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LAMPIRAN

Lampiran 1 Tabel LHG dari penghuni ruangan

Table 4.5 Rates of Heat Gain from Occupants of Conditioned Spaces [a]

Degree of Activity	Typical Application	ADULT MALE		ADJUSTED GROUP[b]		ADJUSTED GROUP[b]		ADJUSTED GROUP[b]	
		Watts	Btu/h	Watts	Btu/h	Watts	Btu/h	Watts	Btu/h
Seated at rest	Theater, movie	115	400	100	350	60	210	40	140
Seated, very light work writing	Offices, hotels, apts	140	480	120	420	65	230	55	190
Seated, eating	Restaurant[c]	150	520	170	580[c]	75	255	95	325
Seated, light work, typing	Offices, hotels, apts	185	640	150	510	75	255	75	255
Standing, light work or walking slowly	Retail Store, bank	235	800	185	640	90	315	95	325
Light bench work	Factory	255	880	230	780	100	345	130	435
Walking, 3 mph, light machine work	Factory	305	1040	305	1040	100	345	205	695
Bowling[d]	Bowling alley	350	1200	280	960	100	345	180	615
Moderate dancing	Dance hall	400	1360	375	1280	120	405	255	875
Heavy work, heavy machine work, lifting	Factory	470	1600	470	1600	165	565	300	1035
Heavy work, athletics	Gymnasium	585	2000	525	1800	185	635	340	1165

[a]Note: Tabulated values are based on 78 F room dry-bulb temperature. For 80 F room dry-bulb, the total heat remains the same, but the sensible heat value should be decreased by approximately 8% and the latent heat values increased accordingly.

[b]Adjusted total heat gain is based on normal percentage of men, women, and children for the application listed, with the postulate that the gain from an adult female is 85% of that for an adult male, and that the gain from a child is 75% of that for an adult male.

[c]Adjusted total heat value for eating in a restaurant, includes 60 Btu/hr for food per individual (30 Btu sensible and 30 Btu latent).

[d]For bowling figure one person per alley actually bowling, and all others as sitting (400 Btu/hr) or standing and walking slowly (790 Btu/hr).

Also refer to Tables 4 and 5, Chapter 8, 1977 ASHRAE Handbook of Fundamentals.

Lampiran 2 Tabel Koefisien Perpindahan Dinding

TABLE 21—TRANSMISSION COEFFICIENT U—MASONRY WALLS*

FOR SUMMER AND WINTER

Btu/(hr) (sq ft) (deg F temp diff)

All numbers in parentheses indicate weight per sq ft. Total weight per sq ft is sum of wall and finishes.

