



High-Performance **Water Filtration** Solutions



As part of our proactive new product development focus, Prince has developed a wide range of products for the water treatment markets. We offer a comprehensive range of filtration media for the effective treatment of potable water and wastewater, serving customers worldwide in the private, industrial and municipal sectors.

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OUR PORTFOLIO

PYROLOX RANGE

PYROLOX ORE

PYROLOX PRO

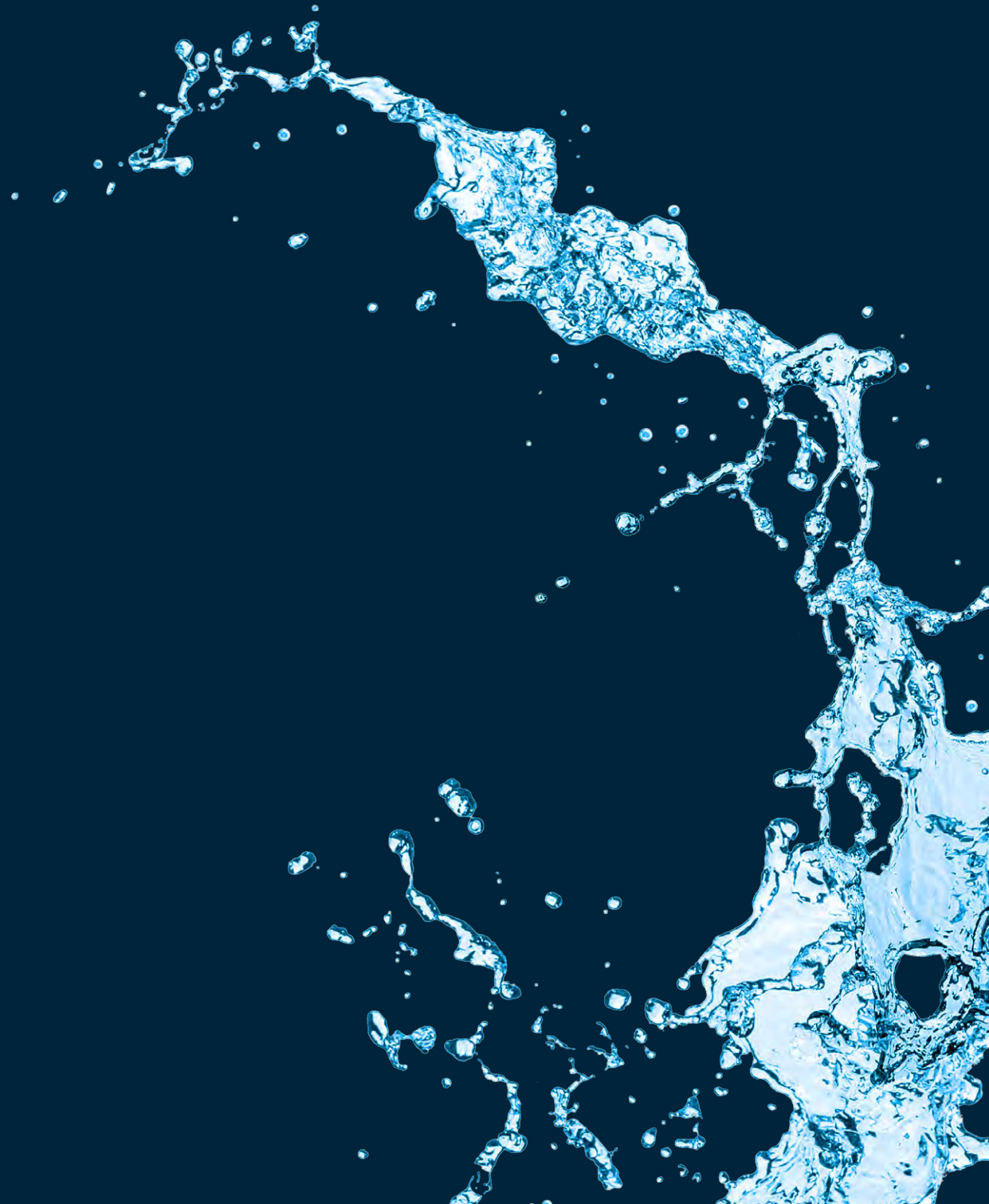
PYROLOX ADVANTAGE

PYROLOX ULTRA

PHLOCRITE

METACIL

PRINCE MINERALS





OUR **PORTFOLIO INCLUDES**

-  *The widest range of manganese dioxide filtration products*
-  *Manganese dioxide media for iron, manganese and arsenic removal*
-  *Media for pH correction and remineralisation*
-  *Ceramic media for turbidity and physical filtration*
-  *Activated carbon, iron oxide and other mineral-based media for heavy metal removal*
-  *Magnetite for wastewater coagulation*

