AS-H Iso-Disc®
Cloth Media Filter

Tertiary filtration and final polishing of wastewaters
in municipal and industrial applications

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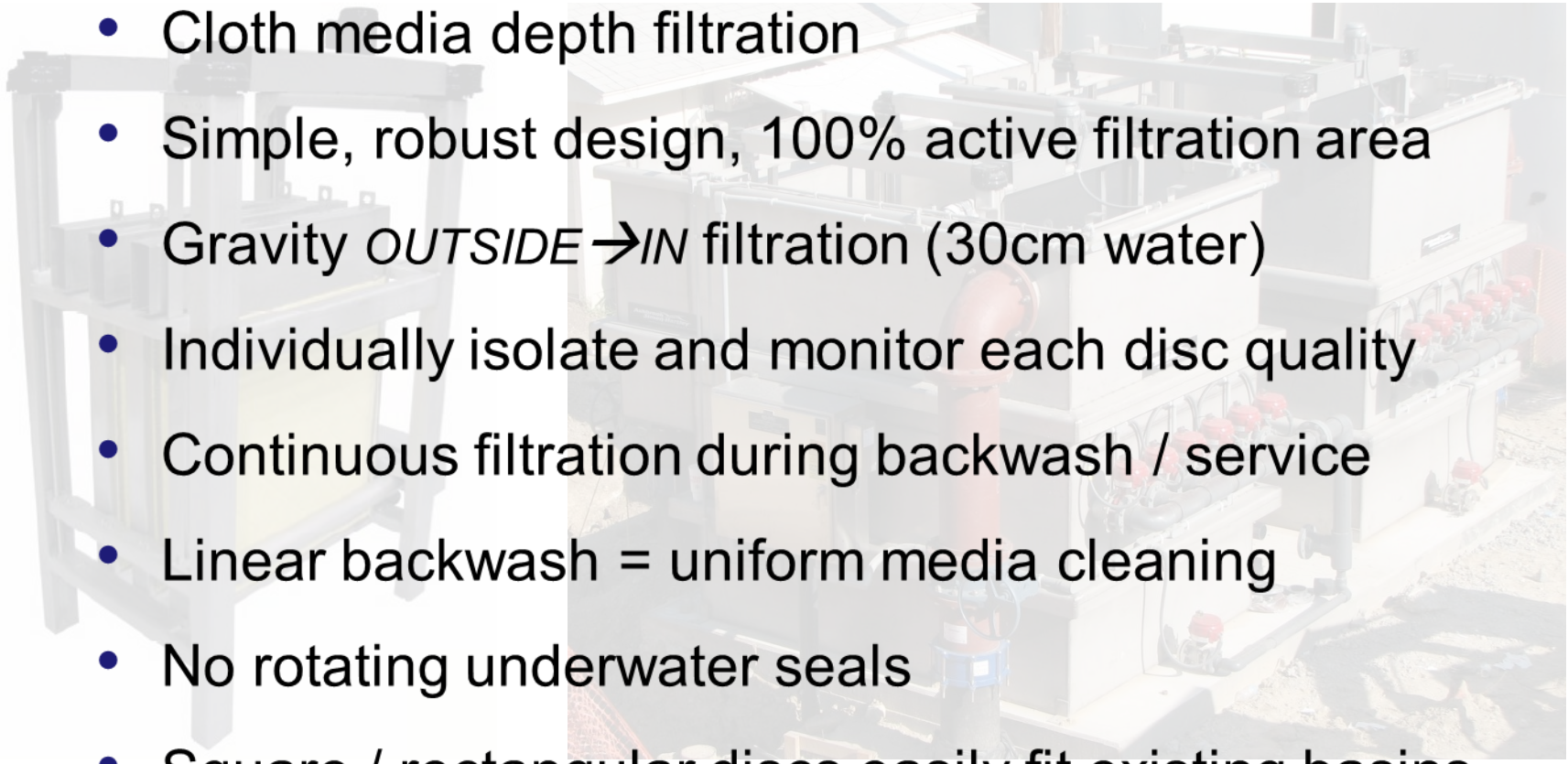
Alfa Laval AS-H Iso-Disc®



