

# GLASS FILTER MEDIA

An introduction to the benefits of virgin plate glass filter media versus traditional silica filter media.

By: PW Pretorius



# Glass Filter Media

## What is it?

- A High-Tech Filter Media
- Virgin plate-glass (no bottle glass)
- Developed by Ultra Water in their laboratory in Dunoon
- Advanced Manufacturing Technology (discussed later)
- Slightly negative charge attract particles (released on backwash)

## What is it?

- High-Tech Filter Media
- Recycled Plate Glass
- Developed by Ultra Water
- Advanced Manufacturing Technology
- Attracts Particles (Negative Charge)

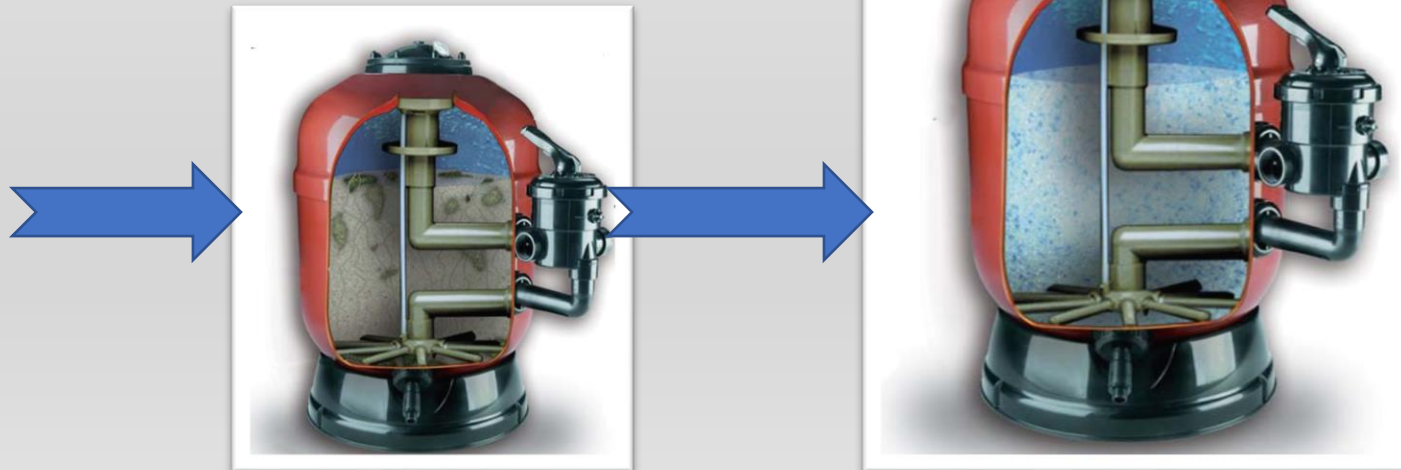
# Glass Filter Media

## What is it for?

### ➤ Substitute for Silica Filter Media

➤ To begin taking advantage of the benefits of Glass Filter Media :

- Remove old filter media
- Fill with Glass Filter Media
- Start normal operations



## What is it?

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## What is it for?

- Substitute and start to work

# Glass Filter Media

## What is it for?

- **Water Savings!**
  - Reduced Backwash time
  - Approximately 50% savings
  - Fewer Backwashes needed
- **Energy (and equipment) Savings**
  - Less friction loss
  - Increased filtered water volume
  - Less Equipment Maintenance
- **Chemical Cost Savings**
  - Flocculent products
  - Disinfection products
  - PH control products



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- **Water Savings**
- Energy Savings
- Chemical Cost Savings

# Glass Filter Media

## What is it for?

### ➤ Longer Life Span

- Silica lasts 3 – 5 years, glass media will last 15 years
- A single grain type is used, filters can be emptied for maintenance and the same media can be reused.

