\*Hach's LDO technology has been approved in numerous states for mer or speak with a Hach representative to leam if your state is approved. asuring and reporting Dissolved Oxygen (DO) and BOD. Visit www.wa

> monitoring.\* for use in compliance Hach LDO® Method 10360 EPA Recommends

- Laboratory meter stand.
- Power and communication cables.
- LBOD Probe (Prod. No. LBOD10101).
  - HQ40d Digital Meter.
- Complete System available—Includes:

  - · Calibration in less than one minute. No membranes to replace.
- with the built-in features to measure BOD!

All the same great benefits of the Hach LDO probe,

Reliable performance and accurate readings time after time.

LDO® technology to deliver superior confidence in results! The Hach LBOD IntelliCAL" probe uses patented A Breakthrough in BOD Measurement!

See catalog pages 34-35 for complete listing of IntelliCAL probes.



and Temperature—only from Hach. IntelliCAL probes for pH, Conductivity, Dissolved Oxygen, BOD,

IntelliCAL<sup>™</sup> Probes

# **HQd Meter & IntelliCAL™ Probe Kits**

# **NEW!** BOD Measurement System

- NEW only from Hach: Complete BOD measurement system featuring the LDO advantage
- Calibration in less than one minute
- No membranes to replace

Prod. No. Description **BOD Measurement System** 



Prod. No. 2943100.

For use with 300 mL BOD bottles,

for complete BOD system. See catalog page 35

# pH Starter Kit

- Complete starter kit featuring HQ11d Meter and Standard IntelliCAL Gel pH probe
- Includes pH calibration buffers for quick ordering and start up
- · Features the new IntelliCAL probe stand for measurement and probe storage Prod. No. Description



# **Conductivity Starter Kit**

pH Starter Kit

- Complete starter kit featuring HQ14d Meter and Standard IntelliCAL Conductivity probe
- Includes Conductivity Standard Solution for quick ordering and start up
- Features the new IntelliCAL probe stand for measurement and probe storage

Prod. No. Description 8506100 **Conductivity Starter Kit** 



# Rugged DO Field Kit

- Rugged field kit for dissolved oxygen monitoring applications
- Features the rugged Hach LDO probe for maximum durability in the field or plant
- Case includes space to add an additional rugged probe Rugged field case includes everything needed for measurement
- and calibration, organized securely in a durable, die-cut foam insert

Prod. No. Description 8505100

Rugged DO Field Kit



# Rugged DO Field Kit w/ HQ40d Multi Meter

- Same rugged kit and components as HQ30d kit above, but includes the HQ40d multi meter
- HQ40d meter enables simultaneous, two parameter measurement
- Includes USB/Power Adapter for data transfer and line power operation
- Prod. No. Description

Rugged DO Field Kit w/ HQ40d Multi Meter

















eliminates membranes for low maintenance. Innovative technology—Patented breakthrough Hach LDO  $^{\!\otimes}$  luminescent dissolved oxygen technology

and even be downloaded to a printer or PC."

epeatability is very good, and we like the fact that it stores readings that can be tracked by the operator

lengths. Ideal for lab and field applications, even Flexible and durable—IntelliCAL probes available in standard and rugged versions in multiple cable

routines and calibration reminders. brobe and parameter recognition, check standard Reliable results—Accuracy ensured with automatic

history, making change outs simple and fast. • Time savings—IntelliCAL probes store calibration

simultaneous measurements with the HQ40d. switch out parameters later. Take up to 2 Versatile—Get the probes you need now, expand or

simple, and reliable measurements. interchangeable IntelliCAL probes for quick, Use a single handheld HQd meter and

and Temperature. Oxygen Demand (LBOD), Oxygen (LDO), Biochemical pH, Conductivity, Dissolved IntelliCAL<sup>TM</sup> Probes: HQd Meters and





Multi-Parameter Digital Meter HO40d Dual-Input,

HQd Meters



Choose Your Measurement: pH, Conductivity, Dissolved Oxygen (LDO®), **BOD**, Temperature.

> **Meters and Probes for** Field or Lab Applications.