- Cloth media depth filtration
- Simple, robust design, 100% active filtration area
- Gravity *OUTSIDE→IN* filtration (30cm water)
- Individually isolate and monitor each disc quality
- Continuous filtration during backwash / service
- Linear backwash = uniform media cleaning
- No rotating underwater seals
- Square / rectangular discs easily fit existing basins

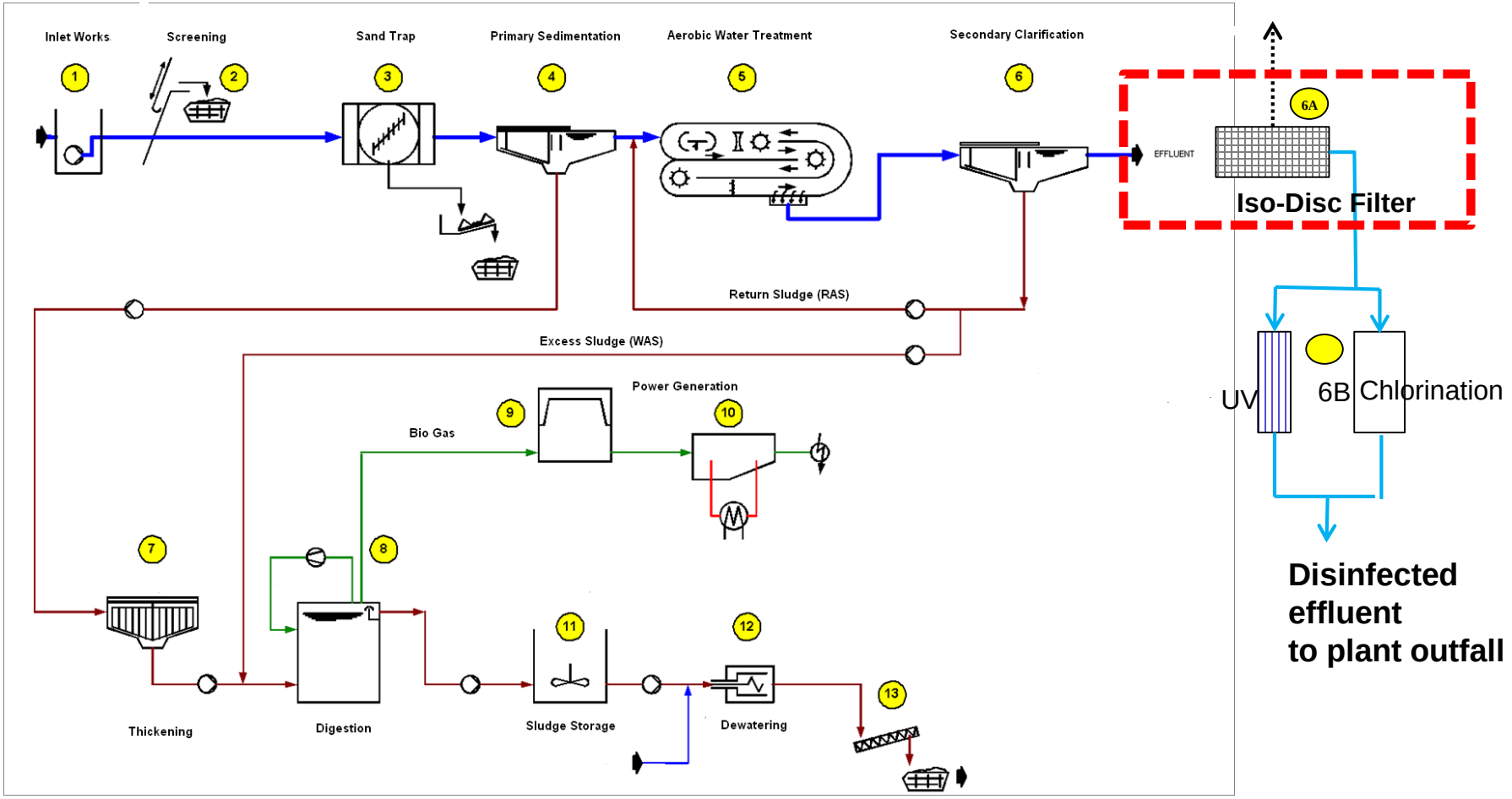
Typical Performance Range

- Influent
  - Average TSS 10-30 mg/l
  - Max TSS 50-60 mg/l
  - Phosphorous 1-2 mg/l
- Effluent
  - TSS 5-10 mg/l, <2 NTU
  - Phosphorous <0.5 mg/l
  - BOD 5-10 mg/l
- Flux
  - Average daily 7.3 $m^3/m^2.h$
  - Peak hourly 14.3 $m^3/m^2.h$

Municipal Application

- A compact, cost-efficient alternative to sand filters
- Capacities from 132 to 1,570m3/day per element
- Reliable static operation, minimal maintenance
