wagtech WTD

a division of Palintest Ltd

POTAFLEX

WAG-WE10050

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Wagtech WTD is a leading manufacturer and supplier worldwide of scientific instruments for use in:

Water Quality Testing, General Environmental Monitoring, Agriculture, Health, Education and Construction Industries.

Our products are used by scientists, engineers and technicians working in research, education and industry throughout the world

Details of the products can be found in our catalogues as follows:

Water Quality and Environmental Testing
Comprehensive range of water testing instruments covering portable water testing, BOD/COD/Toxicity digital instrumentation, mobile laboratories, hydrology and groundwater monitoring, general laboratory equipment and training.

Laboratory Equipment & Scientific Instruments
A comprehensive range of general laboratory equipment for use in a wide range of industries.

POTAFLEX

The Wagtech WTD range of portable water testing laboratories contain the essential components for testing the quality of water to both W.H.O. and E.C. guidelines/regulations.

The system is modular, enabling end users to tailor units to their exact requirements. The unique Flexi Rack System provides the facility of a wide range of media options that can be tailored to most types of bacteriological techniques including: Nutri Disks, Dip Slides & Multiple Tubes.

The Potaflex is generally supplied as a complete bacteriological testing laboratory and these operating instructions detail all the necessary procedures for a complete bacteriological analysis.

A wide range of instruments are also available from Wagtech International Ltd to enable physico-chemical testing to be carried out if required. The operating instructions for the physico-chemical equipment and accessories are included in the individual carrying cases.

If a different system or alternative parameters are required , additional instructions will be issued as appropriate.

SECTION 1: POTAKIT COMPONENTS

1. 20 Aluminium Petri Dishes
2. 200 Membrane Pads
3. 200 Membranes
4. 38.1gm Membrane Lauryl Sulphate Media
5. Ball-point Pen
6. Battery Cable with Crocodile Clips
7. Bronze Membrane Support Disc
8. Carrying Case
9. Cigarette Lighter
10. Cigarette Lighter Lead
11. Declorination Kit
12. Electrical Adapter
13. Electrical Lead with Transformer
14. Filter Assembly Base
15. Filter Funnel and Locking Collar
16. Flexi Rack System
17. Hand Lens
18. Lubrication Grease *
19. Media Measuring Device
20. Membrane Forceps
21. Membrane Pad Dispenser
22. Operating Instructions
23. Pasteur Pipettes *
24. Pistol Grip Hand Pump with Rubber Tubing
25. Polypropylene Bottles
26. Rucksack
27. Sample Cup and Cable
28. Screwdriver
29. Single Incubator
30. Upper and Lower 0 Rings

OPTIONAL ACCESSORIES
Solar Panel with Voltage Controller and leads

SECTION 2: ASSEMBLY OF FILTRATION APPARATUS

1. Hand Vacuum Pump
2. Filtrate Flask
3. Sampling Cup
4. Graduated Aluminium Reservoir Tube
5. Membrane Support & Compression Holder
6. Sealing Gaskets
7. Bronze Sintered Support

The assembly of the reservoir tube filtration base

SECTION 3: PREPARING BACTERIOLOGICAL MEDIA IN A CENTRAL LABORATORY

As the Potaflex incubator is so flexible it can be applied to the users requirements. The main examples of applications is detailed are below:

3.1 DIRECT METHOD: PREPARING MEMBRANE LAURYL SULPHATE BROTH (MLSB)

3.1.1 For 200 tests, dissolve the 38.1 grams of Membrane Lauryl Sulphate Broth (MLSB) (supplied in a pre-weighed container) in 500 ml distilled water in a flask or beaker.

3.1.2 Heat the mixture to ensure the powder is fully dissolved, but do not boil.

3.1.3 Pour the medium into the 50ml plastic bottles provided and ensure that they contain no residues of previous MLSB or cleansing agent.

3.1.4 Replace bottle tops but leave them slightly loose - do not tighten. Sterilise bottles upright in an autoclave.

3.1.5 Sterilise at 121°C for 10 minutes, or place bottles in a pressure cooker and maintain steam at pressure for 15 minutes. Remove bottles, allow to cool, tighten the tops and then store in the cool and dark.

3.1.6 For 10 tests use the Media Measuring Device (MMD) as explained in Section 3.4.

3.1.7 When the media has cooled to room temperature, pour about 2mls onto each membrane pad sufficiently to saturate the pad.

3.1.8 When the pad is fully saturated, pour off any excess MLSB.

3.2 PRE-PREPARED MEDIA

3.2.1 Nutri Disks: Nutri Disks: Consists of a sterile petri –dish with the pad impregnated with dehydrated media which is re-hydrated using sterile distilled water.

