

WATCH WATER®

Presented by Mr. Deepak Chopra (GM)

KATALOX-LIGHT® TWO-in-ONE

**Revolutionary ZEOLITE-based Granular
CATALYTIC MEDIA for removal of
Suspended Solids, Particles, Colloids including
Iron, Manganese, Arsenic, Hydrogen Sulfide,
Heavy metals and Radionuclide from water**

W

Water

A

and

T

Technology

including

CH

Chemicals

Manufacturer

Technology

Presenters

Watch Water®, Germany

Filtration and Heavy Metal Removal

Mr. Deepak Chopra

- Watch-Water[®] is the manufacturer of Katalox-Light and many other products related to Water Treatment.
- Watch-Water[®] only sells to Watch-Water[®] branches and distributors of filter media and related products as well as to OEMs (Original Equipment Manufacturers).



Development of Katalox-Light:

KL is a revolutionary coating technology. Catalytic filtration media is very robust and designed for removal of high levels of Fe, Mn, H₂S, As, U, Ra, other Heavy metals without using Flocculants or KMnO₄.

The unique structure of **Al₂O₃SiO₂** as natural mineral has the highest surface to efficiently remove suspended solids up to 2-3 microns. The media has already been used in 60 different countries for a wide variety of applications.



Katalox-Light is ANSI/NSF 61 Certified by WQA, USA



Current Problems: Water Quality Issues		Current Solutions
▪ Turbidity, Colour	→	Sand, Anthracite
▪ Inorganic Chemicals ▪ Hydrogen sulfide	→	Chemicals
▪ Radionuclide	→	Reverse Osmosis
▪ Microorganism	→	None
▪ Disinfectants	→	Aluminium Sulphate
▪ Disinfection Byproducts (DBPs)		
▪ Growing demand of water	→	None
▪ High cost of Aging Infrastructure	→	None
▪ High Maintenance Costs	→	None
▪ Concern of Energy Costs	→	None

All the existing solutions and their drawbacks can be effectively addressed by **Katalox Light**.

Overview of The New Paradigm

The Green Infrastructure

**Community
increases water flow**

**Without increasing
Buildings &
Infrastructures**

Change is not difficult
Investments are smaller

**Just-In-Time
Water
Infrastructure**

**Increases sources
of water**

This means,
Not only the infiltration of ground water, it also manages stream water to support Surface water and capture of runoff from impervious surfaces like roof-top, driveways, streets, parking lots and down slope streams etc.

Katalox Light is environmentally-based system for adding small units of high capacity, responding just-in-time to actual measured conditions.

**Systems closer to
reuse area**

- **Energy Efficiency**
- **Less Water to pump**
- **Less water to treat**
- **Less water to waste**

Treatment close to the source requires less energy for conveyance

“NEUTRAL” by which we mean not upsetting the natural balance.

