CATALOX

CATALOX is a high rate, granular filter media used for removing hydrogen sulfide, iron and manganese compounds from water supplies. CATALOX operates both as a classical filter working with an oxidant and as a catalytic media due to its ability to accelerate the reaction between the oxidizing agent and any prevalent dissolved oxygen with sulfide, iron and manganese present. Dissolved iron, manganese and hydrogen sulfide will stay in solution unless the equilibrium is changed. Iron and manganese that is not oxidized become catalytically precipitated and then adsorbed directly on the media. CATALOX is a very dense media that stops oxidized (precipitated) forms of iron, manganese and hydrogen sulfide from passing through the bed. Most of the manganous manganese is rapidly removed in the first few inches of the media where it is further oxidized to manganese dioxide.

The adsorbed manganese, iron and precipitated sulfur are expelled during backwash. Any insoluble ferric hydroxide particulate growths are also expelled during backwash. The media must be properly backwashed to break loose and remove the filtered contaminants and precipitated iron, manganese and hydrogen sulfide. System sizing of the control valve and tank are necessary to sustain media performance.

A continuous reaction occurs with the addition of an oxidant, regenerating the media surface and replenishing the CATALOX. For difficult applications, CATALOX filters can be enhanced with aeration, chlorination, and ozone. Because of CATALOX's naturally high manganese dioxide content, it provides a higher adsorption capacity than other media. A CATALOX filter is recommended before softeners to protect the ion exchange resin from fouling.

Advantages

- Efficient reduction of manganese, iron and hydrogen sulfide
- Long service life
- Only regular backwashing is necessary
- Ability to process high flow rates with low pressure drop
- Continuous regeneration
- Ability to be utilized with common oxidants including:
  - CL2 (gas)
  - Sodium hypochlorite
  - Potassium Permanganate
- 10 – 30 second reaction time with oxidant additive
- Converts ferrous iron to ferric iron
- Converts H2S to sulfur
- Converts Manganese to MnO2
- No chemical regeneration is required but may reduce service life
- Allows for adequate reaction time to permit for the formation of ferric hydroxide
- Allows for physical straining of the ferric hydroxide floc and sulfur until media requires backwashing
- Allows for adsorption of MnO2
- NSF/ANSI Standard 61-2002 Certified

Applications

- Removal of Iron up to 10 ppm
- Removal of Manganese up to 5 ppm
- Removal of Hydrogen Sulfide (rotten egg smell) up to 3 ppm
- Not recommended for Iron Bacteria and Manganese bacteria removal
- Not recommended for tannin and organics removal

