GAC FILTERS

GRANULAR ACTIVATED CARBON, GAC, REMOVES TASTES, ODORS, DISSOLVED ORGANIC CHEMICALS, AND CHLORINE FROM MUNICIPAL AND INDUSTRIAL WATER SUPPLIES. Water King standard carbon is 8x30 created from bituminous coal. The activation process increases the porosity and surface area of the media developing a capacity for adsorption of organics from water. GAC has two different uses.

ADSORPTION. Using activated carbon for adsorption of trace organics improves taste, reduces odors and reduces toxic compounds such as pesticides and herbicides.

CHLORINE REMOVAL. GAC also has the ability to catalize the oxidation of free chlorine to chloride. It is a functional method of removing chlorine from water prior to softening or dealkalyzation. Chlorine in water reduces resin life and chlorine over 1 or 2 ppm is unacceptable in most resin based ion exchange applications.

APPLICATION

- Feed water should be clear and free of iron and suspended solids.
- Service rates of 5 gpm/sq. ft. are practical for ordinary taste, odor and chlorine loads.
- Backwash flow rates of 10-12 gpm/sq. ft create 30 to 40 % bed expansion.
- GAC requires periodic backwashing to eliminate accumulated suspended matter and to re-grade the GAC bed.
- GAC must be periodically replaced in either adsorption or chlorine removal applications.

PHYSICAL PROPERTIES

- Designation: Granular Activated Carbon 8x30 Mesh Virgin Coal Base
- Color: Black
- US Standard Mesh Size: 8x30
- Tolerances: larger than 8 mesh 5% max, smaller than 30 mesh 3% max
- Iodine Number (ASTM D 2866-83): 1000 minimum
- Molasses Number: 210 minimum
- Abrasion Number (ASTM D 3802-79): 85 minimum
- Methylene Blue: 180 minimum
- Benzene Number: 38 minimum
- CTC (ASTM D 3467-88): 55 minimum
- Ash Content (ASTM D 2866-83): 12% maximum
- pH (ASTM D 3838-80): 7 units
- Moisture (ASTM D 2867-91): 3% maximum
- Bulk Density: 0.42 g/ml, 31 lbs/ft^3
- Meets American Water Works Association Standard B604-96
- NSF Approved
- Meets Food Chemical CODEX Standards
- Reference: CEI Specification Sheet 080106

ACTIVATED CARBON FILTER PACKS

PART NO	DESCRIPTION		TANK (1)		MEDIA CUBIC FT	GRAVEL lbs.	WEIGHT POUNDS
479701	AC FILTER PK	45	10x54	F	1	15	40
479702	AC FILTER PK	50	12x52	F	1	15	40
479703	AC FILTER PK	70	13x54	F	2	30	80
479704	AC FILTER PK	100	14x65	F	3	40	115
479705	AC FILTER PK	120	16x65	F	4	55	155
479706	AC FILTER PK	150	21x62	F	5	140	265
479707	AC FILTER PK	240	24x72	F	8	200	400
479708	AC FILTER PK	300	30x72	F	10	200	450
479709	AC FILTER PK	450	36x72	F	15	300	675
479721	AC FILTER PK	120	18x54	S	4	100	200
479722	AC FILTER PK	150	20X54	S	5	100	225
479726	AC FILTER PK	240	24X54	S	8	200	400
479727	AC FILTER PK	300	30X60	S	10	300	550
479729	AC FILTER PK	600	36X60	S	20	600	1100
479731	AC FILTER PK	900	42X72	S	30	1000	1750
479732	AC FILTER PK	1200	48X72	S	40	1100	2100
479733	AC FILTER PK	1650	54X72	S	56	1300	2700
479734	AC FILTER PK	2100	60X72	S	70	1600	3350
479735	AC FILTER PK	2550	66X72	S	86	2100	4250
479736	AC FILTER PK	3000	72X72	S	100	2600	5100
4800007-25	GRANULAR ACTIVATED CARBON 8x30 1-cu ft. bags 25 lbs.						

NOTES:

F – FIBERGLASS OR POLY GLASS TANKS

S – STEEL TANKS

GRAVEL WEIGHT IS 100 LBS. PER CUBIC FT.