The types of media options include the following:

3.2.1.1 M- FC Nutri Disk for Total Coliforms and Faecal Coliforms: This consists of dehydrated pale pink media which is re-hydrated with 3.5ml of sterile water using the sterile Pasteur pipettes. The recommended incubations conditions are 16-24 hours at 44°C.

The procedure is as follows:

3.2.1.2 Fill the 60 ml plastic bottles with distilled or de-ionised water to the shoulder of the bottle.

3.2.1.3 Sterilise the filled bottle: Place the filled bottles in a prepared pressure cooker and heat sterilise for 15 minutes. Ensure that the bottles do not come into contact with the bottom of the pressure cooker.

3.2.1.4 Allow the bottles to cool.

3.2.1.5 Take the required number of petri- dishes out of the sterile bags.

3.2.1.6 Dispense 3.5ml of the sterilised water on to the nutrient pad in the petri- dish ensure as shown in figure 3. Optimum moisture level is reached when an excess ring of liquid is clearly visible.

Dispense 3.5ml of the sterilised water on to the nutrient pad in the petri- dish

3.2.1.7 Replace the lid of the petri- dish and allow the pad to fully saturate and rehydrate the media. This is will change the pad from white to a uniform pink colour and can take a minimum of 10 minutes.

3.2.1.8 Decant the excess liquid as waste.

3.2.2 Azide NutriDisk for Faecal Streptococci .(Wag-WE10060): This consists of dehydrated white media which is re-hydrated with 3.5ml of sterile water. It is a selective media for Faecal Streptococci. The recommended incubations conditions are 24 to 48 hours at 37°C.

3.2.3 Cetrimide NutriDisk for Pseudomonas Aeruginosa.(Wag-WE10062): This consists of dehydrated white media which is re-hydrated with 3.5ml of sterile water using. It is a selective media for Pseudomonas Aeruginosa. The recommended incubations conditions are 48 hours at 37°C.

3.2.4 Standard NutriDisks for Total Colony Counts.(Wag-WE10064): This consists of dehydrated white media which is re-hydrated with 3.5ml of sterile water using the sterile Pasteur pipettes. It is the media for total colony counts and can be incubated at 16 to 24 hours at 44°C.

3.3 Media Ampoules: Media Ampoules are sterile ampoules containing 2 ml of dissolved media. They have the advantage of convenience and of always being sterile. These ampoules are available for Faecal Coliform Counts (pack of 50) and Total Coliform Counts (pack of 50). Simply unscrew the cap, pour the media onto the pad and discard the empty ampoule.

3.4 MEMBRANE LAURYL SULPHATE MEDIA MEASURING DEVICE (MMD)

3.4.1 If up to ten analyses are only required, the Media Measuring Device can be applied.

3.4.2 Boil at least 100ml of clean water for at least two minutes to sterilise it and allow to cool.

3.4.3 The MMD containers are pre-sterilised. Take a level spoonful of media from the stock container with the blue scoop spatula and dispense the media into the clear plastic bottle. Hold the spoon via the bottle lid and do not touch the spatula itself.

Dispense the level spoonful of the media into the clear plastic bottle.

3.4.4 Repeat the above procedures until 10 spoonfuls of the media have been dispensed into the bottle.

3.4.5 Pour the hot sterilised water into the bottle and seal the lid tightly.

3.4.6 Shake the bottle so that the media is completely dissolved.

3.4.7 Allow the solution to cool and then continue as in 3.1.7.

SECTION 4: PREPARING BACTERIOLOGICAL MEDIA IN THE FIELD

4.1 Choose the cleanest water available e.g. rainwater, filtered water, or, if necessary, stand raw water in a container overnight. Do not use water, which has been chlorinated. Boil the water for at least two minutes cover and allow to cool. Filter 200ml of the water through the membrane (2 x l00ml). If the water is turbid, more than one membrane may be required. Prepare a total of 500 ml of filtered water.

4.2 Check that the pH of the prepared water is in the range 6.5-8.0. In the exceptional circumstances the pH of the filtered water may not be in this range then adjust the pH using dilute sodium hydroxide solution (increases pH) or dilute hydrochloric acid (reduces pH).

4.3 Add the contents of a pre-weighed container of 38.1 grams of Membrane Lauryl Sulphate Broth (MLSB) to the 500ml of the prepared water and heat to aid dissolving.

4.4 Dispense the dissolved MLSB into the clean 50ml polypropylene bottles.

4.5 Replace bottle tops and tighten firmly.

4.6 Place the filled bottles in a prepared pressure cooker and heat sterilise for 15 minutes. Ensure that the bottles do not come into contact with the bottom of the pressure cooker.

4.7 Continue with procedures 3.7 in Section 3.

SECTION 5: SAMPLING FROM A RIVER OR STREAM

5.1 Take the sample as near as possible to the main flow and not too close to the edge where the water may be still and unrepresentative.

