

COMBI KIT  
AE 101

COOLING WATER



AQUASOL

*Any time ... Any where...*

*Analyzing Waters*

*Analyzing Waters*

# AQUASOL

Analyzing Waters  
Anytime... Anywhere...

## COMBI KIT COOLING WATER



- ◆ Simple, easy to follow procedures, **Anytime... Anywhere...**
- ◆ Based on proven laboratory methods backed by sound chemical research
- ◆ Rapid, accurate and reliable results are achieved
- ◆ Low cost, user friendly, compact and portable systems
- ◆ **AQUASOL** gives you freedom from the need of a laboratory, trained manpower and laborious processes involved
- ◆ **AQUASOL** systems are extremely convenient, and free you from the tedium of the laboratory, while saving precious time. Now you do not have to bother about reagent preparations and standardization.

Therefore **AQUASOL** systems have been designed especially for You, who require accuracy of the highest standards.

You will believe **AQUASOL**, the more you use it.



## Combi Kit For COOLING WATER



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Regular periodical water analysis protects the cooling system from the attack of corrosion and scaling and allows it to function at its maximum capacity. Testing of makeup water helps in providing optimum pre-treatment and testing of recirculating cooling water helps in monitoring cooling efficiency.

Thereby attaining control over :

- Scale formation
- Corrosion
- General fouling
- Microbiological fouling

The parameters required to be tested regularly are :

- |                                    |   |
|------------------------------------|---|
| 1) For scale & deposit free system | pH, Total Hardness,<br>Calcium Hardness,<br>Alkalinity, Silica, Phosphate |
| 2) Corrosion monitoring            | Iron, Chloride  |
| 3) Microbiological control         | Free Chlorine   |



# Cooling Water Analysis



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# TOTAL HARDNESS

**AE : 201**



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Range : 10–200, ppm Hardness as ppm CaCO<sub>3</sub>

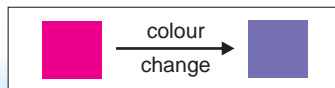
## Directions for Use :

1. Take 25 ml of water sample to be tested in the test jar.
  2. Add one spoonful (provided herewith) of **TH 1S**.
  3. Mix contents well to dissolve.
  4. Add 10-12 drops\* of **TH 2** and mix contents well.
  5. If colour turns blue, it indicates there is 'No Hardness' in the water.
  6. If colour turns red, it indicates there is 'Hardness'.
  7. Now drop wise\* add **TH 3**<sup>♦</sup>, counting the number of drops while mixing, until the colour changes from red to blue.
- ♦ If the expected hardness of the test sample is more than 40 ppm, then use **TH 4** instead of **TH 3**.

## Calculations :

Total Hardness as ppm CaCO<sub>3</sub> = 2 x (No. of drops of **TH 3**)  
= 5 x (No. of drops of **TH 4**)

\* For controlled addition of drops, follow instructions on the dispenser.



## TOTAL HARDNESS

**AE : 221**



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### **Directions for Use : (25-500 ppm)**

1. Take 10 ml of water sample to be tested in the test jar.
2. Add one spoonful (provided herewith) of **TH 1S**.
3. Mix contents well to dissolve.
4. Then add 10-12 drops of **TH 2**, and mix contents well.
5. Now drop wise\* add **TH 5**, counting the number of drops while mixing, until the colour changes from red to blue.

### **Calculations :**

Total Hardness as ppm  $\text{CaCO}_3$  = 25 x (Number of drops of **TH 5**)

\* For controlled addition of drops, follow instructions on the dispenser.

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**pH**

---

**AE : 306**

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### **Colour Comparison Method**

### **Directions for Use :**

- 1) Fill the test jar with the water sample upto 10 ml mark.
- 2) Add 10 drops of **pH 1** and mix well.
- 3) Compare the colour developed with the colour chart by placing the test jar near the colour. View the sample colour from the top of the jar while matching with the colour chart.
- 4) Read the pH.



## CALCIUM HARDNESS

AE : 202

Range : 5 – 100 ppm



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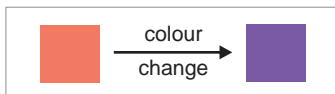
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### Directions for Use:

1. Take 10 ml. of water sample to be tested in the test jar.
2. Add one spoonful (provided herewith) of **CH 2**.
3. Mix well to dissolve.
4. Then add 10 drops of **CH 1**.
5. Now drop wise\* add **CH 3**, counting the number of drops while mixing, until the colour changes from red to violet.

