Needled Felt and Monofilament Mesh Filter Bags

HEAVY-DUTY POLYPROPYLENE, POLYESTER AND NYLON FILTER BAGS

KEY FEATURES

- All Bag Materials Silicone-Free
- Size 1 – Single Length 7" x 16"
- Size 2 – Double Length 7" x 32"
- Sewn or Welded Construction
- Size 1 – Maximum Flow Rate 90 GPM
- Size 2 – Maximum Flow Rate 180 GPM
- Sewn Bags Have Sewn-In Cloth Handles
- Flanged Bags Have Molded-In Handles

BENEFITS

- Easy Change-Out Reduces Down Time
- Compact, for Easy Disposal
- Versatile Micron Ratings Will Accommodate Most Applications

TYPICAL APPLICATIONS

- Water and Wastewater Treatment
- Desalinization, RO and Deionized Water Systems
- Chemical Processing
- Food and Beverage
- Aquatic and Animal Life Support Systems
- Metal Finishing and Plating
- Marine and Corrosive Environments

MICRON RATINGS

- 1 Micron *(Material – Polypropylene and Polyester Needled Felt)*
- 5 Microns *(Material – Polypropylene and Polyester Needled Felt)*
- 10 Microns *(Material – Polypropylene and Polyester Needled Felt)*
- 25 Microns *(Material – Polypropylene and Polyester Needled Felt)*
- 50 Microns *(Material – Polypropylene and Polyester Needled Felt)*
- 100 Microns *(Material – Polypropylene and Polyester Needled Felt)*
- 150 Microns *(Material – Polypropylene and Nylon Monofilament Mesh)*
- 200 Microns *(Material – Polypropylene and Polyester Needled Felt)*
- 400 Microns *(Material – Polypropylene and Nylon Monofilament Mesh)*
- 600 Microns *(Material – Polypropylene and Nylon Monofilament Mesh)*
- 800 Microns *(Material – Polypropylene and Nylon Monofilament Mesh)*

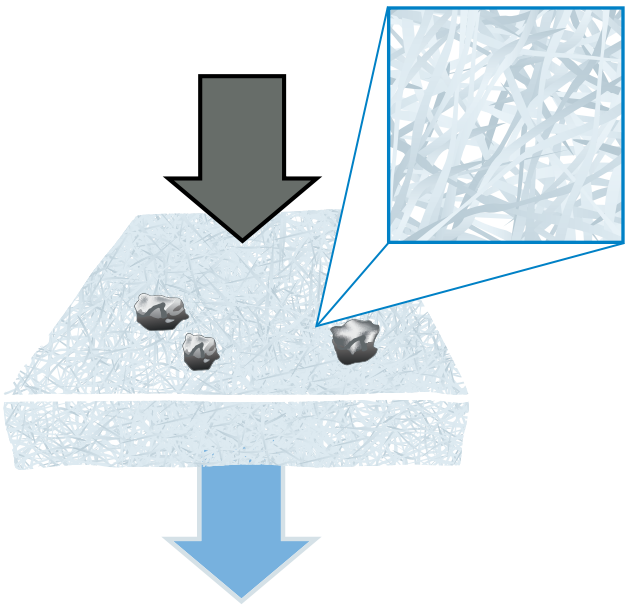
MATERIALS

- Glazed Polypropylene Needled Felt - Rated up to 200°F
- Singed Polyester Needled Felt - Rated up to 300°F
- Polypropylene Monofilament Mesh - Rated up to 200°F
- Nylon Monofilament Mesh - Rated up to 325°F

Needled Felt and Monofilament Mesh Filter Bags, *CONTINUED*

GLAZED* POLYPROPYLENE AND SINGED** POLYESTER NEEDLED FELT FILTER BAGS:

Felt material offers particle filtration by a depth process. Particles larger than the felt openings are trapped against the surface as particles that are smaller are forced into the material and trapped by the fibrous web. This three-dimensional media filtration is effective at removing both solid and gelatinous particles and is available in silicone-free polypropylene and polyester materials. Bags are available in 1 to 100 and 200 microns.