### ➤ Increased Quality and Hygiene

- Reduces presence of bacteria
- Does not build up a biofilm
- Reduced Chloramines & presence of disinfectants

### ➤ Eco-friendly

- Facility performs more efficiently, reducing environmental impact
- Glass Media is 100 % re-cyclable

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# Glass Filter Media

## Background

Our history with filter media is vast and the knowledge base within our group of companies has grown tremendously. We now offer a complete range of filter related services, including:

- Building and installation of pressure filters;
- Reconditioning filters (pressure and gravity);
- Specially graded filter media;
- Filter Parts

We are proud to say that we are experts in the field of filters and filter media.

# Glass Filter Media

## Our Product Quality

### Glass Crushing and Grading Plant:

Over the last 18 months we developed a glass crushing and screening plant that can produce speciality graded filter media for narrow envelopes. We can produce glass filter media that falls within the specification envelopes of the City of Cape Town.

Filter media that is specifically tailored to suit the requirements of individual facilities (raw water quality, treatment process and chemicals used) increases the effectivity and performance of the filters.

# Glass Filter Media

## Our Product Quality

We are the only South African manufacturer of Glass Filter Media that uses Virgin Glass as a raw material and has a final particle shape that is sub-angular with a high sphericity.

Virgin Glass Filter Media



Bottle Glass Filter Media





# Glass Filter Media

## Our Product Quality

### Virgin Glass Filter Media

- Glass merchants.
- Limited amount of Raw materials.
- Clear flat glass (windows).
- Tempered Glass.
- Only Virgin Glass (offcuts)
- Crystal Clear Cullet
- Specialized Grading per customer specification or requirement
- Specialized Glass Filter Media Manufacturing plant

#### Origin

#### Composition

#### Contamination

#### Appearance

#### Grading

#### Sector

### Bottle Glass Filter Media

- Landfill Sites
- Unlimited Amount of Waste Glass available.
- Bottles and mix glass from landfill sites.
- From used bottles and glass.
- Various Coloured Glass Cullet
- Fixed Grading for various applications
- Industrial Waste recycling plants

### Virgin Glass Filter Media



### Bottle Glass Filter Media



# Glass Filter Media

## Our Product Quality

### Virgin Glass Filter Media

- Melting point (>800°C)
- Doesn't cut your hands when you handle the product (specific sub-angular design).
- Extremely durable and rigid. It doesn't splinter off during the backwash and normal filter cycle.

### Chemical Properties

### Product handling

### Safety and consistency

### Bottle Glass Filter Media

- Melting point 600 °C
- Cuts your hand when you handle the product.
- Not as durable. Some of surface areas of the recycled glass are softer, causing splinters to break off. They end up in the drains when backwashed and in the swimming pools and treated water when filtered.

