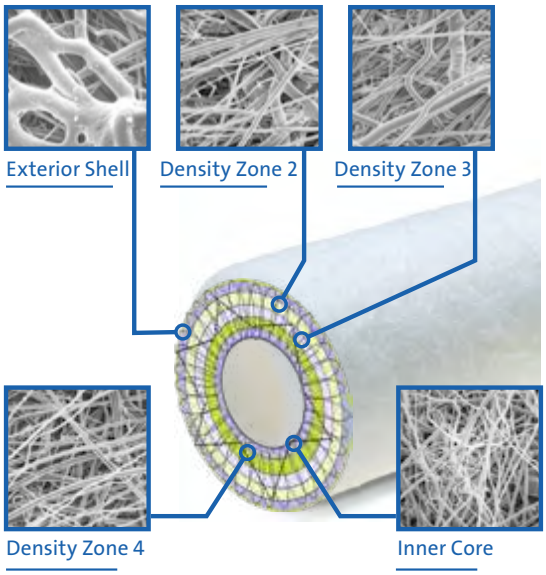
Water Technologies

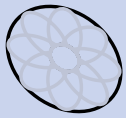
# Z.Plex* Technology Filters –

## State-of-the-Art Performance

**A Revolutionary Technology for Depth Filtration**




up to 100%



increased dirt holding and filter life

## Z.Plex Filter Technology

### –Graded Density (4 Zones) an Inside Look

### Z.Plex Technology Value:

- Higher performance
- Exceptional Dirt Holding capacity
- Longer life, due to greater efficiency
- Lower pressure drops
- Durable with Clean finish
- Environmentally Friendly, less waste.
- Fewer Change outs, reduced operator time.
- Designed for wide breath of Applications.

### Graded Density Maximizes Efficiency and Lifetime:

- The different zones of fibers are formed, each zone has a high capture rate for different micron particles.
- Aqueous flow moves from the outside in, capturing larger particles on the outer zones and progressively smaller particles on inside zones.
- This graded density of particle capture maximizes the dirt holding and efficiency.

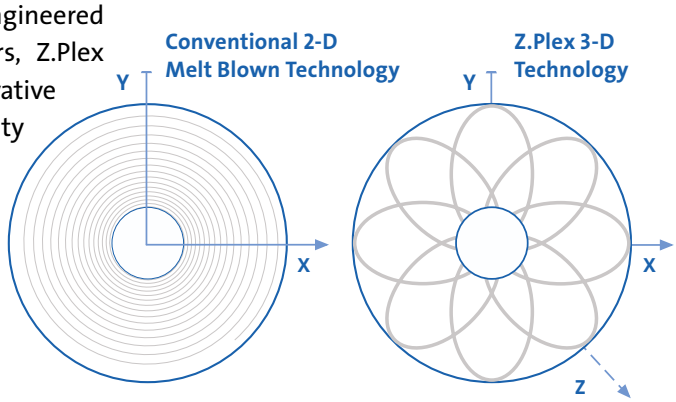
VEOLIA

# The Dawn of Graded Density Filtration

In 1983, Veolia dramatically changed the depth filtration industry when it pioneered a technique to produce true graded density filters. Competitors throughout the industry soon attempted to replicate this innovation in melt blown polypropylene technology. These graded density filters have long served as the gold standard for exceptionally efficient, high-performance, thermally bonded depth filters. Until now.

## A Revolutionary Technology

The patented Z.Plex filter technology from Veolia represents years of media research and filtration technology expertise. Engineered for greater void volume than current melt blown filters, Z.Plex technology incorporates smaller diameter fibers and an innovative 3-dimensional fiber matrix that maintains structural integrity while greatly increasing filter capacity.

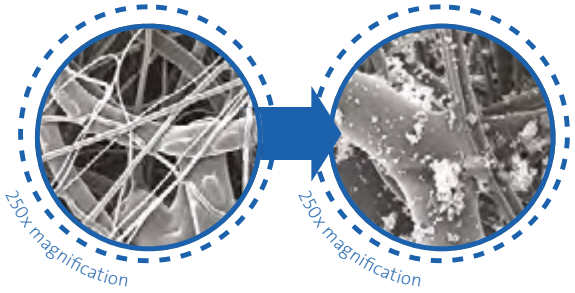



## Z.Plex Filter Technology
### for Longer Life

Conventional melt blown graded density filters consist of 2-dimensional, layered fiber strands that create voids to trap dirt and other contaminants. The Z.Plex filter technology features a 3-dimensional fiber structure. It's the innovative addition of transverse Z-fibers that supports the increased layer spacing. The smaller diameter fibers and increased space between layers result in more void volume, to offer:

- Up to **100%** greater dirt holding capacity
- Up to **100%** longer filter life
- Up to **50%** decreased pressure drop

Dirt holding capacity filter cross-section with SEM images showing large void volume to capture more particles.




