



2013

**Ultra Design
and Research Company**

WATER TEST CATALOG

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WATER TEST CATALOG

USACE Lab Certificate for Ultra Design




DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
AFGHANISTAN ENGINEER DISTRICT - SOUTH
APO AE 09355

5 September 2010

CETAS-EC-QAB

2010 INSPECTION AND CERTIFICATION FOR THE
ULTRADESIGN & RESEARCH LABORATORY AT HERAT



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
AFGHANISTAN ENGINEER DISTRICT - SOUTH
APO AE 09355

23 July 2011

USACE-EC-QAB

2012 INSPECTION AND CERTIFICATION FOR THE
ULTRADESIGN & RESEARCH LABORATORY AT HERAT

This letter confirms the completion of 2012 inspection and certification for the Ultra Design & Research Lab, located in Herat, Afghanistan. While this laboratory is located in Herat, the facility will be approved to conduct field tests anywhere in Afghanistan Engineer District (AED)-South. The laboratory will also be recommended for use anywhere in AED - North.

The inspection/evaluation is based on ASTM lab checklists and procedures including facility, equipment, calibration, knowledge, personnel, references, reporting and attitude. The inspection reflected the lab's positive and professional reputation.

This laboratory is certified for use by Afghanistan Engineer District South for the construction materials tests listed in lab inspection checklist (attached) conditional on compliance with ASTM and USACE standards. This certification will be included with records that are maintained at the AED Headquarters in Herat and Kabul, Afghanistan. Retaining certification will require yearly inspections by AED-S. This certification is also contingent upon the continued employment of Professor Noman Moheb (Lab Manager), Said Shakib Atef (Deputy Manager), and Mahboba Tawakoli (Senior Lab Technician). Without the oversight of these personnel, the laboratory will require recertification. Also, if the laboratory moves to a new location, it will require recertification.

The inspection and certification process for the Ultra Design & Research - Herat Laboratory adhered to procedures outlined by the Materials Testing Center (MTC), located at the U.S. Army Engineer Research and Development Center (ERDC), Vicksburg, Mississippi, USA. The MTC is the USACE agency for certifying labs for quality control testing for USACE construction projects. To facilitate construction in Afghanistan, AED-S has authorized these authors to conduct laboratory inspections and certifications with adherence to MTC standards.

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Quality Assurance Branch
Afghanistan Engineer District - South
U.S. Army Corps of Engineers

USACE-EC-QAB
SUBJECT: 2012 INSPECTION AND CERTIFICATION FOR THE ULTRA DESIGN & RESEARCH LABORATORY AT HERAT

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LABORATORY DEPARTMENT

Introduction:

Ultra Design Construction Material Testing Laboratory is an AISA and USACE registered, independent testing laboratory providing expert chemical and physical analyses for construction materials and related items.

Our water quality test department established in 2011 and by now has two year experience of water quality testing in major projects of Afghanistan, Our professional team with USA reagents and equipment represents the best quality test results in the region.



fig. 1: Water test department

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fig. 2: Conductivity

Ultra Design Lab Department Capabilities

- ✦ Bitumen test
- ✦ Cement test
- ✦ Rock test
- ✦ Aggregate test
- ✦ Geotechnical investigation
- ✦ Water test
- ✦ Concrete test
- ✦ Steel test
- ✦ Soil test
- ✦ Mix designs



fig. 3: Water test equipments



fig. 4: Specialist conducting test



fig. 5: Water quality test kit

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WATER TEST CATALOG

We test the follwings

Water Available Test

No	Test	No	Test
01	Sample Preparation	22	Manganese
02	Aluminum	23	Nickel
03	Alkalinity	24	Nitrate
04	Ammonia a MR	25	Dissolved
05	Ammonia a LR	26	Ozone
06	Bromine	27	PH
07	Calcium	28	Phosphate
08	Free Chlorine	29	Silica
09	Total Chlorine	30	Sulfate
10	Chlorine Dioxide	31	Zinc
11	Chromium Vi HR	32	Dissolved Oxygen
12	Chromium Vi LR	33	Hydrazine
13	Color of Water	34	Phosphorus
14	Copper LR	35	Nitrogen
15	Cyanuric Acid	36	Chlorine
16	Fluoride	37	Colorimetry
17	Calcium Hardness	38	Conductivity
18	Magnesium Harness	39	Dissolved Oxygen
19	Iodine	40	Ion Analyses
20	Iron	41	Turbidity
21	Magnesium		

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Some Lab Photo

US Army corps of engineers lab visit for certification



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fig. 6: US Army corps of engineers lab visit for certification 2012



fig. 7: US Army corps of engineers lab visit for certification 2010

WATER TEST CATALOG

What is conductivity and why is it important?