### Virgin Glass Filter Media



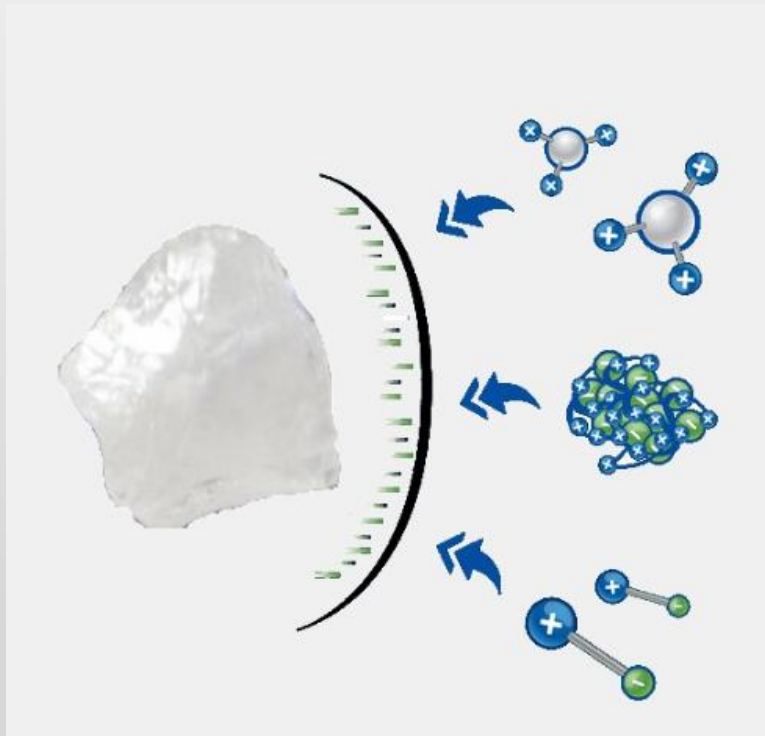
### Bottle Glass Filter Media



# Glass Filter Media

## Our Product Quality

### Negative Charged surface area



### Self-sterilizing surface

-When in contact with water flowing through the filter, a small amount of free radicals ( $O^-$  and  $HO^-$ ) are formed on the surface. These free radicals has a very strong oxidation potential which protects the media from bacterial growth.

### Molecular structure












-Plate glass contains metal oxides which improves the durability, shock resistance and temperature resistance of the product.

# Glass Filter Media

## Our Product Quality

Crushing and screening methods:

Particles shape is of extreme importance. Sub-angular particles with high sphericity is needed for the increased contact area. Other crushing methods result in splintered particles that pack tightly against each other and restricts water flow.

	Well Rounded	Rounded	Sub-Rounded	Sub-Angular	Angular	Very Angular
High Sphericity						
Low Sphericity						

## Virgin Glass Filter Media



## Silica Filter Media



# Glass Filter Media Comparative Testing Using Imhoff Cones

Virgin Glass Filter Media		Silica Filter Media
Size : 0,50 – 1,10mm Uniformity : 1,6	<b>Envelopes (used for test)</b>	Size : 0,45 – 0,55mm Uniformity : 1,36
01 min 03 sec		03 min 48 sec
1,4 NTU		1,4 NTU
0,02 NTU		1,0 NTU
42 Pt co		42 Pt co
0 Pt co		29 Pt co
		<b>Filtered Water Colour</b>

# Glass Filter Media

## Summary of Advantages / Benefits

### Single Media Filtration

- Prevents channelling as in dual media filtration
- Can be re-used

### Filtration Time

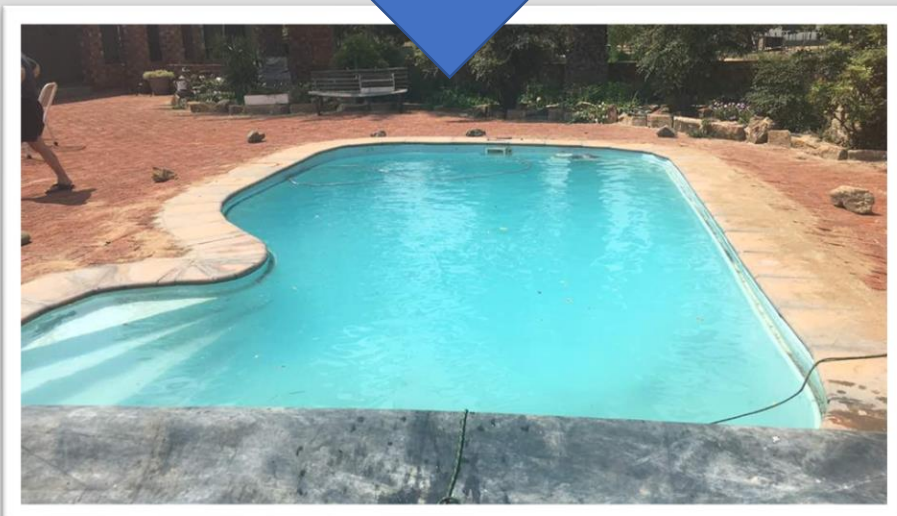
- Sub-angular particle shape packs less dense
- Less friction loss due to particle shape
- Minimum sizes as per envelope - no fines
- Will improve filter run time and reduce water losses due to backwashing.

