

EFL-BALLSTSINGLE

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# Eflochem Single Ballast Water Kit

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## MANUAL

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## TESTING METHODS

### BOILER WATER TESTING

#### FULL SERVICE BOILERS

< 28 Bar  
28 - 56 Bar

- Excess Phosphate (High Range)
- P & M Alkalinity
- Chlorides
- Conductivity / TDS
- pH
- Oxygen Scavengers

## WATER TREATMENT

### SAMPLE FILTRATION

While conducting water testing, there are cases in which collected samples may be turbid. This complicates the end point color & the results may not be correct. In such cases, filtration of the turbid sample with a special filter paper is necessary. After filtration it may be necessary to dilute the sample, if it is still turbid, by adding distilled water (DW). The result of the test is multiplied by the corresponding factor which is the dilution factor, as given below.

Sample Vol. (ml)	DW Vol. (ml)	Dil Factor
25	25	2
10	40	5
25	50	3
10	90	10

By dilution, the quantity of dissolved foreign matter decreases, and the sample acquires the necessary clarity for determining color changes.

### WATER SAMPLING POINTS

**Boiler:** From Boiler Blowdown, as instructed by the manufacturer. Sample should be cooled to < 26° C.

**Sampling Procedure:** Flush sampling line a few minutes then reduce the flow for 3-5 minutes with no disturbance. Flush the sample bottles a few times with the sample water. Collect the sample in the bottle w/o touching the sampling line. If the analysis is to be delayed, sample must be kept in tightly closed sample bottles.

**Condensate:** From main or auxiliary condensate pump depending on which pump is in use.

**Feedwater:** From main feedline (as close as possible the boiler).

**Make-up Water:**

- From distilled tank or other storage tank, as appropriate.
- From evaporator distiller condenser.

## WATER TREATMENT TESTING METHODS



### Determination of Chloride

Cl<sup>-</sup> (10 - 5000 mg/l)  
NaCl (16 - 8000 mg/l)

- Use 2 ml to measure **range 500 - 5000 mg/l Cl<sup>-</sup>** or **800 - 8000 mg/l NaCl**  
Use 10 ml to measure **range 100 - 1000 mg/l Cl<sup>-</sup>** or **160 - 1600 mg/l NaCl**  
Use 50 ml to measure **range 20 - 200 mg/l Cl<sup>-</sup>** or **32 - 320 mg/l NaCl**  
Use 100 ml to measure **range 10 - 100 mg/l Cl<sup>-</sup>** or **16 - 160 mg/l NaCl**
- Add one tablet of *Chloride* with gentle mixing. The sample should turn yellow.
- Add tablets of *Chloride* one at a time with gentle mixing until the brown colour disappears. Count the number of tablets used.

*Note!*  
If measuring boiler water, it is possible to use the completed Alkalinity test sample, then follow instructions from step 2 above.

#### Results

N° of tablets	Cl <sup>-</sup>				NaCl			
	2 ml	10 ml	50 ml	100 ml	2 ml	10 ml	50 ml	100 ml
1								
2	500	100	20	10	800	160	32	16
3	1000	200	40	20	1600	320	64	32
4	1500	300	60	30	2400	480	96	48
5	2000	400	80	40	3200	640	128	64
6	2500	500	100	50	4000	800	160	80
7	3000	600	120	60	4800	960	192	96
8	3500	700	140	70	5600	1120	224	112
9	4000	800	160	80	6400	1280	256	128
10	4500	900	180	90	7200	1440	288	144
11	5000	1000	200	100	8000	1600	320	160

**20 - 70 mg/l Cl<sup>-</sup>**: Maintain daily blowdown!

**100 - 220 mg/l Cl<sup>-</sup>**: Acceptable chlorides in low pressure boiler!

**240 - 400 mg/l Cl<sup>-</sup>**: Reduce chlorides by increased blowdown!

#### Conversion factors

	Cl <sup>-</sup> mg/l	NaCl mg/l
mg/l	1	1.6

#### SVZ1600

Kit contains:

- Black plastic carrying case
- 100 ml shaker tube (SVZdev100)
- Stirring rod (SPstr1)
- Cleaning brush (Spclb1)
- 250 tablets Chloride (TbsRCD250)



Attention!  
Wear protective gloves and safety goggles when performing any tests using corrosive, harmful or irritant reagents. Do not ingest.

## WATER TREATMENT

### TESTING METHODS



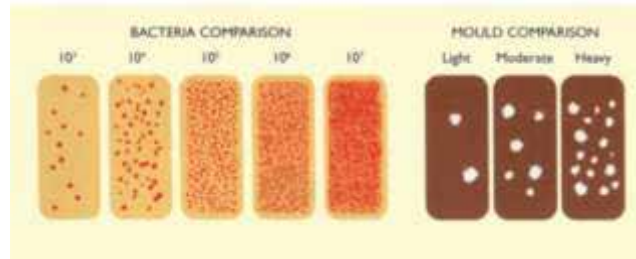
## Dipslides

### Samling & Testing Notes

Weekly monitoring of bacteria levels has been recommended by many legislators and professional authorities as a visual performance indicator to both system and treatment regime. This allows the user to gauge how effective a chemical or biocide product is in the particular application and a trend can be quickly established identifying changes and taking quick remedial action where required. It should be noted from the outset that Dipslides alone do not detect Legionella as a select micro-organism, however it is generally accepted that overall bacteria levels in excess of  $10^4$  are considered able to support Legionella and obviously a serious risk.