EXTERIOR FINISH		THICKNESS (inches) and WEIGHT (lb per sq ft)	INTERIOR FINISH: None	⅜" Gypsum Board (Plaster Board) (2)	½" Plaster on Wall: Sand Agg (6)	½" Plaster on Wall: Lt Wt Agg (3)	Metal Lath Plastered on Furring: ¾" Sand Plaster(7)	Metal Lath Plastered on Furring: ¾" Lt Wt Plaster(3)	⅜" Gypsum or Wood Lath Plastered on Furring: ½" Sand Plaster(7)	⅜" Gypsum or Wood Lath Plastered on Furring: ½" Lt Wt Plaster(2)	Insulating Board Plain or Plastered on Furring: ½" Board (2)	Insulating Board Plain or Plastered on Furring: 1" Board (4)
SOLID BRICK	Face & Common	8 (87)	.48	.41	.45	.41	.31	.28	.29	.27	.22	.16
		12 (123)	.35	.31	.33	.30	.25	.23	.23	.22	.19	.14
		16 (173)	.27	.25	.26	.25	.21	.19	.20	.19	.16	.13
	Common Only	8 (80)	.41	.36	.39	.35	.28	.26	.26	.25	.21	.15
		12 (120)	.31	.28	.30	.27	.23	.22	.22	.21	.18	.14
		16 (160)	.25	.23	.24	.23	.19	.18	.18	.18	.16	.12
STONE		8 (100)	.67	.55	.63	.53	.39	.34	.35	.32	.26	.18
		12 (150)	.55	.47	.52	.46	.34	.31	.31	.29	.24	.17
		16 (200)	.47	.41	.45	.40	.31	.28	.28	.27	.22	.16
		24 (300)	.36	.32	.35	.32	.26	.24	.24	.23	.19	.15
ADOBE-BLOCKS OR BRICK		8 (26)	.34	.30	.32	.30	.25	.23	.23	.22	.18	.12
		12 (40)	.25	.23	.24	.23	.20	.18	.18	.18	.15	.14
POURED CONCRETE	140 lb/cu ft	6 (70)	.75	.55	.69	.58	.41	.36	.37	.34	.27	.18
		8 (93)	.67	.49	.63	.53	.39	.34	.35	.32	.26	.17
		10 (117)	.61	.44	.57	.49	.36	.32	.33	.31	.25	.17
		12 (140)	.55	.40	.52	.45	.34	.31	.31	.29	.24	.16
	80 lb/cu ft	6 (40)	.31	.28	.30	.27	.23	.21	.22	.21	.18	.14
		8 (53)	.25	.23	.24	.23	.19	.18	.18	.18	.16	.12
		10 (66)	.21	.19	.20	.19	.17	.16	.15	.14	.14	.11
		12 (80)	.18	.17	.17	.15	.15	.14	.14	.14	.12	.10
	30 lb/cu ft	6 (15)	.13	.13	.13	.13	.12	.11	.11	.11	.13	.09
		8 (20)	.10	.10	.10	.10	.09	.09	.09	.09	.10	.07
		10 (25)	.08	.08	.08	.08	.08	.07	.08	.07	.08	.06
		12 (30)	.07	.07	.07	.07	.07	.07	.06	.06	.07	.06
HOLLOW CONCRETE BLOCKS	Sand & Gravel Agg	8 (43)	.52	.44	.48	.43	.33	.29	.30	.28	.23	.17
		12 (63)	.47	.41	.45	.40	.31	.28	.28	.27	.22	.16
	Cinder Agg	8 (37)	.39	.35	.37	.34	.27	.25	.25	.24	.20	.15
		12 (53)	.36	.33	.35	.32	.26	.24	.23	.23	.19	.15
	Lt Wt Agg	8 (32)	.35	.32	.34	.31	.26	.23	.24	.22	.19	.15
		12 (43)	.32	.29	.31	.28	.24	.22	.22	.21	.18	.14
STUCCO ON HOLLOW CLAY TILE		8 (39)	.36	.32	.34	.32	.26	.24	.24	.23	.19	.15
		10 (44)	.32	.29	.31	.28	.23	.22	.22	.21	.18	.14
		12 (49)	.29	.27	.28	.26	.22	.20	.21	.20	.17	.13

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Equations: Heat Gain, Btu/hr = (Area, sq ft) × (U value) × (equivalent temp diff, *Table 19*)
Heat Loss, Btu/hr = (Area, sq ft) × (U value) × (outdoor temp − inside temp)

*For addition of insulation and air spaces to above walls, refer to *Table 31, page 75.*

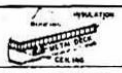
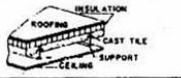
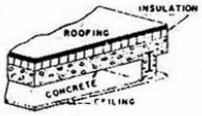
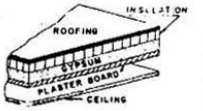
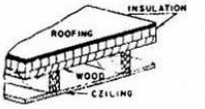
Lampiran 3 Tabel Koefisien Perpindahan Atap

TABLE 27—TRANSMISSION COEFFICIENT U—FLAT ROOFS COVERED WITH BUILT-UP ROOFING*

FOR HEAT FLOW DOWN—SUMMER. FOR HEAT FLOW UP—WINTER (See Equation at Bottom of Page).

Btu/(hr) (sq ft) (deg F temp diff)

All numbers in parentheses indicate weight per sq ft. Total weight per sq ft is sum of roof, finish and insulation.

