	46	45	43	42	41		38 1.0		37 1.2	35 1.4	34 1.6	32 1.8	30 2.0	29 2.2	27 2.4	26 2.7	25 2.9	23 3.5	4.1 24	22 5.3	20 6.0
SU289-2											63	59	57	55	52	51	50	48	47 1.0		44 1.2		43 1.3	40 1.6	39 1.8	36 2.0	34 2.2	33 2.5	32 2.8	30 3.0	29 3.3	27 3.9	4.6 27	25 5.9	23 6.7
SU2810-2											72	67	65	63	60	59	57	54 1.0	53 1.0		50 1.3		48 1.5	45 1.7	43 2.0	41 2.2	39 2.5	37 2.8	36 3.1	35 3.4	33 3.7	30 4.4	5.1		
Avg. Tube vel. 28"—2-Pass						1.0ft./ sec	1.1	1.2	1.3	1.4	1.6	1.7	1.8	2.0	2.1	2.2	2.3	2.5	2.6	2.7	2.9	3.0	3.1	3.4	3.6	3.9	4.1	4.4	4.7	5.0	5.3	5.8	6.3	6.8	7.4

TABLE 2-30" DIAMETER "SU" CAPACITY TABLE

"SU" Number	G.P.M. HEATED IN TUBES																														
	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2200	2400	26000	2800	3000	3100
SU304-6	58	54	48	44	41	38	34	32	31	29	27	25	24	22	21																
		1.2	1.6	1.9	2.3	2.8	3.2	3.7	4.3	4.8	5.4	6.0	6.6	7.3	8.0																
SU305-6	80	72	66	61	56	52	48	46	44	42	39	37	35	33	32																
	1.2	1.6	2.0	2.5	3.0	3.5	4.1	4.7	5.4	6.1	6.8	7.6	8.4	9.3	10.2																
SU306-6		91	84	76	70	65	61	57	55	52	51	47	45	43	41																
		1.9	2.4	3.0	3.6	4.3	5.0	5.7	6.5	7.4	8.3	9.2	10.2	11.2	12.3																
SU307-6				93	87	81	76	72	69	65	63	59	56	53	50																
				3.5	4.2	5.0	5.8	6.7	7.7	8.7	9.7	10.8	12.0	13.2	14.5																
SU308-6					95	89	84	81	77	73	69	66	62	59																	
					5.8	6.7	7.9	8.8	10.0	11.2	12.5	13.8	15.2	16.6																	
SU309-6							96	93	87	82	78	75	72	69																	
							8.7	10.0	11.3	12.6	14.1	15.6	17.1	18.7																	
SU3010-6										97	92	87	84	80	77																
										12.6	14.1	15.7	17.3	19.1	21.0																
Avg. Tube vel. 30"—6-Pass	2.3 ft./ sec.	2.6	3.0	3.4	3.7	4.1	4.5	4.9	5.2	5.6	6.0	6.3	6.7	7.1	7.5																
SU304-4	56	52	47	44	42	38	36	34	33	31	30	27	26	25	23	21	19	17	16	15	14										
							1.0	1.1	1.3	1.4	1.6	1.8	2.0	2.2	2.4	2.8	3.3	3.8	4.3	4.9	5.4										
SU305-4	73	67	59	56	52	48	46	43	41	39	38	35	34	32	31	28	26	24	22	21	20										
						1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.5	2.7	3.0	3.5	4.1	4.8	5.4	6.1	6.9										
SU306-4	87	83	74	71	65	60	58	55	52	50	48	45	43	41	39	36	33	31	29	27	26										
					1.1	1.3	1.5	1.7	1.9	2.2	2.4	2.7	3.0	3.3	3.6	4.3	5.0	5.8	6.6	7.5	8.4										
SU307-4		97	87	84	78	73	70	67	63	60	58	54	52	50	47	43	40	37	35	33	32										
				1.0	1.3	1.5	1.7	2.0	2.3	2.6	2.9	3.2	3.5	3.9	4.3	5.1	5.9	6.8	7.7	8.8	9.8										
SU308-4				97	93	87	82	79	74	71	68	65	62	60	56	51	48	45	42	40	37										
				1.2	1.4	1.7	2.0	2.3	2.6	2.9	3.3	3.7	4.1	4.5	4.9	5.8	6.8	7.8	8.9	10.1	11.3										
SU309-4							96	91	85	81	78	73	70	67	64	58	55	51	48	45	42										
							2.2	2.6	2.9	3.3	3.7	4.2	4.6	5.1	5.5	6.6	7.6	8.8	10.1	11.4	12.7										
SU3010-4									95	91	88	83	80	76	72	66	62	58	54	51	49										
									3.3	3.7	4.2	4.6	5.1	5.6	6.2	7.3	8.5	9.8	11.2	12.7	14.2										
Avg. Tube vel. 30"—4-Pass	1.4	1.6	1.9	2.1	2.4	2.6	2.8	3.0	3.3	3.5	3.7	4.0	4.2	4.4	4.7	5.2	5.6	6.1	6.5	7.0	7.5										
SU304-2								26	25.5	25	24	23	22	21.5	21	20	18	17.5	17	16	15	14	13.5	13		11	10	9	8	7	7
SU305-2								32	31	30	29	28	27	26.5	26	25	23	22	21	20	19	18	17	16.5		15	13.5	12.5	12	10	10
																					1.0	1.1	1.2	1.3		1.7	2.0	2.3	2.6	3.0	3.1
SU306-2								41	39	38	37	35	34.5	34	33	31	29	28	27	25	24	23	22	21		19	17.5	16	14.5	13.5	13
																				1.1	1.2	1.3	1.5	1.6		2.1	2.4	2.8	3.2	3.6	3.8
SU307-2								48	46	45	43	42	41	40	38	37	35	34	33	31	30	28	27	26		23	21.5	20	18	17	16.5
																		1.0	1.4	1.2	1.4	1.5	1.7	1.9		2.4	2.8	3.3	3.7	4.2	4.5
SU308-2								56	54	52	50	48	47	46	44	42	41	39	38	36	34	33	32	30		27	25	23	21.5	20	19.5
																	1.0	1.1	1.3	1.4	1.6	1.8	2.0	2.2		2.8	3.3	3.8	4.3	4.8	5.1
SU309-2								65	62	60	58	55	53	52	51	48	46	45	43	41	39	37	36	34		31	28.5	26	24.5	23	22
																	1.1	1.2	1.4	1.6	1.8	2.0	2.2	2.4		3.2	3.7	4.2	4.8	5.5	5.8
SU3010-2								73	70	68	66	63	61	60	58	55	52	50	48	46	44	42	40	38		35	32	30	28	26	25
																1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.5	2.7		3.5	4.1	4.2	5.4	6.1	6.5
Avg. Tube vel. 30"—2-Pass				1.0ft./ sec.	1.1	1.3	1.4	1.5	1.6	1.7	1.8	2.0	2.1	2.2	2.3	2.5	2.7	3.0	3.2	3.4	3.7	3.9	4.1	4.4	4.6	5.0	5.5	6.0	6.4	6.9	7.1

جداول ابعاد و اندازه مبدلهای طرح SU:





2-PASS					4-PASS					
SELL DIA.	FLG A	C	D	E	SELL DIA.	FLG A	B	C	D	E
10"	4	9 1/4	14 5/8	5 1/2	10"		NOT AVAILABLE			
12"	4	9 1/4	16 5/8	5	12"		NOT AVAILABLE			
14"	5	10 1/4	17 7/8	6 1/2	14"	4	9 1/4	2 3/16	17 7/8	6 1/8
16"	6	11 1/4	19 7/8	6 3/4	16"	4	9 1/2	2 1/8	19 7/8	6 3/4
18"	6	11 1/2	22	7 1/4	18"	4	9 1/2	4 1/2	22	7
20"	8	13 3/4	24	8	20"	6	11 1/4	3 1/4	24	7 3/4

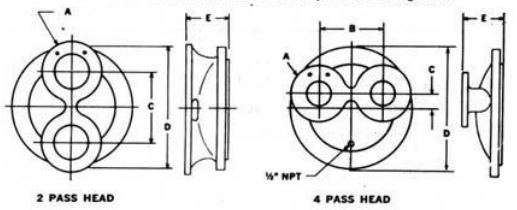
DIMENSIONS

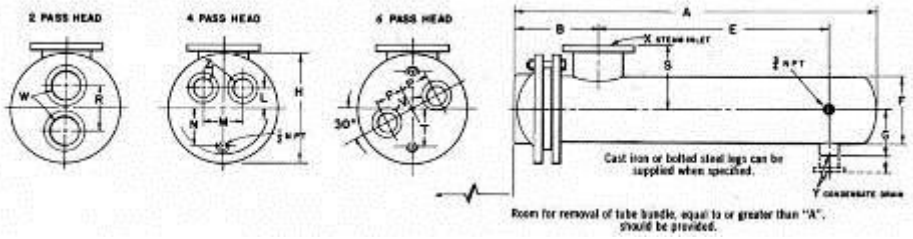
"SU" type U tube
Shell diameter in inches
Tube length in feet
Number of tube passes
Complete sales number consists of example: SU-86-6

UNIT NUMBER			HEAD DIMENSIONS IN INCHES									HEAD DIMENSIONS IN INCHES									HEATING SURFACE SQ. FT.			Approx. Shpg. Wt.
			2 Pass		4 Pass				6 Pass			2, 4 & 6 Pass												
2 pass	4 pass	6 Pass	W	R	L	M	N	Z	P	T	V	A	B	E	F	G	H	S	X	Y	2 pass	4 pass	6 Pass	(Ibs)
SU42-2	SU42-4		1¼ NPT	2	1	2 ¼	1 ¾	1 NPT	-	-	-	29	7	16 ¼	4 ½	3 ¼	7¼	3¼	1¼ NPT	1 NPT	2.5	2.5	-	56
SU43-2	SU43-4		1¼ NPT	2	1	2 ¼	1 ¾	1 NPT	-	-	-	41	7	28 ¼	4 ½	3 ¼	7¼	3¼	1¼ NPT	1 NPT	4.1	4.1	-	70
SU44-2	SU44-4	Not	1¼ NPT	2	1	2 ¼	1 ¾	1 NPT	-	-	-	53	7	40 ¼	4 ½	3 ¼	7¼	3¼	1¼ NPT	1 NPT	5.7	5.7	-	84
SU45-2	SU45-4	Availabl e	1¼ NPT	2	1	2 ¼	1 ¾	1 NPT	-	-	-	65	7	52 ¼	4 ½	3 ¼	7¼	3¼	1¼ NPT	1 NPT	7.2	7.2	-	98
SU46-2	SU46-4		1¼ NPT	2	1	2 ¼	1 ¾	1 NPT	-	-	-	77	7	64 ¼	4 ½	3 ¼	7¼	3¼	1¼ NPT	1 NPT	8.8	8.8	-	112
SU47-2	SU47-4		1¼ NPT	2	1	2 ¼	1 ¾	1 NPT	-	-	-	89	7	76 ¼	4 ½	3 ¼	7¼	3¼	2 NPT	1 NPT	10.4	10.4	-	126
SU62-2	SU62-4	SU62-6	2 NPT	3 ¾	1 19/32	3	2	1½ NPT	2	2 13/16	1¼ NPT	28	7 3/8	15 ½	6	4	10 ½	4½	1½ NPT	1 NPT	8.0	8.0	6.0	68
SU63-2	SU63-4	SU63-6	2 NPT	3 ¾	1 19/32	3	2	1½ NPT	2	2 13/16	1¼ NPT	40	7 3/8	27 ½	6	4	10 ½	4½	2 NPT	1 NPT	12.7	12.7	9.6	93
SU64-2	SU64-4	SU64-6	2 NPT	3 ¾	1 19/32	3	2	1½ NPT	2	2 13/16	1¼ NPT	52	7 3/8	39 ½	6	4	10 ½	4½	2½ NPT	1 NPT	17.4	17.4	13.1	118
SU65-2	SU65-4	SU65-6	2 NPT	3 ¾	1 19/32	3	2	1½ NPT	2	2 13/16	1¼ NPT	64	7 3/8	51 ½	6	4	10 ½	4½	2½ NPT	1 NPT	22.1	22.1	16.7	143
SU66-2	SU66-4	SU66-6	2 NPT	3 ¾	1 19/32	3	2	1½ NPT	2	2 13/16	1¼ NPT	76	7 3/8	63 ½	6	4	10 ½	4½	3 NPT	1 NPT	26.8	26.8	20.2	168
SU67-2	SU67-4	SU67-6	2 NPT	3 ¾	1 19/32	3	2	1½ NPT	2	2 13/16	1¼ NPT	88	7 3/8	75 ½	6	4	10 ½	4½	3 NPT	1 NPT	31.5	31.5	23.8	193

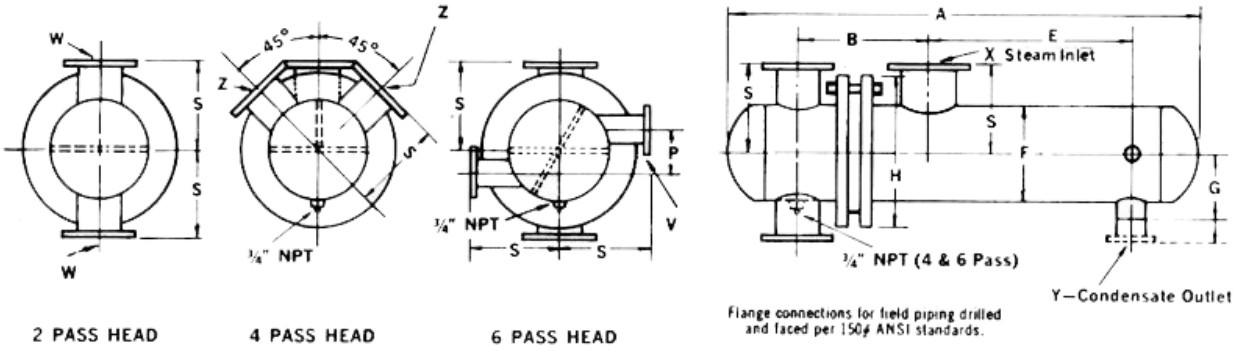
SU68-2	SU68-4	SU68-6	2 NPT	3 ¾	1 19/32	3	2	1½ NPT	2	2 13/16	1¼ NPT	100	7 3/8	87 ½	6	4	10 ½	4½	3 NPT	1 NPT	36.2	36.2	27.3	218
SU82-2	SU82-4	SU82-6	3 NPT	5	2	4	3 ½	2 NPT	3	3¾	2 NPT	29	9 5/8	13	8	5	12 ½	5 5/16	2 NPT	1 NPT	15	15	12	112
SU83-2	SU83-4	SU83-6	3 NPT	5	2	4	3 ½	2 NPT	3	3¾	2 NPT	41	9 5/8	25	8	5	12 ½	5 9/16	2½ NPT	1 NPT	23	23	19	148
SU84-2	SU84-4	SU84-6	3 NPT	5	2	4	3 ½	2 NPT	3	3¾	2 NPT	53	9 5/8	37	8	5	12 ½	5 11/16	3 NPT	1 NPT	32	32	26	184
SU85-2	SU85-4	SU85-6	3 NPT	5	2	4	3 ½	2 NPT	3	3¾	2 NPT	65	9 5/8	49	8	5	12 ½	8¾	4 FLG	1 NPT	41	41	33	220
SU86-2	SU86-4	SU86-6	3 NPT	5	2	4	3 ½	2 NPT	3	3¾	2 NPT	77	9 5/8	61	8	5	12 ½	8¾	4 FLG	1¼ NPT	49	49	41	256
SU87-2	SU87-4	SU87-6	3 NPT	5	2	4	3 ½	2 NPT	3	3¾	2 NPT	89	9 5/8	73	8	5	12 ½	8¾	4 FLG	1¼ NPT	58	58	48	292
SU88-2	SU88-4	SU88-6	3 NPT	5	2	4	3 ½	2 NPT	3	3¾	2 NPT	101	9 5/8	85	8	5	12 ½	8¾	6 FLG	1¼ NPT	67	67	55	328
SU89-2	SU89-4	SU89-6	3 NPT	5	2	4	3 ½	2 NPT	3	3¾	2 NPT	113	9 5/8	97	8	5	12 ½	8¾	6 FLG	1¼ NPT	75	75	62	364

150 PSI DESIGN PRESSURE HEADS Available only on the followmg units.





UNIT NUMBER			HEAD DIMENSIONS IN INCHES											DIMENSIONS IN INCHES							HEATING SURFACE SQ.FT.			Approx Shpg. Wt.
			2 Pass		4 Pass				6 Pass					2,4–"6 Pass, 4"thru 12" only										
2 Pass	4 Pass	6 Pass	W	R	L	M	N	Z	P	T	V	A	B	E	F	G	H	S	X	Y	2 Pass	4 Pass	6 Pass	(Ibs.)
SU102-2	SU102-4	SU102-6	4NPT	5 7/8	2 3/8	4¾	4 7/8	3NPT	3 13/16	4 7/8	2½NPT	29	10	11¾	10¾	6½	14 5/8	6¾	3NPT	1NPT	27	25	21	184
SU103-2	SU103-4	SU103-6	4NPT	5 7/8	2 3/8	4¾	4 7/8	3NPT	3 13/16	4 7/8	2½NPT	41	10	23¾	10¾	6½	14 5/8	9 7/8	4FLG	1NPT	42	39	33	230
SU104-2	SU104-4	SU104-6	4NPT	5 7/8	2 3/8	4¾	4 7/8	3NPT	3 13/16	4 7/8	2½NPT	53	10	35¾	10¾	6½	14 5/8	9 7/8	4FLG	1¼NPT	56	53	45	276
SU105-2	SU105-4	SU105-6	4NPT	5 7/8	2 3/8	4¾	4 7/8	3NPT	3 13/16	4 7/8	2½NPT	65	10	47¾	10¾	6½	14 5/8	9 7/8	6FLG	1¼NPT	71	68	56	322
SU106-2	SU106-4	SU106-6	4NPT	5 7/8	2 3/8	4¾	4 7/8	3NPT	3 13/16	4 7/8	2½NPT	77	10	59¾	10¾	6½	14 5/8	9 7/8	6FLG	2NPT	86	82	68	368
SU107-2	SU107-4	SU107-6	4NPT	5 7/8	2 3/8	4¾	4 7/8	3NPT	3 13/16	4 7/8	2½NPT	89	10	71¾	10¾	6½	14 5/8	9 7/8	6FLG	2NPT	101	96	80	414
SU108-2	SU108-4	SU108-6	4NPT	5 7/8	2 3/8	4¾	4 7/8	3NPT	3 13/16	4 7/8	2½NPT	101	10	83¾	10¾	6½	14 5/8	9 7/8	6FLG	2NPT	116	110	92	460
SU109-2	SU109-4	SU109-6	4NPT	5 7/8	2 3/8	4¾	4 7/8	3NPT	3 13/16	4 7/8	2½NPT	113	10	95¾	10¾	6½	14 5/8	9 7/8	6FLG	2NPT	131	124	104	506
SU1010-2	SU1010-4	SU1010-6	4NPT	5 7/8	2 3/8	4¾	4 7/8	3NPT	3 13/16	4 7/8	2½NPT	125	10	107¾	10¾	6½	14 5/8	9 7/8	6FLG	2NPT	146	138	116	552
SU123-2	SU123-4	SU123-6	4NPT	7¾	2 5/8	5 7/8	5 7/8	4NPT	4½	5 13/16	3NPT	41½	12	21½	12¾	7¾	16 5/8	10 7/8	4FLG	1¼NPT	61	58	50	294
SU124-2	SU124-4	SU124-6	4NPT	7¾	2 5/8	5 7/8	5 7/8	4NPT	4½	5 13/16	3NPT	53½	12	33½	12¾	7¾	16 5/8	10 7/8	6FLG	1¼NPT	83	78	68	363
SU125-2	SU125-4	SU125-6	4NPT	7¾	2 5/8	5 7/8	5 7/8	4NPT	4½	5 13/16	3NPT	65½	12	45½	12¾	7¾	16 5/8	10 7/8	6FLG	1½NPT	104	98	85	432
SU126-2	SU126-4	SU126-6	4NPT	7¾	2 5/8	5 7/8	5 7/8	4NPT	4½	5 13/16	3NPT	77½	12	57½	12¾	7¾	16 5/8	10 7/8	6FLG	2NPT	126	119	103	501
SU127-2	SU127-4	SU127-6	4NPT	7¾	2 5/8	5 7/8	5 7/8	4NPT	4½	5 13/16	3NPT	89½	12	69½	12¾	7¾	16 5/8	10 7/8	8FLG	2NPT	147	139	121	570
SU128-2	SU128-4	SU128-6	4NPT	7¾	2 5/8	5 7/8	5 7/8	4NPT	4½	5 13/16	3NPT	101½	12	81½	12¾	7¾	16 5/8	10 7/8	8FLG	2NPT	169	160	139	639
SU129-2	SU129-4	SU129-6	4NPT	7¾	2 5/8	5 7/8	5 7/8	4NPT	4½	5 13/16	3NPT	113½	12	93½	12¾	7¾	16 5/8	10 7/8	8FLG	2½NPT	191	180	156	708
SU1210-2	SU1210-4	SU1210-6	4NPT	7¾	2 5/8	5 7/8	5 7/8	4NPT	4½	5 13/16	3NPT	125½	12	105½	12¾	7¾	16 5/8	10 7/8	8FLG	2½NPT	212	200	174	777
SU143-2	SU143-4	SU143-6	6NPT	8	3 5/16	5 7/8	6 9/16	4NPT	-	-	3FLG	44¾	15 3/8	21¾	14	8 3/8	17 7/8	11½	6FLG	1¼NPT	86	83	72	449
SU144-2	SU144-4	SU144-6	6NPT	8	3 5/16	5 7/8	6 9/16	4NPT	-	-	3FLG	56¾	15 3/8	33¾	14	8 3/8	17 7/8	11½	6FLG	2NPT	116	111	97	534
SU145-2	SU145-4	SU145-6	6NPT	8	3 5/16	5 7/8	6 9/16	4NPT	-	-	3FLG	68¾	15 3/8	45¾	14	8 3/8	17 7/8	11½	6FLG	2NPT	146	139	122	619
SU146-2	SU146-4	SU146-6	6NPT	8	3 5/16	5 7/8	6 9/16	4NPT	-	-	3FLG	80¾	15 3/8	57¾	14	8 3/8	17 7/8	11½	8FLG	2NPT	175	167	147	704
SU147-2	SU147-4	SU147-6	6NPT	8	3 5/16	5 7/8	6 9/16	4NPT	-	-	3FLG	92¾	15 3/8	69¾	14	8 3/8	17 7/8	11½	8FLG	2½NPT	204	196	171	789
SU148-2	SU148-4	SU148-6	6NPT	8	3 5/16	5 7/8	6 9/16	4NPT	-	-	3FLG	104¾	15 3/8	81¾	14	8 3/8	17 7/8	11½	8FLG	2½NPT	234	224	196	874
SU149-2	SU149-4	SU149-6	6NPT	8	3 5/16	5 7/8	6 9/16	4NPT	-	-	3FLG	116¾	15 3/8	93¾	14	8 3/8	17 7/8	11½	10FLG	2½NPT	263	252	221	959
SU1410-2	SU1410-4	SU1410-6	6NPT	8	3 5/16	5 7/8	6 9/16	4NPT	-	-	3FLG	128¾	15 3/8	105¾	14	8 3/8	17 7/8	11½	10FLG	3NPT	292	280	246	1044
SU163-2	SU163-4	SU163-6	6NPT	9 1/8	4	8	7 9/16	4NPT	-	-	4FLG	45 5/8	16½	21	16	9½	19 7/8	12½	6FLG	1½NPT	112	106	96	570
SU164-2	SU164-4	SU164-6	6NPT	9 1/8	4	8	7 9/16	4NPT	-	-	4FLG	57 5/8	16½	33	16	9½	19 7/8	12½	6FLG	2NPT	150	143	129	675
SU165-2	SU165-4	SU165-6	6NPT	9 1/8	4	8	7 9/16	4NPT	-	-	4FLG	69 5/8	16½	45	16	9½	19 7/8	12½	8FLG	2½NPT	188	180	162	780
SU166-2	SU166-4	SU166-6	6NPT	9 1/8	4	8	7 9/16	4NPT	-	-	4FLG	81 5/8	16½	57	16	9½	19 7/8	12½	8FLG	2½NPT	227	217	195	885
SU167-2	SU167-4	SU167-6	6NPT	9 1/8	4	8	7 9/16	4NPT	-	-	4FLG	93 5/8	16½	69	16	9½	19 7/8	12½	10FLG	2½NPT	265	254	228	990
SU168-2	SU168-4	SU168-6	6NPT	9 1/8	4	8	7 9/16	4NPT	-	-	4FLG	105 5/8	16½	81	16	9½	19 7/8	12½	10FLG	3NPT	304	291	261	1095
SU169-2	SU169-4	SU169-6	6NPT	9 1/8	4	8	7 9/16	4NPT	-	-	4FLG	117 5/8	16½	93	16	9½	19 7/8	12½	10FLG	3NPT	342	327	294	1200
SU1610-2	SU1610-4	SU1610-6	6NPT	9 1/8	4	8	7 9/16	4NPT	-	-	4FLG	129 5/8	16½	105	16	9½	19 7/8	12½	10FLG	3NPT	380	363	327	1305
SU183-2	SU183-4	SU183-6	6NPT	11	4 5/8	9¼	8 3/8	4NPT	-	-	4FLG	48½	17¾	21½	18	10½	22	13½	6FLG	2NPT	148	148	136	712
SU184-2	SU184-4	SU184-6	6NPT	11	4 5/8	9¼	8 3/8	4NPT	-	-	4FLG	60½	17¾	33½	18	10½	22	13½	8FLG	2NPT	195	195	179	836
SU185-2	SU185-4	SU185-6	6NPT	11	4 5/8	9¼	8 3/8	4NPT	-	-	4FLG	72½	17¾	45½	18	10½	22	13½	8FLG	2½NPT	242	242	223	960
SU186-2	SU186-4	SU186-6	6NPT	11	4 5/8	9¼	8 3/8	4NPT	-	-	4FLG	84½	17¾	57½	18	10½	22	13½	10FLG	3NPT	290	290	266	1084
SU187-2	SU187-4	SU187-6	6NPT	11	4 5/8	9¼	8 3/8	4NPT	-	-	4FLG	96½	17¾	69½	18	10½	22	13½	10FLG	3NPT	339	339	309	1208
SU188-2	SU188-4	SU188-6	6NPT	11	4 5/8	9¼	8 3/8	4NPT	-	-	4FLG	108½	17¾	81½	18	10½	22	13½	10FLG	3NPT	387	387	352	1332
SU189-2	SU189-4	SU189-6	6NPT	11	4 5/8	9¼	8 3/8	4NPT	-	-	4FLG	120½	17¾	93½	18	10½	22	13½	12FLG	3NPT	435	435	395	1456
SU1810-2	SU1810-4	SU1810-6	6NPT	11	4 5/8	9¼	8 3/8	4NPT	-	-	4FLG	132½	17¾	105½	18	13½	22	13½	12FLG	4FLG	483	483	439	1580
SU203-2	SU203-4	SU203-6	8NPT	10 5/8	4 3/8	8¾	9½	6NPT	-	-	5FLG	49¾	21	19	20	11½	24	14½	8FLG	2NPT	194	188	182	1001
SU204-2	SU204-4	SU204-6	8NPT	10 5/8	4 3/8	8¾	9½	6NPT	-	-	5FLG	61¾	21	31	20	11½	24	14½	8FLG	2½NPT	259	251	240	1158
SU205-2	SU205-4	SU205-6	8NPT	10 5/8	4 3/8	8¾	9½	6NPT	-	-	5FLG	73¾	21	43	20	11½	24	14½	10FLG	3NPT	324	314	298	1315
SU206-2	SU206-4	SU206-6	8NPT	10 5/8	4 3/8	8¾	9½	6NPT	-	-	5FLG	85¾	21	55	20	11½	24	14½	10FLG	3NPT	388	377	355	1472
SU207-2	SU207-4	SU207-6	8NPT	10 5/8	4 3/8	8¾	9½	6NPT	-	-	5FLG	97¾	21	67	20	11½	24	14½	12FLG	3NPT	453	439	413	1629
SU208-2	SU208-4	SU208-6	8NPT	10 5/8	4 3/8	8¾	9½	6NPT	-	-	5FLG	109¾	21	79	20	14½	24	14½	12FLG	4FLG	517	502	471	1786
SU209-2	SU209-4	SU209-6	8NPT	10 5/8	4 3/8	8¾	9½	6NPT	-	-	5FLG	121¾	21	91	20	14½	24	14½	12FLG	4FLG	582	565	528	1943
SU2010-2	SU2010-4	SU2010-6	8NPT	10 5/8	4 3/8	8¾	9½	6NPT	-	-	5FLG	133¾	21	103	20	14½	24	14½	14FLG	4FLG	647	628	586	2100



UNIT NUMBER			DIMENSION IN INCHES																		HEATING SURFACE SQ. FT.			Approx. Shpg. Wt.
			2 Pass			4 Pass			6 Pass				2, 4 & 6 Pass											
2 Pass	4 Pass	6 Pass	A	B	W	A	B	Z	A	B	P	V	E	F	G	H	S	X	Y	2 Pass	4 Pass	6 Pass	(Ibs.)
SU223-2	SU223-4	SU223-6	69	19	10	63	17	6	62 7/8	16 7/8	11	5	23	22	13	26	15½	8	2½NPT	255	249	228	1212
SU224-2	SU224-4	SU224-6	81	21	10	75	18	6	76 7/8	18 1/8	11	5	36	22	13	26	15½	10	3NPT	333	325	298	1396
SU225-2	SU225-4	SU225-6	93	21	10	87	18	6	86 7/8	18 1/8	11	5	46	22	13	26	15½	10	3NPT	411	401	369	1580
SU226-2	SU226-4	SU226-6	105	22	10	99	20	6	98 7/8	19	11	5	56	22	15½	26	15½	12	4FLG	489	477	438	1764
SU227-2	SU227-4	SU227-6	117	22	10	111	20	6	110 7/8	19	11	5	68	22	15½	26	15½	12	4FLG	568	554	508	1948
SU228-2	SU228-4	SU228-6	129	23	10	123	21	6	122 7/8	20	11	5	79	22	15½	26	15½	14	4FLG	645	630	578	2132
SU229-2	SU229-4	SU229-6	141	23	10	135	21	6	136 7/8	20	11	5	91	22	15½	26	15½	14	4FLG	724	706	647	2316
SU2210-2	SU2210-4	SU2210-6	153	24	10	147	22	6	146 7/8	21	11	5	101	22	15½	26	15½	16	6FLG	803	782	718	2500
SU244-2	SU244-4	SU244-6	82	21	10	79	20	8	77	19	12	6	33	24	14	28	16½	10	3NPT	394	385	370	1710
SU245-2	SU245-4	SU245-6	96	23	10	91	22	8	89	20	12	6	43	24	16½	28	16½	12	4FLG	490	479	457	1928
SU246-2	SU246-4	SU246-6	106	23	10	103	22	8	101	20	12	6	55	24	16½	28	16½	12	4FLG	586	572	545	2146
SU247-2	SU247-4	SU247-6	118	24	10	115	23	8	113	21	12	6	66	24	16½	28	16½	14	4FLG	681	666	632	2364
SU248-2	SU248-4	SU248-6	130	25	10	127	24	8	125	23	12	6	75	24	16½	28	16½	16	6FLG	777	759	719	2582
SU249-2	SU249-4	SU249-6	142	25	10	139	24	8	137	23	12	6	87	24	16½	28	16½	16	6FLG	873	853	806	2800
SU2410-2	SU2410-4	SU2410-6	154	25	10	151	24	8	149	23	12	6	99	24	16½	28	16½	16	6FLG	969	946	893	3018
SU264-2	SU264-4	SU264-6	88¼	25½	12	82	22¾	8	79 15/16	21½	12	6	32	26	15	30 5/8	17½	12	3NPT	488	476	447	2036
SU265-2	SU265-4	SU265-6	100¼	25½	12	94	22¾	8	91 15/16	21½	12	6	44	26	17½	30 5/8	17½	12	4FLG	600	585	549	2280
SU266-2	SU266-4	SU266-6	112¼	26½	12	106	23¾	8	103 15/16	22½	12	6	55	26	17½	30 5/8	17½	14	4FLG	712	694	651	2524
SU267-2	SU267-4	SU267-6	124¼	27¾	12	118	25	8	115 15/16	23¾	12	6	64	26	17½	30 5/8	17½	16	6FLG	823	803	754	2768
SU268-2	SU268-4	SU268-6	136¼	27¾	12	130	25	8	127 15/16	23¾	12	6	76	26	17½	30 5/8	17½	16	6FLG	935	912	856	3012
SU269-2	SU269-4	SU269-6	148¼	28½	12	142	25¾	8	139 15/16	24½	12	6	87	26	17½	30 5/8	17½	18	6FLG	1047	1021	959	3256
SU2610-2	SU2610-4	SU2610-6	160¼	28½	12	154	25¾	8	151 15/16	24½	12	6	99	26	17½	30 5/8	17½	18	6FLG	1159	1130	1061	3500
SU284-2	SU284-4	SU284-6	78 5/8	255/8	12	75 3/8	24	10	70 1/16	21	12	6	20	28	18½	32 5/8	18½	12	4FLG	456	447	420	2502
SU285-2	SU285-4	SU285-6	905/8	265/8	12	87 3/8	25	10	82 1/16	22	12	6	31	28	18½	32 5/8	18½	14	4FLG	587	575	540	2785
SU286-2	SU286-4	SU286-6	1025/8	27	12	99 3/8	26	10	94 1/16	23	12	6	41	28	18½	32 5/8	18½	16	6FLG	717	703	661	3068
SU287-2	SU287-4	SU287-6	1145/8	27	12	111 3/8	26 3/8	10	106 1/16	23	12	6	53	28	18½	32 5/8	18½	16	6FLG	848	831	781	3351
SU288-2	SU288-4	SU288-6	1265/8	285/8	12	123 3/8	27	10	118 1/16	24	12	6	64¼	28	18½	32 5/8	18½	18	6FLG	978	959	901	3634
SU289-2	SU289-4	SU289-6	1385/8	285/8	12	135 3/8	27	10	130 1/16	24	12	6	76	28	18½	32 5/8	18½	18	6FLG	1110	1088	1022	3917
SU2810-2	SU2810-4	SU2810-6	1505/8	29	12	147 3/8	28 3/8	10	142 1/16	25	12	6	87	28	18½	32 5/8	18½	20	6FLG	1240	1216	1142	4200
SU304-2	SU304-4	SU304-6	82	26	14	77¾	24 3/8	10	74 11/16	23	14½	8	21½	30	19½	34 5/8	19½	12	4FLG	539	529	499	2886
SU305-2	SU305-4	SU305-6	94	29	14	89¾	26 5/8	10	86 11/16	25	14½	8	31¼	30	19½	34 5/8	19½	16	4FLG	690	676	639	3205
SU306-2	SU306-4	SU306-6	106	29	14	101¾	26 5/8	10	98 11/16	25	14½	8	41 15/16	30	19½	34 5/8	19½	16	6FLG	840	822	778	3524
SU307-2	SU307-4	SU307-6	118	29	14	113¾	27 3/8	10	110 11/16	26	14½	8	53 3/16	30	19½	34 5/8	19½	18	6FLG	991	970	917	3843
SU308-2	SU308-4	SU308-6	130	29	14	125¾	27 3/8	10	122 11/16	26	14½	8	65 3/16	30	19½	34 5/8	19½	18	6FLG	1139	1116	1056	4162
SU309-2	SU309-4	SU309-6	142	31	14	137¾	28 5/8	10	134 11/16	27	14½	8	75 15/16	30	19½	34 5/8	19½	20	6FLG	1289	1264	1195	4481
SU3010-2	SU3010-4	SU3010-6	154	31	14	149¾	28 5/8	10	146 11/16	27	14½	8	87 15/16	30	19½	34 5/8	19½	20	6FLG	1439	1410	1333	4800

طریقه محاسبه مبدلهای آب به آب (طرح WU):

۱- از جدول ۳ و با دانستن دمای ورودی و خروجی آب گرم شونده از یک سو و همچنین دمای آب داغ دیگ و کاهش دمای آن در مبدل از سوی دیگرمقدار (CTF)CLEAN TUBE TEMPERATURE FACTORS اولیه را بدست می آوریم.

۲- با قرار دادن این مقدار در ستون دبی آب گرم شونده در جدول ۴ سرعت جریان داخل لوله را بدست می آوریم.

۳- با دانستن مقدار سرعت داخل لوله و پوسته از جدول ۵ ضریب F را بدست می آوریم.

۴- مقدار Adjusted Clean Tube Factor – ACTF را از فرمول زیر بدست می آوریم:

ACTF = CTF × (TD/TR) × F × (Fouling% if required From Chart 1).

۵- این مقدار را دوباره در جدول ۴ و در یکی از ستونهای A,B (ستون A برای کوچکترین مدل ممکن و ستون B برای بدست آوردن مدلی با کمترین افت فشار) گذاشته و مدل نهایی را انتخاب می کنیم.

TYPICAL FOULING FACTORS*

Temp. of Heating Medium	Up to 240ºF.		240º.400ºF.**	
Temp. of Water	125ºF. or less		Over 125ºF.	
TYPE OF WATER	Water Vel. ft./sec.		Water Vel. ft./sec.	
	Less 3 ft.	Over 3 ft.	Less 3 ft.	Over 3 ft.
Sea Water	.0005	.0005	.001	.001
Distilled	.0005	.0005	.0005	.0005
Treated Boiler Feedwater	.001	.0005	.001	.001
Engine jacket	.001	.001	.001	.001
City or Well (Great Lakes)	.001	.001	.002	.002
River Water:			.004	

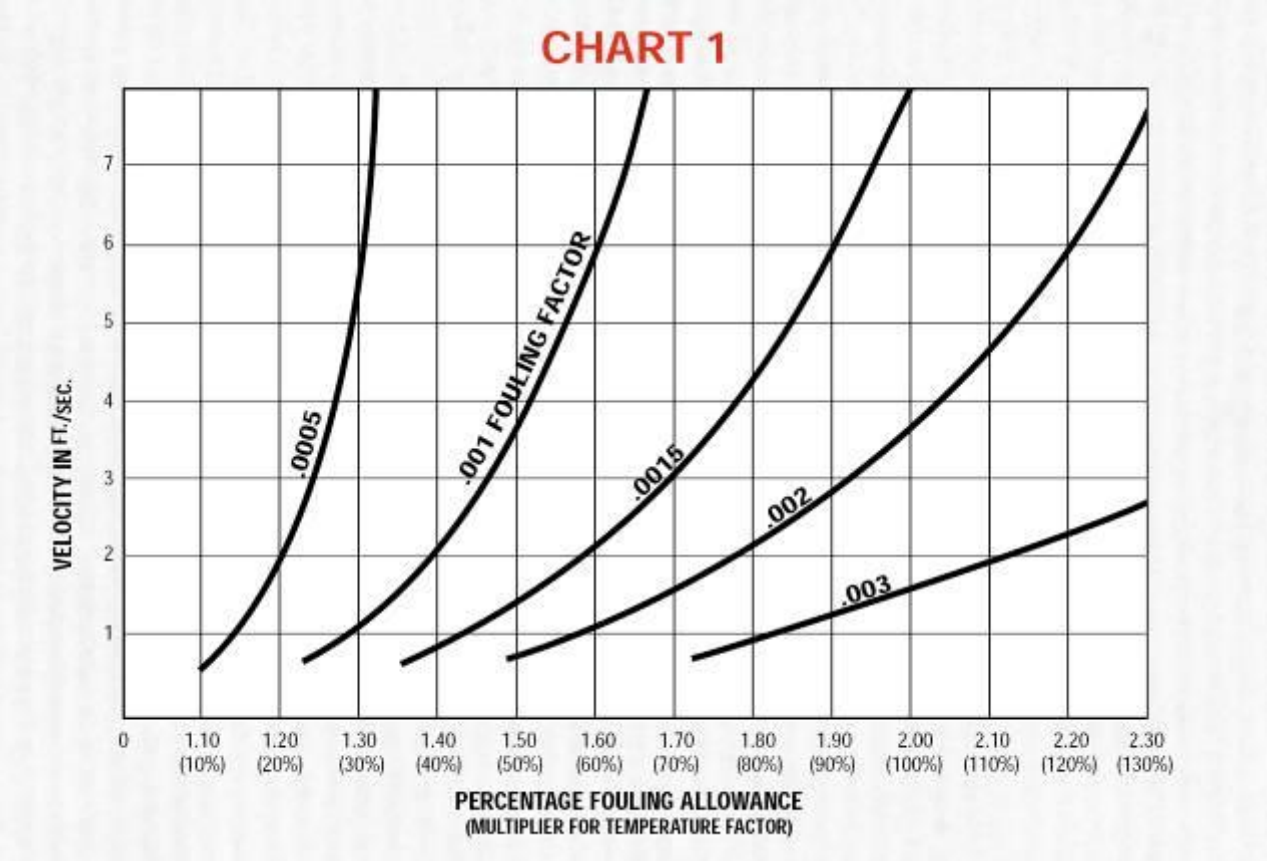


TABLE 3-CLEAN TUBE TEMPERATURE FACTORS

		120º HEATING WATER									130º HEATING WATER									
Heated Water		TEMPERATURE DROP									TEMPERATURE DROP									
In	Out	5º	10º	15º	20º	25º	30º	35º	40º	45º	5º	10º	15º	20º	25º	30º	35º	40º	45º	50º
40	45	3.2	3.3	3.5	3.6	3.8	4.0	4.3	4.6	4.9	2.7	2.8	2.9	3.1	3.2	3.4	3.5	3.7	3.9	4.2
	50	6.6	6.9	7.2	7.5	7.9	8.4	8.9	9.5	10.2	5.6	5.8	6.1	6.3	6.6	6.9	7.3	7.7	8.2	8.7
	55	10.2	10.6	11.1	11.7	12.3	13.1	14.0	15.0	16.2	8.7	9.0	9.4	9.8	10.3	10.8	11.4	12.0	12.8	13.7
	60	14.0	14.7	15.4	16.3	17.2	18.3	19.6	21.1	23.0	11.9	12.4	12.9	13.5	14.2	14.9	15.8	16.7	17.9	19.2
	70	22.7	23.9	25.2	26.7	28.5	30.6	33.2	36.4	40.6	19.0	19.8	20.8	21.8	23.0	24.3	25.9	27.8	30.0	32.8
	80	33.2	35.2	37.4	40.1	43.3	47.3	52.4	59.5		27.3	28.6	30.1	31.8	33.8	36.1	38.9	42.2	46.6	52.4
45	50	3.4	3.5	3.7	3.9	4.1	4.3	4.6	5.0	5.4	2.9	3.0	3.1	3.2	3.4	3.6	3.8	4.0	4.2	4.5
	55	7.0	7.3	7.6	8.1	8.5	9.1	9.7	10.4	11.4	5.9	6.1	6.4	6.7	7.0	7.4	7.8	8.3	8.9	9.5
	60	11.0	11.3	11.9	12.6	13.4	14.2	15.3	16.6	18.2	9.1	9.5	9.9	10.4	10.9	11.5	12.2	13.0	13.9	15.1
	70	19.5	20.5	21.7	23.0	24.6	26.6	28.9	31.9	35.9	16.2	17.0	17.8	18.7	19.8	21.0	22.4	24.0	26.1	28.7
	80	30.0	31.8	33.9	36.4	39.4	43.3	48.2	55.3		24.6	25.8	27.2	28.7	30.6	32.7	35.3	38.5	42.7	48.6
50	55	3.6	3.8	3.9	4.2	4.4	4.7	5.1	5.5	6.0	3.0	3.1	3.3	3.5	3.6	3.8	4.0	4.3	4.6	5.0
	60	7.4	7.8	8.2	8.7	9.2	9.9	10.7	11.6	12.8	6.2	6.5	6.8	7.2	7.5	8.0	8.4	9.0	9.7	10.5
	70	16.1	17.0	18.0	19.2	20.5	22.2	24.3	27.0	30.7	13.3	14.0	14.7	15.4	16.3	17.4	18.6	20.0	21.9	24.2
	80	26.6	28.3	30.2	32.5	35.3	38.9	43.7	50.7		21.7	22.8	24.0	25.5	27.1	29.1	31.6	34.6	38.6	44.4
	90	40.2	43.2	46.8	51.4	57.4	66.0				31.8	33.6	35.8	38.3	41.3	45.1	49.9	56.7		
	100	59.8	65.7	73.6	85.0						44.9	48.0	51.7	56.4	62.4	70.6				
55	60	3.8	4.0	4.3	4.5	4.8	5.2	5.6	6.1	6.9	3.2	3.4	3.5	3.7	3.9	4.1	4.4	4.7	5.1	5.6
	65	8.0	8.4	8.9	9.5	10.1	10.9	11.9	13.2	14.9	6.6	6.9	7.3	7.7	8.1	8.6	9.2	9.9	10.8	11.9
	70	12.5	13.2	14.0	15.0	16.1	17.5	19.2	21.6	24.9	10.3	10.8	11.4	12.0	12.7	13.5	14.5	15.8	17.3	19.3
	80	23.0	24.5	26.2	28.3	30.9	34.2	38.8	45.7	58.9	18.6	19.6	20.7	22.0	23.5	25.3	27.5	30.3	34.1	40.9
	90	36.5	39.4	42.8	47.2	53.0	61.5				28.7	30.4	32.4	34.8	37.6	41.2	46.0	52.7		
	100	56.1	61.8	69.6	80.9						41.8	44.8	48.4	52.9	58.7	66.9				
60	65	4.1	4.4	4.6	4.9	5.3	5.8	6.3	7.1	8.1	3.4	3.6	3.8	4.0	4.2	4.5	4.8	5.2	5.7	6.3
	70	8.7	9.2	9.8	10.4	11.3	12.3	13.6	15.5	18.2	7.1	7.4	7.8	8.3	8.8	9.4	10.1	11.0	12.2	13.8
	80	19.1	20.4	21.9	23.8	26.1	29.1	33.3	40.1	10.2	15.4	16.2	17.2	18.3	19.6	21.2	23.1	25.7	29.2	34.8
	90	32.7	35.3	38.5	42.6	48.2	56.7			24.7	25.4	27.0	28.9	31.1	33.7	37.1	41.7	48.3		
	100	52.1	57.7	65.2	76.5						38.5	41.3	44.8	49.1	54.8	63.0				
65	70	4.5	4.8	5.1	5.5	6.0	6.6	7.3	8.4	15.4	3.7	3.9	4.1	4.3	4.6	4.9	5.3	5.8	6.5	7.5
	75	9.5	10.1	10.8	11.7	12.8	14.2	16.1	19.0		7.6	8.0	8.5	9.0	9.7	10.4	11.4	12.6	14.2	18.7
	80	15.0	16.0	17.3	18.8	20.8	23.4	27.2	33.7		11.9	12.6	13.4	14.3	15.4	16.7	18.3	20.5	23.7	29.1
	90	28.5	30.8	33.8	37.7	43.0	51.4				22.0	23.4	25.1	27.0	29.5	32.7	37.0	43.6		
	100	47.9	53.2	60.5	71.8						35.0	37.7	41.0	45.1	50.7	58.8				
	110	84.1	103.0								53.8	59.3	66.7	77.5						
70	75	5.0	5.3	5.7	6.2	6.8	7.6	8.8	10.7		4.0	4.2	4.4	4.7	5.1	5.5	6.0	6.7	7.7	9.4
	80	10.5	11.2	12.2	13.3	14.8	16.9	20.0	26.1		8.3	8.8	9.3	10.0	10.8	11.8	13.0	14.7	17.4	22.4
	85	16.7	18.0	19.7	21.8	24.6	28.7	35.8			13.0	13.8	14.8	15.9	17.3	19.0	21.3	24.7	30.5	
	90	23.9	26.0	28.7	32.2	37.2	45.4				18.3	19.5	21.0	22.7	24.9	27.8	31.8	38.3		
	100	43.3	48.4	55.4	66.6						31.3	33.8	36.8	40.8	46.2	54.2				
	110	79.4	97.8								50.0	55.3	62.5	73.3						
75	80	5.5	5.9	6.5	7.1	8.0	9.3	11.3	16.5		4.3	4.6	4.9	5.2	5.7	6.2	7.0	8.0	9.8	13.9
	85	11.8	12.7	14.0	15.6	17.8	21.2	27.9			9.0	9.6	10.3	11.2	12.2	13.5	15.4	18.2	23.6	
	90	19.0	20.7	23.0	26.0	30.5	38.5				14.3	15.3	16.5	18.0	19.8	22.3	26.0	32.2	14.8	
	100	38.3	43.0	49.8	60.8						27.3	29.6	32.4	36.1	41.2	49.1				
	110	74.3	92.5								45.9	51.0	58.1	68.8						
80	85	6.2	6.8	7.5	8.4	9.8	12.1	17.7			4.7	5.1	5.4	5.9	6.5	7.3	8.4	10.2		
	90	13.4	14.8	16.5	18.9	22.7	30.2				10.0	10.8	11.6	12.7	14.2	16.1	19.1	25.0		
	95	22.0	24.5	27.8	32.9	41.9					16.0	17.3	18.8	20.8	23.5	27.4	34.3			
	100	32.7	37.0	43.4	54.2						23.0	25.0	27.5	30.8	35.6	43.4	17.0			
	110	68.7	86.7								41.6	46.4	53.2	63.8						
90	95	8.6	9.7	11.4	14.2	21.4					6.0	6.5	7.2	8.1	9.4	11.6				
	100	19.2	22.3	27.1	37.0						12.9	14.2	15.8	18.1	21.7	28.9				
	105	33.4	40.2								21.2	23.5	26.7	31.5	40.2					
	110	55.0	72.6								31.4	35.6	41.6	52.0						
100	105	14.2	18.1	28.7							8.2	9.3	10.9	13.6	20.6					
	110	35.8	52.0								18.5	21.4	26.0	35.6						
	115										32.2	38.6	51.0							
110	115										13.7	17.4	27.5							
	120										34.4	50.1								

