

# MATRIKX®

## EXTRUDED CARBON FILTERS

# CTO

**MATRIKX® CTO** filters are composed of a high-performance extruded activated carbon that simultaneously removes free chlorine and organic chemicals that contribute to taste and odor, while providing the particle removal and dirt holding capacity of a absolute 10 µm sediment filter. These filters are optimized for application where they replace both the sediment and activated carbon filters.

**MATRIKX® CTO** carbon filters flow in the radial (outside-to-inside) direction, providing increased flow at lower pressure drop than conventional granular activated carbon (GAC) filters.

**MATRIKX® CTO** filters will not channel or bypass, due to the extreme uniformity of their extruded carbon core and can be installed without prefiltration because of their high dirt holding capacity.

**Function:** provide extended life while removing sediment, chlorine, taste, odor, and organic contaminants from water, aqueous solutions or suspensions, and many organic solvents (call KX Industries for advice regarding non-aqueous applications).

**Applications:** residential and industrial water purification systems, industrial effluent water treatment, food service, pre- and post-RO systems. Industrial makeup, product rinse, and process water.

#### **Features:**

- Fine-mesh and granular carbon in high-integrity bonded structure
- 10 µm Absolute Filtration.
- Integral Extruded Construction.
- Custom Designs Available.

#### **Benefits:**

- Functions as Efficient Sediment Filter.
- High Adsorptive Capacity.
- High Adsorptive Efficiency.
- No channeling/No Fluidizing/No Bypassing.
- Maximum Service Life.
- No Release of Carbon Fines.
- Residential & Industrial Applications.



# Chlorine Reduction

**Test Results:** Standard 2.50" O.D. x 1.25" I.D. x 9.75" L. **MATRIX® CTO** extruded carbon filters removed all detectable free chlorine (<0.05 ppm) from an influent containing 2 ppm free chlorine and flowing continuously at 1 gpm, for more than 1,250 gallons, removed greater than 90% of influent chlorine for more than 3,750 gallons, and greater than 80% of influent chlorine at 6,000 gallons.

**Test Conditions:** Two randomly selected production cartridges were evaluated for chlorine reduction.

Flow: 1 gpm, constant.

System Pressure: 60 psi, constant.

Prefiltration: None

Influent water: 250 gallon batches.

Chlorine challenge: sodium hypochlorite @ 2 ppm FAC (free available chlorine).

Analysis: Standard methods for the examination of water and wastewater method number 4500-Cl G

Total challenge: 6,000 gallons.

Influent water analysis:

Turbidity: <2.2 NTU.

pH: 7.9 ± .5

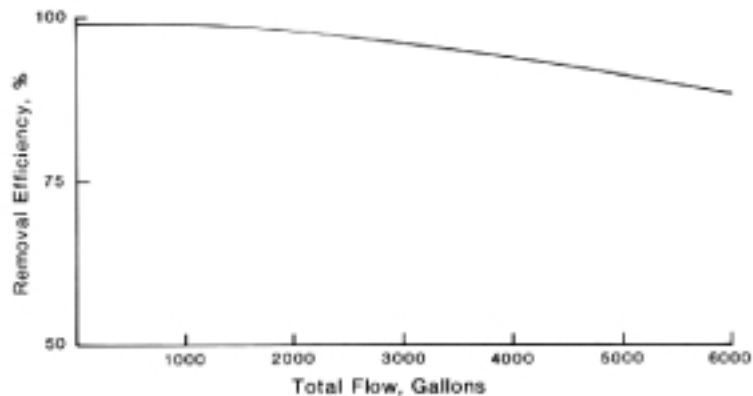
TDS: 200 mg/L

Hardness: 171 mg/L.

Alkalinity: 26.8 mg/L.

Temperature: 24° ± 2° C.

Phosphate: <1mg/L.



Source of test data: Spectrum Laboratories, New Brighton, Minnesota.

