

Kodiak





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Introduction



Kodiak

The Wireline Industry has grown significantly over the past two decades and we've grown with it. With the collective experience of our team, we have an abundant reserve to draw upon for every project.

Job safety has been integral to our success. It protects both our employees and our clients by keeping projects accident-free, on-schedule and on-budget. Kodiak is currently implementing ISO 9001:2008 compliant Quality Management system. This program will streamline business processes among all locations with the goal of improving our customer's satisfaction with the services we provide.

Our team is dedicated to participating in the design and fabrication of industry-leading E-Line and Slickline technologies. At Kodiak, our managers are hands-on to provide exceptional service and custom solutions.

About Kodiak

A FULL SERVICE WIRELINE COMPANY

Kodiak is a full service Wireline company headquartered in Canada. Company operations are spread throughout Western Canada; U.S.A; Colombia and Saudi Arabia. Kodiak has developed a reputation for combining skilled operators and state of the art equipment to create practical and valuable client-focused solutions.

Since 1997 Kodiak has been providing expertise in E-line and Slickline services, and remained at the forefront of new technologies in the industry. Kodiak has also placed an exceptional emphasis on workplace safety and responsible environmental practices, while emerging as a premiere service provider to the oil and gas industry.

Kodiak Mission Statement

Kodiak combines skilled operators and state-of-the-art equipment to meet the wide range of needs in the exploration, completion and production of oil and gas. We are committed to offering value by being a one stop cohesive shop capable of providing practical solutions focused on the unique needs of our customers. We do this with highly trained, professional, engaged employees, focused on providing exceptional customer service.



Safety

Safety

WE ARE LEADERS IN WIRELINE SAFETY PRACTICES

Our commitment to safety is part of our workplace culture, where for almost 17 years we've fine-tuned our Safety and Environmental Program. We have earned the Certificate of Recognition (COR) with the Partnerships in Health and Safety Program – certified by the Petroleum Industry Training Service. We've also focused on education, training and communication to continually improve safety practices. This ensures that management, supervisors, employees, contractors and subcontractors are engaged in our techniques and able to work safely and effectively while complying with relevant rules and legislation.

Our Corporate HSE Policy is overseen by the Health, Safety and Environmental Committee which provides direction for the management of HSE and input on current and emerging health, safety and environmental issues.

In addition:

- Kodiak is ISO 9001:2008 certified.
- Kodiak has been a member in the Certificate of Recognition (COR) with the Partnership in Health and Safety Program since 1999
- Kodiak is RUC certified
- Kodiak has taken an active leadership role in the Wireline Industry through our participation in the Petroleum Services Association of Canada Health and Safety, Transportation and Oil Well Perforating Committees
- Kodiak is committed to quality and safety through our participation in the development of a Standard of Competence for Slickline and Cased Hole Occupations



Safety

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Units

Units

Units

ELINE UNITS

Along with the Warrior Well Logging Systems' advanced software, Kodiak is able to provide a cost-effective solution to well logging requirements for cased hole applications. All-aluminum extruded body construction provides lightweight strength, corrosion resistance, and maintenance-free durability. Heavy-duty tarp covers drawworks area and protects

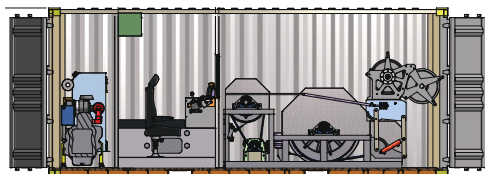
equipment from dirt, rain, or snow during travel and storage. Long-tool storage racks with air-bag containment system keeps equipment safely in place during transport. All hardware and fasteners are stainless steel for durability and resistance to corrosion. External compartment doors have a flush-fit design with the door seal protected by the doorframe extrusion. This eliminates leaks through the doors and creates an esthetically appealing exterior.



COMBINATION UNITS

Combining the advantages of both slickline and e-line technology with the latest in Warrior program software, Kodiak offers clients viable options. Kodiak has chosen to combine the slickline and e-line services on most of their e-line service units,

accommodating both on-road and all-terrain accessibility. Along with the Warrior Well Logging Systems' advanced software, Kodiak has a proven track record of providing a cost-effective solution to well logging requirements for cased hole applications.



Container Combination Units

ELINE MAST UNITS

Combined function of a slickline truck, swabbing unit and picker truck on a simple, efficient, rugged platform. Rig in or Rig out takes only a couple minutes, save additional time and money, especially on days when our clients need to perform wireline or swabbing operations on more than one well in a day. High strength, galvanized Dyform cable offers extremely high working loads compared to conventional

slickline. When jarring on bumper springs or when jarring in dry gas environments, the wireline tool string can be sling shot and could cause slickline to break above the rope socket. Dyform line is much more rugged and durable; it is capable of withstanding much more abuse than slickline. 14.6 m (48') Telescopic mast allows wireline and pressure control equipment to be rigged in very fast, eliminating the need for a picker unit for rigless operations.



SLICKLINE UNITS

The Kodiak Units have been designed for measurement and workover activities with wire capacities of more than 8000 m / 26,250 ft. Stepless roofs above winch area provide an

unrestricted view of operations, mounting possible on any available truck chassis, parallel-working independent electrical and hydraulic backup system, air or manual driven hydraulic pump with backup function.



Units

BRAIDED UNITS

Our industry leading high-corrosive resistant line service allows us to perform any type of heavy lifting

required. 1/4" sour Dyform™ braided line is best used in situations with fishing services, high-pressure, extremely deep wells, problem wells or just when you need brute strength.



OFF-ROAD UNITS

We are equipped for all terrains; we've invested extensive research and development in a wide range of off-road systems to provide clients with e-line and/or slickline service when and where

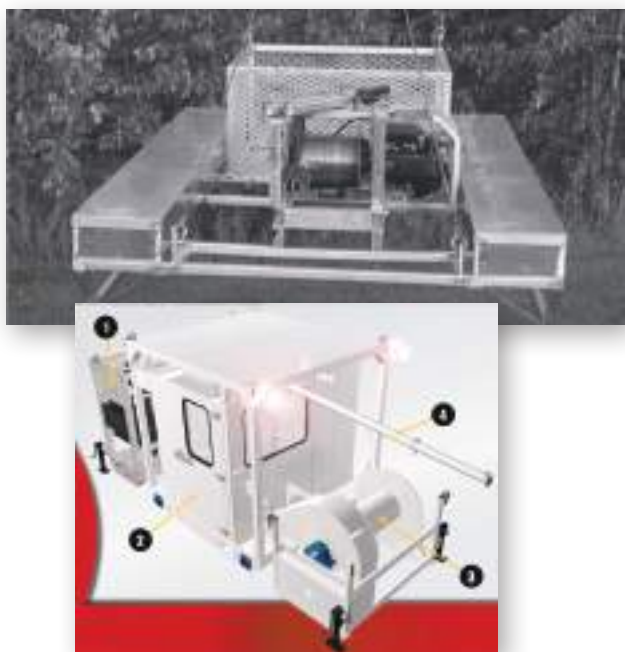
they need it. Our heavy-duty systems feature superior carrying capacity and track design, while being compact enough to get us out to the worksite. Our ultralight and amphibious cargo systems allow for quick off-road access.



HELIPORTABLE UNITS

Kodiak's Heli-Portable Mast for slickline or braided line operations in remote locations, lightweight, easy to operate and built for harsh environments.

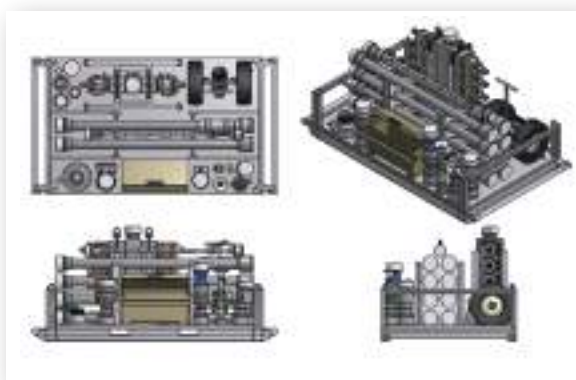
Swing arms extended between 0° (horizontal along base length) and 45° (shown) allow for free-standing mast. Guide wires required with swing arms extended from 46° to 90° (horizontal across base width) and in gusting winds



WELL CONTROL EQUIPMENT

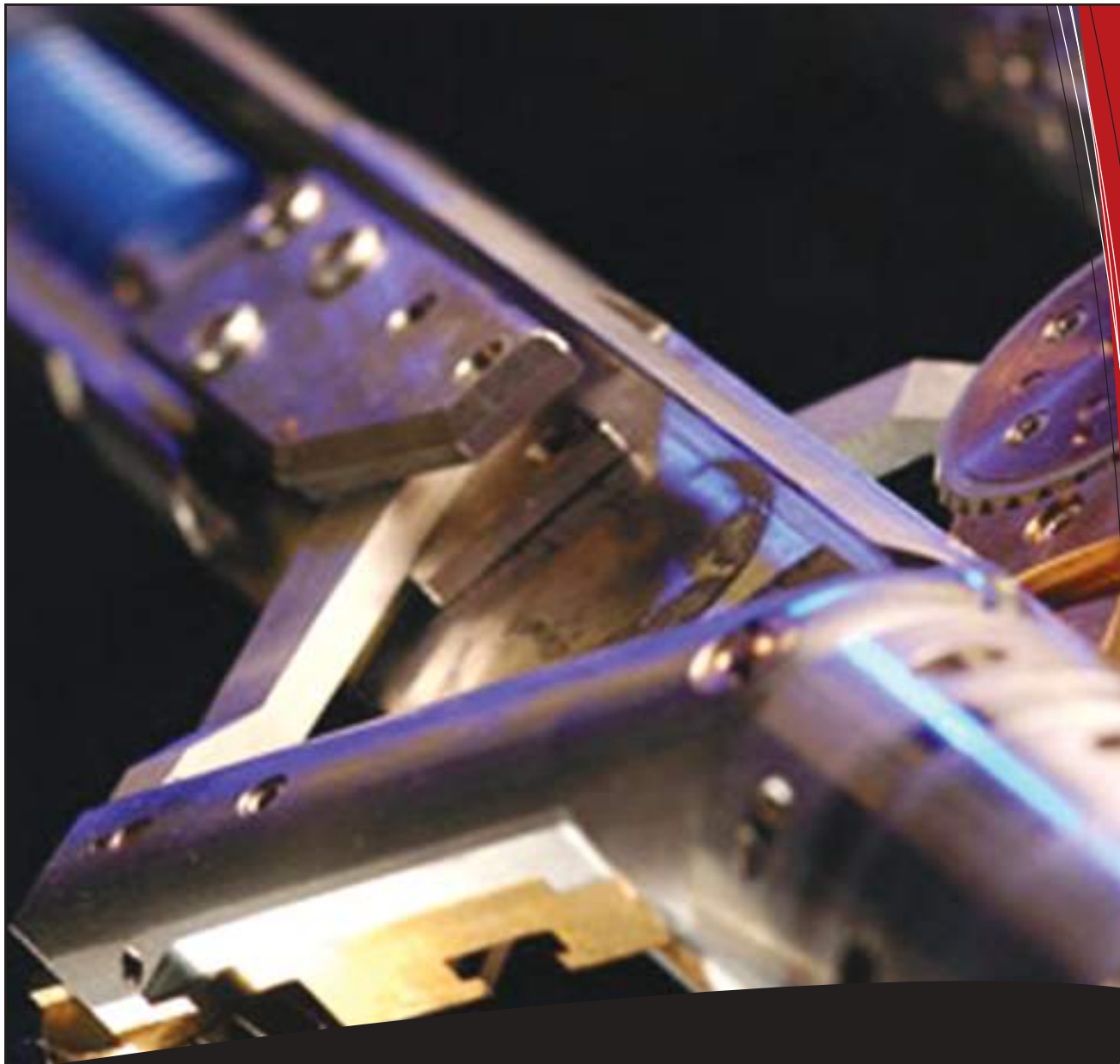
The pressure control utilized during Eline operations is intended allow Eline access to the wellbore with surface or reservoir induced pressure. During open hole logging, cased hole Cement Bond Logging or Perforating operations where the well is overbalanced the pressure equipment would typically be to allow access with Eline and have the capacity to pump at surface therefore the pressure would be surface induced.

During cased hole electric line logging or perforating on a producing well where the pressure is reservoir induced the equipment would allow access with Eline with reservoir induced pressure at surface. Kodiak has pressure control equipment ranging from 500 - 20,000psi, all of Kodiak's Eline end Slickline units are installed with a dedicated set of Well Control Equipment for normal use to make the typical operations more efficient.



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Tractors

Modular Downhole Tractor

Modular Downhole Tractor (MDT)

DESCRIPTION

The Modular Downhole Tractor (MDT) is used to transport passenger wireline tools into wells where standard wireline deployment is not possible or practical.

FEATURES

- Field proven technology with third party logging tools and equipment.
- Highly portable, compact system.
- Software simulation package.
- Reverse traction & failsafe.
- Data transmission whilst tracting.
- Drive System

The high efficiency DC motor and drive system minimizes power requirements allowing the required

surface equipment to be easily portable. The innovative tractor mechanism automatically adjusts so that as the load increases so does the available traction. Pulling power is therefore limited only by the current and voltage limits of the cable.