- Removes residual solids down to 10 µm
- California Title 22 Water Reuse Certification
- Can be combined with chemical conditioning to enhance removal efficiency (e.g. P)

PFD – Typical Municipal WwTP



Industrial Application

- Removes particulate organic & inorganic pollutants
- Water filtration technology for any industry:
  - Cooling towers: treatment of intake water
  - Cooling towers: side-stream treatment
  - Process or Irrigation water reclamation for reuse
  - Ground water recharge
  - Effluent for compliant surface water discharge
  - Pre-treatment for high purity water technologies

Standard Disc Size & Capacity*

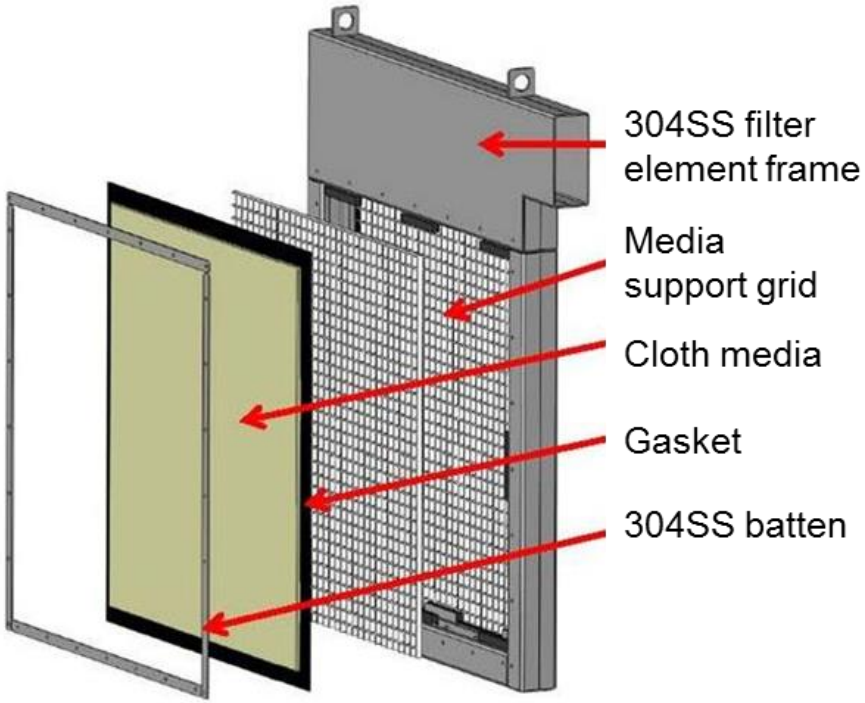
- Square Disc Element (h x w)
  - 0.6m x 0.6m 132m^3/d
  - 0.9m x 0.9m 295m^3/d
  - 1.5m x 1.5m 818m^3/d
- Rectangular Disc Element (h x w)
  - 1.5m x 2.4m 1,308m^3/d
  - 1.8m x 2.4m 1,570m^3/d

