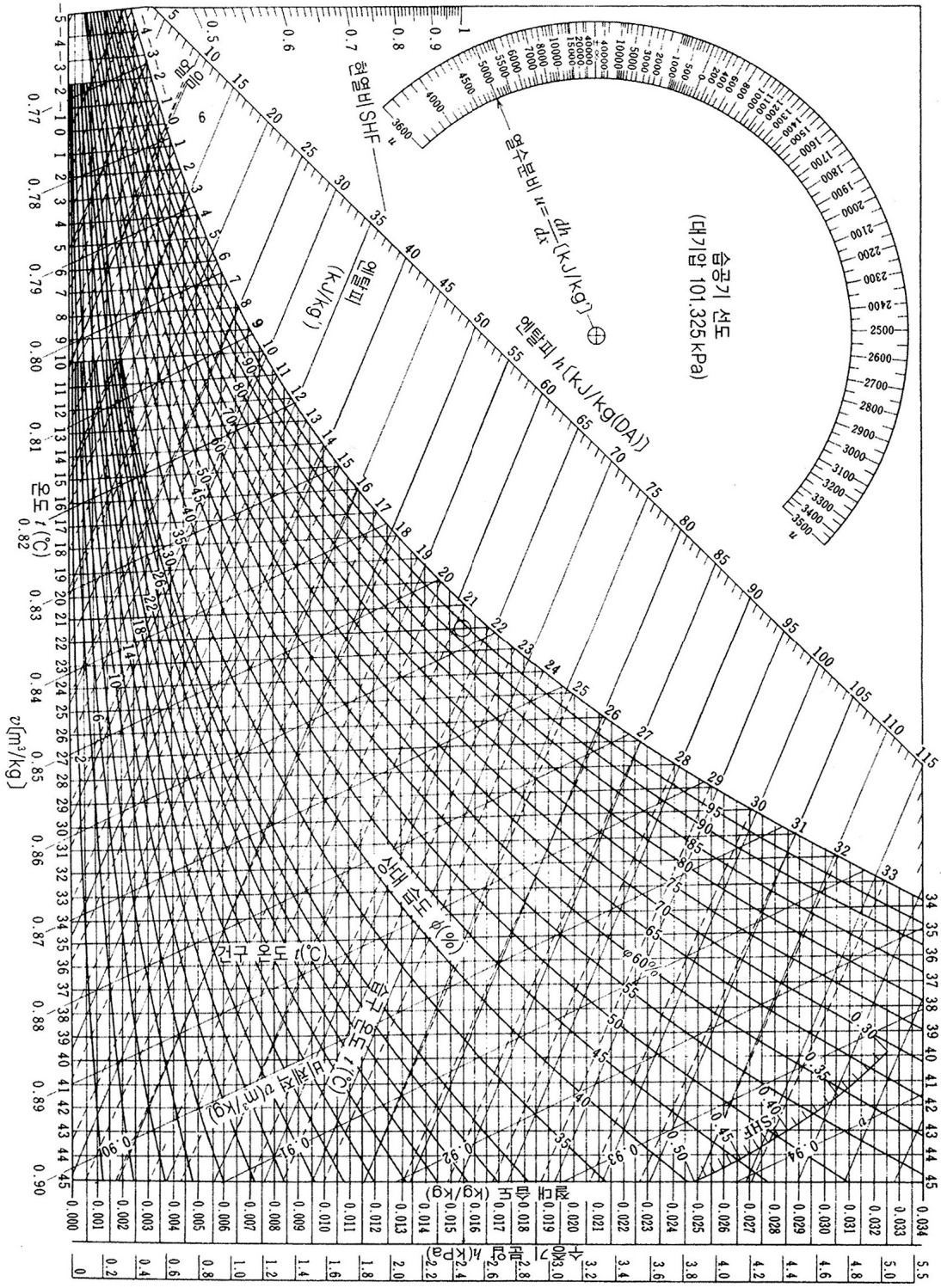
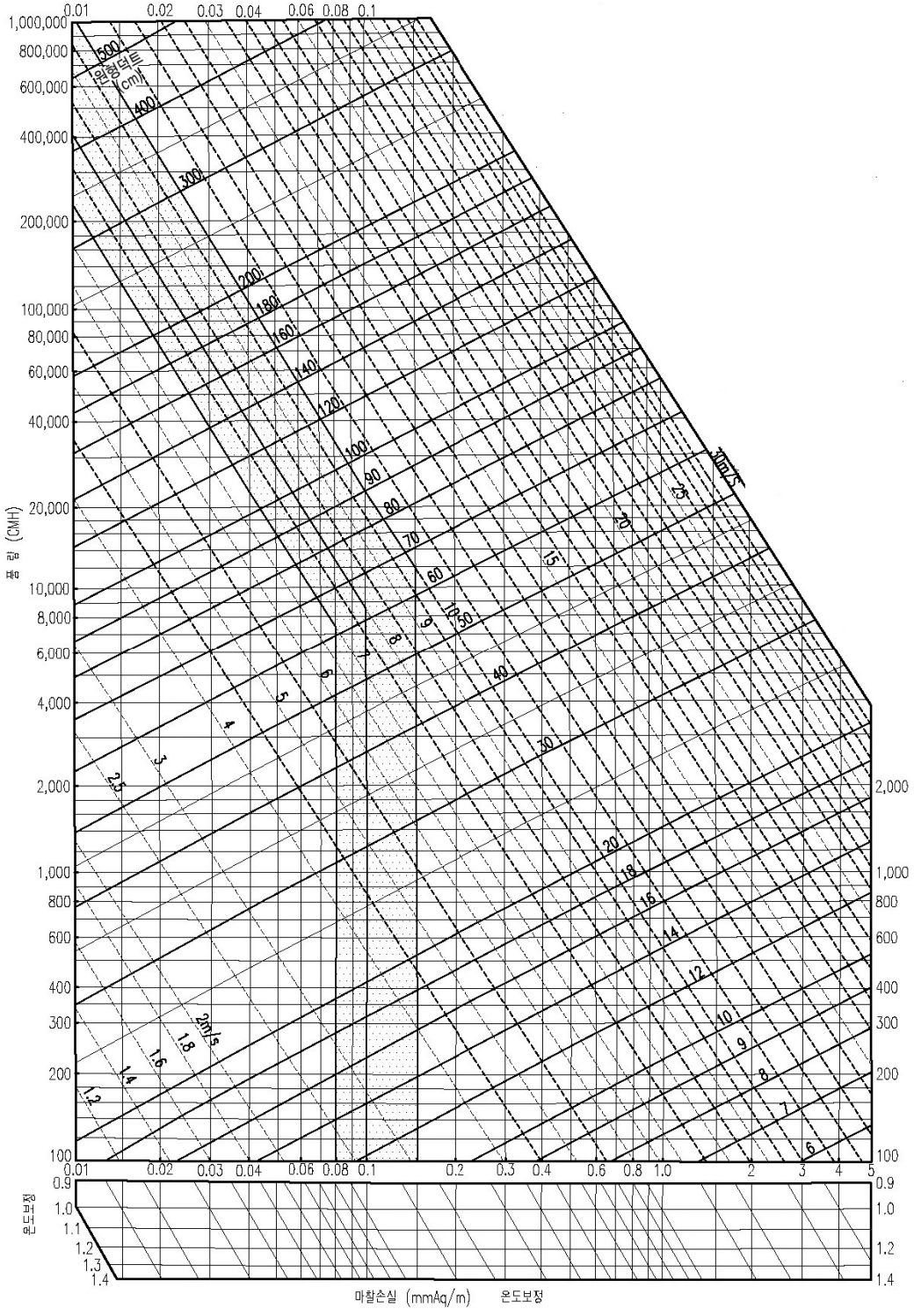
8편

