

Introducing the



Innovative design/Cleaner indoor air/Healthier choice

Coziahr Heating and Air Conditioning

Leadership - Past and Present



Walt Coziahr

Founder 1936

Deceased 1960



Walter Coziahr

Retired

Owner/President 1960 - 1999

Iowa State College - Engineering



Dave Coziahr

Owner/President

B.S. Construction Engineering -
Mechanical emphasis - ISU

Engineer-In-Training



Luanne Coziahr

Owner/Vice President

B.S. Plant Pathology - ISU
M.S. Biological Science -UNL

Coziahr Furnace Repair was founded in 1936 when Walt's employer (Nelson Heating) refused overtime pay (amounting to about \$5) for him working over the weekend to finish a project that had to be completed by Monday.

The Problem

The typical HVAC air filtering system is poorly designed, grossly undersized and woefully ineffective.

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Static Pressure Measurements			
Equipment		Filter	
Entering Pressure	.81	Before Pressure	.15
Exiting Pressure	.28	After Pressure	.81
Total ESP	1.09	Pressure Drop	.66
Duct		Coil	
Supply Pressure Drop	.17	Before Pressure	.28
Return Pressure Drop	.15	After Pressure	.17
Total Pressure Drop	.32	Pressure Drop	.11

80K Btu/hr, 90% AFUE furnace requires 1200 cfm. Plotted air flow: 750 cfm.
2-1/2 ton air conditioner requires 1000 cfm. Plotted air flow: 680 cfm.

High static pressure reduces air flow causing early heat exchanger failure, compressor floodback, poor indoor air quality, and comfort complaints.

The Solution

The Cozi-Aire Filter Cabinet

Engineered for:

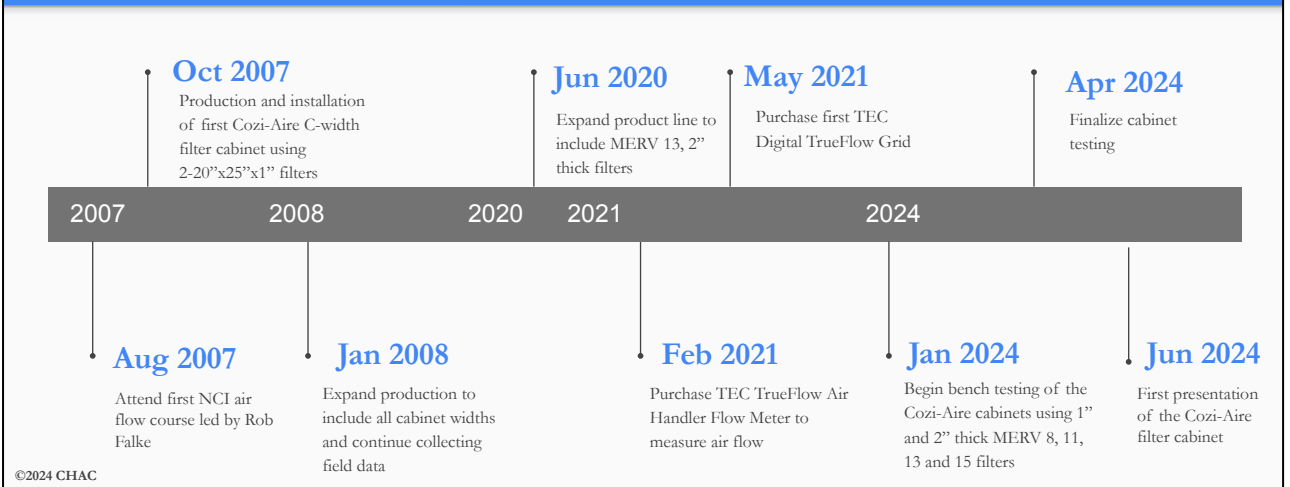
- ★ Extremely low pressure drops
- ★ Easy filter change
- ★ Standard filter sizes
- ★ Use with multiple MERV filter ratings
- ★ Use with all furnace and air handler cabinet widths
- ★ Compact size, and
- ★ Low duct leakage



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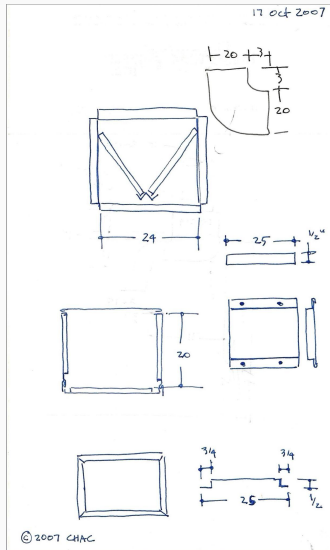
Air filtering is an integral component of a well engineered and installed duct system.