- Number of elements per cassette dependent on flow rate and element size

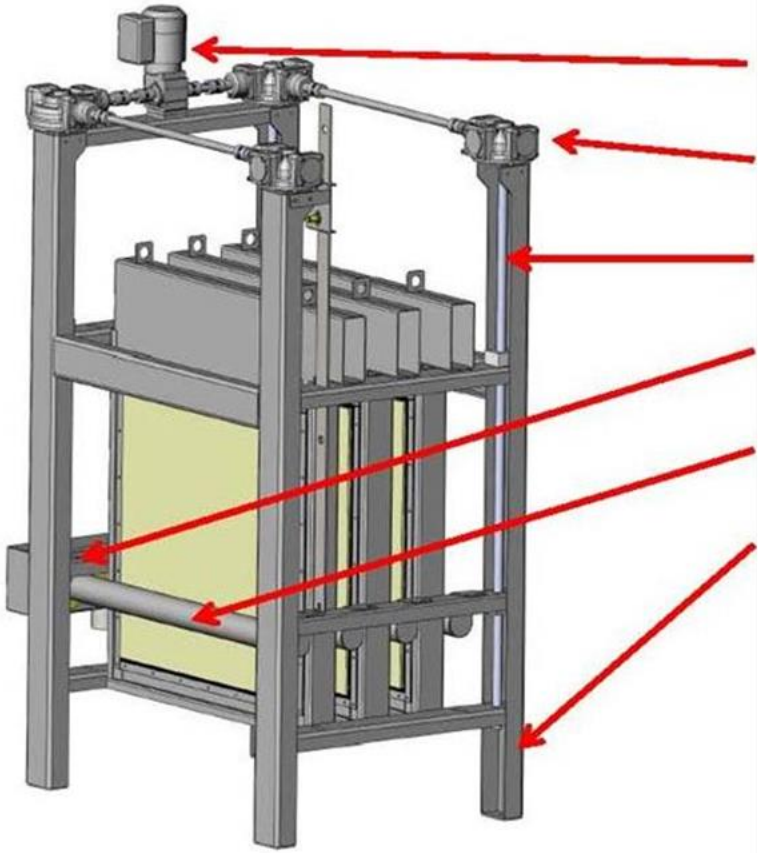
* at average daily flow flux of 7.3 m3/hr/m2

Filter Element & Cloth Media

- Outside-in depth filtration
- Polyester and acrylic fabric cloth media
- Effective solids capture to less than10 µm
- Cleans readily and is easy to change
- Square or rectangular filter elements for easy retrofits
- Each filter element can be isolated and monitored individually