From small scale to bulk manufacture, our Quality Management System guides our operating procedures. With ISO 9001 certification at Prince manufacturing locations, our commitment to quality is foremost. Our stringent controls on product quality, batch traceability, and operations management allow us to deliver products to the highest of standards providing assurance, consistency and high-quality solutions that deliver every time.



the **Pyrolox[®]** Range

Our Pyrolox[®] range of products is the “one-stop solution” for all your manganese dioxide filtration media requirements. The Pyrolox[®] name is well established as a trusted, high-performance filtration solution, supported by specialist research and development personnel worldwide. Additionally, Prince partners with Cranfield University (UK) to bring evidence based performance data for its range of

Pyrolox[®] products. For more detailed information on the effectiveness of our products, please contact your local Prince representative who will be happy to share the results of our work with Cranfield.



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Fe, Mn & As Removal



Pyrolox[®] Advantage

MATERIAL



Manganese Dioxide Coated Silica Sand

APPLICATION



Fe, Mn & As Removal



Pyrolox[®] Ultra

MATERIAL



High Purity Synthetic Manganese Dioxide

APPLICATION

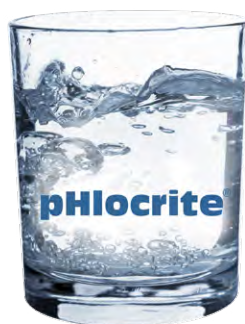


Fe, Mn & As Removal

Other Solutions



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pHlocrite®

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APPLICATION



*pH Correction and
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MetaCIL

MATERIAL



*Blend of Clay Based
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APPLICATION



*Heavy Metal Removal
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Magnetite