Cozi-Aire Filter Cabinet Timeline

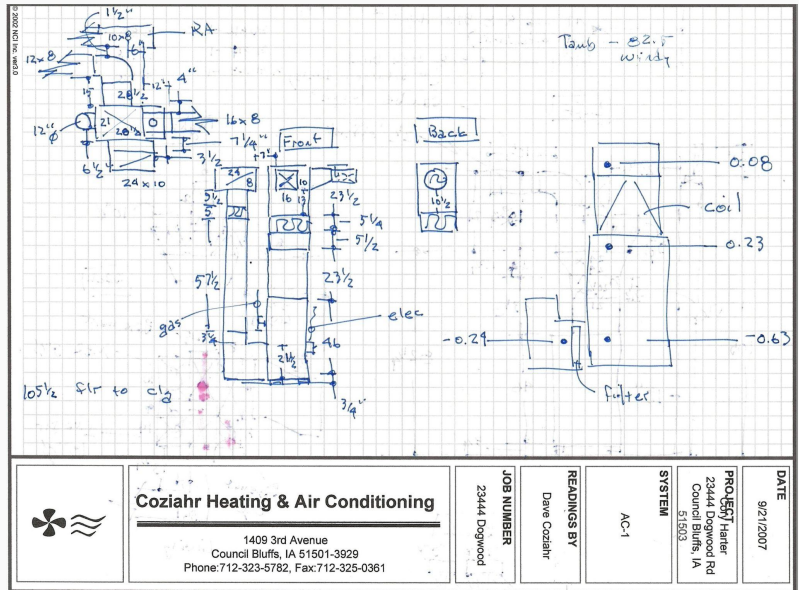


From initial concept to current product offerings, the Cozi-Aire filter cabinet has proven to be thoughtfully engineered and highly effective.

First Cabinet



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2007 Project: 100K Btu 80% furnace (1300 cfm) & 3.5 ton AC (1400 cfm). Test-In: TESP = 0.87 iwc with filter pressure drop of 0.39 iwc and delivering approximately 1000 cfm. Test-Out: TESP = 0.49 iwc with final filter pressure drop of 0.12 iwc and delivering approximately 1300 cfm.

Job Site Information Sheets (Data collection)

Corzhair Heating Air Conditioning

1409 3rd Avenue
Council Bluffs, IA 51501-3929
712-233-5782

Jobsite Information Sheet

Name: H3-267 Date: 21 Sep 07
Owner: 26444 Raymond
City: _____ State: _____
Zip Code: _____ Phone: _____

Problem summary: _____

Product information: _____

Make: Carrier Outdoor unit Make: Carrier
Model: 58363A-100-1 Model: 5832-52-1-P
Serial number: 5832-14452 Serial number: 5832-03314

Thermostat: Make: _____ Indoor unit Make: _____
Model: _____ Model: _____
Honeydwell: Make: _____ Serial number: _____
Model: _____
Fiber: Make: _____ Refrigerant: _____ Merging device: _____
Model: _____
Type: split Size: 36,000 BTU

Operating conditions

Temperature

Heating

Air Temperature: _____ Cooling

Rated Temp rise: _____ Rated Temp drop: 17 to 22F Refrig Temp: _____

T supply: _____ T return: _____ T liquid: _____ Saturated: _____

T min: _____ T supply: _____ T sat. liq: _____ Saturated: _____

Actual Temp rise: _____ Actual Temp drop: _____ T evapor: _____ T hot gas: _____

T vent: _____

Pressure

Heating

G test: _____ High [3.8] Low [3.8] Cooling: _____

Maximum Suction: 0.60 Return dew: -0.24 -0.15 P liquid: _____

Unit: _____ System test: -0.53 -0.77 Filter resistance: 0.20 0.1 P. P liquid: _____

Yeast: _____ System cut: 3.33 3.33 Supply return: 0.68 0.71 _____

Drain: _____ Measured Suction: 0.81 0.80 Coil resistance: 0.15 0.15 _____

Electrical

Indoor

Line: _____ Amps: _____ Outdoor: _____

Phase: _____

Blower: _____ Fan: _____

IDM: _____ Compressor: _____

Transformer: _____ Phase error: _____

Flue motor: _____

[illegible][illegible]

Since attending my first NCI air flow class in August of 2007 I have been collecting pressure and air flow data on all equipment I touch. Over 85% of the equipment exceeds by at least 10% the maximum TESP nameplate rating with nearly 15% exceeding the rating by over 60%.

Measuring Static Pressure and Air Flow



Date tested: 4/28/2024
4/29/2024 1:22:43 PM
Company Info
Name: Coziah Hg & A/C
Phone: (712) 323-5782
Email: coziahr@gmail.com

Tech Info
Name: David Coziah
ID: 263
Title: Owner
Credentials: BP1 5044809

True Flow System Air Flow and Static Pressure Analysis

Air measurements

Total air flow = 1005 SCFM
Return duct = -0.120 inH₂O
After filter = -0.284 inH₂O
Supply duct = 0.042 inH₂O

System & Conditions

Cooling Climate: Moist
Elevation: 981 ft
Return temp: 68° F

System Type: Electric
Orientation: Upflow
Cooling Capacity: 2.5
Filter Location: InDuct

Summary calculations



Flow 402 SCFMton
TESP 0.325 inH₂O
Return Plenum 0.120 inH₂O
Filter Drop 0.164 inH₂O
Supply Plenum 0.042 inH₂O

Summary of Warnings

No warnings.

Customer

Name: Deupree
Phone: N/A
Email: N/A
Address: 3318 Avenue G Council Bluffs IA 51501 United States

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A/C System Test 5/30/2024, 1:03:17 PM

Outdoor Measurements

Low Pressure (PSID) 110.5 / 41.8
High Pressure (PSID) 302.5 / 41.8
Suction Line Temp (°F) 53.8
Liquid Line Temp (°F) 75.8
Discharge Line Temp (°F) -
Outdoor Air Temp (°F) 76.4
Superheat (°F) 115.5
Subcooling (°F) -
Condenser Voltage 241.2
Condenser Amperage 6.9
Condenser Power Factor 0.98
Condenser Power (kW) 1.877

Indoor Measurements

Return Temp (°F) 72.0
Return Splits 50.8
Return Wet Bulb (°F) 59.2
Supply Temp (°F) 51.4
Supply Splits 82.4
Supply Wet Bulb (°F) 48.6
Total External Static Press (inH₂O) 0.5
Airflow (SCFM) 1007
Airflow (CFM) 1007
Airflow Power Factor 0.78
Airflow Power (kW) 207

