

# *Break The One-Inch Cycle!*

*With the 5" MERV 10 High Performance*



**Practical**  **Pleat<sup>®</sup>**

*...And Watch Your Ucxkpi u Grow!*

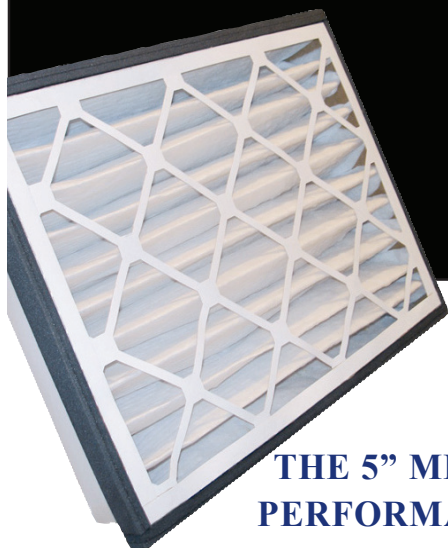


**No More  
Retro-Fitting!**

*“Because of the 1-inch restriction combined with a limited allocation for pressure, homeowners are limited as to their choices of filters for their home without retrofitting the system.” (National Air Filtration Association – Residential Air Filtration).*

# Practical Pleat<sup>®</sup>

NO FILTER BYPASS · NO RETROFITTING · NO HEADACHES



## THE 5" MERV 10 HIGH PERFORMANCE FILTER

Designed to fit into 1" Return Air Grilles.

### 28X INCREASED EFFICIENCY

The "Practical Pleat" media is up to 28 times more effective at capturing particles than standard fiberglass panel filters.

### LOW PRESSURE DROP

In general, the more efficient a filter is at removing particles, the greater it's resistance to airflow, and the greater the pressure drop it creates. One way to overcome this problem is to increase the surface area of the filter media. The "Practical Pleat" contains over 500% greater surface area than a MERV 10 one-inch pleat. For example:

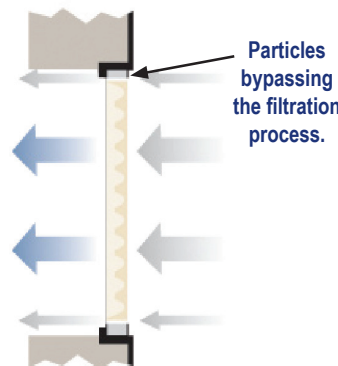
	INITIAL RESISTANCE	SERVICE LIFE	ENERGY COSTS*
1" RETAIL PLEAT	.29 IN W.G.	30 DAYS	\$69.13
COMPETITOR'S MERV 8 4" PLEAT	.15 IN W.G.	180 DAYS	\$35.76
<b>PRACTICAL PLEAT</b>	<b>.09 IN W.G.</b>	<b>180 DAYS</b>	<b>\$21.10</b>

\* Annual energy costs

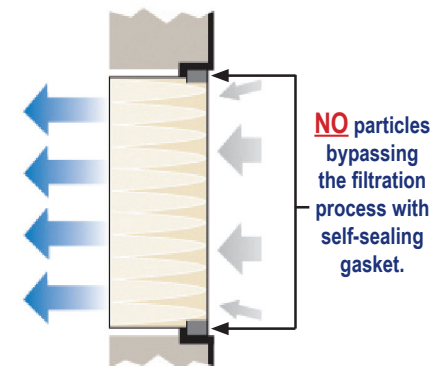
### LAST 6X LONGER

Effective service life is six times longer than a standard capacity MERV 10 1" pleat.

#### STANDARD 1" FILTER

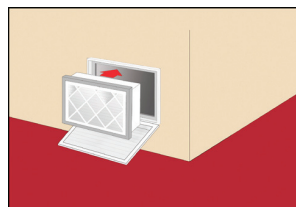


#### PRACTICAL PLEAT 5" MERV 10 FILTER



### ELIMINATES FILTER BYPASS

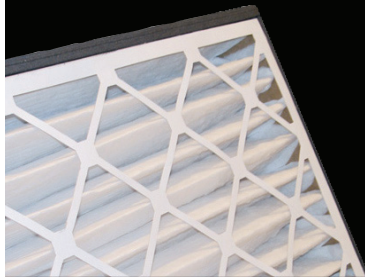
Gaps between the filter and filter frames allow particles to be pulled around the filter, entering the duct system and ultimately, the inhabited spaces. Particles that by-pass the filtering process, can accumulate on the evaporator coils. A 0.05-inch accumulation of these particles can reduce efficiency and increase utility bills up to 37% for that unit. These same particles provide nutrients for mold, mildew and other biological contaminants that can breed and grow in the ventilation system. The Practical Pleat's self sealing gasket conforms to imperfections in the filter track, eliminating filter by-pass, and preserving the integrity of the MERV 10 rating.