Simple, Robust Cassette Design



Gear drive motor

Screw jack gear

Screw jack

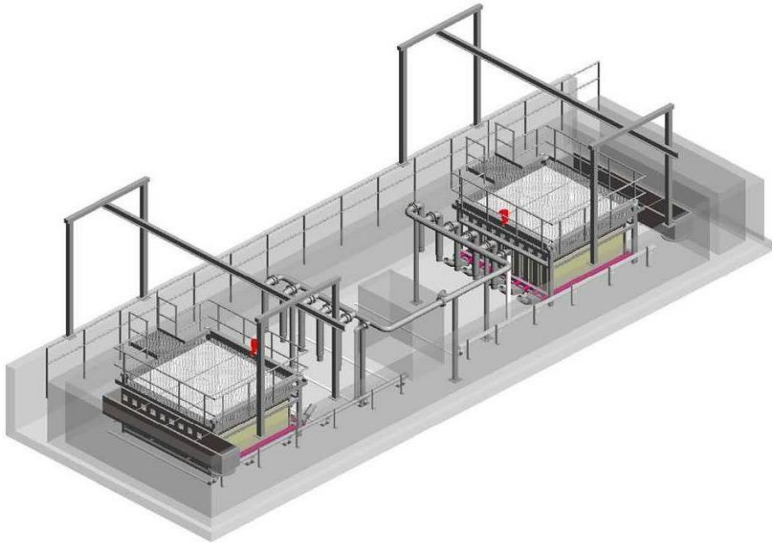
Backwash manifold

Backwash shoe

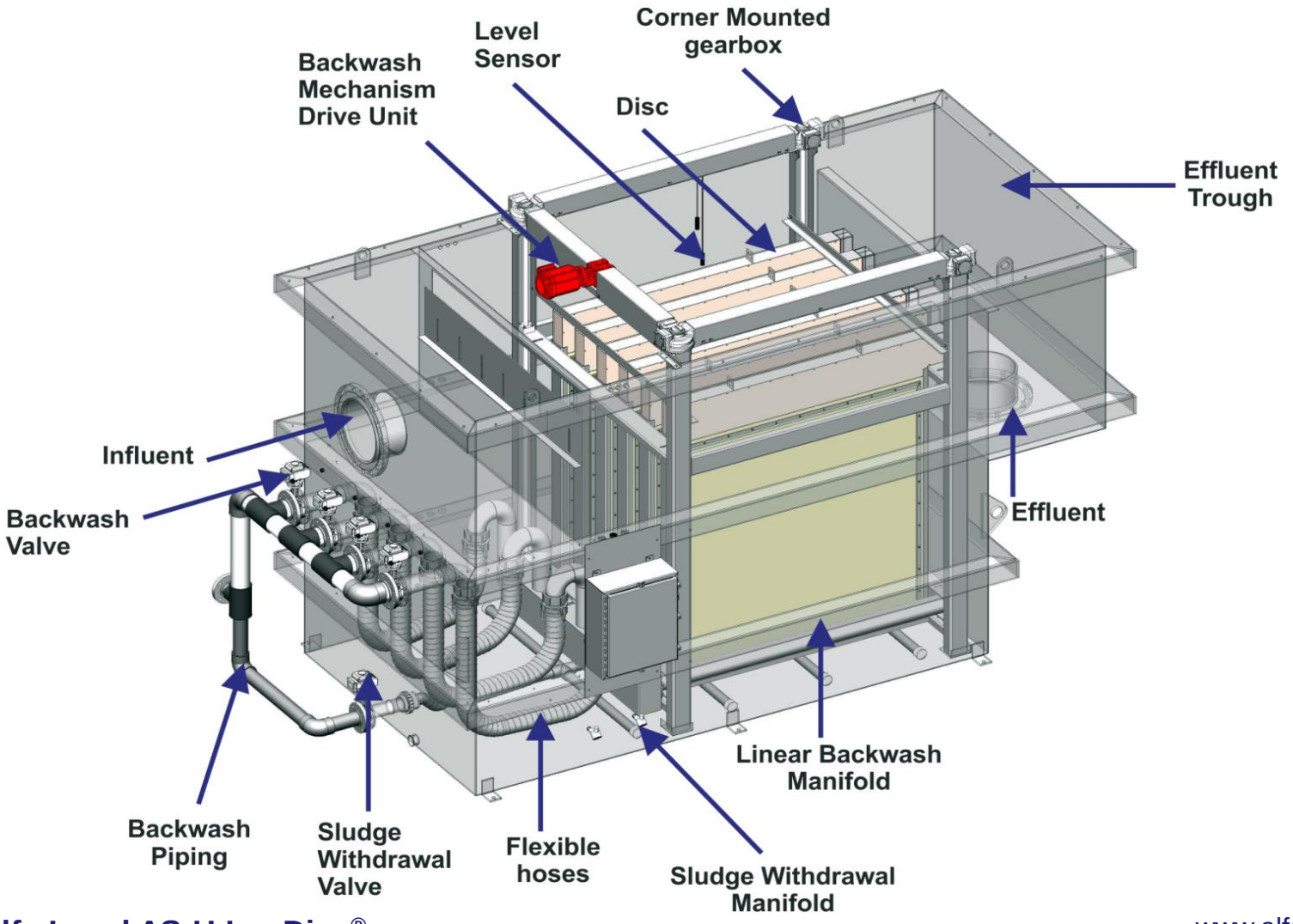
Cassette frame

Steel Or Concrete Tank

- 304SS or coated carbon steel, depending on the influent characteristics
- Concrete typically used for larger projects or retrofits (concrete basins by others)