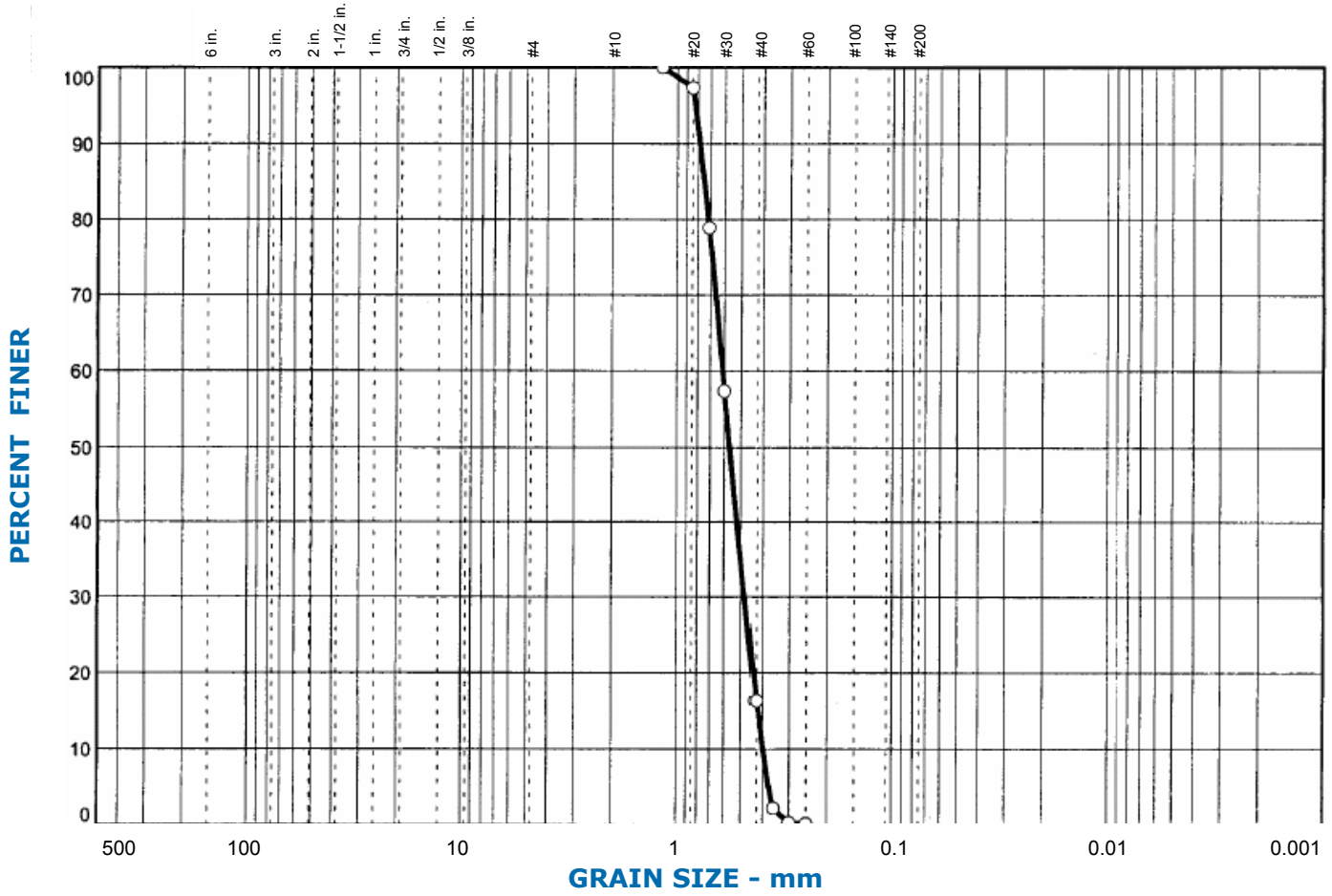
Physical Properties	
Color	Black
Purity	> 85 %
C.A.S No.	1313-13-9
Physical Form	Granular particles
Moisture content	< 0.5 % as shipped
Bulk density	125 lbs/cu.ft (2.00 g / cm^3)
Mesh size (US-Unit)	8 x 20 / 20 x 40
Mesh size (mm)	0.85 – 2.36 / 0.425 – 0.85
Uniformity Coefficient	1.77
Specific Gravity	3.8

Operating Conditions	
PH	6 – 9
Bed depth	36 – 48 inches (900 – 1200 mm)
Service flow rate	5 – 10 gpm / sq ft. (12 – 20 m/h)
Back wash flow rate	22-30 gpm / Sq ft (50 - 72 m/h)
Back wash expansion	15 – 30 %
Freeboard	70 % of bed depth
Oxidant type	Chlorine
Oxidant Form	12.5 % Sodium Hypochlorite
Oxidant contact time	10 – 30 seconds
Typical oxidant dosage	0.5 – 2 ppm
Regeneration	Continuous w / oxidant addition
Removal efficiency	95 – 99 % for Iron 99 % for Manganese
Back wash efficiency	Every 24 hours (typical)

Shipping Information	
Packaging	25 kg bags, 1 Metric Ton Big Bag
Bags per pallet (25 kg bags)	25
NPFA Rating	Health: 2 Flammability: 0 Reactivity: 1

Particle Distribution

Sieve Size	Percent Finer
#16	100
#20	97.3
#25	78.9
#30	57.4
#40	16.3
#45	2.2
#50	0.3
#60	0.2