*No retrofitting required – Designed to fit into one inch return air grilles. Eliminates the aggravation and expense of installing in-duct housings to accommodate duct mounted, deep pleat filters.*

### REDUCES ENERGY COST

Reduced resistance to airflow allows the air-conditioning/heating system to operate more efficiently, thereby, reducing energy consumption by as much as 300% compared to one-inch pleat filters.



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## Practical Pleat Energy Cost Comparison

**Base Formula:** 
$$ECS = \frac{CFM \times 5.2 \times DELTA-P \times .746 \times PC \times T}{33,000 \times ME}$$

**Value Descriptions:**

Shaded fields will show you the estimated energy cost to operate 1 filter for a year (8760 hrs)

<b>ECS</b> =	Cost Est.	Energy cost to operate one filter (24x24) for a given period (stated in hours)
<b>CFM</b> =	1180	Air flow per filter
<b>DELTA-P</b> =	0.09	Initial resistance (measured in in. w.g.) at the specified rate of flow (cfm)
<b>PC</b> =	0.1254	Power cost (in \$ per kwh)
<b>T</b> =	8760	Time period (measured in hours; <b>8760 hours = 1 year</b> )
<b>5.2</b> =	5.2	1.0 in. w.g. used to convert static pressure to working pressure, and provide for inconsistencies in air mass.
<b>.746</b> =	0.746	Kilowatt equivalent of 1 horsepower
<b>33,000</b> =	33000	1 hp in ft-lb (33,000 lb raised 1 ft in 1 minute = 1 hp)
<b>ME</b> =	0.65	Motor and blower efficiency (65%)

### Practical Pleat MERV 10

#1	<b>5" Practical Pleat MERV 10</b> Filtration Mfg., Inc.	<b>ECS</b> \$21.10	=	<b>CFM</b> 1180	X	5.2	X	<b>DELTA-P</b> 0.09	X	0.746	X	\$	<b>PC</b> 0.13	X	<b>T</b> 8760
				33000 X 0.65											

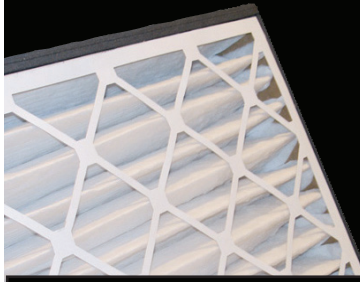
### Competition

#1	<b>1" Self Supporting Media MERV 7</b> Competitor	<b>ECS</b> *\$68.02	=	<b>CFM</b> 1180	X	5.2	X	<b>DELTA-P</b> 0.29	X	0.746	X	\$	<b>PC</b> 0.13	X	<b>T</b> 8760
				33000 X 0.65											
#2	<b>1" High Capacity MERV 11</b> Competitor	<b>ECS</b> *\$60.97	=	<b>CFM</b> 1180	X	5.2	X	<b>DELTA-P</b> 0.26	X	0.746	X	\$	<b>PC</b> 0.13	X	<b>T</b> 8760
				33000 X 0.65											
#3	<b>1" Popular Retail MERV 11</b> Home Depot	<b>ECS</b> *\$46.92	=	<b>CFM</b> 1180	X	5.2	X	<b>DELTA-P</b> 0.20	X	0.746	X	\$	<b>PC</b> 0.13	X	<b>T</b> 8760
				33000 X 0.65											
#4	<b>4" fits 1" Filter Frame MERV 8</b> Competitor	<b>ECS</b> *\$35.18	=	<b>CFM</b> 1180	X	5.2	X	<b>DELTA-P</b> 0.15	X	0.746	X	\$	<b>PC</b> 0.13	X	<b>T</b> 8760
				33000 X 0.65											
#5	<b>REFERENCE (Cost per 0.01 in. w.g.)</b>	<b>ECS</b> \$2.38	=	<b>CFM</b> 1200	X	5.2	X	<b>DELTA-P</b> 0.01	X	0.746	X	\$	<b>PC</b> 0.13	X	<b>T</b> 8760
				33000 X 0.65											

Note: Formula taken from "THE AIR CONDITIONING, HEATING & REFRIGERATION NEWS - July 5, 1999 issue.

Power cost taken from Dallas Business Journal August 23, 2005 article on Direct Energy.