What is Katalox Light

Technical Description

What is Novel

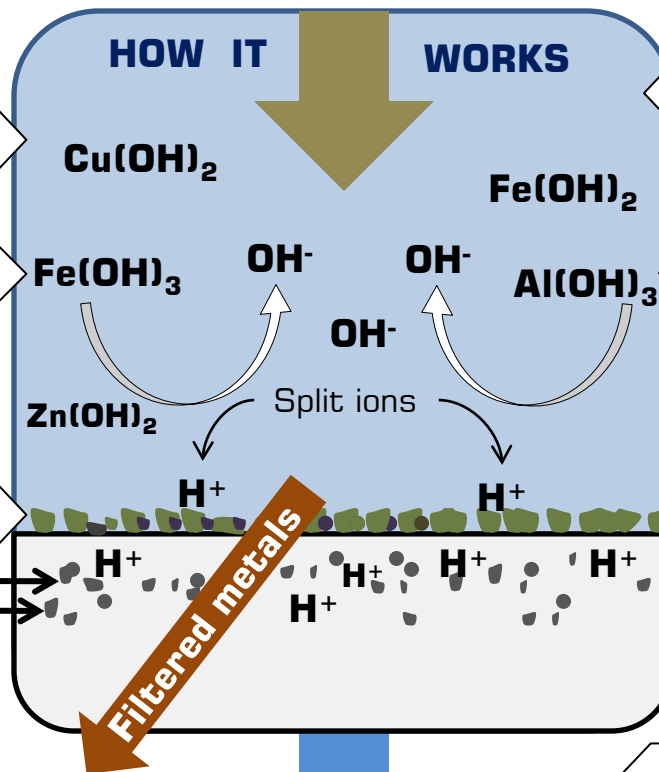
No chemicals

Dissolved ions held in free-board

Freeboard: 40%

Particle size > 3 μm

Particle captured deeper in Katalox Light



pH increase from 8 up to 10

High flocs capture colloids, bacteria, virus

Captured Particles

Katalox Light

No Pressure Drop

Flow from 0.5 m³/h up to 1000 m³/h

**Clean & Safe Water
24 / 7 / 365**


**Backwash: 4 minutes
Rinse: 1 minute**

List of a few filtered metals

- Fe(OH)_2
- Cu(OH)_2
- Zn(OH)_2
- Fe(OH)_3
- Pb(OH)_2
- Ca(OH)_2
- Fe(OH)_2
- Co(OH)_2
- Mg(OH)_2
- FePO_4
- Ba(OH)_2
- Ni(OH)_2
- Al(OH)_3



Katalox-Light is based on Proprietary Catalyst and cannot be compared with any other technologies like Pyrolox, Filox or Greensand Plus.

 Watch Water® has developed a Manganese dioxide based Catalyst media that can split water efficiently at pH from 5.6 to 10.5. Watch Water® Catalyst based on Manganese can mimic the splitting of water into Hydrogen (H⁺) and Hydroxide (OH⁻).

Hydroxide ions are used for the precipitation of heavy metals up to **99.99%**. Which represents the highest percentage of metal removal than any media in water treatment. It took 10 years to manufacture the catalyst and to develop the product. The freeboard in KL systems should be maximum 40% to concentrate the cations and turn them into stable floculants or solid-state and then remove them with backwash. Concentrate from backwash can be filtered with bag or can be evaporated with solar energy.

Benefits-Advantages : Municipal and wastewater

Comparison #1



Operation and Energy Usage

Currently used Technology	Katalox Light Novel Technology
Continuous operation mode	Continuous or intermittent Stop/Start
✘ Performance impaired if stopped and started	✔ Performance unaffected by intermittent operation
✘ Normally requires significant treated water storage	✔ Demand-based operation results in minimized water storage and reduced backwash waste
✘ Difficult to operate effectively using alternative energy sources (solar, wind etc.)	✔ Opportunity to use alternative energy sources such as Solar or Wind. ✔ Readily used with other treatment processes as pre-filter for better performance

<i>Comparison #2</i>	Currently used Technology	Katalox Light Novel Technology
Raw Water Quality And Chemical Usage	✗ Usage of chemicals	✓ No Chemicals
	✗ Max. turbidity up o 20 NTU	✓ Max. Turbidity 100 NTU or more
	✗ Suspended solids including iron & manganese ≤ 1 mg/L	✓ Suspended solids including iron, manganese & heavy metals up to 100 mg/L or more
Production (loading rate)	✗ 1500 – 3000 liters/m ² /h	✓ up to 30000 liters/m ² /h
Performance and Footprint	<ul style="list-style-type: none"> ✗ Toxins – unknown ✗ Iron/manganese: not used ✗ H₂S/CO₂/Organics: not used ✗ Arsenic – not used ✗ Radionuclide – not used ✗ Heavy Metals – not used 	<ul style="list-style-type: none"> ✓ Toxins: 0%–100% (depending on the toxin) ✓ Iron/manganese: up to 40 mg/L ✓ Iron/manganese: up to 100% (with H₂O₂ or OXYDES dosing) ✓ H₂S/CO₂/Organics: yes ✓ Arsenic – 100% in presence of Iron in water ✓ Arsenic, phosphate, copper, lead, chromium 100% with FERRO-Z dosing.

Comparison #3

Currently used Technology	Katalox Light Novel Technology
<u>Disadvantages</u>	<u>Benefits and Advantages</u>
<ul style="list-style-type: none"> ✘ Filter media (normally Sand or Anthracite) frequently replaced several times over lifetime of the filter ✘ Limited or no quality control) 	<ul style="list-style-type: none"> ✓ Katalox-Light has 07 to 10 years of service life. ✓ Very good quality control.
<ul style="list-style-type: none"> ✘ Very Large civil works – Typically several meters in depth 	<ul style="list-style-type: none"> ✓ Very compact: 1- 2 meters in diameter, 2-3 meters in height. Constructed of GF/composite tanks with polyethylene liner or stainless steel.
<ul style="list-style-type: none"> ✘ Significant foundation requirements ✘ Substantial construction works requiring large skilled work force. 	<ul style="list-style-type: none"> ✓ Minimum construction works ✓ Minimum foundation requirements.
<ul style="list-style-type: none"> ✘ Nor portable, must be constructed on-site. 	<ul style="list-style-type: none"> ✓ Portable, Constructed off-site, depending also on size.