# Flow Resistance

**Test Results:** Standard 2.50" O.D. x 1.25" I.D. x 9.75" L. **MATRIX® CTO** extruded carbon filters were tested with municipal tap water from Bridgeport, CT, at 60 psig system pressure, to determine differential-pressure vs. flow curves. **MATRIX® CTO** filters have a measured  $\Delta P=1.10$  psid at 1.0 gallon per minute.

**Test Conditions:** Three randomly selected production cartridges were subjected to varying flows to determine the initial-differential-pressure vs. flow curve.

Influent water: Bridgeport, CT municipal water.

pH of Influent water: 6.3-6.5.

Temperature: 16°C.

Range of tested flows: 1-11 gpm.

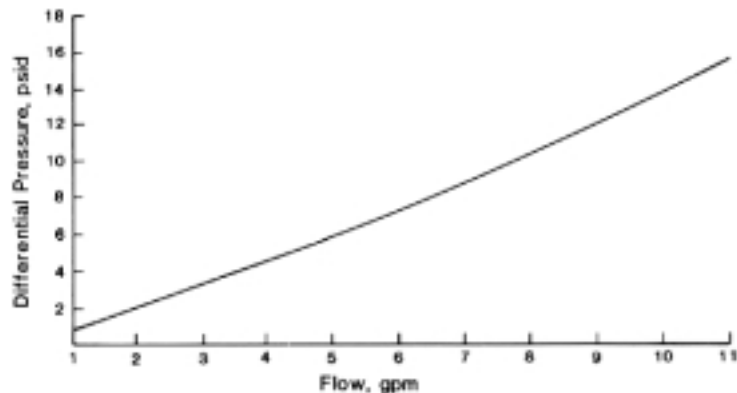
Duration of test: approx. 4 minutes

Instrumentation: Omega Engineering FL710 Series,

1 to 11 gpm range, with 0.2 gpm accuracy.

Orange Research, Inc. differential pressure

gauges, 0 to 40 psid.



Source of test data: KX Industries, LP, Bridgeport, CT.

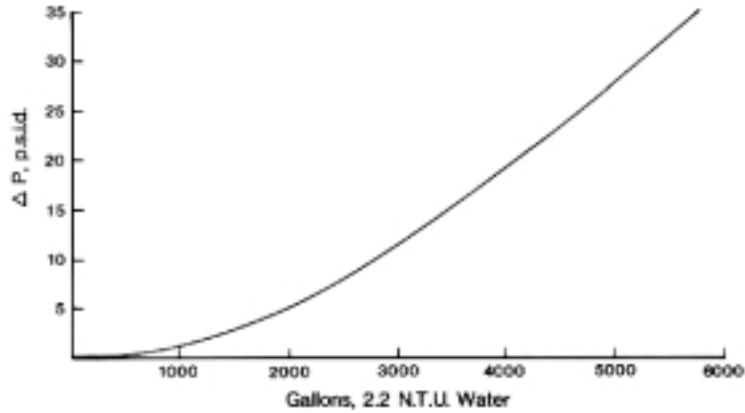
# Dirt Capacity

**Test Results:** Standard 2.50" O.D. x 1.25" I.D. x 9.75" L. **MATRIKX® CTO** extruded carbon filter cartridges were tested with Minneapolis, Minnesota tap water at 2.2 NTU turbidity and 60 psig system pressure to determine differential pressure vs. cumulative flow curves. The standard **MATRIKX® CTO** filters demonstrated a back pressure of 20 psid following 3,500 gallon cumulative flow of high turbidity influent water.

**Test Conditions:** Two randomly selected production cartridges were evaluated for dirt life under the following conditions.