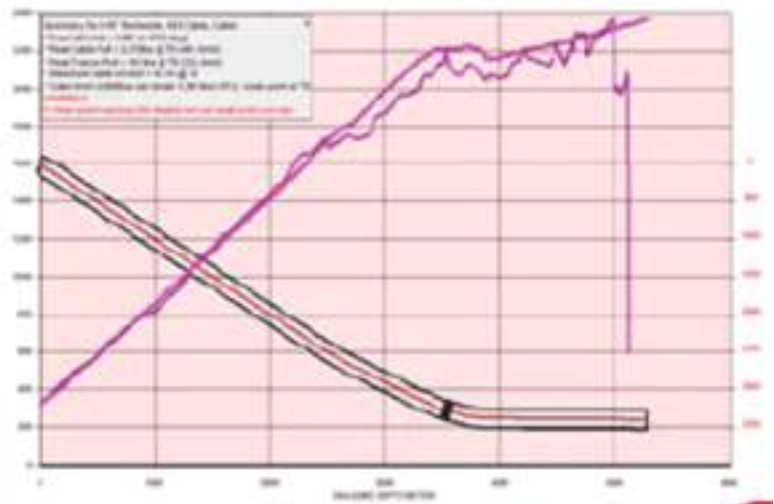
Data Transmission

Continuous condition monitoring and data transmission while tracting allows precise control. An overlay of head tension and tractor load curves provides the operator with valuable information about the tractor performance and well conditions. Real-time data includes:

- Head Tension, Tractor Load, Tractor Speed, Contact Pressure, Temperature, Head Voltage, Distance traveled, CCL, Cable Current, Logic Voltage, Switch Status, Motor Status, Motor rev/min

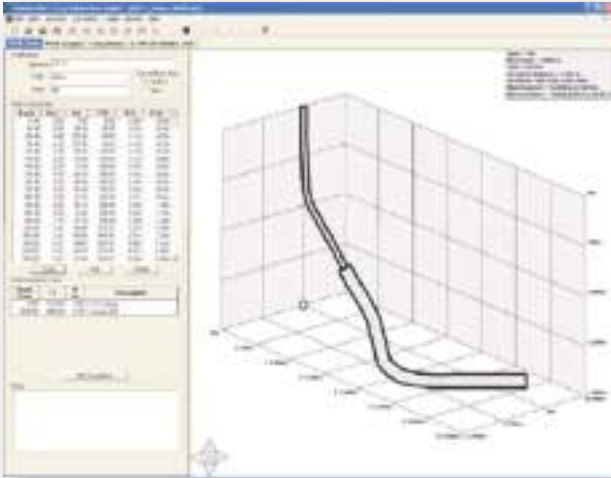
SPECIFICATIONS

Model	MDT001	MDT002
Temperature rating	302 °F (150 °C)	
Pressure rating	15000 psi (103.4 Mpa)	
Tool diameter	2.125 in (54 mm)	2.5 in (64 mm)
Tool length	24.5 ft (7.46 m)	26.6 ft (8.11 m)
Tool weight	190 lb (86 kg)	
Max. tractor speed	30 ft/min (9m/min)	
Min. operating diameter	4.5 in (114.3 mm)	
Max. operating diameter	9.625 in (245 mm)	13.375 (340 mm)



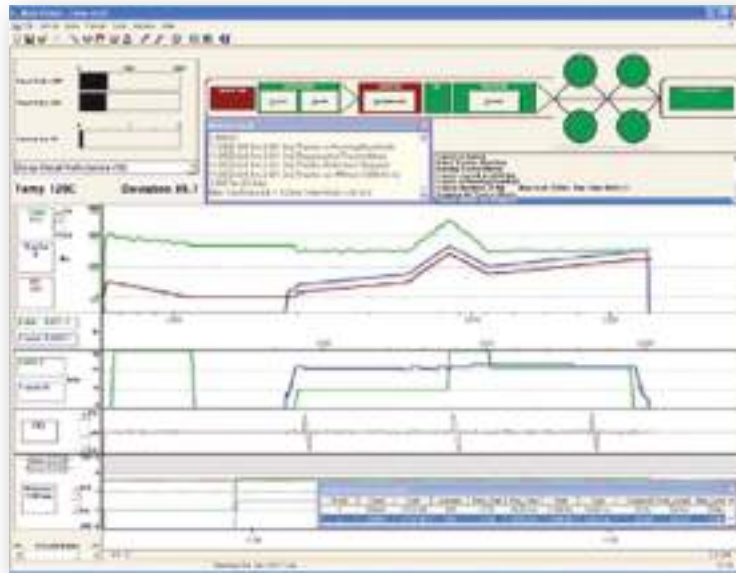
KEY ADVANTAGES

- Downhole sensors provide user with absolute control
- Real-time Head Ten, Tractor Load, CCL
- Real-time Arm Position, Wheel Speed & Tractor Depth
- WEST software with real-time risk management
- Bi-Directional drive
- Self-adjusting Traction control
- Highly Portable system
- Electro-mechanical drive
- DC powered (safety advantage when combined with Explosives)
- Failsafe mechanism closes arms if power is lost
- Low Friction Roller Centralizers included
- Comprehensive Service Kit



TRACTOR PARAMETERS MONITORED IN REAL-TIME

- Surface Tension
- Tractor Load
- Head Tension
- Wheel Speed
- Cable Speed
- CCL
- Arm Positions
- Temperature
- Head Voltage



Modular Downhole Tractor

Addressable Downhole Release (ADR)

FEATURES

- Main tool body and electronics are retrieved, leaving only the fishing neck downhole
- Full pre-job function check (including latch/unlatch) possible at wellsite
- Ability to run four ADR tools per downhole string
- Three-stage controlled release process monitored in real-time
 - Electrical release
 - Pressure equalisation
 - Mechanical release
- Tools above ADR continue to function after release
- Fail-safe logic to prevent accidental release
- Robust design to withstand ballistic shock
- Feed-through conductor rated for high voltages and currents

SPECIFICATIONS

OD	2 1/8
Length	25.4"
Temp	177 °C
Pressure	15000 psi
Fishing strength	20000 lbs



Addressable Downhole Switch (ADS)

FEATURES

- Downhole Safety Switch provides greater protection
- Enables tractor-conveyed ballistic operations
- Certified to comply with API-RP67 2nd Edition
- Zero voltage on bottom sub while switching
- Tolerant of a short circuit below the bottom sub
- Isolator switch position monitored in real time
- Robust design to withstand ballistic shock
- System incorporates fail-safe logic
- Electro-mechanical isolator switch
- Required for tractor conveyed ballistic ops
- Complies with API RP-67



Accessories

Smart Release Tool

Smart Release Tool

DESCRIPTION

The Smart Release Tool allows you to control the release a downhole tool without the use of explosives or jarring. The Smart Release Tool is the “SMART” and safe way to release tools by using innovative technology. Superior safety design features, controlled by a microprocessor and redundant lockouts, give the user the peace-of-mind that the Release Tool is “The Safe And Smart Control” for Logging and Test tools downhole. Time, Temperature, and Motion Parameter windows must be satisfied before the soft release takes place leaving a fishing neck looking up hole. A sequence log is recorded before and after opening which can be useful to check tool performance. With the use of our simple, menu driven software, you can retrieve the log from the tool once it is removed from the well (using a compatible computer and printer). Internal status codes are checked to confirm proper tool operation.

ADVANTAGES

Some advantages of slickline versus electric-line operations are:

- NO Explosives necessary
- Cost savings
 - Less equipment and personnel required
 - Less time required for transport and rigging
- Safer operation no possible detonation due to electric-line or truck power source
- More reliable pressure control with less environmental hazard



SMART FEATURES

Technological features of the Smart Release Tool are:

- SAFETY in firmware
 - Time
 - Temperature
 - Motion Detection
- Stores internal status codes and log to aid in problem solving
- Switch selectable Release Time settings are DEMO, 30m, 45m, 60m, 75m, 90m, 105m, 120m, 150m, 180m
- Switch selectable Temperature Safety are >60, >80, >100, >120, >140, >160, >180, >200, >225, >250 °F
- Tool will not release while detecting Motion
- Audible operating signal to indicate the operational status

SPECIFICATIONS

Operating Temperature	32° F to 320° F
Accuracy	Temperature ± 3° F (0° C to 160° C)
	Time ± .05%
Maximum Pressure	15,000 psi (102,000 kPa)
Length	57" (1.5 m)
Diameter	1.38" (34.9 mm)
Power	18.4 V (5 'C' cell Lithium)
Weight	16 lbs. (6.4 Kg)

Smart Release Tool

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Well Integrity

Multifinger Imaging Tool

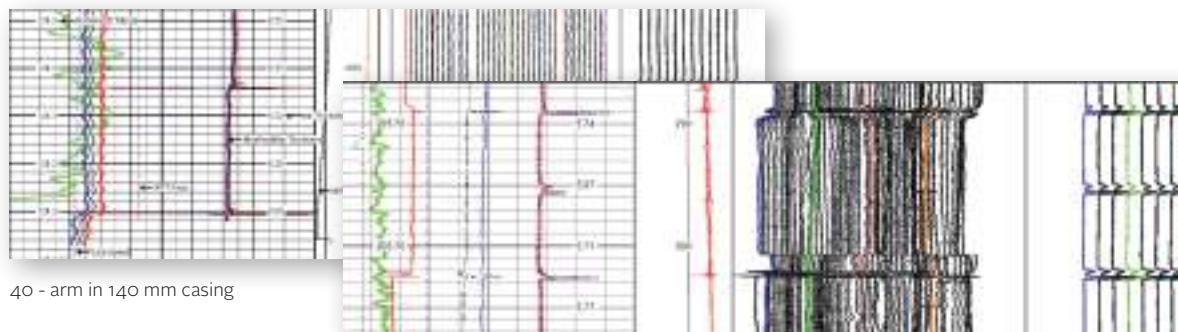
Multifinger Imaging Tool

DESCRIPTION

The MIT is available in a range of diameters to suit varying casing/tubing sizes. The number of fingers increases with the diameter of the tool to maintain maximum surface coverage. The tools can be run in combination with other Well Integrity instruments and Ultrawire* Production Logging tools. When the tool is run in hole, the fingers are closed to prevent damage. Once at logging depth, a motor is activated from the logging system or by the memory tool and the fingers open. A continuous measurement of the pipe's surface condition is made as the tool is logged up. The tool has an inclinometer to indicate the finger positions relative to the high side of the pipe, so that features can be orientated correctly during data processing. MIT data can be used to generate 3D images of pipe condition using Kodiaks visualization software Well Integrity Visual Analysis (WIVA). Well Integrity Processing, Evaluation & Reporting (WIPER) software can also be used to make a statistical analysis of the pipe condition.

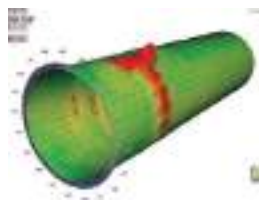
FEATURES

- Available in 24, 40 or 60 finger versions
- Surface readout or memory options
- Combinable with other Ultrawire tools
- 3D data analysis using WIVA software
- Statistical analysis using WIPER software
- Suitable for all well deviations
- Extended finger lengths available for all tools (optional)

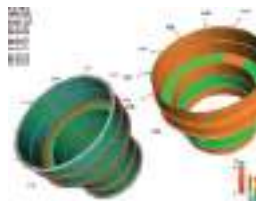


40 - arm in 140 mm casing

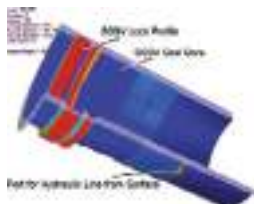
60 - arm in 219 mm casing



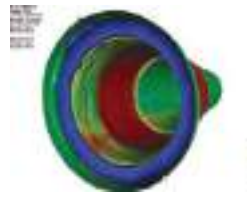
Hole in casing (Highlighted in red)



Sub-surface safety valve



Diameter change



Erosion in a cross-over

SPECIFICATIONS - MULTIFINGER IMAGING TOOL (MIT)

	24-Finger	40-Finger	(Regular/Extended Fingers) 60-Finger
Temp Rating	350F (177.0C)	350F (177.0C)	350F (177.0C)
Press. Rating	15,000psi (103.4MPa)	20,000psi (138.0MPa)	20,000psi (138.0MPa)
Tool Diameter	1 11/16" (43mm)	2.75-7.0" (70mm)	3.9" (99.06mm) / 4.4" (111.76mm) Extended
Tool Length	64.6" (1.64m)	66.0" (1.68m)	61.0" (1.55m)
Toolbuss	Ultrawire	Ultrawire	Ultrawire
Current Draw	<30mA (logging) <400mA Motor Operating	<30mA (logging) <400mA Motor Operating	<30mA (logging) <400mA Motor Operating
Meas. Range	1.75-4.5" (45-114mm) / 1.75-7" (45-178mm) Extended	2.75-7.0" (70-178mm) / 2.75-10.0" (70-254mm) Extended	4.0-7.0" (101.6-254.0mm) / 4.5-14.0" (114.3- 356.6mm) Extended
Accuracy -Rad.	+/- 0.02" (0.508mm)	+/- 0.02" (0.508mm) / +/- 0.025" (0.64mm) Extended	+/- 0.025" (0.635mm) / +/- 0.030" (0.762mm) Extended
Resolution-Rad.	0.002" (0.051mm) / 0.003" (0.076mm) Extended	0.0015" (0.04mm) / 0.0022" (0.06mm) Extended	0.003" (0.76mm) / 0.005" (0.127mm) Extended
Finger Tip Width	0.063" (1.60mm)	0.64" (1.63mm)	0.64" (1.63mm)
Contact Force	0.75-1.25lbf (3.4-5.7N)	0.75-1.25lbf (3.4-5.7N)	0.75-1.25lbf (3.4-5.7N)
Logging Speed	30ft/min(10m/ min) Recommended 60ft/min(20m/min) Maximum	30ft/min(10m/ min) Recommended 60ft/min(20m/min) Maximum	30ft/min(10m/ min) Recommended 60ft/min(20m/min) Maximum
Materials	Corrosion Resistant Throughout	Corrosion Resistant Throughout	Corrosion Resistant Throughout
Accuracy	+ / - 0.030" (0.76mm) (Can be enhanced by downhole calibration)		

Multifinger Imaging Tool

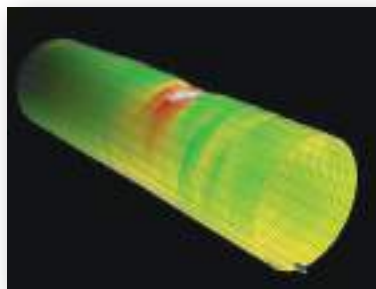
Magnetic Thickness Tool

Magnetic Thickness Tool (MTT)

DESCRIPTION

The Magnetic Thickness Tool surveys variations in pipe metal thickness. Twelve sensors are mounted on the inside of a set of bow springs, allowing the tool to pass through tubing and log pipe sizes up to 9 5/8" casing.

An alternating magnetic wave is emitted from the tool; this permeates through the casing wall and then travels a short distance along the outside before passing back through the wall and being detected by the sensors. The velocity and amplitude of the emitted wave are affected by the metal thickness; thinner walls resulting in faster wave propagation and less attenuation. These differences are used to detect and quantify variations such as pitting and metal loss. Reference to the Multifinger Imaging Tool data determines whether the metal loss found with the MTT is internal or external.

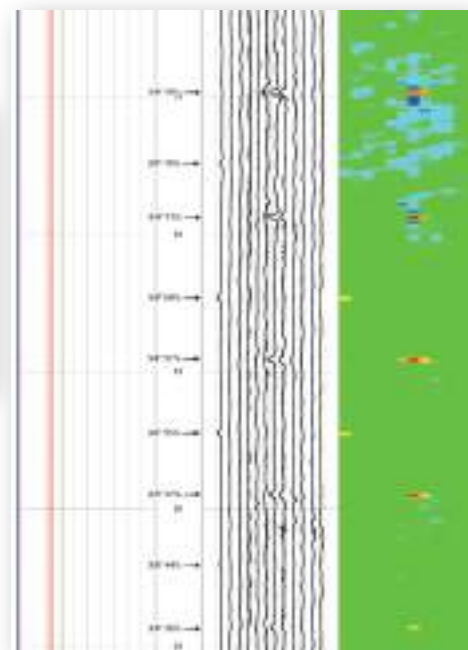


By combining information from the MIT and MTT in WIVA software, images can be created on a computer screen in 3 dimensions. Colour schemes, meshes, arrows and numerical data can be added to help an engineer understand the structure and condition of their well.

Data from the MIT and MTT can be automatically processed with WIPER software to identify certain features in the well; most obviously the collars. After setting certain parameters, the software carries out a joint by joint statistical analysis and builds a report summarizing the condition of pipe in the well.

APPLICATION

Providing accurate measurements of the internal diameter is extremely effective, but is not the complete story. Many instances of corrosion damage are on the outside of the casing / tubing.

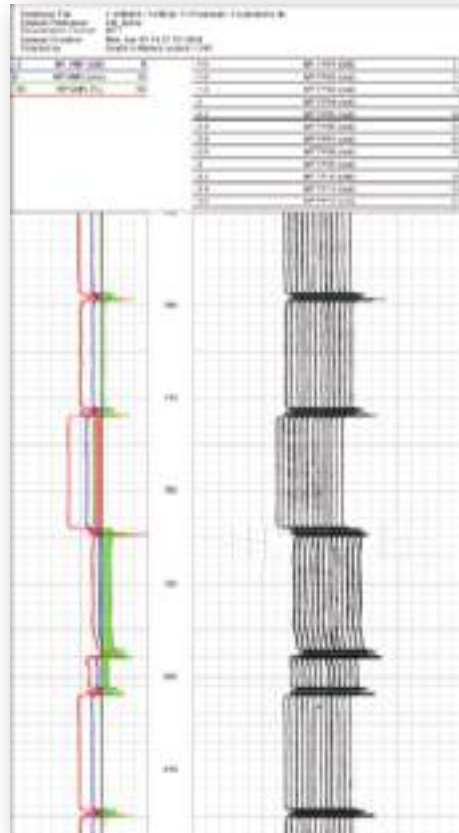


FEATURES

- Pipe inspection for internal & external metal loss.
- Surveys wall thickness.
- Optimized results using MIT data for internal diameter.
- Logs casing below tubing due to bow spring design.
- Simultaneous operation with other Sondex
- Ultrawire™ tools.
- Surface read out or memory logging.
- Visualization using WIVA 3D imaging software.
- Processing, Evaluation and Reporting with
- WIPER software.