각종 선도 및 환산표

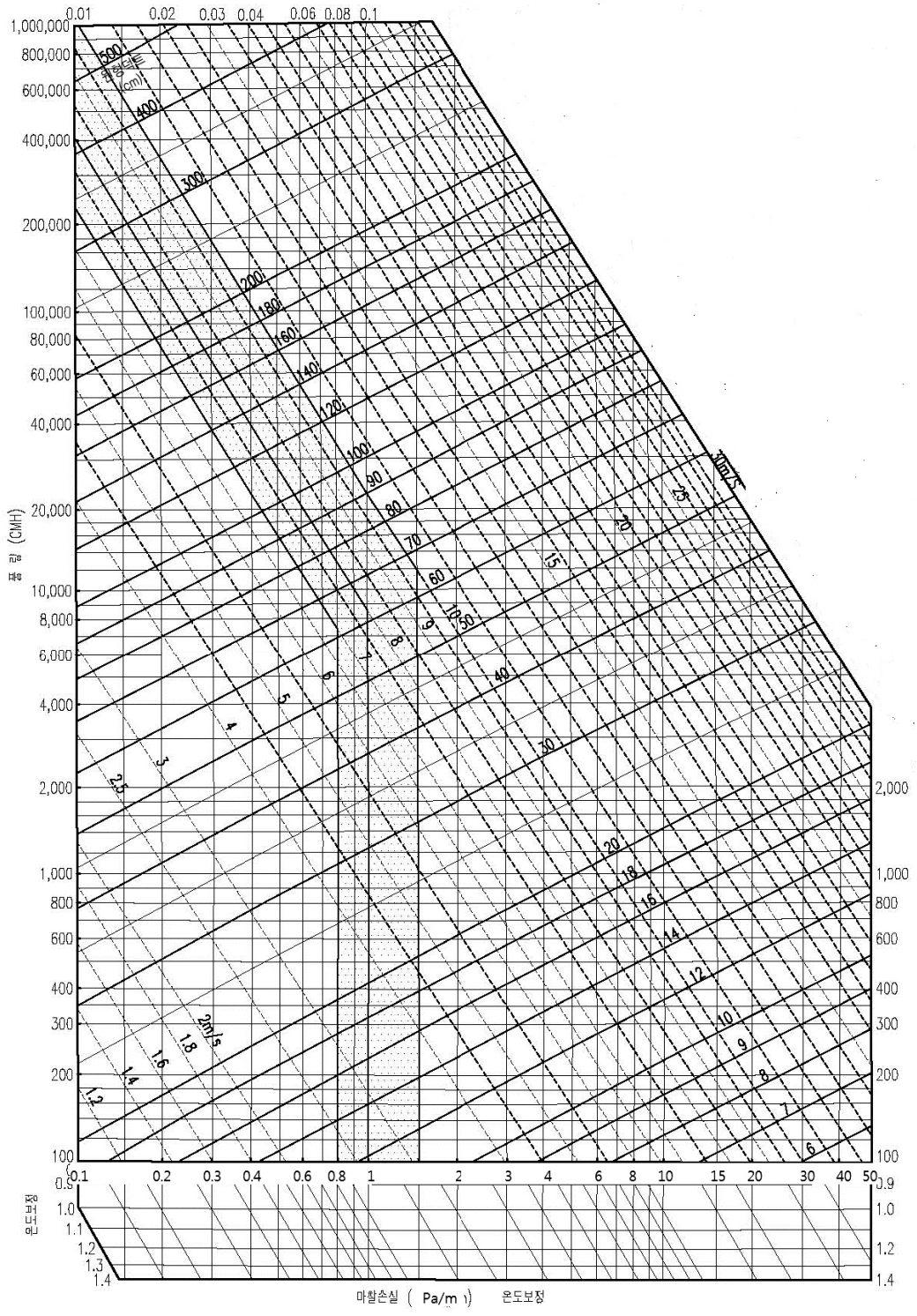
[부록-1] 습공기선도(SI 단위)



[부록-2] 덕트선도(mmAq 단위)