TABLE 3-CLEAN TUBE TEMPERATURE FACTORS

		140° HEATING WATER									150° HEATING WATER									
Heated Water		TEMPERATURE DROP									TEMPERATURE DROP									
in	Out	5°	10°	15°	20°	25°	30°	40°	50°	60°	5°	10°	15°	20°	25°	30°	40°	50°	60°	70°
40	45	2.4	2.5	2.6	2.7	2.8	2.9	3.1	3.5	39	2.1	2.2	2.2	2.3	2.4	2.5	2.7	2.9	3.2	3.6
	50	4.9	5.1	5.2	5.4	5.7	5.9	6.4	7.2	8.1	4.3	4.4	4.6	4.8	4.9	5.1	5.6	6.0	6.7	7.5
	55	7.5	7.8	8.1	8.4	8.7	9.1	10.0	11.1	12.6	6.6	6.8	7.0	7.3	7.6	7.8	8.5	9.3	10.4	11.8
	60	10.3	10.6	11.0	11.5	12.0	12.5	13.8	15.4	17.7	9.0	9.3	9.6	10.0	10.3	10.7	11.7	12.8	14.3	16.4
	70	16.3	10.9	17.6	18.3	19.2	20.1	22.4	25.4	29.9	14.2	14.6	15.2	15.8	16.4	17.1	18.7	20.8	23.5	27.5
	80	23.1	24.1	25.1	26.3	27.7	29.2	32.9	38.3	47.0	19.9	20.7	21.5	22.3	23.3	24.4	26.9	30.3	35.1	42.7
45	50	2.5	2.6	2.7	2.8	2.9	3.0	3.3	3.7	4.2	2.2	2.3	2.3	2.4	2.5	2.6	2.8	3.1	3.4	3.9
	55	5.1	5.3	5.5	5.7	6.0	6.2	6.9	7.7	8.8	4.5	4.6	4.8	5.0	5.2	5.4	5.8	6.4	7.1	8.1
	60	7.9	8.2	8.5	8.8	9.2	9.6	10.6	12.0	13.8	6.9	7.1	7.4	7.6	7.9	8.2	9.0	9.9	11.1	12.8
	70	13.9	14.4	15.0	15.7	16.4	17.2	19.2	22.0	26.1	12.0	12.5	12.9	13.4	14.0	14.6	16.0	17.8	20.3	24.0
	80	20.7	21.6	22.6	23.6	24.9	26.3	29.8	34.9	43.4	17.8	18.5	19.2	20.0	20.9	21.9	24.2	27.4	31.9	39.4
50	55	2.6	2.7	2.8	2.9	3.1	3.2	3.5	4.0	4.6	2.3	2.4	2.4	2.5	2.6	2.7	3.0	3.3	3.7	4.2
	60	5.4	5.6	5.8	6.0	6.3	6.6	7.3	8.3	9.7	4.7	4.8	5.0	5.2	5.4	5.6	6.2	6.8	7.7	8.9
	70	11.4	11.8	12.3	12.9	13.5	14.2	15.9	18.3	22.0	9.8	10.2	10.6	11.0	11.4	12.0	13.2	14.7	16.9	20.1
	80	18.2	19.0	19.8	20.8	22.0	23.2	26.5	31.2	39.6	15.6	16.2	16.8	17.6	18.4	19.2	21.4	24.3	28.5	35.8
	90	26.2	27.4	28.8	30.5	32.3	34.5	40.3	50.0		22.2	23.1	24.1	25.2	26.5	27.9	31.5	36.6	44.9	
	100	36.0	37.9	40.2	42.8	45.9	49.8	61.1			29.9	31.2	32.8	34.5	36.5	38.8	44.7	54.2		
	110	48.6	51.8	55.6	60.2	66.1	74.1				39.3	41.4	43.7	46.4	49.6	53.4	64.5			
55	60	2.8	2.9	3.0	3.1	3.2	3.4	3.8	4.3	5.1	2.4	2.5	2.6	2.7	2.8	2.9	3.2	3.5	4.0	4.7
	65	5.6	5.9	6.1	6.4	6.7	7.1	7.9	9.1	10.8	4.9	5.1	5.3	5.5	5.7	6.0	6.5	7.3	8.4	9.9
	70	8.7	9.1	9.5	9.9	10.4	11.0	12.4	14.3	17.4	7.5	7.8	8.1	8.4	8.8	9.2	10.2	11.4	13.2	16.0
	80	15.5	16.2	17.0	17.9	18.9	20.0	22.9	27.3	35.4	13.3	13.8	14.4	15.1	15.7	16.5	18.4	21.0	24.9	32.0
	90	23.5	24.7	26.0	27.5	29.2	31.3	36.8	46.3		19.8	20.7	21.6	22.7	23.8	25.2	28.5	33.3	41.5	
	100	33.3	35.1	37.3	39.8	42.8	46.5	57.8			27.6	28.8	30.3	31.9	33.8	36.0	41.8	51.1		
60	65	2.9	3.0	3.1	3.3	3.5	3.6	4.1	4.7	5.8	2.5	2.6	2.7	2.8	2.9	3.1	3.4	3.8	4.4	5.3
	70	6.0	6.2	6.5	6.8	7.2	7.6	8.6	10.0	12.4	5.1	5.3	5.6	5.8	6.0	6.3	7.0	7.9	9.2	11.3
	80	12.8	13.4	14.0	14.8	15.6	16.6	19.1	23.1	30.9	10.9	11.3	11.8	12.3	12.9	13.6	15.2	17.5	21.0	27.8
	90	20.8	21.8	23.0	24.4	26.0	27.8	33.0	42.4		17.4	18.2	19.0	20.0	21.0	22.2	25.3	29.8	37.8	
	100	30.5	32.2	34.3	36.7	39.5	43.1	54.2			25.1	26.3	27.7	29.2	31.0	33.1	38.6	47.9		
	110	43.1	46.0	49.6	54.1	59.8	67.6				34.6	36.4	38.6	41.1	44.1	47.8	58.6			
65	70	3.1	3.2	3.4	3.5	3.7	3.9	4.5	5.3	6.7	2.6	2.7	2.8	3.0	3.1	3.3	3.6	4.1	4.8	6.1
	80	9.9	10.3	10.9	11.5	12.1	12.9	15.0	18.4	25.7	8.4	8.7	9.1	9.5	10.0	10.5	11.8	13.7	16.7	23.0
	90	17.8	18.8	19.8	21.0	22.5	24.2	29.0	38.0		14.9	15.6	16.3	17.2	18.1	19.2	21.9	26.1	33.9	
	100	27.5	29.2	31.1	33.3	36.1	39.5	50.4			22.6	23.7	25.0	26.4	28.0	30.0	35.3	44.4		
	110	40.1	43.0	46.4	50.7	56.3	64.2				32.0	33.8	35.8	38.2	41.1	44.7	55.4			
	120	58.3	63.8	71.2	81.7						44.2	47.1	50.7	55.0	60.6	68.2				
70	75	3.3	3.4	3.6	3.8	4.0	4.3	5.0	6.0	8.3	2.8	2.9	3.0	3.2	3.3	3.5	3.9	4.5	5.5	7.5
	80	6.8	7.1	7.5	7.9	8.4	9.0	10.5	13.1	19.6	5.7	6.0	6.2	6.6	6.9	7.3	8.2	9.6	11.9	17.5
	90	14.7	15.6	16.5	17.5	18.8	20.3	24.6	33.3		12.3	12.8	13.5	14.2	15.0	15.9	18.3	22.1	29.5	
	100	24.4	25.9	27.7	29.8	32.3	35.6	46.3			20.0	21.0	22.1	23.4	25.0	26.7	31.7	40.6		
	110	37.0	39.7	43.0	47.1	52.6	60.4				29.3	31.0	33.0	35.2	38.0	41.4	52.0			
	120	55.1	60.5	67.8	78.2						41.5	44.3	47.8	52.0	57.5	65.0				
75	80	3.5	3.7	3.9	4.1	4.4	4.7	5.6	7.1	12.1	3.0	3.1	3.2	3.4	3.6	3.8	4.3	5.1	6.4	10.7
	85	7.3	7.7	8.1	8.7	9.3	10.0	12.0	16.0		6.1	6.4	6.7	7.0	7.4	7.9	9.1	10.8	14.3	
	90	11.5	12.1	12.8	13.7	14.7	16.0	19.6	27.8		9.5	9.9	10.4	11.0	11.7	12.4	14.4	17.6	24.6	
	100	21.1	22.5	24.0	25.9	28.3	31.3	41.7			17.2	18.1	19.1	20.2	21.6	23.2	27.8	36.5		
	110	33.6	36.2	39.3	43.3	48.6	56.4				26.5	28.1	29.9	32.0	34.7	37.9	48.4			
	120	51.7	57.0	64.1	74.5						38.6	41.4	44.7	48.8	54.2	61.7				
80	90	7.9	8.4	8.9	9.6	10.3	11.3	14.1	21.4		6.5	6.9	7.2	7.6	8.1	8.6	10.1	12.6	18.8	
	100	17.6	18.8	20.1	21.8	23.9	26.6	36.7			14.2	15.0	15.8	16.8	18.0	19.5	23.6	31.9		
	110	30.1	32.5	35.4	39.2	44.3	52.0				23.5	25.0	26.6	28.6	31.1	34.2	44.4			
	120	48.1	53.2	60.1	70.5						35.6	38.2	41.4	45.4	50.6	58.1				
90	100	9.6	10.3	11.2	12.2	13.6	15.4	24.0			7.6	8.1	8.6	9.2	9.9	10.8	13.6	20.6		
	110	22.1	24.0	26.4	29.6	34.2	41.7				17.0	18.1	19.4	21.0	23.0	25.6	35.2			
	120	40.0	44.7	51.2	61.4						29.0	31.3	34.1	37.8	42.7	50.1				
100	110	12.4	13.6	15.2	17.5	20.9	27.8				9.3	10.0	10.8	11.8	13.1	14.9	23.0			
	120	30.3	34.3	40.1	50.1						21.3	23.2	25.5	28.6	33.0	40.2				
	130	63.7	80.4								38.7	43.1	49.4	59.2						
110	120	17.8	20.6	25.1	34.3						12.0	13.2	14.7	16.8	20.2	26.8				
	130	51.1	67.4								29.3	33.1	38.7	48.4						
	130	33.2	48.4								17.2	19.9	24.2	33.1						

TABLE 3-CLEAN TUBE TEMPERATURE FACTORS

Heated Water		160° HEATING WATER									170° HEATING WATER									
		TEMPERATURE DROP									TEMPERATURE DROP									
In	Out	5°	10°	15°	20°	30°	40°	50°	60°	70°	5°	10°	15°	20°	30°	40°	50°	60°	70°	80°
40	45	1.9	1.9	2.0	2.1	2.2	2.4	2.5	2.8	3.0	1.7	1.8	1.8	1.8	2.0	2.1	2.2	2.4	2.6	2.9
	50	3.8	4.0	4.1	4.2	4.5	4.8	5.2	5.7	6.2	3.5	3.6	3.6	3.8	3.9	4.2	4.6	4.9	5.3	5.9
	55	5.9	6.0	6.2	6.4	6.9	7.4	8.0	8.7	9.7	5.3	5.4	5.6	5.7	6.1	6.5	7.0	7.5	8.2	9.1
	60	8.0	8.2	8.5	8.8	9.4	10.1	11.0	12.0	13.4	7.2	7.4	7.6	7.8	8.3	8.8	9.5	10.3	11.3	12.6
	70	12.5	12.9	13.3	13.8	14.8	16.0	17.5	19.4	21.8	11.1	11.5	11.8	12.2	13.0	13.9	15.0	16.4	18.1	20.4
	80	17.5	18.0	18.7	19.3	20.9	22.7	25.0	28.1	32.4	15.5	16.0	16.4	17.0	18.2	19.6	21.3	23.4	26.2	30.1
45	50	2.0	2.0	2.1	2.1	2.3	2.5	2.7	2.9	3.2	1.8	1.8	1.8	1.9	2.0	2.2	2.3	2.5	2.7	3.0
	55	4.0	4.1	4.2	4.4	4.7	5.0	5.5	6.0	6.7	3.6	3.7	3.8	3.9	4.1	4.4	4.7	5.1	5.6	6.3
	60	6.1	6.3	6.5	6.7	7.2	7.7	8.4	9.3	10.4	5.4	5.6	5.8	5.9	6.3	6.8	7.3	7.9	8.7	9.7
	70	10.6	10.9	11.3	11.7	12.6	13.6	14.9	16.6	18.8	9.4	9.7	10.0	10.3	11.0	11.8	12.8	14.0	15.5	17.6
	80	15.6	16.1	16.6	17.3	18.7	20.4	22.5	25.3	29.4	13.8	14.2	14.6	15.1	16.2	17.5	19.1	21.0	23.6	27.3
50	55	2.0	2.1	2.2	2.2	2.4	2.6	2.8	3.1	3.4	1.8	1.9	1.9	2.0	2.1	2.2	2.4	2.6	2.9	3.2
	60	4.1	4.3	4.4	4.6	4.9	5.3	5.8	6.4	7.2	3.7	3.8	3.9	4.0	4.3	4.6	5.0	5.4	6.0	6.7
	70	8.6	8.9	9.2	9.5	10.3	11.2	12.3	13.7	15.6	7.7	7.9	8.1	8.4	9.0	9.7	10.5	11.5	12.8	14.6
	80	13.6	14.1	14.6	15.1	16.4	17.9	19.8	22.4	26.2	12.0	12.4	12.8	13.2	14.2	15.3	16.7	18.5	20.9	24.3
	90	19.2	19.8	20.6	21.4	23.4	25.8	29.0	33.5	40.8	16.8	17.4	17.9	18.6	20.0	21.8	24.0	26.9	31.0	37.4
	100	25.5	26.5	27.6	28.8	31.7	35.5	40.7	48.9		22.2	23.0	23.8	24.8	26.8	29.4	32.8	37.5	44.6	
	110	33.0	34.4	36.0	37.8	42.2	48.2	57.5			28.3	29.4	30.6	31.9	34.9	38.8	44.1	52.0		
55	60	2.1	2.2	2.2	2.3	2.5	2.7	3.0	3.3	3.7	1.9	1.9	2.0	2.1	2.2	2.4	2.5	2.8	3.1	3.5
	65	4.3	4.4	4.6	4.8	5.1	5.6	6.1	6.8	7.8	3.8	3.9	4.1	4.2	4.5	4.8	5.2	5.7	6.4	7.2
	70	6.6	6.8	7.1	7.3	7.9	8.6	9.5	10.6	12.2	5.9	6.0	6.2	6.4	6.9	7.4	8.1	8.9	9.9	11.4
	80	11.6	12.0	12.4	12.9	14.0	15.3	17.0	19.4	22.9	10.2	10.5	10.9	11.2	12.1	13.1	14.3	15.9	18.0	21.2
	90	17.1	17.7	18.4	19.2	21.0	23.2	26.2	30.5	37.6	15.0	15.5	16.0	16.6	17.9	19.6	21.6	24.3	28.1	34.5
	100	23.4	24.4	25.4	26.6	29.3	32.9	38.0	46.0		20.3	21.1	21.8	22.7	24.7	27.2	30.4	34.9	41.9	
60	65	2.2	2.3	2.3	2.4	2.6	2.9	3.2	3.5	4.0	2.0	2.0	2.1	2.1	2.3	2.5	2.7	3.0	3.3	3.8
	70	4.5	4.6	4.8	5.0	5.4	5.9	6.5	7.3	8.5	4.0	4.1	4.2	4.4	4.7	5.1	5.5	6.1	6.8	7.9
	80	9.4	9.8	10.1	10.5	11.5	12.6	14.1	16.1	19.2	8.3	8.6	8.9	9.2	9.9	10.7	11.8	13.1	15.0	17.8
	90	15.0	15.6	16.2	16.9	18.5	20.5	23.3	27.3	34.3	13.1	13.5	14.0	14.5	15.7	17.2	19.0	21.5	25.1	31.3
	100	21.3	22.2	23.2	24.2	26.8	30.2	35.1	43.0		18.4	19.1	19.8	20.6	22.5	24.8	27.9	32.2	39.1	
	110	28.8	30.1	31.5	33.2	37.3	43.0	52.0			24.6	25.6	26.6	27.8	30.6	34.2	39.2	47.0		
	120	37.9	39.9	42.1	44.7	51.4	62.0				31.8	33.2	34.7	36.5	40.7	46.4	55.3			
70	80	4.9	5.1	5.3	5.6	6.1	6.7	7.6	8.8	10.8	4.3	4.5	4.6	4.8	5.2	5.7	6.2	7.0	8.2	10.0
	90	10.5	10.9	11.4	11.9	13.1	14.6	16.8	20.1	26.6	9.1	9.4	9.8	10.2	11.0	12.1	13.5	15.5	18.4	24.2
	100	16.8	17.5	18.3	19.2	21.4	24.3	28.6	36.3		14.4	15.0	15.6	16.2	17.8	19.7	22.4	26.2	32.9	
	110	24.2	25.4	26.7	28.1	31.8	37.1	46.0			20.6	21.4	22.2	23.4	25.8	29.1	33.7	41.3		
	120	33.3	35.1	37.2	39.6	46.0	56.4				27.8	29.0	30.4	32.0	35.9	41.4	50.1			
	130	45.1	48.1	51.6	55.8	68.6					36.6	38.5	40.6	43.1	49.6	59.8				
	140	62.2	67.7	74.8	84.6						48.1	51.1	54.6	58.9	71.3					
80	90	5.5	5.8	6.0	6.3	7.0	7.9	9.2	11.4	16.8	4.8	5.0	5.1	5.4	5.8	6.5	7.3	8.5	10.4	15.2
	100	11.8	12.4	13.0	13.6	15.3	17.6	21.2	28.3		10.1	10.5	11.0	11.4	12.6	14.1	16.1	19.3	25.5	
	110	19.2	20.2	21.3	22.6	25.7	30.5	39.0			16.2	16.9	17.7	18.5	20.6	23.4	27.6	34.9		
	120	28.3	29.9	31.8	34.0	39.9	50.1				23.4	24.5	25.8	27.1	30.7	35.8	44.3			
	130	40.1	42.8	46.1	50.2	62.7					32.2	33.9	35.9	38.2	44.4	54.4				
	140	57.1	62.3	69.2	79.0						43.6	46.5	49.8	54.0	66.2					
90	100	6.3	6.6	6.9	7.3	8.3	9.7	12.1	18.1		5.3	5.6	5.8	6.1	6.7	7.6	8.9	11.0	16.1	
	110	13.7	14.4	15.3	16.2	18.8	22.7	30.7			11.4	12.0	12.5	13.2	14.8	17.0	20.4	27.3		
	120	22.7	24.1	25.7	27.6	33.0	42.8				18.6	19.5	20.6	21.8	24.8	29.4	37.6			
	130	34.4	36.9	40.0	43.8	56.1					27.4	28.9	30.7	32.8	38.6	48.4				
	140	51.4	56.4	63.1	72.8						38.8	41.4	44.6	48.5	60.6					
	150	83.1	99.2								55.3	60.4	67.0	76.4						
100	110	7.4	7.8	8.3	8.9	10.4	13.1	19.8			6.1	6.4	6.7	7.1	8.0	9.4	11.7	17.4		
	120	16.4	17.5	18.7	20.3	24.7	34.0				13.2	14.0	14.8	15.7	18.1	21.9	29.6			
	130	28.1	30.3	33.0	36.5	48.4					22.0	23.3	24.9	26.7	31.9	41.3				
	140	44.9	49.6	56.1	65.7						33.3	35.8	38.7	42.4	54.2					
	150	76.5	92.4								50.0	54.6	61.1	70.4						
110	120	9.0	9.6	10.4	11.4	14.4	22.2				7.2	7.6	8.0	8.6	10.1	12.6	19.1			
	130	20.6	22.4	24.6	27.6	38.8					15.9	16.9	18.1	19.6	23.9	32.8				
	140	37.4	41.7	47.8	57.3						27.2	29.3	31.9	35.3	46.8					
	150	68.8	84.6								43.5	48.1	54.3	63.3						
120	130	11.6	12.8	14.2	16.3	25.9					8.7	9.3	10.1	11.0	13.9	21.5				
	140	28.4	32.1	37.5	46.8						20.0	21.7	23.9	26.8	37.6					
	150	59.6	75.2								36.3	40.5	46.3	55.5						
130	140	16.7	19.3	23.4	32.1						11.3	12.4	13.8	15.8	25.1					
	150	47.9	63.1								27.5	31.1	36.6	45.4						
140	150	31.2	45.4								16.22	18.47	22.74	31.09						

TABLE 3-CLEAN TUBE TEMPERATURE FACTORS

Heated Water		180º HEATING WATER												190º HEATING WATER											
		TEMPERATURE DROP												TEMPERATURE DROP											
In	Out	5º	10º	15º	20º	30º	40º	50º	60º	70º	80º	90º	100º	5º	10º	15º	20º	30º	40º	50º	60º	70º	80º	90º	100º
40	60	6.5	6.6	6.8	7.0	7.4	7.9	8.4	9.0	9.8	10.7	11.8	13.4	5.88	6.02	6.17	6.32	6.66	7.04	7.47	7.97	8.55	9.25	10.11	11.20
	80	13.9	14.3	14.7	15.1	16.1	17.2	18.5	20.1	22.0	24.6	28.1	33.6	12.54	12.86	13.20	13.55	14.34	15.23	16.26	17.48	18.95	20.77	23.12	26.37
	100	22.7	23.4	24.2	25.0	26.8	28.9	31.5	34.9	39.3	45.8			20.35	20.91	21.51	22.15	23.58	25.25	27.22	29.64	32.68	36.72	42.56	
	120	34.0	35.2	36.5	37.9	41.2	45.4	50.9	58.7					29.95	30.89	31.90	33.00	35.48	38.49	42.24	47.14	53.99			
	140	49.8	52.0	54.5	57.3	64.4	74.7							42.71	44.33	46.10	48.06	52.72	58.81	67.36					
	160	77.7	83.4	90.6	100.0									62.33	65.60	69.37	73.86	**85.97**							
	180													108.98	124.53										
50	70	6.9	7.1	7.3	7.5	8.0	8.5	9.1	9.9	10.8	12.0	13.7	16.1	6.23	6.39	6.55	6.73	7.11	7.55	8.05	8.64	9.35	10.22	11.34	12.86
	90	14.9	15.4	15.8	16.3	17.5	18.8	20.5	22.5	25.1	28.8	34.6		13.39	13.76	14.14	14.56	15.47	16.52	17.77	19.27	21.14	23.57	26.94	32.22
	110	24.8	25.6	26.5	27.5	29.7	32.5	36.0	40.7	47.6				21.97	22.63	23.34	24.10	25.82	27.87	30.38	33.56	37.81	44.01		
	130	37.8	39.4	41.0	42.9	47.4	53.4	62.1						32.86	34.01	35.26	36.63	39.82	43.81	49.08	56.58				
	150	57.8	61.0	64.8	69.2	81.6								48.21	50.35	52.76	55.48	62.30	72.16						
	170	105.3	121.1											75.36	80.85	87.75	96.86								
60	80	7.4	7.6	7.8	8.1	8.6	9.3	10.1	11.0	12.3	14.0	16.5	21.4	6.65	6.83	7.02	7.22	7.66	8.17	8.78	9.50	10.40	11.54	13.10	15.46
	100	16.2	16.7	17.3	17.9	19.3	21.0	23.1	25.9	29.7	35.9			14.42	14.87	15.30	15.78	16.87	18.16	19.71	21.65	24.17	27.69	33.26	
	120	27.4	28.4	29.5	30.8	33.7	37.4	42.5	50.1					23.97	24.77	25.63	26.56	28.71	31.34	34.70	39.22	45.90			
	140	43.1	45.1	47.4	50.0	56.8	66.8							36.64	38.10	39.71	41.51	45.84	51.61	59.99					
	160	70.7	76.2	83.1	92.4									56.06	59.16	62.77	67.06	78.99							
	180													102.14	117.46										
80	100	8.8	9.1	9.4	9.8	10.6	11.7	13.3	14.9	17.7	23.3			7.76	8.00	8.26	8.55	9.19	9.96	10.92	12.15	13.85	16.42	21.38	
	120	19.9	20.7	21.6	22.6	25.0	28.1	32.5	39.8					17.27	17.88	18.55	19.28	20.98	23.12	25.92	29.89	36.30			
	140	35.5	37.3	39.3	41.7	48.0	57.8							29.85	31.12	32.54	34.14	30.03	43.38	51.58					
	160	62.8	68.0	74.8	84.0									49.10	51.99	55.40	59.50	71.21							
	180													94.65	109.74										
100	120	11.1	11.6	12.1	12.8	14.3	16.4	19.7	26.3					9.48	9.85	10.26	10.70	11.77	13.14	15.05	17.99	23.75			
	140	26.5	28.0	29.8	31.8	37.3	46.8							22.00	23.02	24.18	25.49	28.77	33.50	41.41					
	160	53.6	58.5	65.0	**74.1**									41.09	43.73	46.87	50.72	62.19							
	180													86.16	101.04										
110	115	2.8	3.0	3.1	3.3	3.7	4.3	5.2	7.1					2.43	2.52	2.63	2.75	3.03	3.39	3.91	4.72	6.41			
	120	5.9	6.2	6.5	6.9	7.8	9.1	11.3	16.8					5.01	5.22	5.44	5.70	6.31	7.12	8.28	10.22	15.03			
	125	9.2	9.7	10.2	10.8	12.3	14.6	18.8						7.77	8.11	8.47	8.89	9.89	11.25	13.27	16.88				
	130	12.8	13.5	14.3	15.2	17.5	21.2	28.6						10.75	11.23	11.76	12.36	13.84	15.90	19.10	25.47				
	150	32.4	34.7	37.5	41.1	52.6								25.77	27.22	28.89	30.87	36.20	45.36						
	170	78.2	93.3											52.13	56.88	63.12	71.96								
120	125	3.3	3.5	3.7	3.9	4.6	5.6	7.7						2.76	2.89	3.03	3.19	3.58	4.14	5.02	6.87				
	130	6.9	7.3	7.8	8.3	9.8	12.2	18.5						5.73	6.00	6.31	6.66	7.54	8.80	10.92	16.27				
	135	10.9	11.6	12.4	13.3	15.8	20.5							8.95	9.40	9.90	10.48	11.96	14.18	18.18					
	140	15.4	16.4	17.6	19.0	23.2	31.8							12.47	13.13	13.88	14.75	17.01	20.55	27.74					
	160	42.3	46.7	52.7	61.7									31.46	33.71	36.46	39.92	51.03							
	180													76.08	90.76										
130	135	4.0	4.3	4.6	5.0	6.1	8.5							3.22	3.39	3.59	3.82	4.43	5.40	7.47					
	140	8.5	9.1	9.8	10.7	13.5	20.8							6.73	7.12	7.56	8.08	9.48	11.85	17.92					
	145	13.5	14.6	15.9	17.5	23.0								10.62	11.26	12.01	12.90	15	19.91						
	150	19.4	21.1	23.2	26.0	36.5								14.97	15.93	17.08	18.47	38	30.87						
	170	64.9	79.8											41.13	45.42	51.26	60.01	22.50							
	190																								
140	145	5.1	5.5	6.1	6.8	9.7								3.88	4.14	4.45	4.82	5.92	8.29						
	150	10.9	12.0	13.4	15.3	24.3								8.22	8.81	9.51	10.39	13.10	20.22						
	155	18.0	19.9	22.6	26.7									13.16	14.17	15.42	17.02	22.33							
	160	26.7	30.2	35.3	44.1									18.89	20.50	22.54	25.23	35.43							
	180													63.18	77.62										
150	155	7.0	7.9	9.3	11.6									4.93	5.36	5.91	6.64	9.45							
	160	15.8	18.2	22.1	30.2									10.65	11.68	13.03	14.90	23.65							
	165	27.5	32.9	43.4										17.49	19.41	22.02	25.94								
	170	45.3	56.6											26.03	29.41	34.35	42.86								
160	165													6.83	7.73	9.03	11.24								
	170													15.36	17.73	21.52	29.41								
	175													26.74	32.06	42.30									
	180													44.09	58.05										
170	175													11.38	14.47	22.88									
	180													28.75	41.76										
	185													67.78											
180	185													**41.24**											

TABLE 3-CLEAN TUBE TEMPERATURE FACTORS

Heated Water		200° HEATING WATER												210° HEATING WATER											
		TEMPERATURE DROP												TEMPERATURE DROP											
In	out	5°	10°	15°	20°	30°	40°	50°	60°	70°	80°	90°	100°	5°	10°	15°	20°	30°	40°	50°	60°	70°	80°	90°	100°
	60	5.38	5.50	5.63	5.76	6.04	6.36	6.72	7.12	7.59	8.14	8.79	9.60	4.95	5.06	5.17	5.28	5.52	5.79	6.09	6.43	6.81	7.25	7.77	8.38
	80	11.42	11.68	11.97	12.27	12.92	13.65	14.49	15.46	16.60	17.96	19.66	21.84	1045	10.68	10.93	11.18	11.73	12.34	13.03	13.82	14.73	15.80	17.08	18.61
	100	18.37	18.84	19.34	19.86	21.02	22.35	23.90	25.74	27.97	30.77	34.48	39.78	16.71	17.11	17.53	17.97	18.93	20.01	21.26	22.70	24.41	26.49	29.09	32.51
40	120	26.73	27.49	28.30	29.16	31.11	33.39	36.14	39.56	43.97	50.09			24.09	24.71	25.38	26.08	27.64	29.44	31.56	34.09	37.22	41.25	46.77	
	140	37.38	38.62	39.96	41.41	44.77	48.92	54.27	61.62					33.21	34.18	35.23	36.36	38.92	41.96	45.71	50.48	56.95			
	160	52.44	54.64	57.10	59.88	66.73	76.41							45.37	46.98	48.75	50.70	55.28	61.18	69.26					
	180	79.13	84.62	91.44	100.39									64.12	67.30	70.96	75.26	86.80							
	70	5.68	5.81	9.95	6.10	6.42	6.78	7.19	7.66	8.21	8.88	9.69	1073	5.20	5.32	5.44	5.56	5.83	6.13	6.47	6.86	7.30	7.82	8.45	9.21
	90	12.12	12.42	12.74	13.08	13.83	14.68	15.67	16.83	18.23	19.96	22.21	25.31	11.04	11.30	11.57	11.86	12.48	13.18	13.98	14.90	15.99	17.30	18.91	21.00
	110	19.68	20.22	20.80	21.41	22.78	24.37	26.26	28.57	31.48	35.35	40.94		17.79	18.24	18.72	19.22	20.33	21.60	23.09	24.84	26.98	29.67	33.22	38.30
50	130	29.00	29.90	30.88	31.93	34.32	37.20	40.81	45.50	52.09				25.91	26.64	27.42	28.25	30.11	32.31	34.95	38.23	42.48	48.35	57.52	
	150	41.40	42.96	44.66	46.55	51.04	56.91	65.14						36.27	37.46	38.75	40.15	43.38	47.38	52.54	59.63				
	170	60.48	63.63	67.28	71.58	83.32								50.92	53.05	55.43	58.11	64.73	74.08						
	190	105.83	120.90											76.91	82.22	88.84	97.51								
	80	6.02	6.17	6.33	60.50	6.86	7.28	7.76	8.32	9.00	9.83	10.89	12.34	5.49	5.62	5.75	5.89	6.20	6.54	6.93	7.38	7.91	8.55	9.32	10.32
	100	12.96	13.30	13.67	14.07	14.94	15.95	17.14	18.58	20.37	22.69	25.92	30.98	11.74	12.03	10.23	12.66	13.37	14.19	15.13	16.25	17.59	19.25	21.40	24.37
	120	21.27	21.91	22.59	23.32	24.97	26.94	29.35	32.40	36.48	42.43			19.08	19.60	20.15	20.74	22.05	23.58	25.40	27.61	30.41	34.13	39.50	
60	140	31.86	32.96	34.17	35.48	38.55	42.39	47.46	54.68					28.14	29.01	29.94	30.95	33.25	36.04	39.50	44.03	50.37	60.51		
	160	46.78	48.84	51.16	53.79	60.38	69.82							40.21	41.71	43.35	45.18	49.51	55.18	63.13					
	180	73.18	78.50	85.17	94.00									58.78	61.83	65.36	69.53	80.89							
	200													102.94	117.58										
	100	6.92	7.12	7.33	7.56	8.06	8.66	9.37	10.26	11.39	12.95	15.30	19.79	6.23	6.40	6.57	6.76	7.16	7.64	8.19	8.85	9.67	10.73	12.16	14.33
	120	15.21	15.69	16.21	16.77	18.06	19.61	21.56	24.11	27.68	33.39			13.55	13.94	14.36	14.81	15.81	17.00	18.43	20.22	22.55	25.80	30.95	
	140	25.73	26.68	27.72	28.87	31.56	35.02	39.73	46.78					22.57	23.30	24.10	24.97	26.96	29.41	32.52	36.72	42.92			
80	160	40.53	42.43	44.58	47.04	53.30	62.65							34.55	35.91	37.42	39.10	43.13	48.51	56.33					
	180	66.67	71.80	78.30	87.04									52.96	55.86	59.24	63.26	74.45							
	200													96.63	111.08										
	120	8.26	8.55	2.86	9.19	9.97	10.94	12.19	13.91	16.55	21.67			7.30	7.53	7.77	8.04	8.63	9.35	10.23	11.38	12.95	15.34	19.94	
	140	18.74	19.49	20.31	39.30	23.43	26.34	30.49	37.30					16.28	16.85	17.48	18.16	19.74	21.73	24.34	28.04	34.02	47.71		
100	160	33.44	35.13	37.07	79.21	45.13	54.30							28.19	29.38	30.71	32.20	35.85	40.86	48.53					
	180	59.33	64.24	70.55										46.45	49.17	52.37	56.22	67.24							
	200													89.68	103.94										
	115	2.11	2.18	2.27	2.35	2.56	2.81	3.14	3.61	4.34	5.85			1.86	1.92	1.98	2.05	2.21	2.39	2.63	2.93	3.36	4.02	5.38	
	120	4.34	4.49	4.66	4.85	5.29	5.84	6.58	7.62	9.36	13.62			3.81	3.94	4.07	4.21	4.54	4.94	5.45	6.12	7.07	8.64	12.45	
	125	6.70	6.95	7.22	7.52	8.23	9.13	10.36	12.17	15.37				5.87	6.06	6.27	6.50	7.03	7.67	8.50	9.61	11.25	14.13		
110	130	9.21	9.56	9.96	10.39	11.41	12.74	14.58	17.42	22.99				8.03	8.31	8.61	8.93	9.68	10.62	11.82	13.49	16.04	20.99		
	150	21.38	22.37	23.49	24.76	27.93	32.51	40.17						18.23	18.95	19.57	20.64	22.77	25.59	29.61	36.20				
	170	39.97	42.53	45.57	49.31	60.43								32.55	34.19	36.07	38.24	43.89	52.78						
	190	83.87	98.34											57.79	62.57	68.70	77.11								
	125	2.36	2.45	2.55	2.67	2.94	3.29	3.79	4.57	6.21				2.05	2.12	2.20	2.29	2.48	2.73	3.05	3.50	4.20	5.67		
	130	4.87	5.07	5.29	5.53	6.12	6.90	8.03	9.90	14.56				4.22	4.37	4.53	4.72	5.14	5.67	6.38	7.40	9.07	13.19		
120	135	7.55	7.87	8.23	8.63	9.60	10.91	12.87	16.37					6.51	6.75	7.02	7.31	7.99	8.87	10.05	11.80	14.91			
	140	10.45	10.91	11.43	12.01	13.44	15.43	18.53	24.69					8.96	9.30	9.68	10.10	11.09	12.38	14.16	16.91	22.30			
	160	25.07	26.47	28.09	30.01	35.18	44.06							20.81	21.77	22.58	24.09	27.17	31.61	39.04					
	180	50.74	55.36	61.49	70.01									38.93	41.42	44.38	48.00	58.81							
	135	2.68	2.81	2.94	3.10	3.48	4.01	4.87	6.66					2.29	2.38	2.48	2.59	2.86	3.20	3.68	4.44	6.02			
	140	5.57	5.84	6.13	6.47	7.32	8.55	10.60	15.78					4.74	4.93	5.14	5.38	5.95	6.71	7.80	9.62	14.13			
	145	8.71	9.14	9.63	10.19	11.62	13.77	17.65						7.35	7.66	8.01	8.39	9.33	10.61	12.50	15.89				
130	150	12.13	12.77	13.49	14.33	16.53	19.96	26.94						10.17	10.62	11.12	11.68	13.07	15.00	18.00	23.99				
	170	30.61	32.80	34.48	38.84	49.63								24.42	25.78	27.36	29.21	34.24	42.86						
	190	74.11	88.39											49.46	53.95	59.85	68.20								
	145	3.13	3.30	3.49	3.72	4.31	5.25	7.26						2.61	2.73	2.86	3.01	3.38	3.90	4.73	6.47				
	150	6.55	6.92	7.35	7.86	9.22	11.51	17.41						5.43	5.68	5.97	6.30	7.12	8.31	10.31	15.34				
	155	10.33	10.96	11.68	12.55	14.95	19.35							8.48	8.90	9.37	9.92	11.31	13.39	17.16					
140	160	14.57	15.51	16.62	17.97	21.88	30.01							11.82	12.43	13.14	13.96	16.08	19.42	26.19					
	180	40.06	44.24	49.91	58.43									29.83	31.97	34.57	37.84	48.33							
	200													72.29	86.20										
	155	3.78	4.03	4.33	4.69	5.76	8.06							3.05	3.21	3.40	3.62	4.19	5.11	7.06					
	160	8.01	8.57	9.26	10.11	12.75	19.67							6.39	6.75	7.16	7.65	8.97	11.20	16.94					
150	165	12.81	13.80	15.02	16.57	21.72								10.07	10.68	11.38	12.22	14.56	18.84						
	170	18.40	19.97	21.95	24.57	34.49								14.20	15.11	16.19	17.51	21.31	29.21						
	190	61.59	75.65											39.07	43.14	48.67	56.96								
	165	4.80	5.22	5.76	6.47	9.20								3.68	3.93	4.22	4.57	5.61	7.85						
	170	10.38	11.38	12.69	14.51	23.03								7.81	8.36	9.03	9.86	12.42	19.15						
160	175	17.05	18.91	21.46	25.26									12.50	13.46	14.64	16.15	21.17							
	180	25.37	28.66	33.47	41.76									17.95	19.47	21.40	23.95	33.61							
	200													60.11	73.82										
	175	6.66	7.53	8.80	10.95									4.68	5.09	5.61	6.30	8.96							
170	180	14.97	17.29	20.97	28.66									10.13	11.10	12.38	14.15	22.45							
	185	26.08	31.27	41.24										16.64	18.45	20.93	24.64								
	190	43.01	56.61											24.76	27.97	32.66	40.74								
	185	11.10	14.11	22.31										6.50	7.35	8.59	10.69								
180	190	28.05	40.74											14.62	16.88	20.47	27.97								
	195	66.14												25.47	30.52	40.25									
	200													42.00	55.27										
	195	40.25												10.84	13.78	21.79									
190	200													27.40	39.79										
	205													64.61											