BENEFITS

Measurement of Metal loss on outside of casing.



SPECIFICATIONS

Temperature rating	300°F (150°C)
Pressure rating	15000psi (103.4MPa)
Tool diameter	111/16in (43mm)
Tool length	82.3in (2.090m)
Tool weight	30lb (13.6kg)
Number of sensors	12
Sensor measure point	36.22in (0.92m)
Pipe range	2 7/8" to 9 5/8"
Coverage	100% with 12 sensors up to 5in ID pipe
Relative Bearing accuracy	5°
Relative Bearing deviation	5° to 175°
Defect resolution	3/8in (9mm) defect: 50% wall thickness, 35% metal loss
(internal or external)	3/4in (18mm) defect: 30% wall thickness, 20% metal loss
Materials	Corrosion resistant throughout

Magnetic Thickness Tool

Radial Incremental Bond & High Definition Radial Incremented Bond



Radial Incremental Bond & High Definition Radial Incremented Bond

RID Conventional dual spaced 3ft-5ft CBL is an economical way to evaluate a cement job. However, if it shows less than perfect bonding, additional information is needed to correctly evaluate the cement bond. KODIAK Radial Incremental Bond (RIB) tools provide the conventional CBL-VDL receivers plus additional directional radial receivers that can measure circumferential data necessary to determine if there is channeling in the cement.

KODIAK unique 1.5ft transmitter to radial receiver spacing provides highly directional information without the averaging effect seen in traditional 3ft spacing, and is less susceptible to fast formation interference. The amplitude display of each directional receiver forms a detailed 360° cement map that can be used to identify channeling and other bonding irregularities.

HD RIB The industry standard 8-Sector radial Bond provides excellent cement evaluation between the casing and formation in most applications. However, as the casing size increase the, sector resolution of the 8-Sector RIB tool decreases making it difficult to accurately identify channeling and other bonding irregularities. These unique challenges have been addressed by KODIAL industry leading High Definition radial Incremented Bond (HD-RIB) tools. The high sector azimuthal resolution, up 22.5°, provides details necessary for identification of channeling, voids and other bonding irregularities in casing sizes of 7" (178mm) or larger. A sonic receiver spaced 3ft from the transmitter provides quality information on casing to cement bonding. Amplitude display of the highly directional receivers allows a detailed 360° cement map of the wellbore to be created. A deeper investigating receiver confirms the data obtained from the 3ft receiver and shows formation bonding by a full VDL wave display.

APPLICATIONS

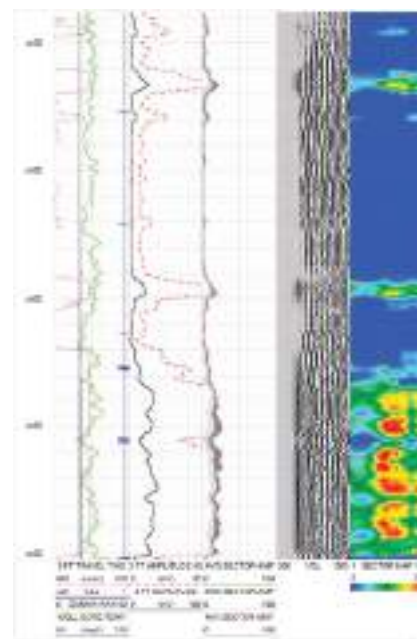
- Assessment of cement bond quality and hydraulic isolation
- Identification of micro annulus and channeling
- Locating top of cement (TOC)

FEATURES RIB & HD RIB

- 1.5ft spacing map sensors
- Slip joint and bi-metallic isolator bar construction
- Industry leader in high definition cement mapping
- Wellbore and internal temperature sensors
- Rigid V-Slot Isolator Bar incorporated into the tool body
- 450°F (204°C) flaked version available
- VDL crystal at 6ft to increased depth of investigation
- Compatible with Titan Compensated Neutron, GR-Neutron and CCL

BENEFITS RIB & HD RIB

- Less fast formation interface in cement mapping
- 22.5° azimuthal resolution on cement maps
- Minimal flexing of tool body ensures optimum centralization in deviated well
- Temperature sensor allows real-time tool quality control
- VDL spacing ideal for large boreholes



SPECIFICATIONS

	Radial Incremental Bond (RIB)		High Definition Radial Incremental Bond (HD RIB)	
	1-11/16 IN (43 MM)	2-3/4 IN (70 MM)	3-1/4 IN (83 MM)	4-1/2 IN (114 MM)
Measurements				
Vertical Resolution	1.5ft RIB 3 ft CBL and 5 ft VDL	1.5ft RIB 3 ft CBL and 5 ft VDL	1.5ft RIB 3 ft CBL and 5 ft VDL	3ft RIB 3 ft CBL and 6 ft VDL
Azimuthal Resolution	60 ° Cement map/ 6 Sector	45 ° Cement map/ 8 Sector	30° Cement map/ 12 Sector	22.5° Cement map/ 16 Sector
Logging Speed (ft/min)[m/min]	60 [18.3]	60 [18.3]	60 [18.3]	60 [18.3]
Mud Type • Weight	Must be liquid • No limitations	Must be liquid • No limitations	Must be liquid • No limitations	Must be liquid • No limitations
Offset from bottom shoulder (in)[cm]	78.0 [198.2] • 70.0 [177.8]	76.5 [194.3] • 70.0 [177.8]		
Temperature • Transmitter	61 [154.9]	61 [154.9]	76.5 [194.3] • 70.0 [177.8]	88.6 [225.0] • 81.2 [206.2]
RIB			61.0 [154.9]	63.2 [160.5]
3f Crystal • 5ft Crystal	52.0 [132.1] • 40.0 [101.6]	52.0 [132.1] • 40.0 [101.6]	52.0 [132.1] • 40.0 [101.6]	63.2 [160.5] • 45.2 [114.8]
Environmental				
Temperature rating Standard (°F)[°C] High Temperature (°F)[°C]	-25 to 400 [-32 to 204] -25 to 450 [-32 to 232]	-25 to 400 [-32 to 204] -25 to 450 [-32 to 232]	-25 to 400 [-32 to 204] -25 to 450 [-32 to 232]	-25 to 400 [-32 to 204] -25 to 450 [-32 to 232]
Pressure Rating (psi)[MPa]	20,000 [138]	20,000 [138]	20,000 [138]	20,000 [138]
Material	H ₂ S resistant construction	H ₂ S resistant construction	H ₂ S resistant construction	H ₂ S resistant construction
Mechanical				
Outside Diameter (in)[mm]	1.69 [42.9]	2.75 [69.9]	3.25 [82.6]	4.50 [114.3]
Length (ft)[m] {Hi Temp}	9.13 [2.78] {10.34 [3.15]}	9.13 [2.78] {10.47 [3.19]}	9.13 [2.78] {10.75 [3.28]}	10.29 [3.14] {11.86 [3.61]}
Weight (lb)[kg] {Hi Temp}	63 [29] {73 [33]}	120 [54] {148 [67]}	135 [61] {160 [73]}	202 [92] {234 [106]}
Max. Tension (lbf) [kN]	40,000 [178]	60,000 [267]	60,000 [267]	60,000 [267]
Min. • Max. Casng Size (in){mm}	2.38 [60]	4.50 [114]	5.50 [140]	8.63 [219]
Max. Casing Size (in)[mm]	5.50 [140] (RIB) 7.00 [178] (CBL/ VDL)	7.63 [194] (RIB) 9.63 [244] (CBL/ VDL)	10.75 [273] (RIB) 12.75 [324] (CBL/ VDL)	18.00 [457]
Crystal Type	Piezoelectric	Piezoelectric	Piezoelectric	Piezoelectric
Temperature Sensor	Platinum RTD	Platinum RTD	Platinum RTD	Platinum RTD
Pressure Compensation	Sliding cans	Sliding cans	Sliding cans	Sliding cans

Radial Incremental Bond & High Definition Radial Incremented Bond

Kodiak

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Roke Quad Neutron

Quad Neutron™ Thru Pipe Formation Evaluation

DESCRIPTION

Quad Neutron tool is used on high risk horizontal new drills and can log through drill pipe, case and then log. It's also a great tool for cased reservoir management wells and can identify areas with high water saturation and bypassed hydrocarbon. Applications for shale oil and gas formations, formation water salinity determination and fracture planning and evaluation can also be done with this tool.

APPLICATIONS

- High risk horizontal new drills
 - Log thru drill pipe
 - Case and then log
- Cased reservoir management wells
 - identify areas with high water saturation
 - identify bypassed hydrocarbon
- Thru pipe bypassed pay wells with poor or no open hole data
- Shale Oil formation evaluation
- Shale Gas formation evaluation
- Formation water salinity determination
- Fracture planning and evaluation

BENEFITS

Proven Production	Porosity	Bulk Density
Low Risk		Cost Effective
Saturation	Clay Volume	Permeability

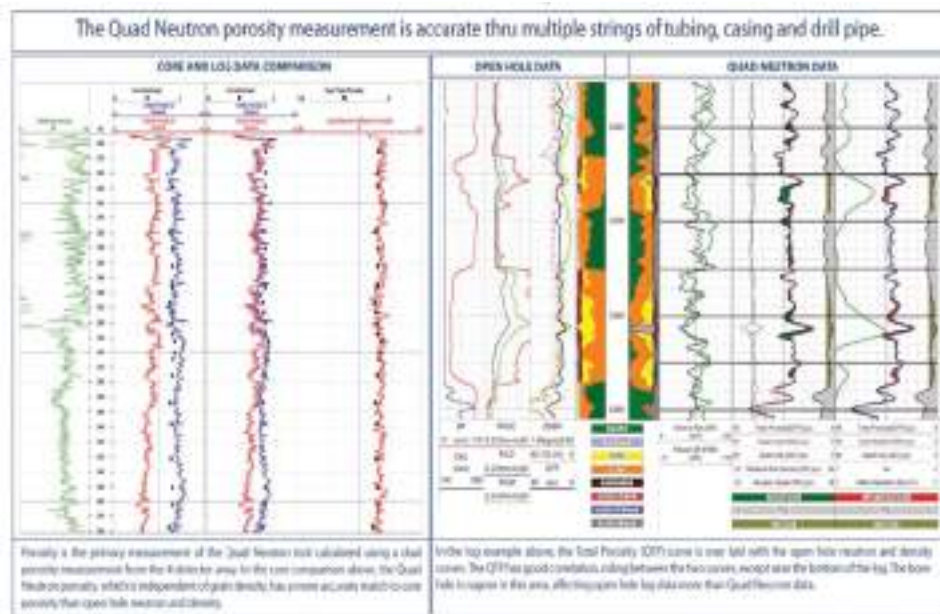
STRING CONFIGURATION		
SENSOR		DESCRIPTION
UHT	—	Up Hole Temperature
FGR	—	Filtered Gamma Ray
GR	—	Gamma Ray
ECL	—	Casing Collar Locator
LNG	—	Long Neutron Gamma
SNG	—	Short Neutron Gamma
	—	Neutron Source
SNN	—	Short Neutron Neutron
LNN	—	Long Neutron Neutron
BHT	—	Bottom Hole Temperature Fluid Resistivity



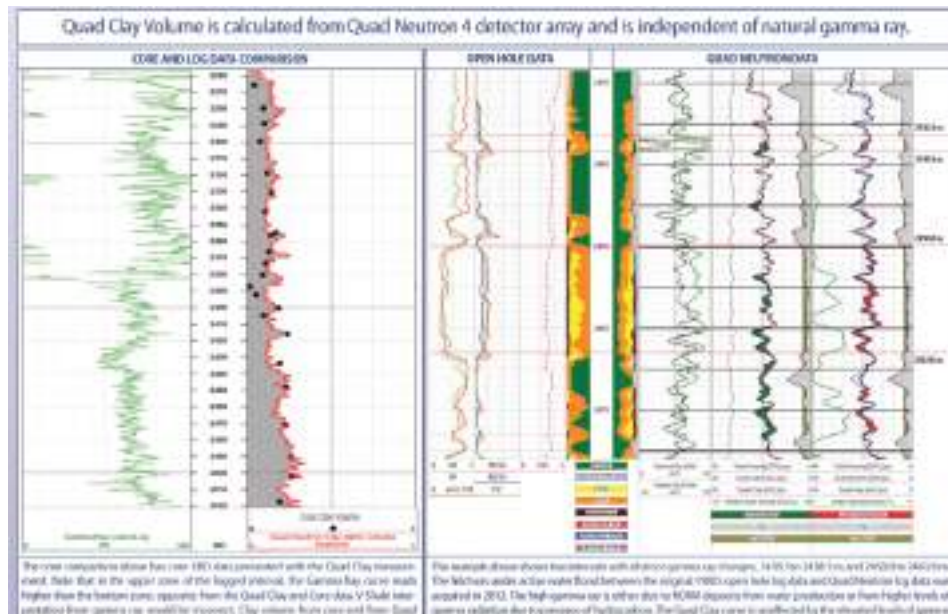
SPECIFICATIONS

Maximum OD	43 mm (1.7 in)
Length	4.5 m (179 in)
Weight	42 kg (92 lbs)
Maximum Temperature	150 C (302 F)
Maximum Pressure	137.9 Mpa (20kpsi)
Minimum constriction	54 mm (2.125 in)
# of strings	Multiple strings of pipe
Vertical Resolution	0.61 m (2 ft)
Maximum logging speed	4-10 m/min (13-33 ft/min)