[부록-3] 덕트선도(Pa 단위)



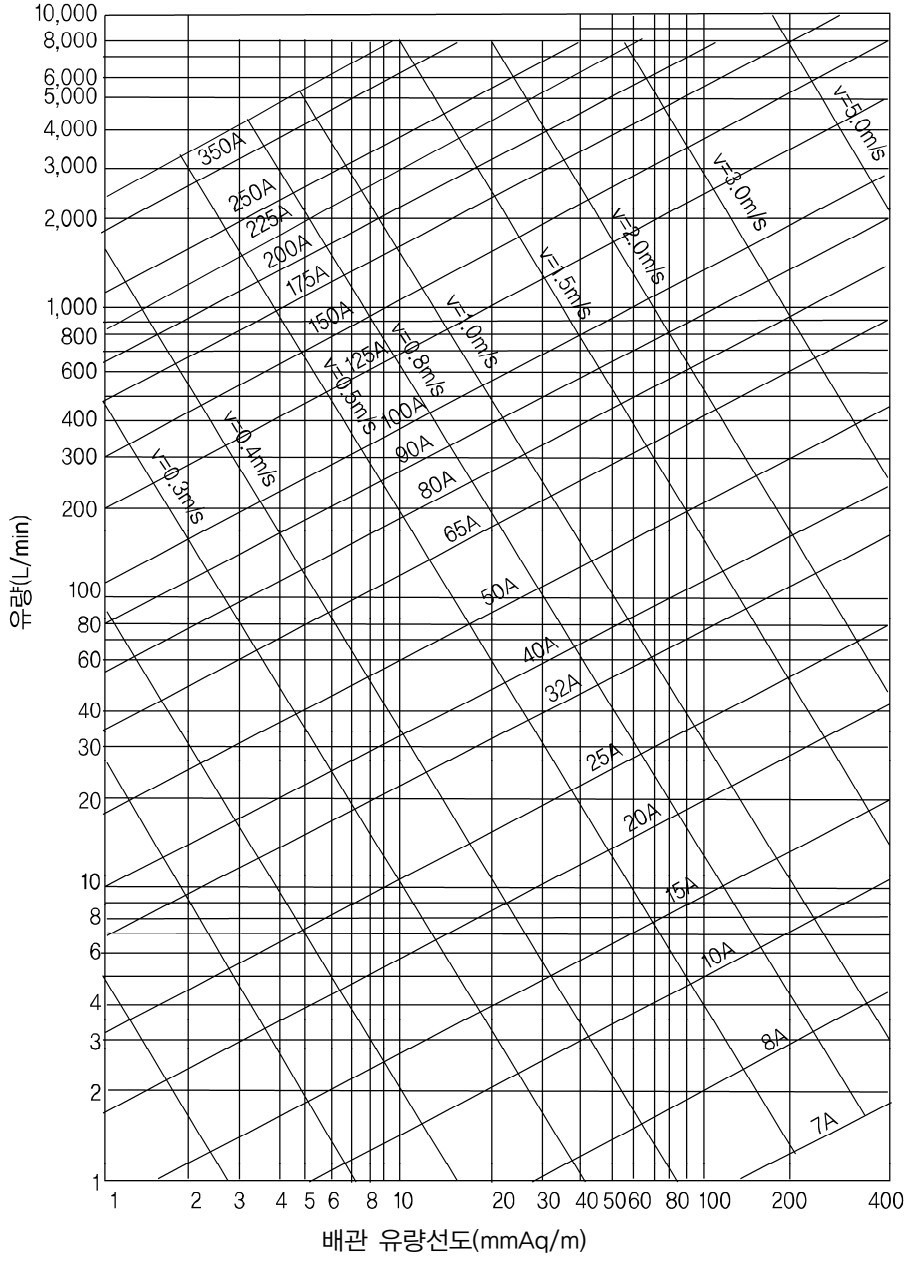
[부록-4] 각형 덕트 환산표(5cm 규격)