TABLE 3-CLEAN TUBE TEMPERATURE FACTORS

Heated Water		220° HEATING WATER												230° HEATING WATER											
		TEMPERATURE DROP												TEMPERATURE DROP											
In	out	5°	10°	15°	20°	30°	40°	50°	60°	70°	80°	90°	100°	5°	10°	15°	20°	30°	40°	50°	60°	70°	80°	90°	100°
40	60	4.58	4.67	4.76	4.86	5.07	5.30	5.56	5.84	6.16	6.52	6.94	7.43	4.25	4.33	4.41	4.50	4.68	4.88	5.10	5.34	5.61	5.92	6.26	6.65
	80	9.62	9.82	10.03	10.25	10.72	11.24	11.89	12.47	13.21	14.07	15.08	16.28	8.90	9.07	9.26	9.45	9.85	10.30	10.79	11.34	11.96	12.66	13.47	14.42
	100	15.30	15.64	16.00	16.37	17.18	18.08	19.10	20.27	21.63	23.23	25.16	27.59	14.09	14.38	14.69	15.00	15.69	16.46	17.31	18.27	19.38	20.65	22.16	23.97
	120	21.89	22.41	22.96	23.55	24.83	26.29	27.98	29.93	32.28	35.17	38.87	43.89	20.02	20.47	20.94	21.43	22.50	23.70	25.07	26.64	28.48	30.67	33.35	36.77
	140	29.83	30.62	31.47	32.38	34.39	36.74	39.53	42.94	47.26	53.03			27.04	27.70	28.40	29.14	30.78	32.65	34.83	37.40	40.54	44.47	49.69	
	160	39.99	41.24	42.59	44.05	47.39	51.48	56.66	63.61					35.74	36.74	37.80	38.95	41.52	44.56	48.24	52.88	58.99			
	180	54.39	56.56	58.97	61.68	68.31	77.50							47.39	48.99	50.74	52.66	57.14	62.84	70.51					
50	70	4.79	4.89	4.99	5.10	5.33	5.59	5.88	6.20	6.56	6.98	7.47	8.06	4.43	4.52	4.61	4.70	4.90	5.12	5.37	5.64	5.94	6.29	6.69	7.15
	90	10.12	10.34	10.57	10.82	11.34	11.93	12.59	13.34	14.21	15.23	16.46	17.97	9.33	9.52	9.72	9.93	10.38	10.87	11.43	12.05	12.76	13.58	14.55	15.70
	110	16.20	16.58	16.98	17.40	18.32	19.36	20.56	21.94	23.58	25.57	28.06	31.34	14.85	15.17	15.51	15.87	16.64	17.51	18.49	19.61	20.91	22.45	24.31	26.63
	130	23.37	23.97	24.61	25.29	26.79	28.52	30.55	32.99	36.00	39.87	45.17	53.30	21.26	21.76	22.29	22.85	24.09	25.49	27.10	28.99	31.25	34.03	37.59	42.42
	150	32.25	33.19	34.20	35.29	37.75	40.69	44.29	48.90	55.13				28.99	29.76	30.58	31.45	33.39	35.66	38.35	41.64	45.80	51.37		
	170	44.09	46.65	47.36	49.24	53.64	59.37	67.18						38.90	40.11	41.41	42.85	46.05	50.00	55.01	61.73				
	190	62.37	65.45	69.00	73.16	84.35								52.95	55.05	57.38	60.01	66.43	75.33						
60	80	5.04	5.15	5.26	5.38	5.64	5.93	6.25	6.62	7.05	7.54	8.14	8.87	4.65	4.74	4.84	4.94	5.16	5.41	5.68	5.99	6.34	6.74	7.21	7.77
	100	10.70	10.95	11.21	11.48	12.08	12.75	13.52	14.40	15.44	16.70	18.25	20.25	9.82	10.03	10.25	10.49	10.99	11.55	12.19	12.91	13.74	14.72	15.90	17.35
	120	17.26	17.69	18.15	18.64	19.70	20.93	22.35	24.04	26.09	28.67	32.09	36.97	15.73	16.10	16.48	16.89	17.77	18.78	19.92	21.25	22.83	24.74	27.14	30.29
	140	25.16	25.86	26.61	27.41	29.21	31.33	33.87	37.03	41.12	46.78			22.72	23.30	23.91	24.56	26.01	27.68	29.64	31.98	34.88	38.62	43.73	
	160	35.25	36.40	37.65	39.00	42.12	45.98	5.96	57.81	68.37				31.36	32.28	33.25	34.31	36.68	39.52	43.00	47.45	53.48			
	180	49.53	51.59	53.89	56.49	62.90	71.96							42.92	44.43	46.09	47.91	52.20	57.72	65.28					
	200	74.86	80.02	86.45	94.86									60.75	63.74	67.19	71.23	82.09							
80	100	5.66	5.79	5.94	6.09	6.43	6.81	7.25	7.77	8.39	9.16	10.14	11.47	5.17	5.29	5.41	5.54	5.82	6.14	6.50	6.91	7.40	7.98	8.70	9.61
	120	12.20	12.52	12.86	13.22	14.03	14.96	16.07	17.40	19.05	21.20	24.18	28.86	11.07	11.34	11.62	11.92	12.58	13.34	14.21	15.24	16.48	18.02	20.01	22.76
	140	20.06	20.65	21.28	21.96	23.50	25.32	27.56	30.40	34.19	39.72			18.02	18.50	19.02	19.56	20.78	22.21	23.90	25.96	28.56	32.02	37.02	
	160	30.09	31.12	32.24	33.47	36.33	39.92	44.66	51.40					26.62	27.43	28.31	29.25	31.40	34.00	37.24	41.46	47.40			
	180	44.26	46.19	48.36	50.83	57.01	65.94							38.09	39.50	41.05	42.76	46.82	52.14	59.60					
	200	69.34	74.35	80.64	88.97									55.77	58.65	61.97	65.90	76.62							
100	120	6.53	6.71	6.91	7.12	7.59	8.14	8.80	9.62	10.68	12.12	14.31	18.48	5.89	6.04	6.20	6.37	6.75	7.19	7.71	8.32	9.08	10.06	11.40	13.41
	140	14.36	14.81	15.30	15.82	17.02	18.47	20.29	22.66	26.00	31.33			12.82	13.18	13.57	13.99	14.93	16.03	17.37	19.04	21.22	24.26	29.06	
	160	24.34	25.23	26.20	27.28	29.80	33.34	37.45	44.06					21.38	22.07	22.82	23.63	25.50	27.79	30.71	34.64	40.46			
	180	38.40	40.19	42.21	44.52	50.40	59.20							32.78	34.06	35.48	37.06	40.85	45.91	53.28					
	200	63.26	68.10	74.25	82.50									50.31	53.05	56.25	60.04	70.62							
110	115	1.66	1.71	1.76	1.81	1.94	2.08	2.25	2.47	2.75	3.14	3.74	4.99	1.50	1.53	1.58	1.62	1.72	1.83	1.97	2.13	2.33	2.59	2.95	3.51
	120	3.39	3.49	3.60	3.71	3.97	4.27	4.64	5.11	5.72	6.60	8.03	11.48	3.05	3.13	5.22	3.31	3.52	3.75	4.04	4.38	4.81	5.38	6.19	7.50
	125	5.20	5.36	5.53	5.71	6.11	6.60	7.20	7.95	8.97	10.47	13.08		4.67	4.79	4.93	5.07	5.40	5.78	6.23	6.78	7.48	8.42	9.79	12.18
	130	7.10	7.32	7.56	7.81	8.39	9.08	9.94	11.04	12.56	14.87	19.33		6.35	6.53	6.72	6.92	7.38	7.91	8.55	9.35	10.37	11.76	13.88	17.92
	150	15.85	16.40	17.00	17.66	19.20	21.12	23.66	27.24	33.03				13.99	14.43	14.90	15.41	16.56	17.97	19.73	22.03	25.26	30.43		
	170	27.46	28.62	29.91	31.35	34.89	39.75	47.19						23.73	24.59	25.53	26.57	29.03	32.17	36.44	42.86				
	190	45.28	47.92	51.03	54.77	65.48								37.46	39.19	41.16	43.41	49.12	57.68						
120	125	1.81	1.87	1.93	1.99	2.14	2.33	2.55	2.85	3.26	3.90	5.22		1.62	1.66	1.71	1.76	1.88	2.02	2.19	2.40	2.67	3.05	3.63	4.84
	130	3.71	3.83	3.96	4.10	4.42	4.80	5.29	5.94	6.86	8.38	12.07		3.30	3.40	3.50	3.61	3.86	4.16	4.51	4.97	5.56	6.41	7.79	11.14
	135	5.71	5.90	6.10	6.32	6.83	7.46	8.26	9.33	10.92	13.70			5.07	5.22	5.38	5.56	5.95	6.42	7.00	7.73	8.72	10.16	12.69	
	140	7.82	8.08	8.37	8.69	9.42	10.32	11.49	13.10	15.57	20.37			6.92	7.13	7.36	7.60	8.16	8.83	9.66	10.73	12.20	14.45	18.76	
	160	17.75	18.46	19.23	20.10	22.16	24.89	28.79	35.19					15.45	15.99	16.57	17.21	18.70	20.57	23.02	26.50	32.12			
	180	31.73	33.32	35.15	37.25	42.74	51.39							26.79	27.91	29.16	30.57	34.00	38.73	45.96					
130	135	2.00	2.07	2.14	2.22	2.42	2.65	2.97	3.40	4.08	5.50			1.76	1.82	1.88	1.94	2.09	2.26	2.48	2.77	3.16	3.79	5.07	
	140	4.11	4.25	4.41	4.59	5.00	5.52	6.20	7.19	8.81	12.81			3.61	3.73	3.85	3.99	4.30	4.67	5.15	5.78	6.67	8.14	11.73	
	145	6.34	6.58	6.83	7.12	7.78	8.63	9.78	11.47	14.48				5.56	5.75	5.94	6.16	6.6	7.26	8.03	9.08	10.61	13.32		
	150	8.73	9.06	9.43	9.83	10.79	12.04	13.77	16.44	21.67				7.62	7.88	8.16	8.46	9.17	10.05	11.18	12.75	15.14	19.80		
	170	20.29	21.22	22.27	23.47	26.46	30.77	37.99						17.32	18.00	18.75	15.59	21.60	24.25	28.04	34.26				
	190	37.98	40.39	43.27	46.80	57.32								30.97	32.52	34.29	36.34	41.68	50.10						
140	145	2.24	2.32	2.42	2.53	2.78	3.11	3.58	4.31	5.85				1.95	2.01	2.09	2.17	2.35	2.58	2.89	3.31	3.97	5.35		
	150	4.62	4.80	5.01	5.24	5.79	6.53	7.59	9.35	13.74				4.00	4.15	4.30	4.47	4.87	5.37	6.04	6.99	8.57	12.46		
	155	7.16	7.47	7.80	8.18	9.09	10.33	12.17	15.46					6.19	6.41	6.66	6.94	7.58	8.40	9.52	11.17	14.09			
	160	9.91	10.35	10.83	11.38	12.73	14.61	17.52	23.34					8.51	8.83	9.19	9.58	10.52	11.73	13.41	16.00	21.09			
	180	23.81	25.14	26.67	28.48	33.37	41.76							19.80	20.71	21.73	22.8	25.80	30.00	37.03					
	200	48.27	52.65	28.39	66.54									37.08	39.44	42.24	45.68	55.93							
150	155	2.55	2.66	2.79	2.94	3.30	3.80	4.60	6.30					2.18	2.27	2.36	2.46	2.71	3.03	3.49	4.20	5.70			
	160	5.29	5.54	5.82	6.14	6.94	8.09	10.03	14.93					4.50	4.68	4.89	5.11	5.65	6.36	7.39	9.11	13.37			
	165	8.27	8.68	9.14	9.67	11.02	13.05	16.71						6.99	7.28	7.61	7.98	8.86	10.06	11.85	15.06				
	170	11.53	12.13	12.81	13.61	15.67	18.92	25.51						9.67	10.10	10.57	11.10	12.42	14.24	17.08	22.73				
	190	29.12	31.20	33.73	36.92	47.13								23.26	24.55	26.04	27.80	32.56	40.74						
	210	70.59	84.17											47.16	51.43	57.04	64.98								
160	165	2.98	3.13	3.32	3.53	4.09	4.98	6.88						2.49	2.60	2.72	2.876	3.21	3.71	4.49	6.14				
	170	6.23	6.58	6.99	7.46	8.75	10.92	16.50						5.17	5.41	5.68	2.86	6.77	7.89	9.78	14.55				
	175	9.83	10.42	11.10	11.92	14.20	18.36							8.07	8.47	8.92	5.99	10.75	12.73	16.29					
	180	13.86	14.75	15.80	17.08	20.78	28.48							11.26	11.84	12.51	9.44	15.30	18.46	24.88					
	200	38.16	42.12	47.51	55.60									28.45	30.48	32.95	13.28	46.02							
	220													69.01	82.27		36.05								
170	175	3.60	3.83	4.12	4.46	5.47	7.65							2.91	3.06	3.24	3.44	3.99	4.85	6.71					
	180	7.62	8.16	8.81	9.62	12.11	18.68							6.09	6.43	6.82	7.29	8.54	10.66	16.10					
	185	12.20	13.14	14.29	15.76	20.65								9.60	10.17	10.84	11.64	13.86	17.92						
	190	17.52	19.01	20.89	23.38	32.80								13.54	14.41	15.43	16.68	20.29	27.80						
	210	58.73	72.12											37.30	41.17	46.43	54.33								
180	185	4.58	4.97	5.48	6.15	8.75								3.51	3.74	4.02	4.36	5.34	7.47						
	190	9.89	10.48	12.09	13.82	21.92								7.45	7.97	8.61	9.40	11.83	18.24						
	195	16.25	18.03	20.44	24.06									11.93	12.84	13.96	15.40	20.17							
	200	24.20	27.32	31.90	39.79									17.13	18.58	20.42	22.85	32.04							
	220													57.44	70.53										
190	195	6.35	7.18	8.39	10.44									4.47	4.86	5.36	6.01	8.55							
	200	14.29	16.49	20.00	27.32									9.67	10.60	11.82	13.51	21.42							
	205	24.89	29.83	39.34										15.89	17.63	19.92	23.52								
	210	41.06	54.03											23.67	26.72	31.19	38.90								
200	205	10.60	13.47	21.30										6.22	7.03	8.21	10.21								
	210	26.79	38.90											13.98	16.13	19.56	26.72								
	215	63.19												24.36	29.18	38.48									
	220													40.18	52.86										
210	215	38.48												10.38	13.18	20.84									
	220													26.22	38.07										
	225													61.85											
220	225													37.67											

TABLE 3 CLEAN TUBE TEMPERATURE FACTORS

Heated Water		240° HEATING WATER												250° HEATING WATER											
		TEMPERATURE DROP												TEMPERATURE DROP											
In	out	5°	10°	15°	20°	30°	40°	50°	60°	70°	80°	90°	100°	5°	10°	15°	20°	30°	40°	50°	60°	70°	80°	90°	100°
40	60	3.96	4.03	4.10	4.18	4.34	4.51	4.70	4.91	5.14	5.40	5.69	6.02	3.70	3.76	3.83	3.90	4.04	4.19	4.36	4.54	4.74	4.96	5.21	5.48
	80	8.27	8.42	8.58	8.74	9.10	9.48	9.91	10.38	10.90	11.49	12.15	12.92	7.71	7.84	7.98	8.13	8.44	8.78	9.14	9.55	9.99	10.49	11.05	11.68
	100	13.03	13.29	13.55	13.83	14.42	15.07	15.80	16.61	17.52	18.56	19.77	21.18	12.11	12.33	12.56	12.80	13.32	13.89	14.51	15.19	15.96	16.83	17.81	18.95
	120	18.42	18.81	19.21	19.63	20.54	21.55	22.68	23.97	25.45	27.17	29.22	31.72	17.04	17.37	17.72	18.08	18.86	19.72	20.68	21.75	22.97	24.36	25.98	27.91
	140	24.69	25.25	25.84	26.46	27.82	29.35	31.09	33.12	35.51	38.41	42.03	46.78	22.69	23.17	23.67	24.20	25.34	26.62	28.05	29.69	31.59	33.83	36.52	39.87
	160	32.28	33.10	33.97	34.89	36.94	39.30	42.09	45.46	49.64	55.11			29.40	30.09	30.81	31.57	33.25	35.15	37.35	39.92	43.02	46.84	51.78	
	180	42.02	43.27	44.61	46.06	49.36	53.36	58.37	64.98					37.75	38.75	39.82	40.97	43.53	46.53	50.14	54.62	60.43			
50	70	4.12	4.20	4.28	4.36	4.53	4.72	4.93	5.16	5.42	5.71	6.04	6.42	3.84	3.91	3.98	4.05	4.21	4.37	4.55	4.75	4.98	5.22	5.50	5.81
	90	8.64	8.80	8.98	9.16	9.55	9.97	10.44	10.97	11.56	12.24	13.01	13.92	8.03	8.18	8.33	8.49	8.82	9.19	9.60	10.05	10.55	11.11	11.75	12.49
	110	13.68	13.96	14.25	14.56	15.22	15.96	16.78	17.70	18.76	19.98	21.43	23.17	12.67	12.91	13.17	13.43	14.00	14.63	15.32	16.10	16.98	17.98	19.13	20.50
	130	19.46	19.89	20.34	20.81	21.85	23.00	24.32	25.83	27.60	29.71	32.29	35.58	18.92	18.29	18.68	19.08	19.96	20.93	22.02	23.26	24.69	26.34	28.32	30.73
	150	26.30	26.94	27.61	28.33	29.91	31.71	33.81	36.30	39.32	43.12	48.15		24.04	24.58	25.14	25.74	27.05	28.53	30.21	32.17	34.48	37.28	40.77	45.36
	170	34.79	35.75	36.79	37.89	40.37	43.31	46.88	51.36	57.27				31.45	32.24	33.08	33.97	35.95	38.24	40.94	44.19	48.24	53.52		
	190	46.16	47.71	49.41	51.27	55.61	61.14	68.57						40.96	42.17	43.47	44.88	48.08	51.95	56.81	63.21				
60	80	4.30	4.39	4.47	4.56	4.75	4.96	5.20	5.46	5.75	6.08	6.46	6.90	4.00	4.07	4.15	4.23	4.40	4.58	4.78	5.00	5.25	5.53	5.84	6.20
	100	9.06	9.24	9.43	9.53	10.07	10.54	11.08	11.67	12.36	13.14	14.07	15.17	8.39	8.55	8.72	8.90	9.27	9.68	10.13	10.64	11.21	11.85	12.60	13.47
	120	14.43	14.74	15.07	15.41	16.16	16.99	17.94	19.02	20.27	21.74	23.53	25.77	13.31	13.58	13.86	14.16	14.79	15.50	16.29	17.18	18.20	19.37	20.76	22.44
	140	20.67	21.16	21.67	22.22	23.41	24.76	26.31	28.14	30.32	33.00	36.43	41.09	18.94	19.36	19.79	20.25	21.25	22.36	23.63	25.09	26.80	28.83	31.32	34.50
	160	28.22	28.96	29.75	30.60	32.47	34.66	37.26	40.44	44.47	49.85			25.62	26.24	26.89	27.58	29.11	30.85	32.88	35.29	38.21	41.88	46.75	
	180	37.89	39.06	40.32	41.69	44.82	48.64	53.50	60.01					33.91	34.85	35.84	36.92	39.32	42.17	45.63	49.96	55.70			
	200	51.61	53.65	55.92	58.46	64.70	73.34							45.02	46.53	48.17	49.98	54.20	59.56	66.78					
80	100	4.75	4.85	4.96	5.07	5.31	5.57	5.87	6.21	6.60	7.06	7.61	8.28	4.39	4.47	4.57	4.66	4.87	5.09	5.35	5.63	5.95	6.32	6.76	7.27
	120	10.11	10.34	10.58	10.83	11.39	12.01	12.72	13.54	14.50	15.66	17.10	18.95	9.29	9.49	9.69	9.91	10.38	10.90	11.49	12.16	12.93	13.84	14.93	16.27
	140	16.33	16.73	17.16	17.61	18.60	19.74	21.07	22.64	24.55	26.95	30.13	34.69	14.91	15.25	15.61	15.98	16.81	17.74	18.81	20.05	21.52	23.30	25.53	28.47
	160	23.84	24.49	25.19	25.95	27.63	29.60	31.98	34.93	38.76	44.06			21.55	22.10	22.67	23.28	24.63	26.19	28.03	30.22	32.94	36.43	41.22	
	180	33.45	34.53	35.69	36.97	39.90	43.52	48.20	54.63					29.80	30.66	31.57	32.56	34.79	37.46	40.73	44.91	50.57			
	200	47.06	49.00	51.17	53.62	59.66	68.20							40.83	42.26	43.81	45.53	49.58	54.78	61.92					
100	120	5.35	5.48	5.62	5.76	6.07	6.43	6.84	7.32	7.90	8.61	9.52	10.76	4.90	5.01	5.12	5.24	5.50	5.80	6.13	6.52	6.97	7.52	8.18	9.04
	140	11.56	11.86	12.18	12.52	13.27	14.14	15.17	16.41	17.96	19.96	22.75	27.13	10.50	10.75	11.02	11.30	11.92	12.62	13.44	14.40	15.56	17.00	18.86	21.44
	160	19.03	19.58	20.18	20.82	22.25	23.97	26.06	28.72	32.28	37.47			17.12	17.57	18.06	18.57	19.71	21.05	22.63	24.57	27.01	30.25	34.95	
	180	28.59	29.56	30.62	31.77	34.46	37.84	42.30	48.65					25.33	26.09	26.91	27.80	29.82	32.27	35.32	39.30	44.89			
	200	42.10	43.93	45.98	48.31	54.14	62.58							36.28	37.61	39.07	40.69	44.53	49.55	56.61					
110	115	1.36	1.39	1.43	1.46	1.54	1.64	1.74	1.87	2.02	2.21	2.45	2.78	1.24	1.27	1.30	1.33	1.40	1.47	1.56	1.26	1.78	1.92	2.10	2.32
	120	2.76	2.83	2.90	2.98	3.15	3.34	3.56	3.83	4.15	4.55	5.08	5.83	2.52	2.58	2.64	2.70	2.84	3.00	3.18	3.39	3.64	3.94	4.32	4.81
	125	4.22	4.33	4.44	4.56	4.82	5.12	5.48	5.90	6.41	7.07	7.94	9.21	3.85	3.94	4.03	4.13	4.35	4.60	4.88	5.21	5.61	6.09	6.70	7.51
	130	5.74	5.88	6.04	6.20	6.57	7.00	7.49	8.09	8.83	9.77	11.06	13.02	5.22	5.34	5.47	5.61	5.91	6.26	6.66	7.12	7.68	8.37	9.25	10.45
	150	12.50	12.85	13.23	13.63	14.54	15.61	16.91	18.52	20.63	23.58	28.24		11.27	11.56	11.87	12.20	12.93	13.78	14.77	15.98	17.48	19.42	22.13	26.37
	170	20.85	21.52	22.25	23.04	24.85	27.07	29.91	33.73	39.37				18.57	19.11	19.69	20.31	21.70	23.37	25.40	27.98	31.44	36.48		
	190	31.99	33.24	34.61	36.15	39.84	44.76	51.92						27.92	28.68	29.89	31.01	33.63	36.92	41.25	47.42				
120	125	1.46	1.50	1.54	1.58	1.67	1.78	1.91	2.07	2.26	2.52	2.86	3.40	1.32	1.36	1.39	1.42	1.50	1.59	1.70	1.82	1.96	2.14	2.38	2.70
	130	2.97	3.05	3.13	3.22	3.42	3.65	3.93	4.26	4.68	5.23	6.01	7.28	2.69	2.76	2.83	2.90	3.07	3.25	3.47	3.73	4.04	4.43	4.94	5.66
	135	4.55	4.67	4.80	4.94	5.26	5.62	6.06	6.59	7.27	8.18	9.51	11.83	4.12	4.22	4.33	4.44	4.70	4.99	5.33	5.74	6.24	6.87	7.72	8.95
	140	6.19	6.37	6.55	6.75	7.19	7.70	8.32	9.09	10.08	11.43	13.49	17.41	5.59	5.74	5.89	6.05	6.40	6.82	7.30	7.88	8.59	9.51	10.76	12.65
	160	13.65	14.07	14.53	15.02	16.14	17.51	19.21	21.45	24.58	29.60			12.20	12.54	12.91	13.30	14.18	15.22	16.48	18.05	20.09	22.96	27.49	
	180	23.16	23.99	24.91	25.92	28.31	31.36	35.52	41.76					20.36	21.02	21.72	22.49	24.25	26.41	29.17	32.88	38.37			
130	135	1.58	1.62	1.67	1.72	1.83	1.97	2.13	2.33	2.60	2.96	3.53	4.70	1.42	1.46	1.50	1.54	1.63	1.74	1.86	2.02	2.20	2.45	2.79	3.31
	140	3.22	3.31	3.41	3.52	3.76	4.05	4.40	4.83	5.41	6.23	7.57	10.82	2.90	2.98	3.06	3.14	3.34	3.56	3.83	4.15	4.56	5.09	5.85	7.08
	145	4.94	5.09	5.25	5.42	5.80	6.25	6.81	7.53	8.48	9.89	12.34		4.44	4.56	4.68	4.82	5.13	5.48	5.90	6.42	7.08	7.97	9.26	11.51
	150	6.75	6.95	7.18	7.41	7.95	8.60	9.41	10.45	11.88	14.06	18.25		6.04	6.21	6.39	6.58	7.01	7.51	8.11	8.86	9.82	11.13	13.12	16.94
	170	15.08	15.60	16.17	16.79	18.23	20.05	22.44	25.82	31.28				13.33	13.74	14.18	14.66	15.75	17.08	18.74	20.91	23.96	28.84		
	190	26.16	27.25	28.47	29.84	33.18	37.78	44.82						22.62	23.44	24.33	25.32	27.64	30.61	34.66	40.74				
140	145	1.72	1.77	1.83	1.89	2.03	2.21	2.42	2.69	3.08	3.68	4.93		1.54	1.58	1.63	1.68	1.79	1.92	2.08	2.27	2.53	2.88	3.44	4.57
	150	3.53	3.64	3.76	3.89	4.19	4.56	5.02	5.63	6.49	7.92	11.41		3.14	3.23	3.33	3.44	3.67	3.95	4.28	4.71	5.27	6.07	7.37	10.53
	155	5.43	5.61	5.80	6.01	6.49	7.08	7.83	8.84	10.34	12.97			4.83	4.97	5.12	5.28	5.66	6.10	6.64	7.34	8.26	9.63	12.02	
	160	7.44	7.69	7.96	8.26	8.94	9.80	10.90	12.42	14.75	19.28			6.59	6.79	7.01	7.24	7.76	8.39	9.18	10.19	11.58	13.69	17.77	
	180	16.91	17.58	18.31	19.12	21.08	23.66	27.35	33.40					14.73	15.24	15.79	16.40	17.80	19.57	21.89	25.19	30.51			
	200	30.26	31.77	33.49	35.49	40.70	48.90							25.57	26.64	27.82	29.15	32.41	36.90	43.77					
150	155	1.90	1.97	2.04	2.11	2.29	2.52	2.81	3.22	3.87	5.21			1.68	1.73	1.79	1.85	1.99	2.15	2.36	2.63	3.00	3.59	4.80	
	160	3.91	4.05	4.20	4.36	4.75	5.24	5.89	6.82	8.35	12.13			3.45	3.55	3.67	3.80	4.09	4.45	4.89	5.49	6.33	7.72	11.12	
	165	6.04	6.26	6.50	6.77	7.40	8.20	9.28	10.89	13.73				5.30	5.48	5.66	5.87	6.33	6.91	7.64	8.62	10.08	12.64		
	170	8.31	8.63	8.97	9.36	10.26	11.45	13.08	15.60	20.56				7.27	7.51	7.78	8.06	8.73	9.56	10.64	12.11	14.38	18.79		
	190	19.34	20.23	21.22	22.36	25.19	29.28	36.13						16.53	17.18	17.89	18.69	20.59	23.11	26.70	32.60				
	210	36.25	38.55	41.29	44.64	54.46								29.59	31.07	32.75	34.70	39.78	47.79						
160	165	2.13	2.21	2.30	2.40	2.64	2.96	3.40	4.10	5.55				1.86	1.92	1.99	2.07	2.24	2.46	2.75	3.15	3.77	5.08		
	170	4.40	4.58	4.77	4.99	5.51	6.21	7.21	8.88					3.82	3.96	4.10	4.26	4.64	5.12	5.75	6.65	8.15	11.83		
	175	6.83	7.12	7.43	7.79	8.65	9.82	11.57	14.69					5.90	6.12	6.35	6.61	7.22	8.01	9.06	10.62	13.40			
	180	9.45	9.86	10.32	10.84	12.12	13.90	16.66	22.18					8.12	8.43	8.77	9.14	10.03	11.18	12.77	15.23	20.06			
	200	22.73	23.99	25.45	27.17	31.81	39.79							18.92	19.78	20.75	21.86	24.62	28.62	35.30					
	220	46.13	50.30	55.78	63.53									35.47	37.72	40.39	43.67	53.44							
170	175	2.43	2.54	2.66	2.80	3.14	3.62	4.38	5.99					2.08	2.16	2.25	2.35	2.58	2.89	3.32	4.00	5.42			
	180	5.05	5.28	5.55	5.85	6.61	7.71	9.55	14.19					4.30	4.47	4.66	4.88	5.39	6.07	7.04	8.67	12.73			
	185	7.89	8.28	8.72	9.22	10.50	12.43	15.91						6.68	6.96	7.27	7.61	8.46	9.60	11.30	14.34				
	190	11.00	11.57	12.22	12.98	14.94	18.03	24.29						9.24	9.65	10.10	10.60	11.85	13.58	16.28	21.66				
	210	27.83	29.81	32.22	35.25	44.98								22.25	23.47	24.90	26.57	31.11	38.90						
	230	67.53	80.49											45.16	49.24	54.59	62.18								
180	185	2.84	2.99	3.16	3.37	3.90	4.74	6.55						2.38	2.48	2.60	2.74	3.07	3.54	4.28	5.85				
	190	5.95	6.28	6.67	7.12	8.34	10.41	15.72						4.94	5.17	5.43	5.72	6.46	7.53	9.33	13.87				
	195	9.39	9.95	10.60	11.38	13.54	17.51							7.72	8.10	8.53	9.02	10.27	12.15	15.55					
	200	13.24	14.09	15.09	16.31	19.83	27.17							10.77	11.32	11.96	12.69	14.61	17.62	23.74					
	220	36.50	40.28	45.43	53.15									27.24	29.18	31.53	34.50	44.01							
	240													66.14	78.83										
190	195	3.44	3.66	3.93	4.26	5.22	7.30							2.78	2.93	3.10	3.29	3.81	4.64	6.40					
	200	7.29	7.80	8.42	9.19	11.57	17.83							5.82	6.15	6.53	6.97	8.16	10.18	15.37					
	205	11.67	12.56	13.66	15.06	19.73								9.19	9.74	10.38	11.14	13.25	17.13						
	210	16.76	18.18	19.97	22.35	31.33								12.97	13.79	14.77	15.96	19.40	26.57						
	230	56.23	69.04											35.75	39.45	44.48	52.04								
	250																								
200	205	4.38	4.76	5.24	5.88	8.36								3.37	3.59	3.85	4.17	5.11	7.14						
	210	9.47	10.38	11.56	13.22	20.95								7.13	7.64	8.24	9.00	11.32	17.44						
	215	15.56	17.25	19.56	23.02									11.43	12.30	13.37	14.74	19.31							
	220	23.17	26.16	30.53	38.07									16.42	17.81	19.56	21.88	30.67							
	240													55.10	67.64										
210	215	6.09	6.88	8.03	9.99									4.29	4.66	5.13	5.76	8.18							
	220	13.69	15.79	19.15	26.15									9.27	10.16	11.32	12.94	20.51							
	225	23.85	28.58	37.67										15.24	16.90	19.16	22.54								
	230	39.35	51.77											22.70	25.62	29.91	37.29								
	250																								
220	225	10.16	12.91	20.41										5.96	6.74	7.87	9.79								
	230	25.69	37.29											13.41	15.48	18.76	25.62								
	235	60.60												23.38	28.01	36.92									
	240													38.57	50.74										
230	235	36.92												9.96	12.65	20.00									

TABLE 3 CLEAN TUBE TEMPERATURE FACTORS

Heated Water		260° HEATING WATER TEMPERATURE DROP					280° HEATING WATER TEMPERATURE DROP				
In	out	20°	40°	60°	80°	100°	20°	40°	60°	80°	100°
40	60	3.65	3.91	4.21	4.58	5.02	3.22	3.43	3.67	3.95	4.29
	80	7.58	8.15	8.83	9.64	10.65	6.66	7.12	7.64	8.26	9.00
	100	11.91	12.85	13.98	15.37	17.13	10.40	11.14	12.01	13.04	14.30
	120	16.74	18.16	19.88	22.05	24.90	14.52	15.61	16.90	18.47	20.43
	140	22.27	24.32	26.88	30.21	34.82	19.14	20.67	22.53	24.83	27.80
	160	28.80	31.77	35.60	40.86	48.88	24.44	26.57	29.21	32.60	37.19
	180	36.89	41.30	47.36	56.60		30.71	33.72	37.56	42.74	50.43
50	70	3.78	4.06	4.40	4.80	5.30	3.32	3.55	3.81	4.12	4.48
	90	7.90	8.52	9.26	10.16	11.31	6.91	7.39	7.96	8.64	9.47
	110	12.45	13.49	14.75	16.32	18.36	10.82	11.62	12.57	13.71	15.14
	130	17.59	19.17	21.13	23.64	27.06	15.16	16.35	17.79	19.56	21.82
	150	23.56	25.89	28.87	32.85	38.69	20.08	21.79	23.88	26.53	30.06
	170	30.76	34.22	38.84	45.53		25.81	28.23	31.28	35.30	41.04
	190	39.94	45.33	53.18			32.73	36.22	40.83	47.36	
60	80	3.94	4.24	4.61	5.06	5.62	3.44	3.69	3.97	4.30	4.71
	100	8.25	8.93	9.75	10.77	12.10	7.18	7.71	8.33	9.08	10.01
	120	13.07	14.22	15.64	17.45	19.87	11.28	12.16	13.21	14.50	16.13
	140	18.58	20.36	22.61	25.59	29.82	15.89	17.21	18.82	20.84	23.49
	160	25.08	27.77	31.30	36.24	44.06	21.16	23.09	25.48	28.59	32.90
	180	33.12	37.25	43.02	52.07		27.41	30.19	33.79	38.73	46.26
	200	43.78	50.56	61.59			35.14	39.30	45.01	53.72	
80	100	4.31	4.68	5.14	5.71	6.48	3.73	4.02	4.36	4.77	5.29
	120	9.12	9.96	11.01	12.38	14.26	7.83	8.46	9.23	10.18	11.41
	140	14.61	16.08	17.97	20.51	24.27	12.42	13.50	14.82	16.51	18.78
	160	21.09	23.47	26.63	31.18	38.77	17.68	19.35	21.46	24.25	28.22
	180	29.08	32.90	38.33	47.18		23.90	26.43	29.75	34.39	41.76
	200	39.67	46.23	56.96			31.59	35.49	40.94	49.49	
100	120	4.80	5.27	5.87	6.66	7.80	4.10	4.44	4.87	5.41	6.12
	140	10.28	11.38	12.81	14.80	17.88	8.68	9.47	10.45	11.73	13.50
	160	16.74	18.74	21.46	25.51	32.78	13.92	15.31	17.08	19.47	23.00
	180	24.69	28.13	33.16	41.76		20.11	22.36	25.34	29.63	36.80
	200	35.22	41.41	51.92			27.77	31.38	36.52	44.89	
110	115	1.22	1.34	1.49	1.70	2.00	1.04	1.13	1.23	1.37	1.56
	120	2.47	2.72	3.04	3.48	4.11	2.10	2.28	2.51	2.80	3.18
	125	3.77	4.16	4.66	5.34	6.37	3.19	3.48	3.83	4.28	4.89
	130	5.11	5.65	6.35	7.31	8.78	4.32	4.71	5.19	5.82	6.68
	150	11.02	12.31	14.03	16.55	20.86	9.20	10.10	11.24	12.77	14.98
	170	18.13	20.53	23.95	29.48		14.86	16.47	18.58	21.54	26.27
	190	27.15	31.50	38.34			21.69	24.36	28.05	33.75	
120	125	1.30	1.44	1.62	1.87	2.26	1.09	1.19	1.32	1.48	1.70
	130	2.64	2.93	3.31	3.84	4.68	2.22	2.43	2.68	3.02	3.50
	135	4.03	4.48	5.08	5.93	7.30	3.38	3.70	4.10	4.63	5.39
	140	5.47	6.10	6.94	8.15	10.17	4.58	5.02	5.58	6.32	7.39
	160	11.91	13.44	15.58	18.92	25.68	9.81	10.84	12.19	14.07	16.97
	180	19.83	22.81	27.30	35.57		15.98	17.87	20.44	24.27	31.15
130	135	1.39	1.55	1.77	2.09	2.63	1.16	1.27	1.42	1.61	1.89
	140	2.83	3.17	3.63	4.31	5.51	2.36	2.59	2.89	3.30	3.90
	145	4.34	4.87	5.60	6.69	8.71	3.59	3.96	4.43	5.08	6.04
	150	5.90	6.65	7.68	9.26	12.32	4.87	5.38	6.04	6.95	8.34
	170	12.99	14.86	17.61	22.38		10.53	11.74	13.37	15.75	19.82
	190	21.98	25.79	32.09			17.33	19.61	22.85	28.08	
140	145	1.50	1.70	1.96	2.39	3.22	1.24	1.37	1.54	1.78	2.14
	150	3.07	3.47	4.05	4.96	6.90	2.52	2.79	3.15	3.65	4.45
	155	4.71	5.35	6.27	7.77	11.21	3.85	4.27	4.84	5.64	6.94
	160	6.43	7.33	8.64	10.85	16.50	5.23	5.82	6.61	7.75	9.66
	180	14.33	16.68	20.41	28.13		11.38	12.83	4.86	18.03	24.44
	200	24.75	29.91	39.79			18.98	21.80	26.07	33.93	
150	155	1.64	1.87	2.22	2.81	4.46	1.33	1.48	1.69	1.99	2.50
	160	3.36	3.85	4.60	5.92	10.26	2.71	3.03	3.46	4.11	5.24
	165	5.16	5.96	7.16	9.39		4.14	4.65	5.34	6.38	8.29
	170	7.07	8.20	9.95	13.36		5.64	6.35	7.33	8.83	11.72
	190	16.03	19.12	24.60			12.43	14.20	16.81	21.35	
	210	28.52	36.07				21.05	26.68	30.68		
160	165	1.81	2.10	2.57	3.50		1.44	1.62	1.87	2.27	3.07
	170	3.71	4.34	5.36	7.54		2.94	3.32	3.86	4.73	6.57
	175	5.73	6.75	8.42	12.33		4.50	5.11	5.98	7.40	10.68
	180	7.89	9.34	11.83	18.35		6.15	7.01	8.25	10.35	15.72
	200	18.28	22.59	31.86			13.72	15.96	19.51	26.87	
	220	33.96	46.75				23.73	28.65	38.07		
170	175	2.02	2.40	3.07	4.96		1.57	1.79	2.12	2.68	4.25
	180	4.17	5.00	6.50	11.55		3.21	3.69	4.39	5.65	9.78
	185	6.47	7.83	10.38			4.94	5.70	6.84	8.97	
	190	8.94	10.93	14.88			6.77	7.84	9.51	12.76	
	210	21.39	27.99				15.37	18.32	23.54		
	230	42.75					27.36	34.58			
180	185	2.30	2.83	3.91			1.73	2.01	2.45	3.34	
	190	4.77	5.93	8.48			3.56	4.16	5.12	7.20	
	195	7.45	9.39	14.02			5.50	6.46	8.06	11.79	
	200	10.38	13.29	21.18			7.56	8.95	11.32	17.54	
	220	26.02	38.07				17.54	21.66	30.51		
	240	60.91					32.61	44.85			
190	195	2.68	3.46	5.72			1.94	2.30	2.94	4.74	
	200	5.60	7.37	13.56			4.00	4.79	6.22	11.05	
	205	8.83	11.89				6.21	7.50	9.94		
	210	12.43	17.25				8.58	10.48	14.25		
	230	33.79					20.54	26.86			
	250						41.09				
200	205	3.22	4.54				2.21	2.71	3.74		
	210	6.83	9.97				4.58	5.69	8.12		
	215	10.91	16.77				7.15	9.00	13.44		
	220	15.63	26.02				9.96	12.75	20.30		
	240	50.99					25.00	36.56			
210	215	4.08	6.99				2.57	3.32	5.48		
	220	8.81	17.08				5.38	7.08	13.01		
	225	14.45					8.48	11.41			
	230	21.44					11.94	16.56			
	250						32.50				
220	225	5.65					3.10	4.36			
	230	12.69					6.56	9.57			
	235	22.10					10.49	16.11			
	240	36.56					15.04	25.00			
230	235	9.60					6.72				
	240	25.13					16.42				

