

TECHNICAL DATA SHEET

TC 19: CO₂ MODELLING AND LOGGING TOOL FOR DOWNHOLE CO₂ MEASUREMENT AND QUANTIFICATION

Scope A: Modelling		
No	Parameters	Description / Operating Envelope
1	Differentiation between Hydrocarbon Gas and CO ₂	Able to conceptually and theoretically distinguish between hydrocarbon gas and CO ₂ . This involves understanding the distinct physical and chemical properties of each gas and applying this knowledge to accurately identify and separate them during logging measurements.
2	Quantitative Measurement of CO ₂ Saturation and Volume	Able to conceptually and theoretically measure precise CO ₂ saturation and volume. This includes utilizing sound physics, measurement principles and advanced modelling techniques to quantify the amount of CO ₂ present in the reservoir accurately.
3	Accuracy	Accuracy of the modeling performance against existing methods/techniques such fluid sampling as PVT lab results as calibration point. It evaluates the percentage accuracy achieved in quantifying CO ₂ saturation and volume.
4	Reliability	The reliability of the modeling by evaluating the model error. It measures the extent to which the model error is minimized, ensuring consistent and dependable results.
5	Uncertainty Management	The implementation of correction techniques and mitigation procedures to manage and minimize uncertainties and errors in the modeling process.
6	Data Processing Workflow	Availability and effectiveness of the database, benchmark, workflow, and calibrated model used to process raw data, interpret, and quantify CO ₂ saturation and volume.
7	AI-ML Application	Use of additional or alternative AI-ML simulations to enhance the quantification of CO ₂ saturation and volume. It measures the impact of AI-ML techniques on improving the accuracy and reliability of the modelling.
Scope B: Hardware – logging tool		
1	Easy to operate and compliance to HSE	Ease of handling and operability of the logging tool/equipment and its compliance with country and company-specific safety regulations such as licensing, Malaysia AELB requirement, lifting, transportation, rig-up/rig-down, etc.
2	Versatility	It measures how handy and easy to transport the tool is, and its suitability for use in various well conditions.
3	Applicability	The effectiveness of the logging tool/equipment in varying CO ₂ concentration and well environments. It evaluates the tool's ability to function under varying conditions and its versatility.

4	Calibration/Validation	The calibration and validation techniques performed on the logging tool/equipment measurement. It measures the extent of errors minimization through effective calibration and validation processes.
5	Depth and Strength of Detection (SNR)	The depth and strength of detection (signal to noise ratio) of the logging tool/equipment measurement. It evaluates the tool's ability to detect CO ₂ saturation and volume at various DOI from the borehole and the strength of the detection signals.
6	Track Record/case studies	Proven performance and reliability of the existing or new logging tool and measurement based on past deployments and usage in similar projects.