- Flow rate: 1 gpm, constant.
- System Pressure: 60 psi, constant
- Prefiltration: None
- Influent water: 250 gallon batches.
- Total challenge: 6,000 gallons.
- Influent water analysis:
 

Turbidity: <2.2 NTU.	Alkalinity: 26.8 mg/L.
pH: 7.9 ± 0.5	Temperature: 24° ± 2°C.
TDS: 190 mg/L	Phosphate: <1 mg/L.
Hardness: 171 mg/L	



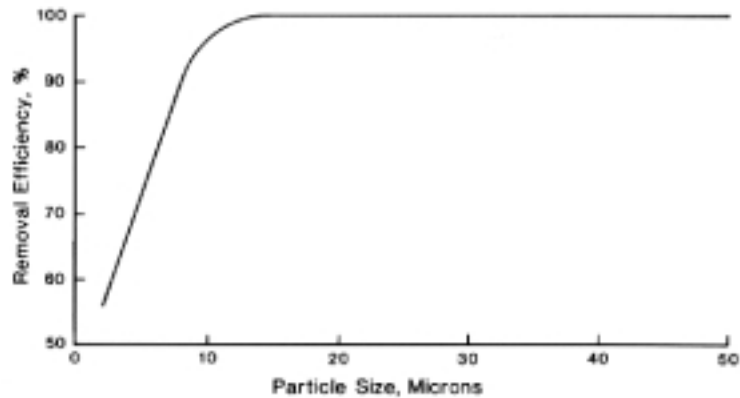
Source of test data: Spectrum Laboratories, New Brighton, Minnesota.

# Particulate Removal

**Test Results:** Five standard 2.50" O.D. x 1.25" I.D. x 9.75" L. **MATRIKX® CTO** filters were tested for particulate removal with two different particle counting instruments, and demonstrated greater than 98% removal of 10 μm diameter particles.

**Test Conditions #1:** Performed by KX Industries, LP.

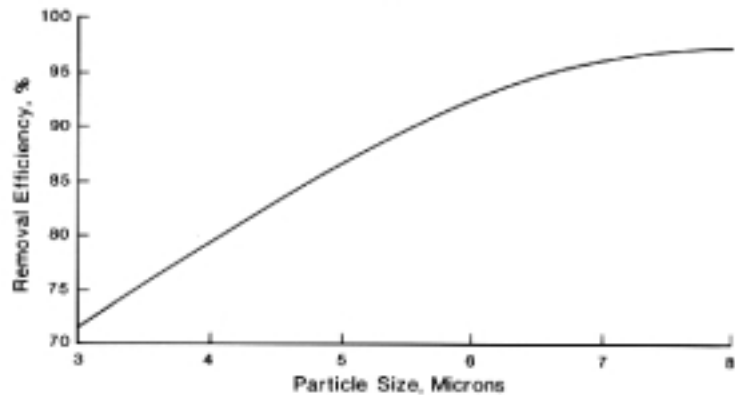
- Instrumentation: Met-One particle counting system, model 233-S157;
- Instrument capability: 2 μm to 200 μm.
- Influent water temperature: 24°C.
- Challenge: 1,500 particles/ml influent, size range: 2 μm to 50 μm.
- Flow: 1 gpm, constant.
- Sensor flow rate: 50 ml/min.
- Sample pretreatment: performed at 30 minutes after start of flow through filter element.



Source of test data: KX Industries, LP, Bridgeport, CT.

**Test Conditions #2:** Performed by third party testing lab.

- Test method: single pass retention efficiency per IBR TM E-100.
- Instrumentation: Hiac 4200 with Hach 2100A sensor elements.
- Fluid: deionized water.
- Contaminant: AC fine test dust, LN 1538.
- Temperature: ambient
- Flow rate: 1 gpm.
- Description of samples: filter elements, preflushed for 15 minutes.



Source of test data: Inter Basic Resources, Inc. Ann Arbor, Michigan.

# TABLE 1\* SUMMARY TECHNICAL DATA

Part Number	O.D. x Length	Carbon Weight <sup>1</sup>	Chlorine capacity @ Flow <sup>2</sup>	Absolute µm rating <sup>3</sup>	Initial ΔP @ Flow
32-250-125-975	2.50" x 9.75"	0.75 lb.	> 3,750 gal. @ 1.0 GPM	10 µm	0.75 psid @ 1.0 GPM
32-250-125-20	2.50" x 20.0"	1.75 lb.	> 9,000 gal. @ 2.0 GPM	10 µm	0.75 psid @ 2.0 GPM
32-425-125-975	4.25" x 9.75"	2.60 lb.	> 12,000 gal. @ 3.0 GPM	10 µm	4.0 psid @ 3.5 GPM
32-425-125-20	4.25" x 20.0"	5.60 lb.	> 26,000 gal. @ 7.0 GPM	10 µm	4.5 psid @ 7.0 GPM

