FILTRATION MEDIA

ZEOLITE-61
PARTICULATE REDUCTION MEDIA

Zeolite-61 (P/N HC10003) is a high purity natural zeolite. The surface area of Zeolite-61 is 100-times greater than sand/anthracite thus allowing smaller particles to be trapped. Its larger surface area greatly improves water clarity and increases the time between backwashes. This product is Certified to NSF/ANSI Standard 61.

BENEFITS

- Safe, natural, nontoxic, inexpensive replacement for sand/anthracite and multimedia beds
- High surface area holds up to 55% its weight in water and up to 2.1% nitrogen
- High potassium and low sodium content
- Long filter bed life (approx. 10 years)
- Reduced backwash time and frequency
- Certified to NSF/ANSI Standard 61
- Certified to NSF/ANSI Standard 372

APPLICATIONS

- Bottle water and drinking water plants
- Economical pre-filter for RO systems
- Well water and industrial wastewater filtration
- Cooling tower, chillers, heat exchanger water filtration

Physical filtration barriers for accumulation or collection of microorganisms in water that endanger human health have been in focus during the last several years. Zeolite-61 will be an ideal collector of pathogens such as Giardia, Cryptosporidium, and other oocyst and protozoa and their spores. Most of these organisms and their spores are in the size range of 0.5 to 10 micrometers (microns). In contrast, the water permeable pores in Zeolite-61 are mostly smaller than 0.05 microns; therefore the zeolite fragment or granule can surface collect a high percentage of these microorganisms while the water passes through the zeolite fragment. The U.S. drinking water standards for microorganism pathogens and turbidity can be easily met using a natural, low-cost material, such as Zeolite-61 rather than sand which is chiefly quartz grains.

Specifications

Part Number	HC10003
Mineral	Clinoptilolite zeolite
Mesh Size	14 x 40
Particle Size	0.42 mm to 1.4 mm
Smaller than 0.42 mm	Less than 2%
Larger than 1.4 mm	Less than 2%
Effective Size	0.62 mm (d_{10})
Uniformity Coefficient	1.6 (d_{60}/d_{10})
Average Size	0.88 mm (d_{50})
BET Surface Area	29.3 square meters/gram
Surface Absorption	Hydrophillic
Porosity	High porosity, irregular surface
Surface Charge	Negative
Cation Exchange Capacity	1.5 to 1.8 meq/gram (as ammonium, -N)
Water Retention (max.)	Holds 55% of its weight
Hardness	Moh's no. 4
Service Flow Rate *	10 to 20 gpm/sq.ft.
Backwash Rate (@ 60°F)	12 to 22 gpm/sq.ft.
Backwash Expansion	40 to 50%
Minimum Bed Depth	24 inches
Solids Loading	High (1.7 x multimedia)
Filtration Rating (nominal)	3 to 10 micron
Color	Light gray green
Packaging	55 lb (1 cu.ft.) bags, or 2,000 lb supersack

* A general sizing guideline for 5 micron filtration would be 15 gpm/sq.ft. service flow rate.

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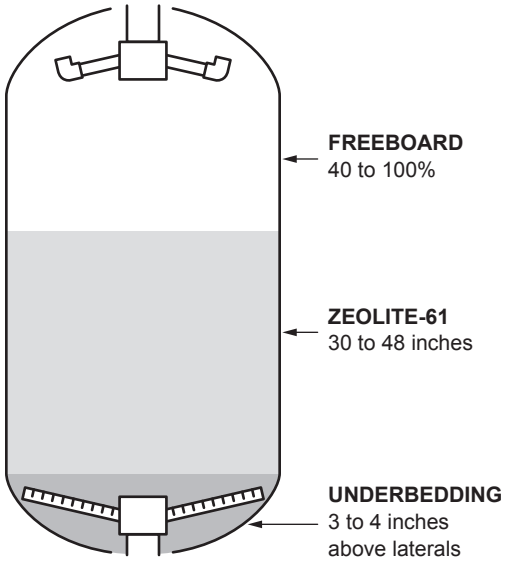
Zeolite-61 vs. Conventional Media Performance (Pressure Vessels)

Filter Media	Filter Rating (nominal)	Solids Loading Capacity
Sand (20 x 40 Mesh)	~20 micron	1x
Sand/Anthracite (20 x 40 Mesh & Anthracite)	~15 micron	~1.4x
Multimedia (8 x 12 Garnet, 30 x 40 Garnet, 0.45–0.55 Sand, Anthracite #1)	~12 micron	~1.6x
Zeolite-61 (14 x 40 Mesh)	< 5 micron	~2.7x



Typical Backwash Flow Requirements

Water Temperature	Backwash Flow Rate*	
	gpm/sq.ft.	m/h
40°F (4.5°C)	12.5	30.6
50°F (10°C)	14.8	36.2
60°F (16°C)	17.2	42.0
70°F (21°C)	19.8	48.4
80°F (27°C)	22.3	54.5

* 40% bed expansion for 50% freeboard.