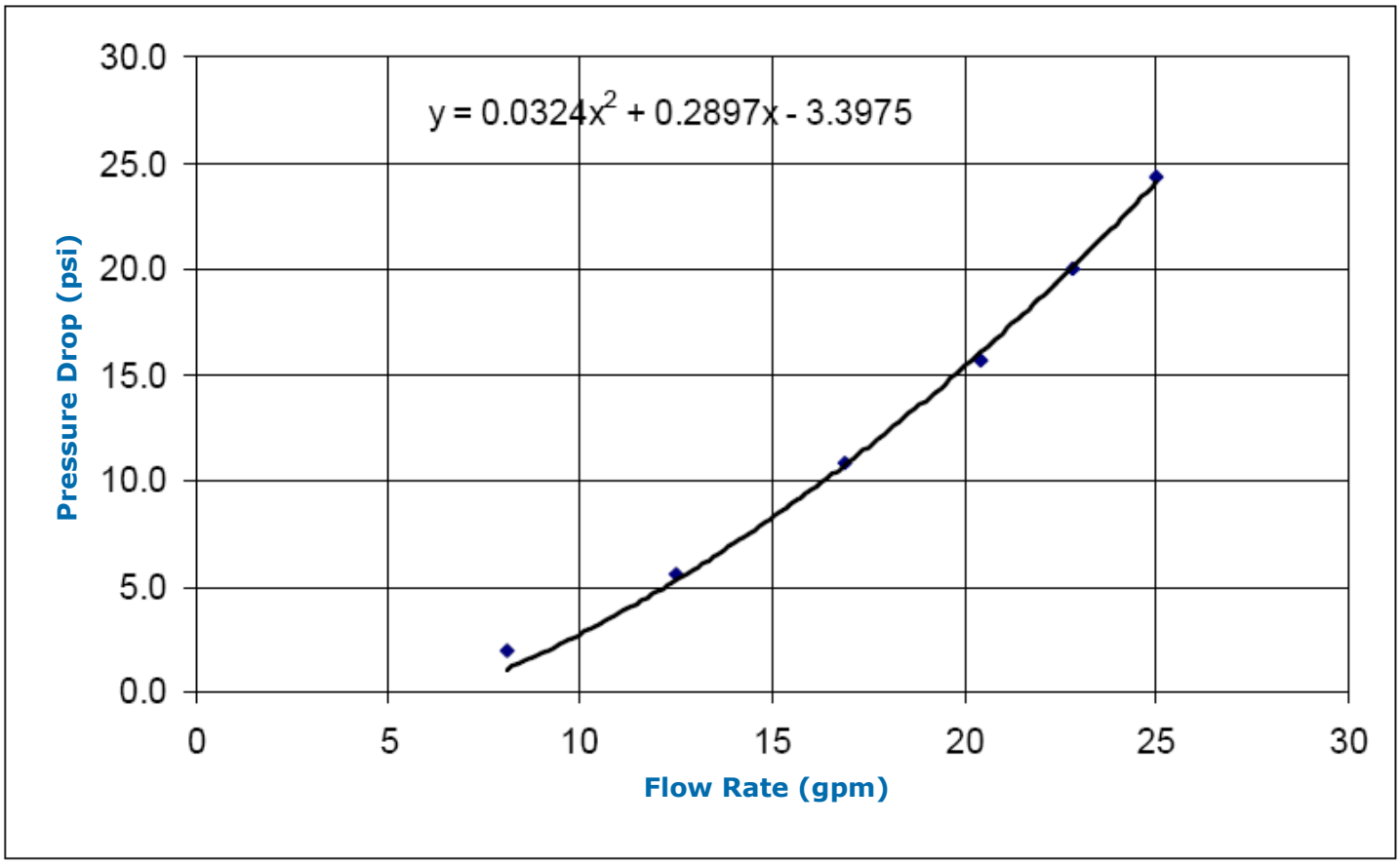


Service Flow

Flow Rate (gpm)	Water Temperature (deg. F)	Temperature Correction Factor	Differential Pressure (psid)	Differential Pressure Corrected (psid)	Cv
8	60	1	2.00	2.00	5.73
13	60	1	5.60	5.60	5.28
17	60	1	10.80	10.80	5.14
20	60	1	15.70	15.70	5.15
23	60	1	20.00	20.00	5.10
25	60	1	24.30	24.30	5.07