System Profile & Weather Data

System Type Split
Nominal Tonnage 2.0
Refrigerant R410A
Nom. Airflow (SCFM/Ton) 400
BEEP BEEP
Measuring Device TXV
Atmospheric Pressure (PSIA) 14.179
Elevation (ft) 988
Temperature (°F) 75.0
Humidity (%) 56.0
Dew Point (°F) 58.7
System Stability Stable
System Benchmarked No

Performance Calculations

Capacity Calculations
Nominal 3.3 Tons / 36,000 Btu/h
Normalized 2.7 Tons / 29,681 Btu/h
Actual 2.8 Tons / 30,716 Btu/h
Sensible 1.3 Tons / 14,000 Btu/h
Latent 0.7 Tons / 7,716 Btu/h
Sensible Heat Ratio 0.74

Air-side Performance
Temp Split Target 18.0°F
Temp Split 19.0°F
Dehumidification 7.5 grains
Sensible 5.9 grains

System Efficiency
Fan Efficiency 0.38
Total Power 1.884
EER/ESEER 10.0/10.0
SEER/ESEER 17.7/16.9
Sensible Efficiency 88.1%

Notes
Test started on 5/30/2024, 12:35:00 PM

Pre-Flow Velocity 156 FPM



Customer

Arion Deupree
135 Applewood Court
Council Bluffs, IA 51503

LUXAIRE AL19B3621S WFP25S2505

ID
Country: 47.2408, -95.7914
Condenser
Name: LUXAIRE
Model: AL19B3621S
Serial: WFP25S2505
Air Handler
Name: BLUD
Model: LUPH19E2P40T
Serial: 0002017P80702500
Evaporator
Name: LUXAIRE
Model: 0002017P80702500
Serial: 0002017P80702500

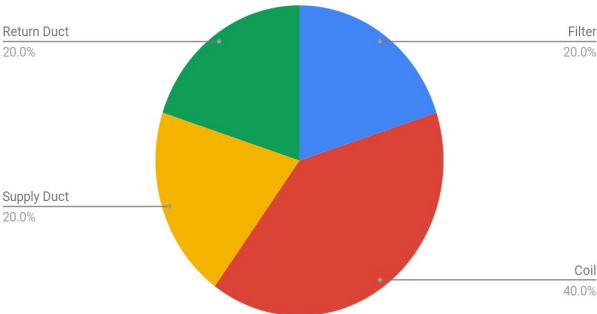


Static pressure and air flow measurements are necessary to determine equipment and system performance.

External Static Pressure Budget

External Static Pressure Budget

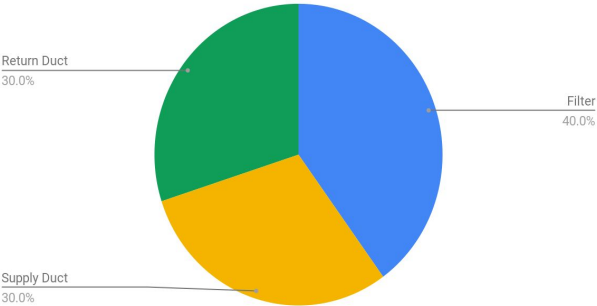
Gas Furnaces (coil external)



Manufacturer Max. ESP	Filter Budget	End of Filter Life $\hat{c}p$
0.50 iwc	40%	0.20 iwc
0.80 iwc	40%	0.32 iwc

External Static Pressure Budget

Air Handling Units (coil internal)



Manufacturer Max. ESP	Filter Budget	End of Filter Life $\hat{c}p$
0.50 iwc	20%	0.10 iwc
0.80 iwc	20%	0.16 iwc

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Obtained through my training with NCI, the External Static Pressure budget guides the ductwork design/redesign process. For air handling units the coil is considered an internal component thus not included as part of the external static pressure budget.

