

## Spinner Array Tool (SAT)

Measures production velocities around the wellbore in highly deviated and horizontal wells

The Halliburton Spinner Array Tool (SAT) provides vital information by measuring discrete local fluid velocities around the wellbore. Featuring six miniature turbines deployed on bowspring arms, the SAT enables determination of the fluid velocities and direction around the wellbore. When used in tandem with other Halliburton tools and analysis programs, the SAT can generate 3D visualizations and provide even more detailed description of the flow downhole. The six miniature turbines use low-friction jeweled bearings to reduce the mechanical threshold of the spinner and improve sensitivity to fluid flow. The tool measures the direction and speed of production flow. A relative bearing measurement is incorporated to indicate the high side of the hole.

Phase segregation occurs in many wells, most prominently in highly deviated and horizontal wells; the lighter phases migrate to the high side of the well, the heavier phases to the low side. The individual phases flow at different velocities and possibly in different directions. The SAT provides direct measurement of individual phase or mixture velocities and direction. When combined with holdup data from the Resistance Array Tool (RAT) and Capacitance Array Tool (CAT™) technologies and additional analysis, it is possible to provide quantitative estimates of the volumetric flow rate of each phase. This identifies information about the reservoir and completion by characterizing production from the contributing individual entry points. This gives the engineer insight into the reservoir and how to possibly improve production.

### Benefits

- Provides information about fluid velocities, distribution, and direction
- Can provide 3D imaging of the velocity profile
- When combined with CAT/RAT data and center hole spinner information, total flow can be determined using additional Halliburton processing

### Features

- Cross-sectional velocity profiling
- Option of larger 0.6-in. (15-mm) diameter spinner
- Surface readout or memory logging operations
- Simultaneous operation with other Halliburton tools
- Optional rotational alignment sub (RAS) to align reference sensor with other multiple-array tools



HAL24636

<b>Spinner Array Tool (SAT) Technical Specifications</b>	
<b>Temperature Rating</b>	350°F (177°C)
<b>Pressure Rating</b>	15,000 psi (103.4 MPa)
<b>Tool Diameter</b>	1-11/16 in. (43 mm) / 2-1/8 in. (54 mm)
<b>Tool Length</b>	45.5 in. (1.156 m)
<b>Tool Weight</b>	14.3 lb (6.5 kg)
<b>Pipe Range</b>	3-in. to 7-in. casing
<b>Number of Sensors</b>	6
<b>Spinner Diameter</b>	0.4 in. (10.16 mm) / .61 in. (15.4 mm)
<b>Sensor Measure Point</b>	16.5 in. (419.1 mm)
<b>Relative Bearing Accuracy</b>	5°
<b>Relative Bearing Dev Range</b>	5° to 175°
<b>Materials</b>	Corrosion resistant throughout
<b>Protective Shroud</b>	Will add to diameter of tool

Developed in part through cooperation with Sondex.

**For more information, contact your local Halliburton representative.**

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