**Design
and
Capital
Expenditure**

Comparison #4

Currently used Technology	Katalox Light Novel Technology
<u>Disadvantages</u>	<u>Benefits and Advantages</u>
<ul style="list-style-type: none"> ✘ Removal of upper sand surface by scraping disposal of cleaning. 	<ul style="list-style-type: none"> ✓ Backwash and fast rinse 10 - 15 min. and 2- 3 min. respectively. No chemicals for cleaning.
<ul style="list-style-type: none"> ✘ Periodic media replacement required. 	<ul style="list-style-type: none"> ✓ no media replacement for 7 to 10 years.
<ul style="list-style-type: none"> ✘ Labor intensive – Manual scraping only 	<ul style="list-style-type: none"> ✓ No surface scraping – no extensive labor required ✓ Manual or automatic Backwash
<ul style="list-style-type: none"> ✘ Expensive, Labor and time intensive 	<ul style="list-style-type: none"> ✓ Portable, Constructed off-site, depending also on size.
<ul style="list-style-type: none"> ✘ Substantial amounts of wastewater produced. Large amount of chemicals are used when mud-balls are produced. 	<ul style="list-style-type: none"> ✓ Negligible backwash water when cleaned. ✓ No cleaning chemicals are required.
<ul style="list-style-type: none"> ✘ Filter efficiency affected ✘ Filter capacity affected 	<ul style="list-style-type: none"> ✓ Filter capacity is not affected. Backwash maybe as frequently as required since media is very robust.

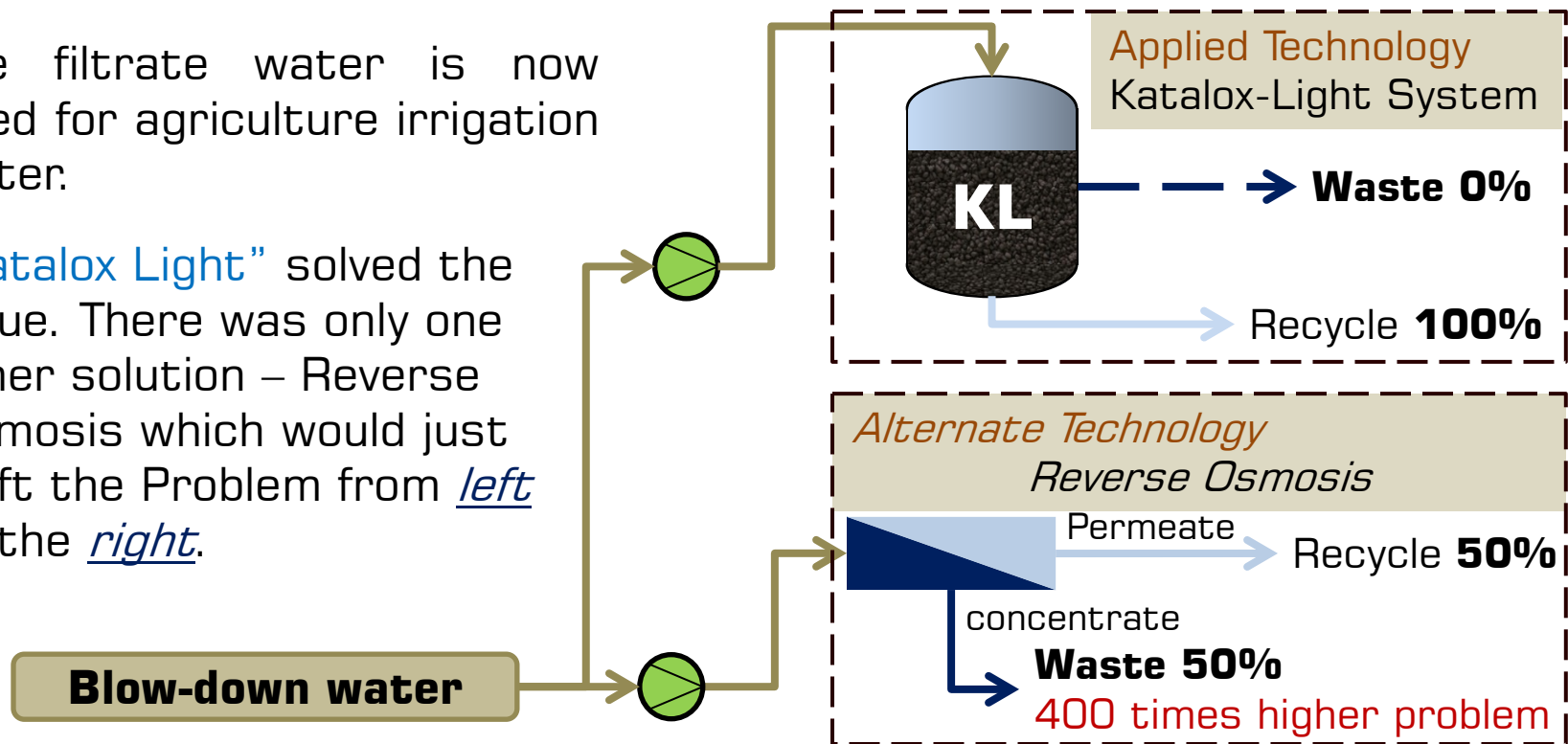
Method of Maintenance and Labor Requirements

Reference and Comparison

A South Korean car-manufacturer wanted to convert blow-down cooling water in to reusable irrigation water. After installation of Katalox-Light.