Conductivity is a measure of the ability of water to pass an electrical current. Conductivity in water is affected by the presence of inorganic dissolved solids such as chloride, nitrate, sulfate, and phosphate anions (ions that carry a negative charge) or sodium, magnesium, calcium, iron, and aluminum cations (ions that carry a positive charge). Organic compounds like oil, phenol, alcohol, and sugar do not conduct electrical current very well and therefore have a low conductivity when in water. Conductivity is also affected by temperature: the warmer the water, the higher the conductivity. For this reason, conductivity is reported as conductivity at 25 degrees Celsius.

pH/EC/TDS/Temperature Meters



Automatic one or two point calibration

- Multi-level LCD display The meters display the current measurement simultaneously with the current temperature.
- On-screen tutorial messages for calibration and setup
- HOLD The HOLD button freezes readings on the display for manual recording.
- Automatic Temperature Compensation
- BEPS (Battery Error Prevention System) alerts the user in the event that low battery power could adversely affect readings
- Measure pH, EC/TDS and temperature with one probe
- Battery % displayed on startup
- Easy to clean and keep clean

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Conductivity and TDS Testers



There are several factors that determine the degree to which water will carry an electrical current. These include:

- 1) the concentration or number of ions;
- 2) mobility of the ion;
- 3) oxidation state (valence) and;
- 4) temperature of the water.

Resistance, which is an electrical measurement expressed in ohms, is the opposite of conductivity. Conductivity is then expressed in reciprocal ohms. A more convenient unit of measurement in the chemical analysis of water is micromhos. The specific conductance or conductivity measurement is related to ionic strength and does not tell us what specific ions are present.

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WATER TEST CATALOG

What is turbidity and why is it important?

Turbidity is a measure of water clarity how much the material suspended in water decreases the passage of light through the water. Suspended materials include soil particles (clay, silt, and sand), algae, plankton, microbes, and other substances. These materials are typically in the size range of 0.004 mm (clay) to 1.0 mm (sand). Turbidity can affect the color of the water.

Higher turbidity increases water temperatures because suspended particles absorb more heat. This, in turn, reduces the concentration of dissolved oxygen (DO) because warm water holds less DO than cold. Higher turbidity also reduces the amount of light penetrating the water, which reduces photosynthesis and the production of DO. Suspended materials can clog fish gills, reducing resistance to disease in fish, lowering growth rates, and affecting egg and larval development. As the particles settle, they can blanket the stream bottom, especially in slower waters, and smother fish eggs and benthic macroinvertebrates. Sources of turbidity include:

Turbidity Tester



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Digital Refractometers, Portable and Benchtop Photometers



Digital Refractometers

HANNA offers digital refractometers for analysis in wine, food, natural and artificial seawater analysis and ethylene and propylene glycol.

- Dual level LCD
- IP65 waterproof protection
- Results in less than 1.5 seconds



Portable Photometers

HANNA has extended the portable photometer line to include new single and multiparameter portable photometers.

- CAL CHECK™ Calibration and Verification
- GLP (Good Laboratory Practice)
- BEPS (Battery Error Prevention System)



Benchtop Photometers

HANNA has expanded its benchtop photometer line including COD.

- Log and recall readings
- On-screen tutorials
- Contextual help at the touch of a button
- PC compatible via USB

- **Soil erosion**
- **Waste discharge**
- **Urban runoff**
- **Eroding stream banks**
- **Large numbers of bottom feeders (such as carp), which stir up bottom sediments**
- **Excessive algal growth.**

Turbidity is a measure of the relative clarity of water: the greater the turbidity the murkier the water. The amount of suspended matter in water will reduce the penetration of light into the water. As light decreases, so does photosynthesis by deeper plants. That decreases the plant growth for food for herbivores and also results in decreases in oxygen production. High turbidity can also make it difficult for predators that use sight to see and capture their prey. A rain event leading to high turbidity can also lead to bad fishing until the water clears back up again. High turbidity may be caused by soil erosion, waste discharge, urban runoff, abundant bottom feeders (such as carp) that stir up bottom sediments or algal growth.

