



Green Water Treatment



About Us

Elgressy Engineering Services established in 1977, is an industry leader in electrochemical **GREEN** water treatment, with thousands of systems installed globally.



About Us

- » All our products are based on electrochemical technology
- » Our products are designed and build to eliminate or reduce dramatically the use of chemicals and improve operation and save money to our customers



Applications

Elgressy has thousands of successful systems installed worldwide.

« Our products are addressing variety of markets including:

Industries

Hotels

Refineries

Power stations

Office-buildings

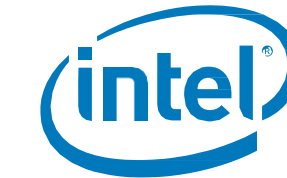
Shopping centers

Hospitals

Landfill leachate

Sewage water

Among our clients



Mercedes-Benz



HONDA



Applications & Elgressy Systems



EEO system for oily water treatment



CL system for chlorine production



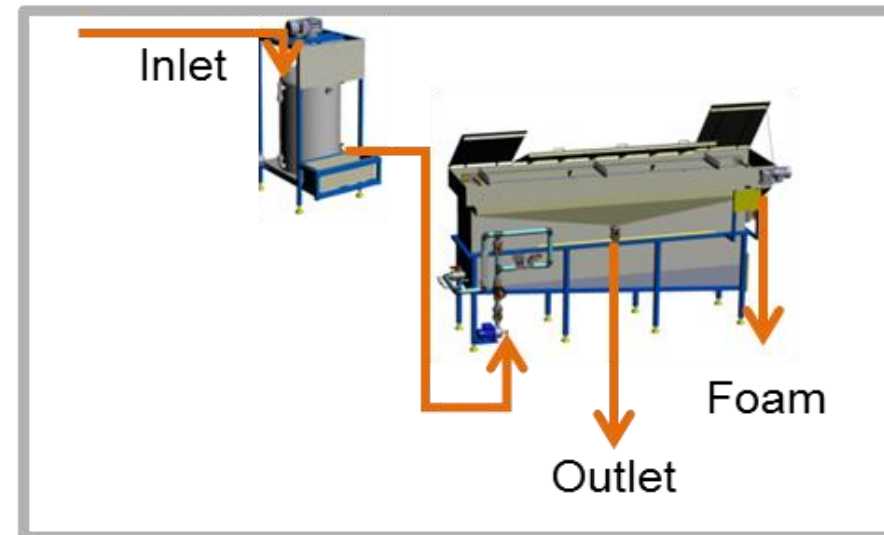
SWT- for the sewage cooling tower water treatment



EEC system for heavy metal removal



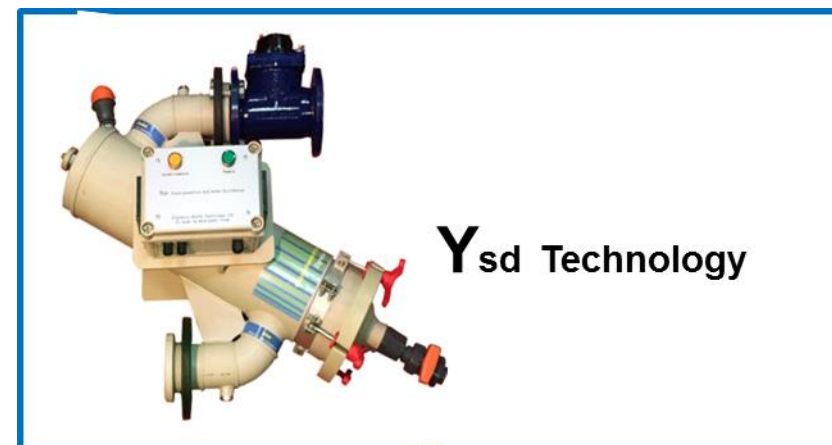
LPB system for the minimizing risk of Legionella bacteria



ART system for ammonia removal



EST system for cooling tower water treatment



water disinfection and scale prevention system designed for public buildings & Irrigation

Company's IP

« Israel EST patent

Cooling tower water treatment system

« USA EST patent

Cooling tower water treatment system

« Israel LPB patent

Minimizing the risk of Legionella system

« USA LPB patent

Minimizing the risk of Legionella system

« EUROPEAN LPB patent

Minimizing the risk of Legionella system

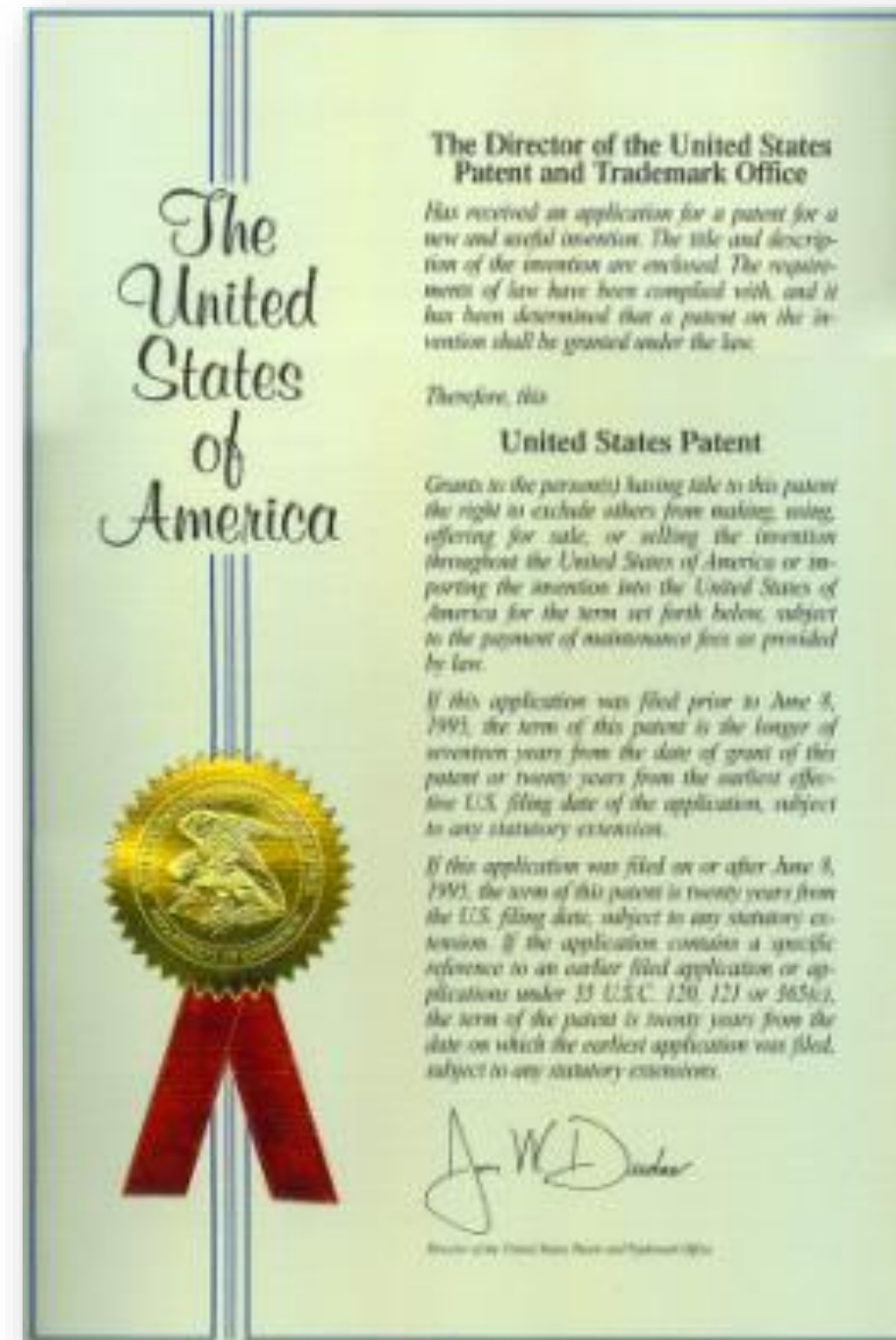
« USA SCP patent

Scale prevention system

« USA/Israel EEC patent

Electro Coagulation system

USA patent



Israel patent



Cooling Towers Treatment - EST

Cooling towers are one of the world biggest water consumer.

For example:

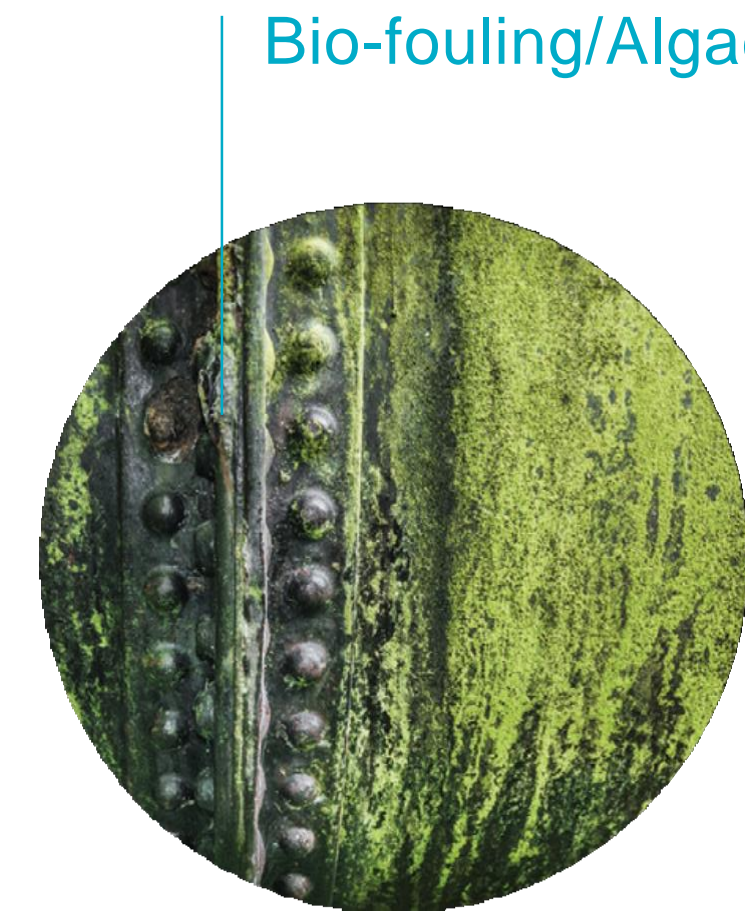
A 1,000 TR cooling tower consume 8 -10 m³/h.