MATERIAL

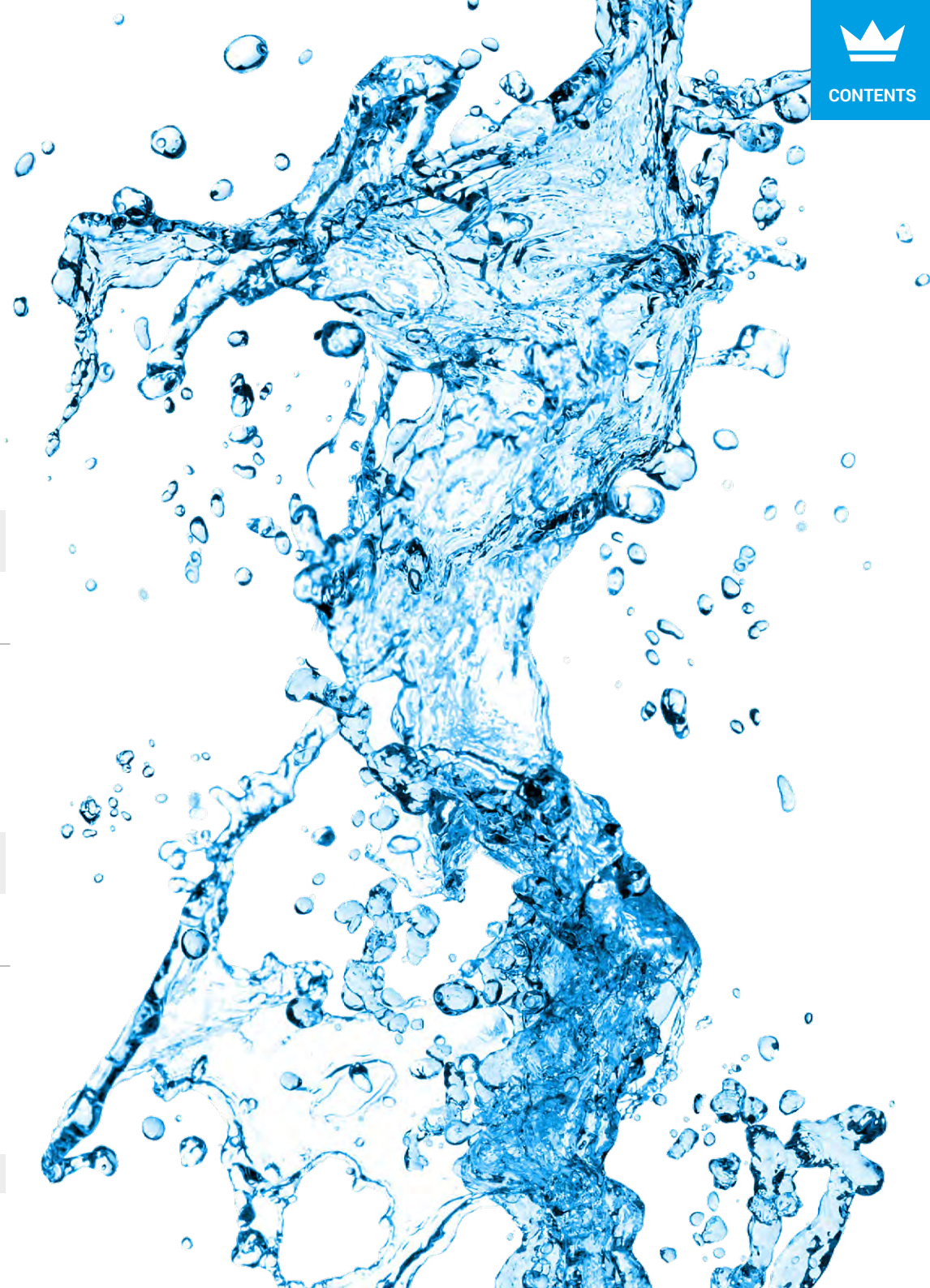


Black Iron Oxide

APPLICATION



Wastewater Coagulant





Product Overview

Product features for Pyrolox® range of manganese dioxide filter media and other solutions are highlighted in the below table

	Pyrolox® Ore	Pyrolox® Pro	Pyrolox® Advantage	Pyrolox® Ultra
Grade (ASTM)	8x20, 20x40	20x40	20x40	20x60
Grade (ISO)	18x44	18x44	18x36	18x16
Manganese Derived				
Low Start-up Fines				
Synthetic MnO ₂ (High Purity)				
Reduced Density: Engineered Product				

	pHlocrite®	MetaCIL	Magnetite
Application	pH correction and remineralisation media	Heavy metal removal media	Wastewater coagulation
Benefits	• pH point increase (1-2 points) • pH stability • Reduced risk of hard settlement	• Adsorption media • Bespoke blended to individual contaminants and water composition • Unique product	• Various grades • Natural mineral • Environmentally friendly alternative to chemical coagulation



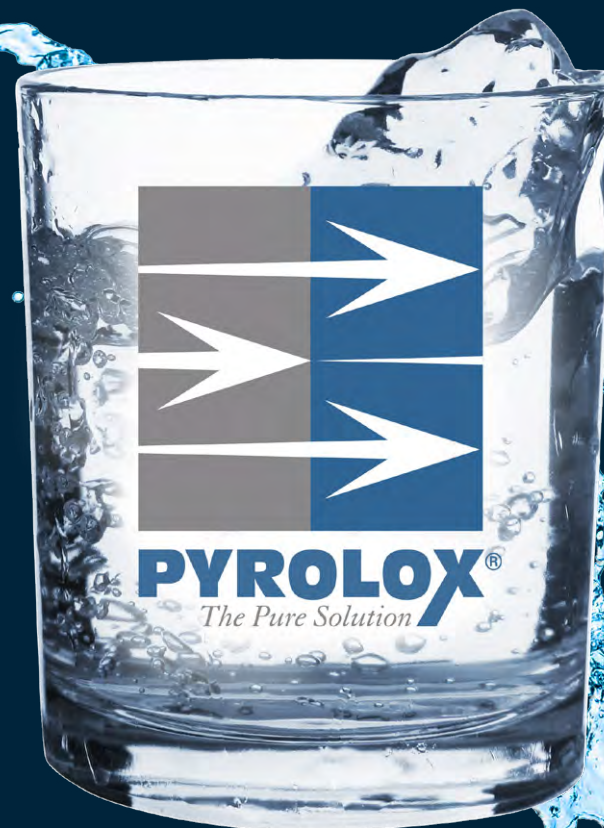
Pyrolox[®] Ore

Naturally versatile

Pyrolox[®] is a granular water filtration media used for the removal of iron, manganese, arsenic and hydrogen sulphide. A naturally mined ore, Pyrolox[®] has been used in water treatment for over 75 years.