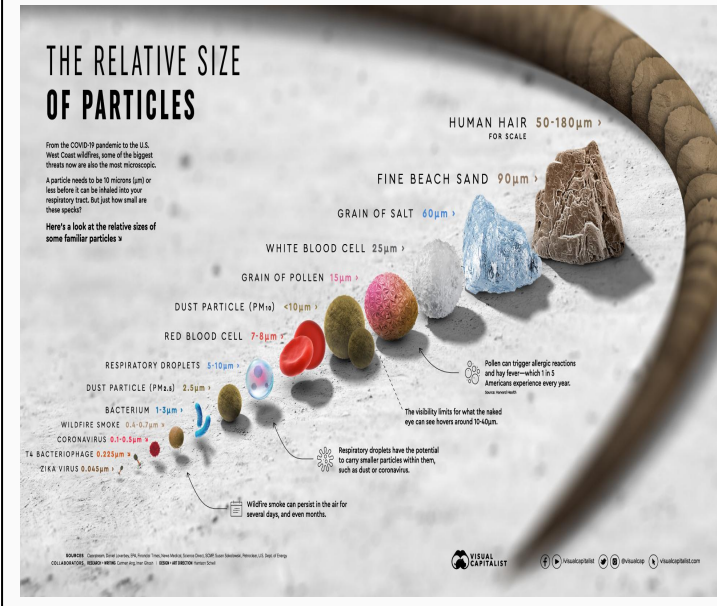


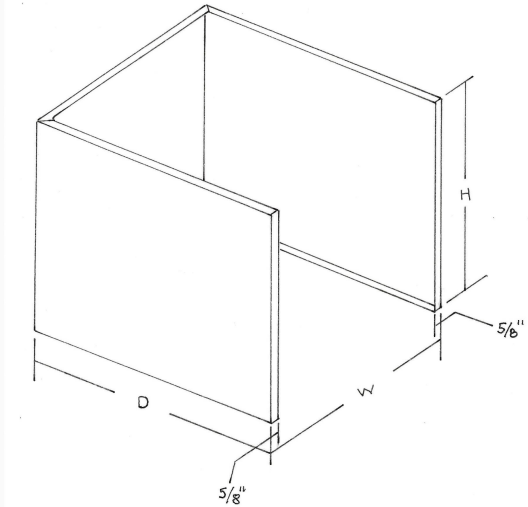
TABLE 3: MERV PARAMETERS

Standard 52.2 Minimum Efficiency Reporting Value (MERV)	Composite Average Particle Size Efficiency, % in Size Range, µm			ASHRAE Arrestance
	Range 1 (0.3-1.0)	Range 2 (1.0-3.0)	Range 3 (3.0-10.0)	
1	n/a	n/a	E3 < 20	Aavg < 65
2	n/a	n/a	E3 < 20	65 ≤ Aavg < 70
3	n/a	n/a	E3 < 20	70 ≤ Aavg < 75
4	n/a	n/a	E3 < 20	75 ≤ Aavg
5	n/a	n/a	20 ≤ E3 < 35	n/a
6	n/a	n/a	35 ≤ E3 < 50	n/a
7	n/a	n/a	50 ≤ E3 < 70	n/a
8	n/a	n/a	70 ≤ E3	n/a
9	n/a	E2 < 50	85 ≤ E3	n/a
10	n/a	50 ≤ E2 < 65	85 ≤ E3	n/a
11	n/a	65 ≤ E2 < 80	85 ≤ E3	n/a
12	n/a	80 ≤ E2	90 ≤ E3	n/a
13	E1 < 75	90 ≤ E2	90 ≤ E3	n/a
14	75 ≤ E1 < 85	90 ≤ E2	90 ≤ E3	n/a
15	85 ≤ E1 < 95	90 ≤ E2	90 ≤ E3	n/a
16	95 ≤ E1	95 ≤ E2	95 ≤ E3	n/a

Our cabinets have been tested with MERV 8, 11, 13 and 15 - 20" x 25" x 2" filters, and allows the owner the flexibility to choose more or less efficient filters based on the current infection risk management mode (IRMM).

Product Nomenclature and Physical Dimensions

Cabinet Width	A	A = 14"
		B = 17-1/2"
		C = 21"
		D = 24-1/2"
Number of Filters	2	2
		3
		4
		5
MERV Rating	M8	M8 = MERV 8
		M11 = MERV 11
		M13 = MERV 13
		M15 = MERV 15



Cabinets for Gas Furnaces		
Width (W)		
A - Cabinet	14"	
B - Cabinet	17-½"	
C - Cabinet	21"	
D - Cabinet	24-½"	
Height (H)		
All Cabinets	22"	
Depth (D)		
All Cabinets	25"	
Columbus Industries Filter Dimensions		
Height	Depth	Thickness
20"	25"	2"

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Our cabinets are designed to mate directly to the furnace or air handler bottom inlet eliminating costly transition ductwork, or installed directly to the return air ductwork. And the 4 - adjustable latches mean no tools are needed to open the cabinet door.

Applications



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Our cabinets can be applied to all orientations and all ducted equipment types.

Suggested Air Flow Ranges

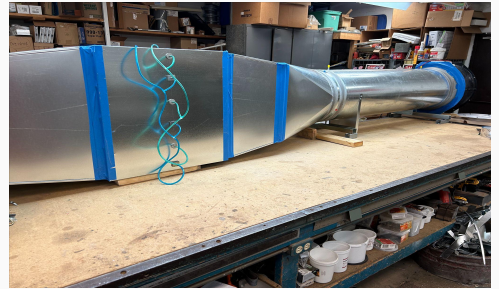
Cabinet Width	Air Flow, cfm	Cabinet Width	Air Flow, cfm
A2	600 to 800	C3	1,000 to 1,200
A3	1,000 to 1,200	C4	1,600 to 1,800
B2	800 to 1,000	D4	1,600 to 1,800
B3	1,400 to 1,600	D5	1,800 to 2,400

When using the air flow range chart as a guide, all of our 25” deep filter cabinets at all MERV ratings satisfy the ESP budget when installed on furnaces rated at 0.80 iwc.

Cozi-Aire Filter Cabinet Bench Test Configuration



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A calibrated TEC BD3 fan was used to deliver air to the filter cabinet. Multiple static pressure probes were utilized to record an average pressure drop across the filters. With the door removed you see the filter configuration of our D5 filter cabinet with MERV 15 filters installed.

Cozi-Aire Filter Cabinet Performance Data (D5M15)

Filter Cabinet Pressures		Filter Rating*	BD3**	Alt Correction	0.96
Inlet Press.	Outlet Press.	MERV 15	Corrected cfm	Airflow, cfm	Ring
0.2320	0.2107	0.0213	1972	2054	A
0.1872	0.1661	0.0211	1749	1822	A
0.1512	0.1312	0.0200	1567	1632	A
0.1206	0.1002	0.0204	1368	1425	A
0.0962	0.0771	0.0191	1202	1252	A
0.0695	0.0514	0.0181	996	1037	A
0.0547	0.0440	0.0107	885	922	B
0.0458	0.0352	0.0106	791	824	B
0.0377	0.0271	0.0106	694	723	B
0.0300	0.0200	0.0100	597	622	B
* - all filters are manufactured by Columbus Industries					
** - The Energy Conservatory BD3 blower door fan, s/n: 29338					
*** - air density corrected, RAT: 68F, RArh: 47%, altitude: 980 ft.					
**** - duct leakage		4.00%			
2" MERV 8 - 9 pleats/ft, 2" MERV 11 - 15 pleats/ft, 2" MERV 13 - 15 pleats/ft, 2" MERV 15 - 44 pleats/ft					

