Automated Lithology

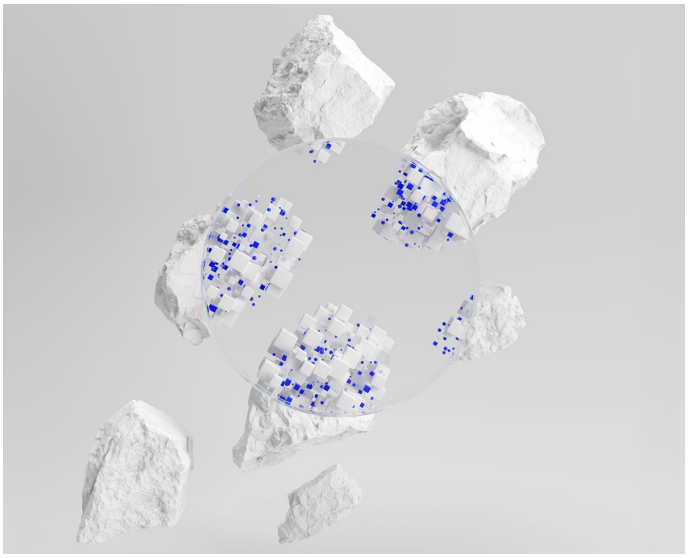
Get digitalized images from cuttings offshore to onshore centers

Applications:

- Minimize geological uncertainties on any type of well
- Lower drilling risk for decision makers
- Reduce HSE risks
- Enhance well planning by using digitalized cuttings data
- Improve details of geological and petrophysical models

Features:

- High Definition (HD) camera with white and UV light
- Intuitive, AI-assisted descriptions
- Global connectivity



How it improves operations

Automated lithology combines the hardware of **Litholink**, the interface of **Lithoscribe**, and **Litholog** to capture and transmit high-resolution digital images with precision cutting descriptions to personnel in performance live centers. AI-enhanced analysis delivers clear, concise descriptions while eliminating input errors, subjective bias, and delays in reporting. Unlike conventional methods, automated lithology generates digital logs with rich datasets which are easily integrated into any reservoir evaluation workflow. Data is rapidly shared through Performance Live™ digitally connected services. Both the calibrated images and the digital descriptions are now highly mobile and can be incorporated directly into your reservoir models.

Lithoscribe improves the characterization process giving you digital descriptions and data of your rock cuttings matched to capture geological features. The descriptions create a digital database of the subsurface of the well, providing quantitative and calibrated color identification based on the munsell rock color chart.

What it replaces

Conventional lithology descriptions are derived through a complex and manual process that requires geologists to analyze and describe a range of rock properties including rock type, color, grain size, and sorting. Those properties vary depending on the rock family described. This process is done visually, because it relies fully on the expertise of geologists and is still highly subjective as it is based on human perception. This process introduces subjective bias and input errors that can degrade accuracy.Visual examination (not a quantitative measurement)Cuttings sequences that rely on memoryLower accuracy from time-consuming written descriptionsMore than 90% of lithology descriptions are not saved

How it works

Automated Lithology delivers precise digital representations of reservoir lithology, including layers, fractures, traps, and pockets that can be effortlessly combined with

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digital data logs. HD digital images of cuttings capture rock color, grain size, grain sorting, roundness, oil show, visual porosity, fossils, and special minerals. This innovative technology delivers digital data that is easily shared with any system and rapidly accessible through a cloud-based collaborative workflow.

Technologies

Litholink is calibrated variable-controlled digital hardware that captures high-resolution images from drilled cuttings that embeds metadata, enabling geologists to analyze lithologies in high detail from the drillsite at labs around the world. Digitized descriptions are continually made more accurate with AI-machine learning.

Litholog provides a comprehensive subsurface log from cuttings where key geological parameters are displayed as lithological layers, and available as numerical values, providing highly mobile data. Interpreted lithology translates cutting percentages from depth intervals into the actual geological layers. Litholog generates illuminated lithology layers with ROP data, and gamma ray technology, to improve quality. This process is done automatically, and all geological properties are displayed as curves.

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Additional information:

This software can be used with any computer. It can load images from litholink hardware, images from other cameras, or can be used without images if the descriptions are made at the rigsite.

- Embedded data model for each rock type
- Color picker to capture quantitative color calibrated to the Munsell color chart
- Widget to measure object size
- Litholink technology has zoom control
- Cuttings are described and saved as numerical values and can be retrieved for comparative analysis

Automated Lithology

Automated Lithology Specifications

Specifications	Camera	Lens	Image
Resolution	18,000,000 geometric pixels	High resolution	
Minimum object size			60 microns
White balance	Standardized and calibrated		
Distortion		Low distortion on images	
Field of view			55 mm × 31 mm
Color accuracy	Accurate ΔE00: <5.5		
Zoom		Numerical zoom	
Type			JPEG / PNG
Color representation	Saturation = 100%		
Distance to samples		Constant	
Picture size for transmission			3 MB
Traceability			Embedded metadata

All specifications are subject to change without notice.

Automated Lithology Specifications

Specifications	White Light	UV Light	Frame
Type	LED	LED	
Dimension (LxWxH)			40 × 40 × 45 cm
Intensity	350 mA		
Wavelength		365 nm	
Safety for UV light			Interlock
Intensity distribution	Homogeneous across FOV		
External light avoidance			100%
Control	Litholink software	Litholink software	

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Automated Lithology Specifications

Specifications	Useability	Power and Interface with Computer	Image Quality Process
Rig-up	Simple		
Power		240 V / 110 V	
Tool			Resolution checker
Connectors	1 to power / 1 to computer		
Interface with Computer		USB 3	
Software			Automatic QC
Control software	Intuitive		

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