**Before Use** **After Use**

**Z.Plex Technology –** *Intellectual Property Patents: Veolia is the only company that can make High Flow Depth Z.plex filters.*

**US 6358417 B1** - Non-woven depth **filter** element.(2002)

**US 6986427-B2** 3D Non-woven depth filter **media.** (2005)

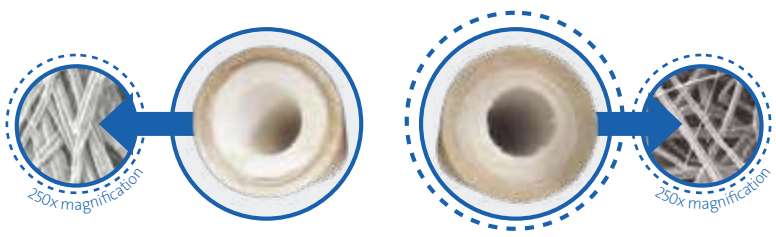
**US 6938781-B2** 3D Non-woven depth **filter.** (2005).

**US 6916395-B2** Process for making 3D non-woven media. (2005).

**US 101079426 B2** – High Flow.Z, Zplex. (2019).

**US 20180028954 A1** – High Flow.Z, Zplex. (2019).

### Z.Plex vs Competitor Depth Filter



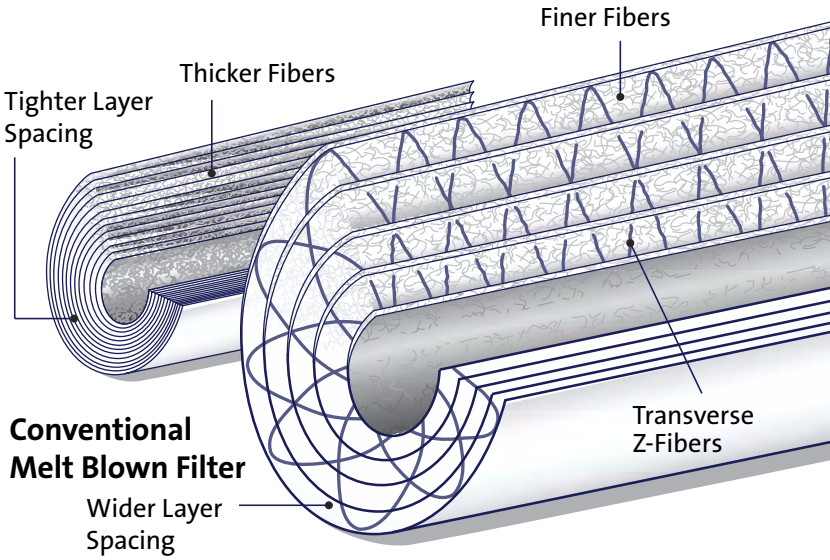

**Competitor Filter** **Z.Plex Filter**

# Z.Plex Filter Technology

## How it Works

During the extrusion process, Z.Plex technology integrates transverse Z-fibers that run through the filter layers from the core to the outer surface, which increase voids and filter strength. Results have shown that this patented process provides up to 100% greater dirt holding capacity and filter life at equivalent competitive efficiencies, while decreasing pressure drop by up to 50%.

**All this translates to reduced filtration costs. Reduced changeouts for time savings, reduced operational costs.**

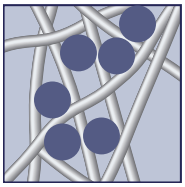



**Z.Plex Filter Technology**

# Z.Plex Technology

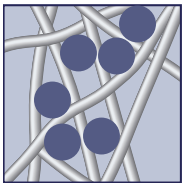
## High Void Volume for Greater Particle Capture

To further illustrate the increased void volume, dirt holding capacity and longer life of filters made with Z.Plex technology, take a closer look at the fiber structure. Conventional melt blown fibers are larger in diameter than Z.Plex technology fibers. Veolia's revolutionary manufacturing process and layer spacing contribute to increased dirt holding capacity. As dirt particles flow into the filter, the proprietary fiber matrix allows the Z.Plex technology engineered filter to capture more particles compared to conventional filters of similar efficiency. Thus, greater void volume means increased dirt holding, which equals longer filter life.