2/3 is evaporated and 1/3 is being drained.

Cooling Towers Treatment - EST

Cooling Towers - problems

The 3 major problems cooling towers water are facing with are:



« **The conventional treatment for these problems up to date is chemicals (RO+ Chemicals or Softeners with Chemicals**

« **Our solution is based on a GREEN technology, environmentally friendly**

Cooling Towers Treatment - EST

How does it work?

Our **GREEN** solution is based on **electro-chemical** technology.

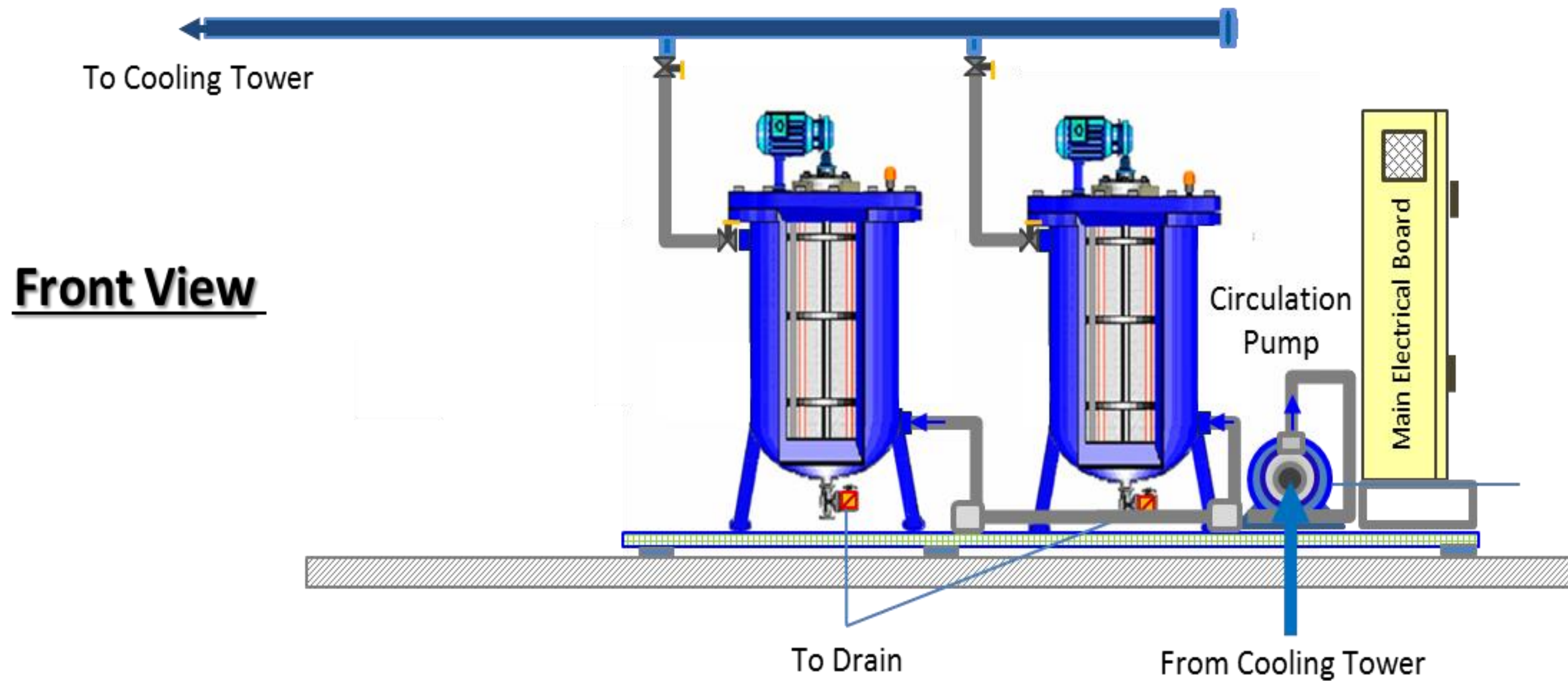
By using our EST system we enable:

- « The precipitation of the Scale on the EST reaction tank
- « Producing gases such as Oxygen, Chlorine, Ozone and other radical gases in the EST reaction tank for water disinfection
- « Convert free Chlorides to Chlorine for water Disinfection



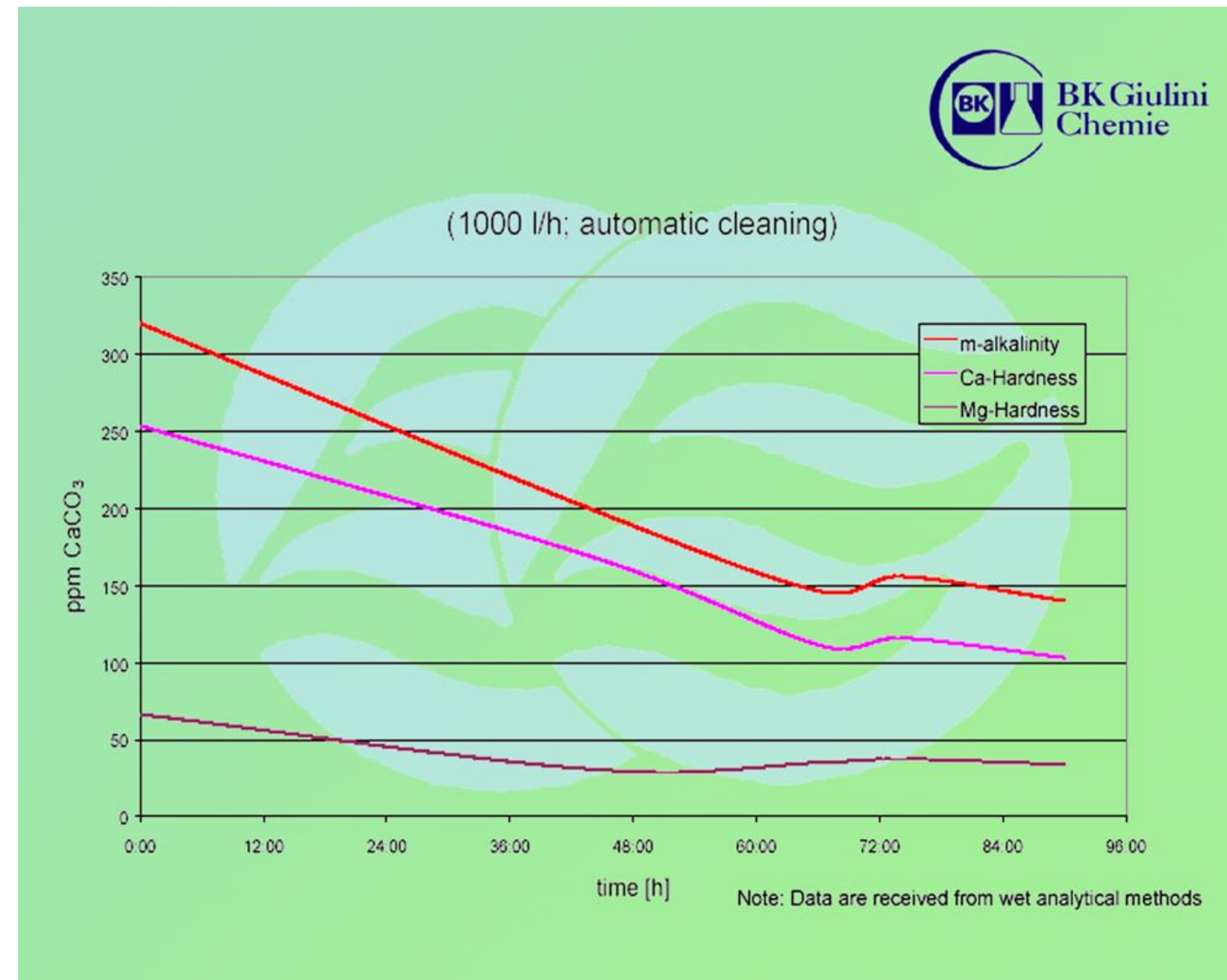
Cooling Towers Treatment – EST

A cross section of the EST system



Cooling Towers Treatment - EST

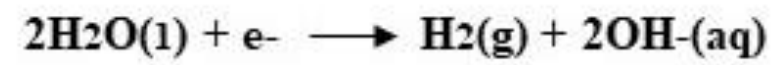
The effect of the EST on the CaH, Mg and Alkalinity