KEY FEATURES

- Needled Felt Structure
- Silicone-Free Material
- Suitable to Lower Viscosity Fluid
- Stable Filtration with High-Flow Velocity
- No Chemical or Fiber Release
- Temperature for Polypropylene: up to 200°F
- Temperature for Polyester: up to 300°F
- Chemical Resistance: Water, Aromatics, Weak Acids, Alkali

SPECIFIC APPLICATIONS

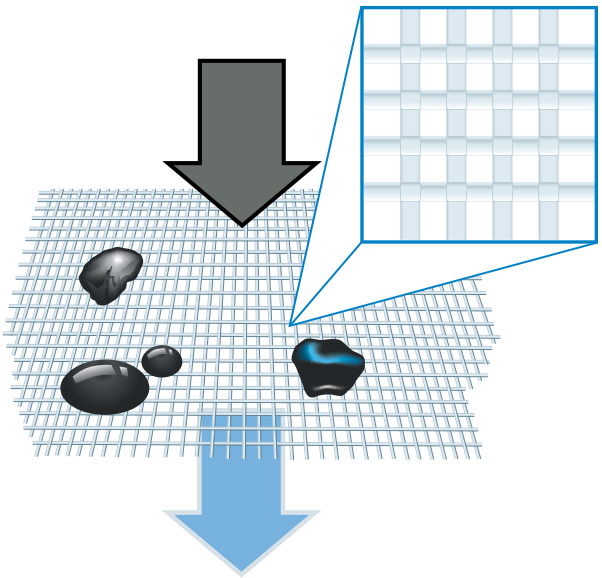
- Prefiltration in Water Treatment
- Amine Filtration in Petroleum Industries
- Electrophoretic Paint Filtration in Automotive Industries
- Syrup Filtration
- Raw Medicine Filtration
- Recycled Water Filtration in Electronics Industries

*Glazed: This process involves putting the felt media through heated rollers to melt back the loose surface fibers to prevent process fluid contamination

**Singed: This process involves exposing the felt media to an open flame to melt back the loose fibers to prevent process fluid contamination

POLYPROPYLENE AND NYLON MONOFILAMENT MESH FILTER BAGS:

Monofilament mesh offers particle filtration on the surface of a single interwoven fiber. All the holes are uniform providing the same filtration from top to bottom and are fusion welded for strength. Filtration is available at 150 microns and 400 to 800 microns.



KEY FEATURES

- Monofilament Mesh Structure
- Silicone-Free Material
- Fixed Aperture
- Good Stretch-Proof Performance
- Suitable to Intercept Rigid Impurity and High Viscosity Fluid
- Easy to Clean
- Temperature for Polypropylene: up to 200°F
- Temperature for Nylon: up to 325°F
- Chemical Resistance: Water, Aromatics, Aliphatic, Alkali

SPECIFIC APPLICATIONS

- Prefiltration in Metallurgy Industries
- Degreasing in Automotive Industries
- Raw Water Filtration in Water Treatment Industries
- Coolant Filtration in Paint Industries
- Cutting Fluid Filtration in Machine Industries
- Coarse Filtration in Chemical Industries
- Recycled Water Filtration in Paper Mills

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Needled Felt and Monofilament Mesh Filter Bags, *CONTINUED*

SINGLE AND DOUBLE LENGTH

All bags are made with silicone-free material. Bags are made in two lengths. Type 1 single length is 7" x 16" and Type 2 double length is 7" x 32". Both industry standard bag sizes fit Hayward's single or double length filter.

SEWN CONSTRUCTION

A sewn bag has the strength of a mechanically secure, sewn seam. These bags have two sewn lines to make sure that certain particles do not pass through the filter bag. These bags are made from media that is silicone free and are sewn with silicone free thread so that the filtrate is not contaminated.

WELDED CONSTRUCTION

Welded construction filter bags have the fabric fused together to form the bag and secure the sealing ring. Modern fabric welding technology provides a strong seal that won't leak or come apart in the flow.

SEWN-IN BAG RING

Another construction consideration is the type of sealing ring. This is a ring at the opening of the bag that helps seal it to the housing. It can be made of plastic or metal. The ring material is important not only for chemical compatibility, but also for disposal purposes. If the bag is going to be disposed of by incineration, it's important that the ring be plastic, and not metal. Hayward bags are made with a sewn-in PP ring.