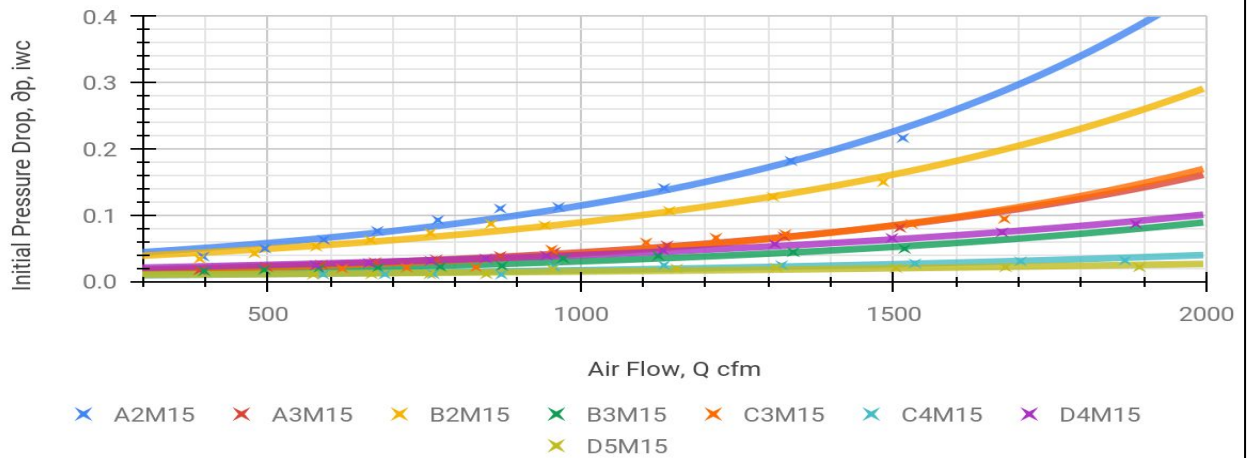
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44 pleats/ft translates into 40 square feet of filter material.

Cozi-Aire Filter Cabinet Performance Chart

Filter Cabinet Performance

Cabinets with 20"x25"x2" MERV 15 filters



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When using MERV 15 filters all cabinets have a pressure drop of less than 0.1 iwc for their suggested operating air flow range.

Filter Sizer App

Heating Target Air Flow				
Heating Type	Air Flow	Heating Input		Heating Target Air Flow, cfm
Gas	cfm/MBtuh	MBtuh Input		
AFUE_80	13	80		1040
Cooling Target Air Flow				
Air Flow		Cooling Capacity	Cooling Target Air Flow, cfm	Dominant Mode
Climate	cfm/ton	Tons		Heating
Mixed	400	2.5	1000	1040
System Static Pressure Budget				
Equip ESP, iwc	Coil Location	Ductwork Press, iwc	Coil Press, iwc	Filter Press, iwc
0.50	External	0.20	0.20	0.10
Filter Cabinet Selection		Projected Cabinet Performance		
Cabinet Width	Number and Type of Filters	Clean Filter Factor of Safety	Target Initial Pressure Drop	Projected Initial Pressure Drop, iwc
C	C3M11	1.50	0.067	0.031
				Meets Target

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Even before testing of our filter cabinets began, I developed a spreadsheet app to size a cabinet for my projects. I am currently developing an iOS based App to assist contractors with selecting their Cozi-Aire filter cabinet.

Cozi-Aire Duct Leakage Test



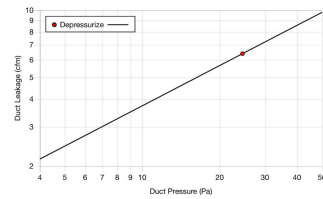
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Duct Leakage Test

Testing Company:	Technician:
Name: WCI	Name: David Coziahr
Address: 2644 Avenue D	Credentials: BPI certification number: 5044809
Council Bluffs, IA 51501	Email: coziahr@gmail.com
Phone: 712-323-5782	
www.coziahrhvac.com	

Building Information:	Customer Information:
Project ID: Cozi-Aire D-width cabinet	Name:
Address:	Address:
Geo-Tag Data:	Latitude:
Longitude:	Longitude:
Timestamp:	Timestamp:

Measured Leakage:	0.40 CFM25/100 ft ²
Leakage Target:	6.00 CFM25/100 ft ²
Compliance with Leakage Target:	Pass
Test ID:	11Jun2024_DLT
Purpose of Test:	Iowa 2012IECC Total Leakage
Measured CFM25:	6.5
Conditioned Floor Area:	1,600.0 ft ²
Coefficient (C):	0.9
Test Standard:	RESNET 380 Total Duct Leakage
Test Characteristics:	Time Average Period: 10 seconds
Test Date and Time:	2024-06-11 15:16:54



A calibrated TEC Duct Blaster fan measured a leakage rate of 6.5 cfm on the Cozi-Aire filter cabinet.