5.2 Care must be taken not to introduce floating matter or material from the edge of the water course into the water sample. Therefore, it may be preferable to attach the sampling cable to the sterilised sampling cup and take the sample from a bridge or other overhanging location. Alternatively, the cup may be cast into the water from the edge and pulled slowly and carefully back towards the operator.

5.2 SAMPLING FROM CHLORINATED DRINKING WATER

When taking samples of water in bottles, from sources that contain residual chlorine, such as a treated drinking water, the bottled sample must be dechlorinated, i.e. the chlorine has to be removed to prevent further chlorination whilst in transit.To declorinate the water one can use the declorination kit.

If the sample is analysed immediately on-site, then it is not necessary to dechlorinate the water.

5.2.1. Dechlorination Kit

1. The dechlorination kit consists of a 1 litre plastic bottle containing 18gm of sodium thiosulphate pentahydrate.
2. Boil about a litre of distilled water and then allow to cool for 5minutes.
3. Pour 1 litre of the water into the bottle to dissolve the sodium thiosulphate.
4. Allow to cool to ambient temperature.
5. Place three drops of the solution into each sample bottle and then sterilise the sampling bottle.

5.2.2. Tap Sample

1. Flush the sample for about 2 minutes to flush the sampling pipeline.
2. Sample and carry out any appropriate on-site physical &
3. Chemical tests e.g. Chlorine residual Turbidity, temperature & pH.
4. Take any other required physical and chemical samples.
5. Then disinfect the tap, which can be carried out in the two following ways:

5.2.2.1. Chemical Disinfection of Tap

1. Turn off the tap.
2. Spray the inside of the tap with concentrated sodium hypochlorite solution e.g. bleach, with a wash bottle.
3. Leave for 3 minutes.
4. Flush the tap until all the bleach has been washed off – this can be checked by taking further residual chlorine tests.
5. Fill the prepared bacteriological sampling bottle with a slight air gap at the top and seal the lid tightly.

5.2.2.2. Heat Disinfection of Tap

1. This can only applied to metal taps but not to any plastic taps or taps with non-removable anti-splash devices.
2. Turn off the tap and flame the closed tap with a small proprietary Propane or Butane burner, cease flaming when any steam issues from the tap.
3. Flush the tap until the water cools to its original temperature.
4. Fill the prepared bacteriological sampling bottle with a slight air gap at the top and seal the lid tightly.

5.2.3. Dip Sample

1. Sterilise the sampling cup by igniting 1ml of methanol/alcohol in the cup.
2. Allow to cool.
3. Rinse the cup with the sample.
4. Then immerse the cup into the water source to obtain the sample and then pour into the sampling bottle.

SECTION 6: USE OF BACTERIOLOGICAL MEDIA

6.1 The dissolved media should remain stable for 6-8 weeks. However, if there are any signs of contamination e.g. yellowing, cloudiness etc., discard.

6.2 Ideally, to reduce the possibility of contamination, use the bottle of media only on a daily basis and use a fresh bottle on each subsequent day. However, if this is not possible, then the bottle must be resealed immediately and the media may be re-sterilised by boiling in a water bath for 15 minutes.

6.3 Clean empty media bottles thoroughly before re-use. Any residues should be washed out with hot water; cleaned with a little detergent; rinsed several times in clean water, dried and stored in a clean environment with the tops replaced.

6.4 The MLSB solution may be applied to the pads for up to 6 hours before sampling, if stored in a cool environment. This procedure can reduce the number of operations in the field.

6.5 If the MLSB powder is stored in dry, cool conditions it should have a shelf life of 5 years.

SECTION 7: ASEPTIC PROCEDURES

7.1 General hygiene and aseptic procedures are of paramount importance and extra care must be taken when outside the central laboratory, i.e. in the field.

7.2 Everything must be kept clean and sterile, particularly on the following surfaces:

a. Inner surface of the sampling cup

b. Inner surface of the filter funnel

c. Filter membrane and support pads

d. Upper surface of the membrane support

e. Inside of the petri dishes

f. Support pad dispenser arm, and forceps

7.3 Dry the filtration unit and sampling cup dry by using clean tissue paper.

7.4 Pour 1 ml of methanol into the sampling cup and swirl. (The methanol can be stored in the plastic bottles provided).

7.5 Place the sample cup in a normal upright position away from anything inflammable.

7.6 Using the cigarette lighter provided, ignite the methanol. Whilst the methanol is still burning invert the filtration unit into the sample cup.

7.7 Wait for at least 5 minutes to ensure that the sample cup and filtration unit are sterile. Methanol burns anaerobically to form Formaldehyde which ensures a complete sterilisation.