TYPE OF DECK	THICKNESS OF DECK (inches) and WEIGHT (lb per sq ft)	CEILING †	INSULATION ON TOP OF DECK, INCHES						
			No Insulation	½ (1)	1 (1)	1½ (2)	2 (3)	2½ (3)	3 (4)
Flat Metal 	1 (5)	None or Plaster (6)	.67	.35	.23	.18	.15	.12	.10
		Suspended Plaster (5)	.32	.22	.17	.14	.12	.10	.09
		Suspended Acou Tile (2)	.23	18	.14	.12	.11	.09	.08
Preformed Slabs—Wood Fiber and Cement Binder 	2 (4)	None or Plaster (6)	.20	.16	.13	.11	.10	.09	.08
		Suspended Plaster (5)	.15	.12	.11	.09	.08	.08	.07
		Suspended Acou Tile (2)	.13*	.10	.09	.08	.08	.07	.06
	3 (7)	None or Plaster (6)	.14	.11	.10	.09	.08	.08	.07
		Suspended Plaster (5)	.12	.10	.09	.07	.07	.06	.05
		Suspended Acou Tile (2)	.10	.09	.08	.07	.07	.06	.05
Concrete (Sand & Gravel Agg)	4, 6, 8 (47),(70), (93)	None or Plaster (6)	.51	.30	.21	.16	.14	.12	.10
		Suspended Plaster (5)	.28	.20	.16	.13	.12	.10	.09
		Suspended Acou Tile(2)	.21	.16	.13	.11	.10	.09	.08
(Lt Wt Agg on Gypsum Board) 	2 (9)	None or Plaster (6)	.27	.20	.15	.13	.11	.10	.08
		Suspended Plaster (5)	.18	.14	.12	.10	.09	.09	.08
		Suspended Acou Tile (2)	.15	.12	.11	.09	.08	.08	.07
	3 (13)	None or Plaster (6)	.21	.16	.13	.11	.10	.09	.08
		Suspended Plaster (5)	.15	.12	.11	.09	.08	.08	.07
		Suspended Acou Tile (2)	.13	.11	.10	.08	.08	.07	.06
	4 (16)	None or Plaster (6)	.17	.14	.11	.10	.09	.08	.07
		Suspended Plaster (5)	13	.11	.10	.08	.08	.07	.06
		Suspended Acou Tile(2)	.12	.10	.09	.07	.07	.06	.05
Gypsum Slab on ½" Gypsum Board 	2 (11)	None or Plaster (6)	.32	.22	.17	.14	.12	.10	.09
		Suspended Plaster (5)	.21	.17	.13	.11	.10	.09	.08
		Suspended Acou Tile (2)	.17	.13	.12	.10	.09	.08	.07
	3 (15)	None or Plaster (6)	.27	.19	.15	.13	.11	.10	.08
		Suspended Plaster (5)	.19	.15	.13	.11	.10	.09	.08
		Suspended Acou Tile (2)	.15	.12	.11	.09	.08	.08	.07
	4 (19)	None or Plaster (6)	.23	.17	.14	.12	.10	.09	.08
		Suspended Plaster (5)	.17	.13	.12	.10	.09	.08	.07
		Suspended Acou Tile (2)	.14	.12	.11	.09	.08	.08	.07
Wood 	1 (3)	None or Plaster (6)	.40	.26	.19	.15	.13	.11	.09
		Suspended Plaster (5)	.24	.18	.14	.12	.11	.09	.08
		Suspended Acou Tile (2)	.19	.15	.13	.11	.10	.08	.07
	2 (5)	None or Plaster (6)	.28	.20	.16	.13	.11	.10	.08
		Suspended Plaster (5)	.19	.15	.13	.11	.10	.09	.07
		Suspended Acou Tile (2)	.16	.13	.11	.10	.09	.08	.07
	3 (8)	None or Plaster (6)	.21	.16	.13	.11	.10	.09	.08
		Suspended Plaster (5)	.16	.13	.11	.09	.09	.08	.07
		Suspended Acou Tile (2)	.13	.11	.10	.09	.08	.07	.06

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Equations: Summer—(Heat Flow Down) Heat Gain, Btu/hr = (Area, sq ft) × (U value) × (equivalent temp diff, *Table 20*).

Winter—(Heat Flow Up) Heat Loss, Btu/hr = (Area, sq ft) × (U value × 1.1) × (outdoor temp—inside temp).

*For addition of air spaces or insulation to roofs, refer to *Table 31, page 75.*

†For suspended ½" insulation board, plain (.6) or with ½" sand aggregate plaster (5), use values of suspended acou tile.

Lampiran 4 Tabel Koefisien Perpindahan Atap dengan Jarak

TABLE 31—TRANSMISSION COEFFICIENT U—WITH INSULATION & AIR SPACES

SUMMER AND WINTER

Btu/(hr) (sq ft) (deg F temp diff)