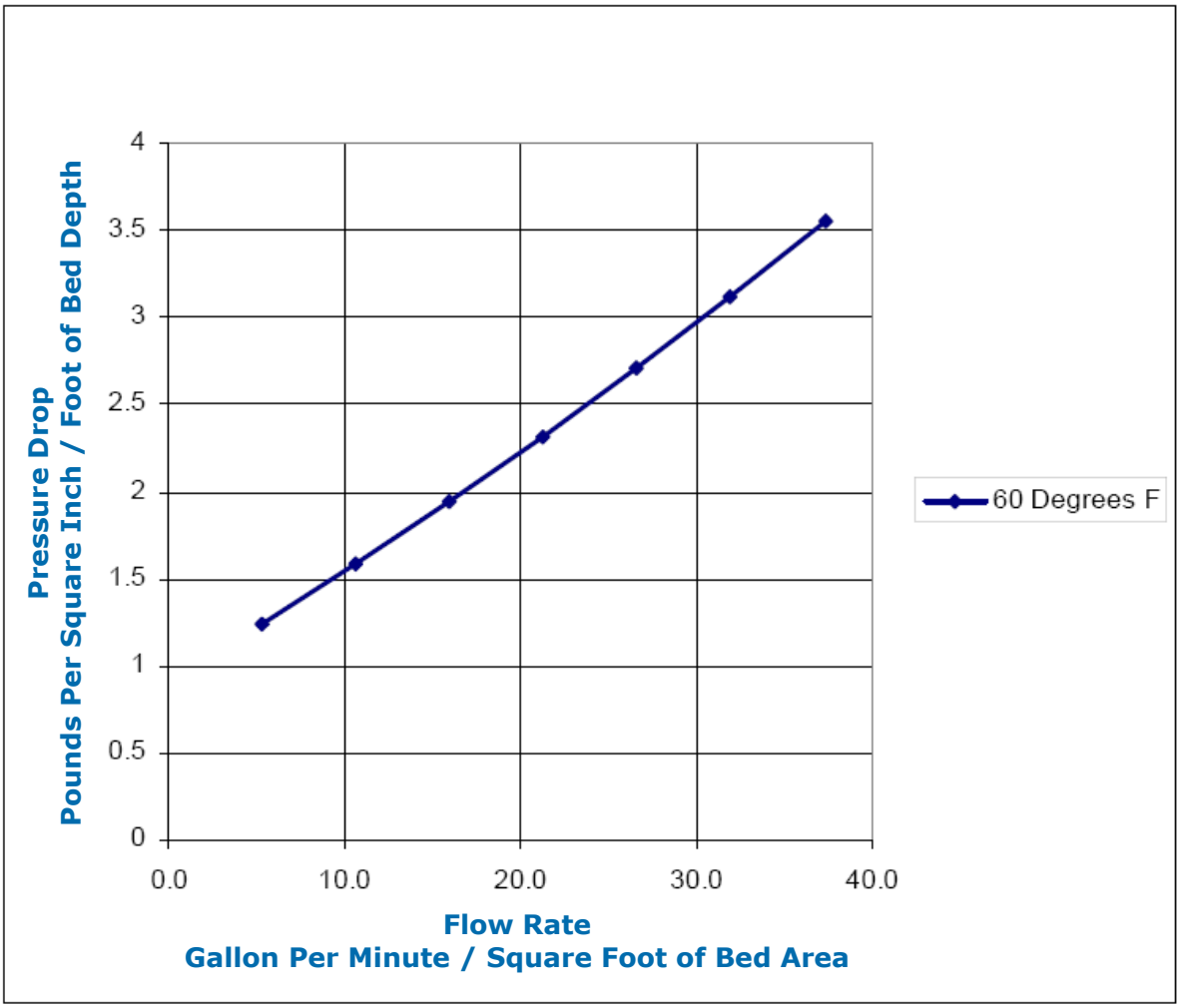
Flow Rating @ 15 psid (gpm): 20.85 per ANSI/NSF Standard 44 - 2001 Section 6.6

Test item CV: 5.38



Service Flow Pressure Drop

Flow Rate (gpm)	Flow Rate (gpm/sq ft)	Empty Tank (psi)	System (psi)	Media Alone (psi)	Media Alone (psi/ft of bed)
1	5.3	-3.0754	-0.5737	2.5017	1.238848654
2	10.7	-2.6885	0.5008	3.1893	1.579350046
3	16.0	-2.2368	1.6771	3.9139	1.93817394
4	21.3	-1.7203	2.9552	4.6755	2.315320334
5	26.6	-1.139	4.3351	5.4741	2.710789229
6	32.0	-0.4929	5.8168	6.3097	3.124580625
7	37.3	0.218	7.4003	7.1823	3.556694522