7.8 Pour any residual solution away.

7.9 The above sterilisation procedures 6.3 to 6.8 should be carried out immediately before sampling and after the filtration of each sample.

7.10 Either reusable aluminium petri dishes or pre-sterilised disposable plastic petri dishes may be used. If aluminium dishes are selected, they must be sterilised in boiling water prior to use. After sterilisation, ensure that the dishes are allowed to dry. Other methods of sterilisation can be employed, including autoclaving, or placing the aluminium dishes in a conventional oven at 300°C for 30 minutes.

7.11 Pads are supplied sterile in cartridges of 100. A sterile pad dispenser is supplied for introducing the pads into the petri-dishes. It is preferable to dispense pads at base, prior to going to the sampling point; in this way the dispenser may be kept attached to a pad cartridge and remain clean and sterile. If it is necessary to dispense pads in the field, every care must be taken not to contaminate the pad dispenser or cartridge. Immediately a cartridge is finished, a new one should be attached to the dispenser. Do not leave the dispenser unattached and if no pad dispenser is available use sterile forceps.

7.11.1 Before handling a membrane filter with the forceps it should be flamed sterilised thus: hold the forceps tips in a flame for 5 seconds and allow to cool before handling the membrane.

SECTION 8: PROCESSING SAMPLES FOR COLIFORM ANALYSIS

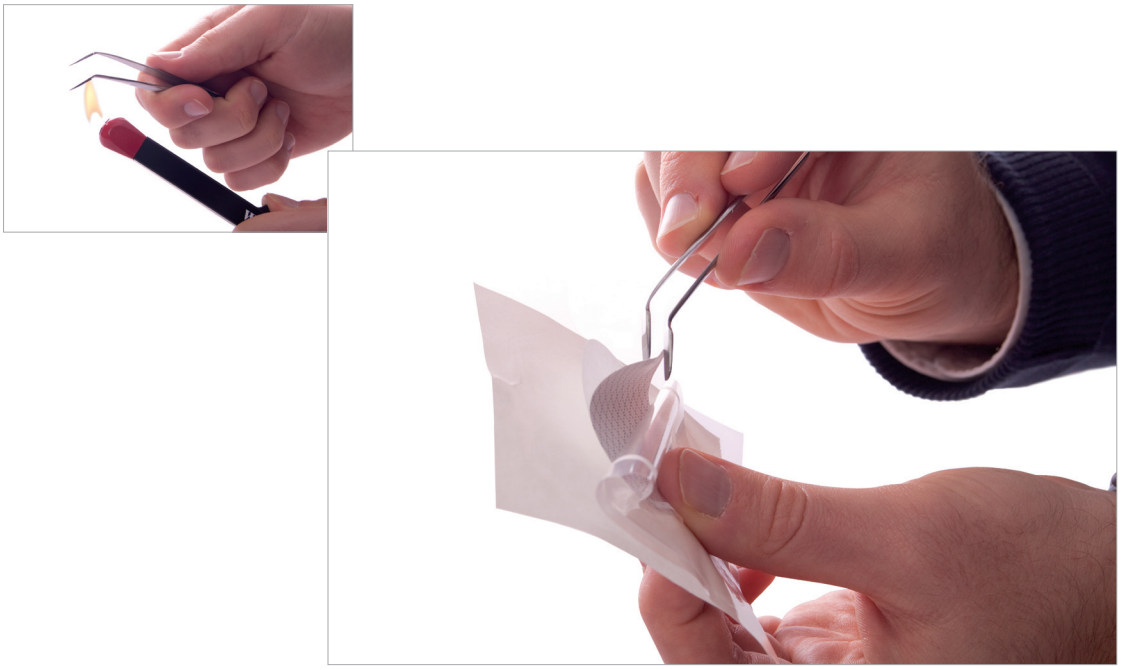
8.1 All samples must be incubated within 6 hours of sampling.

8.2 Dispense a growth pad into a sterile petri dish and saturate with MLSB as in Section 3.

Dispensing of growth pad

8.3 Loosen the filter funnel and remove from the base support.

8.4 Sterilise the forceps using a flame and allow to cool. Using these forceps, place a sterile membrane onto the bronze membrane support, grid side up. If the membrane tears or becomes contaminated discard it and use a new one.



Place the sterile membrane onto the bronze membrane support using the sterilised forceps

8.5 Lock the membrane in place by pushing the filter funnel firmly down into position.

8.6 Pour the water sample into the filter funnel up to the 100 ml graduation.

Pour water sample up to 100 ml graduation

8.7 Connect the hand vacuum pump to the filtration unit base and pump to suck the water sample through the membrane.

Apply hand pump to pass the water through membrane

8.8 When all the water has been filtered, release the vacuum pump and use the sterile forceps to take the membrane from the filtration unit.