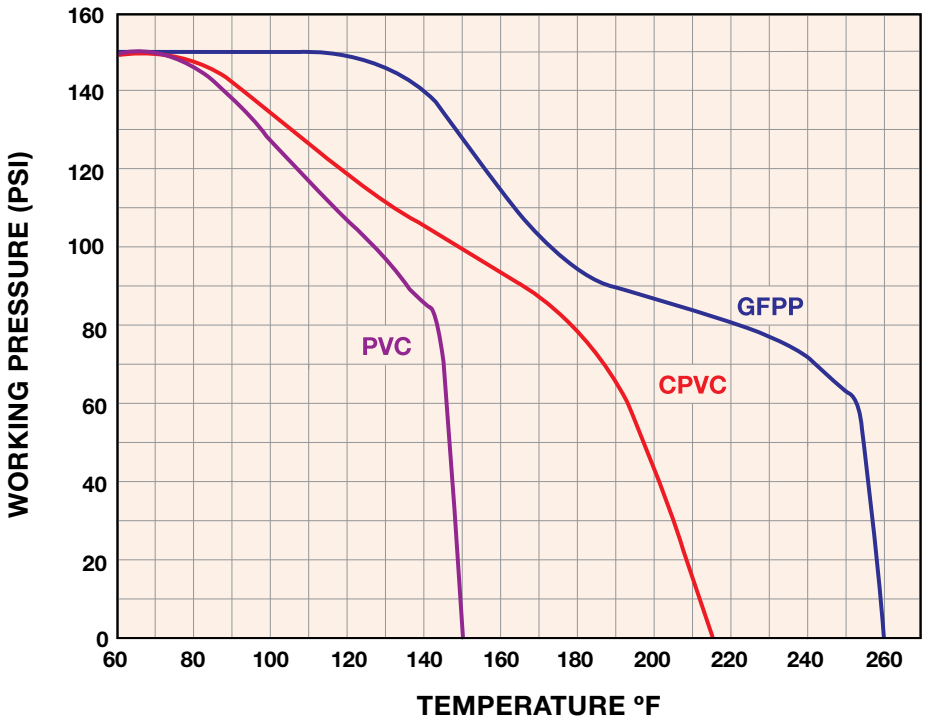
PP FLANGE RING

Consider the ring material of the bag when looking at chemical compatibility of the application. Hayward flanged bags have a PP flange ring.

PP FLANGE HANDLES

Flanged bags have PP handles at the top to make removal easier. Other bags have a sewn-in cloth handle for removal.

How to Select a Bag Filter



1. CHECK THE TEMPERATURE AND PRESSURE RATING OF A FILTER

To make sure that the temperature/pressure of the application falls within the OK range, see the chart on each individual catalog page or check the chart above for FLV Series Filters.

2. DETERMINE THE FLOW RATE

In GPM, of the system into which the bag filter is to be installed. Hayward® single and double length bag filters work with flows of up to 150 GPM. If the system's flow rate is greater, consider using two or more filters manifolded together in parallel. For example, if the system flow rate is 150 GPM or higher, using two manifolded filters would reduce the flow to a manageable 75 GPM through each. Constantly running the flow through the filters at their maximum rating limit is not recommended.

3. SELECT THE BAG

Hayward bags are available from 1 to 800 microns. The bags are made from several types of materials and are either of a sewn or welded construction. All bags are sold in Carton Quantities. A single length bag has a surface area of 2.0 sq ft and a double length of 4.1 sq ft.

4. CONSIDER START-UP PRESSURE LOSS

Bag filters are typically sized so that there is a 2 PSI or less pressure loss across them with a clean bag installed. Keep in mind that this is just a guide. The time between bag change-outs for a double length filter is more than twice that of a single length filter in the same application.

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How to Select a Bag Filter, *CONTINUED*

5. CALCULATE START-UP PRESSURE LOSS

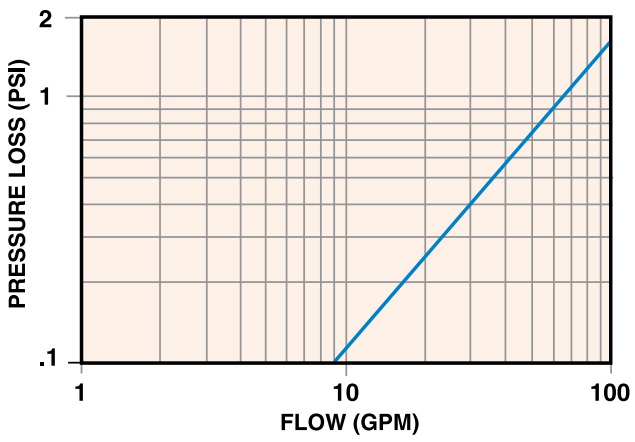
To figure the total pressure loss across the filter with a clean bag requires making two pressure loss calculations and adding them together: The loss across the filter without a bag and the bag loss.