POROSITY



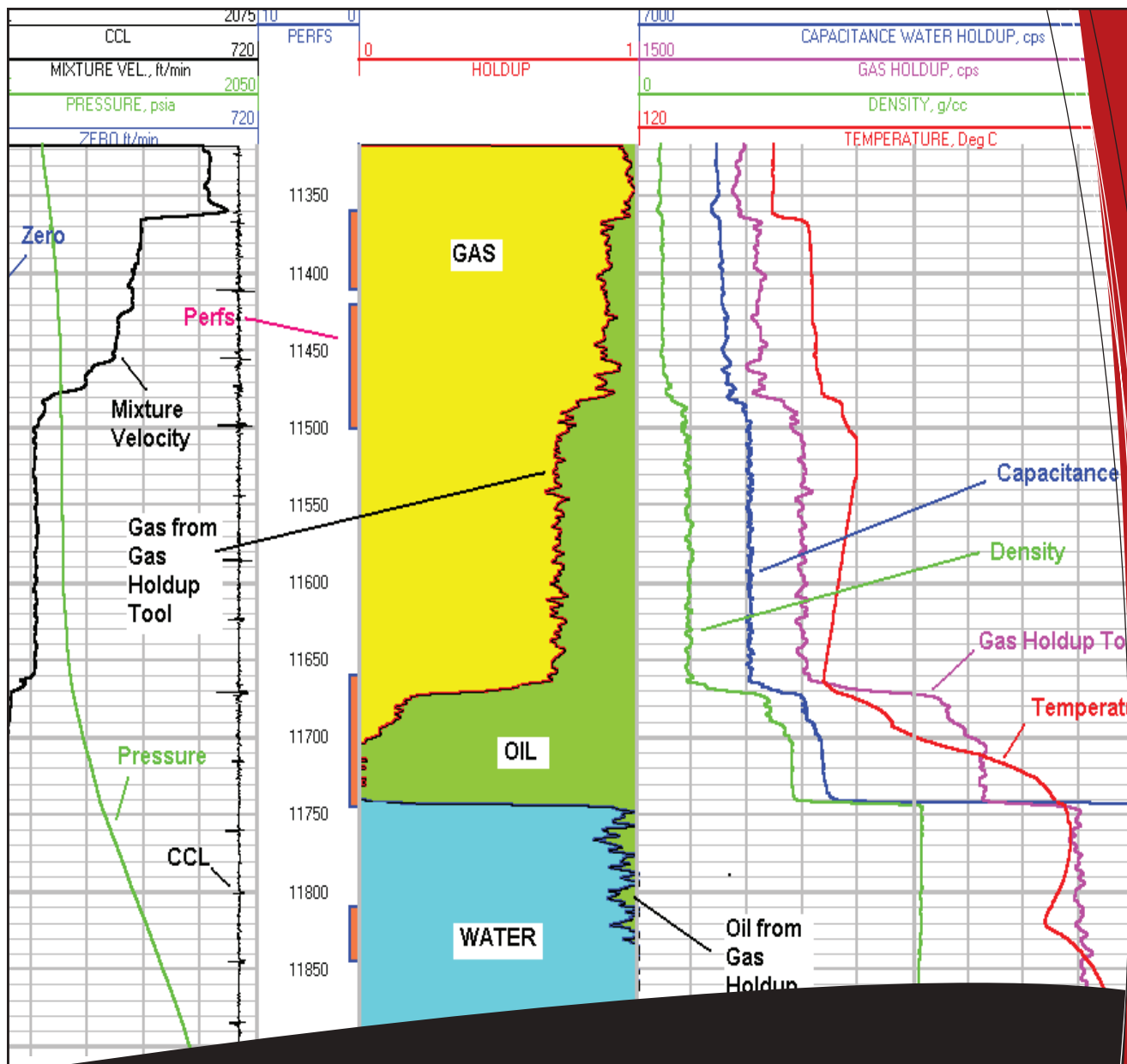
CLAY VOLUME



Roke Quad Neutron

Kodiak

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Production Logging

Multiple Array Production Suite

Multiple Array Production Suite (MAPS)

DESCRIPTION

Kodiak offers an exceptional choice of PL toolstrings, plus a wide range of add-in sensors and over forty variants of flowmeter. Our production logging tools operate in memory or surface readout mode, and can combine effortlessly with Well Integrity tools on our unique high speed Ultrawire* tool bus. This ability to run many sensors in one toolstring not only provides appropriate data, but also reduces lost production by saving valuable operating time and resources.



Industry Leading Innovation

With new oil and gas reserves becoming increasingly difficult to find, secondary and tertiary hydrocarbon recovery is increasingly important. To meet these evolving market requirements and changing customer needs, we are continually innovating and developing the PL product range.

World-Class Technology

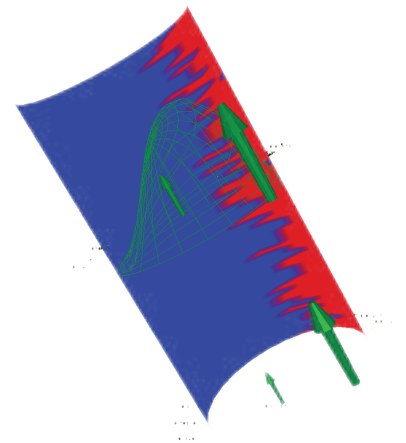
In complicated flow regimes, particularly within deviated and horizontal wells, conventional production logging tools are often inadequate. We have developed innovative production logging technology called MAPS (Multiple Array Production Suite) which provides more extensive information than standard PL tools.

Excellence You Can Rely On

All successful logging jobs depend on obtaining good quality data, without costly failures and lost time. Our equipment is designed to consistently produce precise measurements and operate with high reliability. Our applied expertise ensures excellent sensor design and testing, combined with the selection of reliable components, appropriate materials and rigorous manufacturing procedures.

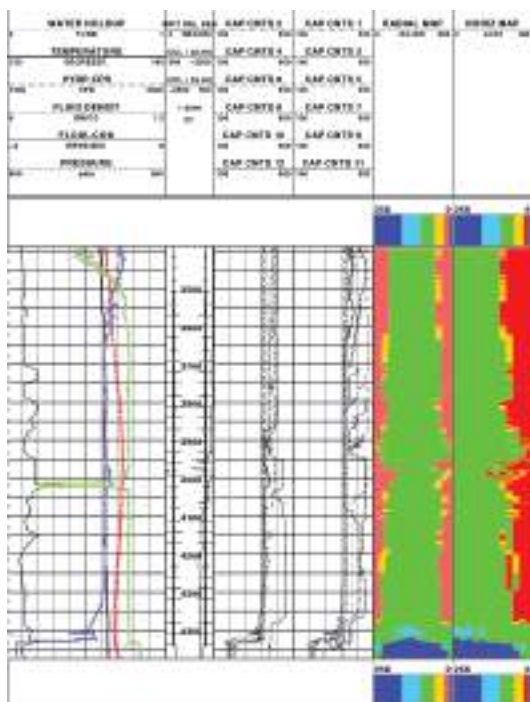
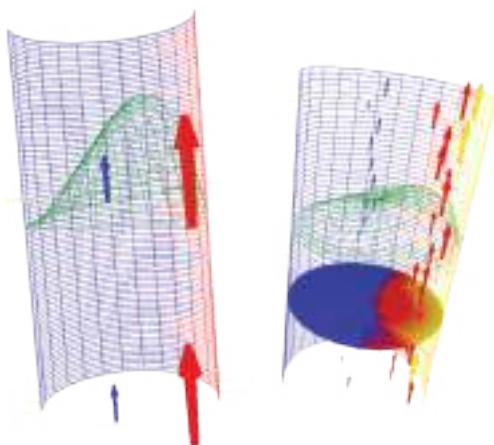
APPLICATIONS

- Measure the capacitance of surrounding fluid (CAT)
- Measure the electrical resistance of surrounding fluid (RAT)
- Measure the velocity of surrounding fluid (SAT)



FEATURES

- User-friendly, configurable 3D presentation of data from multiple tools
- Easy to interpret images and screens with options for annotation
- Arrows and distorted meshes to show velocity
- Color maps and surfaces to show fluid type
- Full MS Windows™ compatibility.



BENEFITS

- Identify oil & gas production and locate water entry points
- Operate in all well inclinations from vertical to horizontal
- MAPS combines the Spinner Array Tool (SAT), Capacitance Array Tool (CAT) and Resistance Array Tool (RAT) to measure phase hold-ups and velocities
- Multiple sensors provide user configurable 3D visualisation of multiphase flow with MAPview Memory and Real Time logging



Multiple Array Production Suite

Production Logging Tools

Production Logging Tools

DESCRIPTION

Kodiak's extensively field proven Production Logging Tools with multiple sensors that provide the customer with highly accurate data sets of downhole production information which describe the behavior of fluids in the well. The PLT string can be run in realtime or in memory mode.

APPLICATIONS

- Production Evaluation
- Flow profiling
- Water identification
- Leak detection
- Perforation identification
- Reservoir & Production Evaluation
- Downhole well testing

FEATURES

- Realtime or Memory acquisition modes
- GR-CCL - for correlation

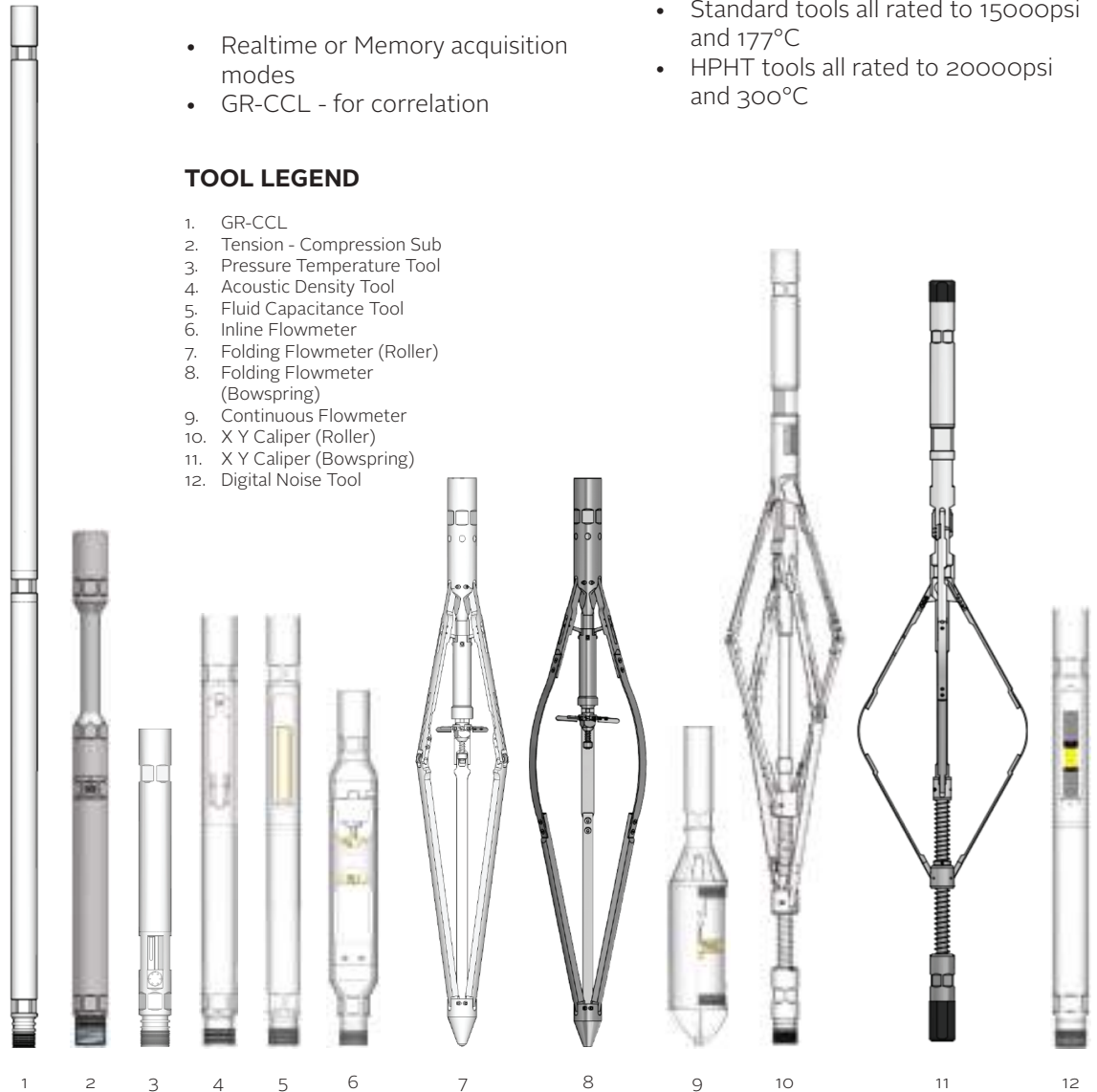
TOOL LEGEND

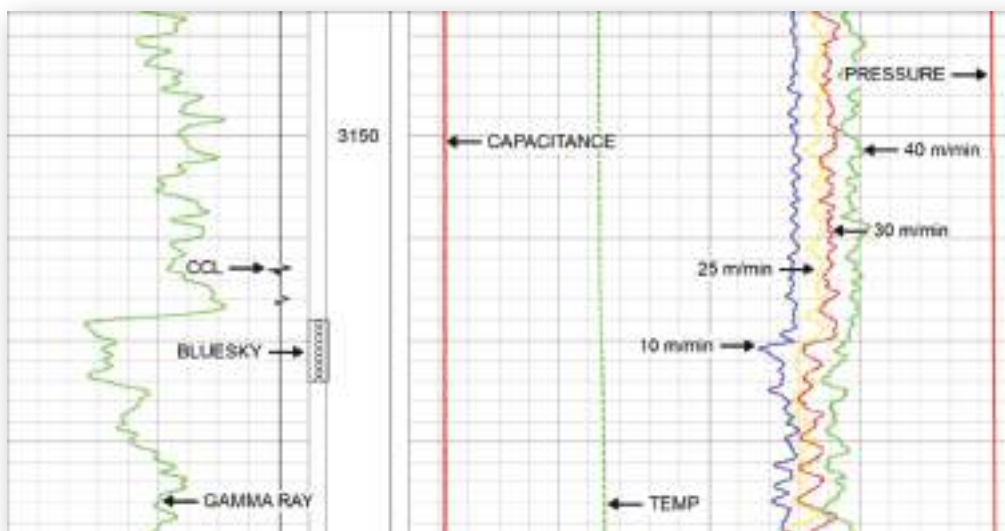
1. GR-CCL
2. Tension - Compression Sub
3. Pressure Temperature Tool
4. Acoustic Density Tool
5. Fluid Capacitance Tool
6. Inline Flowmeter
7. Folding Flowmeter (Roller)
8. Folding Flowmeter (Bowspring)
9. Continuous Flowmeter
10. X Y Caliper (Roller)
11. X Y Caliper (Bowspring)
12. Digital Noise Tool

- Tension - Compression Sub for CT logging, tractor logging and wellbores with restrictions
- Pressure Tool – Available with Quarts or Sapphire Gauge
- Temperature Tool – High speed RTD
- Acoustic Density Tool – High accuracy and reliability, dynamic not affected by deviation
- Flowmeter – Available in Foldable caged, Continuous or Inline depending on requirements
- X Y Caliper – Available in Roller or Bowspring versions
- Digital Noise Tool – Measures noise indicating the presence of bubbles, flowing particles and casing leaks.