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MEDIA LIFE IN MONTHS FOR GAC IN DECHLORINATION SERVICE					
	Chlorine content in ppm				
Loading rate (gpm/ft3)	1	2	3	5	10
1	768	298	171	85	33
2	77	25	13	6	2
3	26	3	2	1	0
4	6	2	1	1	0
Data from Dechlorination of Water (pH 7, 21°C) Clack HAC Brochure					

Application Table For

GAC FILTERS IN DECHLORINATION SERVICE

Model	RF 50	RF 70	RF 100	RF 120	FRF 150	FMF 150	FMF 240	FHF 300	FHF 600	FHF 900
Mineral Tank	12x52	13x54	14x65	16x65	21x62	20x54	24x54	30x60	36x60	42x72
Diameter (inches)	12	13	14	16	21	20	24	30	36	42
Area (ft^2)	0.79	0.92	1.07	1.40	2.40	2.18	3.14	4.91	7.07	9.62
Media Volume (ft^3)	1.5	2	3.25	4	5	5	8	10	15	30
Bed depth (inches)	23	26	37	34	25	28	31	24	25	37
Flow at 1 gpm/ft^3	1.5	2.0	3.3	4.0	5.0	5.0	8.0	10.0	15.0	30.0
Loading (gpm/ft^2)	1.9	2.2	3.0	2.9	2.1	2.3	2.5	2.0	2.1	3.1
Headloss (psi)	0.1	0.1	0.3	0.4	0.4	0.5	0.7	0.1	0.3	1.1
Flow at 2 gpm/ft^3	3.0	4.0	6.5	8.0	10.0	10.0	16.0	20.0	30.0	60.0
Loading (gpm/ft^2)	3.8	4.3	6.1	5.7	4.2	4.6	5.1	4.1	4.2	6.2
Headloss (psi)	0.3	0.5	1.3	1.6	1.6	1.9	2.8	0.5	1.3	4.2
Flow at 3 gpm/ft^3	4.5	6.0	9.8	12.0	15.0	15.0	24.0	30.0	45.0	90.0
Loading (gpm/ft^2)	5.7	6.5	9.1	8.6	6.2	6.9	7.6	6.1	6.4	9.4
Headloss (psi)	0.7	1.2	3.0	3.5	3.6	4.4	6.3	1.2	2.9	9.5
Flow at 4 gpm/ft^3	6.0	8.0	13.0	16.0	20.0	20.0	32.0	40.0	60.0	120.0
Loading (gpm/ft^2)	7.6	8.7	12.2	11.5	8.3	9.2	10.2	8.2	8.5	12.5
Headloss (psi)	1.2	2.1	5.3	6.3	6.4	7.7	11.2	2.1	5.2	16.8

SIZING EXAMPLE:

The carbon life calculation is for continuous loading at the rated flow.

SIZING PROCEDURE:

1. Determine Chlorine Concentration, required Flow Rate (Q) in gpm and Total Usage (V) in gallons.
2. Determine the acceptable interval between media changes (I).
3. Calculate Hours per day of flow as Total Usage / Flow Rate (T=V/(Q*60)).
4. The Media Life (L) will be the time that the media is in service between changes. Thus the required L = I * (T/24).
5. Enter the Media Life table at the chlorine content. Find the loading that is closest to the calculated media life (L). Read the loading from the left hand column of the Media Life table.
6. Enter the GAC table at the loading determined in step 5. Find the flow rate desired. Read the appropriate Water King GAC filter from the table heading in that column.

EXAMPLE:

1. Chlorine Concentration = 3 ppm, Flow Rate (Q) in gpm = 20 gpm and Total Usage (V) in gallons = 7200 gpd.
2. Annual (I = 12 months) media replacement is acceptable.
3. T = V/(Q*60) = 7200/(20*60) = 6 hours per day.
4. Media Life: L = I * (T/24) = 12 * (6/24) = 3 months.
5. Enter the Media Life table at the chlorine content. (3 ppm) Find the loading that is closest to the calculated media life (L = 3 months). For 3 ppm the Media Life is 13 months at 2 gpm/ft^3 and 2 months at 3 gpm/ft3 a conservative design would be to choose 3 gpm/ft3.
6. Enter the GAC table at 3 gpm/ft3 finding an FMF 240-C will produce 24 gpm at 6.3 psi of head loss.