First: Use the system flow rate and Chart 1 to determine the loss across the filter without a bag (single and double length filters have virtually the same pressure loss without a bag). Example: A flow rate of 30 GPM results in a 0.4 PSI pressure loss. If the process media is water or has a viscosity less than 200 CPS, that's it. If the viscosity is greater, select the correction factor that matches the process media viscosity in CPS units from Table Number 1. Multiply the pressure drop by this factor.

Table 1 – Filter Viscosity Correction

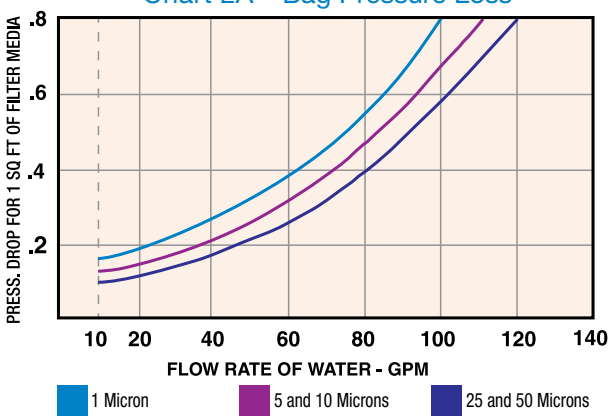
VISCOSITY IN CPS	200	400	600	800
CORRECTION FACTOR	1.10	1.20	1.40	1.50

Chart 1 – Filter Pressure Loss



Second: Single and double length filter bags have different pressure losses. Use Charts 2A and 2B to determine the pressure loss per square foot of bag surface. Example: with a system flow rate of 30 GPM, a 5 or 10 micron bag would have a 0.2 PSI loss per square foot. This loss is divided by 2.0 for a single length bag or 4.1 for a double length bag. These factors are the respective surface areas of the bags in square feet. The loss for a single bag would be 0.1 PSI (0.2 ÷ 2.0) and 0.05 for a double length bag (0.2 ÷ 4.1). For fluids with viscosities other than water, select the correction factor from Table 2 and multiply the pressure drop by it. Example: If the fluid viscosity were 800 CPS, the pressure loss for a single length bag would be 5.0 (0.1 x 50.0).

Chart 2A – Bag Pressure Loss

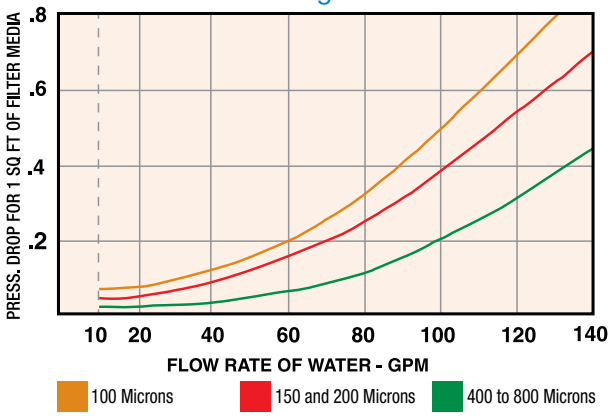


Last: Add the pressure loss of the filter and the bag together to get the pressure loss across the filter with the bag installed.