TABLE 3 CLEAN TUBE TEMPERATURE FACTORS

Heated Water		300° HEATING WATER TEMPERATURE DROP					320° HEATING WATER TEMPERATURE DROP					
In	out	20°	40°	60°	80°	100°	20°	40°	60°	80°	100°	120°
40	60	2.87	3.04	3.24	3.46	3.72	2.58	2.72	2.88	3.06	3.27	3.52
	80	5.92	6.29	6.71	7.19	7.76	5.31	5.61	5.95	6.34	6.79	7.32
	100	9.20	9.79	10.48	11.27	12.22	8.22	8.70	9.25	9.89	10.62	11.50
	120	12.77	13.63	14.63	15.82	17.25	11.36	12.05	12.85	13.78	14.87	16.19
	140	16.71	17.90	19.31	21.00	23.08	14.78	15.73	16.83	18.12	19.67	21.58
	160	21.14	22.76	24.69	27.07	30.10	18.56	19.83	21.31	23.08	25.24	27.98
	180	26.24	28.43	31.11	34.51	39.04	22.83	24.50	26.49	28.91	31.96	35.99
50	70	2.95	3.14	3.35	3.59	3.87	2.65	2.80	2.97	3.16	3.39	3.65
	90	6.11	6.50	6.95	7.48	8.10	5.46	5.78	6.15	6.56	7.05	7.63
	110	9.53	10.16	10.90	11.77	12.82	8.48	8.99	9.58	10.27	11.07	12.04
	130	13.26	14.20	15.29	16.60	18.21	11.75	12.49	13.36	14.37	15.57	17.05
	150	17.42	18.73	20.28	22.18	24.57	15.33	16.36	17.56	18.99	20.72	22.89
	170	22.15	23.95	26.12	28.85	32.42	19.34	20.72	22.36	24.33	26.80	30.00
	190	27.67	30.14	33.23	37.25	42.85	23.89	25.74	27.97	30.74	34.31	39.22
60	80	3.05	3.24	3.47	3.73	4.04	2.73	2.89	3.07	3.27	3.52	3.80
	100	6.33	6.75	7.23	7.81	8.49	5.63	5.98	6.37	6.82	7.35	7.98
	120	9.89	10.85	11.38	12.34	13.52	8.77	9.32	9.96	10.70	11.58	12.66
	140	13.82	14.84	16.04	17.51	19.34	12.18	12.99	13.93	15.03	16.38	18.05
	160	18.23	19.67	21.41	23.57	26.35	15.96	17.08	18.40	19.98	21.94	24.45
	180	23.31	25.32	27.80	30.98	35.30	20.21	21.73	23.55	25.79	28.64	32.48
	200	29.33	32.16	35.78	40.67	47.93	25.10	27.17	29.71	32.91	37.20	43.43
80	100	3.27	3.50	3.76	4.07	4.45	2.91	3.09	3.30	3.54	3.83	4.18
	120	6.83	7.32	7.90	8.60	9.47	6.03	6.43	6.88	7.42	8.06	8.86
	140	10.75	11.57	12.56	13.76	15.29	9.44	10.09	10.84	11.75	12.85	14.24
	160	15.15	16.40	17.91	19.81	22.30	13.21	14.17	15.30	16.68	18.40	20.65
	180	20.21	22.02	24.28	27.21	31.27	17.45	18.81	20.45	22.48	25.10	28.71
	200	26.20	28.83	32.23	36.90	44.02	22.32	24.23	26.57	29.58	33.67	39.79
100	120	3.55	3.82	4.14	4.53	5.02	3.13	3.34	3.58	3.88	4.23	4.68
	140	7.47	8.06	878	9.68	10.83	6.53	6.99	7.54	8.20	9.01	10.06
	160	11.86	12.88	14.12	15.71	17.85	10.29	11.06	11.99	13.12	14.57	16.49
	180	16.90	18.48	20.47	23.11	26.86	14.51	15.69	17.12	18.91	21.27	24.60
	200	22.87	25.26	28.40	32.81	39.79	19.37	21.09	23.23	26.01	29.86	35.85
110	115	0.90	0.97	1.05	1.15	1.27	0.79	0.84	0.91	0.98	1.07	1.19
	120	1.82	1.96	2.12	2.33	2.59	1.59	1.70	1.83	1.99	2.17	2.41
	125	2.76	2.97	3.23	3.55	3.96	2.42	2.58	2.78	3.02	3.31	3.68
	130	3.72	4.02	4.37	4.81	5.38	3.26	3.49	3.76	4.08	4.48	5.00
	150	7.85	852	9.33	10.36	11.73	6.82	7.33	7.94	8.68	9.61	10.86
	170	12.54	13.68	15.12	16.99	19.62	10.79	11.65	12.69	13.99	15.68	18.03
	190	17.99	19.80	22.15	25.37	30.26	15.30	16.62	18.26	20.35	23.21	27.48
120	125	0.94	1.02	1.11	1.22	1.37	.082	0.88	0.95	1.03	1.14	1.27
	130	1.90	2.06	2.25	2.48	2.79	1.66	1.78	1.92	2.10	2.31	2.59
	135	2.89	3.13	3.42	3.79	4.27	2.52	2.71	2.92	3.19	3.52	3.96
	140	3.91	4.24	4.64	5.15	5.82	3.40	3.65	3.95	4.32	4.78	5.39
	160	8.29	9.04	9.97	11.18	12.85	7.15	7.72	8.40	9.24	10.33	11.83
	180	13.32	14.63	16.31	18.57	21.91	11.37	12.33	13.51	15.02	17.04	20.00
130	135	0.99	1.07	1.18	1.31	1.48	0.86	0.92	1.00	1.09	1.21	1.37
	140	2.01	2.18	2.39	2.66	3.03	1.74	1.87	2.03	2.22	2.47	2.80
	145	3.05	3.32	3.65	4.07	4.65	2.64	2.84	3.09	3.39	3.77	4.29
	150	4.13	4.50	4.95	5.55	6.36	3.56	3.84	4.18	4.59	5.13	5.86
	170	8.80	9.65	10.37	12.18	14.27	7.53	8.16	8.93	9.90	11.20	13.07
	190	14.24	15.76	17.76	20.57	25.06	12.03	13.12	14.48	16.26	18.75	22.67
140	145	1.05	1.14	1.26	1.41	1.62	0.90	0.97	1.06	1.17	1.30	1.50
	150	2.12	2.32	2.56	2.88	3.33	1.83	1.97	2.15	2.37	2.66	3.06
	155	3.23	3.54	3.92	4.42	5.13	2.77	3.00	3.28	3.62	4.08	4.72
	160	4.38	4.80	5.33	6.03	7.04	3.75	4.06	4.44	4.92	5.55	6.46
	180	9.39	10.38	11.66	13.43	16.19	7.96	8.67	9.55	10.70	12.28	14.71
	200	15.32	17.12	19.56	23.20	29.75	12.79	14.04	15.63	17.79	20.97	26.57
150	155	1.11	1.22	1.35	1.54	1.80	0.95	1.03	1.13	1.25	1.41	1.65
	160	2.26	2.48	2.76	3.15	3.72	1.92	2.09	2.29	2.55	2.89	3.40
	165	3.44	3.79	4.24	4.85	5.76	2.93	3.18	3.50	3.90	4.44	5.26
	170	4.67	5.15	5.78	6.64	7.95	3.96	4.31	4.75	5.31	6.08	7.25
	190	10.09	11.24	12.79	15.05	18.93	8.45	9.26	10.29	11.66	13.66	17.04
	210	16.62	18.80	21.88	26.87		13.68	15.13	17.04	19.72	24.00	
160	165	1.18	1.31	1.47	1.70	2.05	1.00	1.09	1.20	1.35	1.55	1.86
	170	2.41	2.67	3.01	3.49	4.24	2.04	2.22	2.45	2.76	3.18	3.85
	175	3.69	4.09	4.63	5.39	6.62	3.10	3.39	3.75	4.23	4.91	6.00
	180	5.01	5.57	6.33	7.41	9.23	4.20	4.60	5.11	5.78	6.74	8.34
	200	10.92	12.30	14.23	17.25	23.36	9.03	9.96	11.18	12.88	15.50	20.73
	220	18.22	20.92	24.99	32.49		14.73	16.45	18.78	22.26	28.52	
170	175	1.27	1.42	1.61	1.90	2.39	1.07	1.17	1.30	1.47	1.73	2.16
	180	2.60	2.90	3.31	3.93	5.01	2.17	2.38	2.65	3.02	3.56	4.51
	185	3.98	4.45	5.11	6.10	7.92	3.31	3.64	4.06	4.64	5.52	7.10
	190	5.42	6.09	7.02	8.45	11.20	4.49	4.95	5.54	6.36	7.62	10.01
	210	11.93	13.63	16.12	20.45		9.70	10.81	12.28	14.44	18.14	
	230	20.23	23.70	29.44			16.00	18.08	21.03	25.80		
180	185	1.38	1.55	1.80	2.18	2.93	1.14	1.26	1.41	1.63	1.96	2.62
	190	2.82	3.18	3.70	4.53	5.01	2.32	2.57	2.89	3.34	4.07	5.58
	195	4.32	4.90	5.73	7.09	7.92	3.54	3.93	4.44	5.17	6.35	9.03
	200	5.91	6.72	7.91	9.91	11.20	4.82	5.36	6.07	7.11	8.84	13.21
	220	13.19	15.33	18.72	25.75		10.51	11.83	13.68	16.56	22.41	
	240	22.82	27.53	36.56			17.55	20.13	24.03	31.23		
190	195	1.51	1.72	2.03	2.57	2.93	1.22	1.36	1.55	1.82	2.29	3.57
	200	3.09	3.54	4.21	5.41	6.28	2.50	2.79	3.18	3.77	4.80	8.15
	205	4.75	5.47	6.56	8.59	10.21	3.83	4.28	4.91	5.86	7.60	
	210	6.51	7.53	9.12	12.23	15.04	5.21	5.85	6.74	8.11	10.75	
	230	14.78	17.60	22.60			11.49	13.11	15.50	19.65		
	250	26.34	33.26				19.50	22.83	28.33			
200	205	1.66	1.93	2.35	3.21	4.06	1.33	1.49	1.73	2.09	2.82	
	210	3.42	3.99	4.92	6.90	9.37	2.71	3.06	3.56	4.35	6.03	
	215	5.28	6.21	7.73	11.31		4.16	4.72	5.51	6.81	9.80	
	220	7.27	8.60	10.87	16.83		5.69	6.47	7.61	9.53	14.44	
	240	16.88	20.83	29.32			12.71	14.76	18.02	24.77		
210	215	1.86	2.21	2.82	4.55		1.45	1.66	1.95	2.47	3.90	
	220	3.85	4.61	5.98	10.61		2.97	3.41	4.05	5.20	9.00	
	225	5.97	7.21	9.55			4.58	5.27	6.32	8.26		
	230	8.26	10.08	13.70			6.27	7.26	8.78	11.76		
	250	19.79	25.85				14.26	16.97	21.77			
220	225	2.12	2.61	3.60			1.60	1.86	2.27	3.09		
	230	4.41	5.47	7.81			3.30	3.85	4.73	6.64		
	235	6.89	8.67	12.92			5.10	5.98	7.45	10.88		
	240	9.60	12.27	19.53			7.01	8.29	10.47	16.19		
230	235	2.48	3.20	5.28			1.80	2.13	2.72	4.38		
	240	5.19	6.81	12.51			3.71	4.44	5.76	10.21		
240	245	2.99	4.20				2.05	2.51	3.47			
	250	6.33	9.22				4.26	5.28s	7.53			

TABLE 3 CLEAN TUBE TEMPERATURE FACTORS

Heated Water		340° HEATING WATER							360° HEATING WATER							
		TEMPERATURE DROP							TEMPERATURE DROP							
In	out	20°	40°	60°	80°	100°	120°	140°	20°	40°	60°	80°	100°	120°	140°	160°
40	60	2.34	2.46	2.59	2.74	2.91	3.10	3.33	2.13	2.23	2.34	2.47	2.61	2.77	2.95	3.17
	80	4.80	5.05	5.33	5.65	6.01	6.43	6.93	4.36	4.58	4.81	5.08	5.38	5.72	6.11	6.57
	100	7.40	7.81	8.26	8.77	9.36	10.05	10.86	6.72	7.06	7.43	7.86	8.34	8.89	9.53	10.92
	120	10.19	10.77	11.42	12.16	13.02	14.03	15.25	9.22	9.70	10.24	10.84	11.54	12.34	13.28	14.42
	140	13.20	13.98	14.86	15.88	17.08	18.51	20.26	11.90	12.54	13.27	14.09	15.04	16.15	17.48	19.10
	160	16.50	17.52	18.69	20.05	21.68	23.66	26.16	14.81	15.64	16.59	17.68	18.94	20.44	22.27	24.57
	180	20.15	21.47	23.00	24.82	27.03	29.79	33.41	17.98	19.05	20.27	21.69	23.37	25.39	27.91	31.20
50	70	2.39	2.52	2.66	2.82	3.00	3.21	3.45	2.18	2.28	2.40	2.54	2.68	2.85	3.05	3.28
	90	4.92	5.19	5.49	5.83	6.22	6.67	7.21	4.47	4.69	4.94	5.22	5.54	5.91	6.33	6.83
	110	7.61	8.04	8.52	9.07	9.71	10.46	11.35	6.89	7.25	7.65	8.10	8.61	9.21	9.90	10.74
	130	10.51	11.12	11.81	12.61	13.55	14.66	16.03	9.48	9.99	10.56	11.21	11.95	12.82	13.86	15.12
	150	13.65	14.48	15.43	16.54	17.85	19.45	21.44	12.26	12.95	13.72	14.61	15.64	16.85	18.33	20.16
	170	17.10	18.20	19.48	20.98	22.79	25.04	27.94	15.29	16.19	17.21	18.39	19.77	21.44	23.50	26.16
	190	20.97	22.41	24.10	26.13	28.63	31.84	36.21	18.63	19.78	21.11	22.67	24.53	26.81	29.72	33.16
60	80	2.46	2.59	2.74	2.91	3.10	3.33	3.59	2.23	2.34	2.47	2.61	2.77	2.95	3.16	3.41
	100	5.06	5.34	5.66	6.03	6.45	6.94	7.53	4.58	4.82	5.08	5.38	5.72	6.11	6.57	7.12
	120	7.85	8.30	8.82	9.41	10.10	10.92	11.92	7.08	7.46	7.89	8.37	8.92	9.56	10.32	11.25
	140	10.85	11.51	12.26	13.13	14.15	15.39	16.93	9.76	10.30	10.91	11.61	12.42	13.37	14.52	15.94
	160	14.14	15.04	16.07	17.29	18.74	20.53	22.83	12.66	13.39	14.22	15.18	16.31	17.65	19.31	21.41
	180	17.78	18.98	20.37	22.04	24.08	26.66	30.11	15.83	16.79	17.90	19.19	20.72	22.59	24.95	28.08
	200	21.89	2347	25.35	27.64	30.52	34.33	39.79	19.35	20.60	22.05	23.77	25.86	28.48	31.91	36.76
80	100	2.60	2.75	2.92	3.12	3.34	3.61	3.93	2.35	2.48	2.62	2.77	2.96	3.17	3.42	3.72
	120	5.39	5.71	6.07	6.49	6.99	7.59	8.32	4.85	5.11	5.41	5.75	6.15	6.61	7.16	7.85
	140	8.39	8.91	9.51	10.21	11.04	12.05	13.33	7.52	7.95	8.44	8.99	9.64	10.41	11.35	12.54
	160	11.67	12.43	13.31	14.36	15.62	17.20	19.25	10.41	11.03	11.74	12.56	13.53	14.69	16.14	18.03
	180	15.30	16.36	17.60	19.10	20.95	23.33	26.57	13.58	14.43	15.41	16.55	17.93	19.63	21.80	24.76
	200	19.39	20.83	22.56	24.68	27.38	31.02	36.38	17.09	18.22	19.55	21.13	23.06	25.51	28.78	33.55
100	120	2.78	2.95	3.15	3.38	3.65	3.98	4.39	2.50	2.64	2.80	2.98	3.19	3.44	3.75	4.13
	140	5.78	6.15	6.58	7.08	7.69	8.44	9.40	5.17	5.47	5.81	6.21	6.68	7.24	7.94	8.83
	160	9.05	9.66	10.38	11.23	12.27	13.58	15.34	8.05	8.55	9.11	9.77	10.56	11.52	12.73	14.34
	180	12.67	13.58	14.66	15.96	17.59	19.72	22.71	11.21	11.93	12.77	13.76	14.96	16.45	18.40	21.11
	200	16.75	18.04	19.60	21.53	24.02	27.45	32.69	14.71	15.72	16.90	18.32	20.08	22.34	25.42	30.09
110	115	0.70	0.74	0.79	0.85	0.92	1.01	1.11	0.63	0.66	0.70	0.75	0.81	0.87	0.95	1.05
	120	1.41	1.50	1.60	1.72	1.87	2.04	2.26	1.27	1.34	1.42	1.52	1.63	1.76	1.92	2.13
	125	2.14	2.28	2.43	2.62	2.84	3.10	3.45	1.92	2.03	2.15	2.30	2.47	2.67	2.92	3.24
	130	2.88	3.07	3.28	3.53	3.83	4.20	4.68	2.58	2.73	2.90	3.10	3.33	3.61	3.95	4.39
	150	6.01	6.41	6.88	7.44	8.12	8.98	10.11	5.35	5.68	6.05	6.48	7.00	7.63	8.42	9.46
	170	9.44	10.11	10.90	11.85	13.03	14.57	16.69	8.36	8.90	9.50	10.24	11.12	12.21	13.61	15.55
	190	13.27	14.27	15.48	16.96	18.85	21.41	25.21	11.68	12.46	13.39	14.49	15.84	17.57	19.89	23.31
120	125	0.73	0.77	0.83	0.89	0.97	1.06	1.19	0.65	0.69	0.73	0.78	0.84	0.91	1.00	1.11
	130	1.47	1.56	1.67	1.81	1.96	2.16	2.42	1.31	1.39	1.48	1.58	1.70	1.85	2.03	2.27
	135	2.22	2.37	2.54	2.74	2.99	3.29	3.69	1.98	2.10	2.24	2.40	2.58	2.81	3.09	3.46
	140	3.00	3.20	3.43	3.71	4.04	4.46	5.02	2.67	2.83	3.02	3.23	3.49	3.80	4.19	4.70
	160	6.26	6.70	7.22	7.84	8.62	9.61	10.97	5.55	5.91	6.31	6.79	7.37	8.08	8.99	10.24
	180	9.88	10.61	11.49	12.57	13.94	15.76	18.42	8.71	9.29	9.96	10.77	11.76	13.01	14.67	17.08
130	135	0.76	0.81	0.87	0.94	1.02	1.13	1.28	0.67	0.71	0.76	0.82	0.88	0.96	1.06	1.20
	140	1.53	1.63	1.75	1.90	2.08	2.30	2.61	1.36	1.44	1.54	1.65	1.79	1.95	2.16	2.44
	145	2.32	2.48	2.66	2.89	3.16	3.52	3.99	2.06	2.19	2.33	2.51	2.71	2.97	3.29	3.73
	150	3.12	3.34	3.60	3.91	4.29	4.78	5.44	2.77	2.95	3.15	3.38	3.67	4.02	4.47	5.08
	170	6.55	7.03	7.61	8.31	9.20	10.38	12.07	5.78	6.16	6.61	7.14	7.78	8.60	9.67	11.21
	190	10.37	11.19	12.18	13.41	15.02	17.25	20.73	9.09	9.72	10.47	11.38	12.51	13.97	15.99	19.12
140	145	0.79	0.84	0.91	0.99	1.09	1.21	1.39	0.70	0.74	0.79	0.86	0.93	1.02	1.13	1.29
	150	1.60	1.71	1.84	2.01	2.21	2.47	2.84	1.41	1.50	1.61	1.73	1.88	2.07	2.31	2.65
	155	2.42	2.60	2.80	3.05	3.37	3.78	4.36	2.14	2.28	2.44	2.63	2.86	3.15	3.53	4.06
	160	3.27	3.50	3.79	4.14	4.57	5.15	5.97	2.88	3.07	3.29	3.56	3.87	4.28	4.80	5.55
	180	6.87	7.41	8.06	8.86	9.89	11.32	13.50	6.03	6.45	6.94	7.53	8.27	9.21	10.51	12.48
	200	10.93	11.85	12.98	14.41	16.34	19.16	24.06	9.52	10.22	11.05	12.08	13.38	15.12	17.66	22.01
150	155	0.83	0.89	0.96	1.05	1.16	1.31	1.53	0.73	0.78	0.83	0.90	0.98	1.08	1.22	1.42
	160	1.67	1.80	1.95	2.13	2.36	2.68	3.14	1.47	1.57	1.68	1.82	1.99	2.21	2.49	2.91
	165	2.54	2.73	2.96	3.25	3.61	4.11	4.84	2.23	2.38	2.56	2.77	3.04	3.37	3.82	4.49
	170	3.43	3.69	4.01	4.40	4.91	5.61	6.66	3.01	3.21	3.46	3.75	4.11	4.58	5.21	6.17
	190	7.24	7.84	8.57	9.50	10.74	12.52	15.51	6.31	6.77	7.32	7.99	8.83	9.96	11.57	14.25
	210	11.58	12.62	13.92	15.61	17.99	21.73		10.00	10.78	11.72	12.90	14.43	16.56	19.89	
160	165	0.87	0.93	1.02	1.12	1.25	1.43	1.71	0.76	0.81	0.87	0.95	1.04	1.16	1.33	1.58
	170	1.75	1.89	2.06	2.27	2.55	2.93	3.53	1.54	1.64	1.77	1.93	2.12	2.37	2.72	3.27
	175	2.67	2.88	3.14	3.47	3.91	4.52	5.49	2.33	2.50	2.70	2.94	3.24	3.63	4.18	5.07
	180	3.61	3.90	4.26	4.72	5.32	6.19	7.61	3.15	3.37	3.64	3.98	4.39	4.94	5.72	7.01
	200	7.66	8.34	9.18	10.27	11.78	14.11	18.66	6.63	7.14	7.75	8.52	9.51	10.87	12.96	16.99
	220	12.32	13.51	15.04	17.09	20.13	25.50		10.55	11.42	12.50	13.87	15.71	18.41	23.11	
170	175	0.91	0.99	1.08	1.20	1.36	1.58	1.97	0.79	0.85	0.92	1.01	1.12	1.26	1.46	1.81
	180	1.85	2.01	2.20	2.45	2.78	3.26	4.10	1.61	1.73	1.87	2.05	2.27	2.57	3.01	3.77
	185	2.82	3.06	3.36	3.74	4.26	5.04	6.45	2.44	2.63	2.85	3.12	3.47	3.94	4.65	5.91
	190	3.81	4.15	4.56	5.10	5.83	6.95	9.06	3.30	3.55	3.86	4.24	4.72	5.39	6.39	8.28
	210	8.14	8.91	9.90	11.21	13.12	16.35		6.98	7.56	8.26	9.14	10.33	12.03	14.90	
	230	13.19	14.57	16.40	18.97	23.06			11.17	12.17	13.41	15.04	17.32	20.90		
180	185	0.97	1.05	1.16	1.30	1.49	1.78	2.37	0.83	0.90	0.98	1.08	1.20	1.37	1.64	2.16
	190	1.96	2.14	2.36	2.65	3.06	3.70	5.03	1.69	1.83	1.99	2.19	2.45	2.82	3.39	4.58
	195	2.99	3.26	3.61	4.07	4.71	5.76	8.11	2.57	2.78	3.03	3.34	3.76	4.34	5.27	7.36
	200	4.05	4.43	4.91	5.55	6.47	8.00	11.79	3.48	3.76	4.11	4.54	5.12	5.95	7.31	10.66
	220	8.70	9.60	10.76	12.38	14.90	19.90		7.39	8.04	8.85	9.89	11.34	13.57	17.94	
	240	14.21	15.86	18.09	21.43	27.43			11.90	13.04	14.50	16.48	19.39	24.54		
190	195	1.03	1.12	1.25	1.42	1.66	2.07	3.18	0.88	0.95	1.04	1.15	1.30	1.52	1.89	2.87
	200	2.09	2.29	2.55	2.90	3.42	4.33	7.22	1.79	1.94	2.12	2.35	2.67	3.13	3.94	6.49
	205	3.19	3.50	3.91	4.47	5.30	6.82		2.72	2.95	3.24	3.60	4.10	4.85	6.20	
	210	4.32	4.76	5.33	6.12	7.32	9.61		3.68	4.00	4.40	4.91	5.61	6.68	8.71	
	230	9.36	10.41	11.83	13.90	17.45			7.86	8.60	9.55	10.81	12.63	15.73		
	250	15.44	17.44	20.27	24.85				12.74	14.07	15.83	18.29	22.23			
200	205	1.10	1.21	1.36	1.56	1.88	2.51		0.93	1.01	1.12	1.25	1.43	1.72	2.28	
	210	2.24	2.47	2.78	3.22	3.91	5.36		1.89	2.06	2.28	2.55	2.94	3.56	4.84	
	215	3.42	3.79	4.28	4.97	6.10	8.68		2.89	3.15	3.48	3.92	4.54	5.54	7.79	
	220	4.65	5.16	5.85	6.84	8.51	12.69		3.91	4.28	4.74	5.35	6.23	7.70	11.34	
	240	10.15	11.41	13.18	15.95	21.57			8.41	9.27	10.39	11.95	14.36	19.17		
210	215	1.18	1.31	1.49	1.76	2.20	3.43		0.99	1.09	1.21	1.37	1.60	1.99	3.06	
	220	2.41	2.69	3.07	3.63	4.62	7.83		2.02	2.21	2.46	2.80	3.29	4.17	6.95	
	225	3.69	4.13	4.73	5.64	7.31			3.08	3.38	3.77	4.31	5.11	6.57		
	230	5.03	5.65	6.50	7.81	10.35			4.18	4.60	5.15	5.90	7.06	9.26		
	250	11.10	12.66	14.95	18.94				9.05	10.06	11.43	13.42	16.83			
220	225	1.28	1.44	1.66	2.01	2.71			1.06	1.17	1.31	1.51	1.82	2.42		
	230	2.62	2.96	3.43	7.19	5.81			2.16	2.39	2.69	3.10	3.77	5.17		
	235	4.02	4.55	5.32	6.57	9.44			3.30	3.66	4.13	4.80	5.89	8.36		
	240	5.49	6.24	7.34	9.18	13.91			4.49	4.99	5.65	6.61	8.20	12.23		
230	235	1.40	1.60	1.89	2.38	3.76			1.14	1.27	1.44	1.69	2.13	3.30		
	240	2.87	3.29	3.91	5.02	8.67			2.33	2.60	2.96	3.50	4.46	7.55		

TABLE 3 CLEAN TUBE TEMPERATURE FACTORS

Heated Water		380° HEATING WATER									400° HEATING WATER									
		TEMPERATURE DROP									TEMPERATURE DROP									
In	out	20°	40°	60°	80°	100°	120°	140°	160°	180°	20°	40°	60°	80°	100°	120°	140°	160°	180°	200°
40	60	1.95	2.04	2.14	2.24	2.36	2.49	2.64	2.82	3.01	1.80	1.87	1.96	2.05	2.15	2.26	2.39	2.53	2.69	2.88
	80	3.99	4.17	4.38	4.60	4.85	5.13	5.45	5.82	6.25	3.67	3.83	4.00	4.19	4.40	4.64	4.91	5.21	5.56	5.96
	100	6.13	6.42	6.74	7.09	7.49	7.95	8.46	9.06	9.78	5.63	5.88	6.15	6.45	6.79	7.16	7.59	8.08	8.64	9.31
	120	8.39	8.80	9.25	9.76	10.33	10.98	11.73	12.61	13.67	7.69	8.04	8.42	8.85	9.32	9.86	10.47	11.18	12.01	13.00
	140	10.81	11.35	11.95	12.63	13.40	14.29	15.32	16.56	18.07	9.87	10.33	10.84	11.41	12.05	12.78	13.61	14.58	15.73	17.14
	160	13.39	14.09	14.87	15.76	16.77	17.95	19.35	21.04	23.16	12.20	12.79	13.45	14.18	15.01	15.96	17.06	18.37	19.94	21.91
	180	16.20	17.08	18.08	19.21	20.53	22.08	23.95	26.27	29.28	14.71	15.44	16.27	17.20	18.26	19.49	20.93	22.67	24.82	27.59
50	70	1.99	2.08	2.19	2.30	2.42	2.56	2.72	2.90	3.12	1.83	1.91	2.00	2.09	2.20	2.32	2.45	2.60	2.77	2.97
	90	4.08	4.27	4.48	4.72	4.98	5.28	5.62	6.02	6.49	3.75	3.91	4.09	4.29	4.51	4.76	5.05	5.37	5.74	6.18
	110	6.28	6.58	6.92	7.29	7.72	8.20	8.75	9.41	10.19	5.75	6.01	6.30	6.62	6.97	7.37	7.82	8.35	8.96	9.69
	130	8.61	9.04	9.52	10.05	10.66	11.36	12.17	13.14	14.32	7.87	8.24	8.64	9.09	9.59	10.17	10.82	11.59	12.49	13.59
	150	11.10	11.68	12.32	13.04	13.87	14.83	15.96	17.33	19.03	10.12	10.61	11.15	11.75	12.43	13.21	14.11	15.17	16.44	18.03
	170	13.79	14.53	15.37	16.32	17.42	18.71	20.25	22.16	24.60	12.53	13.15	13.85	14.63	15.52	16.55	17.75	19.19	20.96	23.22
	190	16.72	17.66	18.73	19.97	21.41	23.12	25.22	27.89	31.47	15.13	15.92	16.80	17.80	18.95	20.29	21.88	23.82	26.28	29.55
60	80	2.04	2.13	2.24	2.36	2.49	2.64	2.81	3.00	3.24	1.87	1.95	2.04	2.14	2.25	2.38	2.52	2.68	2.87	3.08
	100	4.18	4.38	4.60	4.85	5.13	5.45	5.82	6.25	6.76	3.83	4.00	4.19	4.40	4.64	4.90	5.20	5.55	5.95	6.43
	120	6.44	6.76	7.11	7.51	7.96	8.48	9.08	9.79	10.66	5.89	6.16	6.46	6.80	7.17	7.59	8.08	8.65	9.31	10.12
	140	8.85	9.30	9.80	10.38	11.03	11.78	12.67	13.74	15.06	8.07	8.45	8.88	9.35	9.89	10.51	11.21	12.04	13.04	14.27
	160	11.43	12.04	12.72	13.50	14.39	15.44	16.69	18.22	20.17	10.39	10.90	11.48	12.12	12.85	13.68	14.66	15.83	17.25	19.06
	180	14.23	15.02	15.92	16.94	18.14	19.56	21.29	2346	26.32	12.89	13.55	14.29	15.13	16.09	17.21	18.53	20.13	22.14	24.78
	200	17.30	18.31	19.47	20.81	22.40	24.32	26.71	29.83	34.20	15.60	16.44	17.39	18.46	19.71	21.19	22.96	25.16	28.02	31.99
80	100	2.14	2.24	2.36	2.49	2.64	2.81	3.01	3.24	3.52	1.96	2.05	2.15	2.26	2.38	2.52	2.68	2.87	3.08	3.35
	120	4.40	4.62	4.87	5.15	5.47	5.84	6.27	6.79	7.42	4.01	4.20	4.41	4.65	4.91	5.21	5.56	5.96	6.45	7.04
	140	6.80	7.16	7.56	8.01	8.53	9.14	9.86	10.73	11.83	6.19	6.49	6.83	7.21	7.63	8.12	8.69	9.36	10.18	11.20
	160	9.38	9.89	10.47	11.13	11.89	12.79	13.88	15.22	16.96	8.51	8.94	9.42	9.96	10.58	11.30	12.14	13.15	14.40	16.01
	180	12.17	12.87	13.66	14.57	15.63	16.91	18.47	20.47	23.16	11.01	11.58	12.23	12.97	13.82	14.81	16.00	17.45	19.30	21.78
	200	15.24	16.15	17.20	18.43	19.88	21.66	23.90	26.87	31.16	13.71	14.47	15.32	16.30	17.43	18.78	20.43	22.49	25.21	29.11
100	120	2.26	2.38	2.51	2.66	2.83	3.03	3.26	3.55	3.90	2.06	2.16	2.27	2.39	2.53	2.69	2.88	3.10	3.36	3.70
	140	4.66	4.91	5.19	5.52	5.89	6.33	6.85	7.49	8.32	4.23	4.44	4.68	4.95	5.25	5.60	6.01	6.49	7.10	7.86
	160	7.24	7.64	8.10	8.63	9.24	9.97	10.86	11.98	13.46	6.55	6.89	7.27	7.70	8.19	8.77	9.45	10.28	11.32	12.69
	180	10.02	10.61	11.28	12.06	12.98	14.09	15.46	17.25	19.73	9.04	9.53	10.08	10.70	11.43	12.28	13.31	14.59	16.24	18.52
	200	13.08	13.89	14.82	15.91	17.22	18.83	20.90	23.70	27.90	11.74	12.40	13.15	14.02	15.04	16.25	17.74	19.64	22.20	26.02
110	115	0.57	0.60	0.63	0.67	0.71	0.76	0.82	0.90	0.99	0.52	0.54	0.57	0.60	0.64	0.68	0.73	0.78	0.85	0.94
	120	1.15	1.21	1.27	1.35	1.44	1.54	1.67	1.82	2.01	1.04	1.09	1.15	1.21	1.29	1.37	1.47	1.58	1.72	1.90
	125	17.73	1.82	1.93	2.05	2.18	2.34	2.53	2.76	3.06	1.57	1.65	1.74	1.84	1.95	2.07	2.22	2.40	2.62	2.89
	130	2.33	2.45	2.59	2.75	2.94	3.15	3.41	3.73	4.14	2.11	2.22	2.34	2.47	2.62	2.79	3.00	3.24	3.54	3.92
	150	4.81	5.08	5.38	5.73	6.13	6.62	7.20	7.93	8.89	4.36	4.58	4.83	5.12	5.44	5.82	6.27	6.82	7.50	8.39
	170	7.48	7.92	8.42	8.99	9.66	10.48	11.48	12.78	14.56	6.76	7.12	7.52	7.99	8.52	9.15	9.91	10.84	12.04	13.69
	190	10.40	11.03	11.76	12.61	13.63	14.88	16.46	18.58	21.69	9.34	9.86	10.46	11.14	11.93	12.87	14.03	15.49	17.44	20.29
120	125	0.59	0.62	0.65	0.69	0.74	0.80	0.86	0.94	1.05	0.53	0.56	0.59	0.62	0.66	0.70	0.76	0.82	0.89	0.99
	130	1.18	1.25	1.32	1.40	1.50	1.61	1.75	1.92	2.13	1.07	1.13	1.19	1.25	1.33	1.42	1.53	1.66	1.81	2.02
	135	1.79	1.88	1.99	2.12	2.27	2.44	2.65	2.92	3.26	1.62	1.70	1.79	1.90	2.02	2.16	2.32	2.51	2.76	3.08
	140	2.40	2.53	2.68	2.86	3.06	3.30	3.59	3.95	4.42	2.18	2.29	2.41	2.55	2.72	2.90	3.13	3.40	3.73	4.17
	160	4.97	5.26	5.59	5.97	6.41	6.94	7.60	8.45	9.59	4.49	4.73	5.00	5.31	5.66	6.07	6.57	7.18	7.97	9.03
	180	7.76	8.23	8.77	9.39	10.14	11.05	12.20	13.73	15.93	6.98	7.36	7.80	8.30	8.89	9.59	10.43	11.50	12.91	17.93
130	135	0.60	0.64	0.68	0.72	0.77	0.83	0.91	1.00	1.12	0.55	0.58	0.61	0.64	0.68	0.73	0.79	0.86	0.95	1.06
	140	1.22	1.29	1.37	1.46	1.56	1.69	1.84	2.03	2.29	1.10	1.16	1.23	1.30	1.38	1.48	1.60	1.74	1.92	2.16
	145	1.85	1.95	2.07	2.21	2.37	2.56	2.80	3.10	3.50	1.67	1.76	1.85	1.97	2.10	2.25	2.43	2.65	2.93	3.30
	150	2.48	2.62	2.79	2.98	3.20	3.46	3.79	4.20	4.77	2.24	2.36	2.49	2.65	2.82	3.03	3.28	3.58	3.96	4.49
	170	5.15	5.64	5.82	6.23	6.72	7.32	8.07	9.06	10.47	4.64	4.89	5.18	5.51	5.90	6.36	6.91	7.61	8.53	9.83
	190	8.06	8.57	9.16	9.85	10.69	11.72	13.06	14.90	17.74	7.22	7.64	8.11	8.66	9.30	10.08	11.03	12.27	13.97	16.56
140	145	0.63	0.66	0.70	0.75	0.81	0.88	0.96	1.07	1.21	0.56	0.59	0.63	0.67	0.71	0.76	0.83	0.91	1.01	1.14
	150	1.26	1.34	1.42	1.52	1.63	1.77	1.95	2.17	2.48	1.14	1.20	1.27	1.35	1.44	1.55	1.68	1.84	2.05	2.33
	155	1.91	2.02	2.15	2.30	2.48	2.70	2.96	3.31	3.80	1.72	1.82	1.92	2.04	2.18	2.35	2.55	2.80	3.12	3.57
	160	2.57	2.73	2.90	3.11	3.35	3.65	4.02	4.50	5.19	2.32	2.44	2.59	2.75	2.94	3.17	3.44	3.79	4.24	4.88
	180	5.35	5.69	6.08	6.53	7.08	7.75	8.62	9.81	11.61	4.80	5.07	5.39	5.75	6.17	6.68	7.31	8.11	9.21	10.86
	200	8.40	8.95	9.60	10.37	11.31	12.50	14.09	16.39	20.30	7.49	7.94	8.45	9.05	9.77	10.64	11.74	13.20	15.30	18.85
150	155	0.65	0.69	0.73	0.78	0.85	0.92	1.02	1.14	1.33	0.58	0.62	0.65	0.69	0.74	0.80	0.87	0.96	1.08	1.24
	160	1.31	1.39	1.48	1.59	1.72	1.87	2.07	2.33	2.72	1.18	1.24	1.32	1.40	1.50	1.62	1.77	1.95	2.20	2.55
	165	1.98	2.11	2.25	2.41	2.61	2.85	3.16	3.58	4.19	1.78	1.88	1.99	2.13	2.28	2.46	2.69	2.97	3.36	3.92
	170	2.67	2.84	3.03	3.25	3.53	3.86	4.29	4.87	5.75	2.40	2.53	2.69	2.87	3.08	3.33	3.64	4.03	4.57	5.38
	190	5.57	5.94	6.36	6.87	7.49	8.26	9.29	10.76	13.19	4.98	5.27	5.61	6.01	6.48	7.05	7.76	8.71	10.06	12.28
	210	8.77	9.38	10.09	10.96	12.04	13.43	15.36	18.36		7.79	8.27	8.84	9.50	10.30	11.29	12.57	14.33	17.05	
160	165	0.67	0.72	0.77	0.82	0.89	0.98	1.09	1.24	1.47	0.60	0.64	0.68	0.72	0.78	0.84	0.92	1.02	1.16	1.38
	170	1.36	1.45	1.55	1.67	1.81	1.99	2.22	2.54	3.04	1.22	1.29	1.37	1.46	1.57	1.71	1.87	2.08	2.38	2.84
	175	2.06	2.20	2.35	2.53	2.75	3.03	3.39	3.90	4.70	1.85	1.95	2.08	2.22	2.39	2.59	2.85	3.18	3.65	4.39
	180	2.78	2.96	3.17	3.42	3.73	4.11	4.61	5.33	6.50	2.48	2.63	2.80	2.99	3.23	3.51	3.86	4.33	4.99	6.06
	200	5.82	6.22	6.69	7.26	7.96	8.86	10.10	11.99	15.61	5.17	5.49	5.86	6.30	6.82	7.47	8.30	9.44	11.16	14.44
	220	9.19	9.86	10.66	11.64	12.89	14.56	16.98	21.15		8.12	8.65	9.27	10.01	10.91	12.05	13.57	15.77	19.53	
170	175	0.70	0.75	0.80	0.87	0.94	1.04	1.17	1.36	1.68	0.63	0.66	0.71	0.76	0.82	0.89	0.98	1.10	1.27	1.56
	180	1.42	1.51	1.62	1.76	1.92	2.12	2.40	2.80	3.48	1.26	1.34	1.43	1.53	1.65	1.80	1.99	2.24	2.61	3.24
	185	2.15	2.30	2.47	2.67	2.92	3.24	3.67	4.31	5.46	1.92	2.03	2.17	2.33	2.51	2.75	3.04	3.44	4.02	5.07
	190	2.90	3.10	3.33	3.61	3.96	4.40	5.01	5.92	7.63	2.58	2.74	2.92	3.14	3.40	3.72	4.13	4.68	5.52	7.08
	210	6.09	6.53	7.06	7.70	8.51	9.58	11.12	13.70		5.39	5.74	6.15	6.63	7.22	7.96	8.95	10.35	12.69	
	230	9.66	10.41	11.31	12.44	13.91	15.95	19.15			8.48	9.07	9.75	10.58	11.62	12.95	14.81	17.68		
180	185	0.73	0.78	0.84	0.91	1.00	1.12	1.28	1.52	1.99	0.65	0.69	0.74	0.79	0.86	0.94	1.05	1.19	1.42	1.84
	190	1.48	1.59	1.71	1.86	2.04	2.28	2.62	3.14	4.21	1.32	1.40	1.49	1.61	1.74	1.91	2.14	2.44	2.92	3.89
	195	2.25	2.41	2.60	2.83	3.12	3.49	4.02	4.87	6.74	1.99	2.12	2.27	2.44	2.66	2.92	3.27	3.75	4.52	6.22
	200	3.04	3.26	3.52	3.83	4.23	4.76	5.51	6.74	9.73	2.69	2.86	3.06	3.30	3.59	3.96	4.44	5.13	6.25	8.95
	220	6.40	6.89	7.48	8.22	9.17	10.47	12.47	16.35		5.63	6.01	6.46	7.10	7.68	8.55	9.74	11.55	15.03	
	240	10.20	11.04	12.07	13.39	15.16	17.75	22.26			8.89	9.54	10.31	11.25	12.45	14.05	16.38	20.39		
190	195	0.77	0.82	0.89	0.97	1.07	1.21	1.41	1.74	2.62	0.68	0.72	0.77	0.84	0.91	1.01	1.13	1.31	1.61	2.41
	200	1.55	1.67	1.81	1.97	2.19	2.48	2.89	3.62	5.89	1.37	1.46	1.57	1.69	1.85	2.05	2.31	2.69	3.35	5.40
	205	2.36	2.54	2.75	3.01	3.35	3.80	4.47	5.68		2.08	2.22	2.38	2.58	2.82	3.13	3.54	4.15	5.25	
	210	3.19	3.43	3.72	4.09	4.55	5.19	6.15	7.97		2.81	3.00	3.22	3.49	3.82	4.25	4.83	5.71	7.35	
	230	6.75	7.30	7.97	8.83	9.96	11.60	14.35			5.90	6.32	6.83	7.44	8.22	9.25	10.73	13.20		
	250	10.81	11.76	12.96	14.52	16.71	20.16				9.36	10.08	10.95	12.03	13.44	15.41	18.48			
200	205	0.81	0.87	0.94	1.04	1.16	1.32	1.58	2.08		0.71	0.76	0.81	0.88	0.97	1.08	1.23	1.46	1.92	
	210	1.64	1.76	1.92	2.11	2.36	2.71	3.27	4.41		1.43	1.53	1.65	1.79	1.97	2.20	2.52	3.02	4.05	
	215	2.49	2.68	2.92	3.23	3.62	4.18	5.08	7.08		2.18	2.33	2.51	2.73	3.01	3.37	3.88	4.69	6.49	
	220	3.36	3.63	3.97	4.38	4.94	5.73	7.04	10.26		2.94	3.15	3.40	3.70	4.08	4.59	5.31	6.49	9.37	
	240	7.15	7.77	8.55	9.55	10.94	13.09	17.29			6.20	6.67	7.24	7.94	8.86	10.11	12.03	15.77		
210	215	0.85	0.92	1.01	1.11	1.26	1.47	1.82	2.76		0.74	0.80	0.86	0.94	1.04	1.17	1.36	1.68	2.52	
	220	1.73	1.87	2.05	2.27	2.58	3.02	3.80	6.25		1.51	1.62	1.75	1.91	2.11	2.39	2.79	3.49	5.68	
	225	2.63	2.85	3.13	3.48	3.96	4.67	5.97			2.29	2.46	2.66	2.91	3.23	3.67	4.31	5.48		
	230	3.56	3.87	4.25	4.74	5.42	6.44	8.39			3.09	3.32	3.60	3.95	4.40	5.01	5.94	7.68		
	250	7.61	8.32	9.23	10.44	12.20	15.19				6.54	7.07	7.72	8.54	9.63	11.21	13.86			
220	225	0.90	0.98	1.08	1.21	1.38	1.66	2.19			0.78	0.84	0.91	1.00	1.12	1.28	1.52	2.01		
	230	1.83	2.00	2.20	2.47	2.84	3.43	4.66			1.58	1.71	1.86	2.04	2.28	2.62	3.15	4.25		
	235	2.79	3.05	3.37	3.79	4.38	5.35	7.52			2.41	2.60	2.83	3.12	3.50	4.04	4.90	6.83		
	240	3.79	4.14	4.58	5.17	6.02	7.43	10.94			3.26	3.52	3.84	4.24	4.77	5.54	6.80	9.90		
230	235	0.96	1.05	1.17	1.32	1.54	1.92	2.95			0.82	0.89	0.97	1.08	1.22	1.42	1.76	2.67		
	240	1.95	2.14	2.38	2.70	3.18	4.02	6.70			1.67	1.81	1.98	2.20	2.49	2.92	3.67	6.03		
240	245	1.03	1.13	1.27	1.46	1.75	2.34				0.87	0.95	1.05	1.17	1.34	1.60	2.12			
	250	2.09	2.31	2.60	3.00	3.64	4.99				1.78	1.93	2.13	2.39	2.75	3.32	4.51			

