

February 25th, 2013



Filter system compare: Conventional systems vs. Leopold filters



Xylem Leopold?

Types of treatment

Xylem Leopold have worked historically in all areas of the municipal water cycle. We do not work in the industrial business unless it is large volume water processing.



WEDECO



POTABLE WATER:

Gravity filters; dual media,
sand

GAC; Activated carbon

Mn & Fe removal

WASTEWATER:

Gravity filters; dual media,
sand

GAC; Endocrine removal

P removal

N removal

DESALINATION:

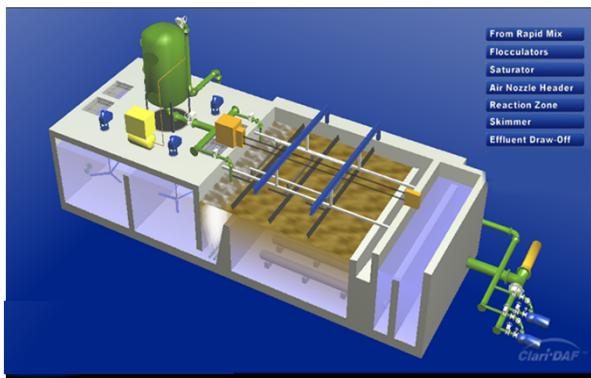
Gravity filters; dual media,
sand

Post RO re-hardening

Xylem Leopold

Clarification

DAF
Dissolved air flotation



Applications:

Wastewater
Potable water
Desalination pre-treatment

Filtration

Rapid gravity filtration
Leopold type S&SL

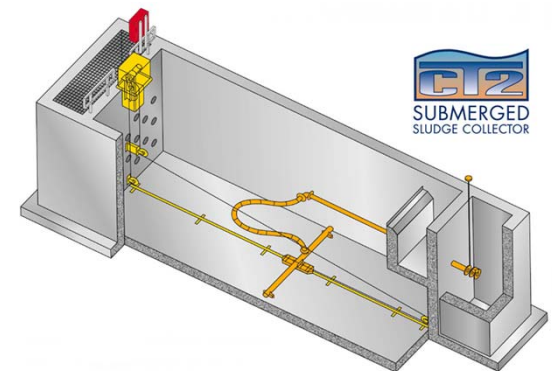


Applications:

Potable water
Wastewater
Desalination pre-treatment

Sludge handling

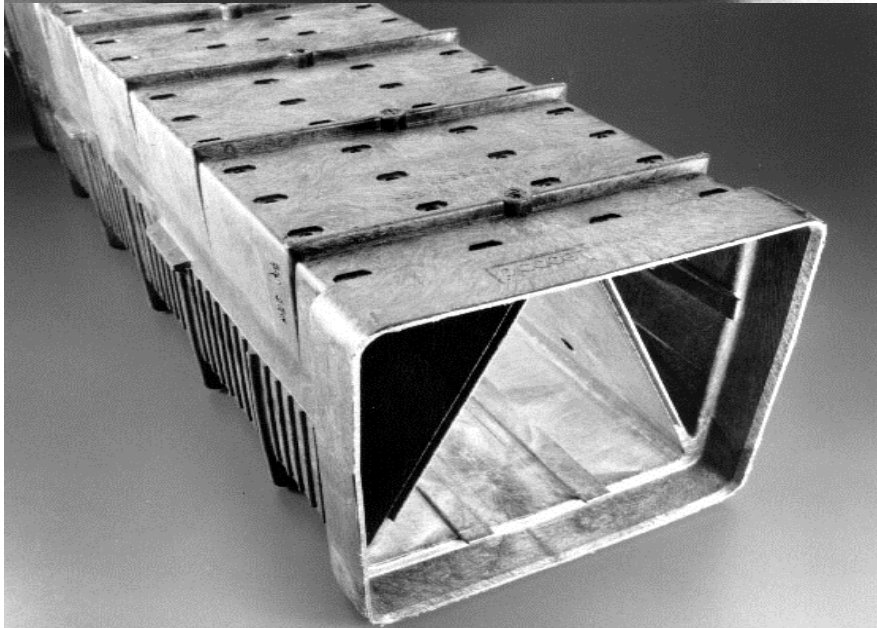
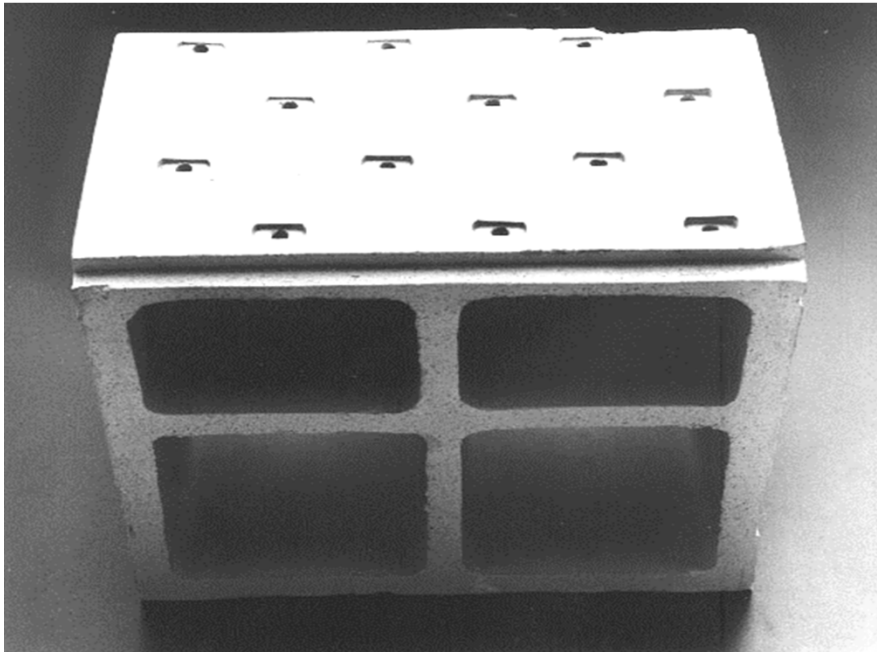
Sludge removal
CT2 and CV



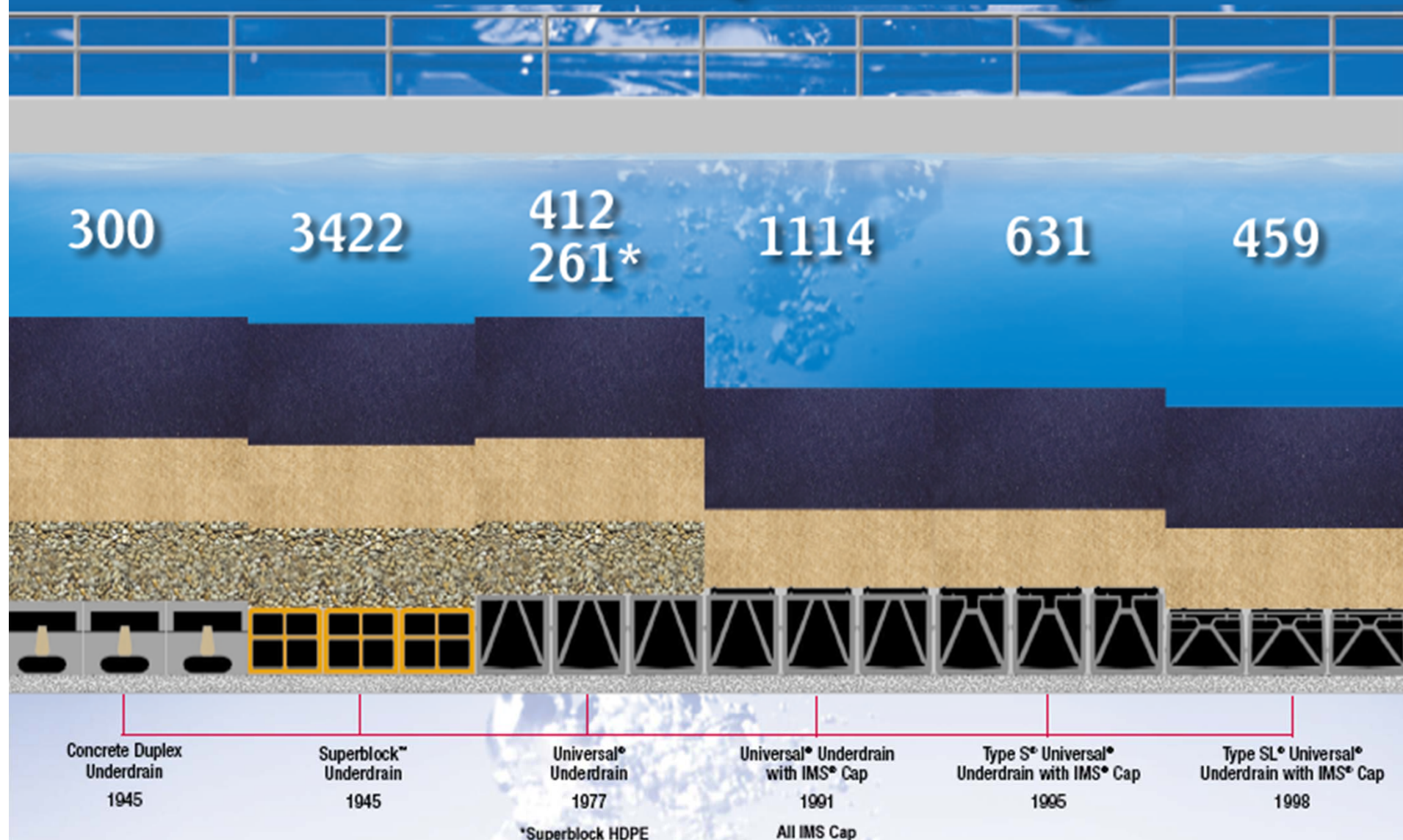
Applications:

Potable water
Wastewater

Leopold underdrains



Advancement of Leopold Technology



Over 6,000 Underdrain installations, 1,889,000 sq. ft. of Type S[®] Family and over 2,200,000 sq. ft. of IMS[®] Cap installed

Leopold world wide references:



Over 8000 Installations World Wide

Leopold references Middle East

Project:	Country:	Application
• Medinah – Yanbu,	KSA	SWRO
• Jeddah I,	KSA	SWRO
• Jeddah II,	KSA	SWRO
• Jeddah III,	KSA	SWRO
• Amman,	Jordan	SWRO
• Hawtat/Bisha,	KSA	SWRO
• Rabigh,	KSA WTP	SWRO
• Sharqiya,	Egypt	WTP
• Mousel,	Iraq	WTP
• Umm Al-Hyman,	Kuwait	STP
• Mafrq,	Abu Dhabi	STP
• Al Awir,	Dubai UAE	STP
• Tabuk phase I,	KSA	STP
• Onayzah,	KSA	STP
• Jebel Ali ,	Dubai UAE	STP
• Arar,	KSA STP	STP
• Al Baha,	KSA	STP

Two questions to start with:

1. What is a filter floor?
2. What does a good filter floor?



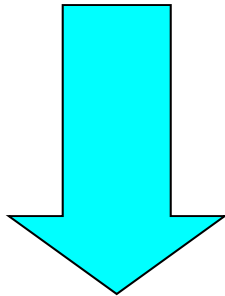
What is a filter floor ?

A filter floor has two primarily functions:

- Collecting the filtered water
- Backwashing the filter media

Collecting the filtered water **EASY**

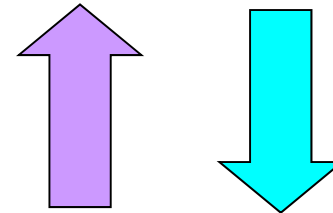
Collecting the filtered water after the filter media and removing it from the filters to disinfection, holes in a pipe can do this.



SINGLE PASS SYSTEM

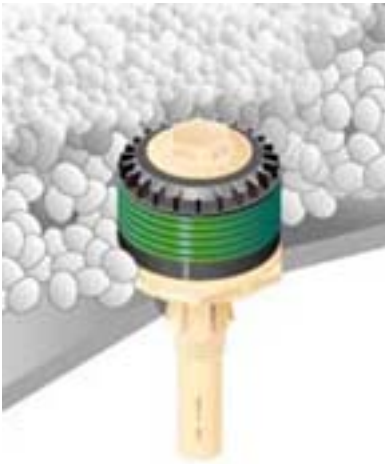
Backwashing the filter media **DIFFICULT**