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What is PH and why is it important?

Although it is sometimes overlooked, pH may very well be one of the most critical variables of water quality parameters within a healthy aquarium environment. It is important to understand the correct range for different setups. For example, maintaining a pH in the range of 8.1 to 8.4 in marine systems will offer a natural, antiseptic effect, helping fish resist illness and also keep coral from calcifying at an accelerated speed. If the pH is in constant fluctuation, or is fixed at a position that is too high or low, it can be harmful to the organisms in your aquarium. This is only one reason why testing your pH is so important. Observed changes can also give you early warning that other water parameters may be endangering the health of your marine aquarium.

Testers and Monitors



pH Monitors

Ideal for growers, pH monitors are supplied with advanced, nonclogging double junction pH electrodes that will withstand the most aggressive environments. Measurements are highly accurate and can be verified with manual or automatic calibration, which can be performed in one or two points. Should the pH exceed a user selected limit, an incorporated LED will alert the user with a flashing light. This feature allows even inexperienced users to successfully monitor parameters. The LED alarm, and pH value can be set through trimmers on the instrument.

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WATER TEST CATALOG

By using quality testing equipment to closely monitor your pH, and by correcting the problem expediently, you greatly improve your chances for keeping a thriving and healthy reef system. For best results, testing with a pH kit should occur twice weekly; you can also invest in an electronic pH monitor for ease and convenience. Monitors display a continuous LCD readout of pH levels; some have an alarm feature that alerts you when the levels stray from the desired range.



Testers and Monitors

ORP Monitors

HANNA has developed oxidation reduction monitors especially for swimming pool and spa facilities where specific monitoring is needed. Casings incorporate a large, bright led indicator that will flash if measurements fall below the user selected value, enhancing the control and maintenance of water.

A failing pH can be an indication of excess ammonia and/or nitrite resulting from a dead organism, decaying food or plants within the system; it could also be linked to a deficiency of calcium, magnesium or alkalinity. Each of these conditions either produces acids, or is an indication of a mineral imbalance that is harmful to aquarium organisms.

The pH should be tested regularly to maintain ideal conditions and also to foresee any dangerous ammonia or nitrate spikes. The investment in time and test equipment will reward your aquarium with happy, healthy, flourishing inhabitants.

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What is Alkalinity and why is it important?

Alkalinity is a measure of the capacity of water or any solution to neutralize or “buffer” acids. This measure of acid-neutralizing capacity is important in figuring out how “buffered” the water is against sudden changes in pH.

Alkalinity should not be confused with pH. pH is a measure of the hydrogen ion (H^+) concentration, and the pH scale shows the intensity of the acidic or basic character of a solution at a given temperature. The reason alkalinity is sometime confused with pH is because the term alkaline is used to describe pH conditions greater than 7 (basic).

The most important compounds in water that determine alkalinity include the carbonate (CO_3^{2-}) and bicarbonate (HCO_3^-) ions. Carbonate ions are able to react with and neutralize 2 hydrogen ions (H^+) and the bicarbonate ions are able to neutralize H^+ or hydroxide ions (OH^-) present in water. The ability to resist changes in pH by neutralizing acids or bases is called buffering.

Alkalinity is important to aquatic organisms because it protects them against rapid changes in pH. Alkalinity is especially important in areas where acid rain is a problem.

HI 766C1, Ultra-Fast Penetration Probe

Penetration probe with fast response time



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Alkalinity Test Kit



Alkalinity Phenolphthalein and Total

Alkalinity is the quantitative capacity of a water sample to neutralize an acid to a set pH. This measurement is very important in determining the corrosive characteristics of water due primarily to hydroxide, carbonate and bicarbonate ions. Other sources of alkalinity can be from anions that can be hydrolyzed such as phosphates, silicates, borates, fluoride and salts of some organic acids. Alkalinity is critical in the treatment of drinking water, wastewater, boiler & cooling systems and soils.

The HANNA alkalinity test kit makes monitoring easy, quick and safe. The compact size gives the user the versatility to use the kit anywhere. The design makes the kit easy to handle and, except for alkalinity titrant, practically prevents accidental injury or damage due to spills.