Field Test Results (B2M8) (B2M15)



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Date tested: 7/6/2023
Spelman, new motor med speed
Company info
Name: Coziahr Htg & A/C
Phone: (712) 323-5782
Email: coziahr@gmail.com

Tech info
Name: David Coziahr
ID: 263
Title: Owner
Credentials: BPI 5044809

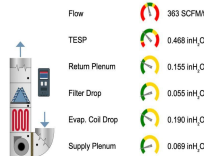
True Flow System Air Flow and Static Pressure Analysis Air measurements

Total air flow = 908 SCFM
Return duct = -0.155 inH₂O
After filter = -0.209 inH₂O
Before evap. coil = 0.259 inH₂O
Supply duct = 0.069 inH₂O

Cooling Climate: Moist
Elevation: 1223 ft
Return temp: 72° F

System Type: Fuel
Orientation: Upflow
Cooling Capacity: 2.5
Filter Location: InDuct

Summary calculations



Summary of Warnings

No warnings.

Customer

Name: Spelman
Phone: N/A
Email: N/A
Address: 19914 Honeysuckle Rd Council Bluffs IA 51503 United States

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Date tested: 6/18/2024
6/18/2024 10:49:00 AM
Company info
Name: Coziahr Htg & A/C
Phone: (712) 323-5782
Email: coziahr@gmail.com

Tech info
Name: David Coziahr
ID: 263
Title: Owner
Credentials: BPI 5044809

True Flow System Air Flow and Static Pressure Analysis Air measurements

Total air flow = 880 SCFM
Return duct = -0.150 inH₂O
After filter = -0.230 inH₂O
Before evap. coil = 0.248 inH₂O
Supply duct = 0.072 inH₂O

Cooling Climate: Moist
Elevation: 1220 ft
Return temp: 73° F

System Type: Fuel
Orientation: Upflow
Cooling Capacity: 2.5
Filter Location: InDuct

Summary calculations



Summary of Warnings

Low Flow, High Return Pressure.
Maximum TESP Adjusted By User

Customer

Name: DeeDee Spelman
Phone: (402) 345-5558
Email: dspelman@gmail.com
Address: 19914 Honeysuckle Road Council Bluffs IA 51503

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This project had an original TESP of 0.97 IWC with a filter pressure drop of 0.32 iwc. The TESP was lowered to 0.47 iwc with a pressure drop of 0.06 iwc for MERV 8 filters and a TESP of 0.48 iwc with a pressure drop of 0.08 iwc for MERV 15 filters.

Field Test Results (A2M8) and (A2M15)



Date tested: 2/24/2024
Meade
Company Info
Name: Cocahz Hg & A/C
Phone: (712) 323-5782
Email: cocahz@gmail.com

Tech info
Name: David Cocahz
ID: 263
Title: Owner
Credential: BPI 5044809

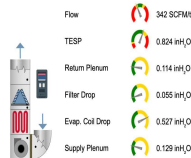
True Flow System Air Flow and Static Pressure Analysis Air measurements System & Conditions

Total air flow = 734 SCFM
Return duct = -0.114 inH₂O
After filter = -0.169 inH₂O
Before evap. coil = 0.656 inH₂O
Supply duct = 0.129 inH₂O

Cooling Climate: Moist
Elevation: 1157 ft
Return temp: 66° F

System Type: Fuel
Orientation: Upflow
Cooling Capacity: 2.145
Filter Location: InDuct

Summary calculations



Summary of Warnings

Low Flow; High Evap Coil Drop.

Customer

Name: Meade
Phone: N/A
Email: N/A
Address: N/A

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Date tested: 6/8/2024
6/8/2024 2:49:16 PM
Company Info
Name: Cocahz Hg & A/C
Phone: (712) 323-5782
Email: cocahz@gmail.com

Tech info
Name: David Cocahz
ID: 263
Title: Owner
Credential: BPI 5044809

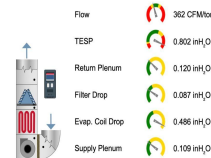
True Flow System Air Flow and Static Pressure Analysis Air measurements System & Conditions

Total air flow = 723 CFM
Return duct = -0.120 inH₂O
After filter = -0.237 inH₂O
Before evap. coil = 0.595 inH₂O
Supply duct = 0.109 inH₂O

Cooling Climate: Moist
Elevation: 1181 ft

System Type: Fuel
Orientation: Upflow
Cooling Capacity: 2
Filter Location: InDuct

Summary calculations



Summary of Warnings

Flow is OK; High TESP.
Flow is OK; High Evap Coil Drop.
Maximum TESP Adjusted by User

Customer

Name: Mary Meade
Phone: N/A
Email: N/A
Address: 240 Zenith Dr Council Bluffs IA 51503 United States

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This furnace had an original TESP of 1.00 iwc with a filter pressure drop of 0.35 iwc and a coil (ADP) pressure drop of 0.49 iwc. After ductwork modifications the TESP was lowered to 0.80 iwc with a filter pressure drop of 0.09 iwc for a set of 2 - MERV 15 filters.

Field Results (C3M8)



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Date tested: 9/15/2023
Bates_TF report
Company info
Name: Coziahr Htg & A/C
Phone: (712) 323-5782
Email: coziahr@gmail.com

Tech info
Name: David Coziahr
ID: 263
Title: Owner
Credentials: BPI 5044809

True Flow System Air Flow and Static Pressure Analysis Air measurements

Total air flow = 1069 SCFM
Return duct = -0.381 inH₂O
After filter = -0.416 inH₂O
Supply duct = 0.106 inH₂O

System & Conditions

Cooling Climate: Moist
Elevation: 1007 ft
Return temp: 74° F

System Type: Electric
Orientation: Upflow
Cooling Capacity: 3
Filter Location: InDuct

Summary calculations



Measurement	Value
Flow	356 SCFM/ton
TESP	0.523 inH ₂ O
Return Plenum	0.381 inH ₂ O
Filter Drop	0.035 inH ₂ O
Supply Plenum	0.106 inH ₂ O

Summary of Warnings

▲ Low Flow; High Return Pressure.