Backwashing the filter for complete regeneration of the filter media must have even distribution of **AIR** and **WATER** in a **COMBINED** method for efficient filter performance over life of filter

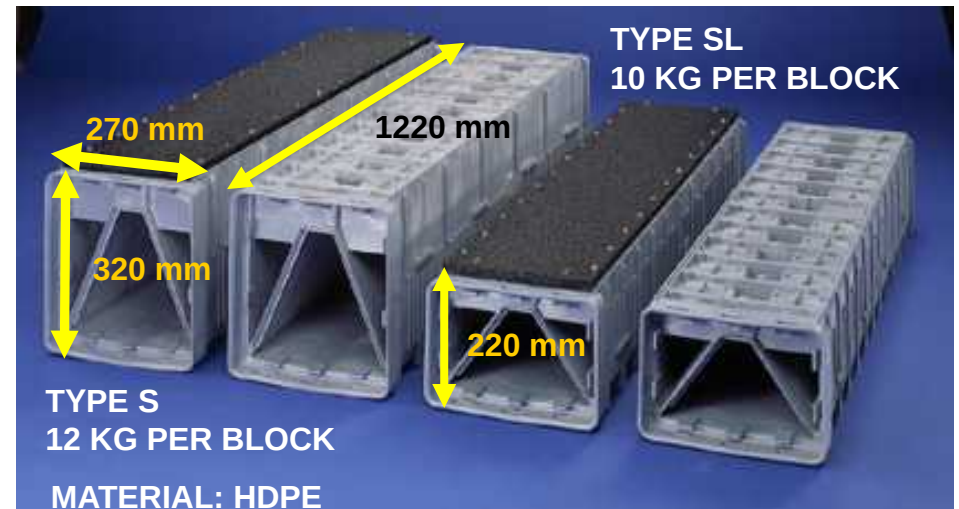


DUAL PASS SYSTEM

Examples of nozzles and Leopold laterals



Nozzle retainers
(Single pass)



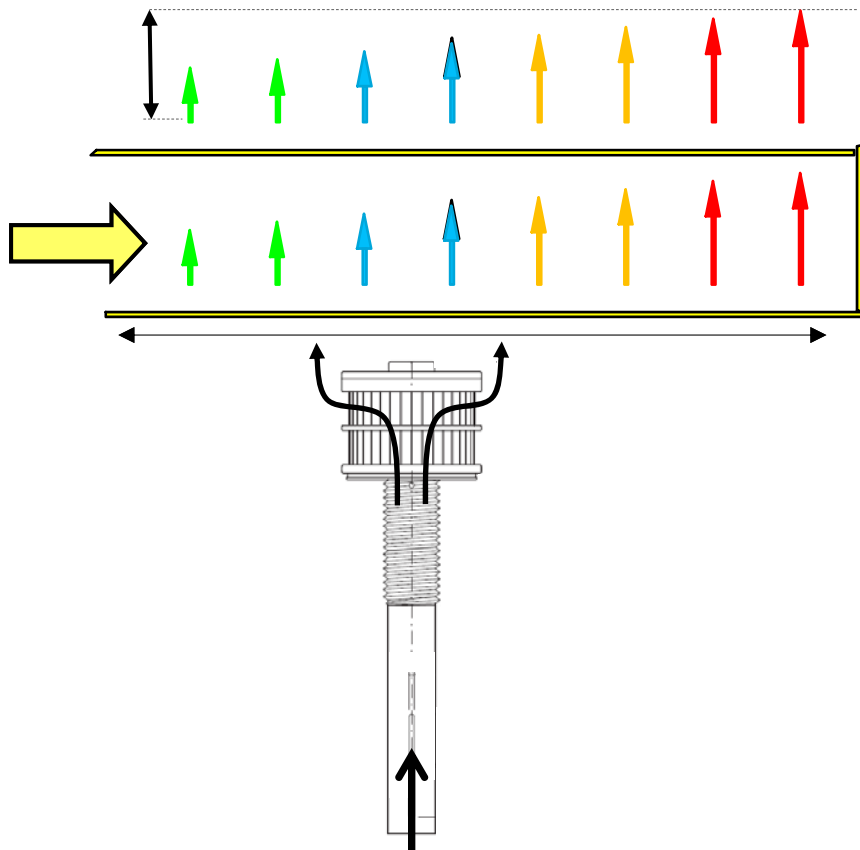
Leopold Type S&SL
underdrains
(Dual pass)