장변 \ 단변	5	10	15	20	25	30	35	40	45	50	55	60	65
5	5.5												
10	7.6	10.9											
15	9.1	13.3	16.4										
20	10.3	15.2	18.9	21.9									
25	11.4	16.9	21.0	24.4	27.3								
30	12.2	18.3	22.9	26.6	29.9	32.8							
35	13.0	19.5	24.5	28.6	32.2	35.4	38.3						
40	13.8	20.7	26.0	30.5	34.3	37.8	40.9	43.7					
45	14.4	21.7	27.4	32.1	36.6	40.0	43.3	46.4	49.2				
50	15.0	22.7	28.7	33.7	38.1	42.0	45.6	48.8	51.8	54.7			
55	15.6	23.6	29.9	35.1	39.8	43.9	47.7	51.1	54.3	57.3	60.1		
60	16.2	24.5	31.0	36.5	41.4	45.7	49.6	53.3	56.7	59.8	62.8	65.6	
65	16.7	25.3	32.1	37.8	42.9	47.4	51.5	55.3	58.9	63.2	65.3	68.3	71.1
70	17.2	26.1	33.1	39.1	44.3	49.0	53.3	57.3	61.0	64.4	67.7	70.8	73.7
75	17.7	26.8	34.1	40.2	45.7	50.6	55.0	59.2	63.0	66.6	69.7	73.2	76.3
80	18.1	27.5	35.0	41.4	47.0	52.0	56.7	60.9	64.9	68.7	72.2	75.5	78.7
85	18.5	28.2	35.9	42.4	48.2	53.4	58.2	62.6	66.8	70.6	74.3	77.8	81.1
90	19.0	28.9	36.7	43.5	49.4	54.8	59.7	64.2	68.6	72.6	76.3	79.9	83.3
95	19.4	29.5	37.5	44.5	50.6	56.1	61.1	65.9	70.3	74.4	78.3	82.0	85.5
100	19.7	30.1	38.4	45.4	51.7	57.4	62.6	67.4	71.9	76.2	80.2	84.0	87.6
105	20.1	30.7	39.1	46.4	52.8	58.6	64.0	68.9	73.5	77.8	82.0	85.9	89.7
110	20.5	31.3	39.9	47.3	53.8	59.8	63.2	70.3	75.1	79.6	83.8	87.8	91.6
115	20.8	31.8	40.6	48.1	54.8	60.9	66.5	71.7	76.6	81.2	85.5	89.6	93.6
120	21.2	32.4	41.3	49.0	55.8	62.0	67.7	73.1	78.0	82.7	87.2	91.4	95.4
125	21.5	32.9	42.0	49.9	56.8	63.1	68.9	74.4	79.5	84.3	88.8	93.1	97.3
130	21.9	33.4	42.6	50.6	57.7	64.2	70.1	75.7	80.8	85.7	90.4	94.8	99.0
135	22.2	33.9	43.3	51.4	58.6	65.2	71.3	76.9	82.2	87.2	91.9	96.4	100.7
140	22.5	34.4	43.9	52.2	59.5	66.2	72.4	78.1	83.5	88.6	93.4	98.0	102.4
145	22.8	34.9	44.5	52.9	60.4	67.2	73.5	79.3	84.8	90.0	94.9	99.6	104.1
150	23.1	35.3	45.2	53.6	61.2	68.1	74.5	80.5	86.1	91.3	96.3	101.1	105.7
160	23.7	36.2	46.3	55.1	62.9	70.0	76.6	82.7	88.5	93.9	99.1	104.1	108.8
170	24.2	37.1	47.5	56.4	64.4	71.8	78.5	84.9	90.8	96.4	101.8	106.9	111.8
180	24.7	37.9	48.5	57.7	66.0	73.5	80.4	86.9	93.0	98.6	104.3	109.6	114.6
190	25.3	38.7	49.6	59.0	67.4	75.1	82.2	88.9	95.2	101.2	106.8	112.2	117.4
200	25.8	39.5	50.6	60.2	68.8	76.7	84.0	90.8	97.3	103.4	109.2	114.7	120.0
210	26.3	40.3	51.6	61.4	70.2	78.3	85.7	92.7	99.3	105.6	111.5	117.2	122.6
220	26.7	41.0	52.5	62.5	71.5	79.7	87.4	94.5	101.3	107.6	113.7	119.5	125.1
230	27.2	41.7	53.4	63.6	72.8	81.2	89.0	96.3	103.1	109.7	115.9	121.8	127.8
240	27.6	42.4	54.3	64.7	74.0	82.6	90.5	98.0	105.0	111.6	118.0	124.1	129.9
250	28.1	43.0	55.2	65.8	75.3	84.0	92.0	99.6	106.8	113.6	120.0	126.2	132.2
260	28.5	43.7	56.0	66.8	76.4	85.3	93.5	101.2	108.5	115.4	122.0	128.3	134.4
270	28.9	44.3	56.9	67.8	77.6	86.6	95.0	102.8	110.2	117.3	124.0	130.4	136.6
280	29.3	45.0	57.7	68.8	78.7	87.9	96.4	104.3	111.9	119.0	125.9	132.4	138.7
290	29.7	45.6	58.6	69.7	79.8	89.1	97.7	105.8	113.5	120.8	127.8	134.4	140.8
300	30.1	46.2	59.2	70.6	80.9	90.3	99.0	107.3	115.1	122.5	129.5	136.3	142.8