BENEFITS

- Can be run on CT, Slickline, Tractor or standard Eline
- Memory or Realtime mode
- Available from 1" – 1 11/16"
- Standard tools all rated to 15000psi and 177°C
- HPHT tools all rated to 20000psi and 300°C





SPECIFICATIONS

Tools	Specifications			Rating 177°C & 15000psi			Rating 300°C & 20000psi
Sensor	Accuracy	Resolution	Range	1"	1.375"	1.6875"	1.6875"
Gamma ray / CCL (Scintillation Crystal)	Point of measure	Point of measure	0-10,000 GAPI	Available	Available	Available	Available
Capacitance Tool	2% - 5% WHU	0.10%	0-100% WHU	Available	Available	Available	Available
Fast response RTD	1°C	0.01°C	0-177°C	Available	Available	Available	Available
Sapphire Pressure	0.05% at Full Scale	0.003% Full Scale	0-15000psi	Available	Available	Available	Not Available
Quartz Pressure	3psi	0.008psi	0-15000psi	Available	Available	Available	Available
Acoustic Density	0.01 g/cc	0.001 g/cc	0 - 1.25 g/cc	Available	Available	Available	Not Available
Acoustic Density HPHT	0.01 g/cc	0.001 g/cc	0 - 2 g/cc	Not Available	Not Available	Not Available	Available
X Y Calliper (Roller or Bowspring)	0.2"	0.015"	1.6" - 9"	Not Available	Available	Available	Not Available
Digital noise Tool	1.0Hz	1.0Hz	200Hz - 20Kz	Not Available	Available	Available	Not Available
Flowmeters	Threshold	Resolution	Range	1"	1.375"	1.6875"	1.6875"
In Line Flow Meter 1.688" & 2.125" OD	8 ft/min	8 pulses / revolution	0 to +/- 200 rps	Not Available	Available	Available	Not Available
Folding Flow Meter (Roller or Bowspring)	2ft/min	8 pulses / revolution	0 to +/- 200 rps	Not Available	Available	Available	Not Available
Continuous Flow Meter 1" OD	2ft/min	8 pulses / revolution	0 to +/- 200 rps	Available	Not Available	Not Available	Not Available
Continuous Flow Meter 1.688", 2.125", 2.875" OD	4ft/min	8 pulses / revolution	0 to +/- 200 rps	Not Available	Available	Available	Not Available
Continuous Flow Meter (3.75")	1ft/min	8 pulses / revolution	0 to +/- 200 rps	Not Available	Available	Available	Not Available
Continuous Flow Meter Jewel Bearing (1 11/16")	2ft/min	8 pulses / revolution	0 to +/- 200 rps	Not Available	Available	Available	Not Available
Continuous Flow Meter 1.688", 2.125", 2.875" OD	2ft/min	12 pulses / revolution	0 to +/- 200 rps	Not Available	Not Available	Not Available	Available
Folding Flow Meter (Roller or Bowspring)	2ft/min	12 pulses / revolution	0 to +/- 200 rps	Not Available	Not Available	Not Available	Available

Production Logging Tools

Noise Temperature Tool

Noise Temperature Tool

DESCRIPTION

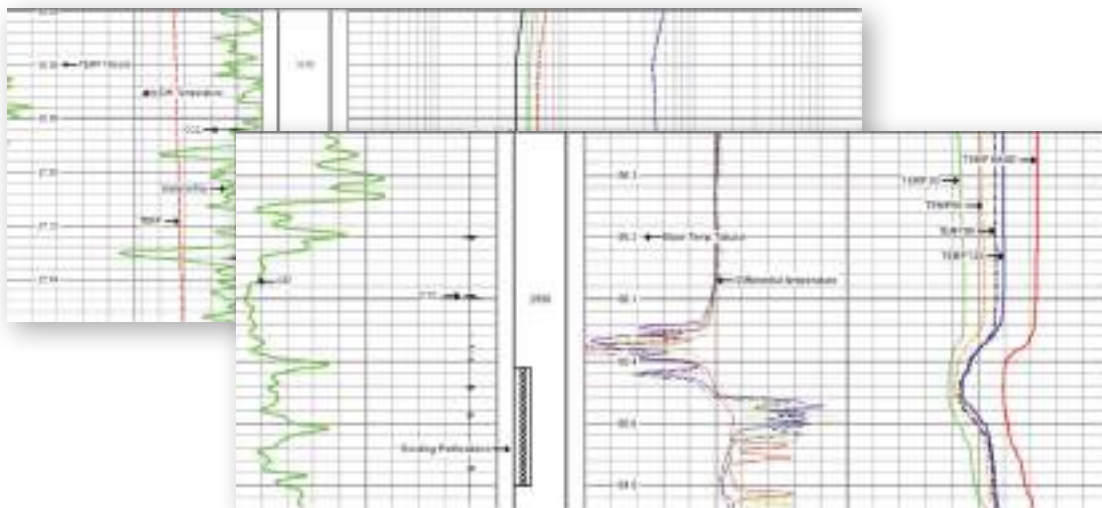
Kodiak's noise tool is primarily run in a cased-hole producing well environment and uses microphones to detect fluid movement. Noise is created from fluid flow inside the casing or behind the casing. Changes in noise are created as the flow rate changes or the pressure changes. The flow rates change as fluid migrates into one channel from multiple sources. Pressure changes are usually the result of an obstruction or opening in the casing. The noise log, therefore, is used for detecting channels behind the casing, flow into casing, flow out of casing, or obstructions inside the casing.

Noise logs are typically created by taking multiple stationary samples and combining the data into one continuous log. Measurements are usually taken when the tool is stationary because with the tool moving, the microphones would pick up all the road noise. The noise tool is commonly stacked with a gamma ray, casing collar locator (CCL), and temperature tool, but these tools are typically powered up using opposite polarity, enabling the noise tool to be powered up individually and recorded separately without being corrupted by electronic noise from the other tools.

FEATURES

- The noise logging tool is essentially a sensitive high-fidelity microphone. The piezoelectric crystals are housed in an oil filled chamber. A piston is used for pressure compensation.
- This tool works with all multiple band noise logging systems. The warrior logging system divides the frequency spectrum into four frequency ranges.
- The option is available for cutting the gain of the downhole tool by a factor of 10 for use in wells with very high noise levels.





SPECIFICATIONS

Max temperature rating	400 F (204.4 C)
Pressure rating	20000 PSI (138 Mpa)
Weight	24 Lbs (10.88 Kg)
Length	80.50" (204.47 cm)
Sensitivity	20 Hz-3000 Hz
OD	1.38" (3.50 CM)
Tool Spacing	
CCL to Top Shoulder	13.18" (33.49 cm)
CCL to Temp Probe	21.10" (53.59 cm)
Temp Probe to ND	32.31" (82.06 cm)
ND to Housing End	12.04" (30.57 cm)
ND to Bottom Shoulder	13.91" (35.33 cm)

Noise Temperature Tool

Flow Meter Spinner

Flow Meter Spinner

DESCRIPTION

The continuous flow meter spinner incorporates an impeller rotated by moving fluid. The impeller is mounted on precision bearings. Rotation is detected with three zero drag Hall Effect devices. The flow meter is run below a telemetry section which supplies power to the tool and transmits flow data to surface. The flow meter operates in vertical or horizontal positions and outputs both up and down flow. The flow meter may be run simultaneously with all other production logging tools.

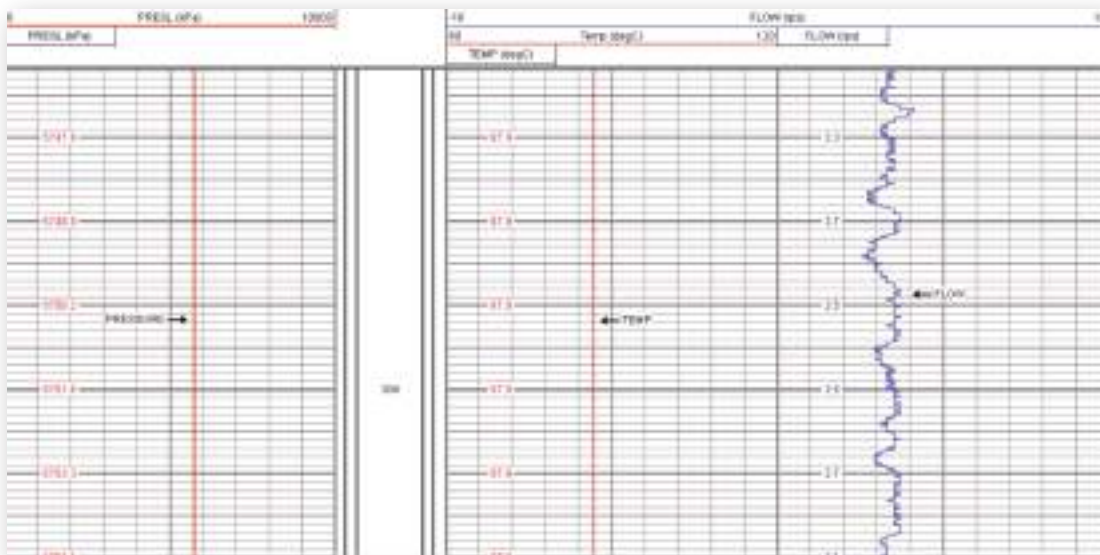
APPLICATIONS

- Production profiles
- Injection profiles
- Casing and tubing leak detections
- Gauging effectiveness of well treatments



FEATURES

- Cage sizes available 1.68"(4.29 cm) – 2.125"(5.40 cm) – 3.00"(7.62 cm)
- Tool connections Standard: 1 3/16 -12 GOI
- H₂S resistant material



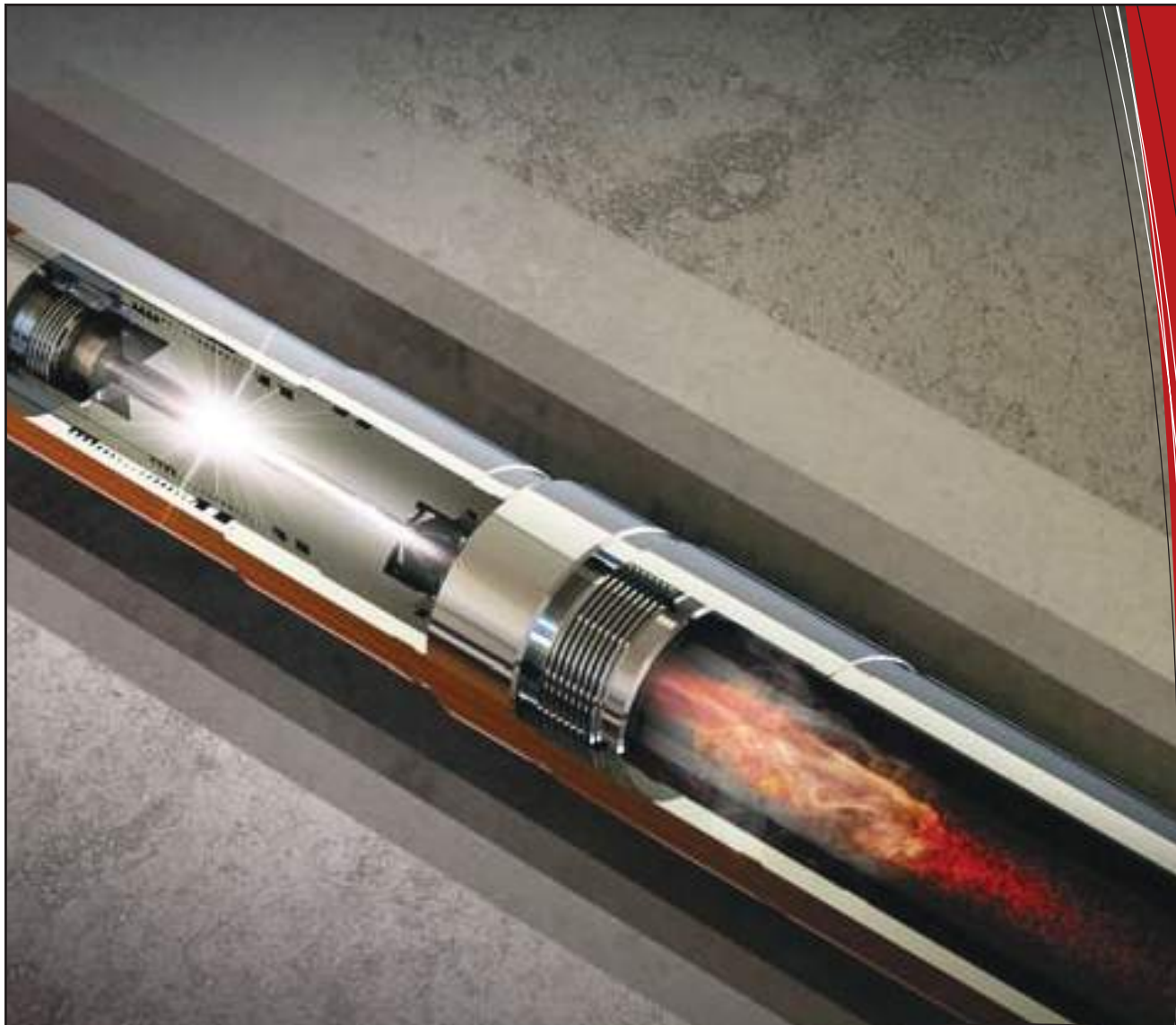
SPECIFICATIONS

Temperature rating	350 F (176.7 C)
Pressure rating	18000 PSI (124 Mpa)
Weight/Length	8 Lbs (3.6 Kg)/23.50" (59.70 cm)
Tool Spacing	
Ctr of Impeller to Top Shoulder	20.75" (52.71 cm)
Ctr of Impeller to Bot. Shoulder	2.75" (6.99 cm)

Flow Meter Spinner

Kodiak

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Plugs

NEO Nest (Non-Explosive Setting Tools) #10 & #20

FEATURES

- Use Baker Setting Tool adapters and routine field operations,
- Reset in seconds, whereupon another plug can be attached and run within minutes,
- Set plugs and packers in 6 – 12 minutes and produce superior long-life pressure isolation,
- Can be operated in any spatial orientation, e.g., vertical through up-side-down orientations,
- Have no transportation restrictions
- Can set plugs at one wellsite and be easily transported to numerous other wellsites to set multiple other plugs.

BENEFITS

- Safer and more efficient field operations.
- Eliminate complications due to explosives logistics.
- Safe, easy transport by land, sea, and air w/o restrictions.
- Produce long-life superior plug and packer seals.
- No Radio silence required at wellsite.
- No risks associated to handling explosives at surface.
- No restricted access to rig floor or wellhead

SPECIFICATIONS

NeoNEST - Standard Service Models							
NeoNEST P/N	Max Service Pressure	Max Service Temp	Max Applied Load Capability	Power Requirement at Head	Run-in Diameter	NeoNEST Make-up Length	NeoNEST Weight
9100-010-114 G5	15000 psig	350 °F (177 °C)	35,000 lbf	2.75"	2.75"	129 1/2"	122 lbms
9100-020-124 G5	15000 psig	350 °F (177 °C)	60,000 lbf	3.81"	3.81"	128"	235 lbms

Non-Explosive Setting Tools

Model 20 NeoBST



Thru-Tubing Bridge Plug

Thru-Tubing Bridge Plug (T-TBP)

DESCRIPTION

T-TBP pass thru small diameter restrictions and can set in diameters up to 8 times their run-in diameter. Cement slurry is placed atop the plug to achieve long-term pressure isolation. Over 30,000 WL-run T-TBPs have been successfully run throughout the global oil industry.

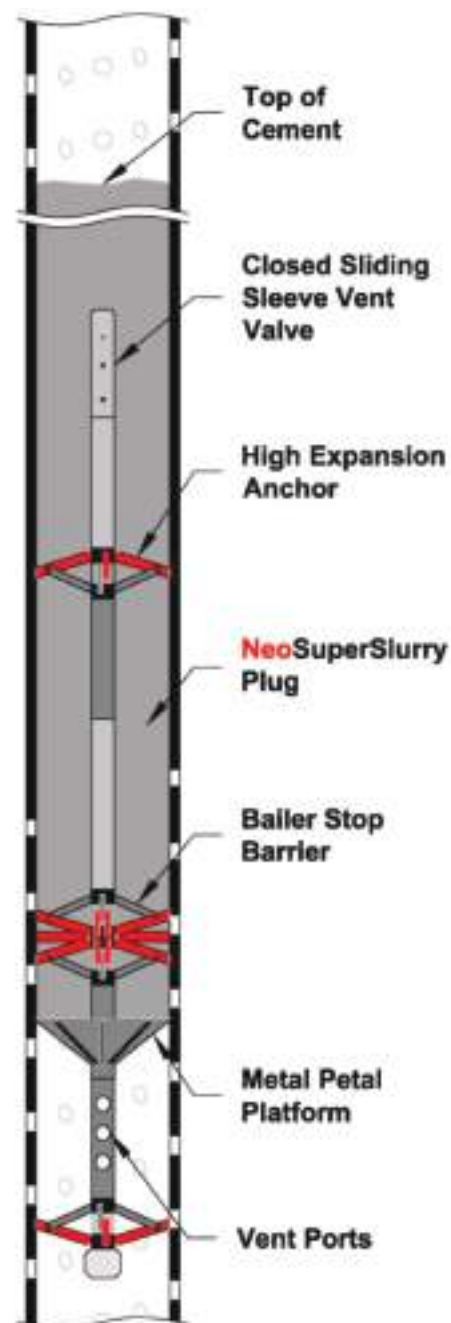
APPLICATION

T-TBPs can run on WL, Slickline and CT. They provide a platform upon which SuperSlurry cement is placed. The cement sets and bonds to casing, therein, providing a long-term high ΔP casing plug.