Zeolite-61 Filter Loading and Startup

1. Load and level the underbedding.
2. Backwash for 20 to 30 minutes to clean and level the underbedding.
3. Load the Zeolite-61.
4. Check that the correct backwash flow rate has been determined based on the water temperature. (See Typical Backwash Flow Requirements Table.)
5. Allow the tank to slowly fill with water from the bottom. This is most easily accomplished by setting the control valve to the backwash position and partially opening the inlet valve until water flows from the drain line.
6. Allow the Zeolite-61 to soak for at least 30 minutes.
7. Fully open the inlet valve and set the control valve to the backwash position.
8. Allow the filter to backwash for 20 to 30 minutes. Continue the backwash until the water is clear and free of particles.
9. Allow the filter to settle for 10 to 15 minutes. Do not allow the control valve to enter the fast rinse cycle.
10. Allow the filter to backwash again for 15 to 20 minutes.
11. Allow the filter to fast rinse (downflow) for 5 to 8 minutes.
12. The filter is now ready for service.

Optional Air Scour

Use 2 to 3 scfm/sq.ft. air @ 90 psi with 3 to 5 gpm/sq.ft. water backwash (@77°F).

NOTE: Above times are application dependent.

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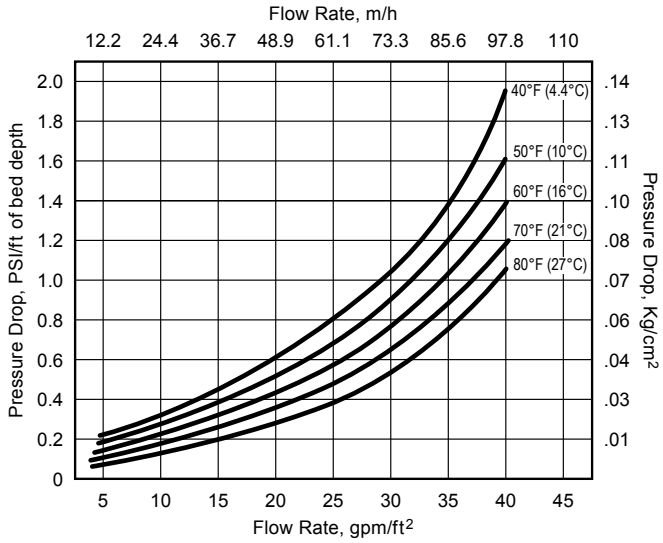
Pressure Drop vs Flow Rate



The examples below illustrate the advantages of Zeolite-61 by comparing two systems designed for the same service flow; one system based on Zeolite-61, and one multimedia system (gravel, garnet, fine garnet, anthracite). Each system is based on best design practices for the respective media.

EXAMPLE 1: 15 gpm Service Flow

	Zeolite-61	Multimedia
Surface Loading	15 gpm/sq.ft.	5 gpm/sq.ft.
Surface Area Required	1.0 sq.ft.	3.0 sq.ft.
Tank Dimensions	14 x 65 inch	24 x 72 inch
Media Volume Required (with underbedding)	3.7 cu.ft.	10.8 cu.ft.
Media Weight (with underbedding)	216 lb	1,057 lb
Backwash Flow Required @ 60°F	17 gpm	51 gpm
Daily Backwash Volume	179 gallons	510 gallons
Filtration	< 5 micron	<10 micron
Ion Exchange Capacity	1.5–1.8 meq/g	None
Comparative Cost	1x	3x

EXAMPLE 2: 45 gpm Service Flow

	Zeolite-61	Multimedia
Surface Loading	15 gpm/sq.ft.	5 gpm/sq.ft.
Surface Area Required	3.0 sq.ft.	9.0 sq.ft.
Tank Dimensions	24 x 72 inch	42 x 72 inch
Media Volume Required (with underbedding)	11 cu.ft.	35.3 cu.ft.
Media Weight (with underbedding)	672 lb	3,469 lb
Backwash Flow Required @ 60°F	53 gpm	153 gpm
Daily Backwash Volume	556 gallons	1,530 gallons
Filtration	< 5 micron	<10 micron
Ion Exchange Capacity	1.5–1.8 meq/g	None
Comparative Cost	1x	3.3x

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