Leopold underdrain filtration system

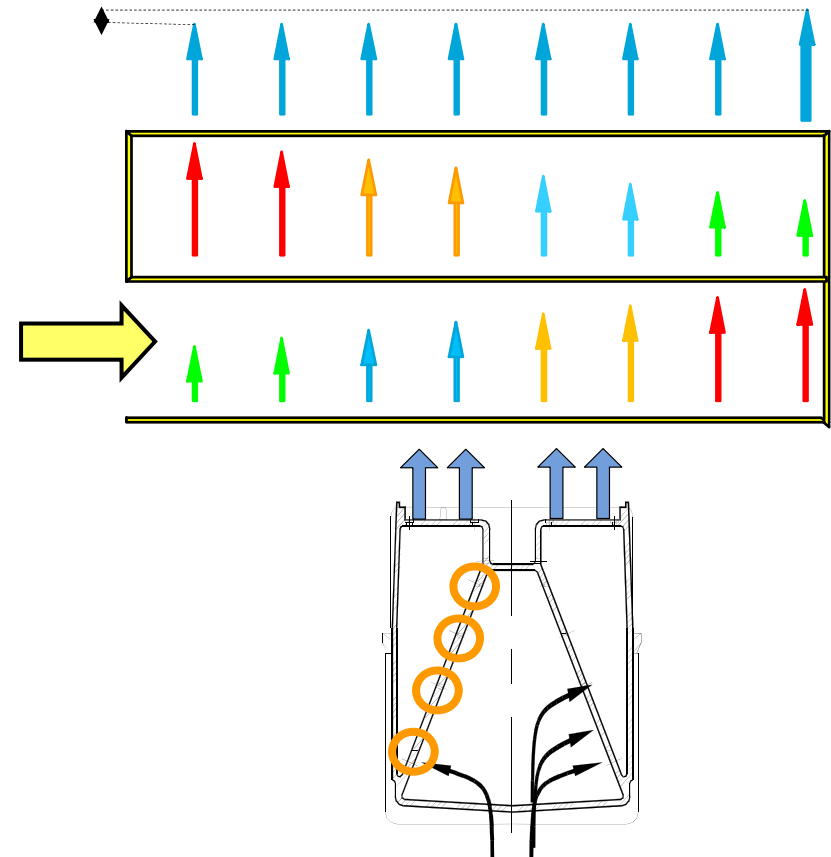


Single pass vs. dual pass systems

Nozzle (single pass)



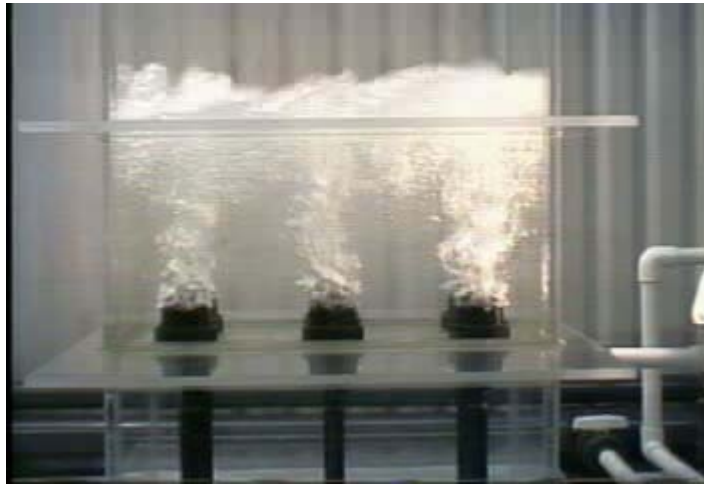
Leopold (dual pass)



Dual pass means: lower maldistribution (<5% for 15m laterals), more efficient backwash, better water quality