BENEFITS & FEATURES

- Each WideRange T-TBP sets in a wide range of casing sizes.
- Successful setting and anchoring is verified on the setting run.
- Bailer Stop allows precise setting depth determination on setting run.
- Bailer Stop not allow bailers to descend to the metal-petal-platform.

WideRange T-TBPs provide zonal isolation in: perforated intervals, salt water wellbore fluids, hot dry natural gas and crude oil and gas condensate. SuperSlurries are available in 17ppg, 18ppg & 20ppg slurry weights. SuperSlurries, high-shear-bond expanding cement formulations, are placed atop WideRange T-TBPs. The combination of the two provides zonal isolation for the life of the well.



SPECIFICATIONS

WideRange T-TBPs, 7 5/8" & 9 5/8" T-TBPs			
Plug P/N	Casing Size	T-TBP Run-In-Length	Run-In-Diameter
0163-238-400-001-S1	2 3/8", 2 7/8", 3 1/2" & 4"	108 in	1 5/8"
0163-450-700-001-S2	4 1/2", 5", 5 1/2", 6 5/8" & 7"	176 in	1 5/8"
0163-763-001	7 5/8"	176 in	1 5/8"
0200-963-001	9 5/8"	176 in	2" & 2 1/4"

Release Tool (RT)

Non-explosive Thru-Tubing Zonal Isolations

DESCRIPTION

RTs provide the ability to deploy non-explosive WideRange Thru-Tubing Bridge Plugs rather than the conventional explosive-deployed Thru-Tubing Bridge Plugs. RTs thread to the top the WideRange Thru-Tubing Bridge Plugs and are actuated by the application of DC power sent down the WL or from a downhole slickline power supply. Actuation requires approximately 275-300 mA at service conditions.

RTs are reusable. Redressing a RT only requires replacing O-rings.

RTs assure non-explosive deployment of WideRange Thru-Tubing Bridge Plugs

APPLICATIONS

The RT. Standard and HPHT/UHPHT Service models are available for sweet, sour and acid gas service conditions.

BENEFITS & FEATURES

-
- Eliminates burdens related to use and transport of explosives
- Exceptionally simple to run and maintain
- Expendable are 2 fl-oz of hydraulic fluid per run
- 1-11/16" RT can deploy 1-5/8" thru 9-5/8" non-explosive WideRange Thru-Tubing Bride Plugs
- RTs can be run on WL and SlickLine (with a downhole power supply)



SPECIFICATIONS

RT Standard & HPHT/UHPHT Service Specifications					
Model	P/N	Dimensions		Service Ratings	
		Length	Diameter	Max BHP	Max BHT
Standard Service 1-11/16" RT	0176-169-001	20" (50.8cm)	1-11/16" (4.29 cm)	15,000psig (1,034 bar)	350°F (177°C)
HPHT Service 1-11/16" RT	0176-169-001HPHT	20" (50.8cm)	1-11/16" (4.29 cm)	25,000psig (1,723 bar)	450°F (232°C)
UHPHT Service 1-11/16" RT	0176-169-001UPHT	20" (50.8cm)	1-11/16" (4.29 cm)	35,000psig (2,413 bar)	500°F (260°C)

Thru-Tubing Bridge Plug

Dump Bailer

Dump Bailer

DESCRIPTION

Dump bailers for cement, acid, or sand-dumping operations are offered in two types—the positive-displacement (PD) bailer and the gravity-feed bailer. Dump bailer uses a weighted swab piston to push, or positively displace, the bailer's contents into the wellbore.

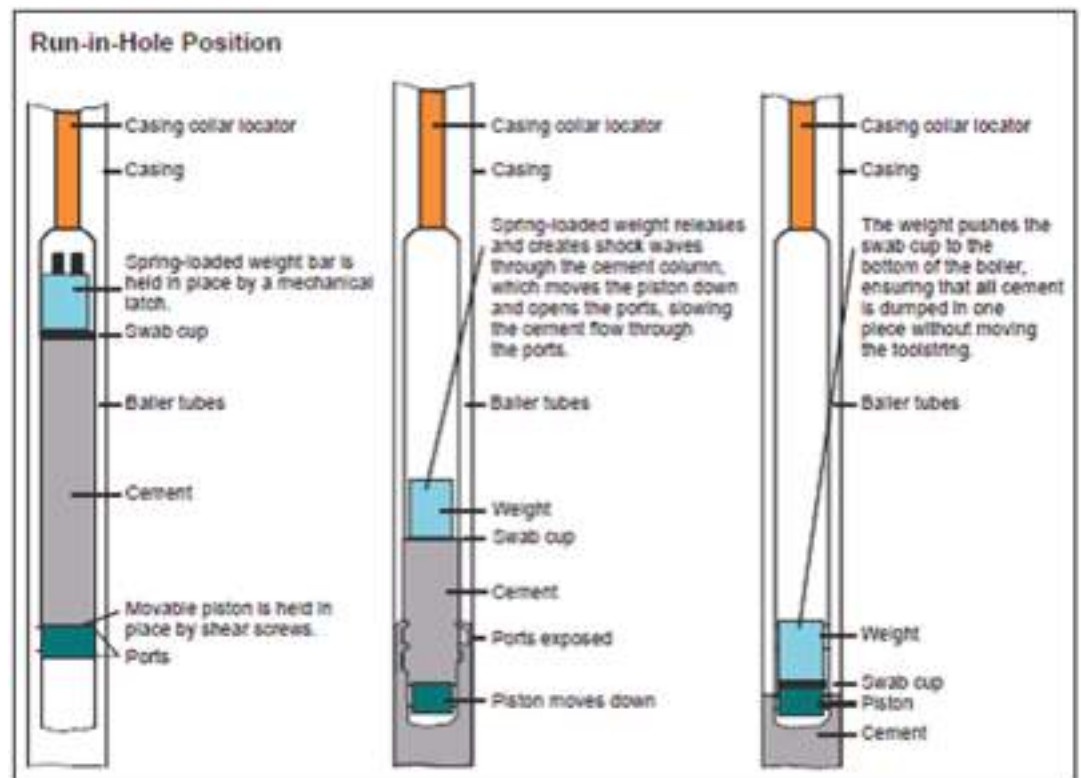
The dump bailer does not use any explosives. Instead, a solenoid drops a weight bar from a set of collets, causing a pressure wave that moves a piston in the bottom of the bailer to release the

cement. This advantage helps to make the system technically superior to other positive-displacement systems in the industry.

The gravity-feed system is the most commonly used dump bailer in the industry. The gravity-feed system requires explosives to shatter the disk in the bottom of the bailer, enabling the cement to flow.

APPLICATION

Permanent cement plugs during plug-and-abandon operations



FEATURES

Positive-Displacement System

- The PD bailer system does not require explosives, providing safer operations.
- Positive displacement ensures accurate placement, even in deviated wells—enhancing efficiency.
- The system provides a clean dump every time, resulting in no stringers to interfere with subsequent operations.

Gravity-Feed System

- The system's simple design requires minimal user training, is easy to operate, and uses an explosive charge to release cement downhole—all help to control costs.
- The absence of internal moving parts makes the system easy to maintain, saving time.

SPECIFICATIONS

	PD Bailer	Gravity Bailer
Maximum Bottomhole pressure	10000 psi (689.6 bar)	Pressure balanced
Maximum Bottomhole temperature	400 °F (204.4 °C)	Dependent on detonator used
Length	4 and 8 ft (1,2 and 2,4 m)	5 and 10 ft (1,5 and 3,05 m)
Material	Stainless steel	Carbon steel

Dump Bailer

Kodiak

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Perforating

Select Fire & Pump Down

Select Fire & Pump Down

DESCRIPTION

Kodiak provides customized completions systems and well application systems to meet unique customer needs and well applications. With the increase in horizontal and non-conventional well completions new solutions for customers was obvious.

- Pump down / select fire IP addressable systems coupled with Tool disconnect services

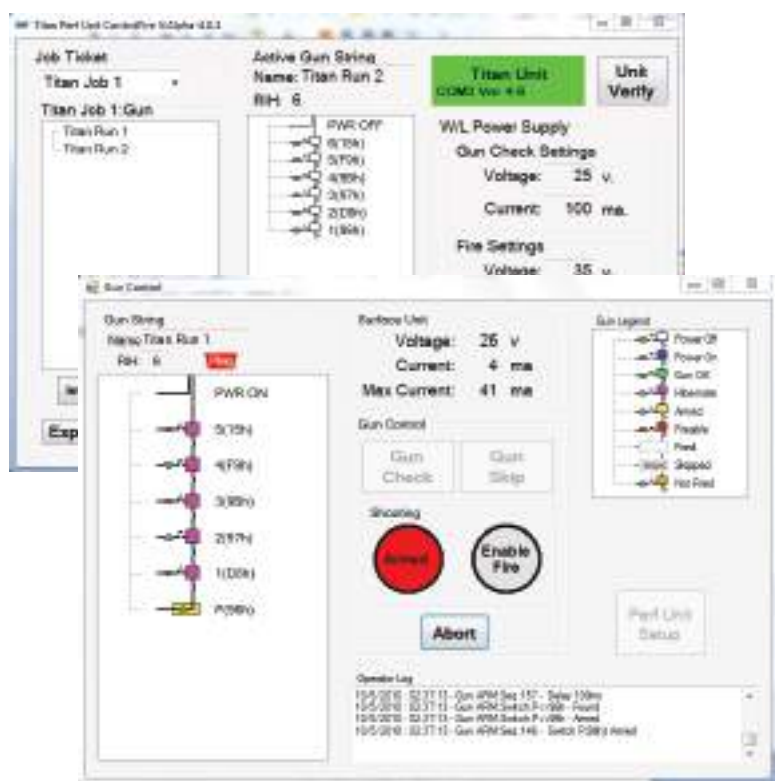
BENEFITS

- Added Level of Safety – detonator is never electrically connected until specific software command is sent
- Non Sequential Operation – independent switch that does not rely on previous gun success
- Skip Over Capabilities – provide valuable time savings as perforating operations can continue in the case of a gun misfire
- Positive Shot Indication – confirmation of firing, especially in deep, horizontal well conditions
- User Friendly System – avoid user positive/negative wiring mistakes leading to off depth perforations
- Eliminate Premature Activation – gun flooding causing piston activation leading to off depth perforations



SPECIFICATIONS

Environmental	
Operating Temperature Range	-20 °F (-29 °C) to 347 °F (175 °C)
Survival Temperature	-58 °F (-50 °C) to 392 °F (200°C)
Max Thermal Change	42.8 °F (5 °C) / Minute
Vibration Compliant	Compliant to all hollow carrier gun systems
Vibration (3 axis) Sweep Frequency 50 – 1000 Hz	50 g RMS
Electrical	
Operating Voltage Range	-5 VDC to -550 VDC
Operating Current – Standby	>1mA
Current – Communicating	10mA at Surface, 30mA Downhole
Bi-directional Communications	FSK Downlink & Current Loop uplink
Compatibility	
Detonators – Hot Wire	50 ohms or higher (two resistor and bridge as well as single resistor types)
Ignitors – Setting tools	50 ohms or higher
RF Safe Detonators	PX-1/EBW, RED (all versions)



Select Fire & Pump Down

CCL & GR Perforating

Casing Collar Locator - Perforating (CCL)

DESCRIPTION

As the tool passes a collar, or change in metal volume, lines of magnetic flux between two opposing permanent magnets are disturbed. This causes a low frequency voltage or Electro Magnetic Field (EMF) to be induced in a coil, mounted between the permanent magnets. Finally the signal is converted by a voltage-controlled oscillator for recording in the section of the tool.

SPECIFICATIONS

Max Temperature Rating	350 F (177C)*
Pressure Rating	20000 PSI (138 Mpa)
Available sizes	Standard 1" – 4 ½" **
*High temp available on request	
**Special order sizes available on request	

FEATURES

- Combinable with other tools.
- Depth control in casing or tubing.
- Location of casing or tubing damage.
- Confirmation of perforation depths or intervals.
- Available in full range of sizes to accommodate correlation of different sized devices.

STRING CONFIGURATION		
SENSOR		DESCRIPTION
UHT	—	Up Hole Temperature
FGR	—	Filtered Gamma Ray



Gamma Ray - Perforating (GR)

DESCRIPTION

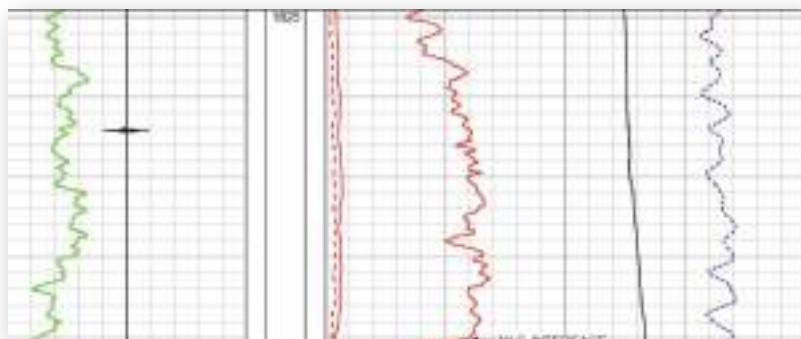
Tool with a Scintillation sensor that detects the gamma rays that coming from the formation. This measurement can localize the zones with presence of hydrocarbons and water, allowing to confirm the shooting interval. Kodiaks range of Gun Gamma Rays allows to perform the GR-CCL log whilst perforating, this can save rig time also its ideal for use in any situation where a standard CCL log is not possible.

FEATURES

- H₂S Resistant Material
- Enables GR correlation whilst shooting
- Engineered for use at high temperature
- Depth control in formation GR, casing or tubing.
- GR & CCL Confirmation of perforation depths or intervals
- Flashed version available for extreme high temperature

SPECIFICATIONS

Max Temperature Rating	350 F (177 C) *
Pressure Rating	20000 PSI (138 Mpa)
Available sizes	1 11/16" – 4 1/2"
*High temp available on request	
**Special order sizes available on request	



Gamma Ray – Perforating Log Example



CCL& GR Perforating

Trigger

Trigger

DESCRIPTION

The Quick Change Trigger (QCT) is designed to fulfill the need for a cost-effective triggering device, without compromising on quality, to initiate all types of explosive and pyrotechnic devices, regardless of the method of deployment.