U Value Before Adding Insul. Wall, Ceiling, Roof Floor	Addition of Fibrous Insulation			Add'n of Air Space ¾" or more	Addition of Reflective Sheets to Air Space (Aluminum Foil Average Emissivity = .05)								
					Direction of Heat Flow								
					Winter and Summer Horizontal			Summer Down			Winter Up		
	Thickness (Inches)				Added to one or both sides	One sheet in air space	Two sheets in air space	Added to one or both sides	One sheet in air space	Two sheets in air space	Added to one or both sides	One sheet in air space	Two sheets in air space
	1	2	3										
.60	.19	.11	.08	.38	.34	.18	.11	.12	.06	.05	.36	.20	.14
.58	.19	.11	.08	.37	.33	.18	.11	.12	.06	.05	.36	.20	.14
.56	.18	.11	.08	.36	.32	.18	.11	.11	.06	.05	.35	.20	.14
.54	.18	.11	.08	.36	.31	.17	.11	.11	.06	.05	.34	.19	.14
.52	.18	.11	.08	.35	.30	.17	.10	.11	.06	.05	.33	.19	.14
.50	.18	.11	.08	.34	.29	.17	.10	.11	.06	.05	.32	.19	.13
.48	.17	.11	08	.33	.28	.16	.10	.11	.06	.04	.31	.18	.13
.46	.17	.10	.08	.32	.28	.16	.10	.11	.06	.04	.30	.18	.13
.44	.17	.10	.07	.31	.27	.16	.10	.11	.06	.04	.29	.18	.13
.42	.16	.10	.07	.30	.26	.15	.10	.11	.06	.04	.28	.17	.13
.40	.16	.10	.07	.29	.26	.15	.10	.10	.06	.04	.27	.17	.12
.38	.16	.10	.07	.28	.25	.15	.09	.10	.06	.04	.26	.17	.12
.36	.15	.10	.07	.27	.24	.14	.09	.10	.06	.04	.25	.16	.12
.34	.15	.10	.07	.26	.23	.14	.09	.10	.06	.04	.24	.16	.12
.32	.15	.10	.07	.25	.22	.13	.09	.10	.05	.04	.23	.15	.11
.30	.14	.09	.07	.23	.21	.13	.09	.10	.05	.04	.22	.15	.11
.28	.14	.09	.07	.22	.20	.13	.08	.09	.05	.04	.20	.14	.10
.26	.13	.09	.07	.21	.19	.12	.08	.09	.05	.04	.19	.13	.10
.24	.13	.09	.07	.20	.17	.12	.08	.09	.05	.04	.18	.13	.10
.22	.12	.08	.06	.18	.16	.11	.08	.08	.05	.04	.16	.12	.09
.20	.12	.08	.06	.17	.15	.10	.07	.08	.05	.04	.15	.11	.09
.18	.11	.08	.06	.15	.14	.10	.07	.08	.05	.04	.14	.11	.08
.16	.10	.07	.06	.14	.12	.09	.07	.07	.05	.04	.13	.10	.08
.14	.09	.07	.05	.12	.11	.08	.06	.07	.04	.04	.12	.09	.07
.12	.08	.06	.05	.11	.10	.08	.06	.06	.04	.03	.10	.08	.07
.10	.07	.06	.05	.09	.08	.07	.05	.06	.04	.03	.09	.07	.06

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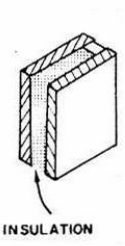
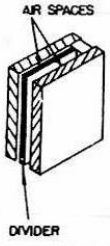
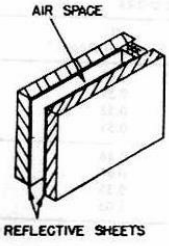
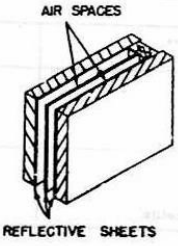
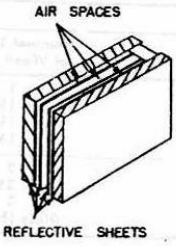
Insulation Added	Air Space Added	Reflective Sheets Added to One or Both Sides	Reflective Sheet in Air Space	Reflective Sheets in Air Space
				

*Checked for summer conditions for up, down and horizontal heat flow. Error from above values is less than 1%.