Iso-Disc® Package Unit

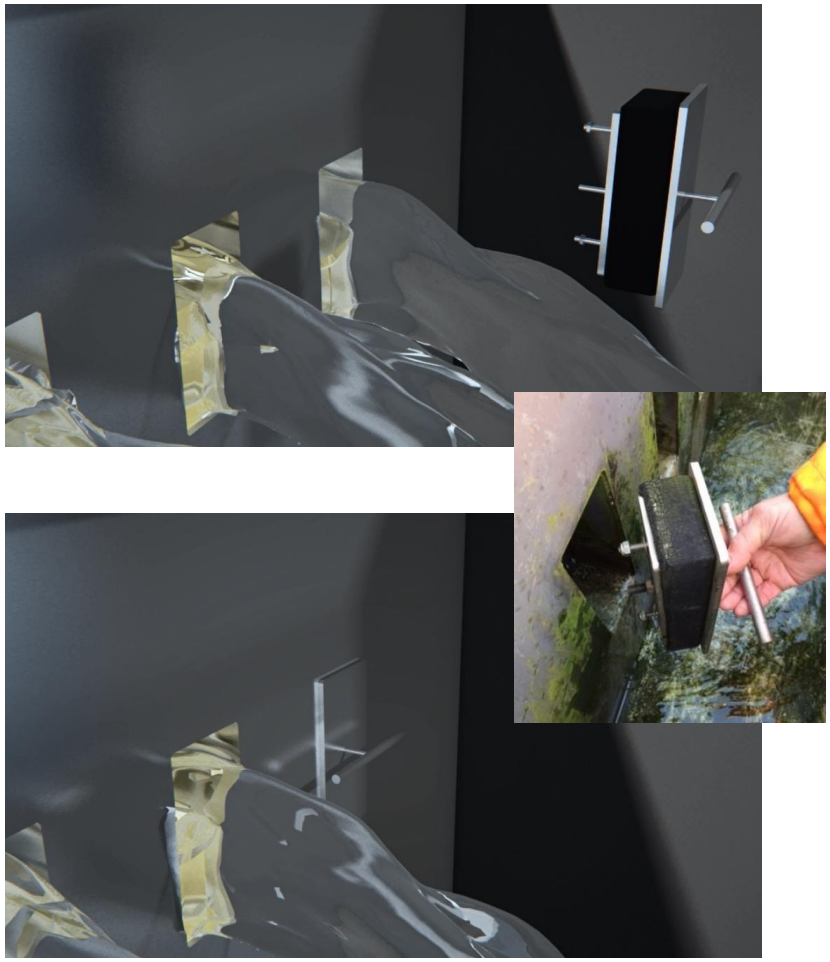


Iso-Disc® Operation

- Completely submerged filtration media
- Low pressure, gravity-driven filtration process
- Outside-in filtration flow pattern
- Continuous operation, even during backwash
- Efficient linear backwash cleaning mechanism
- Fully automatic, highly reliable operation

Iso-Disc® Animation

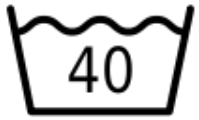
Individual Element Monitoring



- Independent monitoring and isolation of each filter element

Simple Cloth Cleaning

- Super-suck
  - Manually initiated
  - Higher suction
- Power wash
  - Disc element removal
  - Simple jet-wash
  - *No chemicals*
- Industrial laundry
  - Remove cloth
  - machine wash