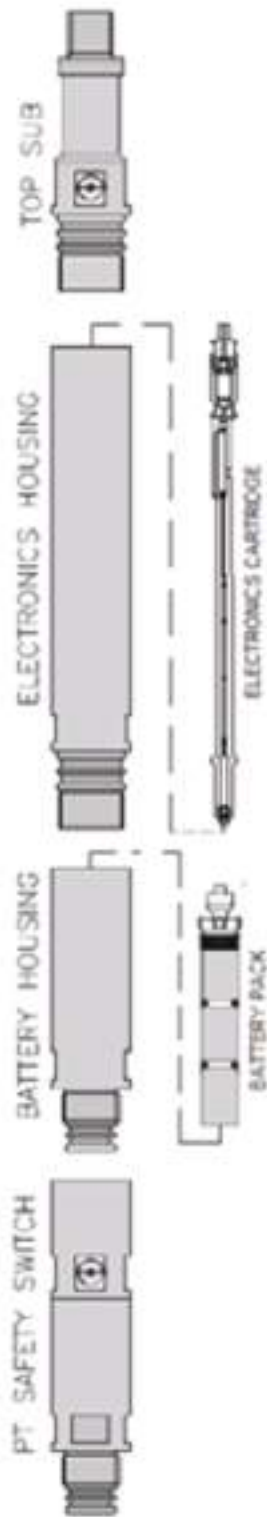
The tools concept has been based around quick & easy cartridge changes if required at the well site and this can be performed with no specialized tools.

The QCT would be suited to lower pressure zones where deployment is via TCP, Coiled Tubing or Slickline due to its selective control pulse window. Cartridge inserts are available for firing a wide range of ballistic devices used in the following applications:

- Casing perforating
- Tubing punching
- Tubing cutting
- Plug/Packer setting
- Downhole sampling
- Various other downhole operations

FEATURES AND APPLICATIONS

- Field replaceable control cartridge
- Quick & easy re-dress between runs
- Suitable for depleted reservoirs
- Can be activated with positive or negative pressure pulse code e.g. TCP or Coiled tubing operations
- Can be activated with pre-programmed accelerometer burst e.g. Slickline operations
- Accelerometer can be disabled for TCP operations
- Option available for long duration TCP battery pack
- Can deploy and initiate all industry standard ballistic devices
- Fully (3rd party) RF, lightning and stray voltage safe via a Certified Safety Assessment
- Design has been Vibration & Shock tested to 40G



SPECIFICATIONS

Operating Range	
Pressure	15000 psi (103.4 Mpa)
Temperature	347 °F (175 °C)
Material	NACE
Dimensions	
Outer Diameter	1.688 in (42.9 mm)
Total Makeup Length	4.69 ft (1.4307 m)
Connections	
Top	1 5/16 in 10 UN Sucker Rod
Bottom	1 3/16 in 12 UN-2A Male GO
Pressure Measurement	
Sensor Type	Strain
Range	0 to 15000 psi (103.4 Mpa)
Accuracy	± 0.1 % of Full-Scale
Resolution	0.00066% of Full-Scale
Temperature Measurement	
Range	0 to 347 °F (175 °C)
Accuracy	± 0.9 °F (± 0.5 °C)
Resolution	0.0036 °F (0.002 °C)



Trigger

60

PRESSURE CALCULATION DATA SHEET

TCP CONTROL LINE SELECT FIRE SYSTEM

WELL DATA REQUIRED

BHT: 30° C 86°F

FLUID: H₂O 0.5039 PSI/FT

TVD: 1491m 4892 FT

HYDROSTATIC: 2465 PSI

NOTE: .100 DIA. PIN = .892 PSI/PIN; .0076 DIA. PIN = .496 PSI/PIN (w/BHT of 86 °F)

		LOW PSI	HIGH PSI					HIGH PSI	LOW PSI	
GUN#1:	RD-A8658-5	2850	3150	100 °F	FRNG. HEAD:	1 EA .100 DIA PIN + 1 EA .0076 DIA PIN				
						(892 psi/pin x 2 pins) + (496 psi/pin x 2 pins) =	2776	PSI (nom.)	2975	3175
SURFACE PRESSURE:		385	685						510	710
										3000 PSI
GUN#2:	RD-A8658-6	3325	3675	100 °F	FRNG. HEAD:	2 EA .100 DIA PINS				
						(892 PSI/PIN X 2 PINS) +(496 PSI/PIN x 3 Pins =	3272	PSI (nom.)	3475	3575
SURFACE PRESSURE:		860	1210						1010	1110
										3500 PSI
GUN#3:	RD-A8658-7	3800	4200	100 °F	FRNG. HEAD:	2 EA .100 DIA PINS + 1 EA .0076 DIA PIN				
						(892 PSI/PIN X 4 PINS) + (496 PSI/PIN x 1) =	4064	PSI (nom.)	3975	4150
SURFACE PRESSURE:		1335	1735						1510	1685
										4000 PSI
GUN#4:	RD-A8658-8	4275	4725	100 °F	FRNG. HEAD:	2 EA .100 DIA PINS + 2 EA .0076 DIA PINS				
						(892 PSI/PIN X 4 PINS) + (496 PSI/PIN X 2 PINS) =	4560	PSI (nom.)	4475	4575
SURFACE PRESSURE:		1810	2260						2010	2110
										4500 PSI
GUN#5:	RD-A8658-9	4275	4725	100 °F	FRNG. HEAD:	2 EA .100 DIA PINS + 3 EA .0076 DIA PINS				
						(892 PSI/PIN X 4 PINS) + (496 PSI/PIN X 3 PINS) =	5056	PSI (nom.)	4975	5125
SURFACE PRESSURE:		2510	2660						2010	2110
										4500 PSI
DRAIN RUPTURE DISC:		4950	5025							
SURFACE PRESSURE:		2485	2560							5000 PSI
RD-A8219-8										

Tubing Conveyed Perforating

Perforating Gun Systems



Perforating Gun Systems

DESCRIPTION

Maximized productivity from your well depends on getting the perforations right, located in the productive interval, correctly oriented, deep and clean, our hollow carrier and capsule perforating guns are engineered systems that are optimized for the wellbore environment, reservoir, and completion geometry. Kodiak can propose the optimum product on a case by case basis or can purchase any of the products available on the market as per client specification.

Capsule Guns

Exposed gun systems, with the individual shaped charges sealed in pressure-tight protective capsules mounted on a carrier strip or links that are exposed to the well environment. Capsule guns are typically used in through-tubing perforation applications to reperfurate and revive wells that have gone into a production decline. The small-diameter design of capsule guns can deliver superior performance compared with hollow carrier guns of the same diameter.

Expendable and Retrievable systems

The two types of capsule guns are expendable (the charges and mounting assembly are left as debris after firing)

and retrievable (debris is left, but the mounting is recovered for use where debris is a concern). The latter design is also called semi expendable. Some capsule gun systems have a selectivity option that allows shooting more than one zone per run. Deployment is on electric wireline cable, although some systems can also be run on slickline

Super Deep Penetrating (SDP) charges

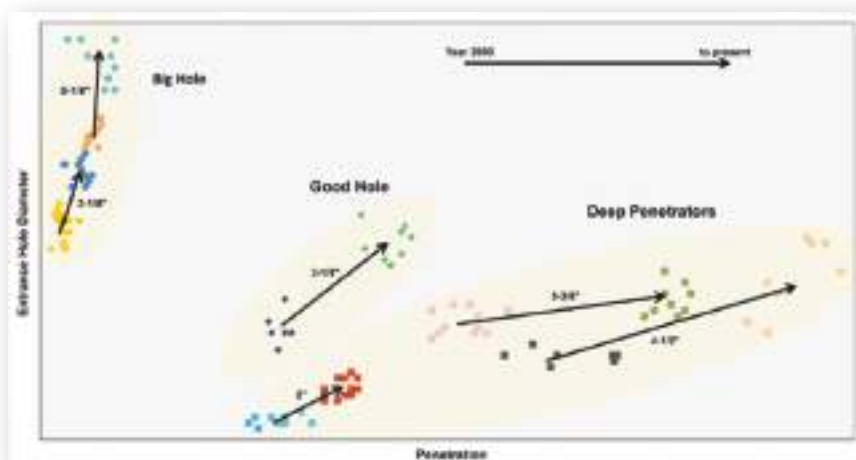
offer unbeatable penetration when compared to conventional shaped charges while maintaining excellent hole diameter. These large holes assure greater tunnel volume beyond the damaged zone allowing for enhanced flow and productivity.

Good Hole (GH) charges

are unique in that they offer a perfect balance between larger hole diameter while retaining very good penetration. This kind of perforation is ideally suited for fracturing operations where hole size needs to be large enough for proppant flow, yet deep enough to go beyond the damaged zone to allow for lower break down pressures.

Big Hole (BH) charges

produce the maximum hole diameter and area of flow while keeping an effective penetration, perfect for gravel pack or frac pack operations.



Performance comparison from 2000 to present for select Big Hole, Good Hole and Super Deep Penetrator gun systems

APPLICATIONS

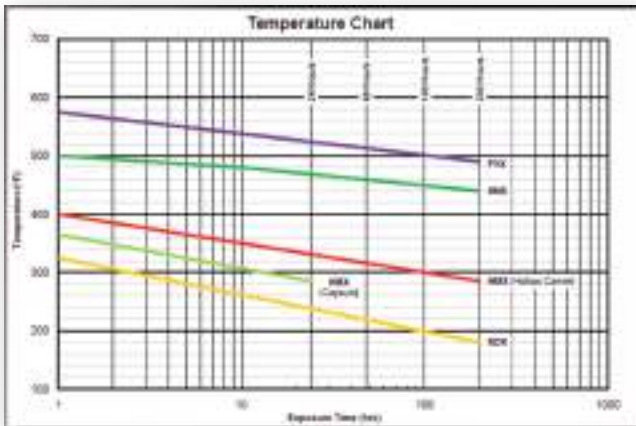
- Natural flowing and stimulated wells
- Sand control and gravel-pack completions
- Production and injection wells
- Damaged formations
- All reservoir types
- All fluid types (oil, water, gas)

BENEFITS

- Improves well performance
- Capable of lowering skin factors allowing improved production or injection
- Helps reduce fracture break down pressure
- Potential reduction in weak sand production
- No incremental cost required to upgrade existing hardware

FEATURES

- Wide variety of charges to meet specific needs
- Super deep penetrating charges perforate beyond the damaged zone
- Greater formation contact created by bigger holes
- Big hole charges optimized for gravel packs
- Compatible and best used with all existing Hunting Titan wireline and
- TCP perforating systems
- Can be deployed using all conveyance methods
- Available with RDX, HMX and HNS



Perforating Gun Systems

Kodiak

WWW.KODIAKSERVICES.COM



Pipe Recovery

Free Point Indicator Tool

Free Point Indicator Tool (FPIT)

DESCRIPTION

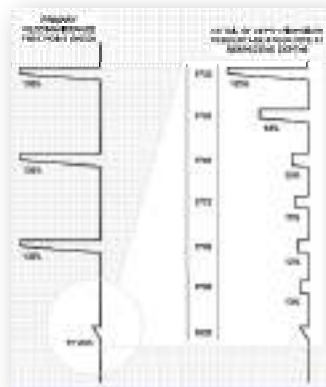
The FPIT free-point indicator tool with combined backoff shot determines the free point in stuck drillpipe, drill collars, tubing, or casing and then provides the force that frees the stuck assembly. The FPIT tool provides accurate information about the stuck assembly, saving you both time and money because you can make immediate and informed decisions.

During the course of drilling or workover, the work string can become stuck in the borehole for many reasons: hole conditions, formation characteristics, mud properties, mechanical problems, assembly tools, or operational error. Saving the well and reducing expense means freeing the stuck assemblies quickly and efficiently. The FPIT tool determines how much of the stuck assembly may be freed. In combination with a backoff shot, the FPIT tool efficiently frees the stuck section of the assembly by applying an explosive shock inside a tool joint to which left-hand torque has been applied. Up to seven strands of Primacord detonating cord can be used for the combined operation's explosive load.

FEATURES

- Provides a survey which accurately locates the stuck point.
- Includes CCL assembly
- Solid-state electronic motor controls sense overload in the system and limit the current
- Senses full open or closed condition of the foot assemblies
- Sensor picks up compression, tension or torque movements from the pipe





ANCHOR SELECTION CHART

Leg Part Number	Closed Diameter (in) [mm]	Open Diameter (in) [mm]
8140-143-016-1	1.43 [37] ¹	2.74 [70] @ 45°
8140-143-016-2	1.43 [37] ¹	4.17 [106] @ 45°
8140-143-016-3	1.43 [40] ¹	5.56 [141] @ 45°
8140-143-016-4	4.10 [104]	5.28 [134] @ 30°
8140-143-016-5	4.10 [104]	6.43 [163] @ 30°
8140-143-016-6	5.86 [149]	8.40 [213] @ 30°
		9.17 [233] @ 45°
8140-143-016-7	7.38 [187]	10.52 [267] @ 30°
		11.27 [286] @ 45°

SPECIFICATIONS

Part Number	1-7/16 in (37 mm)	1-9/16 in (40 mm)
With Panel	8140-14342-600-00	8140-15642-600-00
Without Panel	8140-14342-630-00	8140-15642-630-00
Measurements		
Vertical Resolution	4.03 [1.23]	4.03 [1.23]
Logging Speed CCL	60 [18.3]	60 [18.3]
Mud Type • Weight	No limitations	No limitations
Environmental		
Temperature Rating (°F) [°C]	325 [163]	325 [163]
Pressure Rating (psi) [MPa]	15,000 [103]	18,000 [124]
Material	Nedox® coated steel	Nedox® coated steel
Mechanical		
Outside Diameter (in) [mm]	1.43 [36.5]	325 [163]
Length (ft) [m]	8.32 [2.54]	8.32 [2.54]
Weight (lb) [kg]	45 [20]	50 [23]
Fishing Strength (lbf) [kN]	22,000 [98]	22,000 [98]
Min. • Max. Pipe I.D. (in) [mm]	1.77 [45] • 11.27 [287]	1.90 [48] • 11.27 [287]
Top Connection	1-3/16" GO Box	1-3/16" GO Box
Electrical		
Operating Voltage & Current		
Operating Anchors	32 VDC @ 240±20 mA	32 VDC @ 240±20 mA
Operating Sensors	40 VDC @ 200±10mA	40 VDC @ 200±10mA
Output Signal (Peak to Peak)	1.0 V variable frequency	1.0 V variable frequency
Cable Type	Single conductor	Single conductor
Stretch/Torque Sensor	Magnetic flux gap	Magnetic flux gap

Free Point Indicator Tool

Chemical Cutter

Chemical Cutter

DESCRIPTION

The chemical cutter uses an igniter to electronically initiate the gas generator grain. The grain burns at a controlled rate, increasing the pressure and temperature in the system. Gas pressure acts on the anchoring mechanism to grip the tubing and hold the cutter in place. Gas pressure continues to increase in the gas generator sub, forcing the rupture discs in the cylinder to rupture. The chemical, bromine trifluoride, is then forced through an oil/steel wool mixture in the catalyst sub that reacts with the oil and ignites the steel wool.

The combination of the chemical and reactant causes the temperature and pressure in the chamber to increase. When the pressure exceeds the hydrostatic well pressure and the strength of the shear washer, the severing head piston moves down to expose the severing orifices. Through these orifices, the activated chemical is forced at high pressure to prepare the surface of the tubing and then cut it.

After the chemical has been expelled, pressure in the chemical cutter equalizes with the hydrostatic. The anchoring mechanisms retract under the action of their respective return springs, releasing the tool from the tubing, so that it can be retrieved from the well.

FEATURES

- Uses gas pressure to hold cutter securely in place.
- Retractable anchoring mechanisms make the cutter easily retrievable.
- Reliable cutter under certain conditions.

SPECIFICATIONS

Chemical cutters are available for pipe ranging from 1" coil to 9 5/8" casing. Cutters can be deployed on Eline, Slickline, Coil tubing or jointed pipe. Please contact a Kodiak Representative for job specific requirements.