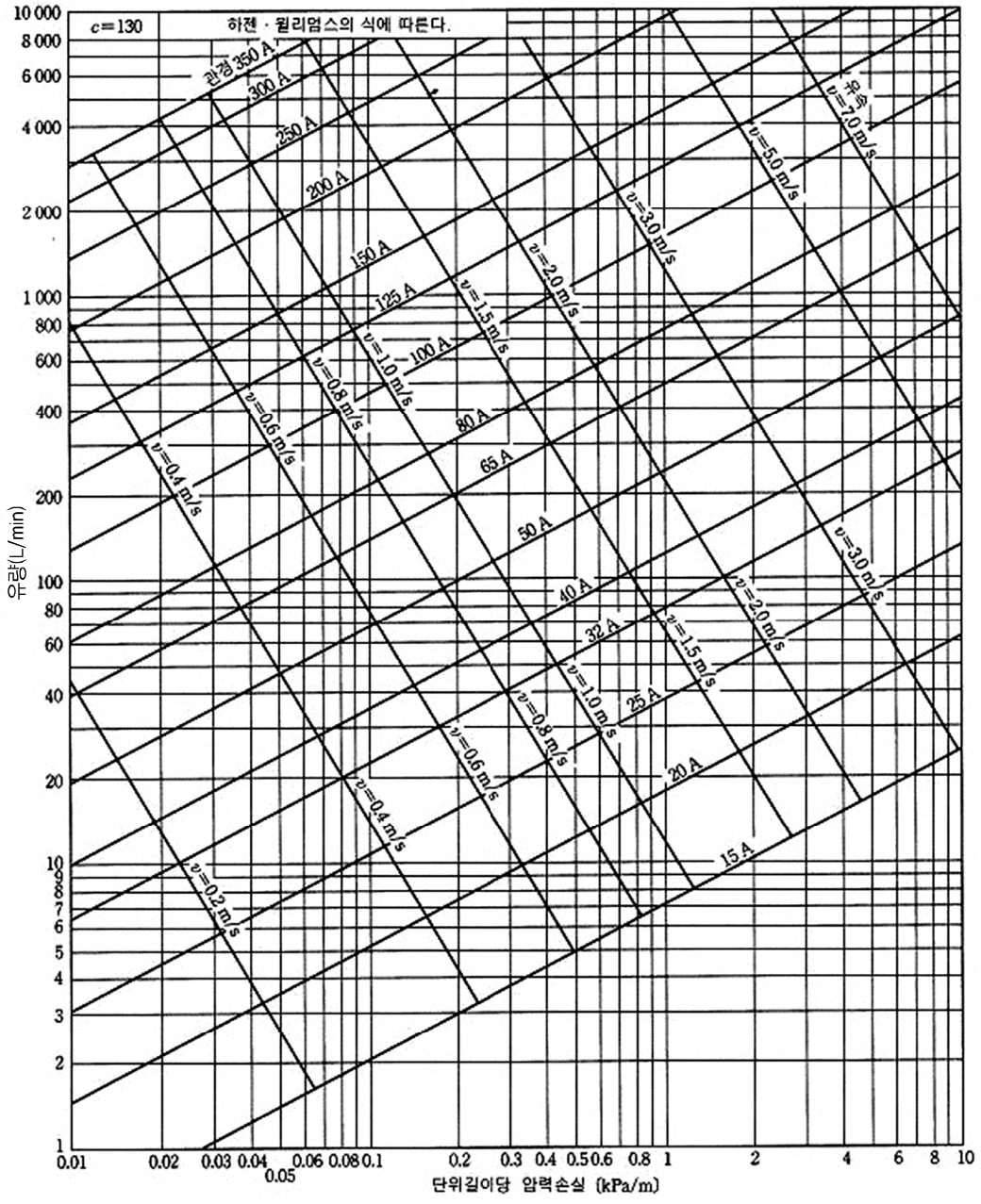
[부록-5] 각형 덕트 환산표(단위 2.5cm)