Use the sterile forceps to take the membrane from the filtration unit

8.9 Place the membrane on top of the pad which has been saturated with the MLSB media.

Place membrane on top of MLSB saturated pad

8.10 Replace the petri-dish lid and label with sample number, place, date, time, etc.

8.11 Place the petri-dish into the petri-dish rack and repeat the process for all the samples and then place the filled rack into the incubator.

8.12 It is important to note that when the last sample has been processed, a resuscitation period of between 1 hour to 4 hours must be observed before incubating. This allows any physiologically stressed coliforms to recover before culturing.

8.13 To incubate faecal coliforms, select the temperature of 44°C and place the loaded petri-dish rack inside the incubator. For

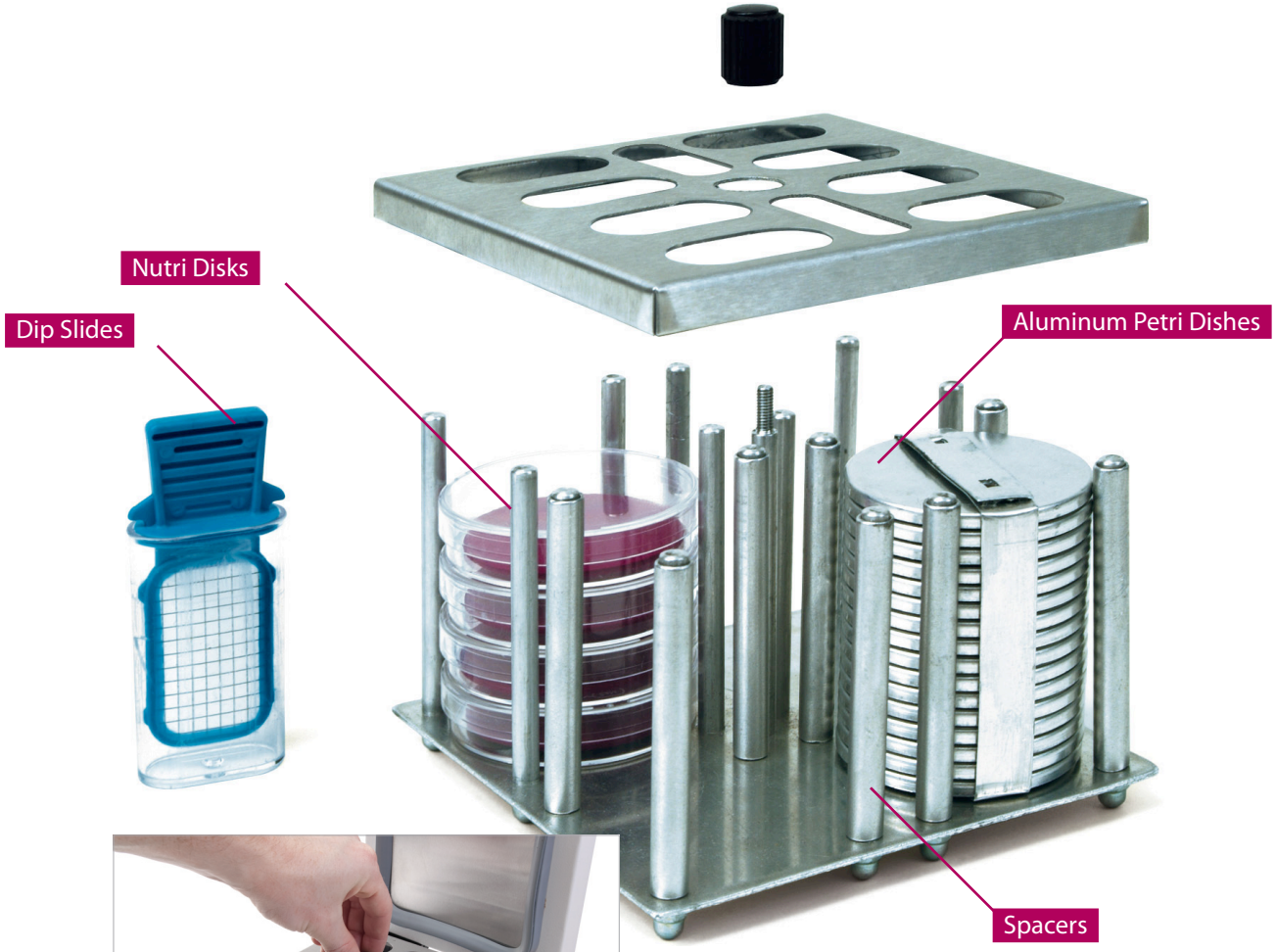
total coliform analysis, select the temperature of 37°C.