This chart contains brief, selected information pertaining to energy consumption of certain air filters and has been prepared by Filtration Manufacturing, Inc. It does not purport to be all inclusive or to contain all of the information which a prospective customer may require. Filtration Manufacturing, Inc. makes no representations or assurances that this information is completely accurate, as it relies on information gathered from literature published by other manufacturers. Filtration Manufacturing, Inc., nor its officers, employees or representatives make any representations as to the accuracy or completeness of this information, nor shall any of the foregoing have any liability resulting from the use of the information contained herewith or otherwise supplied.



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## *Consequences of Filter Bypass*

### ***Filter Bypass:***

Filter bypass is defined as “airflow around a filter or through an unintended path”. Many filter grilles, constructed of hard metals, have imperfections in the filter track. Filter frames, constructed of cardboard, that are not self-sealing, are too rigid to conform to the contour of the filter frame, leaving gaps for air to bypass the filtering process. Gaps the size of a human hair, approximately seventy microns in diameter, are large enough to allow all particles of concern to escape the filtration process and re-enter the inhabited spaces. Therefore, by simply improving filter efficiency without addressing filter bypass, you provide little if any benefit.

Air that bypasses the filter can carry dust and other particulate matter directly into the evaporator coil and ventilation system. Dust can provide a nutrient base on which fungi can grow.

### ***Biological Contaminants:***

“Contaminated central air handling systems can become breeding grounds for mold, mildew and other biological contaminants and can then distribute these contaminants throughout the occupied spaces.” (1)

### ***Increased Energy Costs:***

“HVAC systems evaporator coils and drip pans are a breeding ground for bacteria, mold, algae and other fungi. A .05 inch accumulation of this sticky dirty substance can cut efficiency 32% - raising your electric bill for that unit at least one-third.” (2)

“Equipment operating with dirty coils can use up to 37 percent more energy than it does with clean coils.” (3)

### ***Increased Cost of Equipment:***

“The higher temperatures and operating pressures caused by dirty coils can shorten the life of the equipment by leading to the breakdown of the compressor’s lubricant.” (3)

### ***Increased Cost of Operation:***

“A dirty blower or air conditioning coil inside an air handler can increase operation costs by restricting air flow and heat transfer and can also cause premature motor wear. In addition, restricted airflow can lead to reduced heat transfer at the furnace heat exchanger.” (4)

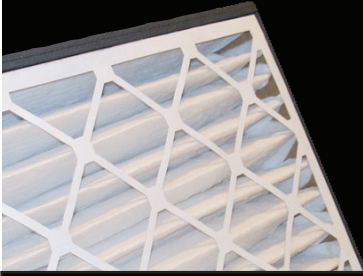
### ***Increased Pressure Drop:***

“Particle deposition of indoor dusts and other particulate matter on evaporator heat exchangers, increases system pressure drop and correspondingly, decreases system airflow and air conditioner performance. An accumulation of 140 (+/- 10) grams of particulate matter deposited on evaporator coils can double pressure drop. For this level of pressure drop, in a typical residential system, the pressure drop at the fouled flow is increased about 40%; the airflow is reduced by 5 to 10%, and the efficiency and capacity of the air conditioner decrease by 2 to 4%.” (5)

### ***Lack of Integrity:***

“ASHRAE Standard 52.2 testing as well as most other filter test methodologies, are tests of the filter media, rather than the installed filter system. When applied to real systems, filter test results implicitly assume that no bypass exists around filters. Examination of most residential and commercial HVAC systems suggests that this is not a good assumption: both small and large gaps are common.” (6)

“A 10 mm gap (bypass) decreased the rating of the MERV 15 filter seven points, the MERV 11 filter three points and the MERV 6 one point.” (6)



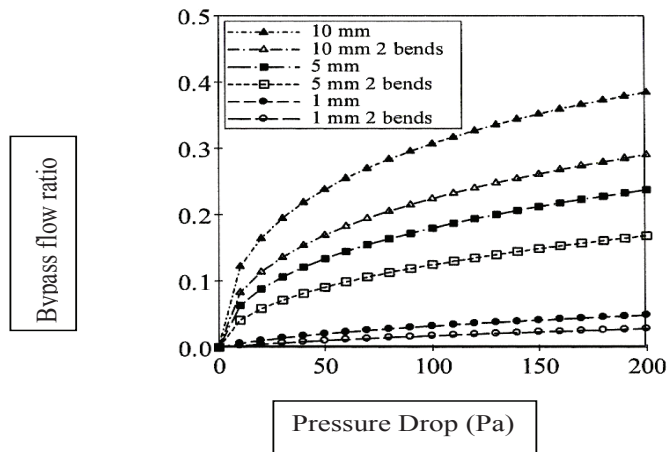
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Effective MERV ratings with bypass included (6)

