More than 240 Analytical Methods and Chemistries
The Hach DR 2800 Portable Spectrophotometer can be used for more than 240 analytical methods. (Test parameters are listed on page 3.) These methods include more than 30 TNTplus™ reagent vial tests that provide innovative barcode labeling for reliable, automatic method detection. All of the chemistries and supplies needed for these tests are available from Hach. The spectrophotometer can store up to 50 user programs and 500 data points, including sample and operator ID.

Use a USB Memory Stick to Update the Instrument or Transfer Data
Easily update DR 2800 spectrophotometer systems and transfer measurement data with a USB memory stick. Use it to stay current as Hach releases new test methods and chemistries. Two USB ports on the instrument allow for a computer to be connected in one port, when used with an upcoming software package, while the other is used to connect the spectrophotometer to a memory device or hand-held bar code scanner.

Small Footprint and Large Touch Screen Interface
The small footprint of the DR 2800 spectrophotometer—only 8.7 by 13.1 inches—lets it easily fit into any lab as well as being completely portable. The touch screen display is intuitive to use and ergonomic in design.

Runs on Either Line Power or Battery Power
Use the DR 2800 spectrophotometer in the lab with regular line power or in the field with the optional lithium-ion battery.

Accommodates Multiple Cell Sizes and Sample Delivery Methods
The DR 2800 spectrophotometer holds eight types of Hach cells—including 1-in. square cells, 1x5-cm cells, 13-mm round vials (TNTplus), and 16-mm round vials. Three adapters are included with the spectrophotometer for other vial types such as 1-in. round/AccuVac™ cells, multi-path 1-in./1-cm cells, 1x1-cm square cells, and Pour-Thru™ cells. The optional Pour-Thru cell kit is ideal for rapid liquid methods when high throughput of analysis is needed.

TNTplus Reagent Vials Designed for the DR 2800 Spectrophotometer
Hach has developed TNTplus reagent vials for selected analytical methods that provide the following features when used with the Hach DR 2800 Portable Spectrophotometer:

- **Automatic method detection**—the spectrophotometer automatically reads the bar code, identifies the appropriate method, and takes the measurement to help eliminate human error, saving time and money.
- **No reagent blank is necessary**—high quality vials, tight regent production controls, 10-absorbance readings averaged for results determination, instrument calibration verification, and negligible instrument drift, all combine to eliminate the need to run reagent blanks.
- **Built-in accuracy**—while rotating the vial, the spectrophotometer takes 10 absorbance measurements in less than 5 seconds. The average value is used to calculate the results.
Specifications*

**Operating Mode**
- Transmittance (%), Absorbance, and Concentration

**Source Lamp**
- Tungsten

**Pre-Installed Programs**
- More than 240

**Available User Programs**
- 50

**Data Storage**
- 500 points

**Export Capability**
- .csv (comma-separated values) file format

**Wavelength Range**
- 340 to 900 nm

**Wavelength Accuracy**
- ±1.5 nm

**Wavelength Resolution**
- 5 nm

**Wavelength Calibration**
- Internal, automatic at power-on, visual feedback

**Wavelength Selection**
- Automatic: based on selected program
- Manual: based on barcode printed on TNTplus™ reagent vials

**Enclosure Rating**
- IP 41

**Operating Temperature**
- 10 to 40°C (50 to 104°F)

**Operating Humidity**
- 80% relative humidity, non-condensing, maximum

**Storage Requirements**
- Temperature: -25 to 60°C (-13 to 140°F)
- Humidity: 80% relative humidity, non-condensing, maximum

**Power Requirements**
- Line: 100 to 240 V; 47/63 Hz; automatic changeover
- Battery: Lithium-Ion 11V/4400mAh

**Interface**
- USB 1.1 (10 ft. (3 m) cable, maximum)

**Languages**
- English, French, German, Italian, Spanish, Portuguese, Chinese, Japanese, and Korean (please contact your Hach representative for availability of additional languages)

**Connections**
- 1 x USB type B (PC)
- 1 x USB type A (USB storage device, printer, keyboard)

**Dimensions**
- 220 x 137 x 332 mm (8.7 x 5.4 x 13.1 in.)

**Weight**
- Without battery: 4.06 kg (8.95 lbs.)
- With battery: 4.38 kg (9.65 lbs.)

**Sample Cell Compatibility**
- 1-in. square
- 1-in. round
- 1 cm square
- 1x5 cm
- 13 mm round
- 16 mm round

**Multi-path 1-in./1 cm**

**Accessories**
- Included:
  - 1-in. square matched glass sample cells
  - Cell adapters for 1-in. round/16 mm round/vials, 1x5 cm cells, and multi-path 1-in./1 cm cells
  - Universal power supply, 100 to 240V, 47/63Hz, with plug adapters for EU, GB, US, China
  - Protective cover for storing adapters
  - Dust cover
- Optional:
  - Hach Pour-Thru cell
  - External USB keyboard
  - Rechargeable lithium-ion battery
  - Carrying Case
  - DataTrans™ Software

**Encyclopedia**

1. The spectrophotometer instrument shall be a multi-wavelength spectrophotometer designed for laboratory or field analysis of multiple analytes.