Place the petri-dishes / dip slides in the Flexi Rack System

8.14 The minimum incubation period is 14 hours following a 4 hour resuscitation.

8.15 THE UNIVERSAL FLEXI RACK SYSTEM

The Potaflex Incubator has an incubator with a volume of approximately 2000 cc and is a has the Universal Flexi Rack System which enables different sizes of petri dishes, dip slides and multiple tubes to be inserted and incubated.



SECTION 9: COUNTING COLIFORMS AND RECORDING THE RESULT

1. Note which incubator is set for 44°C or 37°C.
2. Following incubation~ switch off the power and remove each petri dish from one of the incubators and record the temperature setting.
3. Place the petri dishes on a flat surface.
4. Remove the lids and, count all the yellow colonies irrespective of size count Use a hand lens, if necessary. Count the colonies within a few minutes, as the colours are liable to change on cooling and standing. Ignore those colonies that are not yellow e.g. pink & transparent colonies.

5. Once the number of yellow colonies has been determined for each incubator and assuming that 100ml of sample has been filter, this value equals the number of coliforms per 100 ml. Samples that were incubated at 37°C are Total Coliforms, whilst those incubated at 44°C are Faecal (Thermotolerant) Coliforms.
6. Record the results using the record sheets provided.

SECTION 9: FAECAL STREPTOCOCCI ANALYSIS

Principle

9.1 This is the membrane filtration method for the detection and enumeration of Faecal Streptococci. This method can be used with all types of water except where the turbidity of the sample is too high to allow passage of the water through the membrane. The application of the equipment is the same as Section 8A. The water sample is filtered through the membrane that is capable of retaining the bacteria. The membrane is incubated on Slanetz and Bartley Agar and presumptive Faecal Streptococci multiply as red or maroon colonies after incubation.

9.2 AGAR MEDIA PREPARATION

9.2.1 Suspend 42 grams of the Slanetz & Bartley Media in 1 litre of distilled water and bring to the boil to dissolve the agar completely. Excessive heating must be avoided.

9.2.2 Dispense into the sterile plastic disposable petri dishes (Note, the aluminium petri-dishes do not have sufficient depth).

9.2.3 Allow the agar to cool and solidify. It should be a clear agar and fill the petri dish to a depth of about 3mm. It must not be re-melted.

9.3 CONSUMABLES

Cellulose nitrate membranes
0.45 µm pore size
Slanetz and Bartley media
Sterile plastic petri dishes

9.4 EQUIPMENT

Cellulose nitrate membranes

9.5 PROCDEURE

9.5.1 Set up the filtration apparatus and filter the water sample as in Section 3.

9.5.2 When the water sample is filtered, take the membrane filter using the sterile forceps, lay it on the prepared agar in the petri dish, replace the lid, load the petri-dish rack and place this in the incubator.

9.5.3 For potable waters, incubate at 37°C for 48 hours. For untreated waters, incubate at 37°C for 4 hours and 44°C for 44 hours.

9.5.4 Count the number of pink and maroon colonies. These are recorded as the number of presumptive Faecal Streptococci per volume of water filtered, normally 100ml.

SECTION 10: SELECTING THE OPTIMUM VOLUMES FOR MEMBRANE FILTRATION

The optimum volume of sample is that which will allow the most accurate enumeration of bacteria. This is achieved when the number of faecal coliform colonies on the membrane following incubation is in the range of 20-200. If there are less than 10 colonies, then there is the possibility of statistical error and more than 200 colonies are difficult to count.

Potable Waters

10.1 The number of faecal coliform bacteria in treated water samples,ideally should be zero. Thus the preferred sample volume is 100 ml, and a count of zero faecal coliform bacteria per 100 ml is indicative of a microbiologically safe water supply. If the counts exceeds 1 faecal coliform per 100 ml or 10 faecal coliforms per 100 ml. Contamination is indicated and action is urgently required.

Raw Waters

10.2 For source waters and partially treated waters including those which are ground water derived, it is valuable to adjust the sample volume to obtain faecal coliform counts in the optimum range 10-200. It may be useful to process more than one volume on the first occasion a water is sampled. In such cases it is not necessary to re-sterilise the filtration equipment between different volumes of the same sample, provided that the smaller volume is processed first. Typical volumes which may be appropriate for various water types are shown in the following table. They are only guidelines; there is no substitute for experience of a given source.