	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35	37.5	40	45	50	55	60	65	70	75	80	85
10	10.9																					
12.5	12.2	13.7																				
15	13.3	15.0	16.4																			
17.5	14.3	16.1	17.7	19.2																		
20	15.2	17.2	18.9	20.5	21.9																	
22.5	16.1	18.2	20.0	21.7	23.2	24.6																
25	16.9	19.1	21.0	22.8	24.4	25.9	27.3															
27.5	17.6	19.9	22.0	23.9	25.6	27.2	28.7	30.1														
30	18.3	20.7	22.9	24.8	26.6	28.4	29.9	31.4	32.8													
32.5	18.9	21.5	23.7	25.8	27.7	29.5	31.1	32.7	34.2	35.6												
35	19.5	22.2	24.5	26.7	28.6	30.5	32.2	33.9	35.4	36.9	38.3											
37.5	20.1	22.9	25.3	27.5	29.6	31.5	33.3	34.9	36.6	38.2	39.6	41.0										
40	20.7	23.5	26.0	28.4	30.5	32.5	34.3	36.1	37.8	39.4	40.9	43.4	43.7									
45	21.7	24.7	27.4	29.9	32.1	34.3	36.3	38.2	40.0	41.7	43.3	44.9	46.4	49.2								
50	22.7	25.9	28.7	31.3	33.7	36.0	38.1	40.1	42.0	43.8	45.6	47.2	48.8	51.8	54.7							
55	23.6	26.9	29.9	32.6	35.1	37.6	39.8	41.9	43.9	45.8	47.7	49.4	51.1	54.3	57.3	60.1						
60	24.5	27.9	31.0	33.9	36.5	39.0	41.4	43.6	45.7	47.7	49.6	51.6	53.3	56.7	59.8	62.8	65.6					
65	25.3	28.9	32.1	35.1	37.8	40.4	42.9	45.2	47.4	49.5	51.5	53.5	55.3	58.9	62.2	65.3	68.3	71.1				
70	26.1	29.8	33.1	36.2	39.1	41.8	44.3	46.7	49.0	51.2	53.3	55.4	57.3	61.9	64.4	67.7	70.8	73.7	76.6			
75	26.9	30.6	34.1	37.3	40.2	43.1	45.7	48.2	50.6	52.9	55.0	57.2	59.2	63.0	66.6	69.7	73.2	76.3	79.2	82.0		
80	27.6	31.5	35.0	38.5	41.4	44.3	47.0	49.6	52.0	54.4	56.7	58.0	60.8	64.9	68.7	72.2	75.5	78.7	81.8	84.7	87.5	
85	28.2	32.2	35.9	39.3	42.4	45.4	48.2	50.9	53.4	55.9	58.2	60.6	62.6	66.8	70.6	74.3	77.8	81.1	84.2	87.2	90.1	92.9
90	28.9	33.0	36.7	40.2	43.5	46.5	49.4	52.2	54.8	57.3	59.7	62.1	64.2	68.6	72.8	76.3	79.9	83.3	86.6	89.7	92.7	95.6

[부록-6] 배관마찰손실선도(mmAq/m)



[부록-7] 배관마찰손실선도(kPa 단위)