Lampiran 5 Spesifikasi AC Sentral Spli Duct Daikin

DUCT TYPE

Model Name				5HP	6HP	8HP	10HP
	Indoor unit			FDR05NY1	FDR06NY1	FDR08NY1	FDR10NY1
	Outdoor unit			RUR05NY1	RUR06NY1	RUR08NY1	RUR10NY1
Power supply				380–415 V, 50 Hz, 3 Phase, 4 Wires			
Cooling capacity [1, 3]			kW	14.7	17.6	23.5	29.3
			Btu/h	50,000	60,000	80,000	100,000
			kcal/h	12,600	15,100	20,200	25,200
Power consumption [1]			kW	5.6	6.5	10.2	11.4
Running current			A	9.2	10.6	17.2	19.2
Starting current			%	87.9	88.5	85.6	85.7
Power factor			A	70.0	78.2	115.5	129.5
Indoor unit	Colour			Galvanlze steel			
	Airflow rate (H)		m^3/min	46	54	68	78
			cfm	1,620	1,910	2,400	2,750
	Fan	External static pressure	mmH₂O	9		10	
		Driving system		Belt drive			
	Sound level (H) [2]		dB(A)	49	51		53
	Dimensions (H×W×D)		mm	450×900×850	450×1,130×850	500×1,130×850	500×1,330×850
	Machine weight		kg	72	79	93	104
	Operation range		˚CWB	14 to 25			
Outdoor unit	Colour			Ivory white			
	Compressor	Type		Hermetically sealed scroll type			
		Motor output	kW	4.5	4.5	6.7	9.0
	Refrigerant charge (R-410A)		kg	2.5 (Charged for 7.5 m)	3.5 (Charged for 7.5 m)	4.5 (Charged for 7.5 m)	6.0 (Charged for 7.5 m)
	Refrigerant oil	Model		DAPHNE FVC68D	POLYOL ESTER		
		Charge	L	1.4	1.8	3.3	3.3
	Sound level [2]	380V	dBA	59	59	60	61
		415V	dBA	60	60	61	62
	Dimensions (H×W×D)		mm	1,345×900×320		1,680×930×765	
	Machine weight		kg	92	105	203	206
	Operation range		˚CDB	21 to 46			
Piping connections	Indoor unit	Liquid	mm	ø9.5(Brazing)		ø12.7(Brazing)	
		Gas	mm	ø19.1(Brazing)		ø22.2(Brazing)	ø28.6(Brazing)
		Drain	mm	PS 1B Internal thread			
	Outdoor unit	Liquid	mm	ø9.5(Flare)		ø12.7(Flare)	
		Gas	mm	ø19.1(Flare)		ø22.2(Brazing)	ø28.6(Brazing)
		Drain	mm	ø26.0 (Hole)		——	
Max. interunit piping length			m	50 (equivalent length 70 m)			
Max. installation level difference			m	30			

Model Name				13HP	15HP	18HP	20HP
	Indoor unit			FDR13NY1	FDR15NY1	FDR18NY1	FDR20NY1
	Outdoor unit			RUR13NY1	RUR15NY1	RUR18NY1	RUR20NY1
Power supply				380–415 V, 50 Hz, 3 Phase, 4 Wires			
Cooling capacity [1, 3]			kW	35.2	46.9	52.8	58.6
			Btu/h	120,000	160,000	180,000	200,000
			kcal/h	30,200	40,300	45,400	50,400
Power consumption [1]			kW	15.0	17.9	21.5	25.1
Running current			A	24.5	29.2	35.1	40.9
Starting current			%	88.4	88.5	88.4	88.6
Power factor			A	118.0	130.3	143.4	146.3
Indoor unit	Colour			Galvanlze steel			
	Airflow rate (H)		m^3/min	136		166	
			cfm	4,800		5,860	
	Fan	External static pressure	mmH₂O	15			
		Driving system		Belt drive			
	Sound level (H) [2]		dB(A)	58		60	
	Dimensions (H×W×D)		mm	625×1,620×850		625×1,980×850	
	Machine weight		kg	161		187	
	Operation range		˚CWB	14 to 25			
Outdoor unit	Colour			Ivory white			
	Compressor	Type		Hermetically sealed scroll type			
		Motor output	kW	5.0+5.0	6.7+6.7	7.5+7.5	9.0+9.0
	Refrigerant charge (R-410A)		kg	4.5 (Charged for 7.5 m)	8.0 (Charged for 7.5 m)		
	Refrigerant oil	Model		POLYOL ESTER			
		Charge	L	5.0	6.5	6.5	6.5
	Sound level [2]	380V	dBA	61	62	63	63
		415V	dBA	62	63	64	64
	Dimensions (H×W×D)		mm	1,680×1,240×765			
	Machine weight		kg	243	319	322	329
	Operation range		˚CDB	21 to 46			
Piping connections	Indoor unit	Liquid	mm	ø12.7(Brazing)	ø15.9(Brazing)		
		Gas	mm	ø28.6(Brazing)	ø34.9(Brazing)		
		Drain	mm	PS 1B Internal thread			
	Outdoor unit	Liquid	mm	ø12.7(Flare)	ø15.9(Flare)		
		Gas	mm	ø28.6(Brazing)	ø34.9(Brazing)		
		Drain	mm	——			
Max. interunit piping length			m	50 (equivalent length 70 m)			
Max. installation level difference			m	30			

