**PRODUCT SPEC SHEET**

**QUEST™ LITE GWD**

powered by SPEAR™

Solid-State Gyro While Drilling System with Retrievable Mud Pulser

**MECHANICAL SPECS**

- **Probe Length**: 20.98 - 26.51 ft (6.39 - 8.08 m)
- **Probe OD** (Standard probe): 1.875 in (47.6 mm)

**COLLAR SIZES VS. FLOW RATES**

<table>
<thead>
<tr>
<th>Collar Sizes</th>
<th>Flow Rate</th>
<th>Dogleg Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>(inches)</td>
<td>(gallons/minute)</td>
<td>sliding/rotating</td>
</tr>
<tr>
<td>4 ½</td>
<td>100 - 400</td>
<td>30° / 15°</td>
</tr>
<tr>
<td>6 ½</td>
<td>200 - 700</td>
<td>20° / 10°</td>
</tr>
<tr>
<td>6 ¾</td>
<td>200 - 700</td>
<td>21° / 10°</td>
</tr>
<tr>
<td>8 ¼</td>
<td>400 - 800</td>
<td>14° / 8°</td>
</tr>
</tbody>
</table>

**ENVIRONMENTAL SPECS**

- **Maximum Pressure**: 20,000 psi (138,000 kPa)
- **Temperature Maximum Operating**: 212° F (100° C)
- **Lost Circulation Material**:
  - Fine: 15 lbs/bbl
  - Medium: 10 lbs/bbl
  - Coarse: 8 lbs/bbl
- **Maximum Vibration**
  - Maximum Shock: 20 g
  - Maximum Shock: 500g 1/2 sine 1/2 msec
- **Operating Time**: Up to 300 hrs utilizing 2 lithium batteries

**SENSOR SPECS**

- **Sensor Type**:
  - 3-axis coriolis vibratory rate gyro
  - 3-axis accelerometer
  - 3-axis magnetometer (optional)
- **Telemetry**: Mud Pulse
- **Frequency Range**: 0.33 - 1.30 Hz Field Programmable
- **Data Rates**: 0.5 - 1.1 bps (downlink adjustable)

**INSTRUMENT ACCURACY**

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Range</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gyro Inclination</td>
<td>0 - 40°</td>
<td>±0.05°</td>
</tr>
<tr>
<td>Gyro Azimuth</td>
<td>0 - 360°</td>
<td>±0.1°</td>
</tr>
<tr>
<td>Gyro Tool Face</td>
<td>0 - 360°</td>
<td>±1.0°</td>
</tr>
<tr>
<td>Gravity Tool Face</td>
<td>-180 - 180°</td>
<td>±1.0°</td>
</tr>
<tr>
<td>Magnetic Inclination</td>
<td>0 - 180°</td>
<td>±0.1°</td>
</tr>
<tr>
<td>Magnetic Azimuth</td>
<td>0 - 360°</td>
<td>±1.0°</td>
</tr>
<tr>
<td>Magnetic Tool Face</td>
<td>0 - 360°</td>
<td>±1.0°</td>
</tr>
<tr>
<td>Gamma (cps)</td>
<td>0 - 255.5°</td>
<td>5%</td>
</tr>
</tbody>
</table>

**DESIGN + PERFORMANCE**

- Accurate coriolis vibratory gyro assures precise wellbore guidance for collision avoidance and trajectory placement
- Provides continuous inclination and tool face from vertical while sliding, and full surveys on demand
- Surveys are not affected by magnetic interference
- Surveys during the connections - no additional wait time
- Eliminates the need to use wireline gyros to orient or steer the drilling assembly, which saves considerable rig time and provides for safer operations
- Option for both live inclination and magnetic azimuth
- Robust, no mass unbalance or calibration shift
- Retrievable in the event of stuck pipe
- Fully transparent gyro quality control; gravity, full earth rate and latitude. Third parties can QC the data

**MARKET + APPLICATIONS**

- Vertical and Lower Angle Drilling
- Multi-Well Pad Drilling
- Offshore & Riserless Drilling
- Onshore Drilling
- Batch Well Drilling
- High Latitude Drilling
- Gross Error Detection
- Collision Avoidance
- Side-Tracking
- Areas of Magnetic Interference

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*ISCWSA / SPE WTS compliant error ellipse reports are available upon request for specific well profiles.

*Optional"