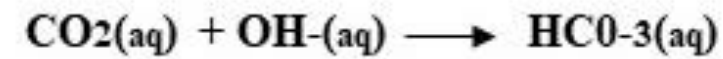
Cooling Towers Treatment – EST

Anodic & Cathodic Reactions

Cathodic reactions that are obtained near the inside tank (cathode):



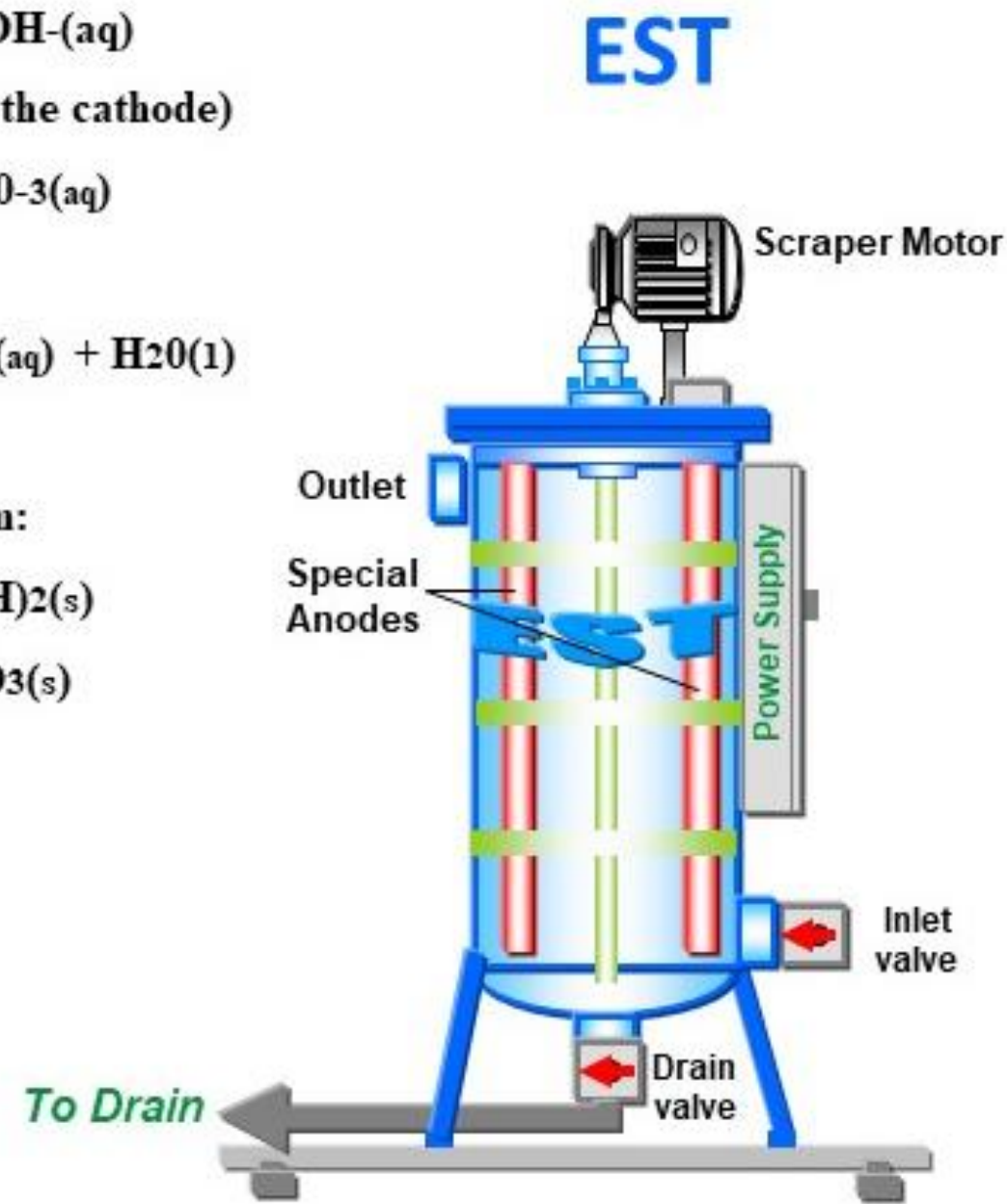
Reaction in alkaline solution (near the cathode)



$\text{Ca}^{2+}(aq)$ ions may form:

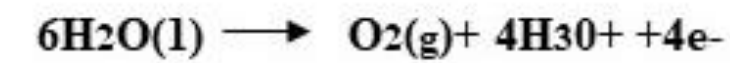
Calcium Hydroxide: $\text{Ca}(\text{OH})_2(s)$

Calcium Carbonate: $\text{CaCO}_3(s)$

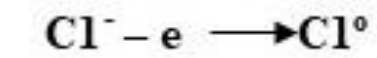


Anodic reactions that are obtained near the electrodes (anodes):

Oxygen



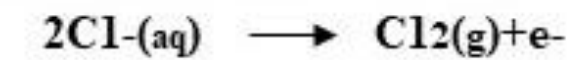
Radical Chlorine



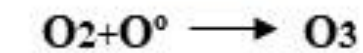
Chlorine Dioxide



Molecular Chlorine



Ozone



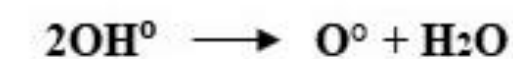
Radical OH^\bullet



Hydrogen



Radical Oxygen



Cooling Towers Treatment - EST

The Elgressy Solution

- » **Savings of up to 60% in annual operational treatment cost:**
 - » No need to use chemicals (chemical free solution!)
 - » Up to 60% saving water
 - » Up to 50% savings in labor costs
- » **System advantages**
 - » **Enable water re-use for irrigation**
 - » Exterior to the cooling tower – no changes needed in the cooling tower
 - » Very low life cycle cost and electricity consumption: ~250W per each EST system
 - » A fully automated & controlled system; use of pH meter, conductivity meter, constant current
 - » Special patented TiNiO electrodes: do not dissolve in the water, approved by Israeli standard #5452
 - » Small footprint
 - » Simple to install & operate