Technical comparison of filter floors

Nozzle



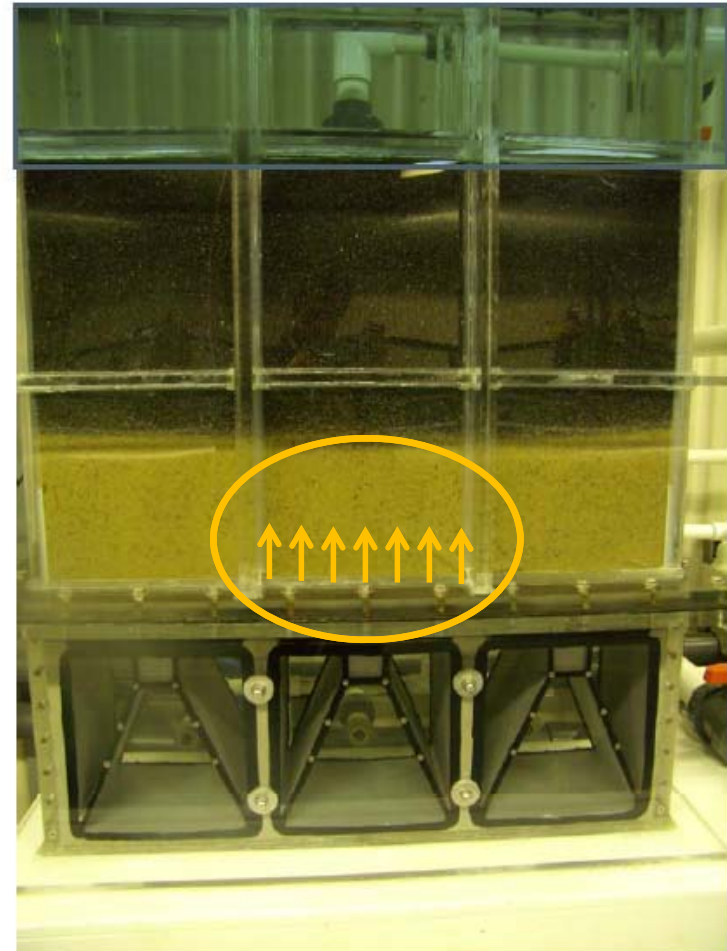
- Nozzle Density 30-50/m²
- Nozzle coverage 15% of area
- Depth of plenum 900 – 1200mm
- Maldistribution Uncontrolled
- Gravel barrier layer 75-200 mm
- Nozzle domes break in time
- Limited support from nozzle manufacturer

Leopold



- Orifice density 236/m²
- Block coverage 95% of filter area
- Depth of Block 204-330 mm
- Maldistribution <5%
- IMS cap (if desired) 25.4 mm
- No items which can break in time
- Technical support from Leopold with 85 years of filter experience