Note : [1]Rated cooling capacities are based on the following conditions : Suction temp., 27°CDB, 19.5°CWB ; outdoor temp. 35°CDB. Equiv. refrigeration piping, 5 m (horizontal).
[2]Anechoic chamber conversion value, measured according to JIS parameters and criteria. During operation these values are somewhat higher owing to ambient conditions.
[3]Capacity includes indoor fan motor heat.

Lampiran 6 Equivalent round duct size

SIDE	6		8		10		12		14		16		18		20		22	
	Area sq ft	Diam in.	Area sq ft	Diam in.	Area sq ft	Diam in.	Area sq ft	Diam in.	Area sq ft	Diam in.	Area sq ft	Diam in.	Area sq ft	Diam in.	Area sq ft	Diam in.	Area sq ft	Diam in.
10	.39	8.4	.52	9.8	.65	10.9												
12	.45	9.1	.62	10.7	.77	11.9	.94	13.1										
14	.52	9.8	.72	11.5	.91	12.9	1.09	14.2	1.28	15.3								
16	.59	10.4	.81	12.2	1.02	13.7	1.24	15.1	1.45	16.3	1.67	17.5						
18	.66	11.0	.91	12.9	1.15	14.5	1.40	16.0	1.63	17.3	1.87	18.5	2.12	19.7				
20	.72	11.5	.99	13.5	1.26	15.2	1.54	16.8	1.81	18.2	2.07	19.5	2.34	20.7	2.61	21.9		
22	.78	12.0	1.08	14.1	1.38	15.9	1.69	17.6	1.99	19.1	2.27	20.4	2.57	21.7	2.86	22.9	3.17	24.1
24	.84	12.4	1.16	14.6	1.50	16.6	1.83	18.3	2.14	19.8	2.47	21.3	2.78	22.6	3.11	23.9	3.43	25.1
26	.89	12.8	1.26	15.2	1.61	17.2	1.97	19.0	2.31	20.6	2.66	22.1	3.01	23.5	3.35	24.8	3.71	26.1
28	.95	13.2	1.33	15.6	1.71	17.7	2.09	19.6	2.47	21.3	2.86	22.9	3.25	24.4	3.60	25.7	4.00	27.1
30	1.01	13.6	1.41	16.1	1.82	18.3	2.22	20.2	2.64	22.0	3.06	23.7	3.46	25.2	3.89	26.7	4.27	28.0
32	1.07	14.0	1.48	16.5	1.93	18.8	2.36	20.8	2.81	22.7	3.25	24.4	3.68	26.0	4.12	27.5	4.55	28.9
34	1.13	14.4	1.58	17.0	2.03	19.3	2.49	21.4	2.96	23.3	3.43	25.1	3.89	26.7	4.37	28.3	4.81	29.7
36	1.18	14.7	1.65	17.4	2.14	19.8	2.61	21.9	3.11	23.9	3.63	25.8	4.09	27.4	4.58	29.0	5.07	30.5
38	1.23	15.0	1.73	17.8	2.25	20.3	2.76	22.5	3.27	24.5	3.80	26.4	4.30	28.1	4.84	29.8	5.37	31.4
40	1.28	15.3	1.81	18.2	2.33	20.7	2.88	23.0	3.43	25.1	3.97	27.0	4.52	28.8	5.07	30.5	5.62	32.1
42	1.33	15.6	1.86	18.5	2.43	21.1	2.98	23.4	3.57	25.6	4.15	27.6	4.71	29.4	5.31	31.2	5.86	32.8
44	1.38	15.9	1.95	18.9	2.52	21.5	3.11	23.9	3.71	26.1	4.33	28.2	4.90	30.0	5.55	31.9	6.12	33.5
46	1.43	16.2	2.01	19.2	2.61	21.9	3.22	24.3	3.88	26.7	4.49	28.7	5.10	30.6	5.76	32.5	6.37	34.2
48	1.48	16.5	2.09	19.6	2.71	22.3	3.35	24.8	4.03	27.2	4.65	29.2	5.30	31.2	5.97	33.1	6.64	34.9
50			2.16	19.9	2.81	22.7	3.46	25.2	4.15	27.6	4.84	29.8	5.51	31.8	6.19	33.7	6.87	35.5
52			2.22	20.2	2.91	23.1	3.57	25.6	4.30	28.1	5.00	30.3	5.72	32.4	6.41	34.3	7.14	36.0
54			2.29	20.5	2.98	23.4	3.71	26.1	4.43	28.5	5.17	30.8	5.90	32.9	6.64	34.9	7.38	36.8
56			2.38	20.9	3.09	23.8	3.83	26.5	4.55	28.9	5.31	31.2	6.08	33.4	6.87	35.5	7.62	37.4
58			2.43	21.1	3.19	24.2	3.94	26.9	4.68	29.3	5.48	31.7	6.26	33.9	7.06	36.0	7.87	38.0
60			2.50	21.4	3.27	24.5	4.06	27.3	4.84	29.8	5.65	32.2	6.50	34.5	7.26	36.5	8.12	38.6
64			2.64	22.0	3.46	25.2	4.24	27.9	5.10	30.6	5.91	33.1	6.87	35.5	7.71	37.6	8.59	39.7
68					3.63	25.8	4.49	28.7	5.37	31.4	6.26	33.9	7.18	36.3	8.12	38.6	9.03	40.7
72					3.83	26.5	4.71	29.4	5.69	32.3	6.60	34.8	7.54	37.2	8.50	39.5	9.52	41.8
76					4.09	27.4	4.91	30.0	5.86	32.8	6.83	35.4	7.95	38.2	8.90	40.4	9.98	42.8
80					4.15	27.6	5.17	30.8	6.15	33.6	7.22	36.4	8.29	39.0	9.21	41.1	10.4	43.8
84							5.41	31.5	6.41	34.5	7.54	37.2	8.55	39.6	9.75	42.3	10.8	44.6
88							5.58	32.0	6.64	34.9	7.87	38.0	8.94	40.5	10.1	43.1	11.2	45.4
92							5.79	32.6	6.91	35.6	8.12	38.6	9.39	41.5	10.4	43.8	11.7	46.3
96							5.90	33.0	7.14	36.2	8.40	39.2	9.70	42.1	10.8	44.5	12.1	47.2
100									7.40	36.9	8.50	39.5	9.80	42.5	11.3	45.5	12.3	47.6
104									7.60	37.4	8.90	40.5	10.3	43.5	11.6	46.2	13.0	48.8
108									7.90	38.0	9.20	41.2	10.6	44.0	12.0	47.0	13.4	49.6
112									8.10	38.6	9.50	41.8	10.9	44.7	12.3	47.5	13.8	50.3
116											9.80	42.4	11.3	45.5	12.6	48.1	14.3	51.3
120											10.0	42.8	11.5	46.0	13.1	49.1	14.4	51.5
124											10.3	43.5	11.9	46.7	13.4	49.6	15.0	52.4
128											10.6	44.1	12.1	47.1	13.8	50.4	15.5	53.3
132													12.5	47.9	14.1	50.9	15.8	53.9
136													12.8	48.5	14.5	51.6	16.2	54.5
140													13.0	48.8	14.7	52.0	16.5	55.0
144													13.3	49.4	15.2	52.9	16.8	55.6