TABLE 3 CLEAN TUBE TEMPERATURE FACTORS

Heated Water		420º HEATING WATER TEMPERATURE DROP										
In	out	20º	40º	60º	80º	100º	120º	140º	160º	180º	200º	220º
40	60	1.66	1.73	1.80	1.88	1.97	2.06	2.17	2.29	2.42	2.57	2.75
	80	3.39	3.53	3.68	3.84	4.02	4.22	4.45	4.70	4.98	5.31	5.70
	100	5.19	5.41	5.64	5.90	6.19	6.50	6.86	7.26	7.72	8.26	8.89
	120	7.08	7.38	7.71	8.07	8.48	8.93	9.43	10.01	10.68	11.46	12.39
	140	9.07	9.47	9.90	10.38	10.92	11.52	12.21	12.99	13.90	14.99	16.31
	160	11.18	11.68	12.24	12.86	13.55	14.33	15.23	16.26	17.48	18.96	20.79
	180	13.44	14.06	14.76	15.54	16.41	17.41	18.56	19.91	21.53	23.52	26.09
50	70	1.69	1.76	1.84	1.92	2.01	2.11	2.22	2.35	2.49	2.65	2.84
	90	3.46	3.60	3.76	3.93	4.12	4.33	4.56	4.83	5.13	5.49	5.90
	110	5.30	5.52	5.77	6.04	6.34	6.67	7.05	7.48	7.97	8.55	9.24
	130	7.23	7.55	7.89	8.28	8.70	9.18	9.72	10.34	11.05	11.90	1.94
	150	9.28	9.70	10.15	10.66	11.23	11.87	12.60	13.45	14.44	15.64	17.12
	170	11.46	11.99	12.58	13.23	13.97	14.80	15.77	16.89	18.24	19.89	21.99
	190	13.72	14.46	15.19	16.02	16.96	18.03	19.29	20.77	22.58	24.85	27.87
60	80	1.73	1.80	1.88	1.96	2.06	2.16	2.28	2.41	2.56	2.74	2.94
	100	3.53	3.68	3.84	4.02	4.22	4.44	4.69	4.97	5.30	5.68	6.13
	120	5.41	5.65	5.91	6.19	6.51	6.86	7.26	7.72	8.25	8.88	9.64
	140	7.40	7.73	8.09	8.50	8.95	9.45	10.03	10.70	11.48	12.41	13.57
	160	9.51	9.95	10.43	10.97	11.57	12.26	13.04	13.96	15.05	16.39	18.07
	180	11.76	12.32	12.94	13.64	14.43	15.33	16.37	17.61	19.10	20.97	23.41
	200	14.18	14.89	15.67	16.56	17.56	18.73	20.10	21.75	23.79	26.43	30.06
80	100	1.80	1.88	1.96	2.06	2.16	2.28	2.41	2.56	2.74	2.94	3.19
	120	3.68	3.85	4.03	4.23	4.45	4.70	4.98	5.31	5.69	6.14	6.70
	140	5.67	5.93	6.21	6.53	6.89	7.29	7.75	8.28	8.91	9.68	10.64
	160	7.78	8.14	8.55	9.00	9.51	10.09	10.76	11.55	12.49	13.66	15.16
	180	10.02	10.51	11.05	11.66	12.36	13.15	14.08	15.19	16.54	18.26	20.55
	200	12.44	13.07	13.78	14.57	15.49	16.55	17.81	19.33	21.24	23.75	27.33
100	120	1.88	1.97	2.06	2.17	2.29	2.42	2.57	2.74	2.95	3.20	3.51
	140	3.87	4.05	4.25	4.47	4.72	5.01	5.33	5.72	6.18	6.74	7.46
	160	5.97	6.26	6.58	6.94	7.34	7.80	8.34	8.98	9.76	10.73	12.01
	180	8.22	8.63	9.08	9.60	10.18	10.86	11.66	12.62	13.81	15.35	17.46
	200	10.63	11.18	11.80	12.50	13.31	14.26	15.39	16.77	18.53	20.89	24.39
110	115	0.47	0.50	0.52	0.55	0.58	0.61	0.65	0.69	0.74	0.81	0.89
	120	0.95	1.00	1.05	1.10	1.16	1.23	1.31	1.40	1.51	1.64	1.80
	125	1.44	1.51	1.58	1.66	1.75	1.86	1.98	2.12	2.28	2.49	2.74
	130	1.93	2.02	2.12	2.23	2.36	2.50	2.66	2.85	3.08	3.36	3.71
	150	3.97	4.16	4.37	4.61	4.88	5.19	5.54	5.96	6.47	7.11	7.94
	170	6.14	6.45	6.79	7.17	7.60	8.11	8.69	9.40	10.27	11.39	12.92
	190	8.47	8.90	9.39	9.94	10.58	11.32	12.20	13.28	14.64	16.44	19.06
120	125	0.49	0.51	0.53	0.56	0.59	0.63	0.67	0.72	0.78	0.85	0.94
	130	0.98	1.02	1.08	1.13	1.20	1.27	1.36	1.45	1.57	1.72	1.91
	135	1.48	1.55	1.63	1.71	1.81	1.92	2.05	2.21	2.39	2.62	2.91
	140	1.98	2.08	2.18	2.30	2.43	2.59	2.76	2.97	3.23	3.54	3.95
	160	4.09	4.29	4.51	4.76	5.05	5.38	5.77	6.24	6.81	7.54	8.53
	180	6.33	6.65	7.01	7.42	7.89	8.44	9.09	9.88	10.87	12.18	14.05
130	135	0.50	0.52	0.55	0.58	0.61	0.65	0.70	0.75	0.82	0.90	1.00
	140	1.01	1.05	1.11	1.17	1.24	1.32	1.41	1.52	1.65	1.82	2.04
	145	1.52	1.59	1.68	1.77	1.87	1.99	2.14	2.30	2.51	2.77	3.12
	150	2.04	2.14	2.25	2.38	2.52	2.69	2.88	3.11	3.39	3.75	4.24
	170	4.21	4.42	4.66	4.93	5.24	5.60	6.03	6.55	7.20	8.05	9.26
	190	6.53	6.87	7.26	7.70	8.22	8.82	9.54	10.43	11.57	13.14	15.53
140	145	0.51	0.54	0.57	0.60	0.64	0.68	0.73	0.79	0.86	0.95	1.08
	150	1.03	1.09	1.14	1.21	1.28	1.37	1.47	1.59	1.74	1.93	2.20
	155	1.56	1.64	1.73	1.83	1.94	2.07	2.23	2.42	2.65	2.95	3.37
	160	2.10	2.21	2.33	2.46	2.62	2.80	3.01	3.26	3.58	4.01	4.60
	180	4.34	4.57	4.82	5.12	5.45	5.85	6.32	6.91	7.66	8.67	10.20
	200	6.75	7.12	7.53	8.01	8.57	9.24	10.05	11.07	12.41	14.35	17.59
150	155	0.53	0.56	0.59	0.62	0.66	0.71	0.76	0.83	0.91	1.02	1.17
	160	1.07	1.12	1.18	1.25	1.33	1.43	1.54	1.67	1.84	2.07	2.40
	165	1.61	1.70	1.79	1.90	2.02	2.16	2.33	2.54	2.81	3.17	3.69
	170	2.17	2.28	2.41	2.55	2.72	2.92	3.15	3.44	3.81	4.31	5.05
	190	4.49	4.73	5.01	5.32	5.69	6.13	6.66	7.32	8.20	9.44	11.49
	210	6.99	7.38	7.84	8.36	8.98	9.72	10.64	11.82	13.44	15.93	
160	165	0.55	0.57	0.61	0.64	0.69	0.74	0.80	0.87	0.97	1.10	1.29
	170	1.10	1.16	1.23	1.30	1.39	1.49	1.61	1.77	1.97	2.24	2.66
	175	1.66	1.75	1.86	1.97	2.10	2.26	2.45	2.69	3.00	3.43	4.12
	180	2.24	2.36	2.50	2.65	2.84	3.05	3.32	3.65	4.08	4.69	5.68
	200	4.64	4.91	5.20	5.55	5.96	6.44	7.04	7.81	8.86	10.44	13.44
	220	7.25	7.68	8.17	8.75	9.43	10.27	11.32	12.72	14.74	18.14	
170	175	0.56	0.59	0.63	0.67	0.72	0.77	0.84	0.92	1.04	1.20	1.46
	180	1.14	1.20	1.27	1.35	1.45	1.56	1.70	1.88	2.11	2.45	3.03
	185	1.72	1.82	1.93	2.05	2.20	2.38	2.59	2.86	3.23	3.77	4.73
	190	2.32	2.45	2.60	2.77	2.97	3.21	3.51	3.89	4.40	5.17	6.60
	210	4.82	5.10	5.43	5.80	6.25	6.80	7.49	8.39	9.69	11.82	
	230	7.54	8.01	8.55	9.19	9.95	10.90	12.13	13.83	16.44	21.64	
180	185	0.58	0.62	0.66	0.70	0.75	0.81	0.89	0.99	1.12	1.32	1.72
	190	1.18	1.25	1.32	1.41	1.52	1.65	1.80	2.01	2.29	2.73	3.62
	195	1.79	1.89	2.01	2.14	2.31	2.50	2.75	3.07	3.52	4.23	5.78
	200	2.40	2.54	2.71	2.89	3.12	3.39	3.73	4.17	4.80	5.83	8.29
	220	5.01	5.32	5.67	6.09	6.59	7.21	8.01	9.10	10.76	13.91	
	240	7.87	8.38	8.97	9.68	10.55	11.64	13.11	15.22	18.83		
190	195	0.61	0.64	0.68	0.73	0.79	0.86	0.95	1.06	1.23	1.50	2.23
	200	1.22	1.30	1.38	1.48	1.60	1.74	1.92	2.16	2.52	3.12	4.98
	205	1.86	1.97	2.10	2.25	2.43	2.65	2.93	3.32	3.88	4.88	
	210	2.50	2.65	2.83	3.04	3.28	3.59	3.98	4.52	5.32	6.82	
	230	5.22	5.65	5.95	6.41	6.98	7.69	8.64	9.99	12.24		
	250	8.22	8.79	9.45	10.24	11.24	12.53	14.31	17.07			
200	205	0.63	0.67	0.71	0.77	0.83	0.91	1.01	1.15	1.36	1.78	
	210	1.27	1.35	1.45	1.56	1.69	1.85	2.06	2.36	2.81	3.75	
	215	1.93	2.05	2.20	2.36	2.57	2.82	3.15	3.62	4.36	6.00	
	220	2.60	2.77	2.96	3.20	3.48	3.83	4.29	4.95	6.03	8.63	
	240	5.46	5.83	6.26	6.78	7.43	8.26	9.41	11.15	14.50		
210	215	0.66	0.70	0.75	0.81	0.88	0.97	1.09	1.27	1.56	2.32	
	220	1.33	1.42	1.52	1.64	1.79	1.98	2.23	2.60	3.23	5.21	
	225	2.02	2.15	2.31	2.50	2.73	3.02	3.42	4.01	5.07		
	230	2.72	2.90	3.12	3.38	3.70	4.11	4.67	5.51	7.09		
	250	5.72	6.13	6.61	7.21	7.95	8.95	10.37	12.76			
220	225	0.69	0.73	0.79	0.86	0.94	1.04	1.19	1.41	1.85		
	230	1.39	1.49	1.60	1.74	1.91	2.13	2.44	2.92	3.91		
	235	2.11	2.26	2.43	2.65	2.91	3.26	3.75	4.53	6.27		
	240	2.85	3.05	3.29	3.59	3.95	4.44	5.13	6.28	9.05		
230	235	0.72	0.77	0.83	0.91	1.00	1.13	1.31	1.62	2.44		
	240	1.46	1.57	1.69	1.85	2.05	2.31	2.70	3.38	5.49		
240	245	0.76	0.82	0.89	0.97	1.08	1.24	1.48	1.94			
	250	1.54	1.66	1.80	1.98	2.21	2.54	3.05	4.11			

TABLE 4 - 4"WU HEAT EXCHANGERS

2 & 4 PASS	BAFFLE SPACE		2"	2½"	3"	4"STD
	SHELL FLOW	A	24-32	33-40	41-48	49-64
	GPM	B	12-23	24-29	30-35	36-47

TABLE 4 - 4"WU HEAT EXCHANGERS (4 Pass)

"WU" Number	TUBE FLOW IN GPM																	
	2		4		6		8		10		15		20		25		30	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU42-4()	25.6	23.1	19.1	16.4	15.6	13.0	13.3	10.8	11.6	9.3	8.9 1.9	7.0 1.9						
WU43-4()	42.0	37.9	31.3	26.9	25.5	21.3	21.8 1.0	17.8 1.0	19.0 1.5	15.3 1.5	14.7 3.0	11.4 3.0						
WU44-4()	58.4	52.7	43.5	37.5	35.5	29.6	30.2 1.4	24.7 1.4	26.5 2.1	21.3	20.4 4.2	15.9 4.2						
WU45-4()	73.8	66.6	54.9	47.3	44.8 1.1	37.4 1.1	38.2 1.8	31.2 1.8	33.4 2.6	26.9 2.6	25.7 5.3	20.1 5.3						
WU46-4()	90.2	81.4	67.2 1.0	57.8 1.0	54.8 1.3	45.8 1.3	46.7 2.1	38.1 2.1	40.9 3.2	32.8 3.2	31.5 6.5	24.5 6.5						
WU47-4()	10.66	96.2	79.4 1.1	68.3 1.1	64.7 1.5	54.1 1.5	55.2 2.5	45.1 2.5	48.3 3.8	38.8 3.8	37.2 7.7	29.0 7.7						
Avg. Vel.4"-4" Pass	.88 ft./sec.		1.8		2.7		3.5		4.4		6.6							

TABLE 4 - 4"WU HEAT EXCHANGERS (2 Pass)

"WU" Number	TUBE FLOW IN GPM																	
	2		4		6		8		10		15		20		25		30	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU42-2()			12.8	11.6	10.9	9.6	9.5	8.2	8.6	7.2	6.9	5.7	5.8	4.7	5.0	4.0	4.5	3.5
WU43-2()			21.0	19.0	17.8	15.7	15.6	13.5	14.0	11.9	11.3	9.3	9.5	7.6	8.3 1.1	6.5 1.1	7.3 1.5	5.7 1.5
WU44-2()			29.2	26.4	24.8	21.8	21.8	18.7	19.5	16.5	15.7	12.9	13.2 1.0	10.6 1.0	11.5 1.5	9.1 1.5	10.2 2.1	7.9 2.1
WU45-2()			36.9	33.3	31.3	27.5	27.5	23.7	24.6	20.9	19.8	16.3	16.7 1.3	13.4 1.3	14.5 1.9	11.5 1.9	12.9 2.7	10.0 2.7
WU46-2()			45.1	40.7	38.2	33.6	33.6	28.9	30.1	25.5	24.2 1.0	19.9 1.0	20.4 1.6	16.4 1.6	17.8 2.4	14.0 2.4	15.7 3.3	12.3 3.3
WU47-2()			53.3	48.1	45.2	39.7	39.7	34.2	35.6	30.1	28.6 1.1	23.5 1.1	24.2 1.9	19.4 1.9	21.0 2.8	16.6 2.8	18.6 3.9	14.5 3.9
Avg. Vel.4"-2" Pass			.9 ft./sec		1.3		1.8		2.2		3.3		4.4		5.5		6.6	

TABLE 4 - 6"WU HEAT EXCHANGERS

2 & 4 PASS	BAFFLE SPACE		2"	2½"	3"STD	4"
	SHELL FLOW	A	30-39	40-50	45-60	61-80
	GPM	B	15-29	30-39	22-44	45-60

TABLE 4 - 6"WU HEAT EXCHANGERS (4 Pass)

"WU" Number	TUBE FLOW IN GPM																									
	5		10		15		20		25		30		35		40		50		60		70		80		90		100	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU62-4()	29.3	26.7	22.1	19.3	18.2	15.5	15.7	13.0	13.8	11.2	12.4	9.9	11.2	8.9	10.3	8.1	8.9	6.9										
											1.0	1.0	1.3	1.3	1.6	1.6	2.4	2.4										
WU63-4()	46.4	42.4	35.1	30.6	29.0	24.5	24.9	20.6	21.9	17.9	19.7	15.8	17.9	14.2	16.4	12.9	14.1	10.9										
									1.1	1.1	1.5	1.5	2.0	2.0	2.6	2.6	3.8	3.8										
WU64-4()	63.6	58.0	48.1	42.0	39.7	33.6	34.1	28.2	30.0	24.5	26.9	21.6	24.5	19.4	22.4	17.6	19.3	14.9										
							1.0	1.0	1.5	1.5	2.1	2.1	2.8	2.8	3.5	3.5	5.2	5.2										
WU65-4()	80.8	73.7	61.1	53.3	50.4	42.7	43.3	35.9	38.2	31.1	34.2	27.5	31.1	24.7	28.5	22.4	24.5	18.9										
							1.3	1.3	1.9	1.9	2.7	2.7	3.5	3.5	4.4	4.4	6.6	6.6										
WU66-4()	98.0	89.4	74.1	64.7	61.1	51.8	52.5	43.5	46.3	37.7	415	33.3	37.7	29.9	34.5	27.1	29.7	23.0										
							1.6	1.6	2.3	2.3	3.2	3.2	4.3	4.3	5.4	5.4	8.0	8.0										
WU67-4()	115.2	105.	87.1	76.0	71.9	60.8	61.7	51.1	54.4	44.3	48.8	39.2	44.3	35.1	40.6	31.9	34.9	27.0										
					1.0	1.0	1.9	1.9	2.8	2.8	3.8	3.8	5.0	5.0	6.3	6.3	9.4	9.4										
WU68-4()	132.0	120.7	100.	87.4	82.6	69.9	71.0	58.8	62.5	50.9	56.0	45.0	50.9	40.4	46.7	36.7	40.1	31.0										
			1.0	1.0	1.3	1.3	2.1	2.1	3.2	3.2	4.4	4.4	5.7	5.7	7.3	7.3	10.8	10.8										
Avg. Vel.4"-4" Pass.	0.8 ft./sec.		1.4		2.2		2.9		3.7		4.4		5.1		5.9		7.3		-		-		*		*		*	

TABLE 4 - 6"WU HEAT EXCHANGERS (2 Pass)

"WU" Number	TUBE FLOW IN GPM																									
	5		10		15		20		25		30		35		40		50		60		70		80		90		100	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU62-2()					12.5	11.1	11.1	9.7	10.0	8.6	9.1	7.7	8.4	7.1	7.8	6.5	6.9	5.6	6.2	5.0	5.6	4.5	5.2	4.1	4.8	3.7	4.4	3.4
																									1.0	1.0	1.2	1.2
WU63-2()					19.9	17.7	17.6	15.3	15.8	13.6	14.5	12.3	13.4	11.2	12.4	10.3	11.0	8.9	9.8	7.9	8.9	7.1	8.2	6.4	7.6	5.9	7.0	5.4
																					1.0	1.0	1.3	1.3	1.6	1.6	1.9	1.9
WU64-2()					27.2	24.2	24.1	21.0	21.7	18.6	19.8	16.8	18.3	15.3	17.1	14.1	15.0	12.2	13.5	10.8	12.2	9.7	11.2	8.8	10.4	8.1	9.6	7.5
																			1.1	1.1	1.4	1.4	1.7	1.7	2.2	2.2	2.6	2.6
WU65-2()					34.6	30.7	30.6	26.7	27.6	23.7	25.2	21.3	23.3	19.5	21.7	17.9	19.1	15.5	17.1	13.7	15.5	12.3	14.2	11.2	13.2	10.3	12.2	9.5
																	1.0	1.0	1.3	1.3	1.0	1.8	2.2	2.2	2.7	2.7	3.3	3.3
WU66-2()					41.9	37.3	37.1	32.2	33.4	28.7	30.6	25.9	28.2	23.6	26.3	21.8	23.1	18.8	20.7	16.7	18.8	14.9	17.3	13.6	16.0	12.4	14.8	11.5
																	1.2	1.2	1.6	1.6	1.2	2.1	2.7	2.7	3.3	3.3	4.0	4.0
WU67-2()					49.3	43.8	43.6	38.0	39.3	33.7	35.9	30.4	33.2	27.8	30.9	25.6	27.2	22.1	24.4	19.6	22.1	17.6	20.3	16.0	18.8	14.6	17.5	13.5
																	1.4	1.4	1.9	1.9	1.4	2.5	3.2	3.2	3.9	3.9	4.7	4.7
WU68-2()					56.6	50.4	50.1	43.7	45.2	38.8	41.3	35.0	38.1	31.9	35.5	29.4	31.3	25.4	28.0	22.5	25.4	20.2	23.3	18.3	21.6	16.8	20.1	15.5
															1.1	1.1	1.6	1.6	2.9	2.9	1.6	2.9	3.6	3.6	4.5	4.5	5.4	5.4
Avg. Vel.4"-2" Pass	-		-		1.1 ft./sec.		1.4		1.8		2.2		2.6		2.9		3.7		4.4		5.1		5.9		6.6		7.3	

TABLE 4 - 8" WU HEAT EXCHANGERS

2 & 4 PASS	BAFFLE SPACE		2"	3"	4"	5"	6"
	SHELL FLOW in GPM	A	40-50	51-80	81-110	111-130	131-160
		B	20-39	40-50	40-80	81-110	111-130

TABLE 4 - 8" WU HEAT EXCHANGERS (4 Pass)

4 PASS	TUBE FLOW IN GPM															
	15		20		25		30		35		40		50		60	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU82-4()	24.7	21.8	21.8	18.9	19.6	16.7	17.8	15.0	16.4	13.7	15.3	12.6	13.4	10.9	12.0 1.2	9.6 1.2
WU83-4()	37.9	33.5	33.4	28.9	30.0	25.6	27.4	23.0	25.2	21.0	23.4	19.3	20.6 1.3	16.6 1.3	18.4 1.8	14.7 1.8
WU84-4()	52.7	46.6	46.4	40.2	41.7	35.6	38.1	32.0	35.1	29.2	32.6 1.2	26.8 1.2	28.6 1.8	23.2 1.8	25.6 2.5	20.4 2.5
WU85-4()	67.5	59.7	59.5	51.6	53.5	45.6	48.8	41.0	45.0 1.4	37.4 1.4	41.8 1.5	34.4 1.5	36.7 2.3	29.7 2.3	32.8 3.1	26.2 3.1
WU86-4()	80.6	71.3	71.1	61.6	63.9	54.5	58.3 1.1	49.1 1.1	53.7 1.4	44.7 1.4	49.9 1.8	41.1 1.8	43.8 2.7	35.5 2.7	39.2 3.8	31.3 3.8
WU87-4()	95.5	84.4	84.1	72.9	75.7	64.5	69.0 1.3	58.1 1.3	63.6 1.7	52.9 1.7	59.1 2.2	48.6 2.2	51.9 3.2	42.0 3.2	46.4 4.5	37.0 4.5
WU88-4()	110	97.5	97.2	84.3	87.4 1.1	74.6 1.1	79.7 1.5	67.1 1.5	73.5 2.0	61.1 2.0	68.2 2.5	56.1 2.5	59.9 3.7	48.5 3.7	53.6 5.1	42.8 5.1
WU89-4()	123	109	109	94.3	97.8 1.2	83.5 1.2	89.2 1.7	75.1 1.7	82.2 2.2	68.4 2.2	76.4 2.8	62.9 2.8	67.1 4.2	54.3 4.2	60.0 5.8	47.9 5.8
4-p T.V.	1.2 ft./sec.		1.6		2.0		2.4		2.8		3.2		4.0		4.8	

4 PASS	TUBE FLOW IN GPM															
	70		80		90		100		120		140		160		180	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU82-4()	10.9 1.5	8.6 1.5	10.0 1.9	7.8 1.9	9.2 2.4	7.1 2.4										
WU83-4()	16.7 2.3	13.1 2.3	15.3 2.9	11.9 2.9	14.1 3.6	10.9 3.6										
WU84-4()	23.2 3.2	18.3 3.2	21.2 4.1	16.6 4.1	19.6 5.0	15.2 5.0										
WU85-4()	29.7 4.1	23.4 4.1	27.2 5.2	21.2 5.2	25.1 6.5	19.4 6.5										
WU86-4()	35.5 4.9	28.0 4.9	32.5 6.3	25.4 6.3	30.0 7.7	23.2 7.7										
WU87-4()	42.0 5.9	33.1 5.9	28.5 7.4	30.0 7.4	35.5 9.1	27.5 9.1										
WU88-4()	48.6 6.8	38.3 6.8	44.4 8.6	34.7 8.6	41.0 10.6	31.8 10.6										
WU89-4()	54.4 7.6	42.9 7.6	49.8 9.6	38.9 9.6	45.9 11.8	35.6 11.8										
4-p T.V.	5.6		6.4		7.2											

TABLE 4 - 8" WU HEAT EXCHANGERS (2 Pass)

2 & 4 PASS	BAFFLE SPACE		2"	3"	4"	5"	6"
	SHELL FLOW in GPM	A	40-50	51-80	81-110	111-130	131-160
		B	20-39	40-50	40-80	81-110	111-130

2 PASS	TUBE FLOW IN GPM															
	15		20		25		30		35		40		50		60	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU82-2()					13.3	11.9	12.3	10.9	11.6	10.1	10.9	9.4	9.8	8.3	8.9	7.5
WU83-2()					20.4	18.3	18.9	16.7	17.7	15.5	16.7	14.5	15.0	12.8	13.7	11.5
WU84-2()					28.4	25.4	6.3	23.3	24.6	21.6	23.2	20.1	20.9	17.8	19.0	16.0
WU85-2()					36.3	32.5	33.7	29.8	31.6	27.6	29.7	25.8	26.7	22.8	24.4	20.5
WU86-2()					43.4	38.9	40.3	35.7	37.7	33.0	35.5	30.8	32.0	27.3	29.2	24.5
WU87-2()					51.4	46.0	47.7	42.2	44.7	39.1	42.1	36.5	37.8	32.3	34.5	29.0
WU88-2()					59.4	53.2	55.1	48.8	51.6	45.2	48.6	42.1	43.7	37.3	39.9	33.5
WU89-2()					66.5	59.5	61.7	54.6	57.8	50.6	54.4	47.2	48.9	41.7	44.6	37.5
2-p T.V.					1.0 ft./sec.		1.2		1.4		1.6		2.0		2.4	

2 PASS	TUBE FLOW IN GPM															
	70		80		90		100		120		140		160		180	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU82-2()	8.2	6.8	7.6	6.3	7.1	5.8	6.7	5.4	6.0	4.8	5.4	4.3	5.0 1.0	3.9 1.0	4.6 1.2	3.6 1.2
WU83-2()	12.6	10.5	11.7	9.6	10.9	8.9	10.3	8.3	9.2	7.3	8.3 1.2	6.6 1.2	7.6 1.5	6.0 1.5	7.0 1.8	5.5 1.8
WU84-2()	17.5	14.6	16.3	13.4	15.2	12.4	14.3	11.6	12.8 1.2	10.2 1.2	11.6 1.6	9.1 1.6	10.6 2.0	8.3 2.0	9.8 2.5	7.6 2.5
WU85-2()	22.5	18.7	20.9	17.2	19.5	15.9	18.3 1.1	14.8 1.1	16.4 1.6	13.1 1.6	14.9 2.1	11.7 2.1	13.6 2.6	10.6 2.6	12.5 3.2	9.7 3.2
WU86-2()	28.9	22.3	25.0	20.5	23.3 1.1	19.0 1.1	21.9 1.4	17.7 1.4	19.6 1.9	15.6 1.9	17.8 2.5	14.0 2.5	16.3 3.1	12.7 3.1	15.0 3.9	11.6 3.9
WU87-2()	31.8	26.4	29.5 1.1	24.3 1.1	27.6 1.3	22.5 1.3	25.9 1.6	21.0 1.6	23.2 2.2	18.5 2.2	21.0 2.9	16.6 2.9	19.2 3.7	15.0 3.7	17.8 4.6	13.7 4.6
WU88-2()	36.7 1.0	30.5 1.0	34.1 1.3	28.1 1.3	31.9 1.5	26.0 1.5	30.0 1.9	24.2 1.9	26.8 2.6	21.4 2.6	24.3 3.4	19.1 3.4	22.2 4.3	17.4 4.3	20.5 5.3	15.9 5.3
WU89-2()	41.1 1.1	34.2 1.1	38.2 1.4	31.4 1.4	35.7 1.7	29.1 1.7	33.6 2.1	27.1 2.1	30.0 2.9	23.9 2.9	27.2 3.8	21.4 3.8	24.9 4.8	19.4 4.8	23.0 5.9	17.8 5.9
2-p T.V.	2.8		3.2		3.6		4.0		4.8		5.6		6.4		7.2	

TABLE 4 - 10"WU HEAT EXCHANGERS (4 Pass)

2 & 4 PASS	BAFFLE SPACE		2"	2½"	3"	4"	5" (Std.)	6"	8"
	SHELL FLOW in GPM	A	52-70	71-87	88-105	106-138	130-173	174-207	208-276
		B	26-51	52-70	71-87	88-105	65-129	139-173	174-207

4 PASS	TUBE FLOW IN GPM																			
	25		30		35		40		50		60		70		80		90		100	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU102-4()	24.9	22.0	23.0	20.1	21.5	18.5	20.2	17.2	18.0	15.1	16.3	13.5	15.0	12.3	13.9 1.1	11.2 1.1	12.9 1.4	10.4 1.4	12.1 1.7	9.6 1.7
WU103-4()	38.9	34.4	36	31.4	33.5	28.9	31.4	26.9	28.1	23.6	25.5 1.0	21.1 1.0	23.4 1.3	19.1 1.3	21.6 1.6	17.5 1.6	20.1 2.0	16.2 2.0	18.8 2.4	15.0 2.4
WU104-4()	52.9	46.7	48.9	42.6	45.5	39.3	42.7	36.5	38.2	32.1	34. 1.2	28.7 1.2	31.8 1.7	26.0 1.7	29.4 2.1	23.8 2.1	27.3 2.6	22.0 2.6	25.6 3.1	20.4 3.1
WU105-4()	67.9	60.0	62.7	54.7	58.4	50.4	54.8	46.8	49.0 1.0	41.1 1.0	44.4 1.5	36.8 1.5	40.7 2.0	33.3 2.0	37.7 2.5	30.5 2.5	35.1 3.1	28.2 3.1	32.9 3.8	26.2 3.8
WU106-4()	81.8	72.3	75.6	66.0	70.5	60.8	66.1	56.5	59.1 1.3	49.6 1.3	53.6 1.8	44.4 1.8	49.1 2.4	40.2 2.4	45.4 3.0	36.8 3.0	42.3 3.6	34.0 3.6	39.6 4.5	31.6 4.5
WU107-4()	95.8	84.6	88.5	77.2	82.5	71.2	77.4 1.0	66.1 1.0	69.1 1.5	58.1 1.5	62.7 2.1	52.0 2.1	57.5 2.7	47.1 2.7	53.2 3.4	43.1 3.4	49.5 4.2	39.8 4.2	46.4 5.2	37.0 5.2
WU108-4()	110	97	101	88.5	94.5	81.5	88.7 1.1	75.8 1.1	79.2 1.6	66.6 1.6	71.9 2.3	59.5 2.3	65.9 3.0	53.9 3.0	61.0 3.9	49.4 3.9	56.8 4.9	45.6 4.9	53.2 5.9	42.3 5.9
WU109-4()	124	109	114	99.7	107 1.0	91.9 1.0	100 1.4	85.4 1.4	89.3 1.9	75.0 1.9	81.0 2.7	67.1 2.7	74.3 3.3	60.8 3.3	68.7 4.3	55.7 4.3	64.0 5.5	51.4 5.5	59.9 6.5	47.7 6.5
WU1010-4()	138	122	127	111	119 1.3	102.3 1.3	111 1.7	95.0 1.7	99.4 2.3	835 2.3	90.2 3.1	74.7 3.1	82.7 3.7	67.7 3.7	76.5 4.8	62.0 4.8	71.2 6.0	57.2 6.0	66.7 7.1	53.1 7.1
4-p T.V.	1.2 ft./sec.		1.5		1.7		2.0		2.5		3.0		3.5		4.0		4.5		5.0	

4 PASS	TUBE FLOW IN GPM																			
	120		140		150		160		180		200		225		250		275		325	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU102-4()	10.7 2.4	8.4 2.4	9.7 3.2	7.5 3.2	9.2 4.0	7.1 4.0														
WU103-4()	16.8 3.4	13.2 3.4	15.1 4.4	11.7 4.4	14.4 5.0	11.1 5.0														
WU104-4()	22.8 4.3	17.9 4.3	20.5 5.6	16.0 5.6	19.6 6.1	15.1 6.1														
WU105-4()	29.2 5.2	23.0 5.2	26.3 6.8	2.5 6.8	25.1 7.4	19.4 7.4														
WU106-4()	35.2 6.1	27.7 6.1	31.8 8.0	24.7 8.0	30.3 9.1	23.4 9.1														
WU107-4()	41.2 7.1	32.4 7.1	37.2 9.3	28.9 9.3	35.5 10.1	27.4 10.1														
WU108-4()	47.3 8.1	37.1 8.1	42.6 10.5	33.1 10.5	40.6 11.2	31.4 11.2														
WU109-4()	53.3 9.0	41.9 9.0	48.0 11.7	37.3 11.7	45.8 12.4	35.4 12.4														
WU1010-4()	59.3 10.0	46.6 10.0	53.5 12.8	41.5 12.8	51.0 13.5	39.4 13.5														
4-p T.V.	6.0		7.0		7.4															

TABLE 4 - 10"WU HEAT EXCHANGERS (2 Pass)

2 & 4 PASS	BAFFLE SPACE		2"	2½"	3"	4"	5" (Std.)	6"	8"
	SHELL FLOW in GPM	A	52-70	71-87	88-105	106-138	130-173	174-207	208-276
		B	26-51	52-70	71-87	88-105	65-129	139-173	174-207

2 PASS	TUBE FLOW IN GPM																			
	25		30		35		40		50		60		70		80		90		100	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU102-2()									13.1	11.6	12.1	10.6	11.3	9.8	10.6	9.1	10.0	8.5	9.5	8.0
WU103-2()									20.3	18.0	18.8	16.5	17.5	15.2	16.5	14.1	15.5	13.2	14.7	12.4
WU104-2()									27.1	24.0	25.0	21.9	23.4	20.2	21.9	18.8	20.7	17.6	19.6	16.6
WU105-2()									34.3	30.4	31.8	27.8	29.6	25.7	27.8	23.9	26.3	22.3	24.9	21.0
WU106-2()									41.6	36.9	38.5	33.7	35.9	31.1	33.7	28.9	31.8	27.1	30.2	25.5
WU107-2()									48.8	43.3	45.2	39.6	42.2	36.5	39.6	34.0	37.4	31.8	35.4	29.9
WU108-2()									56.1	49.7	51.9	4.4	48.4	41.9	45.5	39.0	42.9	36.5	40.7	34.3
WU109-2()									63.3	56.2	58.6	51.3	54.7	47.4	51.3	44.0	48.5	41.2	46.0	38.8
WU1010-2()									70.6	62.6	65.3	57.2	60.9	52.8	57.2	49.1	54.0	45.9	51.2 1.0	43.2 1.0
2-p T.V.									1.2 ft./sec.		1.4		1.6		1.9		2.1		2.3	

2 PASS	TUBE FLOW IN GPM																			
	120		140		150		160		180		200		225		250		275		325	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU102-2()	8.6	7.2	7.9	6.5	7.6	6.2	7.3	6.0	6.8	5.5	6.4	5.1	5.9	4.7	5.5	4.4	5.2 1.0	4.1 1.0	4.6 1.2	3.6 4.2
WU103-2()	13.4	11.1	12.3	10.1	11.8	9.7	11.4	9.3	10.6	8.6	9.9	8.0	9.2 1.2	7.3 1.2	8.6 1.4	6.8 1.4	8.1 1.6	6.3 1.6	7.2 1.8	5.6 1.8
WU104-2()	17.8	14.8	16.4	13.5	15.8	12.9	15.2	12.3	14.1 1.1	11.4 1.1	13.3 1.2	10.6 1.2	12.3 1.5	9.8 1.5	11.5 1.9	9.0 1.9	10.8 2.1	8.4 2.1	9.6 2.5	7.4 2.5
WU105-2()	22.6	18.8	20.8	17.1	20.0	16.3	19.2 1.1	15.7 1.1	17.9 1.3	14.5 1.3	16.8 1.5	13.4 1.5	15.6 1.9	12.4 1.9	14.6 2.4	11.5 2.4	13.7 2.8	10.7 2.8	12.2 3.2	9.4 3.2
WU106-2()	27.4	22.8	25.2 1.0	20.7 1.0	24.2 1.1	19.8 1.1	23.3 1.3	19.0 1.3	21.7 1.6	17.5 1.6	20.4 2.0	16.3 2.0	18.9 2.3	15.0 2.3	17.7 2.8	13.9 2.8	16.6 3.2	12.9 3.2	14.8 3.8	11.4 3.8
WU107-2()	32.2	26.8	29.6 1.2	24.3 1.2	28.4 1.4	23.2 1.4	27.4 1.5	22.3 1.5	25.5 1.8	20.6 1.8	23.9 2.3	19.1 2.3	22.2 2.6	17.6 2.6	20.7 3.3	16.3 3.3	19.5 3.8	15.2 3.8	17.4 4.4	13.4 4.4
WU108-2()	37.0 1.0	30.8 1.0	34.0 1.3	27.9 1.3	32.6 1.5	26.7 1.5	31.4 1.6	25.6 1.6	29.3 2.0	23.6 2.0	27.5 2.5	22.0 2.5	25.5 2.9	20.2 2.9	23.8 3.8	18.7 3.8	22.4 4.4	17.5 4.4	19.9 5.0	15.4 5.0
WU109-2()	41.8 1.2	34.7 1.2	38.3 1.6	31.5 1.6	36.9 1.8	30.1 1.8	35.5 1.9	28.9 1.9	33.1 2.4	26.7 2.4	31.0 2.9	24.8 2.9	28.8 3.4	22.8 3.4	26.9 4.3	21.2 4.3	25.2 4.8	19.7 4.8	22.5 5.6	17.4 5.6
WU1010-2()	46.5 1.4	38.7 1.4	42.7 1.9	35.1 1.9	41.1 2.0	33.6 2.0	39.6 2.1	32.2 2.1	36.9 2.6	29.7 2.6	34.6 3.2	27.7 3.2	32.1 3.6	25.4 3.6	30.0 4.7	23.6 4.7	28.1 5.4	22.0 5.4	25.1 6.2	19.4 6.2
2-p T.V.	2.8		3.3		3.5		3.7		4.2		4.6		5.2		5.9		6.4		7.5	

TABLE 4 - 12"WU HEAT EXCHANGERS (4 Pass)

2&4 PASS	BAFFLE SPACE		3"	4"	5"	6"(std)	8"	9"
	Shell flow In G.P.M.	A	91-121	122-160	161-205	206-245	246-325	326-365
		B	45-90	91-121	122-160	110-205	206-245	246-325

4 PASS	G.P.M. HEATED IN TUBES																					
	25		30		40		50		60		70		80		90		100		110		120	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU123-4( )	46.4	42.0	43.2	38.7	38.4	33.6	34.7	29.9	31.8	27.1	29.4	24.8	27.4	22.8	25.7	21.2	24.2	19.8	22.9	18.6	21.8	17.6
															1.0	1.0	1.2	1.2	1.5	1.5	1.7	1.7
WU124-4( )	62.4	56.5	58.2	52.0	51.6	45.2	46.6	40.3	42.7	36.4	39.5	33.3	36.8	30.7	34.6	28.5	32.6	26.7	30.8	25.1	29.3	23.6
															1.3	1.3	1.7	1.7	2.0	2.0	2.2	2.2
WU125-4( )	78.4	70.9	73.1	65.3	64.8	56.9	58.6	50.6	53.7	45.7	49.7	41.8	46.3	38.6	43.4	35.9	40.9	33.5	38.7	31.5	36.8	29.7
											1.0	1.0	1.3	1.3	1.7	1.7	2.0	2.0	2.3	2.3	2.6	2.6
WU126-4( )	95.2	86.1	88.7	79.3	78.7	69.0	71.2	61.4	65.2	55.5	60.3	50.8	56.2	46.9	52.7	43.5	49.7	40.7	47.0	38.2	44.6	36.1
									1.0	1.0	1.4	1.4	1.6	1.6	2.0	2.0	2.4	2.4	2.8	2.8	3.1	3.1
WU127-7( )	111	101	104	92.7	91.9	80.6	83.1	71.8	76.1	64.9	70.4	59.3	65.7	54.7	61.6	50.9	58.0	47.5	54.9	44.6	52.1	42.1
									1.2	1.2	1.5	1.5	1.8	1.8	2.2	2.2	2.7	2.7	3.1	3.1	3.5	3.5
WU128-4( )	128	116	119	107	106	92.8	95.7	82.6	87.7	74.7	81.1	68.3	75.6	63.0	70.9	58.5	66.8	54.7	63.2	51.4	60.0	48.5
							1.0	1.0	1.4	1.4	1.7	1.7	2.1	2.1	2.4	2.4	3.1	3.1	3.6	3.6	3.8	3.8
WU129-4( )			134	120	119	104	108	92.9	98.6	84.0	91.2	76.8	85.0	70.9	79.7	65.9	75.1	61.6	71.1	57.8	67.5	54.5
							1.3	1.3	1.6	1.6	2.0	2.0	2.3	2.3	2.7	2.7	3.3	3.3	4.0	4.0	4.4	4.4
WU1210-4( )					133	117	120	104	110	93.8	102	85.8	95.0	79.1	89.0	73.5	83.9	68.7	79.4	64.6	75.4	60.9
					1.0	1.0	1.5	1.5	1.8	1.8	2.3	2.3	2.6	2.6	3.0	3.0	3.7	3.7	4.5	4.5	4.9	4.9
4-P T.V.	1.1 ft./sec		1.1		1.5		1.8		2.1		2.5		2.8		3.1		3.5		3.8		4.1	

4 PASS	G.P.M. HEATED IN TUBES																					
	130		140		160		180		200		225		250		300		350		400		450	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU123-4( )	20.7	16.6	19.8	15.8	18.2	14.4	16.8	13.2	15.7	12.2												
	2.0	2.0	2.3	2.3	2.9	2.9	3.5	3.5	4.4	4.4												
WU124-4( )	27.9	22.4	26.6	21.2	24.4	19.3	22.6	17.7	21.1	16.4												
	2.5	2.5	3.0	3.0	3.7	3.7	4.6	4.6	5.6	5.6												
WU125-4( )	35.0	28.1	33.4	26.7	30.7	24.3	28.4	22.3	26.5	20.6												
	3.1	3.1	3.7	3.7	4.5	4.5	5.3	5.3	6.8	6.8												
WU126-4( )	42.5	34.1	40.6	32.4	37.3	29.5	34.5	27.1	32.2	25.0												
	3.7	3.7	4.3	4.3	5.4	5.4	6.4	6.4	8.0	8.0												
WU127-7( )	49.7	39.9	47.4	37.9	43.6	34.4	40.3	31.6	37.6	29.2												
	4.3	4.3	4.9	4.9	6.1	6.1	7.2	7.2	9.3	9.3												
WU128-4( )	57.2	45.9	54.6	43.6	50.1	39.6	46.4	36.4	43.2	33.6												
	4.9	4.9	5.4	5.4	7.0	7.0	8.3	8.3	10.5	10.5												
WU129-4( )	64.3	51.6	61.4	49.0	56.4	44.6	52.2	40.9	48.6	37.8												
	5.4	5.4	6.3	6.0	7.7	7.7	9.2	9.2	11.7	11.7												
WU1210-4( )	71.8	57.7	68.6	54.8	63.0	49.8	58.3	45.7	54.3	42.2												
	6.0	6.0	7.0	7.0	8.1	8.1	10.2	10.2	12.9	12.9												
4-P T.V.	4.3		4.8		5.5		6.1		7.0													

TABLE 4 - 12"WU HEAT EXCHANGERS (2 Pass)

2&4 PASS	BAFFLE SPACE		3"	4"	5"	6"(std)	8"	9"
	Shell flow In G.P.M.	A	91-121	122-160	161-205	206-245	246-325	326-365
		B	45-90	91-121	122-160	110-205	206-245	246-325

2 PASS	G.P.M. HEATED IN TUBES																					
	25		30		40		50		60		70		80		90		100		110		120	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU123-2( )									22.3	19.7	20.7	18.4	19.5	17.2	18.6	16.2	17.7	15.3	16.9	14.6	16.2	13.9
WU124-2( )									29.9	26.8	28.1	25.0	26.6	23.4	25.2	22.1	24.1	20.9	23.0	19.8	22.1	18.9
WU125-2( )									37.5	33.6	35.2	31.3	33.3	29.3	31.6	27.6	30.2	26.2	28.9	24.8	27.7	23.7
WU126-2( )									45.4	40.7	42.7	37.9	40.4	25.5	38.3	33.5	36.5	31.7	25.0	30.1	33.5	28.7
WU127-2( )									53.3	47.9	50.1	44.5	47.4	41.7	45.0	39.3	42.9	37.2	41.1	35.4	39.4	33.7
WU128-2( )									60.9	54.7	57.2	50.9	54.1	47.7	51.4	44.9	49.0	42.5	46.9	40.4	45.0	38.5
WU129-2( )									68.8	61.8	64.7	57.5	61.2	53.9	58.1	50.8	55.4	48.0	53.0	45.6	50.8	43.5
WU1210-2( )									76.8	68.9	72.1	64.1	68.2	60.1	64.8	56.6	61.8	53.6	59.1	50.9	56.7	48.5
2-P T.V.									1.0 ft./sec		1.2		1.3		1.5		1.7		1.8		1.9	

2 PASS	G.P.M. HEATED IN TUBES																					
	130		140		160		180		200		225		250		300		350		400		450	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU123-2( )	15.6	13.3	15.0	12.7	14.0	11.7	13.2	10.9	12.4	10.2	11.6	9.5	10.9	8.8	9.8	7.8	8.8	7.0	8.1	6.3	7.5	5.8
															1.0	1.0	1.3	1.3	1.6	1.6	2.0	2.0
WU124-2( )	21.2	18.1	20.5	17.3	19.1	16.0	17.9	14.9	16.9	13.9	15.8	12.9	14.9	12.0	13.3	10.6	12.0	9.5	11.0	8.6	10.2	7.9
													1.0	1.0	1.3	1.3	1.7	1.7	2.1	2.1	2.6	2.6
WU125-2( )	26.6	22.6	25.6	21.7	23.9	20.0	22.5	18.6	21.2	17.4	19.8	16.1	18.6	15.0	16.6	13.3	15.1	11.9	13.8	10.8	12.7	9.9
													1.2	1.2	1.6	1.6	2.2	2.2	2.7	2.7	3.3	3.3
WU126-2( )	32.2	27.4	31.1	26.3	29.0	24.3	27.2	22.6	25.7	21.1	24.0	19.6	22.5	18.2	20.2	16.1	18.3	14.4	16.7	13.1	15.4	11.9
											1.1	1.1	1.5	1.5	2.0	2.0	2.6	2.6	3.2	3.2	3.9	3.9
WU127-2( )	37.9	32.2	36.5	30.9	34.1	28.5	32.0	25.5	30.1	24.8	28.2	23.0	26.5	21.4	23.7	18.9	21.5	16.9	19.6	15.3	18.1	14.0
							1.0	1.0	1.2	1.2	1.4	1.4	1.6	1.6	2.3	2.3	3.1	3.1	3.8	3.8	4.7	4.7
WU128-2( )	43.3	36.8	41.7	35.2	38.9	32.6	36.5	30.3	34.4	28.3	32.2	26.2	30.2	24.5	27.0	21.6	24.5	19.3	22.4	17.5	20.7	16.0
							1.1	1.1	1.3	1.3	1.5	1.5	1.9	1.9	2.6	2.6	3.6	3.6	4.3	4.3	5.3	5.3
WU129-2( )	48.9	41.6	47.1	39.8	43.9	36.8	41.3	34.2	38.9	32.0	36.4	29.7	34.2	27.6	30.6	24.4	27.7	21.8	25.3	19.8	23.4	18.1
					1.0	1.0	1.2	1.2	1.4	1.4	1.6	1.6	2.2	2.2	3.0	3.0	4.1	4.1	4.9	4.9	6.0	6.0
WU1210-2( )	54.5	46.4	52.5	44.4	49.0	41.0	46.0	38.2	43.4	35.7	40.6	33.1	38.1	30.8	34.1	27.2	30.9	24.3	28.3	22.1	26.1	20.2
					1.2	1.2	1.5	1.5	1.8	1.8	2.1	2.1	2.4	2.4	3.2	3.2	4.4	4.4	5.4	5.4	6.7	6.7
2-P T.V.	2.1		2.3		2.6		3.0		3.3		3.7		4.2		5.0		5.8		6.7		7.5	

TABLE 4 - 14"WU HEAT EXCHANGERS (4 Pass)

2&4 PASS	BAFFLE SPACE 3"		4"	5"	6"	8"	10"	11"
	Shell flow in G.P.M.	A	85-113	114-150	151-190	191-225	226-300	301-380	381-415
		B	42-84	85-113	114-150	151-190	191-225	226-300	301-380