Through a natural chemical reaction, Pyrolox[®] filter media works by oxidising iron, manganese, and hydrogen sulphide in problem water. The trapped particulate is then removed from the media bed during the backwash cycle. An oxidant feed is recommended to maintain and further augment the performance and removal capacity of the media. Chlorine injection, such as sodium hypochlorite, or calcium hypochlorite, immediately upstream of the filter feed is a simple way to meet this recommendation. Other acceptable oxidants include air injection, potassium permanganate and sodium permanganate.

Pyrolox[®] is ideally suited for private, industrial and municipal water treatment systems. It is important that Pyrolox[®] media is backwashed properly to ensure adequate bed expansion and continued service life.



ADVANTAGES

Durable media with long service life
833mg Fe removal / kg
225mg Mn removal / kg
Certified for water application



PHYSICAL PROPERTIES

	US	Rest of World
Bulk Density	120 lbs/ft ³	1900 kg/m ³
Available grades Mesh size	8 x 20 & 20 x 40	18 x 44
Particle size mm	2.36 x 0.85mm & 0.85 x 0.425mm	0.85 x 0.355mm
Accreditation	NSF 61	BS EN 13752:2012
Packaging	60lb bags, 2000lb bags & 2625lb bags	25kg bags & 1000kg bags



CONDITIONS FOR OPERATIONS

pH Range
6.5 - 9.0

Typical Oxidant
Chlorine Feed

Service Flow Rate
15-30 m/hr

Backwash Rate
49-62 m/hr



Pyrolox[®] Pro

Drive greater efficiency

Introducing Pyrolox[®] Pro, our professional, ready-to-use manganese dioxide filter media. Pyrolox[®] Pro is specially cleaned to reduce the volume of fines and turbidity found in unprocessed manganese dioxide whilst maintaining the same superior quality and removal capabilities as standard Pyrolox[®].

Pyrolox[®] Pro is used as a catalyst to oxidise, precipitate and remove iron, manganese, arsenic and hydrogen sulphide pollutants from contaminated water. The trapped particulate is then removed from the media bed during the backwash cycle. An oxidant feed is recommended to maintain and further augment the performance and removal capacity of the media.

The key benefits of Pyrolox[®] Pro are reduced operational time and lower costs at the filter commissioning stage. Pyrolox[®] Pro is ready to use and ready-to-install in potable and waste water filtration systems, whether for private, industrial or municipal applications.



ADVANTAGES

Durable media with long service life
Reduced fines and turbidity
Reduced operational costs
Certified for water application



PHYSICAL PROPERTIES

	US	Rest of World
Bulk Density	120 lbs/ft ³	1900 kg/m ³
Available grades Mesh size	8 x 20 & 20 x 40	18 x 44
Particle size mm	2.36 x 0.85mm & 0.85 x 0.425mm	0.85 x 0.355mm
Accreditation	NSF 61	BS EN 13752:2012
Packaging	60lb bags, 2000lb bags & 2625lb bags	25kg bags & 1000kg bags



CONDITIONS FOR OPERATIONS

pH range
6.5 - 9.0

Typical Oxidant
Chlorine feed

Service Flow Rate
15-30 m/hr

Backwash Rate
49-62 m/hr



Pyrolox[®] Advantage

Next generation filtration

Developed in response to changing market needs, Pyrolox[®] Advantage represents the next generation in manganese dioxide filter media. Engineered to provide effective removal of iron, manganese, hydrogen sulphide and arsenic, Pyrolox[®] Advantage delivers outstanding performance in the form of a lightweight, coated filter media.

Pyrolox[®] Advantage's coating technology offers catalytic removal of iron, manganese and other contaminants by pre-treatment, whilst providing lower backwash requirements and superior oxidation capacity, with virtually no media fines to remove at start-up. The robust manganese dioxide coating acts as a catalyst to oxidise, precipitate, and remove contaminants. The trapped particulate is then removed from the media bed during the backwash cycle. An oxidant feed is recommended to maintain and further augment the performance and removal capacity of the media.