2. The spectrophotometer shall be capable of measuring the following substances or characteristics: alachlor; aluminum; arsenic; atrazine; barium; benzotriazole; boron; bromine; cadmium; chloride; chlorine dioxide; chloride; chromium; cobalt; color; copper; cyanide; cyanuric acid; dissolved oxygen; fluorides; formaldehyde; hardness; hydrazine; iodine; iron; lead; manganese; mercury; molybdenum/molydate; monochloramines; nickel; nitrogen (as ammonia, nitrate, nitrite, total nitrogen, total Kjeldahl nitrogen); chemical oxygen demand; oxygen scavengers; ozone; polychlorinated Biphenyls; phenols; phosphonates; phosphorus; potassium; quaternary ammonium compounds; selenium; silica; silver; sulfate; sulfide; surfactants; suspended solids; tannin and lignin; total organic carbon; tolytriazole; total petroleum hydrocarbons; trihalomethanes; toxicity; volatile acids; and zinc.

3. The following tests shall conform to USEPA-compliant methods: arsenic; chlorine (free); chlorine (total); chloride; chromium (hexavalent); copper; fluoride; iron (total); lead; manganese; nickel; nitrogen (ammonia); nitrogen (nitrate); chemical oxygen demand; phenols; phosphorus (reactive); phosphorus (total); sulfate; sulfide; and zinc.

4. The wavelength range of the instrument shall be 340 to 900 nm with accuracy of ±1.5 nm, resolution of 1 nm, and maximum bandwidth of 5 nm.

5. The instrument, depending on the test selection, shall automatically select the wavelength.

6. Readout modes shall include transmittance, absorbance, and concentration.

7. The interface of the instrument shall be graphical with touch screen.

8. The instrument shall provide graphical display and be capable of printing test results.

9. The instrument shall be equipped with storage capacity for 500 data points (date, time, results, sample ID, user ID) and 50 user-defined calibrations.

10. Information stored in the instrument shall be capable of being downloaded in standard report format.

11. The instrument shall be capable of accepting 1-in. round/vials, 1-in. square cells, 13 mm round vials, 16 mm round vials, 1x5 cm cells, and Pour-Thru cells with 1-in./1 cm path lengths.

12. Power requirement shall be line voltage or optional battery pack.

13. The instrument shall be warranted for one full year against defects in materials and workmanship.

14. The instrument shall be model DR 2800 Portable Spectrophotometer, manufactured by Hach Company.

*Specifications subject to change without notice.*
The following table lists available tests and overall ranges for the Hach DR 2800 Portable Spectrophotometer. The ranges may represent more than one available test for the instrument. Consult your Hach representative, Customer Service, the Hach Master Catalog (Lit. #2550), or the Hach web site at www.hach.com for complete details of all available tests for this instrument.