The dipslide consists of a plastic paddle with culture media on each side, the tube keeps the media both moist & sterile until required. The product most suitable is a slide based on a standard nutrient agar with a red dye supplement added during production, this has the advantage of showing any viable colonies as red dots, easily identified and compared against the comparison chart.

**IMPORTANT** - Monitoring is not a substitute for a treatment regime, it is always best to seek the advice of a professional water treatment or environmental company who will supply a risk assessment together with the required treatment system. The advantage of your weekly monitoring program is you can see how well the system is performing and identify any problems in house in-between visits. Counts should never exceed  $10^4$  at any time.



1 - Prior to use please keep the slides in a cool place (not a fridge) at around 10 - 15°C.



Dipslides have a typical shelf life of 8 - 9 months. Once the dipslide is opened care must be taken not to touch the media or expose the media to the atmosphere in order to prevent false contamination.

2 - Ideally the sample should be taken in a clean container rinsed with the water to be tested.



You can also sample directly from the tower sump ensuring you do not touch any of the surfaces. Submerge the dipslide to the top of the culture media for around 2 seconds and then shake gently to remove excess fluid replacing in the tube.

3 - Place the slide into the Incubator, the correct temperature is 30°C for a period of 48 hours.



Incubation is vital for accurate results. The dipslides should only be incubated in an incubator. If you are mobile you must ensure you incubate the dipslides in a dual voltage incubator which will operate in a vehicle.

## WATER TREATMENT

## TESTING METHODS



### Dipslides

#### Application, Storage & Disposal

##### Storage

Dipslides should be stored in cool dry conditions, but not in a refrigerator - prior to despatch our stock is stored in a cold room at 10°C in order to prevent condensation and de-hydration of the agar and ensure Dipslides arrive in perfect condition.

##### Shelf Life

Dipslides have a typical use by date of 9 months dependent of manufacture cycle, they can be used after this date as long as no contamination or visible shrinkage shows on the agar surface - excess water in the bottom of the slide would indicate the storage temperature was too high.

##### Application

Dipslides can be used to monitor microbial growth wherever the potential may exceed 1000 (10<sup>1</sup>) organisms per ml of sample fluid.

*Industrial Waters:* For detection of slime forming bacteria in cooling & industrial waters, storage tanks and for evaluating biocide performance in treated systems.

*Industrial Fluids:* For detection of bacteria & moulds in metal-working fluids, paper processing waters, fuel tanks etc.

*Environmental Hygiene:* To monitor the surface contamination within domestic or institutional sites.

*Leather Industry:* For detection of spoilage organisms in hide and skin soaking liquors.

##### Product Safety - MSDS

Dipslides when new are non-hazardous.

##### Disposal of Used Slides

Contaminated slides should be sterilised before disposal by immersing in a disinfectant or by autoclave or incineration. After soaking in a disinfectant for 24 hours the dips can be disposed of in any normal non hazardous waste service.

##### Quality Control

Dipslides are manufactured in a clean environment and stored at constant temperature prior to despatch. All materials and each batch are traceable from source to our customer.

**WATER TREATMENT**

**TESTING METHODS**



**Bacteria Testing BactD005**

E.Coli, Coliforms, Pseudomonas Species / TTC (Total Viable Count)

- 10 E.Coli / TTC Dipslide Tests
- Flexible paddle for effective surface contact

The E.Coli/TTC dipslide allows convenient enumeration of aerobic bacteria (TVC) together with E.Coli, Coliforms and Pseudomonas bacteria in a single test. The dipslide is prepared with Nutrient TTC agar on the lighter side (responsive to aerobic bacteria) and a chromogenic agar on the darker side. The nutrient agar reacts with enzymes to produce a colour change which is specific to the bacteria type, allowing easy enumeration.

**SAMPLING: FLUIDS**

The sample should be taken by immersing both sides of the paddle into the fluid to be tested, it having first been removed from the sterile container. Excess sample should be gently shaken from the paddle before it is replaced in the container.

**SAMPLING: SURFACES**

The sample should be taken by allowing direct contact between the agar surface and the test material. The paddle is flexible and can be bent at the upper end to allow both surfaces to come into intimate contact. Bacterial recovery rate is about 50% so that sweeping an area approximately twice that of the paddle will give a more accurate result.

**INCUBATION:**

Incubate at 30°-35° C for 24-48 hours, when full enumeration should be completed.