Alkalinity can be measured as phenolphthalein alkalinity and total alkalinity. The phenolphthalein alkalinity is determined by neutralizing the sample to a pH of 8.3 using adilute hydrochloric acid solution, and a phenolphthalein indicator. Since bicarbonate ions can be converted to carbonic acid with additional hydrochloric acid, the phenolphthalein alkalinity measures total hydroxide ions, but only half of the bicarbonate contribution.

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WATER TEST CATALOG

Conductivity and TDS Testers



- Choose from TDS or EC
- Direct or cable probe connection
- Automatic calibration
- Automatic Temperature Compensation

The Primo series of testers provide a fast and dependable way to measure the total dissolved solids or conductivity in your water samples. It is ideally suited for the rigorous demands of water quality professionals. Many professionals use the cabled version of the Primo when demonstrating the before and after results of conditioning and filtration systems.

Temperature is compensated automatically to ensure the readings are consistent to the standard or reference temperature.

Operating and routine maintenance has never been easier. Primo uses a single button at the top of the meter. Press it once and the meter is powered and ready for use. Press and hold the button for a few seconds and Primo automatically enters calibration mode. Simply open a sachet of calibration solution, dip the probe in, and within seconds the meter recognizes the calibration solution and calibrates itself!

pH, ISE, Conductivity, DO and Temperature Portable Meters

Most pH, ISE, EC and DO portable instrumentation has been updated and redesigned. Features for most models include on-screen tutorials to guide users through operation and calibration, BEPS (Battery Error Prevention System) and waterproof casings.

pH, Conductivity
and
Multiparameter



Application Designed
pH, Conductivity,
and
Multiparameter

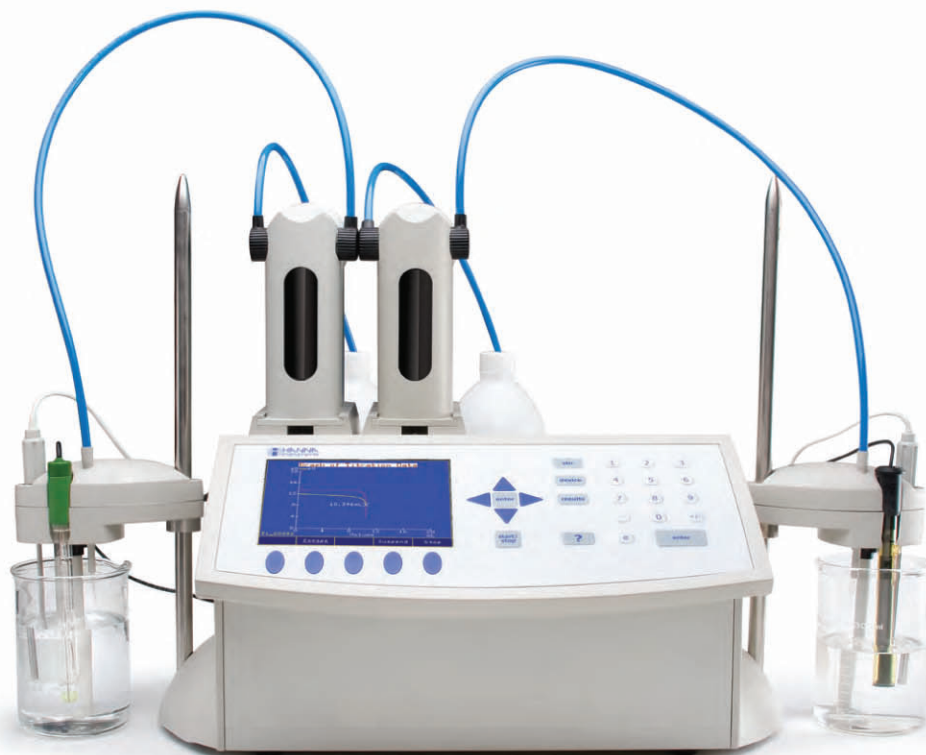


Thermometers



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Automatic Titration Systems



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اهمیت تست آب:

بهداشت و سلامت جامعه رابطه مستقیمی با تهیه آب سالم دارد از آنجایی که آب مهمترین عامل انتقال بیماریها بشمار می آید مسئله آلودگی آب از موضوعاتی است که با توسط مزیان واسط موجبات انتقال بیماری را فراهم می کند لذا از گذشته در زندگی بشر نقش مهمی داشته است آب آلوده با مستقیما سلامتی انسان را تهدید می کند با توجه به موارد فوق بررسی آلودگی آب از نظر وجود پروتوزوئرها و نماتودها و عوامل میکروبی حائز اهمیت می باشد.