# Greater confidence in results.

"We like our Hach LDO meter it is a significant improvement over the membrane-type unit we had been using. But w I took the HO40d meter out in the plant and tested it against the LDO meter. I could run five tests with it in the same time it took me to perform only one with the other unit. It locks in very quickly. Also, a calibration system alerts the user to when recalibration is needed. This, combined with the faster response time, gave us increased confidence in our results. Cindi Rutledge, Plant Operator, Loveland, Colorado WWTF

# Minimize errors with data-logging and data transfer.

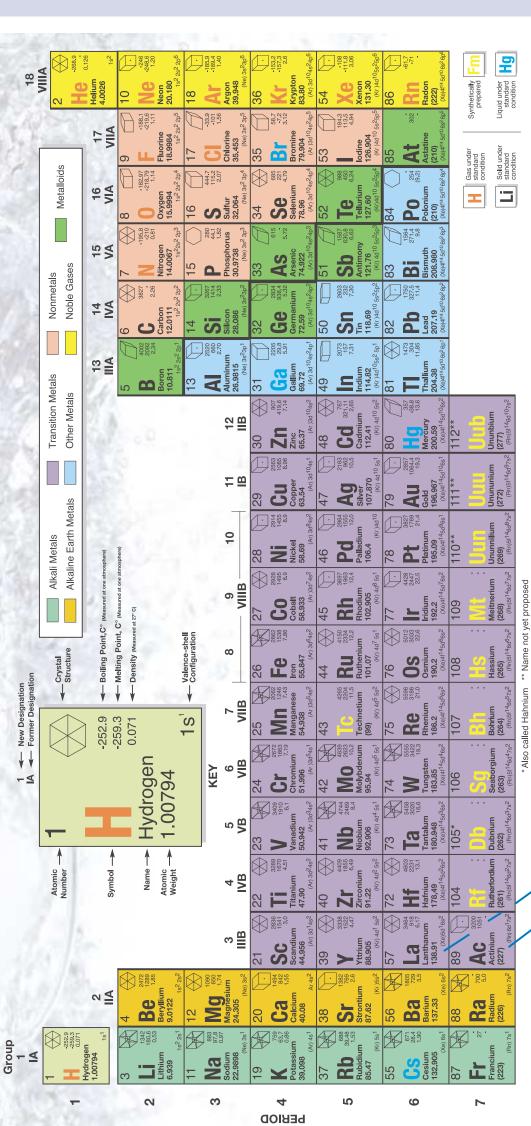
"With our previous pH meter and our galvanic-type DO meter, we did not have the capability to electronically store data. Because we'll now be able to store data and download it straight to our computer, we won't have to write numbers down by hand and key them in later. This will eliminate the potential for transcription errors." Eric Kingsley, Water Quality Specialist, Monterey Bay Aquarium







# Table of the Element eriodic



©2000 M. Ruskin Co. www.painlesslearning.cor Thullium 168.934 3625 山 2700 1474 8.80 n) 5f<sup>11</sup>7s<sup>2</sup> Holmium 164.930 Gd 囧 Sm Samariu 150,35 Plutonii (242) Neodyr 144.24 Praseodyn 140.907 Cerium 140.12 (Xe) 4f<sup>1</sup>g Actinide Series Orthorhombic Monoclinic

Cubic, body centered

Hexagonal

Cubic

Cubic, face centered

Call your dedicated customer service rep today, or go online to use our Live Help option. www.hach.com/industrial 866-450-4248 Industrial:

www.hach.com/muni 800-227-4224 Municipal:

# **CALCULATIONS** COMMON

# Mass (or pounds)

Lbs = Flow (MGD) or Volume (Million Gallons) x Concentration (mg/L) x 8.34

# Lbs in Aeration Tank Sludge Age

Lbs Wasted

# MCRT (Mean Cell Residency Time) Lbs in Aeration Tank + Lbs in Clarifiers Lbs Wasted + Lbs in Effluent

Lbs Volatile Suspended Solids in Aeration Tank **Food to Microorganism Ratio** 

Chlorine Demand + Total Chlorine Residual

**Chlorine Dose** 

Q = AV

# Q = Flow in cubic feet per second (cfs) A = Cross sectional area of the conduit (pipe or open channel) in ft<sup>2</sup>

= Velocity of the fluid in the conduit in ft/sec.  $\pi r^2$  where  $\pi = 3.14$ Area of a Circle

# **Avogadro's Number** 6.022 X 10<sup>23</sup>

A one normal (1N) solution contains one equivalent per liter of solution.

# Normality = # of equivalents

Liter of solution

# **Calculating Dilutions**

 $C_1 = concentration of the starting solution in %,$  $C_1 \times V_1 = C_2 \times V_2$ 

molarity or normality

 $V_1=\mbox{volume}$  of the starting solution  $C_2=\mbox{concentration}$  of the final and the units of

concentration are the same as C<sub>1</sub> volume of the final solution and the units of volume are the same as V<sub>1</sub>

# **Dilution Factor**

Sample Volume Total Volume

Multiply Dilution Factor by the Measured Result to calculate Actual Concentration

Wastewater Treatment is the only process in the world where you cannot control your inputs, but have to create a perfectly defined output.