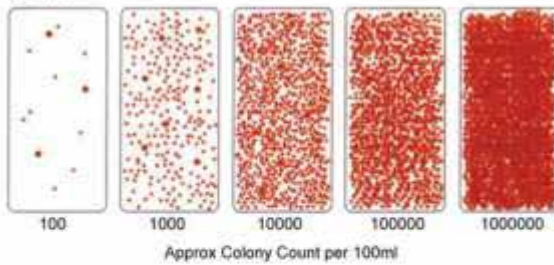
**DISPOSAL**

Used slides should be incinerated or autoclaved. Alternatively, immerse in a 10% bleach solution for 24 hours.

Organism	Colony Size (mm)	Shape & Surface	Colour	Comments
<i>Escheria Coli</i>	1.0 to 2.0	CV.E.G	Blue-Purple	
<i>Enterobacter Aerogenes</i>	1.5 - 2.5	C.VE.G	Rose Pink	
<i>Pseudomonas Aeruginosa</i>	0.5-1.0	FED/C.VE.G	Buff	
<i>Enterococcus faecalis</i>				No growth
<i>Staphylococcus aureus</i>				No growth

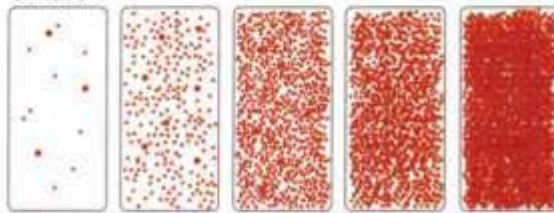
CV.E.G = Convex entirely glossy, FED = Full entire dull

**AEROBIC BACTERIA - TVC**  
Fluids



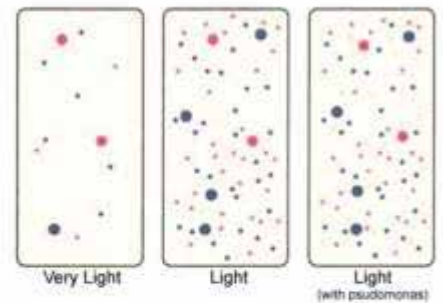
Approx Colony Count per 100ml

**Surface**



Very Light    Light    Moderate    Heavy    Very Heavy

**COLIFORMS & PSEUDOMONAS**



Blue/Purple or Blue/Green colonies = E.Coli  
 Pink/Magenta colonies = Other coliforms  
 Buff colonies = Pseudomonas  
 Blue/Purple + Pink colonies = Total coliforms



Attention!  
 Wear protective gloves and safety goggles when performing any tests using corrosive, harmful or irritant reagents. Do not ingest.

## Incubator BactEDT059



- ÿ Incubator for 10 dipslides and/or petri dishes
- ÿ Applicable for Enterolert Incubation
- ÿ Variable temperature: +5 - 45°C (+/- 0.5°C)

The BactEDT059 incubator is specifically designed for Dipslides (but is easily capable of a several 100mm Petri-dishes) and applications both on site and in a vehicle, the efficient design helps minimise drain on the vehicle battery and the robust ABS case is ideal for a life out in the field.

The BactEDT059 incubator is supplied ready for mains or 12 volt uses as standard and features our world standard plug & power adaptor - all ready to go!

Our tested MX solid state temperature control technology and heat reservoir chassis guarantee superb heat distribution without any fans or moving parts, only 1.2Kg in total weight!

### Ultra Versatile

Featuring the new MX Precision Electronic Temperature Control Technology plus Worldwide Universal Power Supply with Interchangeable Power plugs for UK, Europe, and America & Australia together with Automatic voltage selection – 110 or 240 volts mains. To use in a vehicle just requires the standard & included cigar lighter cable.

### Ultra Safe

The incubator runs from 12 volts DC, the mains stays at the adaptor/plug so reducing risk In situations where the Incubator could be used with liquid samples or wet hands, compliant whatever legislation brings....

### Ultra Reliable

MX Temperature Control Technology is fully solid state with no moving parts, element switching is transistorised and designed for constant long term operation.

### Ultra Accurate

Together with our temperature control technology the BactEDT059 incubator features a heat reservoir chassis - this holds latent heat during operation adding thermal inertia to keep temperature stable even when largerloads are introduced.

### Temperature Range

Ambient + 5 to 45°C +/- 0.5°C

The thermometer is located on a custom ledge, safe from the load and easy to view through the polycarbonate clear internal lid, the BactEDT059 incubator is supplied with universal mains power pack and 12 volt cigar lighter cable as standard

### Specification & Size

Power supply – Adaptor – 100-240v AC @ 320 mA

Power supply – Incubator 12 Volts DC @ 1Amp

Temperature Control – MX Darlington switched solid state

Temperature Range – Ambient + 5 to 45°C +/- 0.5°C

Chamber Size (useable) – 11 x 13 x 70 (H) cm

External case size- (footprint) 27 x 21 x 10(H) cm

Total Weight – Inc cables & adaptor 1.2 Kg

Guarantee – 2 Years



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**WATER TREATMENT  
TESTING METHODS**

## **ENTEROLERT**

Enterococci Test

Please refer to the manual given with the ENTEROLERT pack

## **DIAGNOSE CHOLERA**

Cholera Test

Please refer to the manual given with the Diagnose Cholera pack