Table 2 – Bag Viscosity Correction

VISCOSITY IN CPS	Water 1	50	100	200	400	600	800
CORRECTION FACTOR	1.00	4.50	8.50	16.60	27.70	38.90	50.00

Chart 2B – Bag Pressure Loss



Flow of Water Through Schedule 80 Plastic Pipe

DISCHARGE		VELOCITY IN SCHEDULE 80 PLASTIC PIPE FOR WATER @ 60°F VELOCITY							
Gallons / Minute	*Cubic Feet / Second*	*Feet / Second*	*Feet / Second*	*Feet / Second*	*Feet / Second*	*Feet / Second*	*Feet / Second*	*Feet / Second*	*Feet / Second*
			1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"
0.2	0.000446	—	0.824	—	—	—	—	—	—
0.3	0.000668	—	1.237	0.651	0.392	—	—	—	—
0.4	0.000891	—	1.646	0.867	0.529	—	—	—	—
0.5	0.00111	—	2.061	1.083	0.653	0.359	—	—	—
0.6	0.00134	—	2.476	1.303	0.782	0.431	—	—	—
0.8	0.00178	—	3.295	1.728	1.043	0.574	—	—	—
1	0.00223	—	4.122	2.167	1.311	0.718	0.435	—	—
2	0.00446	—	8.245	4.335	2.609	1.432	0.871	0.525	—
3	0.00668	—	12.381	6.502	3.919	2.161	1.306	0.788	0.538
4	0.00891	2"	16.502	8.671	5.218	2.876	1.747	1.051	0.717
5	0.01114	—	—	10.837	6.528	3.592	2.181	1.313	0.896
6	0.01337	0.65	2-1/2"	13.005	7.827	4.308	2.614	1.579	1.076
8	0.01782	0.86	—	—	10.448	5.741	3.482	2.105	1.434
10	0.02228	1.08	0.752	3"	13.057	7.185	4.351	2.632	1.798
15	0.03342	1.61	1.134	—	—	10.778	6.531	3.941	2.697
20	0.04456	2.15	1.505	0.986	—	—	8.712	5.252	3.596
25	0.0557	2.69	1.886	1.238	—	4"	10.881	6.574	4.484
30	0.06684	3.23	2.256	1.476	—	—	13.062	7.884	5.383
35	0.07798	3.78	2.638	1.726	—	0.973	15.232	9.193	6.282
40	0.08912	4.32	3.009	1.976	—	1.114	17.413	10.515	7.171
45	0.1003	4.84	3.391	2.215	—	1.247	—	11.838	8.069
50	0.1114	5.39	3.761	2.465	—	1.391	—	13.147	8.969
60	0.1337	6.47	4.513	2.953	—	1.665	—	15.779	10.778
70	0.156	7.55	5.266	3.453	—	1.942	—	—	12.577
80	0.1782	8.62	6.018	3.942	—	2.228	—	6"	14.36
90	0.2005	9.69	6.771	4.442	—	2.504	—	—	16.162
100	0.2228	10.77	7.523	4.931	—	2.781	—	1.225	17.96
125	0.2785	13.48	9.409	6.168	—	3.475	—	1.534	22.445
150	0.3342	16.18	11.284	7.395	—	4.171	—	1.893	—
175	0.3899	18.87	13.171	8.633	—	4.865	—	2.141	8"
200	0.4456	21.56	15.068	9.861	—	5.561	—	2.451	—
225	0.5013	—	16.943	11.098	—	6.255	—	2.759	1.577
250	0.557	—	—	12.325	—	6.951	—	3.069	1.752
275	0.6127	—	—	13.563	—	7.645	—	3.367	1.927
300	0.6684	—	—	14.768	—	8.341	—	3.675	2.102
325	0.7241	—	—	16.041	—	9.035	—	3.985	2.277
350	0.7798	—	—	—	—	9.731	—	4.294	2.453
375	0.8355	—	—	—	—	10.425	—	4.592	2.628
400	0.8912	—	—	—	—	11.121	—	4.901	2.803
425	0.9469	10"	—	—	—	11.815	—	5.211	2.989
450	1.003	—	—	—	—	12.511	—	5.519	3.164
475	1.059	2.199	—	—	—	13.205	—	5.817	3.329
500	1.114	2.229	—	—	—	13.901	—	6.126	3.515
550	1.225	2.459	—	—	—	15.279	—	6.744	3.865
600	1.337	2.679	12"	—	—	16.681	—	7.352	4.215
650	1.225	2.899	—	—	—	—	—	7.971	4.566
700	1.56	3.129	2.205	—	—	—	—	8.588	4.916
750	1.671	3.349	2.359	—	—	—	—	9.195	5.267
800	1.56	3.569	2.513	—	—	—	—	9.802	5.617
850	1.782	3.799	2.677	—	—	—	—	10.421	5.968
900	2.005	4.019	2.831	—	—	—	—	11.028	6.318
950	2.117	4.239	2.984	—	—	—	—	11.646	6.668
1000	2.228	4.469	3.149	—	—	—	—	12.253	7.019
1100	2.451	4.919	3.458	—	—	—	—	13.489	7.719
1200	2.674	5.359	3.775	—	—	—	—	14.715	8.431
1300	2.896	5.809	4.093	—	—	—	—	15.929	9.121
1400	3.119	6.259	4.401	—	—	—	—	17.165	9.833
1500	3.342	6.698	4.718	—	—	—	—	18.391	10.534
1600	3.565	7.148	5.037	—	—	—	—	19.611	11.235
1800	4.01	8.038	5.662	—	—	—	—	22.067	12.636
2000	4.456	8.938	6.228	—	—	—	—	24.517	14.038
2500	5.57	11.168	7.868	—	—	—	—	—	17.552
3000	6.684	13.396	9.437	—	—	—	—	—	21.068
3500	7.798	15.637	11.006	—	—	—	—	—	24.572
4000	8.912	17.866	12.587	—	—	—	—	—	28.08
4500	10.13	20.106	14.156	—	—	—	—	—	31.613
5000	11.14								
6000	13.37								
7000	15.6								
8000	17.82								
9000	20.05								
10000	22.28								
12000	26.74								