EST systems with a re-use water tank for irrigation

Cooling Towers Treatment - EST

Few sample references

« Automobile Industry

- « Mercedes Benz
- « Volvo
- « Toyota

« Chemical Industry

- « Kodak
- « Posco
- « Plasson

« Food industry

- « Mahou Beer, Spain
- « Minrav, Ashdod
- « Meat industry, China

« Hotels

- « Hilton
- « Sheraton
- « Club Med

« Shopping Centers

- « Azrieli
- « K mall, Ashdod
- « Espacio Leon, Spain

« Hospitals

- « Ichilov Tel Aviv
- « Rabin
- « Ziv, Zephath

« Institutions

- « UN - The Far East
- « US Embassy
- « Weitzman Institute

Cooling Towers Treatment - EST

Blue Star Polymer plant - China



Sannazzaro Refinery - Italy

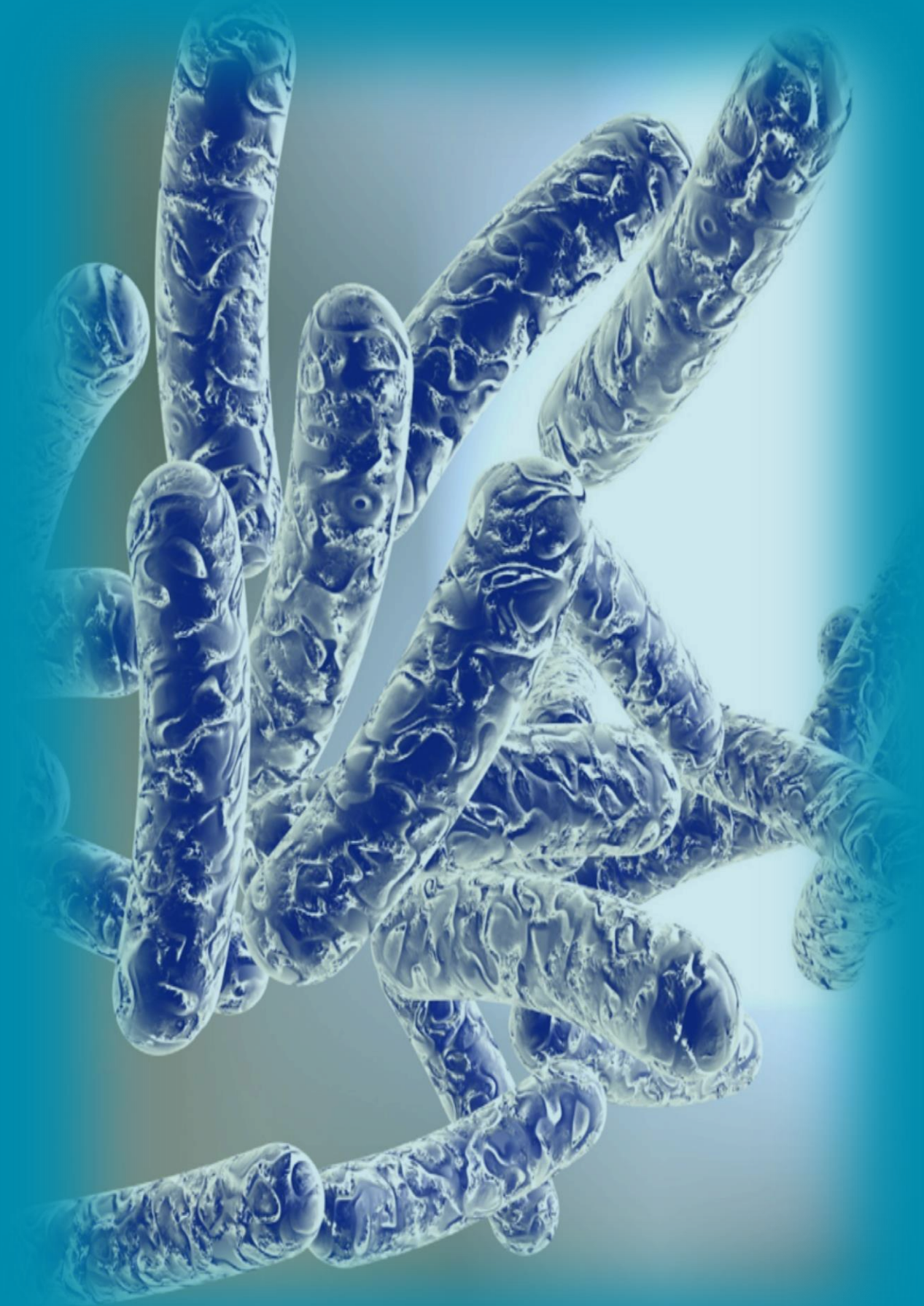


Disinfection of Well Water - Israel

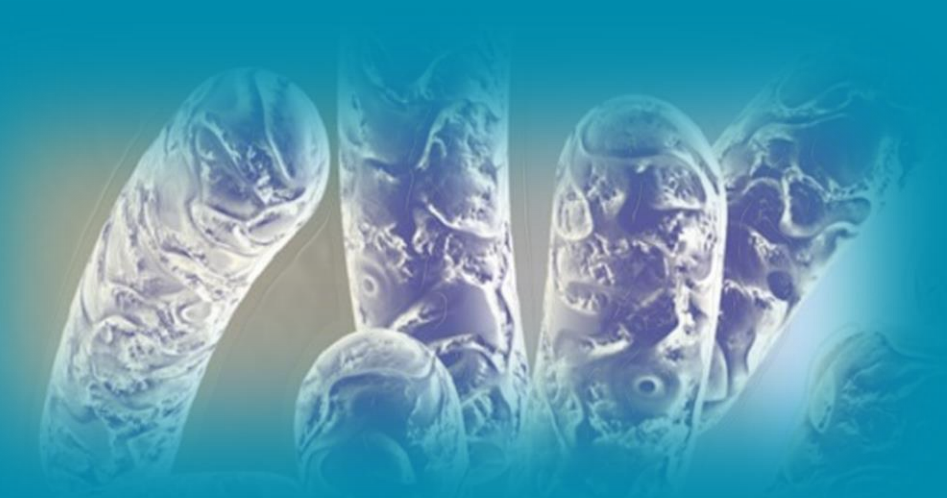


Minimizing the risk of Legionella Pneumophila bacteria in cold and hot water systems - **LPB**

Elgressy' patented **LPB** system, approved by the Spanish and Israel Ministries of Health, enable the automatic control and minimizing the risk of Legionella Pneumophila bacteria, in hot and cold-water systems



Minimizing the risk of Legionella Pneumophila and resilient bacteria - **LPB**

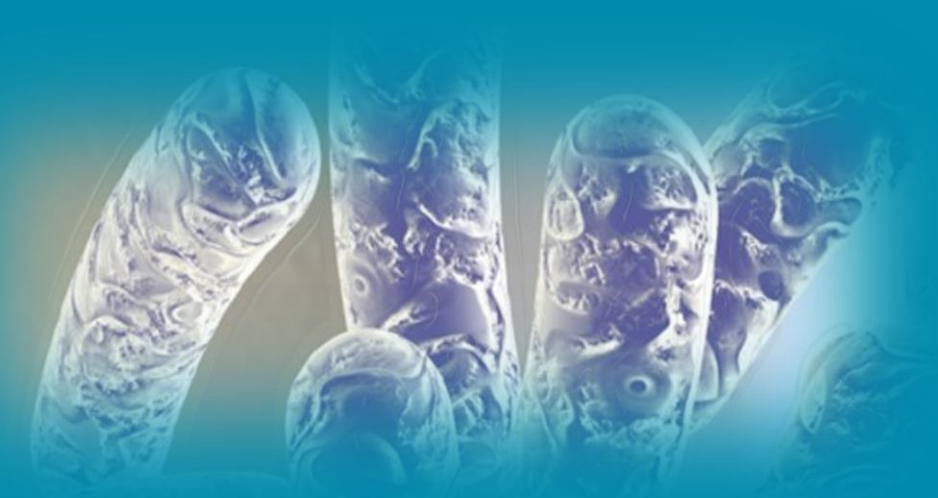


» *Legionella* is a bacteria that can kill people with low immune system and found in:

- » HVAC systems
- » Hot water systems
- » Cold water systems
- » Cooling towers
- » Evaporative condensers
- » Pools & spa

» Traditional treatment against Legionella is based on **Chlorine Dioxide** dosing, which is **dangerous, expensive and non effective in hot water systems.**

Minimizing of Legionella Pneumophila and resilient bacteria - **LPB**



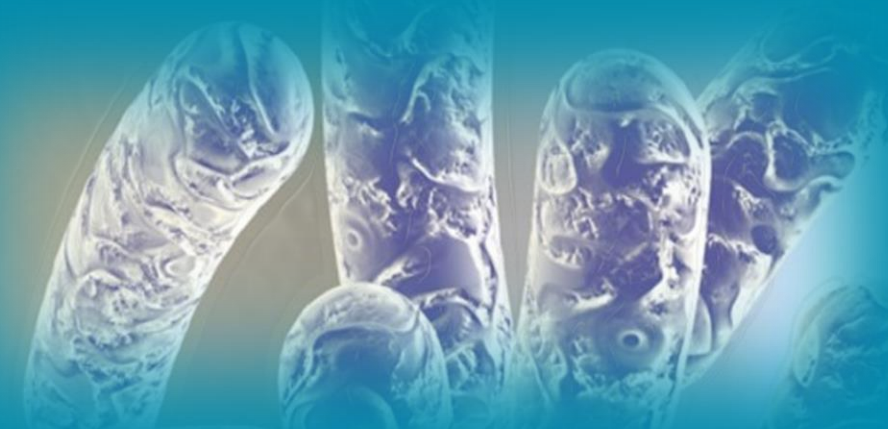
Elgressy solution is based on an **electro-chemical** technology - **chemical-free**

How does it work?

By Using our LPB system we enable:

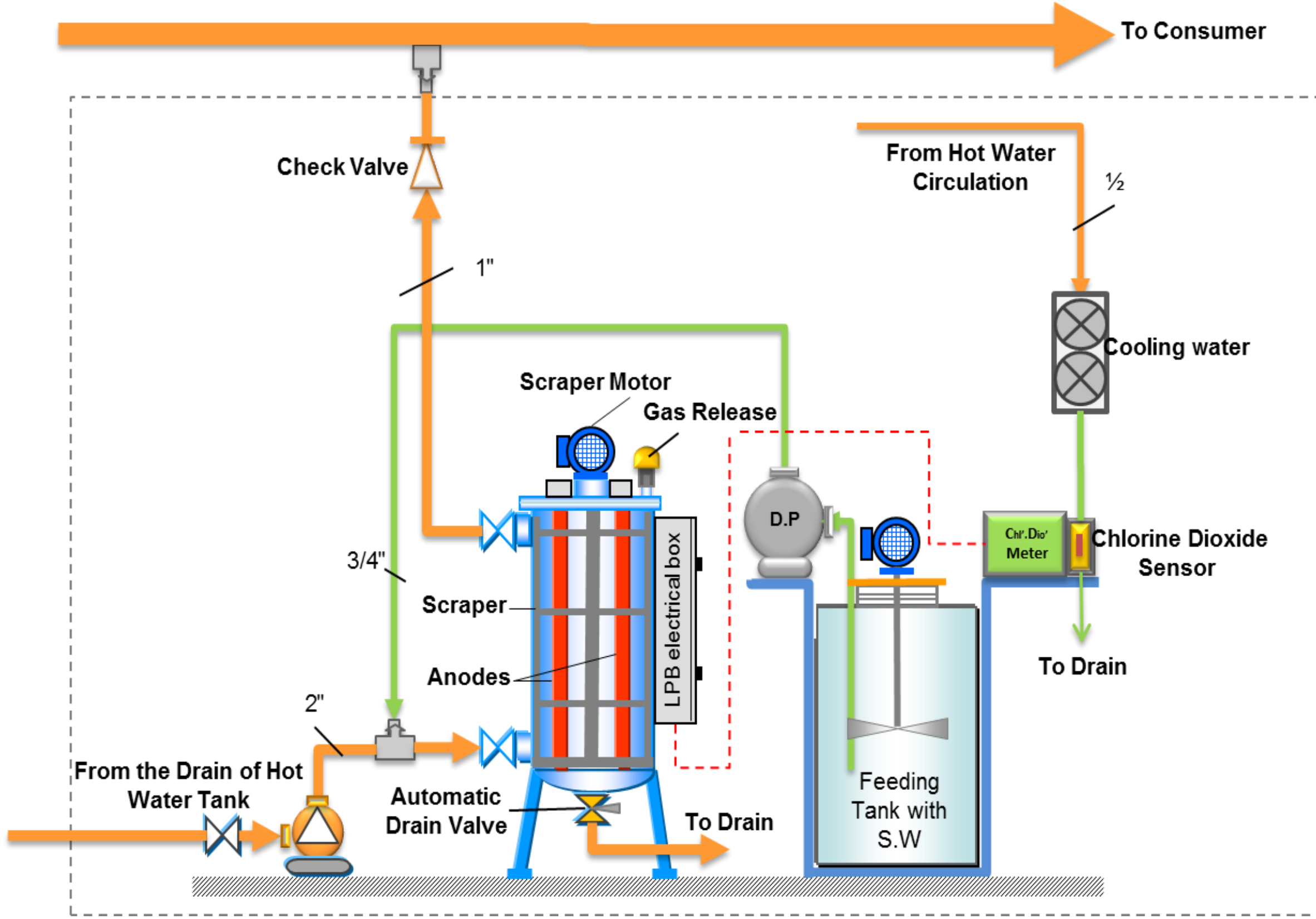
- » Continuous on site production of Chlorine Dioxide inside the LPB reaction tank, by producing oxygen, ozone, chlorine & other radical gases
- » No need to deliver and store dangerous chemicals
- » Continuous measurement and control of the system: using **online** chlorine dioxide meter