### Has an oval to sub-angular grain shape

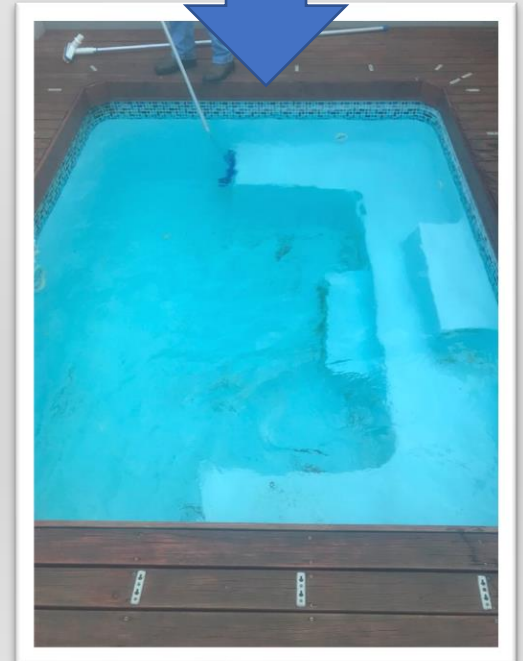
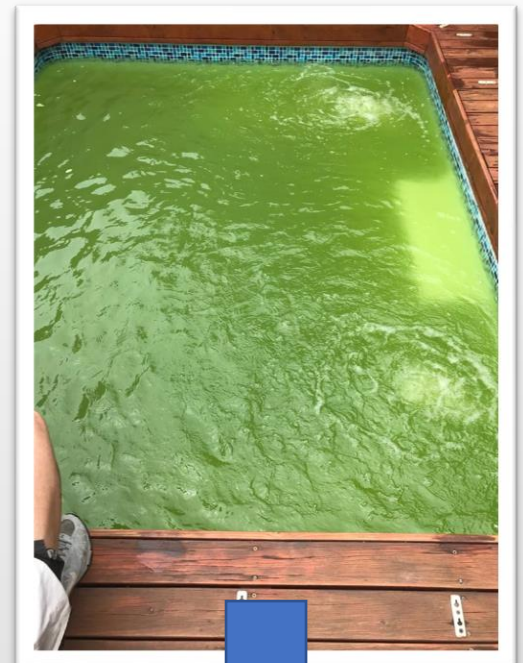
- Is safe to handle (does not cut hands)
- Optimum amount of surface area.

# Glass Filter Media

## Successful Applications



- Ceres Pressure Filters
- Langeberg Gravity Filters
- Virgin Active Pools
- Private Pools
- Hermanus Waste Water
- Robben Island
- Bonnievale
- Wine Farms
- Few Resorts
- Arabella
- Reddam House



