MODEL 44600 HACH ONE CONDUCTIVITY/TDS METER

OBJECTIVE:

The goal of measuring total dissolved solids (TDS) is to determine how contaminated the wash solution is. If a wash solution is too dirty it will simply replace dirt with dirt as it "cleans" or "rinses". Rinse waters and sealers are the most sensitive to contamination. The lower the TDS the "cleaner" the solution is (see theory of operation for explanation). The TDS of incoming tap water is 170-220 parts/million PPM). Different wash solutions have different acceptable levels of contamination - refer to the wash parameters for specific guidelines.

THEORY OF OPERATION

Total dissolved solids (TDS) are determined by measuring the conductivity of a solution. Conductivity is the ability of a solution to conduct an electric current. TDS measurement therefore expresses the concentration of dissolved solids that conduct electricity such as inorganic dissolved solids (chloride, nitrate, phosphate, iron, aluminum, etc.). Organic materials such as oils etc. do not carry an electric current well and therefore can not be measured using conductivity.
Visual inspections are essential to assist in determining contamination. TDS is determined by using a multiplying factor of .5 from conductivity. Because phosphate conducts an electric current it is not possible to accurately determine contamination levels in phosphate wash solutions: Therefore it is not necessary to take a TDS reading of phosphate.

The common form of measurement of TDS is parts/million (ppm). One part/million is equivalent to one milligram/litre (mg/l). The Model 44600 reads TDS both in milligrams/litres and grams/litre. Careful attention should be exercised when using grams/litre to convert it into parts/million by multiplying the grams/litre by 1,000.

Conductivity and TDS measurement are greatly affected by temperature. Model 44600 is equipped to a temperature probe which automatically compensates and adjusts the measurement. The standard temperature reference point is 25^{o}C.

MEASURING THE TDS OF A SOLUTION

1. Obtain a sample of the solution to be tested.
2. Turn the meter on and select the "TDS" function.
3. Immerse probe in sample beyond the vent holes and agitate probe to release any air trapped in the vent.
4. Using the grams/litre range select either "2" or "20".

Note: A reading of "1." indicates out of range and "20" should be selected. If the reading still indicates "1." the solution is out of range of the meter and can not be measured.

1. Allow reading to stabilize and multiply reading by 1,000 to measure milligrams/litre (parts/million).
2. Record TDS measurement in parts/million (PPM).
3. Thoroughly rinse probe using deionized water after using.

MEASURING THE TEMPERATURE OF A SOLUTION

1. Obtain a sample of the solution to be evaluated.
2. Turn meter on and select temperature function.
3. Insert probe into solution.
4. Allow reading to stabilize and record temperature in degrees Celsius.
5. Rinse probe thoroughly in deionized water.

PROBE MAINTENANCE AND CALIBRATION

* All cleaning, calibrating and maintenance must be recorded on "Log Sheet" Provided.*

Proper maintenance of the probe will improve both accuracy as well as life span. After each use the probe should be rinsed using deionized water. This will flush out any interfering substances that may dry on the probe elements. The probe should also be cleaned once a week by **dipping** the probe into a 1:1 solution of Hydrochloric Acid (Oakite 32) and deionized water. The probe then should be rinsed thoroughly in deionized water.

The meter should be calibrated every three months or when a new probe is installed. Calibrate using Sodium Chloride, standard solution (NaCl) and the following steps:

1. Clean the probe.
2. Soak probe in demineralized water for a minimum of thirty minutes. Agitate vertically to remove trapped air.
3. Remove probe from water and fling out drops from inside the probe.
4. Immerse probe beyond vent holes in a breaker of Sodium Chloride (1000 mg/l as NaCl). Agitate vertically to remove trapped air.

Important: NaCl contaminates easily! Be sure a clean dry beaker is used.

1. Repeat steps 3 and 4 at least once more.
2. Turn meter on and select the "CND" function. (Check to ensure that the "LO BAT" indicator does not appear).

3. Select the 2 mS/cm range key.
4. If the reading is not 1.990 mS/cm adjust the calibration pot next to the display. Counter clockwise adjustment increases the reading. The reading is considered accurate if it is within ± .020 of 1.990 mS/cm.

PROBE REPLACEMENT

Refer to Maintenance.

TROUBLE SHOOTING

1.	Readings fluctuate wildly	-	clean probe
		-	check "LO BAT" indicator
		-	check for moisture under circuit board.
2.	Meter will not stay on	-	replace batteries
		-	check for moisture on circuit board.
3.	Meter will not calibrate	-	reclean probe and try again
		-	call Maintenance.
4.	Meter damaged or does not function at all	-	call Maintenance.

LOG OF SERVICE PERFORMED
(CLEANING, CALIBRATING AND REPLACEMENT PARTS)

MODEL: _____ SERIAL #: _____

DATE	SERVICE PERFORMED	TECHNICIAN	EMP. #