The key benefits of Pyrolox[®] Advantage are its lightweight density, reduced backwash rates, the eradication of fines and no requirement for potassium permanganate. Pyrolox[®] Advantage can be used in private, industrial and municipal water treatment systems.



ADVANTAGES

- Lower backwash rates
- Virtually no fines
- Specialist manganese dioxide coating
- Certified for water application



PHYSICAL PROPERTIES

	US	Rest of World
Bulk Density	84 lbs/ft ³	1400 kg/m ³
Available grades Mesh size	20 x 40	18 x 36
Particle size mm	0.85 x 0.425mm	0.85 x 0.425mm
Accreditation	NSF 61	N/A
Packaging	42 lbs bags	19kg bags



CONDITIONS FOR OPERATIONS

pH Range:
6.5 - 9.0

Typical Oxidant:
Chlorine Feed

Service Flow Rate:
5-25 m/hr

Backwash Rate:
30-45 m/hr



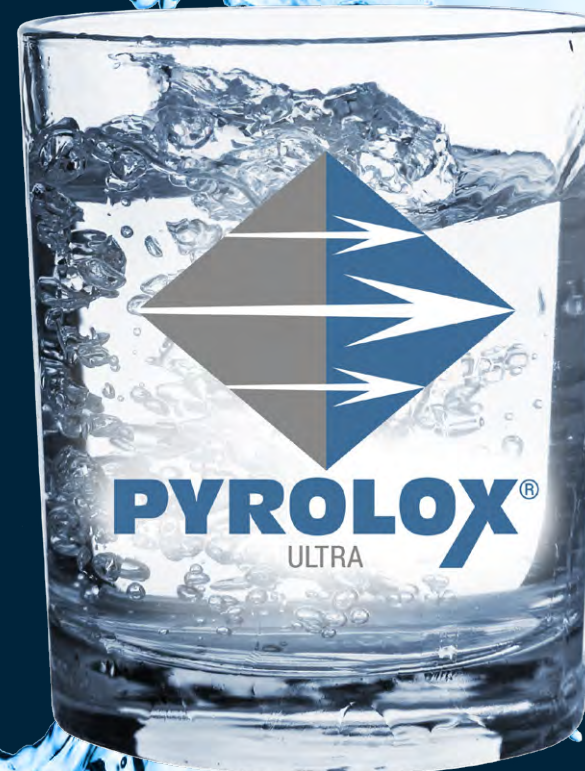
Pyrolox[®] Ultra

Superior oxidation capacity

Pyrolox[®] Ultra is our high-performance synthetic manganese dioxide, specially developed to deliver superior oxidation capacity. High-purity synthetic manganese delivers higher levels of removal performance in comparison to standard manganese ore.

Pyrolox[®] Ultra efficiently oxidises iron and manganese in problem water through precipitation. The trapped particulate is then removed from the media bed during the backwash cycle. An oxidant feed is recommended to maintain and further augment the performance and removal capacity of the media.

Pre-washed and ultra clean, Pyrolox[®] Ultra needs minimal pre-washing at filter commissioning. High oxidising characteristics make Pyrolox[®] Ultra more effective than natural manganese ore for the treatment of water with higher levels of iron and manganese contamination.



ADVANTAGES

- Durable media with long service life
- High purity synthetic manganese
- High oxidation capacity
- Certified for water application



PHYSICAL PROPERTIES

	US	Rest of World
Bulk Density	127 lbs/ft ³	2000 kg/m ³
Available grades Mesh size	20 x 60	18 x 60
Particle size mm	0.85 x 0.25mm	0.85 x 0.25mm
Accreditation	N/A	BS EN 13752:2012
Packaging	60lb bags	27kg bags



CONDITIONS FOR OPERATIONS

pH Range
6.5 - 9.0

Typical Oxidant
Chlorine Feed

Flow Rate
Contact your local representative

Backwash Rate
Contact your local representative



pHlocrite®

pH correction and remineralisation

pHlocrite® is a synthetic high-magnesia, semi-calcined dolomitic limestone filter medium for pH correction and remineralisation. It acts both chemically and physically, raising pH and hardness whilst diminishing acidity until point of saturation is established. The irregular shape of its porous grains provides maximum surface area per unit volume which improves the removal of turbid matter.

pHlocrite® can be used in virtually any gravity or pressure filter tank and does not require additional equipment to that which is already standard on most conventional water filters. Preferably, the filters should be equipped with an air scour as part of the backwash system. Upflow or downflow systems may be used.

