

**SureDrill-IPDT™**



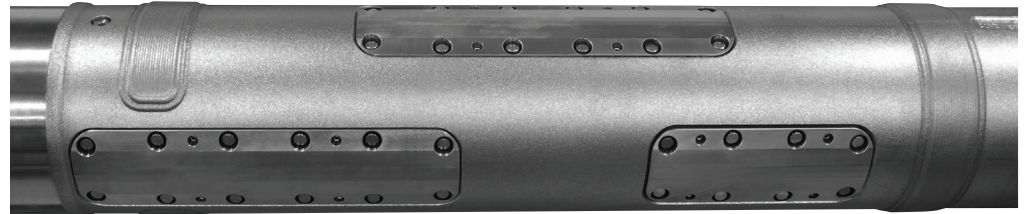
# Intelligent Performance Drilling Tool (IPDT™)

APS's SureDrill™ Intelligent Performance Drilling Tool (IPDT™)\* is a standalone downhole tool that autonomously adapts to changing downhole BHA motion in real time to minimize axial, lateral and torsional drill string vibration. The IPDT has demonstrated 50% improvements in rate of penetration (ROP) and doubling of bit life in the field due to reduced vibration. Other downhole drill string components, like MWD / LWD tools, also benefit from lower vibration.

Structurally, the IPDT is similar to a shock-sub, with the addition of a damper section that has programmable stiffness. The damper chamber is filled with a magneto-rheological fluid that has electronically controlled viscosity. An integrated motion sensor measures displacement several times per second and changes the damping factor over a 7-to-1 range based on observed drilling conditions. By keeping tool string damping in the right range for current drilling conditions, the IPDT significantly reduces vibration, maintaining the bit in better contact with the formation and increasing ROP.

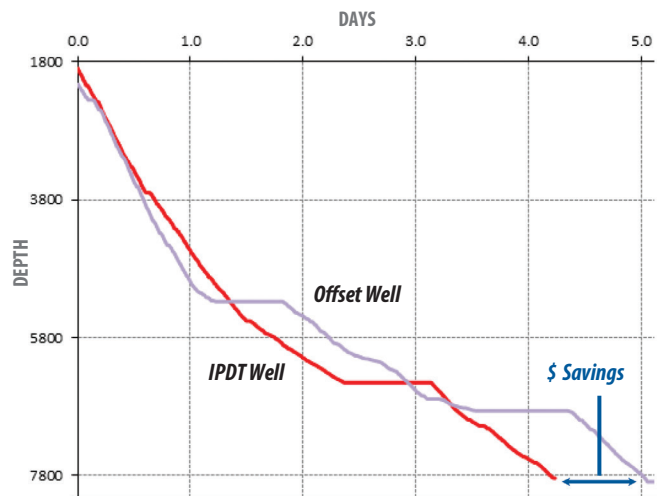
The IPDT is a self-contained drilling tool with no calibration or other rig maintenance required. The IPDT records vibration data for later download.

*\* U.S. Patents #6,257,356 B1; #7,219,752; and #7,377,339*



*Downhole Intelligence Embedded in Control Electronics Hatches*

*Case Study: Days vs. Depth*



*Visit our website to find out how the IPDT helped create a 20% improvement in drilling efficiency.  
<http://www.aps-tech.com/ipdt-case-study>*



Global perspective. Independent thinking.

# Intelligent Performance Drilling Tool (IPDT™)

## Product Specifications

| Mechanical                     |   |   |
|--------------------------------|---|---|
| <b>Tool Size</b>               | 6.75 in. / 7.00 in.<br>(171 mm / 178 mm) O.D.<br>1.89 in. (48 mm) I.D.                      | 9.50 in. (241 mm) O.D.<br>3.00 in. (76 mm) I.D.                 |
| <b>API Connection</b>          | NC-50   | 7-5/8 Reg.  |
| <b>Length</b>                  | 32 ft (9.75 m) shoulder-to-shoulder   |   |
| <b>Weight (approx.)</b>        | 6.75 in. tool: 3,100 lb (1,406 kg)<br>7.00 in. tool: 3,395 lb (1,540 kg)                    | 5,825 lb (2,642 kg)   |
| Environmental                  |   |   |
| <b>Pressure</b>                | 20 kpsi (137.9 MPa)   |   |
| <b>Operating Temperature</b>   | 68° to 302°F (20° to 150°C)   |   |
| <b>Max. Overpull to Re-run</b> | 340,000 lb (154,221 kg)   | 570,000 lb (258,548 kg)   |
| <b>Overpull to Failure</b>     | 745,000 lb (337,926 kg)   | 1,250,000 lb (566,990 kg)                                       |
| <b>Max. Operating Torque</b>   | 26,500 ft*lb (35,929 N*m)   | 90,000 ft*lb (122,024 N*m)                                      |
| <b>Yield Torque</b>            | 35,500 ft*lb (48,131 N*m)   | 120,000 ft*lb (162,698 N*m)                                     |
| <b>Dogleg Severity</b>         | Sliding: 18°/100 ft (18°/30 m) <sup>†</sup><br>Rotating: 13°/100 ft (13°/30 m) <sup>†</sup> | Sliding: 14°/100 ft (14°/30 m)<br>Rotating: 8°/100 ft (8°/30 m) |
| Performance                    |   |   |
| <b>Power</b>                   | Built-in turbine/alternator   |   |
| <b>Max. Static WOB</b>         | 52,250 lb (23,700 kg)   | 100,000 lb (45,359 kg)  |
| <b>Max. Instantaneous WOB</b>  | 75,000 lb (34,020 kg)   | 165,000 lb (74,843 kg)  |
| <b>Maximum Shock Sensed</b>    | Lateral: 120 g<br>Axial: 60 g   |   |
| <b>Shock Resolution</b>        | 0.2 g minimum   |   |
| <b>Damping</b>                 | 1,000 - 6,000 lb*s/in. (18,000 - 107,000 kg*s/m)  |   |
| <b>Dynamic Stiffness</b>       | 15,000 - 150,000 lb/in. (2,680 - 26,800 kg/cm)  |   |

<sup>†</sup> Based on 7.00 in. tool

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Specifications subject to change without notice.

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