4 PASS	G.P.M. HEATED IN TUBES																							
	50		60		70		80		90		100		110		120		130		140		150		160	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU143-4( )	41.4	36.6	38.3	33.4	35.7	30.8	33.5	28.6	31.6	26.7	29.9	25.1	28.4	23.7	27.1	22.5	25.9	21.3	24.9	20.4	23.9	19.4	23.0	18.6
															1.0	1.0	1.2	1.2	1.3	1.3	1.5	1.5	1.6	1.6
WU144-4( )	55.4	48.9	51.2	44.6	47.7	41.1	44.7	38.2	42.2	35.7	40.0	33.6	38.0	31.7	36.3	30.0	34.7	28.6	33.3	27.2	31.9	26.0	30.8	24.9
															1.2	1.2	1.3	1.3	1.6	1.6	1.9	1.9	2.1	2.1
WU145-4( )	69.4	61.3	64.1	55.9	59.7	51.5	56.0	47.9	52.8	44.7	50.1	42.1	47.6	39.7	45.4	37.6	43.4	35.8	41.6	34.1	40.0	32.6	38.5	31.2
													1.0	1.0	1.5	1.5	1.7	1.7	2.0	2.0	2.3	2.3	2.5	2.5
WU146-4( )	83.3	73.6	77.0	67.2	71.7	61.9	67.3	57.5	63.5	53.8	60.1	50.5	57.2	47.7	54.6	45.2	52.2	43.0	50.0	40.9	48.1	39.1	46.3	37.5
											1.4	1.4	1.6	1.6	1.8	1.8	2.0	2.0	2.3	2.3	2.5	2.5	3.0	3.0
WU147-7( )	97.8	86.4	90.4	78.8	84.2	72.7	79.0	67.5	74.5	63.1	70.6	59.3	67.1	56.0	64.0	53.0	61.2	50.4	58.7	48.1	56.4	45.9	54.3	44.0
									1.0	1.0	1.5	1.5	1.8	1.8	2.0	2.0	2.2	2.2	2.5	2.5	3.0	3.0	3.4	3.4
WU148-4( )	111.8	98.7	103.3	90.1	96.2	83.0	90.3	77.1	85.2	72.1	80.7	67.8	76.7	64.0	73.2	60.6	70.0	57.6	67.1	54.9	64.5	52.5	62.1	50.3
							1.0	1.0	1.2	1.2	1.6	1.6	1.9	1.9	2.1	2.1	2.5	2.5	2.9	2.9	3.1	3.1	3.9	3.9
WU149-4( )	125.7	111.1	116.2	101.3	108.3	93.4	101.6	86.8	95.8	81.1	90.8	76.2	86.3	72.0	82.3	68.2	78.7	64.8	75.5	61.8	72.5	59.1	69.8	56.6
							1.1	1.1	1.3	1.3	1.7	1.7	2.1	2.1	2.3	2.3	2.7	2.7	3.0	3.0	3.2	3.2	4.2	4.2
WU1410-4( )	139.7	123.4	129.1	112.6	120.3	103.8	112.9	96.4	106.4	90.1	100.8	84.7	95.9	80.0	91.5	75.8	87.5	72.0	83.9	68.7	80.6	65.6	77.6	62.8
					1.0	1.0	1.2	1.2	1.5	1.5	1.9	1.9	2.3	2.3	2.6	2.6	2.9	2.9	3.2	3.2	3.6	3.6	4.7	4.7
4-P T.V.	1.3 ft./sec		1.5		1.75		2.0		2.25		2.5		2.75		3.0		3.25		3.5		3.75		4.0	

4 PASS	G.P.M. HEATED IN TUBES																							
	180		200		225		250		275		300		325		350		400		450		500		550	
	A	B	A	B	A	B	A	B	A	B	A	B												
WU143-4( )	21.4	17.2	20.1	16.0	18.6	14.7	17.4	13.6	16.3	12.7	15.3	11.9												
	2.0	2.0	2.4	2.4	2.9	2.9	3.4	3.4	4.0	4.0	4.9	4.9												
WU144-4( )	28.6	23.0	26.8	21.4	24.9	19.6	23.2	18.2	21.8	16.9	20.5	15.9												
	2.5	2.5	31.	31.	3.7	3.7	4.3	4.3	5.0	5.0	6.3	6.3												
WU145-4( )	35.9	28.8	33.6	26.8	31.1	24.6	29.1	22.8	27.3	21.2	25.7	19.9												
	3.1	3.1	3.8	3.8	4.0	4.0	5.3	5.3	6.3	6.3	7.7	7.7												
WU146-4( )	43.1	34.6	40.4	32.1	37.4	29.5	34.9	27.4	32.7	25.5	30.8	23.9												
	3.7	3.7	4.9	4.9	5.5	5.5	6.3	6.3	7.8	7.8	9.0	9.0												
WU147-7( )	50.6	40.6	47.4	37.7	43.9	34.7	41.0	32.1	38.4	29.9	36.2	28.0												
	4.2	4.2	5.2	5.2	6.0	6.0	7.2	7.2	9.2	9.2	10.4	10.4												
WU148-4( )	57.8	46.4	54.1	43.1	50.2	39.6	46.8	36.7	43.9	34.2	41.4	32.0												
	4.9	4.9	5.9	5.9	6.8	6.8	8.1	8.1	10.1	10.1	11.0	11.0												
WU149-4( )	65.0	52.2	60.9	48.5	56.5	44.6	52.7	41.3	49.4	38.5	46.5	36.0												
	5.3	5.3	6.5	6.5	8.0	8.0	9.2	9.2	11.0	11.0	13.2	13.2												
WU1410-4( )	72.2	58.0	67.7	53.9	62.7	49.5	58.5	45.9	54.9	42.7	51.7	40.0												
	6.0	6.0	7.1	7.1	8.6	8.6	10.2	10.2	12.0	12.0	14.5	14.5												
4-P T.V.	4.5		5.0		5.6		6.2		6.9		7.5													

TABLE 4 - 14"WU HEAT EXCHANGERS (2 Pass)

2&4 PASS	BAFFLE SPACE		3"	4"	5"	6"	8"	10"	11"
	Shell flow in G.P.M.	A	85-113	114-150	151-190	191-225	226-300	301-380	381-415
		B	42-84	85-113	114-150	151-190	191-225	226-300	301-380

2 PASS	G.P.M. HEATED IN TUBES																							
	50		60		70		80		90		100		110		120		130		140		150		160	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU143-2( )											21.2	18.8	20.4	17.9	19.6	17.2	18.9	16.5	18.3	15.8	17.7	15.2	17.5	14.7
WU144-2( )											28.3	25.0	27.1	23.9	26.1	22.9	25.2	21.9	24.4	21.1	23.6	20.3	22.9	19.6
WU145-2( )											35.6	31.5	34.2	30.1	32.9	28.8	31.7	27.6	30.7	26.6	29.7	25.6	28.8	24.7
WU146-2( )											42.6	37.8	41.0	36.0	39.4	34.5	38.0	33.1	36.8	31.8	35.6	30.7	34.5	29.6
WU147-2( )											49.7	44.0	47.7	42.0	46.0	40.2	44.4	38.6	42.9	37.1	41.5	35.7	40.3	34.5
WU148-2( )											57.0	50.5	54.8	48.2	52.7	46.1	50.9	44.3	49.2	42.6	47.6	41.0	46.2	39.6
WU149-2( )											64.1	56.8	61.5	54.2	59.3	51.8	57.2	49.7	55.3	47.8	53.5	46.1	51.9	44.5
WU1410-2( )											71.4	63.2	68.6	60.4	66.0	57.8	63.7	55.4	61.6	53.3	59.6	51.3	57.8	49.5
2-P T.V.											1.25 ft./sec		1.4		1.5		1.6		1.8		1.9		2.0	

2 PASS	G.P.M. HEATED IN TUBES																							
	180		200		225		250		275		300		325		350		400		450		500		550	
	A	B	A	B	A	B	A	B	A	B	A	B												
WU143-2( )	16.2	13.8	15.4	12.9	14.4	12.1	13.6	11.3	12.9	10.6	12.3	10.1	11.7	9.5	11.2	9.1	10.4	8.3	9.6 1.2	7.6 1.2	9.0 1.4	7.0 1.4	8.4 1.6	6.6 1.6
WU144-2( )	21.6	18.4	20.5	17.3	19.3	16.1	18.2	15.1	17.2	14.2	16.4	13.4	15.7	12.7	15.0	12.1	13.8 1.0	11.0 1.0	12.8 1.6	10.1 1.6	12.0 1.9	9.4 1.9	11.2 2.3	8.8 2.3
WU145-2( )	27.2	23.1	25.8	21.7	24.2	20.2	22.9	19.0	21.7	17.8	20.7	16.9	19.7	16.0	18.9 1.2	15.2 1.2	17.4 1.5	13.9 1.5	16.1 1.9	12.8 1.9	15.1 2.4	11.8 2.4	14.1 2.7	11.0 2.7
WU146-2( )	32.6	27.7	30.9	26.0	29.1	24.3	27.4	22.7	26.0	21.4	24.8 1.0	20.2 1.0	23.6 1.2	19.2 12.0	22.6 1.5	18.2 1.5	20.8 1.8	16.6 1.8	19.3 2.3	15.3 2.3	18.0 2.8	14.2 2.8	16.9 3.3	13.2 3.3
WU147-2( )	38.0	32.6	36.0	30.4	33.9	28.3	32.0 1.0	26.5 1.0	30.3 1.2	24.9 1.2	28.9 1.3	23.6 1.3	27.5 1.4	22.4 1.4	26.3 1.7	21.3 1.7	24.3 2.0	19.4 2.0	22.5 2.6	17.8 2.6	21.0 3.3	16.5 3.3	19.7 3.8	15.4 3.8
WU148-2( )	43.6	37.0	41.3	34.8	38.8	32.4	36.7 1.1	30.4 1.1	34.8 1.3	28.6 1.3	33.1 1.5	27.0 1.5	31.6 1.6	25.6 1.6	30.2 1.8	24.4 1.8	27.8 2.5	22.2 2.5	25.8 2.9	20.5 2.9	24.1 3.8	19.0 3.8	22.6 4.3	17.7 4.3
WU149-2( )	49.0	41.6	46.4	39.1	43.7 1.0	36.5 1.0	41.2 1.2	34.2 1.2	39.1 1.4	32.2 1.4	37.2 1.7	30.4 1.7	35.5 1.9	28.8 1.9	34.0 2.2	27.4 2.2	31.3 2.9	25.0 2.5	29.0 3.3	23.0 3.3	27.1 4.3	21.3 4.3	25.4 4.9	19.9 4.9
WU1410-2( )	54.6	46.4	51.7	43.6	48.6 1.1	40.6 1.1	45.9 1.3	38.1 1.3	43.6 1.6	35.8 1.6	41.5 1.8	33.9 1.8	39.6 2.1	32.1 2.1	37.8 2.4	30.5 2.4	34.9 3.1	27.9 3.1	32.4 3.8	25.6 3.8	30.2 4.7	23.7 4.7	28.3 5.4	22.1 5.4
2-P T.V.	2.25		2.5		2.8		3.1		3.4		3.75		4.0		4.4		5.0		5.6		6.2		6.9	

TABLE 4 - 16"WU HEAT EXCHANGERS (4 pass)

2 & 4 PASS	BAFFLE SPACE		4"	5"	6"	8"	10"	12"
	SHELL FLOW in GPM	A	135-175	176-220	221-265	266-355	356-440	441-525
		B	65-134	135-175	176-220	221-265	266-355	356-440

4 PASS	G.P.M. HEATED IN TUBES																					
	50		70		80		90		100		110		120		130		140		150		160		180	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU163-4()	45.1	40.6	39.3	34.6	37.1	32.3	35.1	30.3	33.4	28.6	31.9	27.1	30.5	25.8	29.3	24.6	28.2	23.6	27.2	22.6	26.2	21.7	24.5	20.1
																					1.0	1.0	1.3	1.3
WU164-4()	60.9	54.7	53.0	46.6	50.0	43.6	47.4	40.9	45.1	38.6	43.0	36.6	41.2	34.8	39.5	33.2	38.0	31.8	36.6	30.5	35.4	29.2	33.1	27.1
																	1.0	1.0	1.1	1.1	1.2	1.2	1.6	1.6
WU165-4()	76.7	68.9	66.8	58.7	63.0	54.8	59.7	51.5	56.8	48.6	54.2	46.1	51.9	43.8	49.8	41.8	47.9	40.0	46.1	38.3	44.5	36.8	41.7	34.1
																	1.0	1.0	1.3	1.3	1.5	1.5	1.9	1.9
WU166-4()	92.4	83.1	80.5	70.8	75.9	66.1	71.9	62.1	68.4	58.6	65.3	55.6	62.5	52.9	60.0	50.4	57.7	48.2	55.6	46.2	53.7	44.4	50.2	41.2
													1.2	1.2	1.3	1.3	1.4	1.4	1.6	1.6	1.8	1.8	2.3	2.3
WU167-4()	108.2	97.2	94.2	82.9	88.8	77.4	84.2	72.7	80.1	68.6	76.4	65.1	73.2	61.9	70.2	59.0	67.5	56.4	65.1	54.1	62.8	52.0	58.8	48.2
											1.0	1.0	1.3	1.3	1.5	1.5	1.7	1.7	1.9	1.9	2.1	2.1	2.7	2.7
WU168-4()	123.9	111.4	108.0	94.9	101.8	88.7	96.4	83.3	91.7	78.6	87.6	74.5	83.8	70.9	80.5	67.6	77.4	64.7	74.6	62.0	72.0	59.5	67.4	55.2
									1.0	1.0	1.1	1.1	1.4	1.4	1.6	1.6	1.9	1.9	2.0	2.0	2.2	2.2	2.8	2.8
WU169-4()	139.3	125.2	121.3	106.7	114.4	99.6	108.4	93.6	103.1	88.4	98.4	83.8	94.2	79.6	90.4	76.0	86.9	72.7	83.8	69.6	80.9	66.9	75.7	62.0
									1.2	1.2	1.3	1.3	1.6	1.6	1.8	1.8	2.0	2.0	2.2	2.2	2.4	2.4	3.0	3.0
WU1610-4()			135.0	118.7	127.3	110.9	120.6	104.2	114.8	98.4	109.5	93.2	104.9	88.7	100.6	84.6	96.8	80.9	93.3	77.5	90.0	74.4	84.3	69.0
							1.0	1.0	1.3	1.3	1.5	1.5	1.8	1.8	2.0	2.0	2.2	2.2	2.4	2.4	2.6	2.6	3.3	3.3
4-p T.V.	1.0 ft./sec.		1.4		1.6		1.8		1.9		2.1		2.3		2.5		2.7		2.8		3.0		3.4	

4 PASS	G.P.M. HEATED IN TUBES																	
	200		225		250		275		300		325		350		375		400	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU163-4()	23.1	18.8	21.5	17.3	20.2	16.1	19.0	15.1	17.9	14.1	17.0	13.3	16.2	12.6	15.5	12.0	14.8	11.4
	1.5	1.5	1.8	1.8	2.3	2.3	2.5	2.5	3.0	3.0	3.5	3.5	4.2	4.2	4.4	4.4	4.9	4.9
WU164-4()	31.1	25.3	29.0	23.4	27.2	21.7	25.6	20.3	24.2	19.1	23.0	18.0	21.9	17.0	20.8	16.2	19.9	15.4
	1.9	1.9	2.3	2.3	2.9	2.9	3.2	3.2	4.1	4.1	4.4	4.4	5.0	5.0	5.7	5.7	6.3	6.3
WU165-4()	39.2	31.9	36.5	29.4	34.2	27.4	32.2	25.6	30.5	24.0	28.9	22.7	27.5	21.4	26.2	20.4	25.1	19.4
	2.3	2.3	2.7	2.7	3.6	3.6	3.9	3.9	4.6	4.6	5.3	5.3	6.5	6.5	6.9	6.9	7.7	7.7
WU166-4()	47.3	38.4	44.0	35.5	41.3	33.0	38.9	30.8	36.7	29.0	34.8	27.3	33.2	25.8	31.6	24.5	30.3	23.4
	2.8	2.8	3.3	3.3	4.2	4.2	4.6	4.6	5.8	5.8	6.3	6.3	7.2	7.2	8.1	8.1	9.0	9.0
WU167-4()	55.3	45.0	51.5	41.5	48.3	38.6	45.5	36.1	43.0	33.9	40.8	32.0	38.8	30.0	37.0	28.7	35.4	27.3
	3.1	3.1	3.7	3.7	4.6	4.6	5.4	5.4	6.7	6.7	7.3	7.3	8.8	8.8	9.4	9.4	10.1	10.1
WU168-4()	63.4	51.5	59.1	47.6	55.3	44.2	52.1	41.3	49.3	38.8	46.7	36.6	44.5	34.7	42.4	32.9	40.6	31.3
	3.7	3.7	4.4	4.4	5.4	5.4	6.3	6.3	7.7	7.7	8.2	8.2	9.8	9.8	10.6	10.6	11.8	11.8
WU169-4()	71.2	57.9	66.4	53.5	62.2	49.7	58.6	46.5	55.4	43.6	52.5	41.2	50.0	39.0	47.7	37.0	45.6	35.2
	3.9	3.9	5.0	5.0	6.0	6.0	6.9	6.9	8.4	8.4	9.2	9.2	10.7	10.7	12.0	12.0	13.2	13.2
WU1610-4()	79.3	64.4	73.9	59.5	69.2	55.3	65.2	51.7	61.6	48.6	58.5	45.8	55.6	43.4	53.1	41.2	50.7	39.2
	4.2	4.2	5.6	5.6	6.6	6.6	7.8	7.8	9.3	9.3	10.2	10.2	12.0	12.0	13.2	13.2	14.5	14.5
4-p T.V.	3.8		4.3		4.8		5.3		5.7		6.2		6.7		7.1		7.5	

TABLE 4 - 16"WU HEAT EXCHANGERS (2 pass)

2 & 4 PASS	BAFFLE SPACE		4"	5"	6"	8"	10"	12"
	SHELL FLOW in GPM	A	135-175	176-220	221-265	266-355	356-440	441-525
		B	65-134	135-175	176-220	221-265	266-355	356-440

2 PASS	G. P. M. HEATED IN TUBES																					
	110		120		130		140		150		160		180		200		225		250		275		300	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU163-2()	22.4	20.1	21.6	19.3	20.9	18.5	20.3	17.9	19.7	17.3	19.1	16.7	18.1	15.7	17.3	14.9	16.3	13.9	15.5	13.1	14.7	12.4	14.1	11.7
WU164-2()	30.0	26.9	29.0	25.8	28.0	24.8	27.2	24.0	26.4	23.1	25.6	22.4	24.3	21.1	23.1	19.9	21.9	18.6	20.7	17.5	19.7	16.6	18.9	15.7
WU165-2()	37.6	33.7	36.3	32.3	35.1	31.1	34.1	30.0	33.1	29.0	32.1	28.1	30.5	26.4	29.0	24.9	27.4	23.3	26.0	22.0	24.7	20.8	23.6	19.7
WU166-2()	45.4	40.7	43.8	39.1	42.4	37.6	41.1	36.3	39.9	35.0	38.8	33.9	36.8	31.9	35.0	30.1	33.1	28.2	31.4	26.5	29.9	25.1	28.5	23.8
WU167-2()	53.0	47.5	51.2	45.6	49.5	43.9	48.0	42.3	46.6	40.9	45.3	39.6	42.9	37.2	40.9	35.1	38.6	32.9	36.6	31.0	34.9	29.3	33.3	27.8
WU168-2()	60.8	54.4	58.7	52.3	56.8	50.3	55.1	48.6	53.4	46.9	52.0	45.4	49.3	42.7	46.9	40.3	44.3	37.8	42.0	35.5	40.0	33.6	38.2	31.9
WU169-2()	68.2	61.1	65.9	58.7	63.7	56.5	61.8	54.5	60.0	52.6	58.3	50.9	55.3	47.9	52.6	45.2	49.7	42.3	47.1	39.9	44.9	37.7	42.9	35.7
																							1.0	1.0
WU1610-2()	75.8	67.9	73.2	65.2	70.8	62.8	68.6	60.5	66.6	58.5	64.8	56.6	61.4	53.2	58.5	50.3	55.2	47.1	52.4	44.3	49.9	41.9	47.6	39.7
																							1.2	1.2
2-p T.V.	1.0 ft./sec.		1.4		1.6		1.8		1.9		2.1		2.3		2.5		2.7		2.8		3.0		3.4	

2 PASS	G. P. M. HEATED IN TUBES																					
	325		350		375		400		450		500		550		600		650		700		750		800	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU163-2()	13.5	11.2	12.9	10.7	12.4	10.2	12.0	9.8	11.2	9.0	10.5	8.4	9.9	7.9	9.3	7.4	8.9	7.0	8.4	6.6	8.1	6.3	7.7	6.0
													1.0	1.0	1.2	1.2	1.3	1.3	1.5	1.5	1.7	1.7	1.9	1.9
WU164-2()	18.1	15.0	17.3	14.3	16.7	13.7	16.1	13.1	15	12.1	14	11.3	13.2	10.5	12.5	9.9	11.9	9.3	11.3	8.8	10.8	8.4	10.3	8.0
									1.0	1.0	1.2	1.2	1.4	1.4	1.6	1.6	1.8	1.8	2.1	2.1	2.3	2.3	2.5	2.5
WU165-2()	22.6	18.7	21.7	17.9	20.9	17.1	20.1	16.4	18.8	15.2	17.6	14.1	16.6	13.2	15.7	12.4	14.9	11.7	14.2	11.1	13.5	10.5	12.9	10.0
									1.2	1.2	1.4	1.4	1.7	1.7	2.0	2.0	2.3	2.3	2.7	2.7	2.9	2.9	3.2	3.2
WU166-2()	27.3	22.6	26.0	21.6	25.2	20.7	24.3	19.8	22.7	18.3	21.2	17.0	20.0	15.9	18.9	15.0	18.0	14.1	17.1	13.4	16.3	12.7	15.6	12.1
							1.0	1.0	1.5	1.5	1.8	1.8	2.1	2.1	2.4	2.4	2.7	2.7	3.0	3.0	3.5	3.5	3.9	3.9
WU167-2()	31.9	26.4	30.6	25.2	29.4	24.1	28.4	23.1	26.5	21.4	24.8	19.9	23.4	18.6	22.1	17.5	21.0	16.5	20.0	15.6	19.1	14.8	18.2	14.1
	1.0	1.0	1.1	1.1	1.3	1.3	1.4	1.4	1.7	1.7	2.0	2.0	2.4	2.4	2.8	2.8	3.2	3.2	3.7	3.7	4.0	4.0	4.5	4.5
WU168-2()	36.6	30.3	35.1	28.9	27.7	27.7	32.5	26.5	30.3	24.5	28.5	22.8	26.8	21.3	25.4	20.1	24.1	18.9	22.9	17.9	21.9	17.0	20.9	16.2
	1.1	1.1	1.3	1.3	1.4	1.4	1.5	1.5	1.9	1.9	2.3	2.3	2.7	2.7	3.2	3.2	3.7	3.7	4.3	4.3	4.7	4.7	5.1	5.1
WU169-2()	41.0	34.0	39.4	32.4	31.0	31.0	36.5	29.8	34.0	27.5	31.9	25.6	30.1	23.9	28.4	22.5	27.0	21.2	25.7	20.1	24.5	19.1	23.5	18.2
	1.3	1.3	1.5	1.5	1.6	1.6	1.7	1.7	2.2	2.2	2.6	2.6	3.1	3.1	3.6	3.6	4.2	4.2	4.7	4.7	5.3	5.3	5.7	5.7
WU1610-2()	45.6	37.8	43.8	36.1	34.5	34.5	40.6	33.1	30.6	36.0	35.5	28.4	33.4	26.6	31.6	25.3	30.0	23.6	28.6	22.3	27.3	21.2	26.1	20.2
	1.5	1.5	1.7	1.7	1.8	1.8	1.9	1.5	2.4	2.4	2.9	2.9	3.4	3.4	3.9	3.9	4.6	4.6	5.2	5.2	5.8	5.8	6.3	6.3
2-p T.V.	3.0		3.2		3.5		3.7		4.2		4.6		5.0		5.4		5.9		6.4		6.8		7.2	

TABLE 4 - 18" WU HEAT EXCHANGERS (4 Pass)

2 & 4 PASS	BAFFLE SPACE		4	5	6	8	10	12	13	15
	Shell Flow in G. P. M	A	140-200	201-250	251-300	301-400	401-500	501-600	601-650	651-750
		B	75-139	140-200	201-250	251-300	301-400	401-500	501-600	601-650

4 PASS	G. P. M. HEATED IN TUBES																			
	100		120		140		160		180		200		225		250		275		300	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU 183-4()	40.3	35.2	37.1	32.0	34.4	29.3	32.2	27.2	30.3	25.3	28.6	23.7	26.8	22.0	25.2	20.6	23.8	19.3	22.6	18.2
													1.0	1.0	1.5	1.5	1.7	1.7	2.0	2.0
WU 184-4()	53.4	46.7	49.2	42.4	45.7	38.9	42.7	36.0	40.2	33.6	37.9	31.5	35.5	29.2	33.4	27.3	31.6	25.6	30.0	24.1
									1.0	1.0	1.2	1.2	1.6	1.6	1.8	1.8	2.0	2.0	2.6	2.6
WU 185-4()	66.3	57.9	61.0	52.6	56.7	48.3	53.0	44.7	49.8	41.7	47.1	39.0	44.1	36.2	41.5	33.8	39.2	31.8	37.2	29.9
					1.0	1.0	1.1	1.1	1.3	1.3	1.5	1.5	1.9	1.9	2.3	2.3	2.6	2.6	3.1	3.1
WU 186-4()	79.5	69.4	73.1	63.0	67.9	57.9	63.5	53.6	59.7	49.9	56.4	46.8	52.8	43.4	49.7	40.5	47.0	38.0	44.6	35.9
					1.1	1.1	1.2	1.2	1.5	1.5	1.8	1.8	2.3	2.3	2.7	2.7	3.0	3.0	3.7	3.7
WU 187-4()	92.9	81.1	85.5	73.7	79.4	67.6	74.2	62.6	69.8	58.4	65.9	54.7	61.8	50.8	58.1	47.4	55.0	44.5	52.1	41.9
			1.0	1.0	1.3	1.3	1.4	1.4	1.7	1.7	2.1	2.1	2.6	2.6	3.1	3.1	3.6	3.6	4.3	4.3
WU 188-4()	106.1	92.6	97.6	84.1	90.6	77.2	84.7	71.5	79.7	66.6	75.3	62.4	70.5	58.0	66.4	54.1	62.7	50.8	59.5	47.9
	1.0	1.0	1.2	1.2	1.4	1.4	1.6	1.6	1.8	1.8	2.3	2.3	3.0	3.0	3.6	3.6	3.9	3.9	4.8	4.8
WU 189-4()	119.2	104.1	109.7	94.6	101.8	86.8	95.2	80.4	89.6	74.9	84.6	70.2	79.3	65.1	74.6	60.8	70.5	57.1	66.9	53.8
	1.2	1.2	1.4	1.4	1.6	1.6	1.9	1.9	2.1	2.1	2.6	2.6	3.3	3.3	3.8	3.8	4.5	4.5	5.4	5.4
WU 1810-4()	132.4	115.6	121.8	105.0	113.1	96.4	105.7	89.2	99.5	83.2	94.0	77.9	88.0	72.3	82.8	67.5	78.3	63.4	74.3	59.7
	1.4	1.4	1.6	1.6	1.8	1.8	22.2	2.2	2.5	2.5	3.0	3.0	3.7	3.7	4.3	4.3	5.3	5.3	5.8	5.8
4-P T. V.	1.5 ft./sec.		1.8		2.1		2.4		2.8		3.0		3.3		3.7		4.2		4.5	

4 PASS	G. P. M. HEATED IN TUBES											
	325		350		375		400		450		500	
	A	B	A	B	A	B	A	B	A	B	A	B
WU 183-4()	21.5	17.2	20.5	16.3	19.6	15.5	18.8	14.8	17.4	13.6	16.2	12.5
	2.3	2.3	2.8	2.8	3.0	3.0	3.3	3.3	4.3	4.3	4.9	4.9
WU 184-4()	28.5	22.8	27.2	21.6	26.1	20.6	25.0	19.7	23.1	18.0	21.5	16.6
	3.1	3.1	3.3	3.3	3.6	3.6	4.2	4.2	5.1	5.1	6.2	6.2
WU 185-4()	35.4	28.3	33.8	26.9	32.3	25.6	31.0	24.4	28.7	22.4	26.7	20.7
	3.7	3.7	4.0	4.0	4.9	4.9	5.2	5.2	6.6	6.6	7.6	7.6
WU 186-4()	42.5	33.9	40.5	32.2	38.8	30.6	37.2	29.2	34.4	26.8	32.0	24.8
	4.4	4.4	4.7	4.7	5.4	5.4	6.1	6.1	7.6	7.6	8.9	8.9
WU 187-4()	49.6	39.7	47.4	37.6	45.3	35.8	43.4	34.2	40.2	31.3	37.4	28.9
	5.0	5.0	5.4	5.4	6.4	6.4	7.0	7.0	8.5	8.5	10.3	10.3
WU 188-4()	56.7	45.3	54.1	43.0	51.7	40.9	49.6	39.0	45.9	35.8	42.7	33.0
	5.8	5.8	6.5	6.5	7.2	7.2	7.9	7.9	9.7	9.7	11.6	11.6
WU 189-4()	63.7	50.9	60.8	48.3	58.1	46.0	55.8	43.9	51.5	40.2	48.0	37.1
	6.1	6.1	7.2	7.2	8.3	8.3	8.9	8.9	10.8	10.8	12.9	12.9
WU 1810-4()	70.7	56.5	67.5	53.6	64.6	51.0	61.9	48.7	57.2	44.6	53.3	41.2
	7.0	7.0	8.0	8.0	8.9	8.9	9.8	9.8	12.1	12.1	14.3	14.3
4-P T. V.	5.0		5.3		5.7		6.0		6.7		7.5	

TABLE 4 - 18" WU HEAT EXCHANGERS (2 Pass)

2 & 4 PASS	BAFFLE SPACE		4	5	6	8	10	12	13	15
	Shell Flow in G. P. M	A	140-200	201-250	251-300	301-400	401-500	501-600	601-650	651-750
		B	75-139	140-200	201-250	251-300	301-400	401-500	501-600	601-650

2 PASS	G. P. M. HEATED IN TUBES																			
	200		225		250		275		300		325		350		375		400		450	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU 183-2()	20.1	17.6	19.1	16.5	18.2	15.6	17.4	14.8	16.6	14.1	16.0	13.5	15.4	12.9	14.8	12.3	14.3	11.9	13.4	11.0
WU 184-2()	26.7	23.3	25.3	21.9	24.1	20.7	23.0	19.7	22.1	18.7	21.2	17.8	20.4	17.1	19.6	16.4	19.0	15.7	17.8	14.6
WU 185-2()	33.2	29.0	31.4	27.2	29.9	25.7	28.6	24.4	27.4	23.2	26.3	22.1	25.3	21.2	24.4	20.3	23.5	19.5	22.0	18.1
WU 186-2()	39.7	34.7	37.7	32.6	35.9	30.8	34.3	29.2	32.8	27.8	31.5	26.5	30.3	25.4	29.2	24.3	28.2	23.4	26.4 1.0	21.7 1.0
WU 187-2()	46.5	40.6	44.0	38.1	41.9	36.0	40.0	34.2	38.3	32.5	36.8	31.0	35.4	29.7	34.1	28.5	33.0	27.3	30.9 1.1	25.4 1.1
WU 188-2()	53.0	46.3	50.3	43.5	47.9	41.1	45.7	39.0	43.8	37.1	42.0	35.4	40.4	33.9	39.0	32.5	37.6 1.0	31.2 1.0	35.3 1.3	29.0 1.3
WU 189-2()	59.6	52.1	56.5	48.9	53.8	46.2	51.4	43.8	49.2	41.7	47.2	39.8	45.5	38.1	43.8 1.0	36.5 1.0	42.3 1.2	35.1 1.2	39.6 1.5	32.6 1.5
WU 1810-2()	66.2	57.8	62.8	54.4	59.7	51.3	57.0	48.7	54.6	46.3	52.5	44.2	50.5	42.3	48.7 1.2	40.6 1.2	47.0 1.4	39.0 1.4	44.0 1.7	36.2 1.7

2 PASS	G. P. M. HEATED IN TUBES																			
	500		550		600		650		700		750		800		850		900		950		1000	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU 183-2()	12.6	10.3	11.9	9.6	11.3	9.1	10.8	8.6	10.3 1.1	8.2 1.1	9.8 1.2	7.8 1.2	9.4 1.4	7.4 1.4	9.0 1.5	7.1 1.5	8.7 1.7	6.8 1.7	8.4 1.8	6.5 1.8	8.1 2.0	6.3 2.0
WU 184-2()	16.7	13.6	15.8 1.0	12.8 1.0	15.0 1.1	12.1 1.1	14.3 1.2	11.4 1.2	13.6 1.5	10.8 1.5	13.0 1.7	10.3 1.7	12.5 1.9	9.8 1.9	12.0 2.0	9.4 2.0	11.6 2.2	9.0 2.2	11.1 2.5	8.7 2.5	10.7 2.7	8.3 2.7
WU 185-2()	20.8 1.0	16.9 1.0	19.6 1.2	15.9 1.2	18.6 1.4	15.0 1.4	17.7 1.6	14.2 1.6	16.9 1.8	13.4 1.8	16.2 1.9	12.8 1.9	15.5 2.3	12.2 2.3	14.9 2.5	11.7 2.5	14.3 2.8	11.2 2.8	13.8 3.1	10.7 3.1	13.3 3.4	10.3 3.4
WU 186-2()	24.9 1.2	20.3 1.2	23.5 1.5	19.0 1.5	22.3 1.7	17.9 1.7	21.2 1.8	17.0 1.8	20.3 2.2	16.1 2.2	19.4 2.5	15.3 2.5	18.6 2.8	14.6 2.8	17.9 3.0	14.0 3.0	17.2 3.4	13.4 3.4	16.6 3.7	12.9 3.7	16.0 4.0	12.4 4.0
WU 187-2()	29.1 1.4	23.7 1.4	27.5 1.7	22.2 1.7	26.1 2.0	21.0 2.0	24.8 2.2	19.8 2.2	23.7 2.6	18.8 2.6	22.7 2.9	17.9 2.9	21.7 3.3	17.1 3.3	20.9 3.5	16.3 3.5	20.1 4.0	15.7 4.0	19.4 4.4	15.0 4.4	18.7 4.7	14.5 4.7
WU 188-2()	33.2 1.5	27.1 1.5	31.4 1.8	25.4 1.8	29.8 2.2	23.9 2.2	28.3 2.5	22.6 2.5	27.0 2.9	21.5 2.9	25.9 3.2	20.4 3.2	24.8 3.7	19.5 3.7	23.8 3.9	18.7 3.9	22.9 4.6	17.9 4.6	22.1 4.9	17.2 4.9	21.3 5.4	16.5 5.4
WU 189-2()	37.3 1.7	30.4 1.7	35.3 2.1	28.5 2.1	33.5 2.3	26.9 2.3	31.8 2.8	25.4 2.8	30.4 3.2	24.1 3.2	29.1 3.6	23.0 3.6	27.9 4.2	21.9 4.2	26.8 4.4	21.0 4.4	25.8 5.1	20.1 5.1	24.8 5.5	19.3 5.5	24.0 6.1	18.6 6.1
WU 1810-2()	41.4 1.8	33.8 1.8	39.2 2.30	31.7 2.3	37.1 2.7	29.9 2.7	35.4 3.2	28.2 3.2	33.7 3.6	26.8 3.6	32.3 4.0	25.5 4.0	31.0 4.6	24.4 4.6	29.7 4.9	23.3 4.9	28.6 5.7	22.3 5.7	27.6 6.1	21.4 6.1	26.6 6.7	20.6 6.7
4-P T. V.	3.7		4.1		4.4		4.8		5.2		5.6		6.0		6.3		6.7		7.1		7.4	

TABLE 4 - 20" WU HEAT EXCHANGERS (4 Pass)

2&4 PASS	BAFFLE SPACE 4"		5	6	7	8	9	11	14	16
	SHELL Flow in G.P.M.	A	170-220	221-280	281-335	336-390	391-450	451-500	621-780	781-900
		B	85-169	170-220	221-280	281-335	336-390	391-450	501-620	621-780

4 PASS	G.P.M. HEATED IN TUBES																							
	100		120		140		160		180		200		225		250		275		300		325		350		375	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Wu203-4()	44.3	39.4	41.1	36.1	38.4	33.3	36.1	31.0	34.1	29.1	32.3	27.4	30.4	25.5	28.8	24.0	27.3	22.6	26.0	21.4	24.8	20.3	23.8	19.3	22.8	18.4
																			1.1	1.1	1.3	1.3	1.5	1.5	1.7	1.7
Wu204-4()	59.1	52.6	54.8	48.1	51.1	44.5	48.1	41.4	45.4	38.8	43.1	36.5	40.6	34.1	38.4	31.9	36.4	30.1	34.7	28.5	33.1	27.0	31.7	25.7	30.4	24.6
															1.0	1.0	1.2	1.2	1.5	1.5	1.8	1.8	1.9	1.9	2.2	2.2
Wu205-4()	73.9	65.7	68.4	60.1	63.9	55.6	60.1	51.7	56.8	48.5	53.9	45.6	50.7	42.6	48.0	39.9	45.5	37.6	43.4	35.6	41.4	33.8	39.6	32.2	38.0	30.7
													1.2	1.2	1.3	1.3	1.5	1.5	1.8	1.8	2.2	2.2	2.4	2.4	2.6	2.6
Wu206-4()	88.7	78.9	82.1	72.2	76.7	66.7	72.1	62.1	68.1	58.2	64.7	54.8	60.9	51.1	57.6	47.9	54.6	45.1	52.0	42.7	49.7	40.5	47.6	38.6	45.6	36.8
													1.4	1.4	1.6	1.6	1.9	1.9	2.1	2.1	2.6	2.6	2.8	2.8	3.1	3.1
Wu207-4()	103.2	91.8	95.6	84.0	89.3	77.6	83.9	72.3	79.3	67.7	75.3	63.7	70.8	59.5	67.0	55.8	63.6	52.5	60.6	49.7	57.8	47.2	55.4	44.9	53.1	42.9
											1.1	1.1	1.5	1.5	1.8	1.8	2.0	2.0	2.5	2.5	3.0	3.0	3.2	3.2	3.5	3.5
Wu208-4()	118.0	105.0	109.3	96.0	102.1	88.7	96.0	82.6	90.7	77.4	86.0	72.9	81.0	68.0	76.6	63.8	72.7	60.1	69.2	56.8	66.1	53.9	63.3	51.3	60.7	49.0
									1.0	1.0	1.2	1.2	1.6	1.6	1.9	1.9	2.3	2.3	2.8	2.8	3.3	3.3	3.6	3.6	4.0	4.0
Wu209-4()	132.8	118.1	123.0	108.1	114.9	99.9	108.0	93.0	102.0	87.1	96.8	82.0	91.1	76.5	86.2	71.7	81.8	67.6	77.9	63.9	74.4	60.7	71.2	57.8	68.4	55.1
									1.2	1.2	1.4	1.4	1.8	1.8	2.0	2.0	2.6	2.6	3.0	3.0	3.5	3.5	4.1	4.1	4.6	4.6
Wu2010-4()	147.6	131.3	136.7	120.1	127.6	111.0	120.0	103.3	113.4	96.8	107.6	91.1	101.3	85.0	95.8	79.7	90.9	75.1	86.6	71.1	82.7	67.4	79.2	64.2	76.0	61.3
							1.2	1.2	1.4	1.4	1.6	1.6	2.0	2.0	2.3	2.3	3.0	3.0	3.4	3.4	3.7	3.7	4.5	4.5	4.9	4.9
4-p T.V.	1.1 ft./sec.		1.3		1.5		1.8		2.0		2.2		2.5		2.8		3.1		3.4		3.7		4.0		4.2	

4 PASS	G.P.M. HEATED IN TUBES											
	400		450		500		550		600		650	
	A	B	A	B	A	B	A	B	A	B	A	B
Wu203-4()	21.9	17.6	20.4	16.2	19.1	15.0	17.9	14.0	16.9	13.2	16.0	12.4
	2.0	2.0	2.4	2.4	3.0	3.0	3.4	3.4	3.8	3.8	4.5	4.5
Wu204-4()	29.3	23.5	27.2	21.6	25.4	20.1	23.9	18.7	22.5	17.5	21.3	16.5
	2.5	2.5	3.1	3.1	3.7	3.7	4.3	4.3	5.0	5.0	5.7	5.7
Wu205-4()	36.6	29.4	34.0	27.0	31.8	25.1	29.8	23.4	28.1	21.9	26.6	20.6
	3.0	3.0	3.7	3.7	5.0	5.0	5.3	5.3	6.0	6.0	7.0	7.0
Wu206-4()	43.6	35.2	40.8	32.5	38.1	30.1	35.8	28.1	33.8	26.3	32.0	24.8
	3.6	3.6	4.4	4.4	5.2	5.2	6.2	6.2	7.4	7.4	8.0	8.0
Wu207-4()	51.1	41.0	47.5	37.8	44.4	35.0	41.7	32.7	39.3	30.6	37.2	28.8
	3.7	3.7	5.1	5.1	6.0	6.0	7.1	7.1	7.7	7.7	9.7	9.7
Wu208-4()	58.4	46.9	54.3	43.2	50.7	40.0	47.6	37.4	44.9	35.0	42.5	33.0
	4.6	4.6	5.8	5.8	7.0	7.0	8.2	8.2	9.6	9.6	10.6	10.6
Wu209-4()	65.7	52.8	61.1	48.6	57.1	45.1	53.6	42.0	50.6	39.4	47.9	37.1
	5.0	5.0	6.4	6.4	7.8	7.8	9.0	9.0	10.6	10.6	12.0	12.0
Wu2010-4()	73.0	58.6	67.9	54.0	63.4	50.1	59.6	46.7	56.2	43.8	53.2	41.2
	5.7	5.7	7.1	7.1	8.5	8.5	10.0	10.0	11.8	11.8	13.6	13.6
4-p T.V.	4.5		5.0		5.6		6.1		6.6		7.1	

TABLE 4 - 20" WU HEAT EXCHANGERS (2 Pass)

2&4 PASS	BAFFLE SPACE 4"		5	6	7	8	9	11	14	16
	SHELL Flow in G.P.M.	A	170-220	221-280	281-335	336-390	391-450	451-500	501-620	621-780	781-900
		B	85-169	170-220	221-280	281-335	336-390	391-450	451-500	501-620	621-780

2 PASS	G.P.M. HEATED IN TUBES																									
	200		225		250		275		300		325		350		375		400		450		500		550		600	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Wu203-2()	22.3	19.9	21.3	18.8	20.3	17.9	19.5	17.0	18.8	16.3	18.1	15.6	17.4	15.0	16.9	14.4	16.3	13.9	15.4	12.9	14.6	12.1	13.8	11.5	13.2	10.8
Wu204-2()	29.8	26.6	28.4	25.1	27.2	23.9	26.0	22.7	25.0	21.7	24.1	20.8	23.3	20.0	22.5	19.2	21.8	18.5	20.5	17.3	19.4	16.2	18.5	15.3	17.6	14.5
Wu205-2()	37.3	33.3	35.5	31.4	34.0	29.8	32.6	28.4	31.3	27.2	30.2	26.0	29.1	25.0	28.2	24.0	27.3	23.2	25.7	21.6	24.3	20.3	23.1	19.1	22.0	18.1
Wu206-2()	44.7	39.8	42.6	37.7	40.7	35.7	39.0	34.0	37.5	32.5	36.1	31.2	34.9	29.9	33.7	28.8	32.7	27.7	30.8	25.9	29.1	24.3	27.7	22.9	26.3	21.7
Wu207-2()	52.2	46.5	49.7	44.0	47.5	41.7	45.6	39.7	43.8	38.0	42.2	36.4	40.7	34.9	39.4	33.6	38.2	32.4	35.9	30.2	34.0	28.4	32.3	26.7	30.8	25.3
																									1.2	1.2
Wu208-2()	59.5	53.1	56.7	50.2	54.2	47.6	52.0	45.4	50.0	43.3	48.2	41.5	46.5	39.9	45.0	38.4	43.6	37.0	41.0	34.5	38.8	32.4	36.8	30.5	35.1	28.9
																							1.1	1.1	1.3	1.3
Wu209-2()	67.0	59.8	63.9	56.5	61.0	53.6	58.5	51.1	56.3	48.8	54.2	46.7	52.3	44.9	50.6	43.2	49.0	41.6	46.2	38.8	43.7	36.4	41.5	34.4	39.5	32.5
																					1.0	1.0	1.2	1.2	1.5	1.5
Wu2010-2()	74.5	66.4	71.0	62.8	67.9	59.6	65.1	56.8	62.6	54.2	60.3	52.0	58.2	49.9	56.3	48.0	54.5	46.3	51.3	43.2	48.6	40.5	46.1	38.2	43.9	36.1
																					1.3	1.3	1.4	1.4	1.6	1.6
2-p T.V.	1.1 ft./sec.		1.2		1.4		1.6		1.7		1.8		1.9		2.1		2.2		2.4		2.7		3.0		3.3	