## Notes: TABLE 1

<sup>1</sup>Performance of a given **MATRIKX**® extruded carbon filter varies in direct proportion to the total weight of carbon in each filter. For example, a 4.25" O.D. x 20"L. **MATRIKX**® filter contains approximately seven times as much activated carbon as a 2.50" O.D. x 9.75" L. **MATRIKX**® filter, and will therefore have seven times the rated chlorine and chloroform capacities, when operating at seven times the rated flow of the smaller cartridge. Hence, rated flow is based on maintaining identical contact/residence times for all filters.

<sup>2</sup>Chlorine capacity is the total estimated capacity in gallons during which the filter will remove greater than 95% of the influent chlorine (2ppm) when operating continuously at the given flow.

<sup>3</sup>Particulate filtration rating is for >99.9% removal of a given size as determined from particle counting results.

## Ordering Information

### MATRIKX® CTO Extruded Carbon Filters

Part Number	Outer Diameter	Length
32-250-125-975	2.50"	9.75"
32-250-125-20	2.50"	20.00"
32-425-125-975	4.25"	9.75"
32-425-125-20	4.25"	20.00"
Special Order	1" to 6"	1" to 60"

Standard filters are finished with an outer prefiltration medium. A protective polypropylene netting is applied to the exterior of the cartridge. Polypropylene end caps with compression gaskets fit most standard housings.

Inquire concerning alternative filter finishing options, including alternative end cap and housing interface styles, a wide range of non-standard extruded filter sizes, and non-standard prefiltration systems.

### LIMITED LIABILITY

SELLER MAKES NO WARRANTIES OF ANY KIND, EXPRESSED OR IMPLIED, CONCERNING THIS PRODUCT, INCLUDING WARRANTIES OF THE MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, EXCEPT THAT THIS PRODUCT SHOULD BE CAPABLE OF PERFORMING AS DESCRIBED IN THE APPROPRIATE PRODUCT DATA SHEET. SELLER'S OBLIGATION SHALL BE LIMITED SOLELY TO REFUND OF PURCHASE PRICE OR REPLACEMENT OF PRODUCT PROVED DEFECTIVE, AT SELLER'S SOLE DISCRETION. DETERMINATION OF SUITABILITY OF PRODUCT FOR USES AND APPLICATIONS CONTEMPLATED BY BUYER SHALL BE THE SOLE RESPONSIBILITY OF BUYER. USE OF THIS PRODUCT CONSTITUTES BUYER'S ACCEPTANCE OF THIS LIMITED LIABILITY.

## Warnings:

- Maximum Operating Temperature: 125° F.
- Maximum Operating Pressure: 250 psig.
- Maximum Differential Pressure: 100 psid.
- Collapse Pressure: 200 psid.
- **MATRIKX**® filters are not to be autoclaved or steam sterilized.
- Activated carbon filter units covered by this standard are not intended to be used where the water is microbiologically unsafe or with water of unknown quality without adequate disinfection before or after the unit.
- Use **MATRIKX**® carbon filters only with microbiologically safe water. Activated carbon filters are not designed to kill or remove bacteria or viruses.
- Actual results obtained will vary with various combinations and amounts of organic contaminants, changes in pH or other conditions encountered in actual use.
- All information presented here is based on data believed to be reliable. It is offered for evaluation and verification, but is not to be considered a warranty of any kind.
- **MATRIKX**® filters are designed to fit most standard household and commercial or industrial housings. Call KX Industries to check filter housing compatibility.

This product is made in accordance with or covered under one or more of the following United States patents: 5,019,311; 5,147,722; 5,189,092; 5,249,948; 5,331,037; 5,922,803; 5,946,342; 6,061,384 and corresponding patents in other countries.

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