### Available Tests

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range</th>
<th>TNTplus Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alachlor</td>
<td>0.1 to 0.5 ppb, threshold</td>
<td></td>
</tr>
<tr>
<td>Aluminum</td>
<td>0.002 to 0.800 mg/L</td>
<td>•</td>
</tr>
<tr>
<td>Ammonia, Nitrogen</td>
<td>0.015 to 50.0 mg/L</td>
<td></td>
</tr>
<tr>
<td>Arsenic</td>
<td>0.020 to 0.200 mg/L</td>
<td>•</td>
</tr>
<tr>
<td>Atrazine</td>
<td>0.5 to 3.0 ppb, threshold</td>
<td></td>
</tr>
<tr>
<td>Barium</td>
<td>2 to 100 mg/L</td>
<td></td>
</tr>
<tr>
<td>Benzotriazole</td>
<td>0.2 to 16.0 mg/L</td>
<td></td>
</tr>
<tr>
<td>Boron</td>
<td>0.2 to 14.0 mg/L</td>
<td></td>
</tr>
<tr>
<td>Bromine</td>
<td>0.05 to 4.50 mg/L</td>
<td></td>
</tr>
<tr>
<td>Cadmium</td>
<td>1.3 µg/L to 0.30 mg/L</td>
<td>•</td>
</tr>
<tr>
<td>Carboxyhydrazide</td>
<td>5 to 600 µg/L</td>
<td></td>
</tr>
<tr>
<td>Chloramime, Mono</td>
<td>0.04 to 10.0 mg/L</td>
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</tr>
<tr>
<td>Chloride</td>
<td>0.1 to 25.0 mg/L</td>
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</tr>
<tr>
<td>Chlorine Dioxide</td>
<td>0.01 to 1000 mg/L</td>
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</tr>
<tr>
<td>Chlorine, Free</td>
<td>0.02 to 10.0 mg/L</td>
<td>•</td>
</tr>
<tr>
<td>Chlorine, Total</td>
<td>2 µg/L to 10.0 mg/L</td>
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<tr>
<td>Chromium, Hexavalent</td>
<td>0.010 to 1.00 mg/L</td>
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<tr>
<td>Chromium, Total</td>
<td>0.01 to 0.70 mg/L</td>
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<tr>
<td>Cobalt</td>
<td>0.01 to 2.00 mg/L</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>3 to 500 units</td>
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</tr>
<tr>
<td>COD (Oxygen Demand, Chemical)</td>
<td>0.7 to 15,000 mg/L</td>
<td>•</td>
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<tr>
<td>Copper</td>
<td>1 µg/L to 8.0 mg/L</td>
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<tr>
<td>Cyanide</td>
<td>0.002 to 0.240 mg/L</td>
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<tr>
<td>Cyanuric Acid</td>
<td>5 to 50 mg/L</td>
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<tr>
<td>DEHA (Diethylhydroxylamine)</td>
<td>3 to 450 µg/L</td>
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<tr>
<td>Dissolved Oxygen</td>
<td>6 µg/L to 40 mg/L</td>
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<tr>
<td>Erythorbic Acid (Isoascorbic Acid)</td>
<td>13 to 1500 µg/L</td>
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<tr>
<td>Fluoride</td>
<td>0.02 to 2.00 mg/L</td>
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<tr>
<td>Formaldehyde</td>
<td>2 to 500 µg/L</td>
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<tr>
<td>Hardness, Total (Calcium and Magnesium as CaCO₃)</td>
<td>4 µg/L to 4.00 mg/L</td>
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<tr>
<td>Hydrazine</td>
<td>4 to 600 µg/L</td>
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<tr>
<td>Hydroquinone</td>
<td>9 to 1000 µg/L</td>
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<tr>
<td>Iodine</td>
<td>0.07 to 7.00 mg/L</td>
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</tr>
<tr>
<td>Iron, Ferrous</td>
<td>0.02 to 3.00 mg/L</td>
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</tr>
<tr>
<td>Iron, Total</td>
<td>0.009 to 6.0 mg/L</td>
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</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range</th>
<th>TNTplus Test</th>
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</thead>
<tbody>
<tr>
<td>Lead</td>
<td>3 µg/L to 2.0 mg/L</td>
<td></td>
</tr>
<tr>
<td>Manganese</td>
<td>0.006 to 20.0 mg/L</td>
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</tr>
<tr>
<td>MEKO (Methylethylketoxime)</td>
<td>15 to 1000 µg/L</td>
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<tr>
<td>Mercury</td>
<td>0.1 to 2.5 µg/L</td>
<td></td>
</tr>
<tr>
<td>Molybdenum, Molybdate</td>
<td>0.02 to 40.0 mg/L</td>
<td></td>
</tr>
<tr>
<td>Nickel</td>
<td>0.006 to 6.0 mg/L</td>
<td>•</td>
</tr>
<tr>
<td>Nitrate, Nitrogen</td>
<td>0.01 to 35 mg/L</td>
<td>•</td>
</tr>
<tr>
<td>Nitrite, Nitrogen</td>
<td>0.002 to 250 mg/L</td>
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</tr>
<tr>
<td>Nitrogen, Total</td>
<td>0.5 to 150 mg/L</td>
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<tr>
<td>Nitrogen, Total Inorganic</td>
<td>0.2 to 25.0 mg/L</td>
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</tr>
<tr>
<td>Nitrogen, Total Kjeldahl</td>
<td>1 to 150 mg/L</td>
<td></td>
</tr>
<tr>
<td>Ozone</td>
<td>0.01 to 1.50 mg/L</td>
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</tr>
<tr>
<td>PCB (Polychlorinated Biphenyls)</td>
<td>1 to 50 ppm, threshold</td>
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</tr>
<tr>
<td>Phenols</td>
<td>0.002 to 0.200 mg/L</td>
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<tr>
<td>Phosphonates</td>
<td>0.02 to 125.0 mg/L</td>
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<tr>
<td>Phosphorus, Acid Hydrolyzable</td>
<td>0.06 to 100.0 mg/L</td>
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<tr>
<td>Phosphorus, Reactive (Orthophosphate)</td>
<td>19 µg/L to 100.0 mg/L</td>
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<tr>
<td>Phosphorus, Total</td>
<td>0.06 to 100.0 mg/L</td>
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</tr>
<tr>
<td>Potassium</td>
<td>0.1 to 7.0 mg/L</td>
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<tr>
<td>Quaternary Ammonium Compounds</td>
<td>0.2 to 5.0 mg/L</td>
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</tr>
<tr>
<td>Selenium</td>
<td>0.01 to 1.00 mg/L</td>
<td></td>
</tr>
<tr>
<td>Silica</td>
<td>3 µg/L to 100 mg/L</td>
<td></td>
</tr>
<tr>
<td>Silver</td>
<td>0.005 to 0.700 mg/L</td>
<td></td>
</tr>
<tr>
<td>Sulfate</td>
<td>2 to 900 mg/L</td>
<td>•</td>
</tr>
<tr>
<td>Sulfide</td>
<td>5 to 800 µg/L</td>
<td></td>
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<tr>
<td>Surfactants, Anionic (Detergents)</td>
<td>0.002 to 0.275 mg/L</td>
<td></td>
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<tr>
<td>Suspended Solids</td>
<td>5 to 750 mg/L</td>
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<tr>
<td>Tannin and Lignin</td>
<td>0.1 to 9.0 mg/L</td>
<td></td>
</tr>
<tr>
<td>TOC (Total Organic Carbon)</td>
<td>0.3 to 700 mg/L</td>
<td></td>
</tr>
<tr>
<td>Tolytriazole</td>
<td>1.0 to 20.0 mg/L</td>
<td></td>
</tr>
<tr>
<td>Toxicity</td>
<td>0 to 100% Inhibition</td>
<td></td>
</tr>
<tr>
<td>TTHM (Trihalomethanes, Total)</td>
<td>10 to 600 µg/L</td>
<td></td>
</tr>
<tr>
<td>TPH (Total Petroleum Hydrocarbons)</td>
<td>2 to 200 ppm, threshold</td>
<td></td>
</tr>
<tr>
<td>Volatile Acids</td>
<td>27 to 2800 mg/L</td>
<td></td>
</tr>
<tr>
<td>Zinc</td>
<td>0.01 to 3.00 mg/L</td>
<td>•</td>
</tr>
</tbody>
</table>
**Ordering Information**