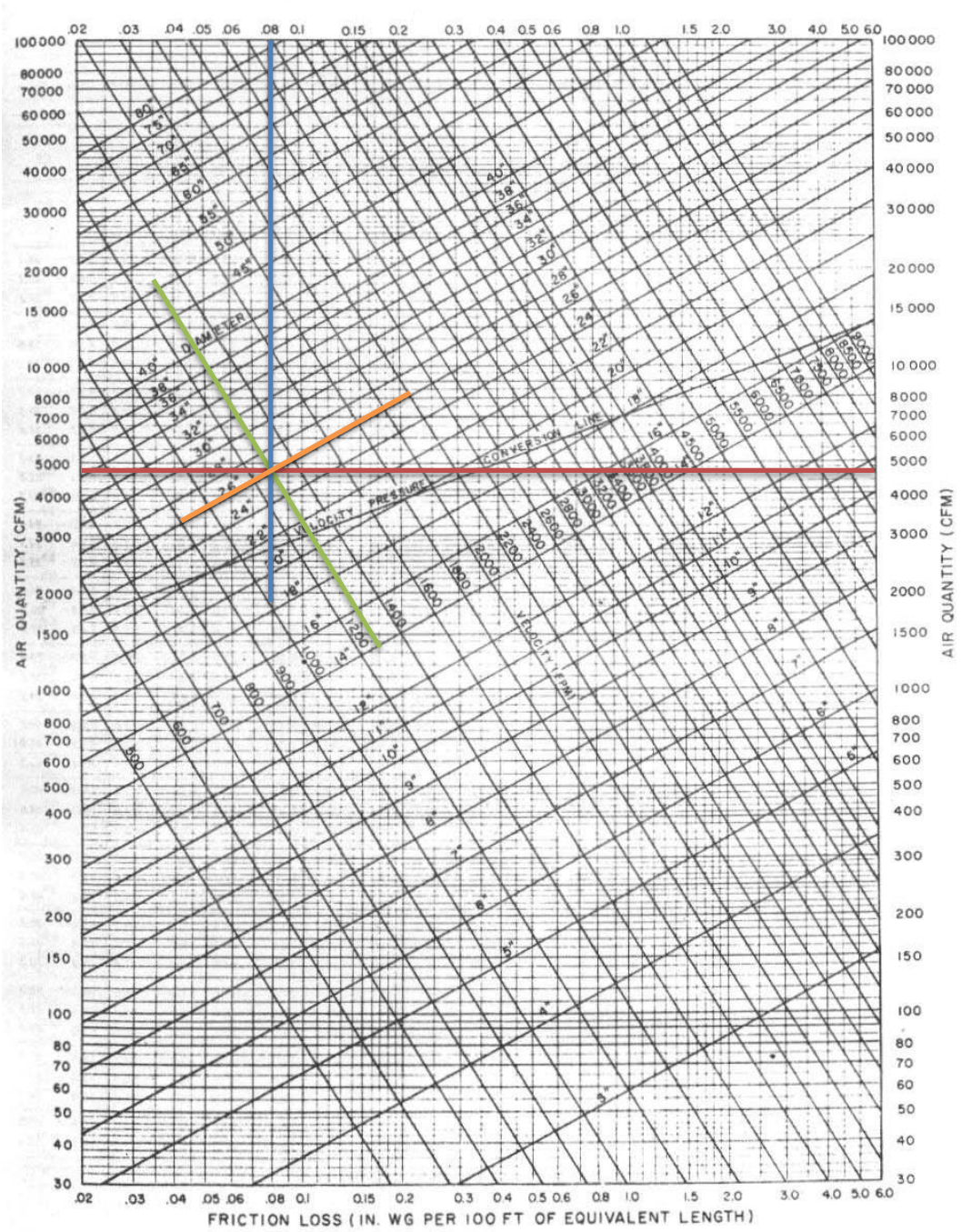
*Circular equivalent diameter (d_e). Calculated from $d_e = 1.3 \frac{(ab)^{.625}}{(a+b)^{.25}}$