The filtrate water is now used for agriculture irrigation water.

“Katalox Light” solved the issue. There was only one other solution – Reverse Osmosis which would just shift the Problem from left to the right.



Katalox-Light performance

SUPER MASS LOADING CAPACITY !

Field Tested Loading Capacity:

30,000 to **50,000 mg** per **liter** of media (Unilever Ltd, Germany)

Loaded contaminants: TSS + TDS

HOW is that possible ?

Features	How it adds up to the media performance
ZEOSORB core	<ul style="list-style-type: none"> • Structural strength • Very high surface area • Hydrophilic surface • No Carcinogenic Compound
Highly porous media bed	<ul style="list-style-type: none"> • High loading capacity
Perfected Bulk density (<i>1060 kg/m³</i>)	<ul style="list-style-type: none"> • Reduced footprint for system design • Less water for media backwash • No extra pump
High content coating of Gamma MnO ₂ (<i>10% MnO₂ coating</i>)	<ul style="list-style-type: none"> • Aggravated catalytic reaction. • Highly reduced Chemical consumption • Negatively charged media surface provides better filtration • Long service life (withstand hydraulic abrasion)

Katalox-Light performance: Bench Test Data

Typical Values obtained from KL pilot test units and commissioned installations from various resources.

Data with relative high contamination concentrations are point of our interest for KL performance:

Contaminants	Inlet	Outlet	Relative reduction (%)	Location
Turbidity	20 NTU	1 NTU	95 %	Spain
TSS	302 mg/L	6 mg/L	98 %	China
Iron	130 mg/L	0.3 mg/L	99.8 %	Ireland
Manganese	24 mg/L	0.7 mg/L	97 %	Bulgaria
Arsenic	30 µg/L	5 µg/L	83 %	Bangladesh
COD _{cr}	293 mg/L	60 mg/L	79.5 %	China

Katalox-Light commissioned installation



Application: **Municipal Water Supply**

Location: **Thessaloniki, Greece**

Total flow rate: **1080 m³/h**

Katalox-Light Volume purchased: 54000 liters

Project Director: Dr. Ch. Papadopoulos

Result obtained:

Before Filtration in **µg/lit:**

Fe= 900

Mn= 360

After KL Filtration **µg/lit:**

Fe= 7

Mn= 17

Katalox-Light commissioned installation



Application: **Irrigation Water Supply**
Location: **California, USA**
Total flow rate: **200 m³/h**
Katalox-Light used: 11200 liters

Residential/Commercial:

Water Treatment companies use **Watch-Water**[®] treatment media and make equipment all across the USA, Canada, Mexico, Argentina, Japan, Korea, India and China.

Our experts work with European customers to design, manufacture and integrate Katalox Light systems for the removal of drinking water contaminants such as metals, organics and solids through the use of Katalox Light.

Municipal Water purification

Engineering and consulting firms working on Municipal drinking water purification projects can easily access Katalox Light specification documents for system design from **Watch-Water**[®] informative website.

Manufacturing of Katalox-Light

At our 7500 m² manufacturing plant, we fabricate Katalox Light, Catalytic media and INSTANT Dosing Chemicals.

Future Plans:

Catalytic Technology “Made in Germany” is making significant contribution to clean water. **Watch-Water**[®] Technology has been oriented very much towards international markets.

Over 90% of Katalox-Light is exported and the United States and Canada are the main importers.

The Katalox-Light filter can be used to filter out the **fine particles, colloids** and changing some of the **ions** to flocculants without clogging rapidly. Thus, all contaminants are trapped above the Katalox-Light and easily removed using backwash cycle which requires **less water** and shorter backwash sequence than any other traditional filters.

The end result is that this technology can remove particles, colloids and precipitate many dissolved salts while requiring 80% less water for backwash.

- We thank everyone for inviting us in this event and we are looking forward to discuss about how to proceed with water utilities
- We are always looking for:
 - A trial and a demonstration unit
 - Full scale installation is always good to achieve a great performance

Thank you for listening!

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Questions & Answers