	APPROPRIATE VOLUME		
SOURCE OF SAMPLE	100ML	50ML	10ML
Lakes, Reservoirs, & Rivers & other surface sources	*	**	***
Wells, boreholes, other protected water sources	*	**	*
Water treatment plant partially treated	**	**	*
Water treatment plant fully treated	***		
Distribution system	***		

*** Normal Volume or First Choice Volume ** Likely Volume * Possible Volume

SECTION 11: OPERATION OF INCUBATORS

11.1 Routine Operation of Incubator

1. Connect to the mains power supply and switch the power button on.
2. The temperature will be displayed and the heater indicator will switch on and off as the incubator heats up.
3. To check the Temperature Set Point press the * button and the display will alternate with ° C (units) with the Set Temperature e.g. 44.
4. To alter the Set Temperature, scroll up or down using the and 6 down buttons.

11.2 Timed Incubation Facility

This is an advanced facility, which will only be required for specialist applications.

Normally the incubation will continue until the power supply is switched off. However the incubation period can be set from 1 minute to 24 hours. This facility may be useful if the incubator is connected to a car battery and there is a need to limit the power drain on the battery.

This facility is set up as follows:

1. Press the up and down buttons simultaneously for about 3 seconds until the display changes. Letters will flash on and off- this is the programme menu.
2. Scroll with the up or down keys until "SPrr" is displayed.
3. Press the * button and then adjust with the up or down keys to display "100".
4. Release the * button and scroll with the up or down keys until "SPrn" is displayed.
5. Press the * button and then adjust with the up or down keys to display "on".
6. Release the * button and scroll with the up or down keys until "SoAk" is displayed.
7. Press the * button and then adjust with the up or down keys to display the required incubation period in minutes e.g. "1440" (24 hours (maximum allowed)).
8. Press the up and down keys simultaneously for about 3 seconds to return to the main men. Press * key to return to the Temperature display.
9. When the incubation time is reached "STOP" will be displayed and the incubation heater will switch off though the temperature will still be displayed.
10. To return to the original mode reset SPrr to 0; SPrn to off; & SoAk to 0; then restart to routine operation as in section 11.1.

The Incubators are calibrated at the Wagtech WTD Quality Control

Department prior to delivery. Therefore this is not a recommended routine procedure and is only required when there is a large disparity (> ± 0.5 ºC) between the true temperature of the incubator and the displayed temperature.

Note there are also a number of extra factory set functions that will be displayed in these procedures which should not be altered.

12.1 If the incubator is only required to operate at one temperature than the single point calibration should be satisfactory.

12.2 Temperature Too High

1. Switch on the incubator and set it to required temperature as in Section 11 e.g. 37°C.
2. Allow the incubator to fully stabilise for about 1 hour and note the thermometer reading and calculate the difference between the thermometer reading and the display reading which should be ± 0.5°C of the Set Temperature.
3. Press the up and down buttons simultaneously for about 3 seconds until the display changes. Letters will flash on and off- this is the programme menu.
4. Scroll with the up or down keys until "LEUL" is displayed.
5. Press the * button and then scroll with the up or down keys until 3 is displayed.
6. Scroll with the up or down keys until "ZEro" is displayed.
7. Press the * button and adjust with the up or down keys according to the difference added to the previous value already displayed. eg.

   Thermometer reads 37°C
   Display reads 38°C
   Difference 1°C

   Therefore adjust the display to add the value 1.0 to the value already displayed. e.g. value displayed is "0.5" re-adjust this value to "1.5".(0.5 + (1.)
8. Press the t and 6 keys simultaneously for about 3 seconds to return to the main men.
9. Press * key to return to the Temperature display.

12.2 Temperature Too Low

1. Carry out steps 12.2.1. to 12.2.4. Therefore adjust the display to add the value 1.0 to the value already displayed.
2. Adjust with the up or down keys according to the difference. e.g.

   Thermometer reads 38°C
   Display reads 37°C
   Difference 1°C

   Therefore adjust the display to add the value 1.0 to the value already displayed. e.g. value displayed is "0.5" re-adjust this value to "-0.5". (0.5 + (-1).
3. Press the up and down keys simultaneously for about 3 seconds to return to the main men.
4. Press * key to return to the Temperature display.
5. Press the t and 6 keys simultaneously for about 3 seconds to return to the main men.
6. Press * key to return to the Temperature display.
7. When the incubation time is reached "STOP" will be displayed and the incubation heater will switch off though the temperature will still be displayed.

SECTION 13: MAINTAINING THE POTAFLEX

12.2 Filtration Unit

Always dry the filtration apparatus, funnel, membrane support, filter base and filtration flask thoroughly at the end of use, ensuring it is clean. This avoids the build-up of an oxide layer on the aluminium components. Smear a small quantity of silicone grease around the rubber O-rings which seal the components.

12.2 Carrying Case

Although cases have been made to very high specifications, care should be taken to avoid falls or other impacts. The components are robust and sealed on manufacture, but in humid environments they will not resist corrosion indefinitely. Always avoid the entry of water into the base of the case and dry any moisture or spillages of water immediately.