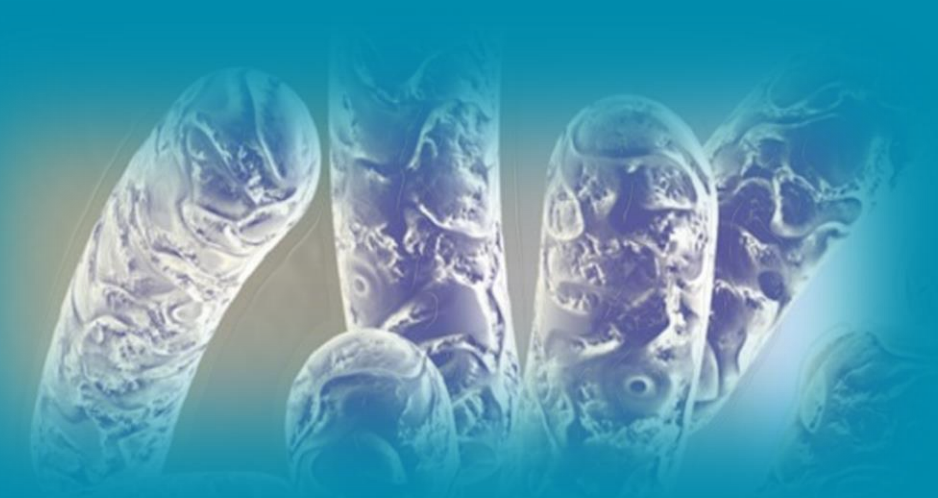


Minimizing the risk of Legionella Pneumophila and resilient bacteria - **LPB**

A connection sketch of the LPB in hot water system



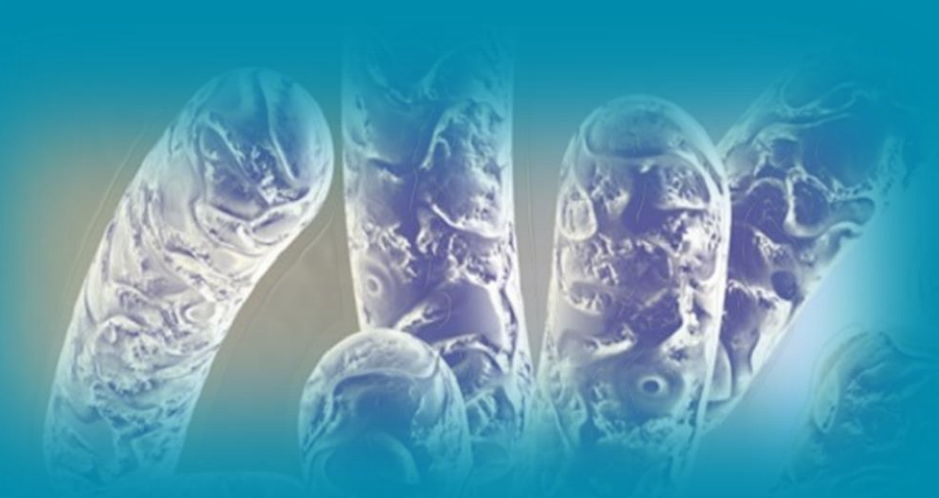
Minimizing the risk of Legionella Pneumophila and resilient bacteria - **LPB**



Advantages:

- » Patented technology
- » Free, safe and ecological
- » Use of non-water-soluble electrodes (TINIO) approved for drinking water by the Israel Standards Institute and the Ministry of Health
- » Cost effective
- » Does not cause corrosion
- » Low operational and maintenance requirements
- » Long equipment lifetime

Minimizing the risk of Legionella Pneumophila and resilient bacteria - LPB



Limoges University Case Study Result

“Experiments implemented during this year have confirmed the results of the bactericidal effect of LPB system from the previous year . More optimal conditions for use of the driver were approached through an extensive study on the initial concentration of chloride. Indeed, it was here to discover the concentration of salt added to the solution in order to meet the standards of free chlorine concentration (residual free chlorine at the end of the network must be at least 0.2 mg / L, there is no upper limit) , the organoleptic properties of water and to obtain a more satisfactory bactericidal effect .

The use of different microorganisms showed the very good efficiency of the system on LPB and forming bacteria but also with the addition of this salt more or less important.

LPB electrolytic system is an apparatus for biological treatment which is competent , satisfactory and easy to use size . Moreover, it fits perfectly in environmental policy , it is environmentally friendly and emits no harmful substance.”



Conclusion

Les différentes méthodes mises en œuvres ont permis d'aboutir à des éléments de réponses quant à l'effet bactéricide du système LPB. L'étude menée a également apporté des éléments sur les conditions nécessaires à une implantation du LPB dans un réseau d'eaux chaudes sanitaires en France.

Un effet bactéricide total a été observé de manière claire dans les conditions préconisées par l'entreprise. La non-efficacité du système, sans ajout de sel au cours de l'expérience, nous amène à conclure que le système nécessite une concentration minimale en chlorure pour fonctionner correctement.

Le système apparaît, au terme de cette étude, être un très bon moyen économique, pratique et écologique de tuer les bactéries testées, dans les conditions optimales d'expérimentation. Si les manipulations effectuées n'ont pas permis de déterminer la part de bactéricidie imputable aux différentes espèces produites, elles ont en revanche mis en avant qu'une injection de sel est nécessaire au bon fonctionnement du LPB qui serait implanté dans un réseau d'eaux chaudes sanitaires.

Afin de confirmer ces résultats de nouvelles expériences sur d'autres bactéries comme les légionelles seraient utiles. Une étude du comportement du LPB réalisée avec des eaux à des températures de 45°C-55°C donnerait une idée plus précise de l'efficacité du système dans ses conditions d'application réelles. Enfin il pourrait être envisageable de tester l'efficacité de l'ensemble des espèces, produites par le procédé sur le bio film qui se développe dans les canalisations.

Minimizing the risk of Legionella Pneumophila and resilient bacteria - LPB



Assaf Harofe Hospital, Israel Case Study Result

“Table 3 summarizes *Legionella Pneumophila* bacteria results measured in different sites of Assaf Harofeh Hospital hot water system. It is seen that during the one-year period no Legionella bacteria was found at the outlet of LPB electrochemical system, while at the inlet of LPB system from July 14 through August 8 2003, *Legionella* bacteria of serogroup number 3 was found.”

Date	A Tap water	B LPB inlet	C LPB outlet	D Air drain	Hot water tank No. 1	Hot water tank No. 2	Hot water tank No. 3	Hot water tank No. 5	From the bar
25.05.03	NF	NF	NF	NF	NF	NF	NF	NF	
9.06.03	NF	NF	NF	NF				NF	
29.06.03			NF	NF	NF			30,000 (2-14)	90,000 (3)
14.07.03		10,000 (3)	NF	NF				10,000 (3)	1,200 (3)
27.07.03		200 (3)	NF	100,000(3,6,7)				10,000 (3)	300 (3)
7.08.03		10,000 (3)	NF	10,000 (3,6)	70,000 (3)			10,000 (3)	20,000 (3)
21.08.03	20,000*	NF	NF	1,600 (3)					
14.09.03		NF	NF	NF				800 (3)	
29.09.03		NF	NF	6,500 (3)				NF	
23.10.03		NF	NF	NF				NF	
9.11.03		NF	NF	100,000 (3)				NF	
30.1.03		NF	NF	30,000 (3)				NF	
17.12.03		NF	NF	NF	NF	NF	NF	NF	
8.01.04		NF	NF	NF			NF	NF	
25.01.04		NF	NF	NF				NF	
8.02.04		NF	NF	NF	NF			NF	
25.02.04		NF	NF	NF				NF	
14.03.03		NF	NF	NF			NF	NF	
14.04.04		NF	NF	NF			NF	NF	NF
29.04.04		NF	NF	NF		NF		NF	
13.05.04		NF	NF	NF				NF	NF

* - Legionella pneumophila, bozemanii, anisa, longbeachae
 () - Bacteria serogroup number

Minimizing the risk of Legionella Pneumophila and resilient bacteria - LPB



Spanish Health Ministry Case Study Result

MINISTERIO DE SANIDAD Y CONSUMO
INSTITUTO NACIONAL DEL CONSUMO
CENTRO DE INVESTIGACIÓN Y CONTROL DE LA CALIDAD

TRANSLATION

DISINFESTATION EFFICIENCY STUDY OF THE PHYSICAL-CHEMICAL SYSTEM "ELGRESSY" CARRIED OUT UPON THE REQUEST OF THE SUBDIRECTORATE OF ENVIRONMENTAL HEALTH OF THE MINISTRY OF CONSUMER AFFAIRS REQUESTED BY FUNDACIÓN BIOMA

MINISTERIO DE SANIDAD Y CONSUMO
INSTITUTO NACIONAL DEL CONSUMO
CENTRO DE INVESTIGACIÓN Y CONTROL DE LA CALIDAD

CONCLUSIONS

The physical-chemical system under this study called "Elgressy" which appears described hereinabove has shown on the micro-organisms studied and under the laboratory conditions described hereinabove its disinfection capacity.