†Large numbers in table are duct class.

Lampiran 7 Recommended maximum duct velocity for low velocity system (FPM)

APPLICATION	CONTROLLING FACTOR NOISE GENERATION Main Ducts	CONTROLLING FACTOR—DUCT FRICTION			
		Main Ducts		Branch Ducts	
		Supply	Return	Supply	Return
Residences	600	1000	800	600	600
Apartments Hotel Bedrooms Hospital Bedrooms	1000	1500	1300	1200	1000
Private Offices Directors Rooms Libraries	1200	2000	1500	1600	1200
Theatres Auditoriums	800	1300	1100	1000	800
General Offices High Class Restaurants High Class Stores Banks	1500	2000	1500	1600	1200
Average Stores Cafeterias	1800	2000	1500	1600	1200
Industrial	2500	3000	1800	2200	1500

Lampiran 8. Friction loss for air flow in galvanized steel round duct



Lampiran 9. Wind Coefficient

Shielding Class	House Height (Stories)		
	One	Two	Three
1	0.000 319	0.000 420	0.000 494
2	0.000 246	0.000 325	0.000 382
3	0.000 174	0.000 231	0.000 271
4	0.000 104	0.000 137	0.000 161
5	0.000 032	0.000 042	0.000 049

2. Terrain class = 3 (rural area with scattered obstacles)
- $R = 0.5$ (half of the building leakage in the walls)
- $X = 0$ (equal amounts of leakage in the floor and ceiling)
- Heights of one-, two-, and three-story buildings = 2.5, 5.0, and **7.5 m, respectively**