Customer

Name: Bates
Phone: N/A
Email: N/A
Address: N/A

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I was not able to measure a pressure drop across the filter of the previous ground loop heat pump (GLHP).

Field Test Results (C3M8)



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Date tested: 10/20/2023
Lowndes
Company Info
Name: Coziar Htg & A/C
Phone: (712) 323-5782
Email: coziarh@gmail.com

Tech info
Name: David Coziar
ID: 263
Title: Owner
Credentials: BPI 5044809

True Flow System Air Flow and Static Pressure Analysis

Air measurements







Total air flow = 1099 SCFM
Return duct = -0.108 inH₂O
After filter = -0.133 inH₂O
Before evap. coil = 0.476 inH₂O
Supply duct = 0.174 inH₂O

System & Conditions


Cooling Climate: Moist
Elevation: 743 ft
Return temp: 74° F

System Type: Fuel
Orientation: Upflow
Cooling Capacity: 2.5
Filter Location: InDuct

Summary calculations

Flow		424 SCFM/ton
TESP		0.609 inH ₂ O
Return Plenum		0.108 inH ₂ O
Filter Drop		0.025 inH ₂ O
Evap. Coil Drop		0.302 inH ₂ O
Supply Plenum		0.174 inH ₂ O

Summary of Warnings

 Flow is OK; High Evap Coil Drop.

Customer

Name: Lowndes
Phone: N/A
Email: N/A
Address: 444 Glen Ave Council Bluffs IA 51503 United States

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This project originally had the 16"x25"x1" filter located inside the blower cabinet and had a TESP of 0.71 iwc with a filter pressure drop of 0.24 iwc. After modifications the TESP was lowered to 0.61 iwc with a filter pressure drop of 0.025 iwc.

Field Test Results (C3M8)



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Date tested: 11/3/2022
210 N 41st St
Company Info
Name: Coziar Htg & A/C
Phone: (712) 323-5762
Email: coziarh@gmail.com

Tech Info
Name: David Coziar
ID: 263
Title: Owner
Credentials: BPI 5044809

True Flow System Air Flow and Static Pressure Analysis

Air measurements

Total air flow = 806 SCFM
Return duct = -0.204 inH₂O
After filter = -0.468 inH₂O
Before evap. coil = 0.187 inH₂O
Supply duct = 0.077 inH₂O

System & Conditions

System Type: Fuel
Orientation: Upright
Cooling Capacity: 1.875
Filter Location: InDuct
Cooling Climate Type: Moist
Elevation: 1001 ft


Summary calculations

Flow	430 SCFM	Flow is OK, High filter drop
TESP	0.655 inH ₂ O	Flow is OK, High Return Pressure
Return Plenum	0.204 inH ₂ O	
Filter Drop	0.265 inH ₂ O	
Evap. Coil Drop	0.109 inH ₂ O	
Supply Plenum	0.077 inH ₂ O	


Summary of Warnings

Flow is OK, High filter drop
Flow is OK, High Return Pressure

Customer
Name: Salvo
Phone: N/A
Email: N/A
Address: 510 N 41st St Council Bluffs IA 51501 United States



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Date tested: 12/4/2023
Salvo
Company Info
Name: Coziar Htg & A/C
Phone: (712) 323-5762
Email: coziarh@gmail.com

Tech Info
Name: David Coziar
ID: 263
Title: Owner
Credentials: BPI 5044809

True Flow System Air Flow and Static Pressure Analysis

Air measurements

Total air flow = 960 SCFM
Return duct = -0.219 inH₂O
After filter = -0.321 inH₂O
Supply duct = 0.106 inH₂O

System & Conditions

Cooling Climate: Moist
Elevation: 978 ft
Return temp: 69° F
System Type: Electric
Orientation: Horizontal
Cooling Capacity: 2.4
Filter Location: InDuct


Summary calculations

Flow	400 SCFM	Flow is OK, High Return Pressure
TESP	0.427 inH ₂ O	
Return Plenum	0.219 inH ₂ O	
Filter Drop	0.102 inH ₂ O	
Supply Plenum	0.106 inH ₂ O	

Summary of Warnings

Flow is OK, High Return Pressure

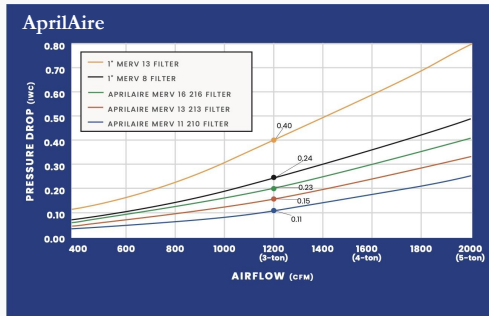
Customer
Name: Salvo
Phone: N/A
Email: N/A
Address: 510 N 41st St Council Bluffs IA 51501 United States



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This project was originally a gas furnace with an external coil (TESP 0.66 iwc at 806 cfm) and was converted to a heat pump with an electric air handler (TESP 0.43 iwc at 960 cfm). The air handler has a TESP rating of 0.80 iwc with a pressure budget for the filters of 0.32 iwc.

