

CONTAMINANTS	INDIA DOMESTIC SEWAGE RW	ECR	MAL'SIA AUTO Parts Mfr. RW	ECR	MAL'SIA F & B Soy Prod. RW	ECR
TDS	3500	140			748	825
TSS	75	8	42	24	5,041	2.2
COD	550	32	297	28	21,668	909
BOD	500	13	110	10	6,373	327
pH			5.6	8.3	4.4	6.2
Oil & Grease	7	0.0			217	0.0
Coliform	5	60				
E.Coli	-	Absent				
F.Coli	-	Absent				
Strepto	-	Neg.				

TEXTILE Industry	Parameter	RAW	ECR	Unit
<b>MALAYSIA</b> Dye & Finish	TDS	2,930	3,000	APHA 2540
	TSS	57	4	APHA 2540
	COD	413	164	APHA 5220
	BOD	148	78	APHA 5210
Mixed Wash Water	Color	>250	30	Hazen Unit
	pH	9.72	10.8	APHA 4500
<b>INDIA</b> Water Jet Yarn Weaving	COD	871	98	APHA 5520
	BOD	309	34	APHA 5210
	O&G	142	.02	APHA 5520
	Color	150	10	APHA 2120
	pH	5.84	8.59	APHA 4500
<b>SINGAPORE</b> Dye & Finish	TDS	323	321	APHA 2540
	TSS	267	71	APHA 2540
	COD	842	355	APHA 5220
	BOD	249	112	APHA 5210
Mixed Wash	Color	>250	60	Lovi - Meter
	pH	10.3	10.9	APHA 4500

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**WATER RESOURCES**

*Towards Greener*

**WASTEWATER SOLUTIONS FOR GLOBAL NEEDS**

**Electro-Contaminant Removal**

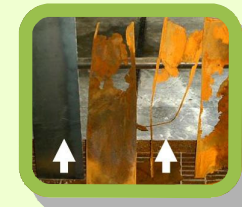
CONSISTANT - RELIABLE & CHEMICAL FREE

Heavy Metals	% Removed / Recovered
Aluminum	99.0
Arsenic	96.0
Barium	98.0
Calcium	98.0
Cadmium	98.0
Chromium	99.0
Cobalt	62.0
Copper	99.0
Iron	99.0
Lead	97.0
Magnesium	98.0
Manganese	83.0
Mercury	66.0
Molybdenum	80.0
Nickel	99.0
Vanadium	95.0
Zinc	99.0
Platinum	83.0
Selenium	42.0
Silver	91.0
Tin	89.0



ECR Reactor Chamber & Sludge generated

The following pictures of the **ECR** atmospheric reactor chamber design indicate the **EASE** of maintenance and simplicity of replacing sacrificed ECR plates.



New Plate Vs Sacrificial Plate



Before & After

**ECR ADVANTAGES**

- **Removes** heavy metals as oxides
- **Removes** suspended and colloidal solids
- **Breaks** oil emulsions in water
- **Removes** fats, oil, and grease
- **Removes** complex organics
- **Destroys** and **removes** bacteria, viruses & cists

The **ECR** process is based on valid scientific principles involving responses of water contaminants to strong electric fields and

**electrically induced oxidation** &  
**reduction reactions**

**CONSISTANT - RELIABLE - CHEMICAL FREE**

**Wastewaters - MUNICIPAL or INDUSTRIAL**  
**Contaminants - INORGANIC & ORGANIC**



INDONESIA OIL & GAS INDUSTRY Exploration

Parameter	RAW Produced Waters	ECR	RAW	ECR
		+ SMART Filter	Drill Waters	+ SMART Filter
COD	610	141	375	38
BOD	375	50	215	15
Phenol	0.63	0.19		
O&G	156	0.0	577	0.0
pH	7.5	8.7	8.0	8.2
Arsenic	180	0.0		
Iron	.52	0.0		
Manganese	.086	.009		
TSS			2,950	98
Turbidity			1,332	18
H2S			.24	.02
Ammonia			38	4
Lead			0.73	.002
Color			14,000	500

**CHEMICAL COAGULATION**

Total Chemical addition(s) averages  
1.5kg / 1m<sup>3</sup>  
(1000 m<sup>3</sup> = 1.5 T/day)

Of Additional & Unwanted Sulphate based sludge  
Chemical costs average exclude Power  
**USD 0.27 – 0.34**

Chemical usage is TSS Dependent  
Real examples in USD/1000m<sup>3</sup>/DAY  
150 to 200Mg/L TSS = 63,500 / Year  
250 to 400Mg/L TSS = 106,000 / Year  
450 to 600Mg/L TSS = 142,000 / Year

**ELECTRO-CONTAMINANT REMOVAL**

Sacrifices FERROUS ONLY at rate of  
0.04kg / 1m<sup>3</sup>  
(1000 m<sup>3</sup> = 40 KG/day)



(Steel consumption & Power)  
ANNUAL Steel costs will  
**not exceed USD6,000**



**Brief Treatment Description**

All of ECR Systems push the wastewater in an upward flow between the plates. This free flow allows access to the reactor chamber which is inspected once a day and the sacrificed plates will be changed one at a time, from time to time, as they dissolve (75 – 90 days).

The plates dissolve paper-thin because there is **NO PRESSURE** within the **guaranteed chamber** thus saving on operating consumables.

Only **One moving part – water pumps!!!**

**+90 % COLOR REMOVAL**    **40 to 60% COD REDUCTION**    **+90% SOLIDS REMOVAL**    **+75% SLUDGE REDUCTION**    **+65% SAVINGS on Op. Cost**  
**Compared to Chemical Use**