2 PASS	G.P.M. HEATED IN TUBES																									
	650		700		750		800		850		900		950		1000		1050		1100		1150		1200		1300		1400	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Wu203-2()	12.6	10.3	12.1	9.8	11.6	9.4	11.1	9.0	10.7	8.6	10.3	8.3	10.0	7.9	9.7	7.7	9.4	7.4	9.1	7.1	8.8	6.9	8.6	6.7	8.1	6.3	7.7	6.0
													1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.32	1.5	1.5	1.6	1.6	1.8	1.8	2.0	2.0
Wu204-2()	16.8	13.7	16.1	13.1	15.4	12.5	14.9	12.0	14.3	11.5	13.8	11.0	13.3	10.6	12.9	10.2	12.5	9.9	12.1	9.5	11.8	9.2	11.5	8.9	10.8	8.4	103	8.0
					1.0	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.5	1.5	1.6	1.6	1.7	1.7	1.8	1.8	2.0	2.0	2.1	2.1	2.4	2.4	2.7	2.7
Wu205-2()	21.0	17.2	20.1	16.4	19.3	15.6	18.6	15.0	17.9	14.3	17.3	13.8	16.7	13.3	16.2	12.8	15.7	12.3	15.2	11.9	14.7	11.5	14.3	11.2	13.6	10.5	12.9	10.0
			1.0	1.0	1.1	1.1	1.3	1.3	1.4	1.4	1.6	1.6	1.8	1.8	1.9	1.9	2.0	2.0	2.2	2.2	2.4	2.4	2.5	2.5	3.0	3.0	3.4	3.4
Wu206-2()	25.2	20.6	24.1	19.6	23.1	18.7	22.3	17.9	21.4	17.2	20.7	16.5	20.0	15.9	19.4	15.3	18.7	14.8	18.2	14.3	17.7	13.8	17.2	13.4	16.3	12.6	15.4	11.9
	1.1	1.1	1.2	1.2	1.5	1.5	1.6	1.6	1.8	1.8	1.9	1.9	2.1	2.1	2.2	2.2	2.6	2.6	2.7	2.7	2.9	2.9	3.0	3.0	3.6	3.6	4.0	4.0
Wu207-2()	29.4	24.0	28.1	22.9	27.0	21.9	26.0	20.9	25.0	20.1	24.2	19.3	23.3	18.5	22.6	17.9	21.9	17.3	21.2	16.7	20.6	16.1	20.0	15.6	19.0	14.7	18.0	13.9
	1.3	1.3	1.4	1.4	1.7	1.7	1.8	1.8	2.1	2.1	2.3	2.3	2.5	2.5	2.6	2.6	2.8	2.8	3.2	3.2	3.4	3.4	3.5	3.5	4.2	4.2	4.7	4.7
Wu208-2()	33.5	27.4	32.1	26.1	30.8	24.9	29.7	23.9	28.6	22.9	27.6	22.0	26.6	21.2	25.8	20.4	25.0	19.7	24.2	19.0	23.5	18.4	22.9	22.9	21.7	16.8	20.6	15.9
	1.5	1.5	1.6	1.6	1.9	1.9	2.1	2.1	2.4	2.4	2.6	2.6	2.8	2.8	3.0	3.0	3.2	3.2	3.6	3.6	3.8	3.8	3.9	3.9	4.8	4.8	5.4	5.4
Wu209-2()	37.8	30.9	36.2	29.4	34.7	28.1	33.4	26.9	32.2	25.8	31.0	24.8	30.0	23.8	29.0	23.0	28.1	22.2	27.3	21.4	26.5	20.7	25.7	25.7	24.4	18.9	23.2	17.9
	1.6	1.6	1.8	1.8	2.1	2.1	2.3	2.3	2.6	2.6	2.9	2.9	3.1	3.1	3.5	3.5	3.9	3.9	4.1	4.1	4.3	4.3	4.4	4.4	5.4	5.4	6.1	6.1
Wu2010-2()	42.0	34.3	40.2	32.7	38.6	31.2	37.1	29.9	35.6	28.6	34.5	27.5	33.3	26.5	32.3	25.5	31.3	24.7	30.3	23.8	29.4	23.1	28.6	28.6	27.1	21.0	25.7	19.9
	1.7	1.7	2.0	2.0	2.3	2.3	2.6	2.6	3.0	3.0	3.3	3.3	3.5	3.5	3.8	3.8	4.2	4.2	4.5	4.5	4.8	4.8	5.0	5.0	6.0	6.0	6.7	6.7
2-p T.V.	3.6		3.8		4.1		4.4		4.6		4.9		5.2		5.5		5.7		5.9		6.2		6.5		7.0		7.5	

TABLE 4 - 22" WU HEAT EXCHANGERS (4 Pass)

2&4 PASS	BAFFLE SPACE		5"	6"	7"	9"	11"	14"	17"
	Shell Flow in G.P.M	A	235-315	316-370	371-435	436-560	561-690	691-880	881-1070
		B	115-234	235-315	316-370	371-435	436-560	561-690	691-880

4 PASS	G.P.M. HEATED IN TUBES																					
	150		200		250		300		350		400		450		500		550		600		650	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Wu224-4()	57.5	50.4	50.4	43.3	45.2	38.1	41.0	34.2	37.7	31.0	34.9	28.5	32.6	26.3	30.5	24.5	28.8	22.9	27.2	21.5	25.8	20.3
									1.2	1.2	1.5	1.5	1.9	1.9	2.3	2.3	2.7	2.7	3.2	3.2	3.6	3.6
Wu225-4()	70.9	62.2	62.2	53.4	55.7	47.1	50.6	42.2	46.5	38.3	43.1	35.1	40.2	32.5	37.7	30.2	35.5	28.2	33.6	26.5	31.9	25.0
							1.2	1.2	1.5	1.5	1.9	1.9	2.4	2.4	2.9	2.9	3.4	3.4	4.0	4.0	4.6	4.6
Wu226-4()	84.4	740	74.0	63.6	66.3	56.0	60.2	50.2	55.3	45.6	51.3	41.8	47.8	38.6	44.8	35.9	42.2	33.6	39.9	31.6	37.9	29.8
					1.0	1.0	1.4	1.4	1.9	1.9	2.4	2.4	2.9	2.9	3.5	3.5	4.1	4.1	4.8	4.8	5.6	5.6
Wu227-4()	98.0	85.9	85.9	73.8	77.0	65.0	70.0	58.3	64.3	52.9	59.5	48.5	55.5	44.8	52.1	41.7	49.0	39.0	46.4	36.7	44.0	34.6
					1.2	1.2	1.7	1.7	2.2	2.2	2.8	2.8	3.4	3.4	4.1	4.1	4.9	4.9	5.7	5.7	6.5	6.5
Wu228-4()	111.4	97.7	97.7	83.9	87.5	73.9	79.6	66.3	73.1	60.2	67.7	55.2	63.1	51.0	59.2	47.4	55.8	44.4	52.7	41.7	50.1	39.3
			1.1	1.1	1.5	1.5	1.9	1.9	2.5	2.5	3.2	3.2	3.9	3.9	4.7	4.7	5.6	5.6	6.5	6.5	7.5	7.5
Wu229-4()	124.8	109.5	109.5	94.1	98.1	82.9	89.1	74.3	81.9	67.4	75.9	61.8	70.8	57.1	66.3	53.1	62.5	49.7	59.1	46.7	56.1	44.1
			1.4	1.4	1.8	1.8	2.1	2.1	2.8	2.8	3.6	3.6	4.4	4.4	5.3	5.3	6.3	6.3	7.3	7.3	8.5	8.5
Wu2210-4()	138.3	121.3	121.3	104.2	108.6	91.8	98.7	82.3	90.7	74.7	84.0	68.5	78.4	63.3	73.5	58.9	69.2	55.1	65.5	51.7	62.1	48.8
	1.1	1.1	1.7	1.7	2.1	2.1	2.4	2.4	3.1	3.1	4.0	4.0	4.9	4.9	5.9	5.9	7.0	7.0	8.2	8.2	9.4	9.4
4-p T.V.	1.4 ft. /sec.		1.8		2.3		2.7		3.2		3.6		4.1		4.5		5.0		5.5		5.9	

4 PASS	700		750		800	
	A	B	A	B	A	B
Wu224-4()	24.6	19.2	23.5	18.2	22.4	17.4
	4.1	4.1	4.7	4.7	5.3	5.3
Wu225-4()	30.3	23.7	28.9	22.5	27.7	21.4
	5.3	5.3	5.9	5.9	6.7	6.7
Wu226-4()	36.1	28.2	34.4	26.8	32.9	25.5
	6.4	6.4	7.2	7.2	8.0	8.0
Wu227-4()	41.9	32.7	40.0	31.1	38.2	29.6
	7.5	7.5	8.4	8.4	9.4	9.4
Wu228-4()	47.6	37.2	45.5	35.4	43.5	33.7
	8.6	8.6	4.7	4.7	10.8	10.8
Wu229-4()	53.4	41.7	51.0	39.6	48.7	37.7
	9.7	9.7	10.9	10.9	12.2	12.2
Wu2210-4()	59.1	46.2	59.4	43.9	54.0	41.8
	10.7	10.7	12.1	12.1	13.6	13.6
4-p T.V.	6.4		6.8		7.3	

TABLE 4 - 22" WU HEAT EXCHANGERS (2 Pass)

2&4 PASS	BAFFLE SPACE		5"	6"	7"	9"	11"	14"	17"
	Shell Flow in G.P.M	A	235-315	316-370	371-435	436-560	561-690	691-880	881-1070
		B	115-234	235-315	316-370	371-435	436-560	561-690	691-880

2 PASS	G.P.M. HEATED IN TUBES																					
	300		350		400		450		500		550		600		650		700		750		800	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Wu224-2()	29.0	25.5	27.1	23.6	25.5	21.9	24.1	20.5	22.8	19.3	21.8	18.3	20.8	17.3	19.9	16.5	19.1	15.8	18.4	15.1	17.7	14.5
Wu225-2()	35.8	31.5	33.5	29.1	31.4	27.1	29.7	25.4	28.2	23.9	26.8	22.6	25.6	21.4	24.6	20.4	23.6	19.4	22.7	18.6	21.9	17.8
Wu226-2()	42.6	37.4	39.8	34.6	37.4	32.2	35.4	30.2	33.5	28.4	31.9	26.8	30.5	25.5	29.2	24.2	28.0	23.1	27.0	22.1	26.0	21.2
																			1.0	1.0	1.1	1.1
Wu227-2()	49.5	43.5	46.2	40.2	43.5	37.4	41.1	35.0	39.0	33.0	37.1	31.2	35.4	29.6	33.9	28.2	32.6	26.9	31.3	25.7	30.2	24.7
																	1.0	1.0	1.2	1.2	1.3	1.3
Wu228-2()	56.2	49.4	52.5	45.6	49.4	42.5	46.6	39.8	44.2	37.5	42.1	35.4	40.2	33.6	38.5	32.0	37.0	30.5	35.6	29.2	34.3	28.0
															1.0	1.0	1.2	1.2	1.3	1.3	1.5	1.5
Wu229-2()	63.1	55.4	58.9	51.2	55.4	47.7	52.3	44.7	49.7	42.0	47.3	39.7	45.2	37.7	43.3	35.9	41.5	34.3	39.9	32.8	38.5	31.4
													1.0	1.0	1.2	1.2	1.3	1.3	1.5	1.5	1.7	1.7
Wu2210-2()	70.0	61.5	65.4	56.8	61.4	52.9	58.1	49.5	55.1	46.6	52.5	44.1	50.1	41.8	48.0	39.8	46.1	38.0	44.3	36.4	42.7	34.9
											1.0	1.0	1.1	1.1	1.3	1.3	1.5	1.5	1.7	1.7	1.9	1.9
2-p T.V.	1.4 ft./sec.		1.6		1.8		2.0		2.2		2.4		2.6		2.9		3.1		3.3		3.5	

2 PASS	G.P.M. HEATED IN TUBES																					
	850		900		950		1000		1050		1100		1150		1200		1300		1400		1500		1600		1700	
	A	B	A	B	A	B	A	B	A	B	A	B	A		A	B	A	B	A	B	A	B	A	B	A	B
Wu224-2()	17.1	13.9	16.5	13.4	16.0	12.9	15.5	12.4	15.0	12.0	14.6	11.6	14.2	11.3	13.8	10.9	13.1	10.3	12.5	9.8	11.9	9.3	11.4	8.8	10.9	8.4
					1.0	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.7	1.7	2.0	2.0	2.2	2.2	2.5	2.5	2.8	2.8
Wu225-2()	21.1	17.1	20.4	16.5	19.7	15.9	19.1	15.3	18.6	14.8	18.0	14.4	17.5	13.9	17.1	13.5	16.2	12.7	15.4	12.1	14.7	11.5	14.1	10.9	13.5	10.4
	1.0	1.0	1.1	1.1	1.2	1.2	1.4	1.4	1.6	1.6	1.6	1.6	1.8	1.8	1.9	1.9	2.2	2.2	2.5	2.5	2.8	2.8	3.1	3.1	3.5	3.5
Wu226-2()	25.1	20.4	24.3	19.6	23.5	18.9	22.8	18.3	22.1	17.7	21.4	17.1	20.8	16.6	20.3	16.1	19.3	15.2	18.3	14.4	17.5	13.6	16.7	13.0	16.1	12.4
	1.2	1.2	1.4	1.4	1.5	1.5	1.6	1.6	1.8	1.8	2.0	2.0	2.1	2.1	2.3	2.3	2.6	2.6	3.0	3.0	3.4	3.4	3.8	3.8	4.2	4.2
Wu227-2()	29.1	23.7	28.2	22.8	27.3	22.0	26.4	21.2	25.6	20.5	24.9	19.8	24.2	19.2	23.6	18.7	22.4	17.6	21.3	16.7	20.3	15.8	19.5	15.1	18.7	14.4
	1.5	1.5	1.6	1.6	1.8	1.8	1.9	1.9	2.0	2.0	2.3	2.3	2.5	2.5	2.7	2.7	3.1	3.1	3.5	3.5	4.0	4.0	4.4	4.4	5.0	5.0
Wu228-2()	33.1	26.9	32.0	25.9	31.0	25.0	30.0	24.1	29.1	23.3	28.3	22.5	27.5	21.8	26.8	21.2	25.4	20.0	24.2	18.9	23.1	18.0	22.1	17.1	21.2	16.4
	1.7	1.7	1.8	1.8	2.0	2.0	2.2	2.2	2.4	2.4	2.6	2.6	2.8	2.8	3.1	3.1	3.5	3.5	4.0	4.0	4.6	4.6	5.1	5.1	5.7	5.7
Wu229-2()	37.2	30.2	35.9	29.1	34.8	28.0	33.7	27.0	32.7	26.1	31.7	25.3	30.9	24.5	30.0	23.8	28.5	22.4	27.1	21.2	25.9	20.2	24.8	19.2	23.8	18.4
	1.9	1.9	2.1	2.1	2.3	2.3	2.5	2.5	2.8	2.8	3.0	3.0	3.2	3.2	3.5	3.5	4.0	4.0	4.5	4.5	5.1	5.1	5.8	5.8	6.4	6.4
Wu2210-2()	41.2	33.5	39.8	32.2	38.6	31.1	37.4	30.0	36.3	29.0	35.2	28.1	34.2	27.2	33.3	26.4	31.6	24.9	30.1	23.6	28.7	22.4	27.5	21.3	26.4	20.4
	2.1	2.1	2.3	2.3	2.5	2.5	2.8	2.8	3.0	3.0	3.3	3.3	3.6	3.6	3.9	3.9	4.4	4.4	5.1	5.1	5.7	5.7	6.4	6.4	7.2	7.2
2-p T.V.	3.7		4.0		4.2		4.4		4.6		4.8		5.1		5.3		5.7		6.2		6.6		7.0		7.5	

TABLE 4 - 24" WU HEAT EXCHANGERS (4 Pass)

2&4 PASS	BAFFLE SPACE		5"	6"	8"	10"	13"	17"	19"
	Shell Flow in G.P.M.	A	259-345	346-415	416-553	554-691	692-899	900-1175	1176-1315
		B	130-258	259-345	346-415	416-553	554-691	692-899	900-1175

4 PASS	G.P.M. HEATED IN TUBES																			
	150		200		250		300		350		400		450		500		550		600		650	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Wu224-4()	60.5	53.8	53.5	46.6	48.2	41.4	44.1	37.3	40.7	34.0	37.9	31.4	35.5	29.1	33.4	27.1	31.5	25.5	29.9	24.0	28.4	22.7
											1.0	1.0	1.3	1.3	1.5	1.5	1.8	1.8	2.1	2.1	2.4	2.4
Wu245-4()	75.3	66.9	66.5	58.0	60.0	51.5	54.9	46.4	50.6	42.4	47.1	39.0	44.1	36.2	41.5	33.8	39.2	31.7	37.2	29.8	35.4	28.2
									1.0	1.0	1.3	1.3	1.6	1.6	1.9	1.9	2.3	2.3	2.7	2.7	3.1	3.1
Wu246-4()	89.9	79.9	79.5	69.3	71.7	61.5	65.6	55.4	60.5	50.6	56.3	46.6	52.7	43.2	49.6	40.3	46.8	37.8	44.4	35.6	42.3	33.7
							1.1	1.1	1.2	1.2	1.6	1.6	1.9	1.9	2.3	2.3	2.8	2.8	3.2	3.2	3.7	3.7
Wu247-4()	104.7	93.1	92.5	80.7	83.4	71.6	76.3	64.5	70.4	58.9	65.5	54.2	61.3	50.3	57.7	47.0	54.5	44.0	51.7	41.5	49.2	39.2
			1.0	1.0	1.1	1.1	1.3	1.3	1.5	1.5	1.9	1.9	2.3	2.3	2.8	2.8	3.3	3.3	3.8	3.8	4.4	4.4
Wu248-4()	119.3	106.1	105.5	91.9	95.1	81.6	86.9	73.6	80.2	67.1	74.7	61.8	69.9	57.3	65.8	53.5	62.1	50.2	58.9	47.3	56.1	44.7
	1.0	1.0	1.2	1.2	1.3	1.3	1.5	1.5	1.7	1.7	2.1	2.1	2.6	2.6	3.2	3.2	3.8	3.8	4.4	4.4	5.1	5.1
Wu249-4()	134.1	119.2	118.5	103.3	106.9	91.7	97.7	82.7	90.2	75.4	83.9	69.5	78.6	64.4	73.9	60.1	69.8	56.4	66.2	53.1	63.0	50.3
	1.2	1.2	1.3	1.3	1.5	1.5	1.7	1.7	1.9	1.9	2.4	2.4	3.0	3.0	3.6	3.6	4.3	4.3	5.0	5.0	5.7	5.7
Wu2410-4()	148.7	132.2	131.4	114.6	118.5	101.7	108.3	91.7	100.0	83.7	93.1	77.0	87.1	71.5	82.0	66.7	77.5	62.6	73.5	58.9	69.9	55.7
	1.4	1.4	1.6	1.6	1.7	1.7	1.9	1.9	2.3	2.3	2.6	2.6	3.3	3.3	4.0	4.0	4.8	4.8	5.6	5.6	6.4	6.4
4-p T.V.	1.1 ft./sec.		1.7		1.9		2.2		2.6		3.0		3.3		3.7		4.1		4.5		4.8	

4 PASS	G.P.M. HEATED IN TUBES													
	700		750		800		850		900		950		1000	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Wu224-4()	27.1	21.5	26.0	20.5	24.9	19.5	23.9	18.7	23.0	17.9	22.2	17.2	21.4	16.5
	2.7	2.7	3.1	3.1	3.5	3.5	3.9	3.9	4.3	4.3	4.7	4.7	5.2	5.2
Wu245-4()	33.8	26.8	32.3	25.5	31.0	24.3	29.7	23.2	28.6	22.3	27.6	21.4	26.6	20.6
	3.5	3.5	4.0	4.0	4.4	4.4	4.9	4.9	5.5	5.5	6.0	6.0	6.5	6.5
Wu246-4()	40.3	32.0	38.6	30.4	37.0	29.0	35.5	27.8	34.2	26.6	32.9	25.5	31.8	24.6
	4.3	4.3	4.8	4.8	5.4	5.4	6.0	6.0	6.7	6.7	7.3	7.3	8.0	8.0
Wu247-4()	46.9	37.2	44.9	35.4	43.0	33.8	41.3	32.3	39.8	31.0	38.3	29.7	37.0	28.6
	5.0	5.0	5.7	5.7	6.4	6.4	7.1	7.1	7.8	7.8	8.6	8.6	9.4	9.4
Wu248-4()	53.5	42.4	51.2	40.4	49.1	38.5	47.1	36.8	45.3	35.3	43.7	33.9	42.2	32.6
	5.8	5.8	6.5	6.5	7.3	7.3	8.2	8.2	9.0	9.0	9.9	9.9	10.4	10.4
Wu249-4()	60.1	47.7	57.5	45.4	55.1	43.3	52.9	41.4	50.9	39.7	49.1	38.1	47.4	36.6
	6.5	6.5	7.4	7.4	8.3	8.3	9.2	9.2	10.2	10.2	11.2	11.2	12.2	12.2
Wu2410-4()	66.7	52.9	63.8	50.3	61.1	48.0	58.7	45.9	56.5	44.0	54.4	42.2	52.5	40.6
	7.3	7.3	8.2	8.2	9.2	9.2	10.3	10.3	11.4	1.4	12.5	12.5	13.6	13.6
4-p T.V.	5.2		5.6		5.9		6.3		6.8		7.1		7.4	

TABLE 4 - 24" WU HEAT EXCHANGERS (2 Pass)

2&4 PASS	BAFFLE SPACE		5"	6"	8"	10"	13"	17"	19"
	Shell Flow in G.P.M.	A	259-345	346-415	416-553	554-691	692-899	900-1175	1176-1315
		B	130-258	259-345	346-415	416-553	554-691	692-899	900-1175

2 PASS	G.P.M. HEATED IN TUBES																					
	400		450		500		550		600		650		700		750		800		850		900	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Wu244-2()	27.0	23.6	25.6	22.2	24.4	20.9	23.3	19.9	22.3	18.9	21.4	18.0	20.6	17.2	19.8	16.5	19.2	15.9	18.5	15.3	17.9	14.8
Wu245-2()	33.6	29.3	31.8	27.6	30.3	26.0	28.9	24.7	27.7	23.5	26.6	22.4	25.6	21.5	24.7	20.6	23.8	19.8	23.0	19.0	22.3	18.3
Wu246-2()	40.2	35.1	38.1	33.0	36.2	31.1	34.6	29.5	33.1	28.1	31.8	26.8	30.6	25.7	29.5	24.6	28.5	23.6	27.6	22.8	26.7	21.9
Wu247-2()	46.7	40.8	44.2	38.3	42.1	36.2	40.2	34.3	38.5	32.7	37.0	31.2	35.6	29.8	34.3	28.6	33.1	27.5	32.0	26.4	31.0	25.5
																			1.0	1.0	1.1	1.1
Wu248-2()	53.2	46.5	50.5	43.7	48.0	41.3	45.9	39.2	43.9	37.3	42.2	35.6	40.6	34.0	39.1	32.6	37.8	31.3	36.5	30.2	35.4	29.1
																	1.0	1.0	1.1	1.1	1.3	1.3
Wu249-2()	59.8	52.2	56.7	49.1	54.0	46.4	51.6	44.0	49.4	41.9	47.4	40.0	45.6	38.2	44.0	36.7	42.5	35.2	41.1	33.9	39.8	32.7
															1.0	1.0	1.2	1.2	1.3	1.3	1.4	1.4
Wu2410-2()	66.4	58.0	62.9	54.5	59.9	51.5	57.2	48.8	54.8	46.5	52.6	44.3	50.6	42.4	48.8	40.7	47.1	39.1	45.6	37.6	44.1	36.3
													1.0	1.0	1.2	1.2	1.3	1.3	1.4	1.4	1.6	1.6
2-p T.V.	1.5 ft./sec.		1.7		1.8		2.0		2.2		2.4		2.6		2.8		2.9		3.1		3.3	

2 PASS	G.P.M. HEATED IN TUBES																					
	950		1000		1100		1200		1300		1400		1500		1600		1700		1800		1900		2000	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Wu244-2()	17.4	14.2	16.9	13.8	16.0	12.9	15.2	12.2	14.4	11.5	13.8	10.9	13.2	10.4	12.6	9.9	12.1	9.5	11.7	9.1	11.2	8.7	10.9	8.4
							1.0	1.0	1.1	1.1	1.3	1.3	1.5	1.5	1.7	1.7	1.8	1.8	2.0	2.0	2.3	2.3	2.5	2.5
Wu245-2()	21.6	17.7	21.0	17.1	19.9	16.1	18.8	15.1	17.9	14.3	17.1	13.6	16.4	12.9	15.7	12.4	15.1	11.8	14.5	11.3	14.0	10.9	13.5	10.5
					1.1	1.1	1.3	1.3	1.5	1.5	1.7	1.7	1.9	1.9	2.1	2.1	2.4	2.4	2.6	2.6	2.9	2.9	3.2	3.2
Wu246-2()	25.9	21.2	25.1	20.5	23.8	19.2	22.5	18.1	21.4	17.1	20.5	16.3	19.6	15.5	18.8	14.8	18.0	14.1	17.4	13.5	16.7	13.0	16.2	12.5
	1.0	1.0	1.1	1.1	1.3	1.3	1.6	1.6	1.8	1.8	2.0	2.0	2.3	2.3	2.6	2.6	2.9	2.9	3.2	3.2	3.5	3.5	3.8	3.8
Wu247-2()	30.1	24.6	29.2	23.8	27.6	22.3	26.2	21.1	24.9	19.9	23.8	18.9	22.8	18.0	21.8	17.2	21.0	16.4	20.2	15.7	19.4	15.1	18.8	14.5
	1.2	1.2	1.3	1.3	1.6	1.6	1.8	1.8	2.1	2.1	2.4	2.4	2.7	2.7	3.0	3.0	3.4	3.4	3.7	3.7	4.1	4.1	4.5	4.5
Wu248-2()	34.3	28.1	33.3	27.2	31.5	25.5	29.9	24.0	28.4	22.7	27.1	21.6	26.0	20.5	24.9	19.6	23.9	18.7	23.0	18.0	22.2	17.2	21.4	16.6
	1.4	1.4	1.5	1.5	1.8	1.8	2.1	2.1	2.4	2.4	2.8	2.8	3.1	3.1	3.5	3.5	3.9	3.9	4.3	4.3	4.7	4.7	5.2	5.2
Wu249-2()	38.6	31.6	37.4	30.5	35.4	28.6	33.6	27.0	32.0	25.5	30.5	24.2	29.2	23.1	28.0	22.0	26.9	21.0	25.9	20.2	24.9	19.4	24.1	18.6
	1.6	1.6	1.7	1.7	2.0	2.0	2.4	2.4	2.7	2.7	3.1	3.1	3.5	3.5	4.0	4.0	4.4	4.4	4.9	4.9	5.4	5.4	5.9	5.9
Wu2410-2()	42.8	35.0	41.5	33.9	39.3	31.8	37.3	30.0	35.5	28.3	33.8	26.9	32.4	25.6	31.0	24.4	29.8	23.4	28.7	22.4	27.7	21.5	26.7	20.7
	1.8	1.8	1.9	1.9	2.3	2.3	2.7	2.7	3.1	3.1	3.5	3.5	3.9	3.9	4.4	4.4	4.9	4.9	5.4	5.4	6.0	6.0	6.6	6.6
2-p T.V.	3.5		3.7		4.0		4.3		4.7		5.1		5.4		5.8		6.2		6.5		6.8		7.3	

TABLE 4 - 26" WU HEAT EXCHANGERS(4 Pass)

2&4 PASS	BAFFLE SPACE		6"	8"	10"	12"	16"	20"
	Shell Flow in G.P.M.	A	339-451	452-602	603-735	754-903	904-1205	1206-1500
		B	170-338	339-451	452-602	603-753	754-903	904-1205

4 PASS	G.P.M. HEATED IN TUBES																			
	200		250		300		350		400		450		500		550		600		650	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Wu264-4()	60.5	53.3	54.8	47.5	50.3	43.1	46.6	39.4	43.5	36.4	40.8 1.0	33.9 1.0	38.5 1.2	31.7 102	36.5 1.4	29.8 1.4	34.7 1.6	28.2 1.6	33.1 1.9	26.7 1.9
Wu265-4()	74.5	65.6	67.5	58.6	61.9	53.0	57.4	48.6	53.6 1.0	44.9 1.0	50.3 1.2	41.8 1.2	47.4 1.5	39.1 1.5	44.9 1.8	36.7 1.8	42.7 2.1	34.7 2.1	40.7 2.4	32.9 2.4
Wu266-4()	88.4	77.9	80.1	69.5	73.5	62.9	68.1 1.0	57.6 1.0	63.5 1.2	53.2 1.2	59.7 1.5	49.5 1.5	56.3 1.8	46.3 1.8	53.3 2.2	43.6 2.2	50.7 2.5	41.1 2.5	48.3 2.9	39.0 2.9
Wu267-4()	102.2	90.1	92.6	80.4	85.0 1.0	72.8 1.0	78.8 1.1	66.7 1.1	73.5 1.4	61.6 1.4	69.0 1.8	57.3 1.8	65.1 2.1	53.6 2.1	61.7 2.5	50.4 2.5	58.6 3.0	47.6 3.0	55.9 3.4	45.1 3.4
Wu268-4()	116.1	102.3	105.2 1.0	91.3 1.0	96.6 1.1	82.7 1.1	89.5 1.3	75.7 1.3	83.5 1.7	70.0 1.7	78.4 2.0	65.1 2.0	74.0 2.5	60.9 2.5	70.1 2.9	57.3 2.9	66.6 3.4	54.1 3.4	63.5 3.9	51.2 3.9
Wu269-4()	130.0 1.0	114.6 1.0	117.8 1.1	102.2 1.1	108.1 1.3	92.6 1.3	100.2 1.5	84.7 1.5	93.5 2.0	78.3 2.0	87.8 2.3	72.9 2.3	82.8 2.8	68.2 2.8	78.4 3.3	64.1 3.3	74.5 3.8	60.5 3.8	71.1 4.4	57.3 4.4
Wu2610-4()	143.9 1.2	126.8 1.2	130.3 1.3	113.1 1.3	119.6 1.6	102.4 1.6	110.9 1.8	93.8 1.8	103.5 2.3	86.7 2.3	97.1 2.5	80.6 2.5	91.6 3.1	75.5 3.1	86.8 3.7	71.0 3.7	82.5 4.3	67.0 4.3	78.7 4.9	63.5 4.9
4-p T.V.	1.3 ft./sec.		1.6		1.9		2.3		2.6		2.9		3.2		3.6		3.9		4.2	

4 PASS																
	700		750		800		850		900		950		1000		1100	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Wu264-4()	31.6 2.1	25.4 2.1	30.3 2.4	24.2 2.4	29.1 2.7	23.1 2.7	28.0 3.0	22.1 3.0	26.9 3.4	21.2 3.4	26.0 3.7	20.4 3.7	25.1 4.0	19.6 4.0	23.5 4.8	18.3 4.8
Wu265-4()	38.9 2.7	31.2 2.7	37.3 3.1	29.8 3.1	35.8 3.5	28.4 3.5	34.4 3.8	27.2 3.8	33.2 4.3	26.1 4.3	32.0 4.7	25.1 4.7	30.9 5.1	24.2 5.1	29.0 6.1	22.5 6.1
Wu266-4()	46.2 3.3	37.1 3.3	44.2 3.7	35.3 3.7	42.5 4.2	33.7 4.2	40.9 4.7	32.3 4.7	39.4 5.2	31.0. 5.2	38.0 5.7	29.8 5.7	36.7 6.2	28.7 6.2	34.4 7.4	26.7 7.4
Wu267-4()	53.4 3.9	42.9 3.9	51.2 4.4	40.9 4.4	49.1 4.9	39.0 4.9	47.3 5.5	37.4 5.5	45.5 6.1	35.9 6.1	43.9 6.7	34.5 6.7	42.5 7.3	33.2 7.3	39.8 8.6	30.9 8.6
Wu268-4()	60.7 4.5	48.7 4.5	58.1 5.0	46.4 5.0	55.8 5.6	44.3 5.6	53.7 6.3	42.5 6.3	51.7 7.0	40.7 7.0	49.9 7.7	39.1 7.7	48.2 8.4	37.7 8.4	45.2 9.9	35.1 9.9
Wu269-4()	67.9 5.0	54.5 5.0	65.1 5.7	51.9 5.7	62.5 6.4	49.6 6.4	60.1 7.1	47.5 7.1	57.9 7.9	45.6 7.9	55.9 8.6	43.8 8.7	54.0 9.5	42.2 9.5	50.6 11.2	39.3 11.2
Wu2610-4()	75.2 5.6	60.3 5.6	72.0 6.3	57.5 6.3	69.2 7.1	54.9 7.1	66.5 7.9	52.6 7.9	64.1 8.7	50.5 8.7	61.8 9.6	48.5 9.6	59.8 10.5	46.7 10.5	56.0 12.5	43.5 12.5
4-p T.V.	4.5		4.9		5.2		5.5		5.8		6.1		6.4		7.0	

TABLE 4 - 26" WU HEAT EXCHANGERS(2 Pass)

2&4 PASS	BAFFLE SPACE		6"	8"	10"	12"	16"	20"
	Shell Flow in G.P.M.	A	339-451	452-602	603-735	754-903	904-1205	1206-1500
		B	170-338	339-451	452-602	603-753	754-903	904-1205

2 PASS	G.P.M. HEATED IN TUBES																			
	400		500		600		700		800		900		1000		1100		1200		1300	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Wu264-2()	30.6	27.0	27.8	24.1	25.5	21.9	23.6	20.0	22.1	18.5	20.7	17.3	19.6	16.1	18.5	15.2	17.6	14.3	16.8	13.6
Wu265-2()	37.6	33.2	34.1	29.7	31.4	26.9	29.1	24.7	27.1	22.8	25.5	21.2	24.1	19.9	22.8	18.7	21.7	17.6	20.7	16.7
																	1.0	1.0	1.1	1.1
Wu266-2()	44.7	39.4	40.5	35.2	37.2	31.9	34.5	29.3	32.2	27.0	30.3	25.2	28.6	23.6	27.1	22.2	25.7	20.9	24.5	19.8
															1.0	1.0	1.2	1.2	1.4	1.4
Wu267-2()	51.6	45.6	46.8	40.7	43.0	36.9	39.9	33.8	37.2	31.3	35.0	29.1	33.0	27.2	31.3	25.6	29.7	24.2	28.4	22.9
													1.0	1.0	1.2	1.2	1.4	1.4	1.6	1.6
Wu268-2()	58.7	51.8	53.2	46.2	48.9	41.9	45.3	38.4	42.3	35.5	39.7	33.1	37.5	30.9	35.5	29.1	33.8	27.5	32.2	26.0
											1.0	1.0	1.2	1.2	1.4	1.4	1.6	1.6	1.9	1.9
Wu269-2()	65.7	58.0	59.6	51.8	54.7	46.9	50.7	43.0	47.4	39.8	44.5	37.0	42.0	34.6	39.8	32.6	37.8	30.8	36.1	29.2
											1.1	1.1	1.3	1.3	1.6	1.6	1.8	1.8	2.1	2.1
Wu2610-2()	72.7	64.2	65.9	57.3	60.6	52.0	56.2	47.6	52.4	44.0	49.3	41.0	46.5	38.4	44.0	36.1	41.9	34.1	39.9	32.3
									1.0	1.0	1.2	1.2	1.5	1.5	1.7	1.7	2.0	2.0	2.4	2.4
2-p T.V.	1.3 ft./sec.		1.6		1.9		2.2		2.5		2.8		3.1		3.5		3.8		4.1	

2 PASS	G.P.M. HEATED IN TUBES																			
	1400		1500		1600		1700		1800		1900		2000		2100		2200		2300	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Wu264-2()	16.1	12.9	15.4	12.3	14.8	11.8	14.2	11.3	13.7	10.8	13.2	10.4	12.8	10.0	12.4	9.7	12.0	9.3	11.6	9.0
	1.0	1.0	1.2	1.2	1.3	1.3	1.5	1.5	1.6	1.6	1.8	1.8	1.9	1.9	2.1	2.1	2.3	2.3	2.5	2.5
Wu265-2()	19.8	15.9	18.9	15.2	18.2	14.5	17.5	13.9	16.9	13.3	16.3	12.8	15.7	12.3	15.2	11.9	14.8	11.5	14.3	11.1
	1.3	1.3	1.5	1.5	1.7	1.7	1.8	1.8	2.0	2.0	2.2	2.2	2.5	2.5	2.7	2.7	2.9	2.9	3.1	3.1
Wu266-2()	23.5	18.9	22.5	18.0	21.6	17.2	20.8	16.5	20.0	15.8	19.3	15.2	18.7	14.6	18.1	14.1	17.5	13.6	17.0	13.2
	1.6	1.6	1.8	1.8	2.0	2.0	2.2	2.2	2.5	2.5	2.7	2.7	3.0	3.0	3.2	3.2	3.5	3.5	3.8	3.8
Wu267-2()	27.1	21.8	26.0	20.8	25.0	19.9	24.0	19.0	23.1	18.3	22.3	17.5	21.6	16.9	20.9	16.3	20.2	15.7	19.6	15.2
	1.9	1.9	2.1	2.1	2.3	2.3	2.6	2.6	2.9	2.9	3.2	3.2	3.5	3.5	3.8	3.8	4.1	4.1	4.5	4.5
Wu268-2()	30.8	24.8	29.5	23.6	28.4	22.6	27.3	21.6	26.3	20.7	25.4	19.9	24.5	19.2	23.7	18.5	23.0	17.9	22.3	17.3
	2.1	2.1	2.4	2.4	2.7	2.7	3.0	3.0	3.3	3.3	3.7	3.7	4.0	4.0	4.4	4.4	4.7	4.7	5.1	5.1
Wu269-2()	34.5	27.7	33.1	26.4	31.7	25.3	30.5	24.2	29.4	23.2	28.4	22.3	27.5	21.5	26.6	20.7	25.7	20.0	25.0	19.4
	2.4	2.4	2.7	2.7	3.0	3.0	3.4	3.4	3.8	3.8	4.1	4.1	4.5	4.5	4.9	4.9	5.4	5.4	5.8	5.8
Wu2610-2()	38.2	30.7	36.6	29.3	35.1	28.0	33.8	26.8	32.6	25.7	31.4	24.7	30.4	23.8	29.4	22.9	28.5	22.2	27.6	21.4
	2.7	2.7	3.0	3.0	3.4	3.4	3.8	3.8	4.2	4.2	4.6	4.6	5.0	5.0	5.5	5.5	6.0	6.0	6.5	6.5
2-p T.V.	4.4		4.7		5.0		5.4		5.7		6.0		6.3		6.6		6.9		7.2	

TABLE 4 - 28" WU HEAT EXCHANGERS(4 Pass)

2&4 PASS	BAFFLE SPACE		6"	8"	10"	13"	17"	22"
	SHELL FLOW in G.P.M.	A	367-488	489-651	652-814	815-1058	1059-1383	1384-1790
		B	183-366	367-488	489-651	652-814	815-1058	1059-1383

4PASS	G.P.M. HEATED IN TUBES																			
	250		300		350		400		450		500		550		600		650		700	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU284-4( )	47.2	41.4	43.5	37.7	40.5	34.7	37.9	32.1	35.7	30.0	33.7	28.1	32.0	26.5	30.5	25.1	29.1	23.8	27.9	22.7
													1.0	1.0	1.2	1.2	1.4	1.4	1.6	1.6
WU285-4( )	60.7	53.3	56.0	48.5	52.0	44.6	48.7	41.3	45.9	38.6	43.4	36.2	41.2	34.1	39.3	32.3	37.5	30.6	35.9	29.2
											1.1	1.1	1.3	1.3	1.5	1.5	1.7	1.7	2.0	2.0
WU286-4( )	74.2	65.2	68.4	59.3	63.6	54.5	59.6	50.5	56.1	47.1	53.1	44.2	50.4	41.7	48.0	39.4	45.8	37.5	43.9	35.7
									1.1	1.1	1.3	1.3	1.6	1.6	1.8	1.8	2.1	2.1	2.4	2.4
WU286-4( )	87.8	77.0	80.9	70.1	75.2	64.4	70.4	59.7	66.3	55.7	62.7	52.3	59.6	49.3	56.7	46.6	54.2	44.3	51.9	42.2
							1.1	1.1	1.3	1.3	1.6	1.6	1.8	1.8	2.2	2.2	2.5	2.5	2.8	2.8
WU287-4( )	101.3	88.9	93.3	80.9	86.8	74.3	81.3	68.9	76.5	64.3	72.4	60.3	68.7	56.9	65.5	53.8	62.5	51.1	59.9	48.6
					1.1	1.1	1.2	1.2	1.5	1.5	1.8	1.8	2.1	2.1	2.5	2.5	2.9	2.9	3.3	3.3
WU289-4( )	114.9	100.8	105.9	91.7	98.5	84.3	92.2	78.2	86.8	73.0	82.1	68.5	78.0	64.5	74.3	61.1	71.0	58.0	67.9	55.2
			1.0	1.0	1.2	1.2	1.4	1.4	1.7	1.7	2.0	2.0	2.4	2.4	2.8	2.8	3.2	3.2	3.7	3.7
WU2810-4( )	128.4	112.7	118.4	102.5	110.1	94.3	103.1	87.4	97.0	81.6	91.8	76.5	87.1	72.1	83.0	68.2	79.3	64.8	75.9	61.7
			1.2	1.2	1.4	1.4	1.6	1.6	2.0	2.0	2.2	2.2	2.7	2.7	3.1	3.1	3.6	3.6	4.1	4.1
4-PT.V.	1.4 ft. / sec		1.6		1.9		2.2		2.4		2.7		3.0		3.2		3.5		3.8	

4PASS	G.P.M. HEATED IN TUBES																			
	750		800		850		900		950		1000		1100		1200		1300		1400	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU284-4( )	26.8	21.6	25.8	20.7	24.8	19.9	23.9	19.1	23.1	18.4	22.4	17.7	21.0	16.5	19.8	15.5	18.8	14.6	17.9	13.8
	1.8	1.8	2.0	2.0	2.2	2.2	2.5	2.5	2.7	2.7	3.0	3.0	3.5	3.5	4.1	4.1	4.7	4.7	5.4	5.4
WU285-4( )	34.5	27.8	33.1	26.6	31.9	25.6	30.8	24.5	29.8	23.6	28.8	22.8	27.1	21.2	25.5	19.9	24.2	18.8	23.0	17.7
	2.2	2.2	2.5	2.5	2.8	2.8	3.1	3.1	3.4	3.4	3.7	3.7	4.4	4.4	5.2	5.2	6.0	6.0	6.8	6.8
WU286-4( )	42.1	34.0	40.5	32.6	39.0	31.2	37.7	30.0	36.4	28.9	35.2	27.8	33.1	26.0	31.2	24.4	29.6	22.9	28.1	21.7
	2.7	2.7	3.1	3.1	3.4	3.4	3.8	3.8	4.1	4.1	4.5	4.5	5.4	5.4	6.3	6.3	7.2	7.2	8.2	8.2
WU286-4( )	49.8	40.2	47.9	38.5	46.1	36.9	44.5	35.5	43.0	34.1	41.6	32.9	39.1	30.7	36.9	28.8	34.9	27.1	33.2	25.6
	3.2	3.2	3.6	3.6	4.0	4.0	4.4	4.4	4.9	4.9	5.3	5.3	6.3	6.3	7.4	7.4	8.5	8.5	9.7	9.7
WU287-4( )	57.5	46.4	55.3	44.4	53.2	42.6	51.4	40.9	49.6	39.4	48.0	38.0	45.1	35.4	42.6	33.2	40.3	31.3	38.3	29.6
	3.7	3.7	4.1	4.1	4.6	4.6	5.1	5.1	5.6	5.6	6.1	6.1	7.2	7.2	8.5	8.5	9.7	9.7	11.1	11.1
WU289-4( )	65.2	52.7	62.7	50.4	60.4	48.3	58.3	46.4	56.3	44.7	54.5	43.1	51.2	40.2	48.3	37.7	45.7	35.5	43.5	33.5
	4.1	4.1	4.7	4.7	5.2	5.2	5.7	5.7	6.3	6.3	6.9	6.9	8.2	8.2	9.5	9.5	11.0	11.0	12.5	12.5
WU2810-4( )	72.9	58.9	70.1	56.4	67.5	54.0	65.1	51.9	63.0	50.0	60.9	48.2	57.2	44.9	54.0	42.1	51.1	39.7	48.6	37.5
	4.6	4.6	5.2	5.2	5.8	5.8	6.4	6.4	7.0	7.0	7.7	7.7	9.1	9.1	10.6	10.6	12.3	12.3	14.0	14.0
4-PT.V.	4.0		4.3		4.6		4.9		5.1		5.4		5.9		6.5		7.0		7.5	

TABLE 4 - 28" WU HEAT EXCHANGERS(2 Pass)

2&4 PASS	BAFFLE SPACE		6"	8"	10"	13"	17"	22"
	SHELL FLOW in G.P.M.	A	367-488	489-651	652-814	815-1058	1059-1383	1384-1790
		B	183-366	367-488	489-651	652-814	815-1058	1059-1383