The following wave surge constants may be used to quickly calculate pressure rise due to water hammer where: "C"= the wave surge constant from the table below multiplied by "V" the line velocity in feet per second. The resultant number is then added to the line pressure to determine the resulting wave surge (Water Hammer Effect).

Pipe Size	1/4"	1/2"	3/4"	1"	1-1/2"	2"	3"	4"	6"	8"	10"	12"
Constant	40	35	32	31	27	25	23	23	21	20	19	19

Maximum recommended fluid velocity is 8 feet per second (solenoid valves 5 feet per second)

How to Order Filter Bags

HOW TO SELECT A PART NUMBER

MATERIAL		MICRON RATING		FINISH		BAG SIZE		BAG STYLE*		OPTIONS	
Glazed Polypropylene Needled Felt	PO	1 Micron	001	Glazed Needled Felt	G	16"	1	PP Ring	PR	Sewn with Handle	SH
Polypropylene Monofilament Mesh	PMO	5 Microns	005	Singed Needled Felt	S	32"	2	PP Flange	PF	Welded with Flange	WF
Singed Polyester Needled Felt	PE	10 Microns	010	Monofilament Mesh	M						
Nylon Monofilament Mesh	NMO	25 Microns	025								
		50 Microns	050								
		100 Microns	100								
		150 Microns	150								
		200 Microns	200								
		400 Microns	400								
		600 Microns	600								
		800 Microns	800								
To find your part number, please select your Material, Micron Rating, Finish, etc., and place the corresponding identifier (PO, 001, G, etc.) in the boxes below.											
EXAMPLE	**PO**		**100**		**G**		**1**		**PR**		**SH**

* Carbon Steel and Stainless Steel rings are available upon request – consult factory for information

STANDARD FIBER AND MICRON RATINGS

FIBER CONSTRUCTION	MATERIAL	AVAILABLE MICRON RATINGS										
		1	*5*	*10*	*25*	*50*	*100*	*150*	*200*	*400*	*600*	*800*
Needled Felts	Polypropylene	●	●	●	●	●	●		●			
	Polyester	●	●	●	●	●	●		●			
Monofilament Meshes	Polypropylene							●		●	●	●
	Nylon							●		●	●	●

COMPATIBILITY AND TEMPERATURE LIMITS

FIBER	COMPATIBLE WITH							
	Organic Solvent	*Animal, Vegetable and Petro Oils*	*Microorganisms*	*Alkalies*	*Organic Agents*	*Oxidizing Agents*	*Mineral Acids*	*Temperature Limits (Max. °F)*
Polyester	A	A	A	B	B	B	B	300
Polypropylene	A	A	A	A	A	C	C	200
Nylon	A	A	A	B	C	D	D	325

A Excellent B Good C Fair D Poor