بسیاری از مردم تصور می کنند که اگر یک قطره نفت یا روغن در مخازن آب ریخته شود هیچ اتفاقی رخ نمی دهد و آسیبی به کسی وارد نمی شود. اگر این کار تنها توسط یک نفر انجام شود اتفاق خاص نمی افتد اما، همیشه اینگونه نیست . اگر هر کدام از انسانها بخواهند یک قطره نفت یا روغن به مخازن آب اضافه کنند آن وقت چه اتفاقی می

افتد؟

مهمترین منابع آب و اهمیت تست آن:

1. منابع آب شهری که قبل استفاده منازل مسکونی و شهروندان میباشد.
 2. آب جاه های اکثر پروژه های ساختمانی که استفاده از آب شامل نمکیات یا عوامل کیمیایی باعث خصرات جبران ناپذیری خواهد شد.
 3. آب دریاها و رودخانه ها و دریاچه ها و جوی ها و استفاده بهینه از آنها در امور شهری .
- بنا براین شرکت ساختمانی الترا دیزاین سعی در این دارد تا با ارائه دادن تست های آب با کیفیت بالا در پیشرفت و ترقی کشور سهمیم بوده و به عنوان عضو موثری از وطن ایفای وظیفه نماید

معرفی تست های آب قابل اجرا:

بطور طبیعی، املاح معدنی در آب وجود دارد و این املاح به معنی مواد شیمیایی در خلأ قرار می گیرند، از اینرو است که در پلانت تصفیه و باطوری کلیتاً از مصر فایده ای ندارند و نظریه کفایت ترشوند در مورد دیامیتر املاح توضیح داده می شود

1. تست آلومینیوم	9. تست سیلیکا	17. تست آهن
2. تست کلسیم	10. تست سلولر	18. تست پتاسیم
3. تست سرب	11. تست فلورید	19. تست سیلیکا
4. تست زنک	12. تست کوپر	20. تست مس
5. تست پی اچ	13. تست مگنیزیم	21. تست سلفات
6. تست تانتریت	14. تست کلراید	22. تست سلفر
7. تست القلی و اسیدی	15. تست آمونیم	23. تست فسفات
8. تست نیکل	16. تست برومین	24. تست ارسنیک

تست های نامبرده هر یک تاثیر خاصی بر روی آب داشته که

با تغییر رنگ و بو و مزه آب را از نظر کیفی قابل شرب یا غیر قابل شرب نموده و استفاده نا آگاهانه آن آب باعث ایجاد بیماری های مختلفی خواهد شد.

تاثیرات مخرب

سرب

سرب یک فلز سمی و رویدند است که با آلودگی آب در تماس با آب در بدن انسان جذب می شود و می تواند باعث ایجاد مشکلاتی در سیستم عصبی، کلیه ها و خون شود. علائم آن عبارتند از: سردرد، تهوع، استفراغ، اسهال، کمردرد، خستگی، کاهش وزن، و مشکلات تنفسی. سرب همچنین می تواند باعث ایجاد مشکلاتی در سیستم ایمنی و تولید مثل شود.

معرفی شرکت:

شرکت ساختمانی الترا دیزاین با بیش از پنج سال سابقه کاری در بخش های ارائه تست و کنترل امور کیفی یا مشتریان در بخش های دولتی و خصوصی شامل ارائه خدماتی به شرح زیر میباشد

(الف) تست آب (تست قیرج) تست ریگ و تست خاک
(ب) تست های سنگ و سمنت و کانگرت (ارانه جنوتیکیناک)
(ج) میکس دیزاین

و هم اکنون برای تکمیل فعالیت های خویش در عرصه کنترل امور کیفی تست آب را نیز برای همشهریان عزیز خود ارائه مینماید

ادرس: سرک پوهنتون، مقابل دروازه پوهنتون، خانه نمبر 56

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