2PASS	G.P.M. HEATED IN TUBES																			
	500		600		700		800		900		1000		1100		1200		1300		1400	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU284-2( )	23.8	20.9	21.9	19.0	20.4	17.5	19.1	16.2	18.0	15.2	17.0	14.2	16.2	13.4	15.4	12.7	14.7	12.1	14.1	11.5
WU285-2( )	30.6	26.9	28.2	24.5	26.3	22.5	24.6	20.9	23.2	19.5	21.9	18.3	20.8	17.3	19.9	16.3	19.0	15.5	18.2 1.0	14.8 1.0
WU286-2( )	37.4	32.9	34.5	29.9	32.1	27.5	30.1	25.5	28.3	23.8	26.8	22.4	25.4	21.1	24.2	20.0	23.2 1.0	19.0 1.0	22.2 1.2	18.1 1.2
WU287-2( )	44.2	38.9	40.8	35.4	38.0	32.6	35.6	30.2	33.5	28.2	31.7	26.5	30.1	24.9	28.7 1.0	23.6 1.0	27.4 1.2	22.4 1.2	26.2 1.4	21.4 1.4
WU288-2( )	51.0	44.8	47.1	40.8	43.8	37.6	41.0	34.8	38.6	32.5	36.5	30.5	34.7 1.0	28.8 1.0	33.1 1.2	27.2 1.2	31.6 1.4	25.9 1.4	30.3 1.6	24.6 1.6
WU289-2( )	57.9	50.9	53.4	46.3	49.7	42.6	46.5	39.5	43.8	36.9	41.5 1.0	34.6 1.0	39.4 1.2	32.7 1.2	37.5 1.3	30.9 1.3	35.9 1.6	29.3 1.6	34.4 1.8	28.0 1.8
WU2810-2( )	64.7	56.9	59.7	51.8	55.5	47.6	52.0	44.2	49.0	41.2	46.3 1.1	38.7 1.1	44.0 1.3	36.5 1.3	41.9 1.5	34.5 1.5	40.1 1.7	32.8 1.7	38.4 2.0	31.2 2.0
2-P.T.V.	1.3ft. / sec		1.6		1.8		2.1		2.3		2.6		2.9		3.1		3.4		3.6	

2PASS	G.P.M. HEATED IN TUBES																			
	1500		1600		1700		1800		1900		2000		2200		2400		2600		2800	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU284-2( )	13.5	11.0	13.0 1.0	10.5 1.0	12.6 1.1	10.1 1.1	12.1 1.2	9.7 1.2	11.7 1.3	9.3 1.3	11.3 1.4	9.0 1.4	10.7 1.8	8.4 1.8	10.1 2.0	7.9 2.0	9.5 2.3	7.4 2.3	9.0 2.6	7.0 2.6
WU285-2( )	17.4 1.1	14.1 1.1	16.8 1.2	13.5 1.2	16.2 1.4	13.0 1.4	15.6 1.5	12.5 1.5	15.1 1.6	12.0 1.6	14.6 1.8	11.6 1.8	13.7 2.1	10.8 2.1	12.9 2.5	10.1 2.5	12.3 2.9	9.5 2.9	11.6 3.3	9.0 3.3
WU286-2( )	21.3 1.3	17.2 1.3	20.5 1.5	16.5 1.5	19.7 1.6	15.8 1.6	19.1 1.8	15.2 1.8	18.4 2.0	14.6 2.0	17.8 2.2	14.1 2.2	16.8 2.6	13.2 2.6	15.8 3.0	12.4 3.0	15.0 3.5	11.6 3.5	14.2 4.0	11.0 4.0
WU287-2( )	25.2 1.5	20.4 1.5	24.2 1.7	19.5 1.7	23.4 1.9	18.7 1.9	22.5 2.1	18.0 2.1	21.8 2.3	17.3 2.3	21.1 2.6	16.7 2.6	19.8 3.0	15.6 3.0	18.7 3.5	14.6 3.5	17.7 4.1	13.8 4.1	16.8 4.7	13.0 4.7
WU288-2( )	29.1 1.8	23.5 1.8	28.0 2.0	22.5 2.0	26.9 2.2	21.6 2.2	26.0 2.4	20.7 2.4	25.1 2.7	20.0 2.7	24.3 2.9	19.3 2.9	22.8 3.5	18.0 3.5	21.6 4.1	16.8 4.1	20.4 4.7	15.9 4.7	19.4 5.4	15.0 5.4
WU289-2( )	33.0 2.0	26.7 2.0	31.7 2.2	25.5 2.2	30.6 2.5	24.5 2.5	29.5 2.8	23.5 2.8	28.5 3.0	22.7 3.0	27.6 3.3	21.8 3.3	25.9 3.9	20.4 3.9	24.5 4.6	19.1 4.6	23.2 5.3	18.0 5.3	22.0 6.0	17.0 6.0
WU2810-2( )	36.8 2.2	29.8 2.2	35.4 2.5	28.5 2.5	34.1 2.8	27.4 2.8	33.0 3.1	26.3 3.1	31.9 3.4	25.3 3.4	30.8 3.7	24.4 3.7	29.0 4.4	22.8 4.4	27.3 5.1	21.4 5.1	25.9 5.9	20.1 5.9	24.6 6.7	19.0 6.7
2-P.T.V.	3.9		4.1		4.4		4.7		5.0		5.3		5.8		6.3		6.8		7.4	

TABLE 4 - 30" WU HEAT EXCHANGERS(4 Pass)

2&4 PASS	BAFFLE SPACE		6"	8"	10"	13"	17"	22"	24"	26"
	Shell Flow IN G.P.M.	A	390-520	521-700	701-870	871-1140	1141-1480	1481-1930	1931-2100	2101-2280
		B	200-389	390-520	521-700	701-870	871-1140	1141-1480	1481-1930	1931-2100

4 PASS	G.P.M. HEATED IN TUBES																					
	250		300		350		400		450		500		550		600		650		700		750	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU304-4( )	51.6	45.7	47.7	41.8	44.5	38.5	41.8	35.8	39.5	33.5	37.4	31.5	35.6	29.8	34.0 1.0	28.2 1.0	32.5 1.1	26.8 1.1	31.2 1.3	25.6 1.3	30.0 1.4	24.5 1.4
WU305-4( )	66.0	58.4	61.0	53.4	56.9	49.2	53.4	45.8	50.4	42.8	47.8	40.3	45.5 1.0	38.0 1.0	43.4 1.2	36.1 1.2	41.5 1.4	34.3 1.4	39.8 1.6	32.7 1.6	38.3 1.8	31.3 1.8
WU306-4( )	80.2	71.1	74.2	64.9	69.2	59.9	65.0	55.7	61.3	52.1	58.1 1.1	49.0 1.1	55.3 1.3	46.3 1.3	52.8 1.5	43.9 1.5	50.5 1.7	41.7 1.7	48.4 1.9	39.8 1.9	46.6 2.2	38.0 2.2
WU307-4( )	94.7	83.9	87.6	76.6	81.7	70.7	76.7	65.7	72.4 1.0	61.5 1.0	68.6 1.3	57.8 1.3	65.3 1.5	54.6 1.5	62.3 1.7	51.7 1.7	59.6 2.0	49.2 2.0	57.2 2.3	46.9 2.3	55.0 2.6	44.9 2.6
WU308-4( )		96.5		88.1	94.0	81.3	88.2 1.0	75.6 1.0	83.3 1.2	70.7 1.2	78.9 1.4	66.5 1.4	75.1 1.7	62.8 1.7	71.7 2.0	59.5 2.0	68.6 2.3	56.6 2.3	65.8 2.6	54.0 2.6	63.2 2.9	51.6 2.9
WU309-4( )						92.1		85.6 1.2	94.3 1.4	80.1 1.4	89.4 1.6	75.3 1.6	85.0 1.9	71.1 1.9	81.2 2.2	67.4 2.2	77.7 2.6	64.1 2.6	74.5 2.9	61.2 2.9	71.6 3.3	58.5 3.3
WU3010-4( )								95.5		89.3 1.6		84.0 1.8	94.9 2.2	79.3 2.2	90.5 2.5	75.2 2.5	86.6 3.0	71.5 3.0	83.1 3.3	68.2 3.3	79.9 3.7	65.2 3.7
4-P.T.V.	1.2 ft. / sec		1.4		1.6		1.9		2.1		2.4		2.6		2.8		3.0		3.3		3.5	

4 PASS	G.P.M. HEATED IN TUBES																					
	800		850		900		950		1000		1100		1200		1300		1400		1500		1600	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU304-4( )	28.9 1.6	23.5 1.5	27.8 1.8	22.5 1.8	26.9 2.0	21.7 2.0	26.0 2.2	20.9 2.2	25.2 2.4	20.1 2.4	23.7 2.8	18.8 2.8	22.4 3.3	17.7 3.3	21.3 3.8	16.7 3.8	20.2 4.3	15.8 4.3	19.3 4.9	15.0 4.9	18.5 5.4	14.3 5.4
WU305-4( )	36.9 2.0	30.0 2.0	35.6 2.2	28.8 2.2	34.4 2.5	27.7 2.5	33.3 2.7	26.7 2.7	32.2 3.0	25.7 3.0	30.3 3.5	24.1 3.5	28.7 4.1	22.6 4.1	27.2 4.8	21.3 4.8	25.9 5.4	20.2 5.4	24.7 6.1	19.1 6.1	23.6 6.9	18.2 6.9
WU306-4( )	44.8 2.4	36.4 2.4	43.3 2.7	35.0 2.7	41.8 3.0	33.7 3.0	40.4 3.3	32.4 3.3	39.2 3.6	31.3 3.6	36.9 4.3	29.2 4.3	34.9 5.0	27.5 5.0	33.1 5.8	25.9 5.8	31.5 6.6	24.5 6.6	30.0 7.5	23.3 7.5	28.7 8.4	22.2 8.4
WU307-4( )	52.9 2.9	43.0 2.9	51.0 3.2	41.3 3.2	49.3 3.5	39.7 3.5	47.7 3.9	38.3 3.9	46.2 4.3	36.9 4.3	43.5 5.1	34.5 5.1	41.1 5.9	32.4 5.9	39.0 6.8	30.6 6.8	37.1 7.7	28.9 7.7	35.4 8.8	27.5 8.8	33.9 9.8	26.1 9.8
WU308-4( )	60.9 3.3	49.5 3.3	58.7 3.7	47.5 3.7	56.7 4.1	45.7 4.1	54.9 4.5	44.0 4.5	53.2 4.9	42.5 4.9	50.1 5.8	39.7 5.8	47.3 6.8	37.3 6.8	44.9 7.8	35.2 7.8	42.7 8.9	33.3 8.9	40.7 10.1	31.6 10.1	39.0 11.3	30.1 11.3
WU309-4( )	69.0 3.7	56.0 3.7	66.5 4.2	53.8 4.2	64.3 4.6	51.7 4.6	62.2 5.1	49.9 5.1	60.2 5.5	48.1 5.5	56.7 6.6	45.0 6.6	53.6 7.6	42.2 7.6	50.8 8.8	39.8 8.8	48.4 10.1	37.7 10.1	46.1 11.4	35.8 11.4	44.1 12.7	34.1 12.7
WU3010-4( )	76.9 4.2	62.5 4.2	74.2 4.6	60.0 4.6	71.7 5.1	57.7 5.1	69.4 5.6	55.6 5.6	67.2 6.2	53.7 6.2	63.3 7.3	50.2 7.3	59.8 8.5	47.1 8.5	56.7 9.8	44.4 9.8	54.0 11.2	42.0 11.2	51.5 12.7	39.9 12.7	49.2 14.2	38.0 14.2
4-P.T.V.	3.7		4.0		4.2		4.4		4.7		5.2		5.6		6.1		6.5		7.0		7.5	

TABLE 4 - 30" WU HEAT EXCHANGERS(2 Pass)

2&4 PASS	BAFFLE SPACE		6"	8"	10"	13"	17"	22"	24"	26"
	Shell Flow IN G.P.M.	A	390-520	521-700	701-870	871-1140	1141-1480	1481-1930	1931-2100	2101-2280
		B	200-389	390-520	521-700	701-870	871-1140	1141-1480	1481-1930	1931-2100

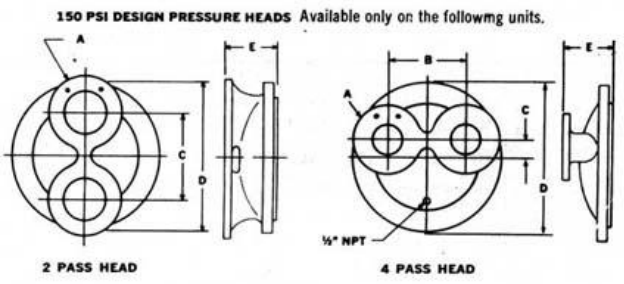
2 PASS	G.P.M. HEATED IN TUBES																					
	500		600		700		800		900		1000		1100		1200		1300		1400		1500	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU304-2( )	26.0	23.0	24.0	21.1	22.4	19.4	21.1	18.1	19.9	16.9	18.9	15.9	18.0	15.0	17.1	14.3	16.4	13.6	15.7	12.9	15.1	12.4
WU305-2( )	33.3	29.5	30.8	27.0	28.7	24.9	27.0	23.1	25.5	21.7	24.1	20.4	23.0	19.3	21.9	18.3	21.0	17.4	20.1	16.6	19.4	15.8
WU306-2( )	40.5	35.9	37.5	32.8	35.0	30.3	32.8	28.2	31.0	26.4	29.4	24.8	28.0	23.4	26.7	22.2	25.6	21.1	24.5	20.2	23.6	19.3
																					1.1	1.1
WU307-2( )	47.8	42.4	44.2	38.7	41.2	35.7	38.7	33.2	36.6	31.1	34.7	29.3	33.0	27.7	31.5	26.2	30.2	24.9	28.9	23.8	27.8	22.8
																	1.0	1.0	1.1	1.1	1.2	1.2
WU308-2( )	54.9	48.7	50.8	44.5	47.4	41.1	44.5	38.2	42.0	35.8	39.9	33.6	37.9	31.8	36.2	30.1	34.7	28.7	33.3	27.3	32.0	26.2
															1.0	1.0	1.1	1.1	1.3	1.3	1.4	1.4
WU309-2( )	62.1	55.1	57.5	50.4	53.6	46.5	50.4	43.2	47.6	40.5	45.1	38.1	42.9	36.0	41.0	34.1	39.2	32.4	37.6	31.0	36.2	29.6
															1.1	1.1	1.2	1.2	1.4	1.4	1.6	1.6
WU3010-2( )	69.4	61.5	64.2	56.2	59.9	51.9	56.2	48.3	53.1	45.2	50.4	42.5	47.9	40.2	45.8	38.1	43.8	36.2	37.6	34.6	40.4	33.0
													1.0	1.0	1.2	1.2	1.4	1.4	1.6	1.6	1.8	1.8
2-P T.V.	1.1 ft .sec		1.4		1.6		1.8		2.1		2.3		2.5		2.7		3.0		3.2		3.4	

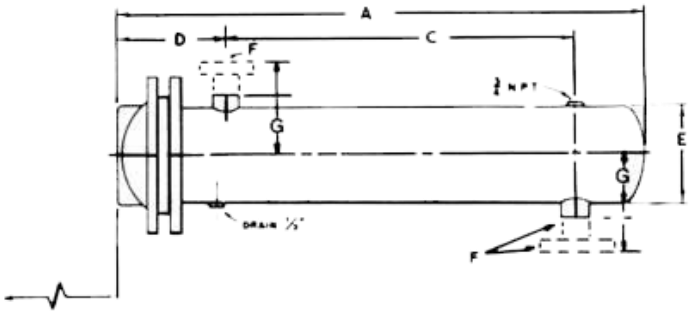
2 PASS	G.P.M. HEATED IN TUBES																					
	1600		1700		1800		1900		2000		2200		2400		2600		2800		3000		3200	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
WU304-2( )	14.6	11.9	14.1	11.4	13.6	11.0	13.1	10.6	12.7	10.2	12.0	9.5	11.3	9.0	10.8	8.4	10.2	8.0	9.8	7.6	9.3	7.2
											1.3	1.3	1.6	1.6	1.8	1.8	2.1	2.1	2.3	2.3	2.6	2.6
WU305-2( )	18.7	15.2	18.0	14.6	17.4	14.0	16.8	13.5	16.3	13.0	15.4	12.2	14.5	11.5	13.8	10.8	13.1	10.2	12.5	9.7	12.0	9.3
	1.0	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.5	1.5	1.7	1.7	2.0	2.0	2.3	2.3	2.6	2.6	3.0	3.0	3.4	3.4
WU306-2( )	22.7	18.5	21.9	17.8	21.2	17.1	20.5	16.5	19.9	15.9	18.7	14.9	17.7	14.0	16.8	13.2	16.0	12.5	15.2	11.8	14.6	11.3
	1.2	1.2	1.3	1.3	1.5	1.5	1.6	1.6	1.9	1.9	2.1	2.1	2.4	2.4	2.8	2.8	3.2	3.2	3.6	3.6	4.1	4.1
WU307-2( )	26.8	21.8	25.9	20.9	25.0	20.1	24.2	19.4	23.4	18.7	22.1	17.5	20.9	16.5	19.8	15.5	18.8	14.7	18.0	14.0	17.2	13.3
	1.4	1.4	1.5	1.5	1.7	1.7	1.9	1.9	2.1	2.1	2.4	2.4	2.8	2.8	3.3	3.3	3.7	3.7	4.2	4.2	4.8	4.8
WU308-2( )	30.8	25.1	29.7	24.1	28.7	23.2	27.8	22.3	26.9	21.5	25.4	20.1	24.0	18.9	22.7	17.8	21.6	16.9	20.7	16.0	19.8	15.3
	1.6	1.6	1.8	1.8	2.0	2.0	2.2	2.2	2.5	2.5	2.8	2.8	3.3	3.3	3.8	3.8	4.3	4.3	4.8	4.8	5.5	5.5
WU309-2( )	34.9	28.4	33.6	27.2	32.5	26.2	31.4	25.3	30.5	24.4	28.7	22.8	27.1	21.4	25.7	20.2	24.5	19.1	23.4	18.2	22.4	17.3
	1.8	1.8	2.0	2.0	2.2	2.2	2.4	2.4	2.8	2.8	3.2	3.2	3.7	3.7	4.2	4.2	4.8	4.8	5.5	5.5	6.3	6.3
WU3010-2( )	38.9	31.7	37.5	30.4	36.3	29.3	35.1	28.2	34.0	27.2	32.0	25.4	30.3	23.9	28.7	22.5	27.3	21.3	26.1	20.3	25.0	19.3
	2.0	2.0	2.2	2.2	2.5	2.5	2.7	2.7	3.1	3.1	3.5	3.5	4.1	4.1	4.7	4.7	5.4	5.4	6.1	6.1	7.0	7.0
2-P T.V.	3.7		3.9		4.1		4.4		4.6		5.0		5.5		6.0		6.4		6.9		7.3	

CHART 5 – MULTIPLIER, F

Tube Velocity Ft./Sec	SHELL VELOCITY Ft./Sec.			
	1	2	3	4
1	1.10	1.12	1.14	1.16
2	1.08	1.09	1.10	1.11
3	1.04	1.05	1.05	1.06
4	1.05	1.06	1.08	1.09
5	1.05	1.06	1.08	1.09
6	1.05	1.06	1.07	1.08
7	1.05	1.05	1.06	1.07

جداول ابعاد مبدلهای WU:



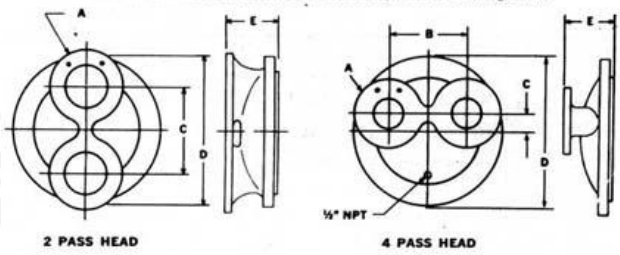


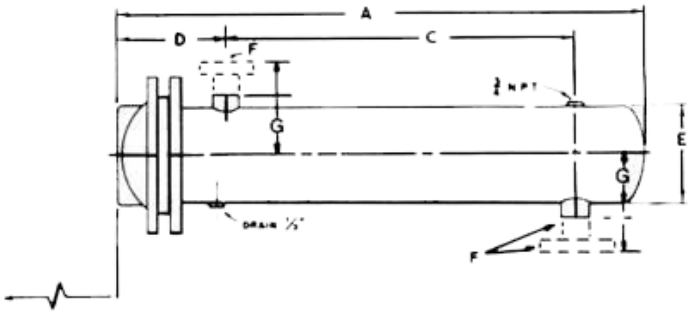
2-PASS						4-PASS					
SHELL DIA.	A FLG	C	D	E		SHELL DIA.	A FLG	B	C	D	E
10"	4	9¼	14 5/8	5½		10"		NOT AVAILABLE			
12"	4	9¼	14 5/8	5		12"		NOT AVAILABLE			
14"	5	10¼	17 7/8	6½		14"	4	9¼	2 3/16	17 7/8	6 1/8
16"	6	11¼	19 7/8	6¾		16"	4	9½	2 1/8	19 7/8	6¾
18"	6	11½	22	7¼		18"	4	9½	4½	22	7
20"	8	13¾	24	8		20"	6	11¼	3¼	24	7¾

UNIT NUMBER			DIMENSIONS IN INCHES																	HEATING SURFACE (SQ.FT.)			WeightT (LBS)
			2 PASS		4 PASS			6 PASS				2, 4, AND 6 PASS											
2PASS	4PASS	6PASS	J	K	H	L	M	N	P	R	S	A	B	C	D	E	F	G	2PASS	4PASS	6PASS	
Wu43-24	WU43144	-	1¼NPT	2 5/8	1NPT	1	1¾	2¼	-	-	-	40 7/8	7¼	29	6 3/8	4½	2½" NPT	3 7/8	4.1	4.1	-	78
Wu44-24	WU44-44	-	1¼NPT	2 5/8	1NPT	1	1¾	2¼	-	-	-	52 7/8	7¼	41	6 3/8	4½	2½" NPT	3 7/8	5.7	5.7	-	92
Wu45-24	WU45-44	-	1¼NPT	2 5/8	1NPT	1	1¾	2¼	-	-	-	64 7/8	7¼	53	6 3/8	4½	2½" NPT	3 7/8	7.2	7.2	-	106
WU46-24	WU46-44	-	1¼NPT	2 5/8	1NPT	1	1¾	2¼	-	-	-	76 7/8	7¼	65	6 3/8	4½	2½" NPT	3 7/8	8.8	8.8	-	120
WU47-24	WU47-44	-	1¼NPT	2 5/8	1NPT	1	1¾	2¼	-	-	-	88 7/8	7¼	77	6 3/8	4½	2½" NPT	3 7/8	10.4	10.4	-	134
WU63-23	WU63-43	WU63-63	2NPT	3¾	1½NPT	1 19/32	2 13/16	3 3/16	2 11/32	1¼NPT	2 13/16	40 1/8	10½	27½	6 7/8	6 5/8	2½" NPT	5 1/16	12.7	12.7	9.6	125
WU64-23	WU64-43	WU64-63	2NPT	3¾	1½NPT	1 19/32	2 13/16	3 3/16	2 11/32	1¼NPT	2 13/16	52 1/8	10½	39½	6 7/8	6 5/8	2½" NPT	5 1/16	17.4	17.4	13.1	150
WU65-23	WU65-43	WU65-63	2NPT	3¾	1½NPT	1 19/32	2 13/16	3 3/16	2 11/32	1¼NPT	2 13/16	64 1/8	10½	51½	6 7/8	6 5/8	2½" NPT	5 1/16	22.1	22.1	16.7	175
WU66-23	WU66-43	WU66-63	2NPT	3¾	1½NPT	1 19/32	2 13/16	3 3/16	2 11/32	1¼NPT	2 13/16	76 1/8	10½	63½	6 7/8	6 5/8	2½" NPT	5 1/16	26.8	26.8	20.2	200
WU67-23	WU67-43	WU67-63	2NPT	3¾	1½NPT	1 19/32	2 13/16	3 3/16	2 11/32	1¼NPT	2 13/16	88 1/8	10½	75½	6 7/8	6 5/8	2½" NPT	5 1/16	31.5	31.5	23.8	225
WU68-23	WU68-43	WU68-63	2NPT	3¾	1½NPT	1 19/32	2 13/16	3 3/16	2 11/32	1¼NPT	2 13/16	100 1/8	10½	87½	6 7/8	6 5/8	2½" NPT	5 1/16	36.2	36.2	27.3	250
WU84-24	WU84-44	WU84-64	3NPT	5	2NPT	2	3½	4	3	2NPT	3¾	53	12½	37	8½	8 5/8	4" FLG	8¾	32	32	26	222
WU85-24	WU85-44	WU85-44	3NPT	5	2NPT	2	3½	4	3	2NPT	3¾	65	12½	49	8½	8 5/8	4" FLG	8¾	41	41	33	258
WU86-24	WU86-44	WU86-64	3NPT	5	2NPT	2	3½	4	3	2NPT	3¾	77	12½	61	8½	8 5/8	4" FLG	8¾	49	49	41	294
WU87-24	WU87-44	WU87-64	3NPT	5	2NPT	2	3½	4	3	2NPT	3¾	89	12½	73	8½	8 5/8	4" FLG	8¾	58	58	48	330
WU88-24	WU88-44	WU88-64	3NPT	5	2NPT	2	3½	4	3	2NPT	3¾	101	12½	85	8½	8 5/8	4" FLG	8¾	67	67	55	366
WU89-24	WU89-44	WU89-64	3NPT	5	2NPT	2	3½	4	3	2NPT	3¾	113	12½	97	8½	8 5/8	4" FLG	8¾	75	75	62	402
WU104-25	WU104-45	WU104-65	4NPT	5 7/8	3NPT	2 3/8	4 7/8	4¾	3 13/16	2½NPT	4 7/8	53	14 5/8	36¼	9	10¾	4" FLG	9 7/8	56	53	45	331
WU105-25	WU105-45	WU105-65	4NPT	5 7/8	3NPT	2 3/8	4 7/8	4¾	3 13/16	2½NPT	4 7/8	65	14 5/8	48¼	9	10¾	4" FLG	9 7/8	71	68	56	384
WU106-25	WU106-45	WU106-65	4NPT	5 7/8	3NPT	2 3/8	4 7/8	4¾	3 13/16	2½NPT	4 7/8	77	14 5/8	60¼	9	10¾	4" FLG	9 7/8	86	82	68	437
WU107-25	WU107-45	WU107-65	4NPT	5 7/8	3NPT	2 3/8	4 7/8	4¾	3 13/16	2½NPT	4 7/8	89	14 5/8	72¼	9	10¾	4" FLG	9 7/8	101	96	80	490
WU108-25	WU108-45	WU108-65	4NPT	5 7/8	3NPT	2 3/8	4 7/8	4¾	3 13/16	2½NPT	4 7/8	101	14 5/8	84¼	9	10¾	4" FLG	9 7/8	116	110	92	543
WU109-25	WU109-45	WU109-65	4NPT	5 7/8	3NPT	2 3/8	4 7/8	4¾	3 13/16	2½NPT	4 7/8	113	14 5/8	96¼	9	10¾	4" FLG	9 7/8	131	124	104	596
WU1010-25	WU1010-45	WU10101-65	4NPT	5 7/8	3NPT	2 3/8	4 7/8	4¾	3 13/16	2½NPT	4 7/8	125	14 5/8	108¼	9	10¾	4" FLG	9 7/8	146	138	116	650
WU124-26	WU124-46	WU124-66	4NPT	7¾	4NPT	2 5/8	5 7/8	5 7/8	4½	3NPT	5 13/16	56½	16 5/8	37¼	10¼	12¾	5" FLG	10 7/8	83	78	68	456
WU125-26	WU125-46	WU125-66	4NPT	7¾	4NPT	2 5/8	5 7/8	5 7/8	4½	3NPT	5 13/16	68½	16 5/8	49¼	10¼	12¾	5" FLG	10 7/8	104	98	85	525
WU126-26	WU126-46	WU126-66	4NPT	7¾	4NPT	2 5/8	5 7/8	5 7/8	4½	3NPT	5 13/16	80½	16 5/8	61¼	10¼	12¾	5" FLG	10 7/8	126	119	103	594
WU127-26	WU127-46	WU127-66	4NPT	7¾	4NPT	2 5/8	5 7/8	5 7/8	4½	3NPT	5 13/16	92½	16 5/8	73¼	10¼	12¾	5" FLG	10 7/8	148	139	121	663
WU128-26	WU128-46	WU128-66	4NPT	7¾	4NPT	2 5/8	5 7/8	5 7/8	4½	3NPT	5 13/16	104½	16 5/8	85¼	10¼	12¾	5" FLG	10 7/8	169	160	139	732
WU129-26	WU129-46	WU129-66	4NPT	7¾	4NPT	2 5/8	5 7/8	5 7/8	4½	3NPT	5 13/16	116½	16 5/8	97¼	10¼	12¾	5" FLG	10 7/8	191	180	156	801

DIMENSIONS (Continued)

150 PSI DESIGN PRESSURE HEADS Available only on the followmg units.

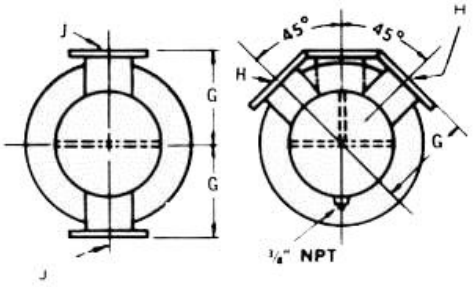




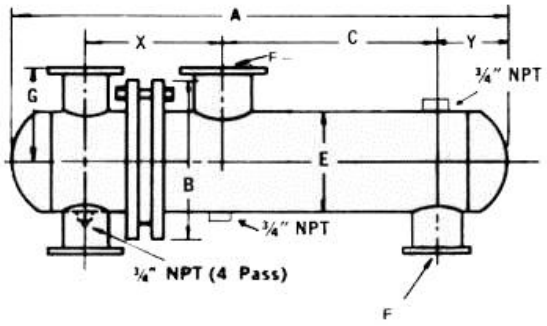
"WU" type "U" tube
Shell diameter in inches
Tube bundle length in feet
Number of tube passes
Baffle spacing in inches

Complete sales number consists of example: WU86-44

UNIT NUMBER		DIMENSIONS IN INCHES													HEATING SURFACE SQ. FT.		APPROX Shpg. WT. (Lbs.)
		2 Pass		4 Pass				2, 4 and 6 Pass									
2 Pass	4 Pass	J	K	H	L	M	N	A	B	C	D	E	F	G	2 Pass	4 Pass	
WU 144-24	WU 144-44	6NPT	8	4NPT	3 5/16	6 9/16	5 7/8	57 1/8	17 7/8	36 7/8	12	14	4FLG	11½	116	111	625
WU 145-24	WU 145-44	6NPT	8	4NPT	3 5/16	6 9/16	5 7/8	69 1/8	17 7/8	48 7/8	12	14	4FLG	11½	146	139	710
WU 146-24	WU 146-44	6NPT	8	4NPT	3 5/16	6 9/16	5 7/8	81 1/8	17 7/8	60 7/8	12	14	4FLG	11½	175	167	795
WU 147-24	WU 147-44	6NPT	8	4NPT	3 5/16	6 9/16	5 7/8	93 1/8	17 7/8	72 7/8	12	14	4FLG	11½	204	196	880
WU 148-24	WU 148-44	6NPT	8	4NPT	3 5/16	6 9/16	5 7/8	105 1/8	17 7/8	84 7/8	12	14	4FLG	11½	234	224	965
WU 149-24	WU 149-44	6NPT	8	4NPT	3 5/16	6 9/16	5 7/8	117 1/8	17 7/8	96 7/8	12	14	4FLG	11½	263	252	1050
WU 144-28	WU 144-48	6NPT	8	4NPT	3 5/16	6 9/16	5 7/8	57 1/8	17 7/8	34 7/8	13	14	6FLG	11½	116	111	625
WU 145-28	WU 145-48	6NPT	8	4NPT	3 5/16	6 9/16	5 7/8	69 1/8	17 7/8	46 7/8	13	14	6FLG	11½	146	139	710
WU 146-28	WU 146-48	6NPT	8	4NPT	3 5/16	6 9/16	5 7/8	81 1/8	17 7/8	58 7/8	13	14	6FLG	11½	175	167	795
WU 147-28	WU 147-48	6NPT	8	4NPT	3 5/16	6 9/16	5 7/8	93 1/8	17 7/8	70 7/8	13	14	6FLG	11½	204	196	880
WU 148-28	WU 148-48	6NPT	8	4NPT	3 5/16	6 9/16	5 7/8	105 1/8	17 7/8	82 7/8	13	14	6FLG	11½	234	224	965
WU 149-28	WU 149-48	6NPT	8	4NPT	3 5/16	6 9/16	5 7/8	117 1/8	17 7/8	94 7/8	13	14	6FLG	11½	263	252	1050
WU 164-25	WU 164145	6NPT	9 1/8	4NPT	4	7 9/16	8	57¾	19 7/8	34	14	16	6FLG	12½	150	143	775
WU 165-25	WU 165-45	6NPT	9 1/8	4NPT	4	7 9/16	8	69¾	19 7/8	46	14	16	6FLG	12½	188	180	880
WU 166-25	WU 166-45	6NPT	9 1/8	4NPT	4	7 9/16	8	81¾	19 7/8	58	14	16	6FLG	12½	227	217	985
WU 167-25	WU 167-45	6NPT	9 1/8	4NPT	4	7 9/16	8	93¾	19 7/8	70	14	16	6FLG	12½	265	254	1090
WU 168-25	WU 168-45	6NPT	9 1/8	4NPT	4	7 9/16	8	105¾	19 7/8	82	14	16	6FLG	12½	304	291	1195
WU 169-25	WU 169-45	6NPT	9 1/8	4NPT	4	7 9/16	8	117¾	19 7/8	94	14	16	6FLG	12½	342	327	1300
WU 164-210	WU 164-410	6NPT	9 1/8	4NPT	4	7 9/16	8	57¾	19 7/8	31¾	16	16	8FLG	12½	150	143	775
WU 165-210	WU 165-410	6NPT	9 1/8	4NPT	4	7 9/16	8	69¾	19 7/8	43¾	16	16	8FLG	12½	188	180	880
WU 166-210	WU 166-410	6NPT	9 1/8	4NPT	4	7 9/16	8	81¾	19 7/8	55¾	16	16	8FLG	12½	227	217	985
WU 167-210	WU 167-410	6NPT	9 1/8	4NPT	4	7 9/16	8	93¾	19 7/8	67¾	16	16	8FLG	12½	265	254	1090
WU 168-210	WU 168-410	6NPT	9 1/8	4NPT	4	7 9/16	8	105¾	19 7/8	79¾	16	16	8FLG	12½	304	291	1195
WU 169-210	WU 169-410	6NPT	9 1/8	4NPT	4	7 9/16	8	117¾	19 7/8	91¾	16	16	8FLG	12½	342	327	1300
WU 184-26	WU 184-46	6NPT	11	4NPT	4 5/8	8 3/8	9¼	63½	22	39½	13¾	18	6FLG	13½	195	195	960
WU 185-26	WU 185-46	6NPT	11	4NPT	4 5/8	8 3/8	9¼	75½	22	51½	13¾	18	6FLG	13½	242	242	1084
WU 186-26	WU 186-46	6NPT	11	4NPT	4 5/8	8 3/8	9¼	87½	22	63½	13¾	18	6FLG	13½	290	290	1268
WU 187-26	WU 187-46	6NPT	11	4NPT	4 5/8	8 3/8	9¼	99½	22	75½	13¾	18	6FLG	13½	339	339	1332
WU 188-26	WU 188-46	6NPT	11	4NPT	4 5/8	8 3/8	9¼	111½	22	87½	13¾	18	6FLG	13½	387	387	1456
WU 189-26	WU 189-46	6NPT	11	4NPT	4 5/8	8 3/8	9¼	123½	22	99½	13¾	18	6FLG	13½	435	435	1580
WU 184-212	WU 184-412	6NPT	11	4NPT	4 5/8	8 3/8	9¼	65½	22	39¼	15	18	8FLG	13½	195	195	960
WU 185-212	WU 185-412	6NPT	11	4NPT	4 5/8	8 3/8	9¼	77½	22	51¼	15	18	8FLG	13½	242	242	1084
WU 186-212	WU 186-412	6NPT	11	4NPT	4 5/8	8 3/8	9¼	89½	22	63¼	15	18	8FLG	13½	290	290	1208
WU 187-212	WU 187-412	6NPT	11	4NPT	4 5/8	8 3/8	9¼	101½	22	75¼	15	18	8FLG	13½	339	339	1332
WU 188-212	WU 188-412	6NPT	11	4NPT	4 5/8	8 3/8	9¼	113½	22	87¼	15	18	8FLG	13½	387	387	1456
WU 189-212	WU 189-412	6NPT	11	4NPT	4 5/8	8 3/8	9¼	125½	22	99¼	15	18	8FLG	13½	435	435	1580
WU 204-28	WU 204-48	8NPT	10 5/8	6NPT	4 3/8	9½	8¾	65 1/8	24	39½	15	20	6FLG	14½	259	251	1332
WU 205-28	WU 205-48	8NPT	10 5/8	6NPT	4 3/8	9½	8¾	77 1/8	24	51½	15	20	6FLG	14½	324	314	1489
WU 206-28	WU 206-48	8NPT	10 5/8	6NPT	4 3/8	9½	8¾	89 1/8	24	63½	15	20	6FLG	14½	388	377	1646
WU 207-28	WU 207-48	8NPT	10 5/8	6NPT	4 3/8	9½	8¾	101 1/8	24	75½	15	20	6FLG	14½	453	439	1803
WU 208-28	WU 208-48	8NPT	10 5/8	6NPT	4 3/8	9½	8¾	113 1/8	24	77½	15	20	6FLG	14½	517	502	1960
WU 209-28	WU 209-48	8NPT	10 5/8	6NPT	4 3/8	9½	8¾	125 1/8	24	99½	15	20	6FLG	14½	582	565	2117
WU 204-210	WU 204-410	8NPT	10 5/8	6NPT	4 3/8	9½	8¾	69 1/8	24	41¼	16¼	20	8FLG	14½	259	251	1332
WU 205-213	WU 205-413	8NPT	10 5/8	6NPT	4 3/8	9½	8¾	81 1/8	24	51	17½	20	10FLG	14½	324	314	1489
WU 206-216	WU 206-416	8NPT	10 5/8	6NPT	4 3/8	9½	8¾	93 1/8	24	63	17½	20	10FLG	14½	388	377	1646
WU 207-216	WU 207-416	8NPT	10 5/8	6NPT	4 3/8	9½	8¾	105 1/8	24	75	17½	20	10FLG	14½	453	439	1803
WU 208-216	WU 208-416	8NPT	10 5/8	6NPT	4 3/8	9½	8¾	117 1/8	24	87	17½	20	10FLG	14½	517	502	1960
WU 209-216	WU 209-416	8NPT	10 5/8	6NPT	4 3/8	9½	8¾	129 1/8	24	99	17½	20	10FLG	14½	582	565	2117



2 PASS HEAD 4 PASS HEAD



Flange connections for field piping drilled and faced per 150# ANSI standards.

UNIT NUMBER		DIMENSIONS IN INCHES												HEATING SURFACE SQ.FT.		Approx Shpg. Wt.
		2 Pass			4 Pass			2 and 4 Pass								
2 Pass	4 Pass	A	X	J FLG	A	X	H FLG	C	E	G	B	F FLG	Y	2 Pass	4 Pass	(ibs.)
WU224-2	WU224-4	91 1/8	21 3/8	10	86 5/8	20 7/8	6	38½	22	17	26 1/8	12	15 1/8	333	325	1535
WU225-2	WU225-4	103 1/8	21 3/8	10	98 5/8	20 7/8	6	50½	22	17	26 1/8	12	15 1/8	411	401	1720
WU226-2	WU226-4	115 1/8	21 3/8	10	110 5/8	20 7/8	6	62½	22	17	26 1/8	12	15 1/8	489	477	1905
WU227-2	WU227-4	127 1/8	21 3/8	10	122 5/8	20 7/8	6	74½	22	17	26 1/8	12	15 1/8	568	554	2090
WU228-2	WU228-4	139 1/8	21 3/8	10	134 5/8	20 7/8	6	86½	22	17	26 1/8	12	15 1/8	645	630	2275
WU229-2	WU229-4	151 1/8	21 3/8	10	146 5/8	20 7/8	6	98½	22	17	26 1/8	12	15 1/8	724	706	2460
WU2210-2	WU2210-4	163 1/8	21 3/8	10	158 5/8	20 7/8	6	110½	22	17	26 1/8	12	15 1/8	803	782	2645
WU244-2	WU244-4	90¾	23 3/8	10	88 5/8	22¼	8	38½	24	18	28½	12	14¾	394	385	1880
WU245-2	WU245-4	102¾	23 3/8	10	100 5/8	22¼	8	50½	24	18	28½	12	14¾	490	479	2098
WU246-2	WU246-4	114¾	23 3/8	10	112 5/8	22¼	8	62½	24	18	28½	12	14¾	586	572	2316
WU247-2	WU247-4	126¾	23 3/8	10	124 5/8	22¼	8	74½	24	18	28½	12	14¾	681	666	2534
WU248-2	WU248-4	138¾	23 3/8	10	136 5/8	22¼	8	86½	24	18	28½	12	14¾	777	759	2752
WU249-2	WU249-4	150¾	23 3/8	10	148 5/8	22¼	8	98½	24	18	28½	12	14¾	873	853	2970
WU2410-2	WU2410-4	162¾	23 3/8	10	160 5/8	22¼	8	110½	24	18	28½	12	14¾	969	946	3188
WU264-2	WU264-4	98	27	12	93 3/8	24 3/8	8	38 1/8	26	21	30 5/8	14	16¾	488	475	2240
WU265-2	WU265-4	110	27	12	105 3/8	24 3/8	8	50 1/8	26	21	30 5/8	14	16¾	600	585	2485
WU266-2	WU266-4	122	27	12	117 3/8	24 3/8	8	62 1/8	26	21	30 5/8	14	16¾	712	694	2730
WU267-2	WU267-4	134	27	12	129 3/8	24 3/8	8	74 1/8	26	21	30 5/8	14	16¾	823	803	2975
WU268-2	WU268-4	146	27	12	141 3/8	24 3/8	8	86 1/8	26	21	30 5/8	14	16¾	935	912	3220
WU269-2	WU269-4	158	27	12	153 3/8	24 3/8	8	98 1/8	26	21	30 5/8	14	16¾	1047	1021	3465
WU2610-2	WU2610-4	170	27	12	165 3/8	24 3/8	8	110 1/8	26	21	30 5/8	14	16¾	1159	1130	3710
WU284-2	WU284-4	90	29	12	87 5/8	27½	10	26¼	28	22	32 5/8	16	18¼	456	447	2754
WU285-2	WU285-4	102 1/8	29	12	99 5/8	27½	10	38¼	28	22	32 5/8	16	18¼	587	575	3037
WU286-2	WU286-4	116 1/8	29	12	111 5/8	27½	10	50¼	28	22	32 5/8	16	18¼	717	703	3320
WU287-2	WU287-4	126 1/8	29	12	123 5/8	27½	10	62¼	28	22	32 5/8	16	18¼	848	831	3603
WU288-2	WU288-4	138 1/8	29	12	135 5/8	27½	10	74¼	28	22	32 5/8	16	18¼	978	959	3886
WU289-2	WU289-4	150 1/8	29	12	147 5/8	27½	10	86¼	28	22	32 5/8	16	18¼	1110	1088	4169
WU2810-2	WU2810-4	162 1/8	29	12	159 5/8	27½	10	93¼	28	22	32 5/8	16	18¼	1240	1216	4452
WU304-2	WU304-4	90¼	30	14	86 1/8	27½	10	24 7/8	30	23	34 5/8	16	18¾	539	529	3170
WU305-2	WU305-4	102¼	30	14	98 1/8	27½	10	36 7/8	30	23	34 5/8	16	18¾	690	676	3489
WU306-2	WU306-4	114¼	30	14	110 1/8	27½	10	48 7/8	30	23	34 5/8	16	18¾	840	822	3808
WU307-2	WU307-4	126¼	30	14	122 1/8	27½	10	60 7/8	30	23	34 5/8	16	18¾	991	970	4127
WU308-2	WU308-4	138¼	30	14	134 1/8	27½	10	74 7/8	30	23	34 5/8	16	18¾	1139	1116	4446
WU309-2	WU309-4	150¼	30	14	146 1/8	27½	10	84 7/8	30	23	34 5/8	16	18¾	1289	1264	4756
WU3010-2	WU3010-4	162¼	30	14	158 1/8	27½	10	96 7/8	30	23	34 5/8	16	18¾	1439	1410	5084

محاسبات حرارتی و مکانیکی دستگاه مبدل حرارتی در کارخانه مبدل سازان مبنا توسط متخصصان مجرب این امر و با کمک نرم افزارهای بسیار پیشرفته انجام می‌پذیرد.

برای جلوگیری از خوردگی دستگاه و محافظت از پوسته کربن استیل از رنگ اپوکسی در داخل و رنگ روغنی در بیرون آن استفاده می‌شود.