Air Conditioning Contractors of America
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Washington, DC 20009
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Date	
Job Number	
System Number	of
Name	
Phone	
Address	

Manual D Residential Duct Sizing Calculations

System Information						
Number of Zones	Number of Returns		Manual J Sensible Cooling Load			BTUH
Type of System	Location		Manual J Heating Load			BTUH
Supply-Side Materials ...	Trunk	Branch	Location of Duct Runs ...	Supply	Return	
Return-Side Materials ...	Trunk	Branch	R-Value of Duct Wall ...	Supply	Return	

Summary of Installed Equipment				
Type of Heating Device			Type of Cooling Equipment	
Make	Model		Make	Model
Output BTUH	Auxiliary KW	(Heat Pump)	Nominal Cooling Capacity BTUH	

Effective Length Calculation Sheet									
Element	Supply Run ID Number				Element	Return Run ID Number			
	#	#	#	#		#	#	#	#
Trunk Length					Trunk Length				
Trunk Length					Trunk Length				
Trunk Length					Trunk Length				
Runout Length					Runout Length				
Group 1					Group 5				
Group 2					Group 6				
Group 3					Group 7				
Group 4					Group 8				
Group 8					Group 10				
Group 9					Group 11				
Group 11					Group 12				
Group 12					Other				
Other					Other				
Other					Other				
Other					Other				
Total Length					Total Length				

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Effective Length Calculation Sheet

Element	Supply Run ID Number				Element	Return Run ID Number			
	#	#	#	#		#	#	#	#
Trunk Length					Trunk Length				
Trunk Length					Trunk Length				
Trunk Length					Trunk Length				
Runout Length					Runout Length				
Group 1					Group 5				
Group 2					Group 6				
Group 3					Group 7				
Group 4					Group 8				
Group 8					Group 10				
Group 9					Group 11				
Group 11					Group 12				
Group 12					Group 13				
Group 13					Other				
Other					Other				
Other					Other				
Other					Other				
Total Length					Total Length				

Effective Length Calculation Sheet

Element	Supply Run ID Number				Element	Return Run ID Number			
	#	#	#	#		#	#	#	#
Trunk Length					Trunk Length				
Trunk Length					Trunk Length				
Trunk Length					Trunk Length				
Runout Length					Runout Length				
Group 1					Group 5				
Group 2					Group 6				
Group 3					Group 7				
Group 4					Group 8				
Group 8					Group 10				
Group 9					Group 11				
Group 11					Group 12				
Group 12					Other				
Other					Other				
Other					Other				
Other					Other				
Other					Other				
Total Length					Total Length				

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Friction Rate Work Sheet

Step 1) Manufacturer's Blower Data

External static pressure (ESP) = _____ IWC CFM = _____

Step 2) Device Pressure Losses

Direct expansion refrigerant coil _____
Electric resistance heating coil _____
Hot water coil _____
Heat exchanger _____
Low efficiency filter _____
High or mid efficiency filter _____
Electronic filter _____
Humidifier _____
Supply outlet _____
Return grille _____
Balancing damper _____
Other device _____

Total device losses (DPL) _____ IWC

Step 3) Available Static Pressure

ASP = (ESP - DPL) = (_____ - _____) = _____ IWC

Step 4) Total Effective Length (TEL)

Supply-Side TEL + Return-Side TEL = (_____ + _____) = _____ FEET

Step 5) Friction Rate Design Value (FR)

FR value from friction rate chart = _____ IWC/100

Friction Rate Chart

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Duct Sizing Worksheet

HF = Blower CFM / Manual J Heat Loss = ( ) / ( ) = _____

CF = Blower CFM / Manual J Sensible Heat Gain = ( ) / ( ) = _____

FR Value

Supply Duct System

Run - Trunk	H-BTUH	C-BTUH	H-CFM	C-CFM	Dsn CFM	Round Size	Velocity	Final Size
1 —								
2 —								
3 —								
4 —								
5 —								
6 —								
7 —								
8 —								
9 —								
10 —								
11 —								
12 —								
13 —								
14 —								
15 —								
		Trunk						
		Trunk						
		Trunk						
		Trunk						

Return Duct System

Run - Trunk	Associated Supply Runs	H-CFM	C-CFM	Dsn CFM	Round Size	Velocity	Final Size
1 —							
2 —							
3 —							
4 —							
5 —							
6 —							
7 —							
8 —							
9 —							
10 —							
11 —							
12 —							
	Trunk						
	Trunk						
	Trunk						