# Glass Filter Media Successful Applications

## Ceres Pressure Filters





# Glass Filter Media Successful Applications

## Ashton Gravity Filters



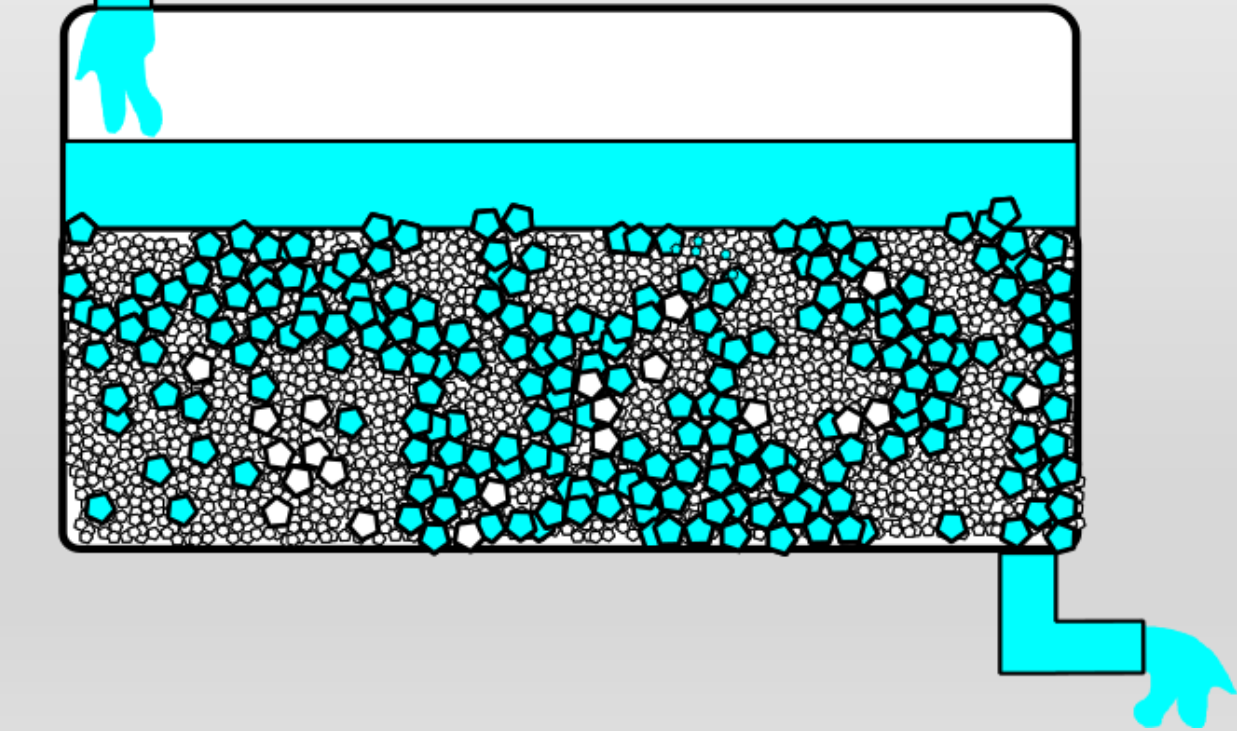
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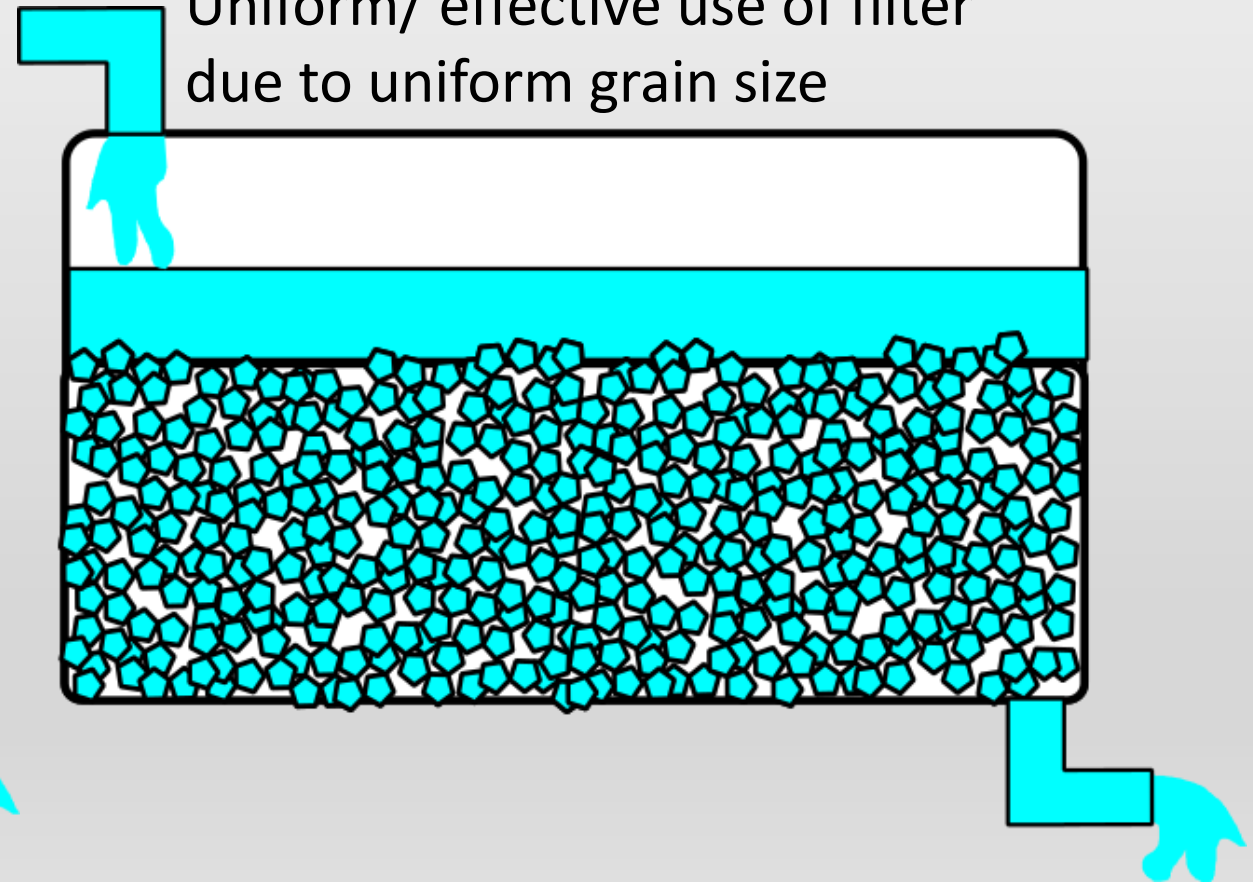
Concept	Advantage
Longer filter runs	Less interruptions
Less backwash time	Water Savings
Lower friction loss	Less equipment strain during backwash
Negatively Charged	Attracts particles (organic matter & metals)
Filter to +/-5 micron	Effective colour & turbidity removal
Lower bulk density	10% Less product used per filter compared to silica
No channelling forming	More effective operation (use of entire filter bed)
Particles does not clump together	No channelling forming
Packed less dense	More effective backwash
Longer lifespan	Cost savings over long term