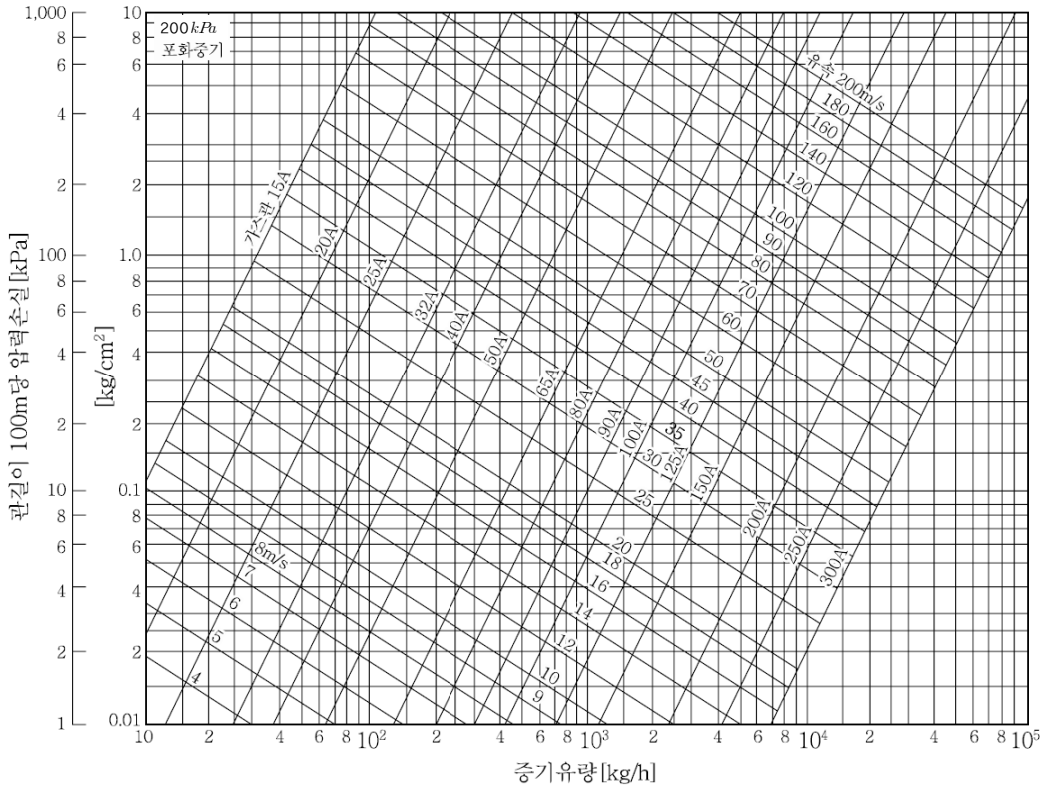


배관유량 선도(kPa/m)

[부록-8] 배관용 탄소강 강관 균등표

호칭경 [A]	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350
15	1														
20	2.2	1													
25	4.1	1.9	1												
32	8.1	3.7	2.0	1											
40	12.1	5.6	2.9	1.5	1										
50	22.8	10.6	5.5	2.8	1.9	1									
65	44.0	20.3	10.7	5.4	3.6	1.9	1								
80	69.4	32.0	16.8	8.5	5.7	3.0	1.6	1							
100	140.0	64.5	33.8	17.2	11.5	6.1	3.2	2.0	1						
125	247	114	60.0	30.4	20.4	10.8	5.6	3.6	1.8	1					
150	387	179	93.9	47.7	31.9	17.0	8.8	5.6	2.8	1.6	1				
200	802	370	194	98.8	66.1	35.1	18.2	11.6	5.7	3.2	2.1	1			
250	1418	655	344	175	117	62.1	32.2	20.4	10.2	5.7	3.7	1.8	1		
300	2284	1054	553	281	188	100	51.9	32.9	16.4	9.2	5.9	2.8	1.6	1	
350	3042	1404	737	375	251	133	69.1	43.9	21.8	12.3	7.9	3.8	3.1	1.3	1

[부록-9] 증기유량 선도표



[부록-10] 온수 관경표

관경(A)	15	20	25	32	40	50	65	80	100	125	150
압력강하 R mmAq/m	유량 kg/h							유량 kg/h			
3.0	110	243	480	975	1470	2820	5500	8850	18150	33000	50500
5.0	145	325	635	1290	1950	3750	7400	11750	241002	43600	66500
7.0	175	390	770	1560	2350	4500	8900	14150	29000	52500	79000
10	213	476	940	1900	2870	5470	10760	17500	35000	63500	96500
16	277	616	1220	2480	3720	7050	14000	22000	45000	81600	125000
20	314	697	1375	2800	4200	7975	15750	249002	50900	92200	141500
26	362	805	1590	3220	4850	9200	18200	28800	58600	106500	163000
30	392	872	1725	3480	5250	9220	19650	31050	63100	115000	176000

[부록-11] 저압 증기관의 관경표(단위 : 상당 방열면적 EDRm^2)