Bed Expansion

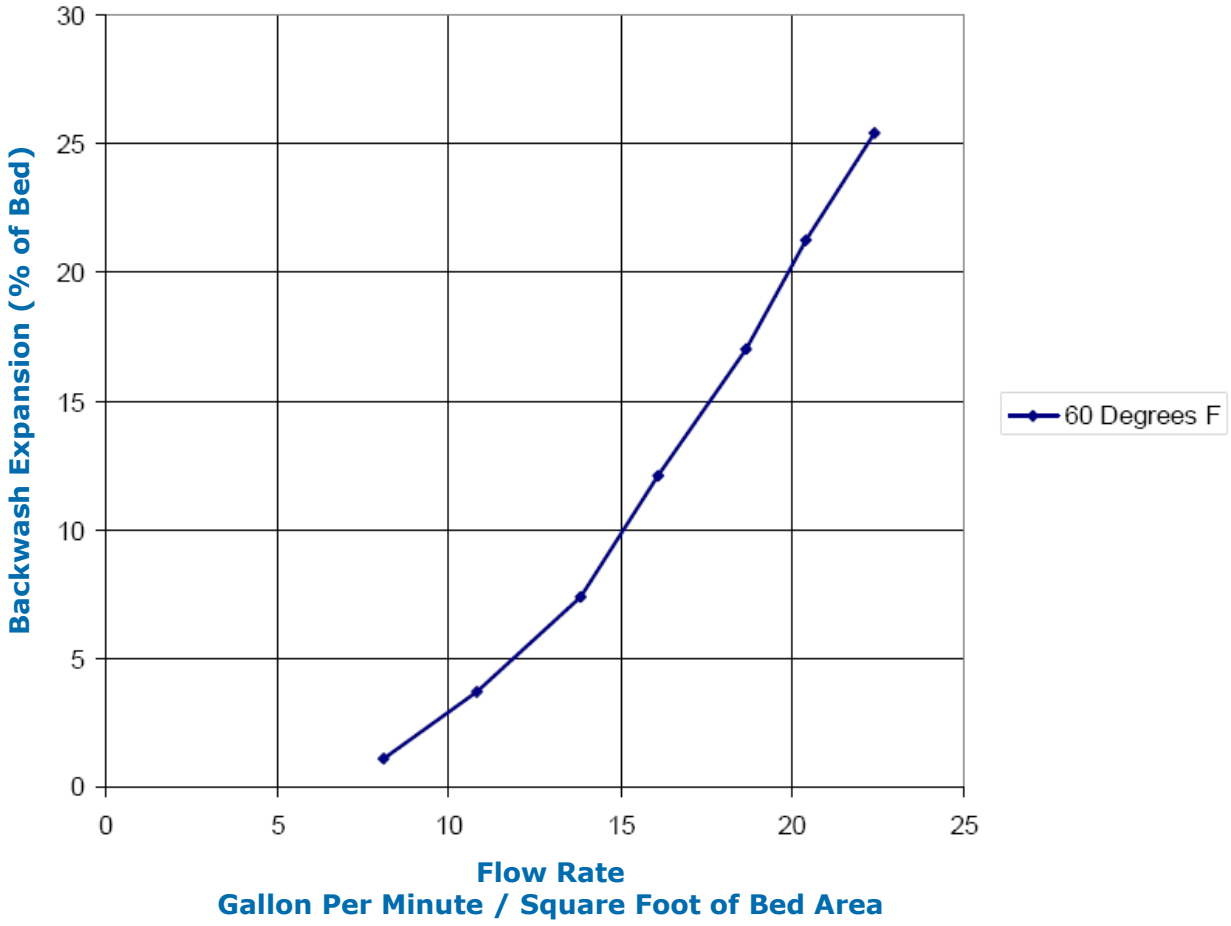
Bed Depth	25.3125	in
Tank Diameter	5.96	in
Dist Tube Diameter	1.05	in
Available Area	27.033	sq in
Available Area	0.188	sq ft

Temperature 60 Degrees F

60 Degrees F

Flow Rate (gpm)	Tape Position	expansion (in)	Expansion (%)	Flow Rate (gpm/sq ft)
1.52	D	0.281	1	8
2.03	E	0.938	4	11
2.60	C	1.875	7	14
3.02	F	3.063	12	16
3.50	J	4.313	17	19
3.83	G	5.375	21	20
4.20	H	6.438	25	22

Backwash Bed Expansion



Composition Analysis

Characteristic	Unit	Chemical Specification		Analysis	Physical Specification		Analysis
		Mín.	Máx.		Mín.	Máx.	
Purity as MnO_2	%	80.0		82.31			
Mn content	%	50.6		52.10			
SiO_2 content	%		2.0	1.10			
Fe_2O_3 content	%		5.0	4.06			
Al_2O_3 content	%		5.0	3.52			
CaO content	%		1.0	0.27			
MgO content	%		1.0	0.24			
Arsenic content				Non detectable			
+ 0.85 mm	%					5	2.7
- 0.35 mm	%					5	2.8
Uniformity coefficient							1.45
Contents of organic matter	N/Y			No content			
Bulk density	g/ml						1.90
Oxidation capacity		500		1750			
Pin ball hardness	%						97