Filter	1 mm gap, 2 bends	1 mm gap, 0 bends	10 mm gap, 2 bends	10 mm gap, 0 bends
MERV 6	6	6	5	<5
MERV 11	11	11	8	8
MERV 15	14	14	8	8

“The fraction that deposits on the heat exchanger causes an additional pressure drop that can then be related to a corresponding drop in airflow. The reduced flow leads to energy use increases and peak power effects.” (6)



Relationship between pressure drop and bypass flow (6)

“An HVAC design that employs high efficiency filters to prevent health problems associated with indoor fine particles may fail to perform as intended due to filter bypass.” (6)

\*The *Practical Pleat's* unique gasket eliminates filter bypass.

- 1). Jeffrey Siegel, Ph.D. – Modeling Filter Bypass: Impact on Filter Efficiency).  
EPA Indoor Air-publications – “The Inside Story: A Guide to Indoor Air Quality.
- 2). HVAC Magazine Online – Clean A/C Saves Money)
- 3). RSES Journal – June 2005
- 4). Home Energy Magazine Online – July/August 1996.
- 5). California Institute for Energy Efficiency - Dirty Air Conditioners: Energy Implications of Coil Fouling.
- 6). Jeffrey Siegel, Ph.D. – Modeling Filter Bypass: Impact on Filter Efficiency.



# Standard Sizes



# Practical Pleat®

**NO FILTER BYPASS · NO RETROFITTING · NO HEADACHES**

Nominal Size W x H x D	Part Number	Case Qty.
*10x20x2	PP08-10202	4
*10x25x2	PP08-10252	4
*12x12x2	PP08-12122	4
*12x20x2	PP08-12202	4
*12x24x2	PP08-12242	4
*12x25x2	PP08-12252	4
*14x20x2	PP08-14202	4
*14x25x2	PP08-14252	4
*15x20x2	PP08-15202	4
*15x25x2	PP08-15252	4
*16x16x2	PP08-16162	4
*16x20x2	PP08-16202	4
*16x24x2	PP08-16242	4
*16x25x2	PP08-16252	4
*18x18x2	PP08-18182	4
*18x24x2	PP08-18242	4
*18x25x2	PP08-18252	4
*20x20x2	PP08-20202	4
*20x24x2	PP08-20242	4
*20x25x2	PP08-20252	4
*20x30x2	PP08-20302	4
*22x22x2	PP08-22222	4
*24x24x2	PP08-24242	4
*24x30x2	PP08-24302	4
*25x25x2	PP08-25252	4

Nominal Size W x H x D	Part Number	Case Qty.
12X12X5	PP08-12125	2
12X24X5	PP08-12245	2
14X25X5	PP08-14255	2
14X30X5	PP08-14305	2
16X20X5	PP08-16205	2
16X25X5	PP08-16255	2
18X24X5	PP08-18245	2
20X20X5	PP08-20205	2
20X24X5	PP08-20245	2
20X25X5	PP08-20255	2
20X30X5	PP08-20305	2
24X24X5	PP08-24245	2
24X30X5	PP08-24305	2
25X32X5	PP08-25325	2

The Practical Pleat features Kimberly-Clark's Intrepid electrostatically charged media. The media is made of thermally bonded, continuous hydrophobic polyolefin fibers that are designed not to shed fibers or absorb moisture. Furthermore, no chemical binders are used during the manufacturing process. Intrepid media is electret treated, creating a force that attracts particles. This provides for high initial efficiency. The combination of electrostatic charge and strong mechanical efficiency in the structure yields an optimal filter design for sustained efficiency.

The 28 point beverage board frame is coated with adhesive and the media bonded to the frame to prevent internal air bypass.

The unique Unifoam S82N gasket is designed to fit into a one-inch filter grille to hold the filter in place. An additional benefit is the elimination of particles being pulled around the filter frame, escaping the filtration process.

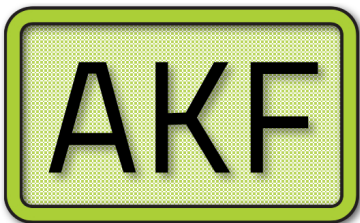
Non-standard sizes also available. "Vq'r wtej cug.'xkukv RtcvleclRrgcv'Clk' Hkngt'ugev'kqp'cv'y y y Qp{ nkp f qHkngt Qqo

\*Results will vary from 5" model

**Break The One-Inch  
Air Filter Cycle & Watch  
Your Savings Grow!**



**Avoid the Hassle &  
Expense of Retro-Fitting!**



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