Translated to real life

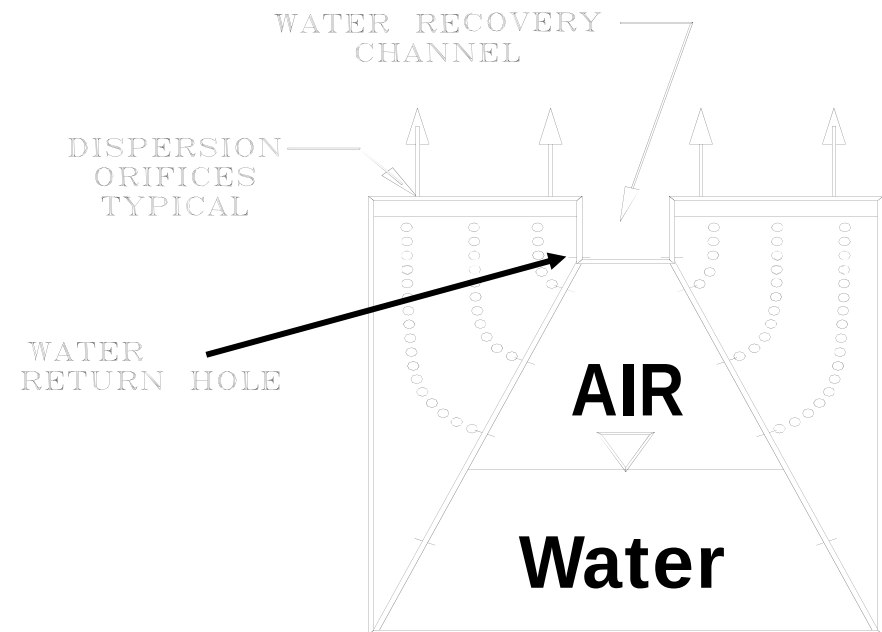
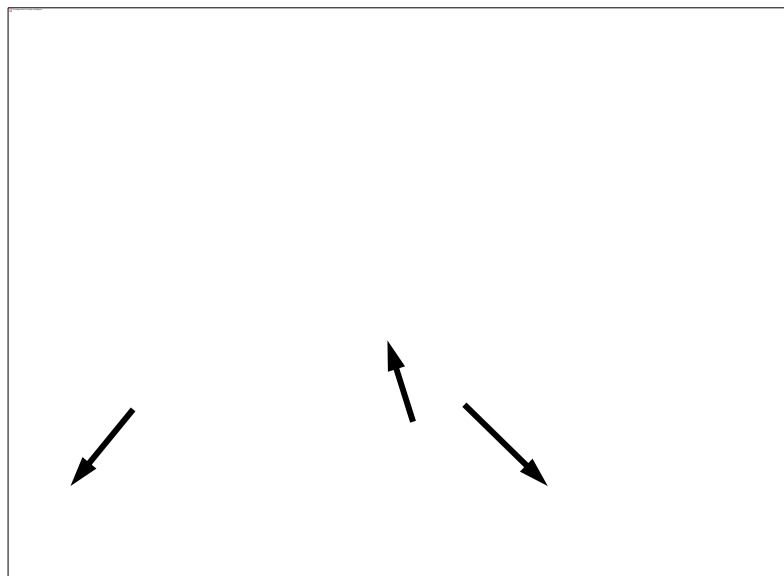


No dead zones = more efficient backwash
no preferential ways = better effluent quality

Leopold underdrain filtration system

Water recovery channel:

By the use of the water return holes is an even distribution of air established.



Leopold underdrain filtration system

No water recovery channel



No other underdrain block except Leopold has an water recovery channel to improve air distribution.

Water recovery channel

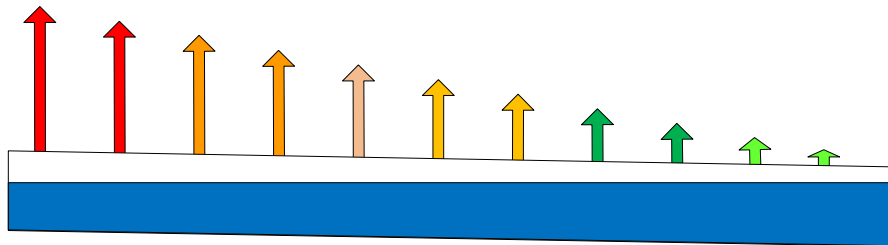


Leopold underdrain filtration system

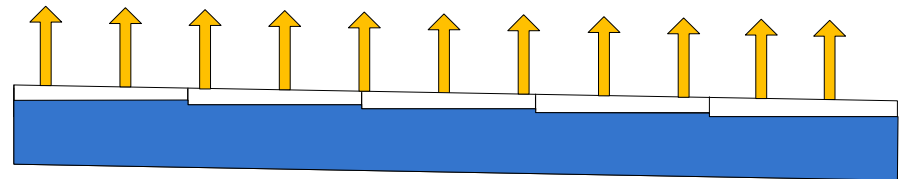
Internal baffles:

Once the underdrain is connected and installed separate segments are created for a better distribution of air.

- Correct installation tolerances
- Absorb air movements in underdrain lateral



Wrong



Right



Leopold underdrain filtration system

IMS Cap or Support gravel?

A barrier between the media and the underdrain is required, there are two options: support gravel or the Intergraded media support cap.