This report has been issued in Madrid on this 30th April 2004 upon the request of FUNDACIÓN BIOMA and for the sole purpose of using these results according to the purpose of the FOUNDATION under the protectorate of the Ministry of the Environment.



TABLES OF RESULTS

The data is in ufc/ml of water

	Sample 1	Sample 2	Sample 3	Sample 4
Sample	5.0×10^6	3.4×10^6	1.6×10^7	1.2×10^7
24 hour control*	1.2×10^7	2.4×10^7	2.4×10^6	1.0×10^7
10 minutes	2.8×10^6	1.8×10^6	9.0×10^6	---
30 minutes	1.2×10^6	1.4×10^6	8.0×10^6	5.7×10^6
1 hour	1.3×10^7	5.2×10^7	2.5×10^7	3.2×10^7
2 hours	8.0×10^4	9.2×10^4	2.0×10^4	3.0×10^6
3 hours	3.5×10^1	6.4×10^4	3.0×10^1	1.7×10^6

	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample 10
Sample	1.3×10^7	9.7×10^7	8.0×10^6	6.0×10^6	1.9×10^6	1.9×10^7
24 hour control*	1.2×10^7	1.0×10^7	9.8×10^6	9.7×10^7	2.5×10^6	2.1×10^7
1 hour	3.1×10^6	8.0×10^6	2.7×10^6	1.7×10^6	4.5×10^5	5.3×10^6
2 hours	2.4×10^6	5.7×10^6	1.7×10^6	4.1×10^5	3.7×10^5	3.9×10^6
3 hours	1.6×10^6	4.4×10^6	5.0×10^5	9.4×10^5	2.4×10^5	2.0×10^6
4 hours	5.7×10^5	3.2×10^6	1.0×10^7	1.0×10^6	1.2×10^7	9.9×10^5
5 hours	9.1×10^4	---	4.0×10^1	2.2×10^7	9.5×10^4	3.2×10^5
6 hours	---	---	---	---	---	4.8×10^5

	Sample 11	Sample 12	Sample 13	Sample 14	Sample 15
Sample	6.8×10^6	7.9×10^6	1.4×10^7	9.3×10^6	4.1×10^6
24 hour control*	4.0×10^7	2.3×10^7	1.1×10^{10}	2.2×10^8	3.0×10^8
1 hour	6.0×10^6	6.5×10^6	1.0×10^7	4.8×10^6	2.5×10^6
2 hours	3.0×10^6	3.5×10^6	9.2×10^6	3.5×10^6	3.9×10^6
3 hours	2.3×10^6	2.6×10^6	6.4×10^6	3.3×10^6	3.7×10^6
4 hours	1.3×10^6	7.1×10^5	5.3×10^6	2.8×10^6	3.0×10^6
5 hours	3.3×10^5	8.2×10^4	4.4×10^6	2.0×10^6	3.0×10^6
6 hours	1.8×10^4	9.2×10^1	4.2×10^6	1.5×10^6	1.4×10^6
24 hours	<10	5.2×10^1	3.5×10^4	3.0×10^4	5.2×10^2
48 hours				<1	<1

* Control + of the sample kept at room temperature for 24 hours

Corrosion Prevention -

E.CP

The growing usage of desalination water over the past few years, causes corrosion in the pipeline and “red water” phenomenon.

E.CP is an effective and innovative electrolysis technology developed to protect the inner surfaces of hot and cold-water pipes and tanks against corrosion and scale.

Corrosion prevention – E.CP

Corrosion and scale lead to increased operational problems, reduced system life expectancy and increased energy consumption

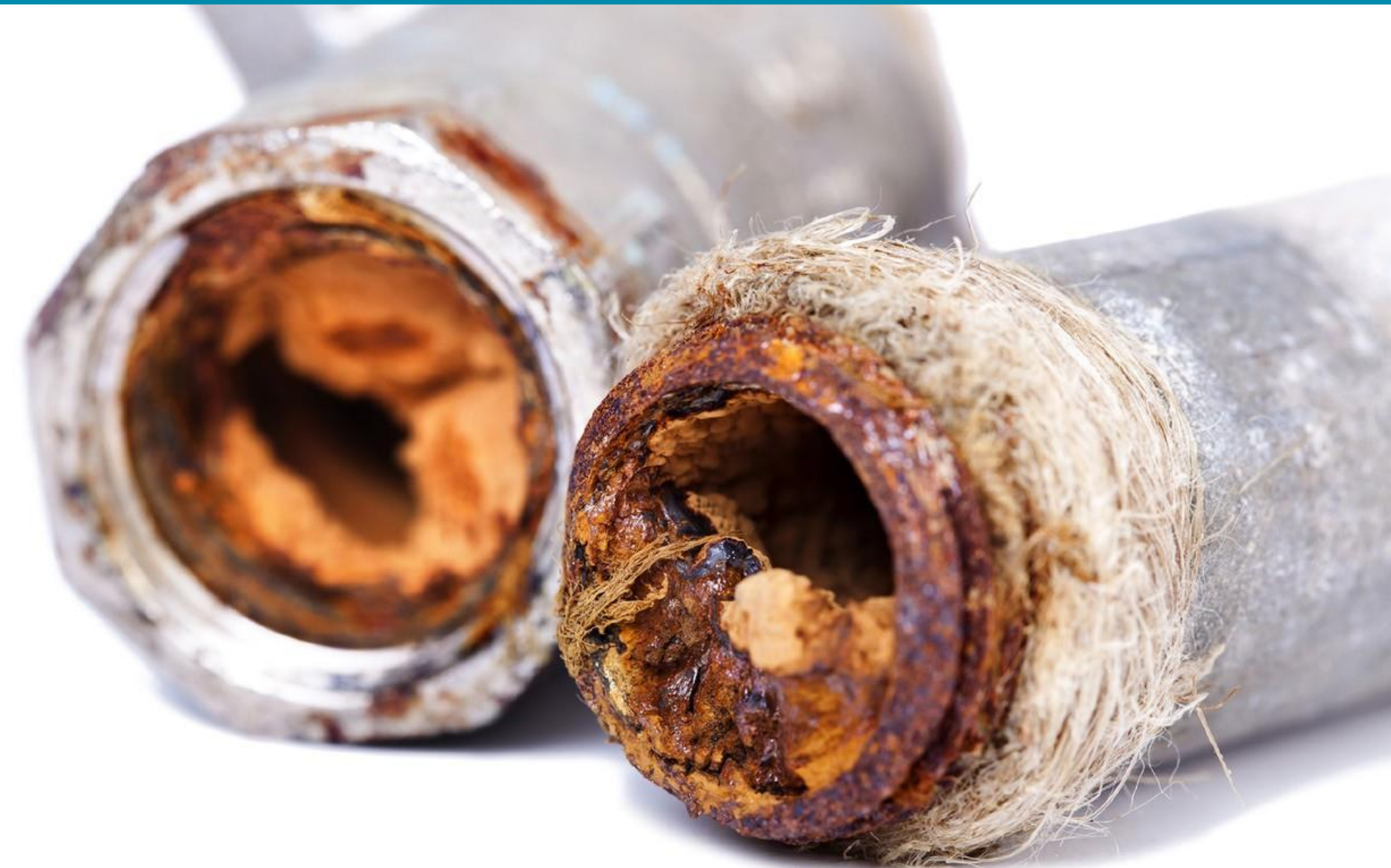
Corroded pipe without treatment



Corroded pipe with treatment



Treated pipe (from the 1st day of operation)



There isn't ANY chemical solution for treating corrosion in drinking water systems

Our solution is based on a GREEN technology, environmentally friendly, suitable for drinking water systems