	순구배 수평관 및 하향급기 수직관(복관식 및 단관식)						역구배 수평관 및 상향급기 수직관			
압력강하	R=압력강하(kPa/100m)						복관식		단관식	
	0.5	1	2	5	10	20	수직관	수평관	수직관	수평관
관경(A)	A	B	C	D	E	F	G(1)	H(3)	I(2)	J(3)
20	2.1	3.1	4.5	7.4	10.6	15.3	4.5	–	3.1	–
25	3.9	57	8.4	14	20	29	8.4	3.7	5.7	3.0
32	7.7	11.5	17	28	41	59	17.0	8.2	11.5	6.8
40	12	17.5	26	42	61	88	26	12	17.5	10.4
50	22	33	48	80	115	166	48	21	33	18
65	44	64	94	155	225	325	90	51	63	34
80	70	102	150	247	350	510	130	85	96	55
90	104	150	218	360	520	740	180	134	135	85
100	145	210	300	500	720	1,040	235	192	175	130
125	260	370	540	860	1,250	1,800	440	360		240
150	410	600	860	1,400	2,000	2,900	770	610		
200	850	1,240	1,800	2,900	4,100	5,900	1,700	1,340		
250	1,530	2,200	3,200	5,100	7,300	10,400	3,000	2,500		
300	2,450	3,500	5,000	8,100	11,500	17,000	4,800	4,000		

[부록-12] 저압 증기의 환수관 관경표(단위 : 상당 방열면적 EDRm^2)

	수평관(K) (R=kPa/100m)									수직관				
압력강하 관경(A)	R=0.5		1		2		5		10	진공식(L)				건식 (M)
	습식	건식	습식 및 진공식	건식	습식 및 진공식	건식	습식 및 진공식	건식	진공식	R=1	2	5	10	
20	22.3	–	31.6		44.5	–	69.6	–	99.4	58.3	77	121	76	17.6
25	39	19.5	58.3	26.9	77	34.4	121	42.7	176	93	130	209	297	41.8
32	67	42	93	54.3	130	70.5	209	88	297	149	209	334	464	92
40	106	65	149	89	209	114	334	139	464	316	436	696	975	139
50	223	149	316	195	436	246	696	293	975	520	734	1,170	1,640	278
65	372	242	520	334	734	408	1,170	492	1,640	826	1,190	1,860	2,650	
80	585	446	826	94	1,190	724	1,860	910	2,650	1,225	1,760	2,780	3,900	
90	863	640	1,225	835	1,760	1,020	2,780	1,300	3,900	1,710	2,410	3,810	5,380	
100	1,210	955	1,710	1,250	2,410	1,580	3,810	1,950	5,380	2,970	4,270	6,600	9,300	
125	2,140	–	2,970	–	4,270	–	6,600	–	9,300	4,830	6,780	10,850	15,200	
150	3,100	–	4,830	–	6,780	–	10,850	–	15,200					

[부록-13] 배수 횡지관 및 입관의 구경

관경	Ⅰ		Ⅱ		Ⅲ		Ⅳ	
	담당할 수 있는 허용최대기구 배수부하단위							
	배수수평지관		3층 건물 또는 지관 간격 3의 1개 수직관		1 수직관에 대한 합계		1층분 또는 1지관 간격의 합계	
	실용	미국규격	실용	미국규격	실용	미국규격	실용	미국규격
30	1	1	2	2	2	2	1	1
40	3	3	4	4	4	8	2	2
50	6	6	9	10	24	24	6	6
65	10	12	18	20	38	42	9	9
75	14	20[*2]	27	30[*3]	54	60[*3]	14	16[*2]
100	96	160	192	240	400	500	72	90
125	216	360	432	540	880	1100	160	200
150	372	620	768	960	1520	1900	280	350
200	840	1400	1760	2200	2880	3600	480	600
250	1500	2500	2660	3800	3920	5600	700	1000
300	2340	3900	4200	6000	5880	8400	1050	1500
375	3500	7000	–	–	–	–	–	–

[부록-14] 통기관의 구경과 그 배관 길이

오수 또는 배수관의 근사관경[mm]	기구배수 부하단위수	통기수직관의 관경[mm]								
		30	40	50	65	75	100	125	150	200
		통기관의 허용최대 거리								
32	2	9								
40	8	15	45							
40	10	9	30							
50	12	9	23	60						
50	20	8	15	45						
65	42		9	30	90					
75	10		9	30	60	180				
75	30			18	60	150				
75	60			15	24	120				
100	100			10	30	78	300			
100	200			9	27	75	270			
100	500			6	21	54	210			
125	200				10.5	24	105	300		
125	500				9	21	90	270		
125	1100				6	15	60	210	390	
150	350				7.5	15	60	120	330	
150	620				4.5	9	38	90	300	
150	960					7.3	30	75	210	
150	1900					6	21	60	150	390
200	600						15	45	120	360
200	1400						12	30	105	330
200	2200						9	24	76	240
200	3600						7.5	18	38	200
250	1000							23	30	150
250	2500							15	24	100
250	3800							9	18	75
250	5600							7.5		