# Glass Filter Media Filtration

Channelling forming due to inconsistent grain size

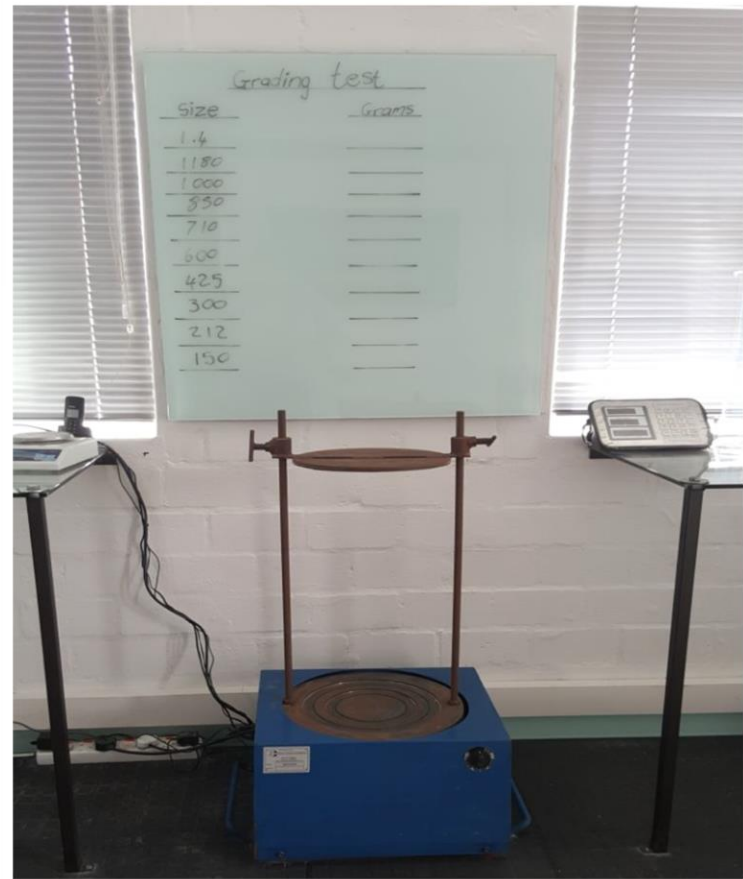


Uniform/ effective use of filter due to uniform grain size



# Glass Filter Media The Plant



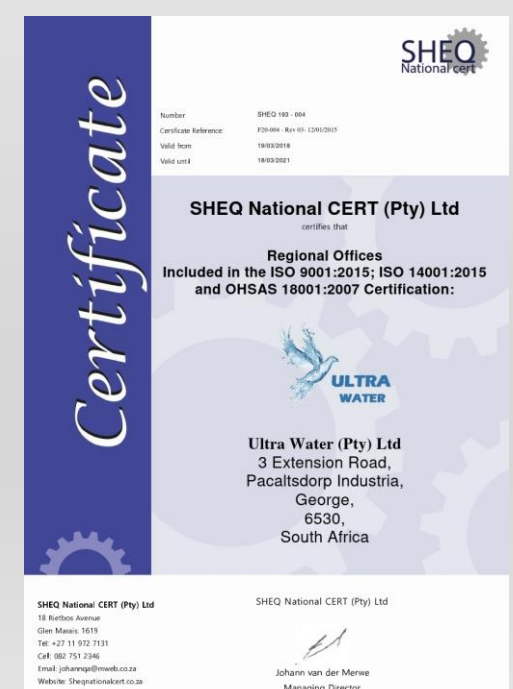
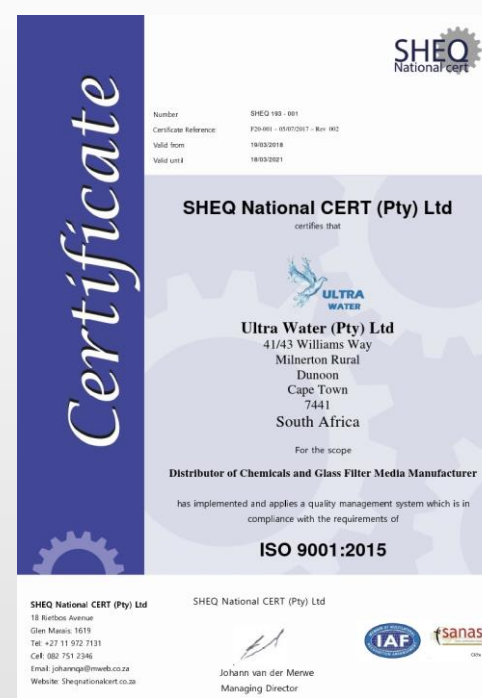


# Glass Filter Media Accreditation

The glass crushing plant is approved by the department of environmental affairs (EIA approved)

Ultra Water has the following ISO Certification in place:

- ISO 9001:2015 (Quality Management System)
- ISO 14001:2015 (Environmental Management System)
- OHSAS 18001:2007 (Occupational Health and Safety Management System)



# Glass Filter Media

## Product labels

**ULTRA CLEAR**

**GLASS FILTER MEDIA**

**Superior Filtration**

- ✓ 25% More clarity
- ✓ Lasts up to 10 x longer
- ✓ 50% Water saving on backwash
- ✓ Chemical cost saving
- ✓ Compatible with all filters
- ✓ Environmentally Friendly
- ✓ Negative charged surface area

**20kg**

INSTRUCTIONS:

1. Remove old filter media
2. Replace with Glass Filter Media
3. Rinse filter
4. Backwash until clear
5. Start filtration

Manufactured From Virgin Float Glass

ULTRA CLEAR  
Info@ultraclear.co.za  
www.ultraclear.co.za

**SHEQ**  
National Egg  
Certified 400 100 100



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**15kg**

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# Glass Filter Media

## Site Visits

We welcome site visits to provide additional information on our product and manufacturing process.

To arrange your site visit, please contact:

PW Pretorius (083 456 4818)

Jaco de Villiers (084 569 6656)

Anton Pretorius (071 609 1985)

We look forward to seeing you!