Corrosion prevention – E.CP

A phenomenon of “red water” as a result of corrosion in the water pipe



Corrosion prevention – E.CP

Corrosion in the Israeli Police Officers Institute

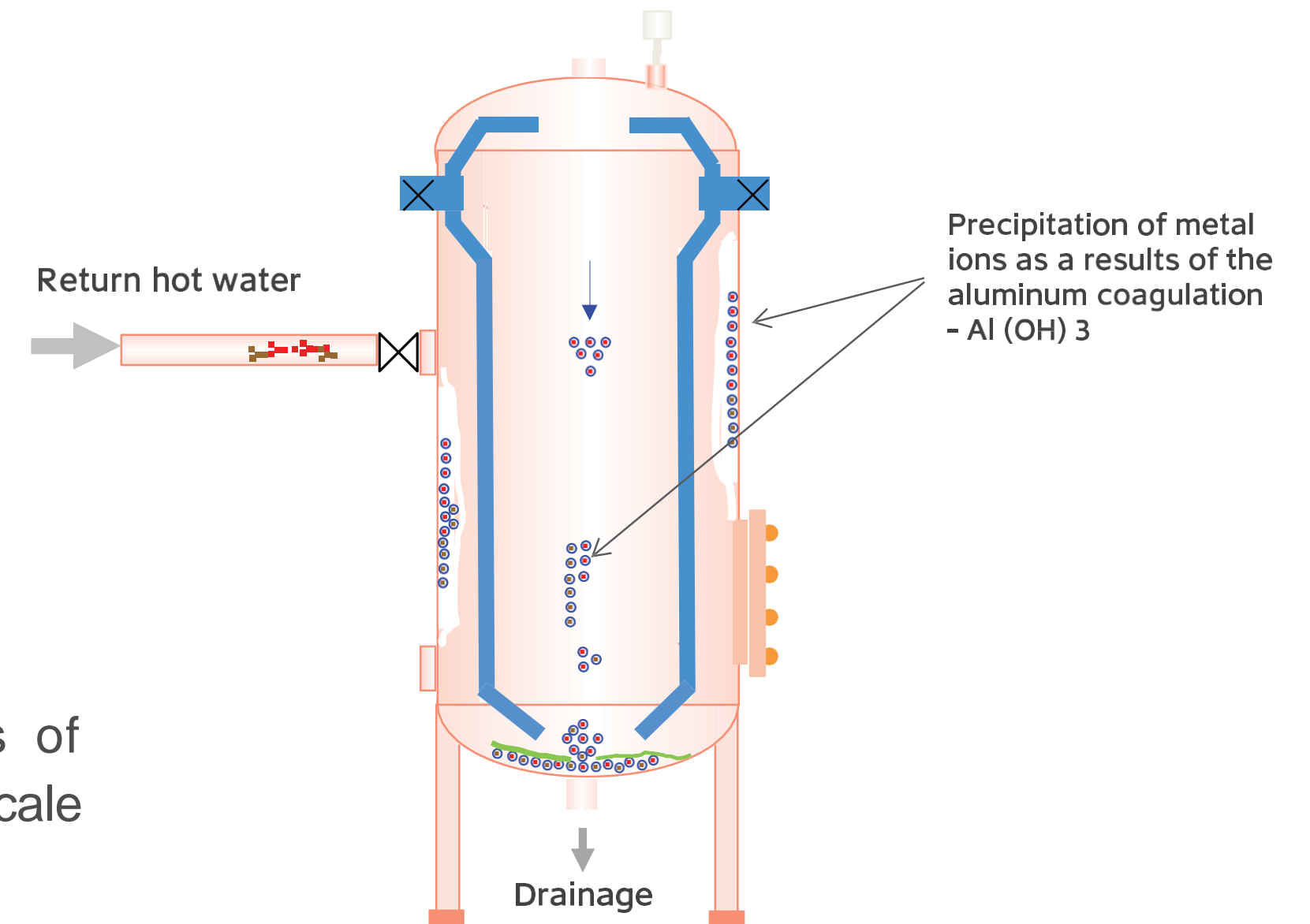


Corrosion prevention - ECP

How does it work?

- » A combination of a constant current and a sacrificial aluminum anodes, release aluminum hydroxide - $\text{Al}(\text{OH})_3$
- » The aluminum compounds form a homogeneous up to 0.2mm thick protective layer on all internal pipe surfaces
- » The aluminum hydroxide is not built on itself and therefore does not cause the pipe clog by Aluminum or corrosion
- » The aluminum hydroxide is compounded with zinc and doesn't allow corrosion to continue to develop
- » The aluminum protective layer shields the system from the effects of corrosion, prevents the spread of existing corrosion and prevents scale build-up

Elgressy solution is based on an **electro-chemical** technology - **chemical-free**



Corrosion prevention - E.CP

Advantages:

- » **Chemical Free solution**
- » Results in short time
- » The system can be installed in hot and cold-water systems and is effective in water tanks and all kind of pipes: galvanized, plastic or copper
- » Prevention and Correction - The E.CP system prevents corrosion effects of corrosion already present in the system
- » Safe drinking water - no adverse effect on drinking water quality or taste
- » Low operational cost - low energy use
- » Cost effective - prevents pipe and water tank damage as well as pipe blockages

Contaminants Removal – EEC/EEO

Elgressy electrocoagulation and oxidation systems efficiently separate and remove contaminants from water, without using chemical additives, or generating hazardous byproducts.



Contaminants Removal – EEC/EEO



Our Solution

By using our advance Electro Coagulation process we enable:

- » Re-use of the water for irrigation, thus saving water
- » Allows drainage of water according to environmental requirements
- » Reduce dramatically the amount of required coagulants
- » Reduce dramatically the retention time
- » Reduce dramatically the required space
- » Fully automatic process



Contaminants Removal – EEC/EEO



Applications

- » Metal processing industry
- » Dye industry
- » Food industry
- » Drinking water industry
- » Landfill Leachate
- » Sewage treatment
- » Paint industry
- » Printing/Ink industry
- » Car and Track wash

Leachate treatment system in China



Silica removal results after EEC



Cooling water of iron production in Izmir- Turkey



Leachate treatment system in Belem- Brazil

Contaminants Removal – EEC/EEO



Landfill Leachate On Site Pilot in China

1 →



leachate sample before treatment

2 →



EEC pilot system on site at a landfill leachate site

3 →



Coagulation of the leachate water after the EEC system treatment

4 →



leachate after EEC treatment before filtration

5 →



leachate sample after the EEC treatment and filtration

Contaminants Removal – EEC/EEO



EEC & EEO Pilot at Elgressy Factory

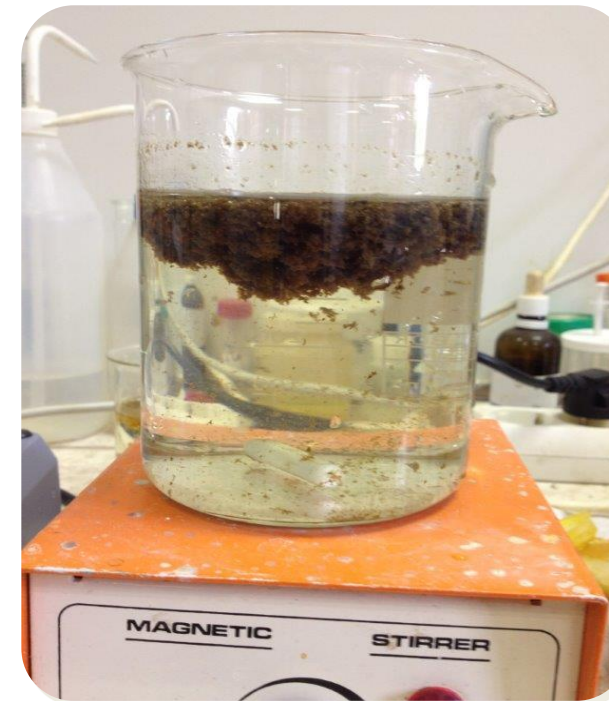
Sample which was sent to Elgressy



With EEC



With EEO and EEC



Contaminants Removal – EEC/EEO



The calculation of current density, electrodes weight and EEC system size

חישוב צפיפות זרם - משקל אלקטרודות - זמני החלפת אלקטרודות								
צפיפות זרם A/dm ²	צפיפות זרם A/m ²	שטח אנודה כללי/dm ²	שטח אנודה כללי/מ"ר	זרם חשמלי A	שטח אנודה/dm ²	שטח אנודה/מ"ר	שטח אנודה/ס"מ	צפיפויות זרם
1.60	160.00	1,250	13	2,000	12.5	0.125	25 * 50	
					סה"כ משקל האנודות בתא /Kg	משקל אנודה 1 /Kg	כמות האנודות בתא	משקל
					400	4	100	אנודות
					אורך התא/ס"מ	מרחק בין האלקטרודות/מ"מ	עובי אלקטרודה/מ"מ	אורך התא
					1000	5	5	
					ימי עיקול האנודות	צריכת אנודות יומית/Kg	צריכת אלקטרודות שנתית	זמן עיקול האנודות
					18.2500	21.9178	8,000	

Contaminants Removal – EEC/EEO



Experience and knowhow:

- « Elgressy EEC and EEO systems are a tailor-made electrocoagulation and electro-oxidation systems.
- « The systems are based on technologies in use for hundreds of years, while using our massive field experience to optimize the technologies into a successful systems.

Revolutionizing water treatment:

- « Each system is tailored-made based on every project specifications, the application needs and the substances required to be removed.
- « The EEC and EEO systems contain patented electrodes, designed and manufactured in Elgressy' factory.
- « The EEC and EEO systems is capable of treating wastewater, leachate, removing heavy metals, silica, ammonia, nitrates, nitrites, phosphates, emulsified oils, suspended solids, solid particles, dye, arsenic, radioactive isotopes and etc'.