### Conventional Filter

Larger diameter fibers inhibit dirt holding void volume



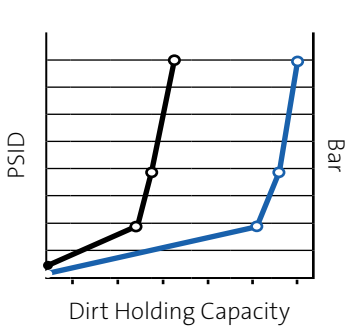
### Z.Plex Technology

Smaller diameter fibers for up to 100% increased dirt holding void volume

| Type | Filtration | Micron Ratings |
|---|---|---|
| *Veolia makes the only High Flow Depth filter in the world. (*) = Industrial Strength Core* | | |
| **High Flow.Za** | Absolute | 15, 25, 40 (*) |
| **High Flow.Zs** | Nominal | 1, 5 (*) |
| **High Flow RO.Z** | Nominal | 1, 5 |
| **High Flow EDR.Z** | Nominal | 5, 10 |
| **Absolute.Za** | Absolute | 0.5, 1, 3, 5, 10, 20, 30 |
| **Aquaplex.Z (LD)** | Nominal | 1, 10, 20 |
| **ROSave.Zs** | Nominal | 1, 5 |
| **SWRO.Zs** | Nominal | 1, 5, 10 |
| **EDR.Zs** | Nominal | 5, 10 |
| **WellPro.Zs** | Nominal | 1, 5, 10, 20 |
| **Filterplex.Z** | Nominal | 1, 5 |
| **Z.Core** | Nominal | 0.5-200 |

# Z.Plex Technology
## Performance

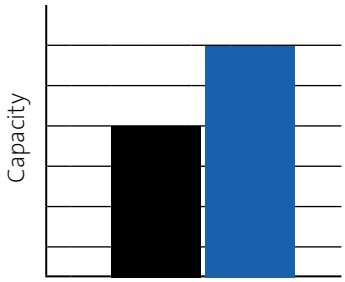
### Time vs Pressure Drop




Z.Plex technology manufactured filters have up to half the pressure drop of competitive filters = increased flow rates and lower energy costs.

■ Competitor Filter ■ Z.Plex Filter Technology

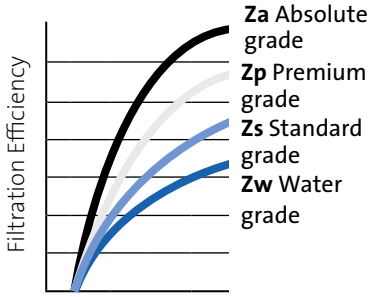
### Dirt Holding Capacity




Z.Plex technology manufactured filters offer up to twice the dirt holding capacity of competitive filters = longer life and lower filtration costs.

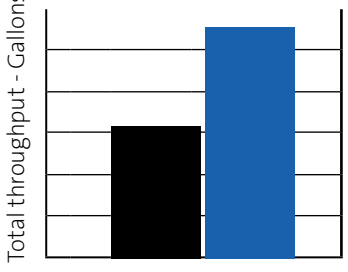
■ Competitor Filter ■ Z.Plex Filter Technology

### Z.Plex Technology Flexibility




Z.Plex technology manufactured filters are available in different grades to match the requirements of each application - from common sediment filters to absolute filtration.

### Filter Performance




Z.Plex technology manufactured filters deliver almost twice the throughput of competitive filters. The filters achieve this superior performance through a combination of higher dirt holding capacity and low pressure drop.

■ Competitor Filter ■ Z.Plex Filter Technology

# Z.Plex Technology Product Family
## Application Engineered

The Z.Plex technology product line will include a complete range of depth filter products with variable micron level filtration, efficiency values and cartridge lengths for a wide range of industrial, commercial and residential applications.

**Veolia's new Z.Plex technology will produce superior melt blown graded density filters engineered to specific applications, such as:**


RO Pretreatment


Beverage Processing


Produced with Oil and Gas


Deep Well Injection


Residential Water


Electronics Manufacture


Healthcare Applications


High Flow

| Features | Benefits | |
|---|---|---|
| **Z-Fiber; Engineered Fiber Matrix** | • Longer life<br>• Stronger filter | • Reduced operating cost<br>• Less change out labor or downtime |
| **Z.Plex Technology Flexibility** | • Optimized performance<br>• Wide range of efficiencies | • Tailored to specific application requirements |
| **Enhanced Shell and Core** | • No extraneous fibers to enter filter stream<br>• Non loading | • Non shedding<br>• Clean appearance<br>• Bulk pack option |
| **Lower Pressure Drop** | • Less energy used<br>• Longer run time | • Longer life |
| **All Polypropylene** | • Purity of media<br>• FDA compliant media | • Wide chemical resistance |
| **Graded Density** | • Built in prefilter<br>• Optimized depth filter loading | • Removal of wide cross section of contaminates |
| **Increased Void Volume** | • Greater dirt holding capacity | • Longer life |
| **Lower Filter Mass** | • Lower shipping | • Lower disposal costs |
| **Integral Support Core** | • Increased filter area | • Ease of disposal |

VEOLIA

Resourcing the world

**Veolia Water Technologies**
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