1) H-BTUH and C-BTUH from the **Manual J** room load calculation procedure.
2) H-CFM = HF x H-BTUH and C-CFM = CF x C--BTUH
3) Dsn CFM = larger of the H-CFM or C-CFM values (runout ducts) . . . or . . . total downstream CFM (trunk ducts).
4) Round size based on FR value. Final size based on FR value (if the velocity is acceptable) or the maximum allowable velocity value

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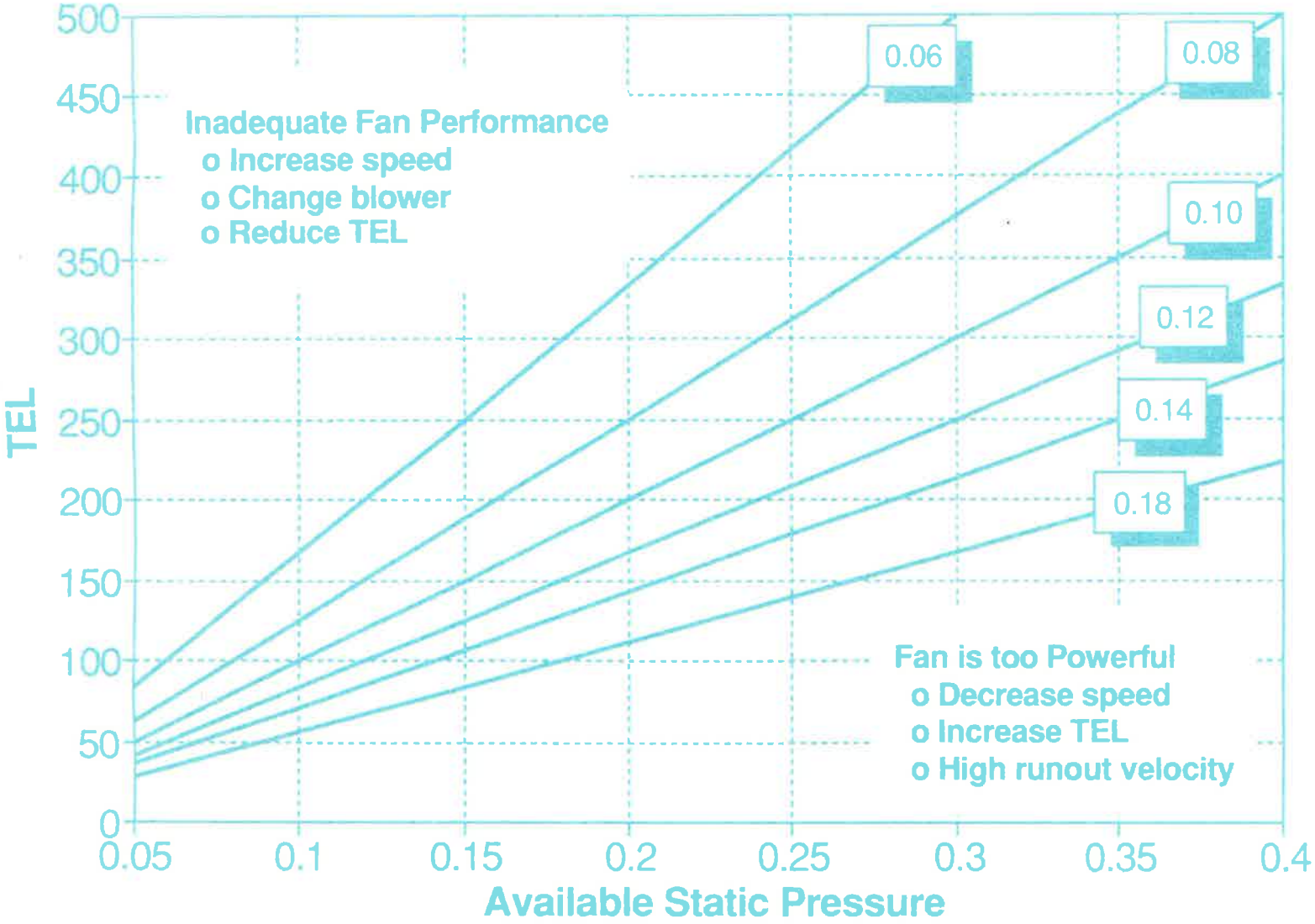
Friction Rate Chart



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