Contaminants Removal – EEC/EEO

Lab Results



Parâmetro	Parameter	unidade	AM1	AM2	Removal Efficiency	AM6	Removal Efficiency	AM7	Removal Efficiency	AM8	Removal Efficiency	AM9	Removal Efficiency	AM10	Removal Efficiency	AM11
Laudo	Report	#	9947	9948		9949		9950		9951		9952		9953		9954
data	date		01/08/2018	01/08/2018		01/08/2018		01/08/2018		01/08/2018		02/08/2018		02/08/2018		02/08/2018
teste	test		Raw leachate; pH=7;	Ti + Al + Fe electrodes; pH=7;		Ti + Al electrodes; pH=5;		Al electrode; pH=5;		Al electrode; pH=4;		Al + Fe electrodes; pH=4;		Ti + Al + Fe electrodes; pH=4;		Raw leachate; pH=4;
pH	pH		7.6	8.76		7.87		7.49		7.25		6.84		8.17		4.52
Condutividade	Conductivity	µS/cm	23400	22250	4.91%	24450	-4.49%	21330	8.85%	21620	7.61%	22040	4.17%	22210	3.43%	23000
DBO	BOD	mg/L	1099	762	30.66%	628	42.86%	448	59.24%	411	62.60%	448	57.58%	430	59.28%	1056
DQO	COD	mg/L	2595	1925	25.82%	1615	37.76%	1345	48.17%	1290	50.29%	1355	44.24%	1110	54.32%	2430
Amônia (como NH3)	Ammonia (as NH3)	mg/L	2267.63	2249.39	0.80%	2322.34	-2.41%	1981.89	12.60%	1957.57	13.67%	2407.45	-8.79%	2377.06	-7.42%	2212.91
Turbidez	Turbidity	NTU	25	266	-964.00%	16.7	33.20%	51.8	-107.20%	32.1	-28.40%	1777	-284.63%	153	66.88%	462
Sólidos Suspensos Totais	Total Suspended Solids	mg/L	116	270	-132.76%	104	10.34%	92	20.69%	< 5	95.69%	472	-32.58%	168	52.81%	356
Alumínio	Aluminum	mg/L	1.071	1.325	-23.72%	6.944	-548.37%	6.377	-495.42%	9.682	-804.01%	8.544	-98.79%	8.798	-104.70%	4.298
Antimônio	Antimony	mg/L	< 0,005	< 0,005	-	< 0,005	-	< 0,005	-	< 0,005	-	< 0,005	-	< 0,005	-	< 0,005
Arsênio	Arsenic	mg/L	0.037	0.036	2.70%	0.029	21.62%	0.041	-10.81%	0.03	18.92%	0.019	72.06%	0.024	64.71%	0.068
Bário	Barium	mg/L	0.015	0.06	-300.00%	0.013	13.33%	< 0,012	20.00%	< 0,012	20.00%	< 0,012	7.69%	< 0,012	7.69%	0.013
Berílio	Beryllium	mg/L	< 0,009	< 0,009	-	< 0,009	-	< 0,009	-	< 0,009	-	< 0,009	-	< 0,009	-	< 0,009
Boro	Boron	mg/L	1.44	1.362	5.42%	1.215	15.63%	1.206	16.25%	1.208	16.11%	1.263	1.71%	1.142	11.13%	1.285
Cádmio	Cadmium	mg/L	< 0,0010	0.001	-	< 0,0010	-	< 0,0010	-	< 0,0010	-	< 0,0010	-	< 0,0010	-	< 0,0010
Cálcio	Calcium	mg/L	129.2	91.49	29.19%	85.34	33.95%	69.49	46.22%	76.63	40.69%	83.29	7.93%	73.92	18.28%	90.46
Chumbo	Lead	mg/L	< 0,010	< 0,010	-	< 0,010	-	< 0,010	-	< 0,010	-	< 0,010	-	< 0,010	-	< 0,010
Cobalto	Cobalt	mg/L	0.024	0.022	8.33%	0.018	25.00%	0.011	54.17%	0.009	62.50%	0.036	-71.43%	0.011	47.62%	0.021
Cobre	Copper	mg/L	0.022	< 0,004	81.82%	0.026	-18.18%	0.018	18.18%	0.007	68.18%	< 0,004	-	< 0,004	-	< 0,004
Cromo	Chromium	mg/L	0.17	< 0,007	95.88%	0.068	60.00%	0.083	51.18%	0.056	67.06%	0.08	60.00%	0.073	63.50%	0.2
Estanho	Tin	mg/L	0.066	0.22	-233.33%	0.033	50.00%	0.026	60.61%	0.023	65.15%	0.021	32.26%	0.025	19.35%	0.031
Ferro	Iron	mg/L	5.856	4.574	21.89%	0.726	87.60%	1.043	82.19%	1.585	72.93%	149.8	-2135.49%	18.49	-175.93%	6.701
Fósforo	Phosphorus	mg/L	15.74	12.41	21.16%	0.491	96.88%	0.36	97.71%	0.326	97.93%	0.669	94.79%	0.424	96.70%	12.84
Lítio	Lithium	mg/L	0.083	0.08	3.61%	0.066	20.48%	0.055	33.73%	0.058	30.12%	0.066	7.04%	0.047	33.80%	0.071
Magnésio	Magnesium	mg/L	133.1	95.89	27.96%	87.92	33.94%	80.62	39.43%	84.71	36.36%	89.96	3.47%	76.58	17.82%	93.19
Manganês	Manganese	mg/L	0.324	0.226	30.25%	0.143	55.86%	0.179	44.75%	0.236	27.16%	6.947	-2254.92%	2.61	-784.75%	0.295
Mercúrio	Mercury	mg/L	< 0,005	< 0,005	-	< 0,005	-	< 0,005	-	< 0,005	-	< 0,005	-	< 0,005	-	< 0,005
Molibdênio	Molybdenum	mg/L	0.009	0.011	-22.22%	0.01	-11.11%	0.006	33.33%	0.006	33.33%	< 0,004	-233.33%	0.009	25.00%	0.012
Níquel	Nickel	mg/L	0.128	< 0,003	97.66%	< 0,003	97.66%	< 0,003	97.66%	< 0,003	97.66%	< 0,003	-	< 0,003	-	< 0,003
Potássio	Potassium	mg/L	1696	1388	18.16%	1438	15.21%	1223	27.89%	1247	26.47%	1312	-6.67%	1312	-6.67%	1230
Prata	Silver	mg/L	< 0,005	< 0,005	-	< 0,005	-	< 0,005	-	< 0,005	-	< 0,005	-	< 0,005	-	< 0,005
Selênio	Selenium	mg/L	< 0,004	< 0,004	-	< 0,004	-	< 0,004	-	< 0,004	-	< 0,004	-	< 0,004	-	< 0,004
Silício	Silicon	mg/L	28.53	26.49	7.15%	4.464	84.35%	5.856	79.47%	6.137	78.49%	7.881	66.96%	3.318	86.09%	23.85
Sódio	Sodium	mg/L	1337	1247	6.73%	1308	2.17%	1115	16.60%	1119	16.31%	1184	-9.33%	1152	-6.37%	1083
Vanádio	Vanadium	mg/L	0.033	0.035	-6.06%	< 0,009	72.73%	0.018	45.45%	0.022	33.33%	0.02	37.50%	< 0,009	71.88%	0.032
Zinco	Zinc	mg/L	0.112	0.446	-298.21%	0.047	58.04%	0.044	60.71%	0.03	73.21%	0.035	73.08%	0.019	85.38%	0.13

Contaminants Removal – EEC/EEO



Advantages:

- » Effective for a wide range of contaminants
- » Automatic - minimal service required
- » Chemical free
- » Low Operating Cost
- » Doesn't require any change in the existing water systems
- » Simple electrodes replacement
- » Capable of treating all capacities – from 1m³/h-100m³/h
- » Large electrode surface area enables improved reactions
- » Minimal energy consumption
- » Minimal electrode material
- » Lower Sludge Quantities
- » Comply with current and future regulations

Plasma Treatment

A new technology for the pharma industry,
cowshed and waste water

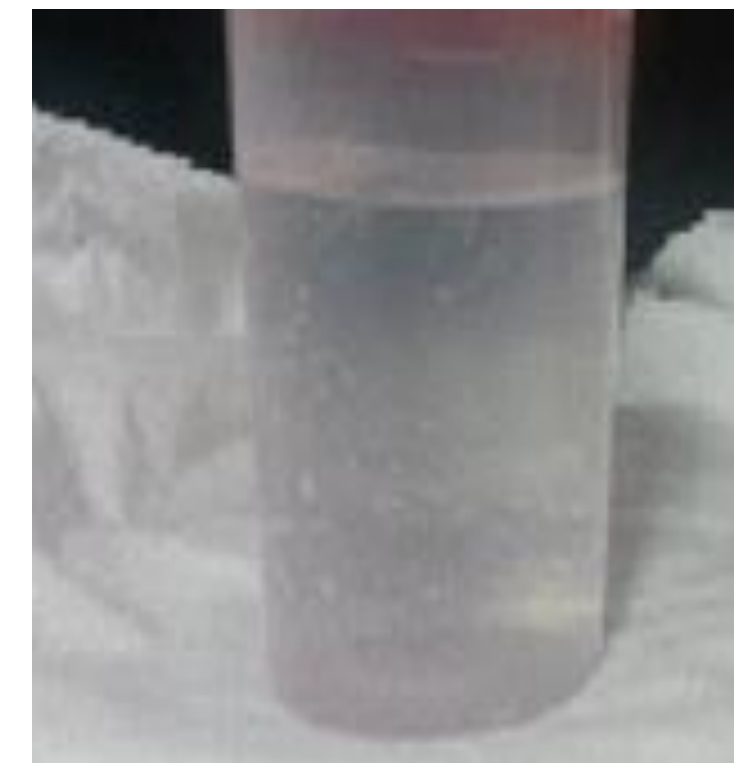
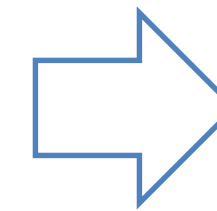
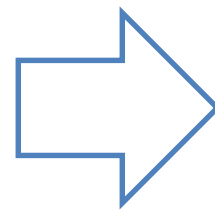
A cooperation of Elgressy with
Prof. Nahum Parkansky & Prof. Ray Boxman



Plasma Treatment



Heavily contaminated
Industrial wastewater



Submerged Arc post treatment of heavily contaminated
industrial wastewater

Thank You

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