Iso-Disc Benefits Vs Sandfilters

- Low head loss reduces pumping to the filter, saving power
- Significantly lower capital costs
  - No structural extensive civil works (as for sandfilters)
  - No expensive transportation costs of sand media
- No media loss – as sand degrades and is lost over time
- Faster recovery after upset – sandfilters can become clogged (mud balling)
- Substantially lower footprint / land requirement
  - Filter area arranged vertically rather than horizontally
  - Higher hydraulic and solids flux rates
- Lower backwash water reject of 1-3% versus 10% or more

Easy To Retrofit

- Low height means easy retrofit to hydraulic profile of existing plant
- Greatly increases flow rate in existing basins
- Minimal renovation required
- Large market consisting of aging equipment
  - Traveling bridge filters
  - Continuous backwash sand media filters

WwTP Retrofit, Texas, USA

Sandfilter Replacement, UK

- 2 x 75% duty units
- Peak 40l/s @ 50mg/l TSS
- Outlet TSS 8-9 mg/l (95%ile)
- NTU removal typically 40-50% (80% with PAC)

Water Re-Use, Texas, USA

- 800m^3/day
- Reclaimed wastewater from the Alfa Laval AS-H Iso-Disc®
- Savings of $25,000/yr

P-removal WwTP, Finland

- Commissioned September 2017
- 2,000m^3/hr peak
- Activated sludge process with P removal

Key Features & Benefits 1

- Outside-in filtration
- Compact
  - Use 100% of filter area
  - Lower capital costs including installation
  - Low head loss (12 inch / 30 cm water column)
- Cloth provides depth filtration
  - Better solids capture efficiency
  - Less backwash due to solids storage in the cloth (typical 1-3% backwash reject)
  - Ability to handle solids spikes
- California Title 22 Certified for water reuse standards

Key Features & Benefits 2

- Isolate the disks
  - Easy to identify compromised cloth.
  - 100% use of cloth (no unnecessary changes).
  - Monitor turbidity and throughput
  - Significantly reduced potential redundancy for lower TotEx
- No spray cleaning
  - No mist covers
  - No plugging of internals or spray nozzles
  - No collection and re-pumping of spray water
- Easier access; Easier maintenance

Key Features & Benefits 3

- No rotating underwater seals
  - Low maintenance
  - Eliminates chance of short-circuiting
- Linear backwash system
  - Clean entire surface – from the solids capture side
  - Uniform cleaning = No tip speed effect (as rotating system)
  - Low backwash flow = lower operating cost (less pumping)
- Rectangular discs allow efficient retrofit of shallow basins
  - i.e. travelling bridge filters

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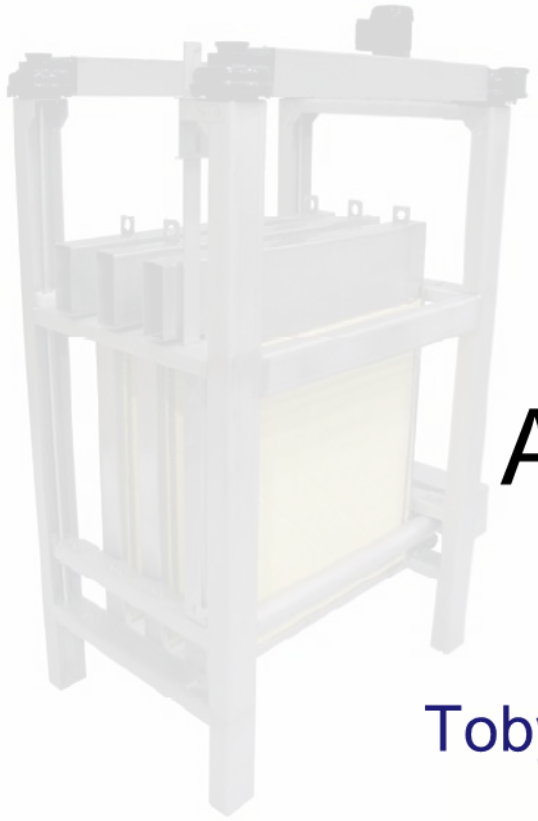

Thank You

Any Questions?

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