**DR 2800-01**  DR 2800 Portable Spectrophotometer; includes printed instrument manual, procedure manual on CD-ROM, universal power supply with exchangeable plug adapters for EU, GB, US, and China, dust cover, and 1-in. square matched glass sample cells

**DR 2800-01B1**  Same as above, but includes a Lithium-ion Battery Pack

**Replacement Parts**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LZW610</td>
<td>Power Supply; 100 to 240V, 47 to 63 Hz, international (exchangeable plug adapters for EU, GB, US, and China)</td>
</tr>
<tr>
<td>LZW583</td>
<td>Adapter A; 1 cm square cells</td>
</tr>
<tr>
<td>LZW585</td>
<td>Adapter B; multi-path cell, 1-in./1 cm, or Pour-Through</td>
</tr>
<tr>
<td>LZW584</td>
<td>Adapter C; 1-in. round cells</td>
</tr>
<tr>
<td>LZW565</td>
<td>Replacement Bulb; 6V, 10W</td>
</tr>
<tr>
<td>LZW642</td>
<td>Protective Cover for storing adapters</td>
</tr>
<tr>
<td>LZW646</td>
<td>Light Shield</td>
</tr>
<tr>
<td>HYH019</td>
<td>Dust Cover</td>
</tr>
</tbody>
</table>

**Optional Accessories**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5940400</td>
<td>Pour-Through Cell Kit; includes 1-in. Pour-Through cell, holder, funnel, and tubing</td>
</tr>
<tr>
<td>LZW537</td>
<td>Certified Test Filter Set</td>
</tr>
<tr>
<td>LZW582</td>
<td>USB Keyboard</td>
</tr>
<tr>
<td>LZW586</td>
<td>USB Hand-held Barcode Scanner</td>
</tr>
<tr>
<td>LZW561</td>
<td>Battery Pack (lithium-ion 11 V/4400 mAh)</td>
</tr>
<tr>
<td>5939700</td>
<td>DR 2800 Carrying Case</td>
</tr>
<tr>
<td>LZY274</td>
<td>DataTran™ Software</td>
</tr>
</tbody>
</table>

**To complete your laboratory analytical instrumentation, choose from these new chemistries...**

**TNTplus™ Reagent Vials**

Hach TNTplus reagent vials are bar-coded for automatic method detection when used with the DR 2800 Portable Spectrophotometer to save time, minimize errors, and reduce laboratory costs. 10-fold measurement and rejection of outliers allows for improved accuracy and precision. (Complete list of available parameters on page 3.)

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Lit. No. 2489 Rev 1
F9  Printed in U.S.A.
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In the interest of improving and updating its equipment, Hach Company reserves the right to alter specifications to equipment at any time.