Performance Comparisons



Dust Free Filter Performance

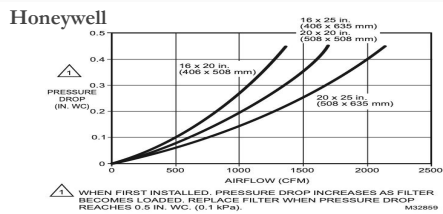
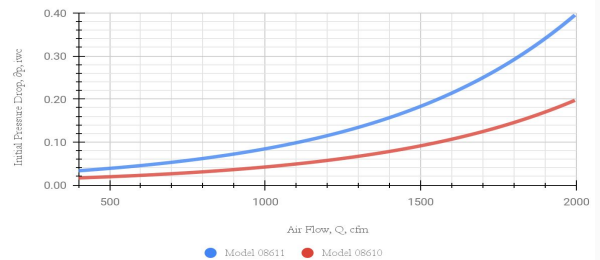
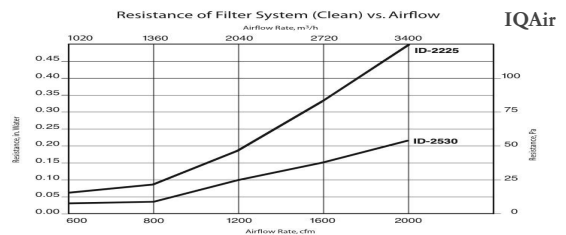


Fig. 3. Capacity, Pressure Drop and Area of F200 Filter Media.



Most of the current filter offerings exceed the pressure budget even before they are installed.

Estimated Filter Life



Air flow and blower motor life can be greatly compromised if the filters are changed based on their filter use charts. Nationwide data collected by NCI reveals that the average total external static pressure (TESP) for gas furnaces is 0.82 iwc. This translates to less than 300 cfm per ton of air flow.

Cabinet Comparisons

	Cozi-Aire				Dust Free 16		IQAir	
	Model				Model		Model	
Size	A	B	C	D	08611	08610	ID-2225	ID-2530
Width, in.	14	17.5	21	24.5	24.75	30.75	21.25	25.25
Depth, in	25.75	25.75	25.75	25.75	27.75	27.75	25.25	29.5
Height, in.	22	22	22	22	23.125	23.25	21.25	21.25
Duct Connections								
Width, in.	14	16	20	24	Unknown at this time		Cut to size, round or rectangular	
Depth, in	24	24	24	24				
Filter Information								
Height, in.	20	20	20	20	19	19	Unknown at this time	
Depth, in.	25	25	25	25	26.5	26.5		
Thickness, in.	2	2	2	2	2.5	2.5		
Number	3	3	4	5	3	4	3	4
Media Area, sq. ft.	120	120	160	200	210	280	170	210
MERV Rating	15	15	15	15	16	16	16	16

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For horizontal and down-flow furnace installations the Cozi-Aire filter cabinets mate to the inlet end of the furnace without the need to fabricate costly transition ductwork, and for upflow applications we recommend sizing the return air drop to match the ductwork connections of each filter cabinet. We also recommend installing a return air furnace base when installing our filter cabinets on C and D width furnaces.

Cabinet Images

Cozi-Aire

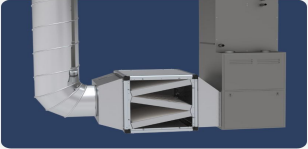


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**DUST FREE**[®]
BREATHE THE DIFFERENCE[®]

Sixteen


IMAGES



Premium high MERV filtration that meets restrictive SEER 3 requirements. Designed to optimize airflow and pressure drop, while impressive MERV 16 filtration effectively traps particles as tiny as 0.3 microns.

Engineered to seamlessly integrate into the return air stream of upflow, horizontal, attic, and basement HVAC systems.

SPECIFICATIONS


IQAir[®]
Fine in Air Quality

Five of the eight tested prototypes

Retail Price Comparison

The image displays four mobile app screenshots for comparison:

- Tru Tech Tools (Left):** Shows search results for "dust free 16". Two products are listed:
 - Dust Free Sixteen 5 Ton High Efficiency MERV 16 Media Air Cleaner with 4 Filters:** Price: \$1,395.00. Stock: "We have 0 in stock".
 - Dust Free Sixteen 3 Ton High Efficiency MERV 16 Media Air Cleaner with 3 Filters:** Price: \$1,295.00. Stock: "We have 0 in stock".
- Tru Tech Tools (Middle-Left):** Shows search results for "dust free 16". Two products are listed:
 - Dust Free Sixteen 5 Ton Replacement MERV 16 Filters - Pack of 4:** Price: \$479.00. Stock: "We have 0 in stock".
 - Dust Free Sixteen 3 Ton Replacement MERV 16 Filters - Pack of 3:** Price: \$389.00. Stock: "We have 0 in stock".
- IQAir (Middle-Right):** Shows a promotional page for "A perfect fit for any house". It lists five models and their compatibility:
 - PerfectPro X 25x30: compatible with a 5-ton HVAC system, \$3,395.
 - PerfectPro X 22x25: compatible with a 3-ton HVAC system, \$2,895.
 - PerfectPro 2025: compatible with a 5-ton HVAC system, \$1,995.
 - PerfectPro 2020: compatible with a 3-ton HVAC system.
 - PerfectPro 1625: a 3-ton HVAC system.
- IQAir (Right):** Shows two product listings for "PerfectPro X Size 3 Filters":
 - Price: \$369.00. Starting at \$31/mo or 0% APR with affirm.
 - Price: \$399.00. Starting at \$34/mo or 0% APR with affirm.

As published in our brochure, the uninsulated filter cabinets without filter should retail for: A-width - \$499.55, B-width - \$551.80, C-width - \$604.55 and D-width - \$656.80. Each Columbus Industries Zero ByPass (ZBP) MERV 15 filter retails for \$145.00.

Thank you for your time



Innovative design/Cleaner indoor air/Healthier choice

What questions can I answer for you?