### Calculations :

Calcium as ppm  $\text{CaCO}_3 = 5 \times [\text{No. of drops of CH}_3]$



## ALKALINITY

AE : 204

(10-200 & 100-2000 ppm Alkalinity)



# AQUASOL

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### Directions for Use :

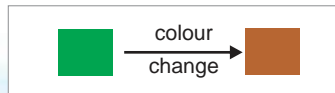
1. Take 10 ml of water sample to be tested in the test jar.
  2. Add 2 drops of **AK 1** mix well to dissolve.
  3. If a pink colour does not appear\* then add one spoonful (provided herewith) of **AK 4**. The sample will turn green.
  4. Now drop wise\* add **AK 2**# counting the number of drops while mixing, until the colour changes from green to reddish violet.
- # If the expected Alkalinity is more than 200 ppm, then use **AK 3** instead of **AK 2**.

### Calculations :

$$\begin{aligned}\text{Total Alkalinity ppm as CaCO}_3 &= 10 \times (\text{Number of Drops of AK 2}) \\ &= 100 \times (\text{Number of Drops of AK 3})\end{aligned}$$

- \* For controlled addition of drops, follow instructions on the dispenser.

- ◆ Indicates P Alkalinity is Nil.





# ALKALINITY

**AE : 204**

(10-200 & 100-2000 ppm Alkalinity)



# AQUASOL

Analyzing Waters  
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## (P Alkalinity & Total Alkalinity)

### Directions for Use :

1. Take 10 ml of water sample in the test jar.
  2. Add 2 drops of **AK 1**. Mix well to dissolve.
  3. If a pink colour appears it indicates presence of P Alkalinity.
  4. Then drop wise\* add **AK 2**<sup>#</sup> counting the number of drops while mixing until the pink colour disappears (N drops).
  5. To this solution add one spoonful (provided herewith) of **AK 4**. The sample will turn green.
  6. Now dropwise\* add **AK 2** counting the number of drops while mixing until the colour changes from green to reddish violet. (N 1 drops)
- # If the expected Alkalinity is more than 200 ppm, then use **AK 3** instead of **AK 2**.

### Calculations :

P Alkalinity ppm as  $\text{CaCO}_3$  = 10 X (N of Drops of **AK 2**)

= 100 X (N of Drops of **AK 3**)

Total Alkalinity ppm as  $\text{CaCO}_3$  = 10 X (N + N 1 drops of **AK 2**)

= 100 X (N + N 1 drops of **AK 3**)

\* For controlled addition of drops, follow instructions on the dispenser.

# CHLORIDE

AE : 203



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Range :10-200 & 50-1000 ppm Chloride

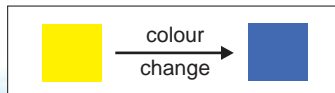
## Directions for Use :

1. Take 10 ml. of water sample to be tested in the test jar.
  2. Add one spoonful (provided herewith) of **CD 1**.
  3. Mix well to dissolve.
  4. Then add **CD 2** drop by drop till the sample turns yellow.
  5. Now drop wise\* add **CD 3**<sup>#</sup>, counting the number of drops while mixing, until the colour changes from yellow to bluish violet.
- # If the expected chloride of the sample is more than 200 ppm, then use **CD 4** instead of **CD 3**.

## Calculations :

$$\begin{aligned}\text{Chloride as ppm Cl} &= 10 \times (\text{Number of drops of } \mathbf{CD\ 3}) \\ &= 50 \times (\text{Number of drops of } \mathbf{CD\ 4})\end{aligned}$$

\* For controlled addition of drops, follow instructions on the dispenser.



# ORTHOPHOSPHATE

**AE : 301**

High Level



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## Colour Comparison Method

Range : 0, 5, 10, 20, 30, 40 ppm Orthophosphate as PO<sub>4</sub>

### Directions for Use :

1. Take 2.5 ml of cooled, filtered and prepared\* sample using syringe in the 10 ml test jar provided.
2. Add equal volume of **OP 1**
3. Dilute to 10 ml mark with DM / clear colourless phosphate free water.
4. Mix the contents well. Keep for 5 minutes. This is now “**S**”.
5. In another test jar fill 10 ml DM water. This is now “**B**”.
6. Read the ppm Orthophosphate as follows :
  - i) Place the test jar “**B**” on the yellow circle and test jar “**S**” on the white circle next to each other on the colour comparison chart.
  - ii) View from the top of the comparator test jar to compare the sample colour.
  - iii) Match the colours by moving the test jar from one circle to another.
  - iv) Read the ppm Orthophosphate after arriving at the correct match.