APPENDIX 1: WHO GUIDELINES FOR PHYSICO-CHEMICAL QUALITY

The chief reference point for all matters concerning Drinking Water Quality is a publication by the World Health Organisation (WHO).

The main purpose of the "Guidelines for Drinking Water Quality" is the protection of Public Health. There are now three published Volumes (1 to 3).

The Guidelines outline in great detail the definition of "Safe Drinking Water" and why every effort should be made to achieve a drinking-water quality as safe as practicable. Diseases related to contamination of drinking-water constitute a major burden on human health. Interventions to improve the quality of drinking-water provide significant benefits to health.

The Guidelines describe reasonable minimum requirements of safe practice to protect the health of consumers and/or derive numerical "guideline values" for constituents of water or indicators of water quality. Neither the minimum safe practices nor the numeric guideline values are mandatory limits.

Below you will see the recommended Guideline Values for some of the parameters of drinking water quality that are of significance to public health and related issues.

PARAMETERS	GUIDELINE VALUE
Arsenic	10 ug/l
Barium	0.7 mg/l
Chlorine	5 mg/l
Chromium	0.05 mg /l
Coliforms faecal	0 CFU
Fluoride	1.5 mg/l
Lead	10 ug/l
Manganese	0.4 mg/l
Nitrate	50 mg/l
Nitrite	3 mg/l
Selenium	10ug/l
Turbidity	5 NTU

There are also other important parameters which may affect the acceptability of drinking water quality but for which no guideline value has been established with regards health. These include:

Aluminium, Chloride, Conductivity (EC), Copper, Hardness, Hydrogen Sulphide, Iron, pH, Sodium, Sulphate and Total Dissolved Solids (TDS).

The WHO Guidelines for drinking water quality are available from Wagtech International Limited free of charge or can be downloaded from the WHO website:

http://www.who.int

APPENDIX 2: WATER QUALITY REPORTS

Water Authority:	
District:	Date:
Sampler/Analyst:	
Sample Number:	
1. Location:	
2. Source:	
3. Time:	
4. Physical Description:	
5. Odour/Taste:	
6. Faecal Coliform Count:	
7. Total Coliform Count:	
8. Turbidity:	
9. Free Chlorine:	
10. Combined Chlorine:	
11. Conductivity:	
12. Temperature:	
13. pH:	
14. Nitrate:	
15. Nitrite:	
16. Ammonia:	
17. Aluminium:	
18. Boron:	
19. Copper:	
20. Fluoride:	
21. Magnesium:	
22. Manganese:	
23. Hardness:	
24. Ozone:	
25. Sulphate:	
26. Sulphide:	
27. Phosphate:	
28. Zinc:	

APPENDIX 4: RE-ORDERING INFORMATION

DESCRIPTION	
Membrane Filtration Unit	Wag-WE10400
Spares Kit for Filtration Unit, comprising of filter disk and gasket kit	Wag-WE10402
Pack of 20 for POTAFLEX	Wag-WE10406
Sterile plastic petri dishes (50 mm diameter by 11 mm depth) pack of 700	Wag-WE10410
Pair tweezers	Wag-WE10412
Cigarette lighter	Wag-WE10414
Hand Lens	Wag-WE10416
Screwdriver	Wag-WE10418
Lubricating grease – 60g tube	Wag-WE10420
Nail clippers	Wag-WE10422
Spare internal battery for POTAFLEX	Wag-WE10424
Spirit thermometer for checking incubator temperature	Wag-WE10426
WagPac – disposable water sample bags (Pack of 500)	Wag-WE10428
Media Measuring Device (MMD) (pack of 5)	Wag-WE10429

DESCRIPTION	
3-Part Turbidity Tube, 5-500 JTU	Wag-WE10438

DESCRIPTION	
Coliform Starter Pack, 200 grid membranes, pads and growth medium for 200 tests	Wag-WE10450
Lauryl Sulphate Broth, 500g (2,600 tests)	Wag-WE10452
Lauryl Sulphate Broth, 38.1 g (200 tests)	Wag-WE10454
Lauryl Sulphate Broth, 1.92g sachets (10 tests),pack of 25	Wag-WE10456
Faecal Streptococci Starter Pack (Slanetz & Bartley Medium) for 200 tests	Wag-WE10458
Absorbent pads and membranes (pack of 200) (pack of 1000)	 Wag-WE10460 Wag-WE10462
Pad dispenser	Wag-WE10464

Pre-prepared Media These are small ampoules and vials which contain a pre-prepared 2ml quantity of media. Being pre-prepared, they have the advantage of convenience and of always being sterile.	
Faecal Coliform Ampoules, 2ml (Pack of 40)	Wag-WE10468
Total Coliform Ampoules, 2ml (Pack of 40)	Wag-WE10470

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