Support gravel

- Different silica gravel layers
- Potable water
- Wastewater
- Desalination pre treatment
- Maximum 375mm in height

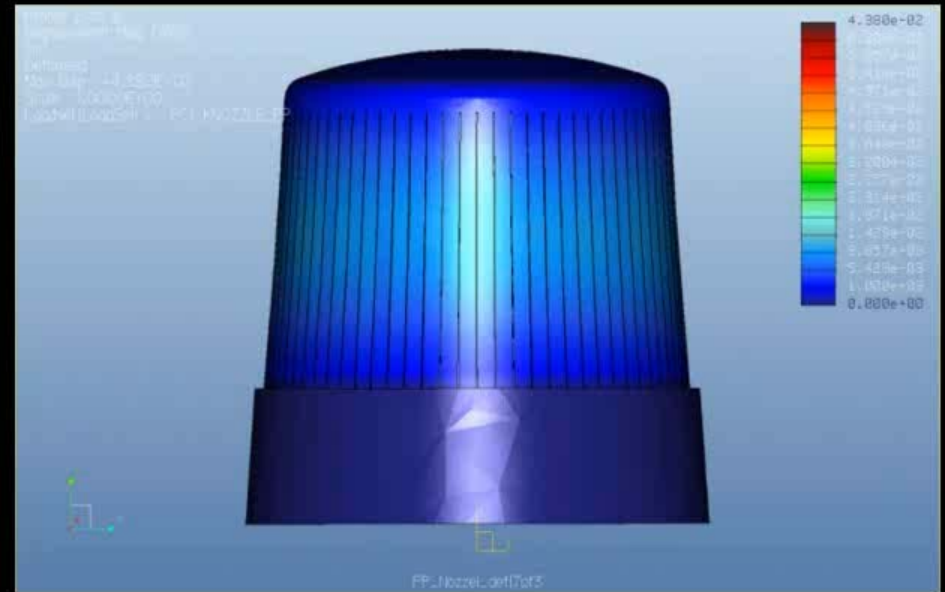
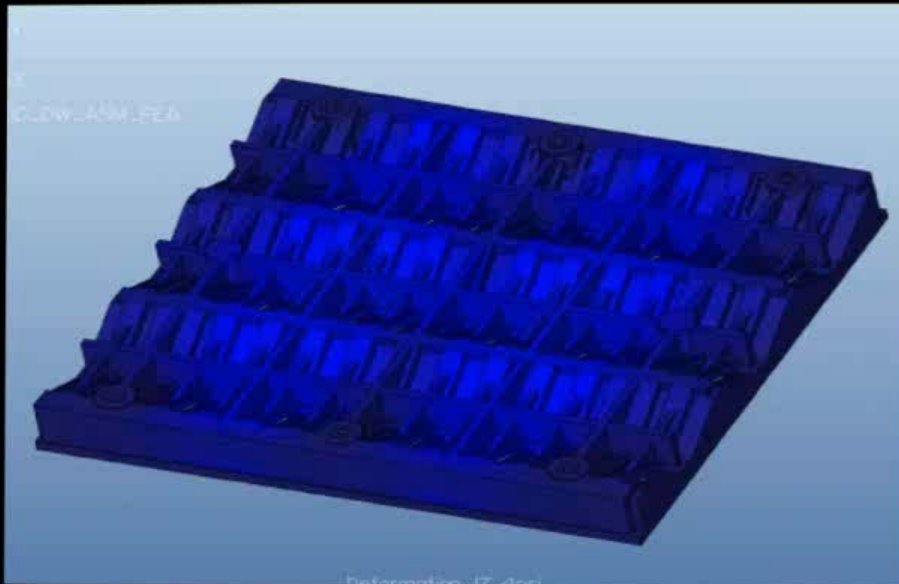


IMS 200®/1000®cap

- High strength plastic
- Potable water
- Wastewater
- Desalination pre treatment
- More freeboard (+275mm)



Deflection of Media Retainers



Problems with single pass systems



Symptoms of failed nozzles are easily seen during backwash



With no chlorination, biological activity goes unchecked and blocks the nozzles



Blocked nozzles: here sand, manganese, and polyzoa (kind of spongy animals) have clogged the nozzle only 18 months after installation – but can take years

Conclusion

Why to buy Leopold filtration equipment?

- **We guarantee you the best underdrain design**
 - We are the inventors of the underdrain and we help you to design the best filter for the project
 - More than 85 years of experience to support you.
- **The best equipment for filtration and backwashing**
 - Leopold HDPE underdrain system
 - Effective media cleaning to achieve effluent and save on backwashing
- **Reduction of cost in civil design**
 - None complex civil structure
 - Easy and effective installation
- **Install and “forget”**
 - Very low maintenance required

Thank you for your time