As the performance of pHlocrite® is dependent only on the contact time with aggressive water, its rapid reaction rate means that filtration velocities can be selected within a wide range (- 5 - 30 m/h). Water containing 10 mg/l (10 grams per m³) of CO₂ will consume 6g of pHlocrite® for every m³ of water passed through the pHlocrite® bed and pro rata for any other level of CO₂.

Determination of specific amounts of pHlocrite® :

- 1 part of pHlocrite® Grade B neutralises approximately 1.2 parts of free CO₂
- 1m³ pHlocrite® weighs approximately 1150 kilograms
- pHlocrite® will need topping up when a maximum of 75% of the bed has been consumed



ADVANTAGES

pH increase 1 - 2 points

Re-mineralisation (after reverse osmosis)

Increased stability compared with standard CaCO₃



PHYSICAL PROPERTIES

	US	Rest of World
Bulk Density	81 lb/ft ³	1300 kg/m ³
Available grades Mesh size	18 x 5 & 10 x 5	16 x 4 & 8 x 4
Particle size mm	Grade B 1 x 4mm & Grade E 2 x 4mm	Grade B 1 x 4mm & Grade E 2 x 4mm
Packaging	55lb bags	25kg bags



CONDITIONS FOR OPERATIONS

Flow Rate

10 - 30 m/hr

Ground Water

200 kg/m³ per hour

Distillates

90 kg/m³ per hour

Backwashing

Conventional sand backwashing



MetaCIL

Mineral-based contaminant removal

MetaCIL is a specially designed mineral-based adsorbent for the effective removal of arsenic, fluoride, selenium, cobalt, cadmium, nickel, lead, manganese, mercury, copper, zinc, chromium and iron from effluent and drinking water.

As a carefully processed mineral granule/powder, MetaCIL removes contaminants from the water upon contact. The granules can be used in agitation and column methods and can be regenerated with a simple washing procedure. MetaCIL is Prince's only filter media with a bespoke composition specific to heavy metal contaminant and inlet water.

MetaCIL is able to treat difficult effluent scenarios, such as, high TDS, pH conditions and inconsistent feed characteristics. The media is eco-friendly and easy to dispose. Applications include pharmaceuticals and cosmetics, automobiles, electroplating, petroleum and oil refineries, textiles, catalyst manufacturing, aluminium production and fluorochemicals.



ADVANTAGES

Wide range of heavy metal removal capabilities

Ability to use in conjunction with pre-existing filter systems

Bespoke to heavy metal contaminant and inlet water



PHYSICAL PROPERTIES

Dependent on grade

Please contact local representative for more information



CONDITIONS FOR OPERATIONS

Dependent on grade

Please contact local representative for more information





PRINCE

SOURCE TO SOLUTION

Headquartered in Houston, Texas with manufacturing facilities and sales offices on six continents, Prince is a world-class producer of engineered additives for niche applications, working as a trusted, value-adding processing intermediary between large global raw material suppliers and end market customers.

We specialise in developing, manufacturing and marketing performance-critical additives for niche applications in over 20 different sectors including construction, electronics, consumer products, agriculture, water treatment, automotive, oil & gas, heavy equipment, industrial and similar end markets.

Prince's heritage stretches back to 1858 when The Prince Manufacturing Company was founded by Robert Prince, quickly becoming a leading supplier of colorants and additives to the North American brick industry. Since then we've grown into a diversified global business, bringing value to customers across a diverse range of industries with a portfolio of high-performance solutions.

Our philosophy is to provide the best quality products for our customers by working across internal departments to source, evaluate, and test the best raw materials for use in our engineered solutions. We take pride in our long-standing relationships with key suppliers, and continually evaluate and improve our engineered products for optimized performance.

The Research and Development group is the creative design center of our company. Staffed with specialised technical personnel worldwide, the group supports all of Prince's new product and market developments and works closely with customers on everything from product selection to process efficiency. Utilizing state-of-the-art industry technology, we collaborate with both customers and our production facilities to develop custom-fit value added products.



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