### \*Preparation of Sample

1. Water pH should be preferably neutral. Neutralize the highly alkaline sample to phenolphthalein end point before testing.
2. In case of sample having colour tint; take 50 ml of this sample, add 1-2 gram of **OP2** and boil till contents turn colourless. Cool and make up to 50 ml using distilled water. Filter through No. 42 paper and proceed for estimation of phosphate. If the sample cannot be decolourized, do the following :
  - a) Take the original water sample in the comparator tube and read the ppm Phosphate as per the procedure in No. 6 above.
  - b) This ppm reading has to be subtracted from the reading of the tested sample.
  - c) Determine chloride in the sample. If necessary, dilute the sample to maintain the chloride to less than 75 ppm Chloride.



# IRON

**AE : 303**



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## Colour Comparison Method

Range : 0, 0.05, 0.1, 0.3, 0.4, 0.5, 0.7, 1.0, 1.5, 2.0 ppm Iron as Fe

### Directions for Use :

1. Take 5 ml of water sample in the test jar with the help of syringe supplied here.
2. Add 15 drops of **FE1** and 30 drops of **FE2**.
3. Mix the contents thoroughly..
4. Add one spoonful provided herewith of **FE3** and mix the contents thoroughly by swirling the test jar. Let the mixture stands for 10 minutes.
5. Transfer the content in small comparator tube supplied Here.
6. Read the ppm Iron as follows :
  - a) Place the comparator tube on the small inner (white) circle, on the colour comparison chart.
  - b) View from the top of the comparator tube to compare the sample colour and the colour around.
  - c) Match the colours by moving the tube from one circle to another.
  - d) Read the ppm after arriving at the correct match.

- Note.
1. Sample pH should be preferably neutral. If a sample is acidic or alkaline it should be neutralized before test.
  2. In case of coloured waters such as some cooling waters, compare the developed colour with the standard colours by holding another test tube containing only the sample exactly in front or being the standard colour.

# SILICA

AE : 302



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## Colour Comparison Method

Range : 5,10, 20, 40, 60, 80 ppm Silica as  $\text{SiO}_2$

### Directions for Use :

1. Take 5 ml. of prepared\* sample in a plastic test jar using syringe.
2. Add in a rapid succession 3 drops of **SL 1** and 6 drops of **SL 2**.
3. Stopper the test jar and mix the content thoroughly by inverting five times. Keep for 5 minutes. Add 6 drops of **SL 3** and mix thoroughly. Wait for 2 minutes.
4. Transfer the content in small comparator tube provided here.
5. Read the ppm Silica as follows:
  - a) Place the comparator tube on the small inner (white) circle, on the colour comparison chart.
  - b) View from the top of the comparator tube to compare the sample colour and the colour around.
  - c) Match the colours by moving the tube from one circle to another.
  - d) Read the ppm after arriving at the correct match.

### Calculations :

Record ppm **SILICA** by standard colour comparison

### \*Preparation of sample

The pH of water should be preferably neutral. Therefore neutralize highly acidic or alkaline sample to pH 6.5 to 7.5.



## FREE CHLORINE

**AE : 205**

Range : 0.1–2.0 ppm Free Chlorine



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### Directions for Use :

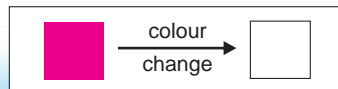
1. Take 10 ml. of water sample to be tested in the test jar.
2. Add one spoonful (provided herewith) of **FC 1**
3. Mix contents well to dissolve.
4. If a pink colour does not develop, chlorine is not present.
5. If a pink colour appears, free chlorine is present.
6. Now drop wise\* add **FC 2** counting the number of drops while mixing, until the pink colour disappears.

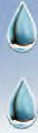
### Calculations :

Free Chlorine as ppm Chlorine =  $0.1 \times (\text{No. of drops of FC 2})$

### Important :

- After the end point (colourless) has reached, if a pink colour reappears on keeping, it should be ignored.
- Since the **FC 1** reagent is sensitive to air, Close the lid of the **FC1** bottle immediately after the use.





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AQUASOL Systems are available for almost all water parameters in individual packs as well as combination packs depending on the specific requirements of different industries, such as, 'Boiler Water', 'Cooling Water', 'Construction Industry', 'Swimming Pools', 'R.O. Water', etc.

Also for any specific requirements, Custom Made AQUASOL Systems can be devised both as Individual or Combination Kits.





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