

Single-Phase Multisample Chamber

HPHT-rated pressure-compensating sampling tool

APPLICATIONS

- Fluid sampling for advanced or routine PVT and compositional analysis
- Flow assurance measurements (asphaltene, wax, and paraffins)
- Heavy oil sampling
- Sampling near-saturated reservoirs using minimum drawdown
- Water sampling for inorganic scale, corrosion, salinity, and live pH studies
- Sulfur- and mercury-species analysis
- Routine, HPHT, high-H₂S, deepwater, and arctic MDT* modular formation dynamics tester sampling operations

BENEFITS

- Single-phase sample retrieval above reservoir pressure without phase split
- Reservoir fluid preservation above reservoir pressure and asphaltene onset pressure
- Accurate and consistent GOR values
- Sample mixing during restoration
- Fast sample validation, analysis, and shipment without need for onsite transfer
- Fluids and reservoir domain expertise and support
- Dangerous goods and hazardous materials certified personnel

FEATURES

- Unique, independent pressure-compensation system design
- US Department of Transportation (US DOT), Transport Canada (TC), and Pressure Equipment Directive (PED) transportation approval
- Downhole self-closure of sampling tool
- No sample flashing
- Agitation piston
- Dursan™ nonreactive coating
- Chain-of-custody sample management tracking
- Dangerous goods and hazardous materials labeling and packaging service

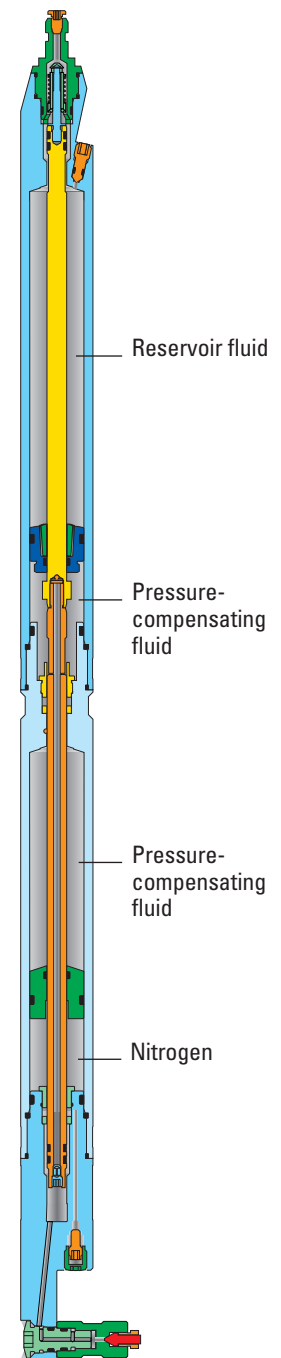
The single-phase multisample chamber (SPMC) is a transportable pressure-compensated reservoir fluid sampling system for use with the Schlumberger MDT modular formation dynamics tester. The SPMC is manufactured from Inconel® or Hastelloy® and captures representative samples during openhole logging operations, enabling advanced and routine PVT and compositional analyses on the entire range of reservoir fluids, even from demanding environments such as HPHT, high-H₂S, and deepwater reservoirs.

The unique pressure-compensating technology and independent gas charge activate concurrent with sample capture, maintaining fluid samples at or above reservoir pressure all the way to surface. This helps meet difficult sampling challenges such as near-saturated gas condensates, fluids with asphaltene-precipitation tendencies, or low-compressibility fluids such as heavy oil or formation waters.

Controlled-displacement MDT sampling techniques eliminate sample flashing in the SPMC by controlling the drawdown to only a few psi, thereby enabling representative sample collection. Whereas noncompensated tools must be closed at surface, the SPMC self-closes downhole, which prevents the loss of any sample components during sampling tool retrieval. This ensures representative and accurate results for compositional analysis, GOR measurement, and saturation pressure determination.

The challenging questions related to H₂S and the concentration of other sulfur species can be reliably addressed by applying unique, latest-generation nonreactive coatings such as Dursan coating. When applied to SPMC and MDT sample flowlines and pumps, this technology inhibits the loss of H₂S, increases durability, and eliminates the need for frequent recoating; as a result, reliable data can be obtained for critical decision making. In addition, combining silicon coating and the Schlumberger fluids- and reservoir-domain-supported approach to well cleanup, sampling, and analysis techniques provides the opportunity to address mercury-species concentration issues in some gas condensate reservoirs.

Up to six SPMC tools can be run on each MDT multisample module with up to five modules run in a single toolstring, enabling collection of up to 1.98 galUS [7.5 L] of single-phase reservoir fluid. Upon retrieval, the integrated sample agitation piston is used to restore samples to reservoir conditions up to 25,000 psi [172 MPa] and 400 degF [205 degC] prior to sample transfer and wellsite or laboratory analysis.



Single-phase multisample chamber.

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Personnel are fully certified to the latest dangerous goods and hazardous materials transportation regulations. Further, sample-management chain-of-custody tracking is provided using the Schlumberger global Web-based sampling and analysis management and tracking system.

Specifications

Model	SPMC	SPMC-T	SPMC-XT
Metallurgy	Inconel 718	Inconel 718	Hastelloy
Length, in [m]	36 [0.91]	36 [0.91]	36 [0.91]
Weight, lbm [kg]	20 [9.1]	20 [9.1]	21 [9.5]
Max. OD, in [cm]	2 [5.1]	2 [5.1]	2 [5.1]
Sample capacity, in ³ [cm ³]	15.25 [250]	15.25 [250]	15.25 [250]
Test pressure, psi [MPa]	30,000 [207]	30,000 [207]	37,500 [259]
Max. working pressure, psi [MPa]	20,000 [138]	20,000 [138]	25,000 [172]
Max. working temperature, degF [degC]	354 [179] [†]	354 [179]	400 [205]
Service	H ₂ S	H ₂ S	H ₂ S
Design code	API 6A, NACE MR0175/ISO 15156	API 6A, NACE MR0175/ISO 15156	API 6A, NACE MR0175/ISO15156
Transport approvals	US DOT in overpack	US DOT, TC, PED	US DOT, PED [‡]
Certifying authority	Bureau Veritas	Bureau Veritas	Bureau Veritas

[†] HPHT version rated to 401 degF [205 degC]

[‡] Application for TC pending

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