Chemical Cutter



TOOL SIZES

11/16" wedge type	1 3/8"	2"	3 1/8"	4"
3/4" wedge type	1 3/8" ER	2" ER	3 1/8" ER	4" ER
13/16" wedge type	1 1/2"	2 1/8" D/A and wedge type	3 1/4"	4 1/8" ER
7/8" wedge type	1 1/2" ER	2 1/8" ER	3 1/4" ER	4 3/16"
15/16" wedge type	1 9/16"	2 3/16" ER	3 3/8"	4 7/16"
15/16" ER wedge type	1 9/16" ER	2 1/4" ER	3 3/8" ER	4 9/16"
1" wedge type	1 11/16" D/A and wedge type	2 3/8"	3 1/2"	5 1/2"
1 1/16" wedge type	1 3/4"	2 3/8" ER	3 1/2" ER	5 3/4"
1 1/8" wedge type	1 3/4" ER	2 5/8"	3 5/8"	6 3/8"
1 3/16" wedge type	1 3/4" ER Special	2 7/8"	3 5/8" ER	7 1/2"
1 1/4" wedge type	1 7/8"	2 7/8" ER	3 7/8"	
	1 7/8" ER		3 7/8" ER	

Radial Cutting Torch

Radial Cutting Torch (RCT)

DESCRIPTION

Radial Cutting Torch Tool is a patented cutting device used to sever tubing, casing, drill pipe and coiled tubing without the use of explosives or hazardous materials, making it one of the safest pipe cutting tools on the market. Using advanced technology, the patented nozzle proprietary mixture of various powdered metals produces jets of highly energized plasma to cut virtually any type of pipe in any well condition. Because the RCT does not use explosives or hazardous chemicals, the tool can be shipped almost anywhere in the world within 24 hours, saving significant time and associated costs, while remaining compliant with safety regulations.

BENEFITS

- Non-Explosive
- Non-Hazmat or hazmat rated fuel
- Radio safe
- Operates in temperatures to 500 °F (260 °C) & pressures up to 20000 psi (137.9 Mpa)
- Cuts all steel, high chrome & plastic coated tubulars
- Cuts in exotic fluids or dry pipe
- Cuts are flare-free and do not produce swelling
- Deployable within hours, not days
- Minimizes downtime and associated costs.

OPERATION

Radial Cutting Torch assembly is lowered into the well until desired depth is reached. Thermal Generator ignites and activates the primary fuel load; highly energized plasma is produced causing an increase in internal pressure. Once the pressure produced inside the torch exceeds that of the well bore, the protective sleeve is displaced exposing the nozzle to the well bore. Plasma exits thru the nozzle to sever the target in drilling, completion or production scenarios, within well bore temperatures up to 500 °F (260 °C) and pressure to 20000 psi (137.9 Mpa).



APPLICATIONS

- Standard applications
- Undersized for restrictions
- HP-HT environments
- Cutting up to 7 5/8" casing
- Custom tools available

CUTS MADE WITH THE RCT



SPECIFICATIONS

Outside Diameter (in.)	Recommended Use	Pressure (PSI)	
		Standard RCT	HP RCT
3/4	Coiled tubing up to 1-1/2 in.	0 to 10,000	0 to 15,000
7/8	Coiled tubing up to 1-3/4 in.		
1	1 1/2- to 1 3/4-in. tubing		
1-3/8	2 1/16- and 2 3/8-in. tubing, all weights		
1-1/2	2 3/8-in. tubing, all weights		
1-11/16	2 7/8-in. tubing, all weights		
2	3 1/2-in. tubing, all weights		
2-1/2	3 1/2-in. tubing, all weights		
2-15/16	4-in. tubing and casing, all weights 4- and 5-in. drillpipe, all weights		
3-3/8	5- and 5 1/2-in. casing, all weights		
4	5 1/2-in. casing, all weights		
5	6 5/8- to 7 5/8-in. casing, all weights		

Radial Cutting Torch

Downhole Electric Cutting Tool

Downhole Electric Cutting Tool (DECT)

DESCRIPTION

The safest, cleanest and most precise downhole cutting option available in the oilfield Cutting Tubing / casing / drill pipe. This an industry unique controllable downhole cutting Tool that delivers a clean and precise machine shop quality cut.

The anchor arms centralize the tool and prevent it from rotating. Cutting takes approximately 7 minutes and a microphone allows operator to monitor cut progress. An analogue CCL is included for depth correlation.

A bigger cutter is in development/field testing with a maximum cut of 9 7/8".

FEATURES

- Clean and safe
- Wireline deployed
- Electrically powered
- Surface controlled



SPECIFICATIONS

Temperature Rating	300 °F (150 °C)
Pressure Rating	15000 psi (1034 Bar)
Tool OD	2.75 in or 3.25 in (70 mm or 82.5 mm)
Tool length	23.4 ft. (7133 mm)
Tool weight	264 lbs. (120 Kgs)
Cut point (from bottom tool)	3 in (76.2 mm)
Anchoring range	2.992 in - 5.1 in (76 - 127 mm)
Maximum cut	6.1 in (155 mm)



Downhole Electric Cutting Tool

Split Shots & Jet Cutters



Split Shots & Jet Cutters

Split shots

DESCRIPTION

Owen's Split Shot® Cutter was designed for use where traditional jet cutters were not effective or could not be used. The Split Shot® Cutter is run in a linear configuration adjacent to any collar or connection and positioned by inline magnets. After detonation the collar or connection is split allowing the pipe to be freed for easy removal.

SPECIFICATIONS

Tool	1-3/8 in.				2 in.			
Tool Diameter	1-3/8 in.	34.9 mm	1.375 in.	34.9 mm	2.000 in.	50.8 mm	2.000 in.	50.8 mm
Housing Material	Aluminum							
Explosive Length	18, 24 in.				18, 24, 48 in.			
45-7, 70.0 cm	45-7, 70.0 cm				45-7, 70.0, 122.0 cm			
Explosive Load	600 grain/ft		900 grain/ft		1200 grain/ft		2000 grain/ft	
Minimum Running Restriction	1.775 in.	45.1 mm	1.775 in.	45.1 mm	2.625 in.	66.7 mm	2.625 in.	66.7 mm
Recommended Tubing / Casing Applications	2.375 to 2.875 in.		2.875 to 4.500 in.		3.500 to 7.000 in.		5.500 to 16.000 in.	
	60.3 to 73.0 mm		73.0 to 114.3 mm		88.9 to 177.8 mm		139.7 to 406.4 mm	
Maximum Pressure	psi	MPa	psi	MPa	psi	MPa	psi	MPa
up to 200°F (93°C)	14,000	96.5	14,000	96.5	11,700	80.7	11,700	80.7
200°F to 325°F (93°C to 163°C)	13,250	91.4	13,250	91.4	11,000	75.8	11,000	75.8
325°F to 400°F (163°C to 200°C)	11,800	81.4	11,800	81.4	9,850	67.9	9,850	67.9

BENEFITS / CAPABILITIES

- "Air shippable" at Class 1.4S
- Conforms to API RP-67
- Can be run through heavy mud, paraffin, collapsed tubing, and reduced restrictions.
- Can be run 4X faster than conventional jet cutters.
- Must be run decentralized to maximize effectiveness of tool.
- If shooting in a connection with a premium thread, (i.e. VAM, Hydril, etc.), please contact your local Owen representative for recommendations.

Jet Cutters

APPLICATIONS

- Pipe recovery operations
- Low pressure gas well tubing recovery

FEATURES

- Cleanest cuts in the industry, with minimal flaring
- Rated up to 400 °F, 22000 psi (2040 °C, 152 Mpa)
- Clean cuts in low pressure gas wells utilizing advanced technology

- Compatible with ControlFire and select RF-safe igniter systems
- No conveyance limitations
- World's largest range of cutters
- Cutters can be customized to specific situations

BENEFITS

- Clean cuts provide operators with simpler, quicker recovery operations
- High success rate for first attempt cuts
- Can provide a cutter for every scenario. Customization of cutters available upon request.

SPECIFICATIONS

Pipe O.D. (in) [mm]	Type	Cutter O.D. (in) [mm]	Recommended Pipe Parameters		Maximum Pressure Rating (psi) [MPa]	Hazard Class
			I.D. (in) [mm]	Weight (lb/ft) [kg/m]		
Low Hydrostatic Pressure Tubing Cutters						
2-3/8 [60]	Tubing	1.66 [43]	2.00-1.87 [51-47]	4.70-5.80 [6.99-8.63]	7,000 [48]	1.4D
		1.81 [46]	2.00-1.87 [51-47]	4.70-5.80 [6.99-8.63]		
		2.13 [54]	2.32 [59]	7.90 [11.8]		
2-7/8 [68]		2.25 [57]	2.32 [59]	7.90 [11.8]		
Premium Specialty Cutters						
2-7/8 [68]		1.90 [48]	2.20 [56]	9.45 [14.1]	18,000 [124]	1.4D
3-1/8 [79]	Tubing	2.19 [56]	2.26 [57]	12.5 [18.6]	22,000 [152]	1.4D
3-1/2 [89]	Drill Pipe	2.19 [56]	2.76-2.60 [70-66]	13.3-15.5 [19.8-23.1]	22,000 [152]	1.4D
	Tubing	2.25 [57]	2.55 [65]	15.5 [23.1]	20,000 [138]	1.4D
		2.25 [57]	2.64-2.55 [67-65]	14.3-15.5 [21.3-23.1]	20,000 [138]	1.4D
4 [102]	Packer Mandrel	2.38 [60]	2.75-2.64 [70-67]	12.95-14.3 [19.27-21.3]	18,000 [124]	1.4D
		3.00 [76]	3.28 [83]	14.00 [20.83]	22,000 [152]	1.4D
		3.19 [81]	3.28 [83]	14.00 [20.83]	22,000 [152]	1.4D
4-1/2 [114]	Tubing	2.69 [68]	3.83-3.74 [97-95]	15.2-17.0 [22.6-25.3]	18,000 [124]	1.4D
		3.38 [86]	3.74-3.64 [95-93]	17.0-18.9 [25.3-28.1]	22,000 [152]	1.4D
		3.48 [88]	3.74-3.64 [95-93]	17.0-18.9 [25.3-28.1]	22,000 [152]	1.4D
5 [127]	Tubing	3.25 [83]	4.28 [109]	18.0 [26.8]	22,000 [152]	1.4D
		3.31 [84]	4.28 [109]	18.0 [26.8]	18,500 [128]	1.4D
		3.68 [93]	4.04 [103]	23.2 [34.5]	18,000 [124]	1.1D
5-1/2 [140]	Drill Pipe	3.68 [93]	4.28 [109]	19.50 [29.02]	18,000 [124]	1.4D
		3.80 [97]	4.28-4.00 [109-102]	19.5-25.6 [29.0-38.1]	18,000 [124]	1.1D
		3.80 [97]	4.28-4.00 [109-102]	19.5-25.6 [29.0-38.1]	18,000 [124]	1.4D
5-1/2 [140]	Tubing	3.38 [86]	4.67 [119]	23.0 [34.2]	22,000 [152]	1.4D
		3.48 [88]	4.67 [119]	23.0 [34.2]	22,000 [152]	1.4D
		4.07 [103]	4.67 [119]	23.0 [34.2]	18,000 [124]	1.4D
7 [178]	Tubing	4.15 [105]	4.67 [119]	23.0 [34.2]	18,000 [124]	1.4D
		4.20 [107]	4.67 [119]	23.0 [34.2]	18,000 [124]	1.1D
		4.20 [107]	4.67 [119]	23.0 [34.2]	18,000 [124]	1.4D
7 [178]	Casing	5.25 [133]	6.00 [153]	35.0 [52.1]	18,000 [124]	1.1D
		5.25 [133]	6.18 [157]	29.0 [43.2]	18,000 [124]	1.4D
		5.38 [137]	6.00 [153]	35.0 [52.1]	18,000 [124]	1.1D
7 [178]	Casing	5.38 [137]	6.18 [157]	29.0 [43.2]	18,000 [124]	1.4D
		5.70 [145]	6.00 [153]	35.0 [52.1]	18,000 [124]	1.1D
		5.70 [145]	6.18 [157]	29.0 [43.2]	18,000 [124]	1.4D

Pipe O.D. (in) [mm]	Type	Cutter O.D. (in) [mm]	Recommended Pipe Parameters		Maximum Pressure Rating (psi) [MPa]	Hazard Class
			I.D. (in) [mm]	Weight (lb/ft) [kg/m]		
Coiled Tubing Cutters						
1 [25]	Coiled Tubing	0.69 [17]	0.84-0.78 [21-20]	0.79-1.04 [1.18-1.55]	18,000 [124]	14D
1.25 [32]		0.80 [20]	0.94 [24]	1.83 [2.72]		
1.25 [32]		0.82 [21]	0.94 [24]	1.83 [2.72]		
1.25 [32]		0.88 [22]	1.09-1.00 [28-25]	1.00-1.51 [1.49-2.25]		
1.50 [38]		1.00 [25]	1.31-1.12 [33-28]	1.43-2.67 [2.13-3.97]		
1.75 [44]		1.19 [30]	1.53-1.34 [39-34]	1.92-3.38 [2.86-5.03]		
1.75 [44]		1.25 [32]	1.53-1.34 [39-34]	1.92-3.38 [2.86-5.03]		
2.00 [51]		1.38 [35]	1.78-1.59 [45-40]	2.21-3.92 [3.29-5.83]		
Tubing and Casing Cutters						
2-3/8 [60]	Tubing	1.58 [40]	2.00-1.87 [51-47]	4.70-5.80 [6.99-8.63]	18,000 [124]	14D
		1.58 [40]	2.00-1.87 [51-47]	4.70-5.80 [6.99-8.63]		
		1.68 [43]	2.00-1.87 [51-47]	4.70-5.80 [6.99-8.63]		
1.68 [43]		2.00-1.87 [51-47]	4.70-5.80 [6.99-8.63]			
1.81 [46]		2.00-1.87 [51-47]	4.70-5.80 [6.99-8.63]			
2.06 [6.2]		2.32 [59]	7.90 [11.8]			
2.13 [64]		2.32 [59]	7.90 [11.8]			
2.13 [64]		2.32 [59]	7.90 [11.8]			
2.25 [67]		2.32 [59]	7.90 [11.8]			
2.25 [67]		2.32 [59]	7.90 [11.8]			
2.50 [64]		2.92 [74]	10.2 [15.2]			
2.50 [64]		2.92 [74]	10.2 [15.2]			
2.50 [64]		2.75 [70]	12.95 [19.27]			
3-1/2 [89]	2.63 [67]	2.75 [70]	12.95 [19.27]			
	2.65 [67]	2.99 [76]	9.30 [13.8]			
	2.68 [68]	2.99 [76]	9.30 [13.8]			
4-1/2 [114]	2.75 [70]	2.92 [74]	10.20 [15.18]			
	2.75 [70]	2.92 [74]	10.20 [15.18]			
	3.50 [89]	4.09-3.83 [104-97]	9.50-15.1 [14.1-22.5]			
5 [127]	Casing	3.75 [95]	4.56-4.28 [116-109]	11.5-18.0 [17.1-26.8]	7500 [52]	
5-1/2 [140]		4.25 [108]	4.89-4.67 [116-109]	17.0-23.0 [25.3-34.2]		
7 [178]		5.80 [147]	6.37-6.18 [162-157]	23.0-29.0 [34.2-43.2]		
7.625 [194]		6.25 [159]	6.88-6.63 [175-168]	29.7-39.0 [44.2-58.0]		

Split Shots & Jet Cutters

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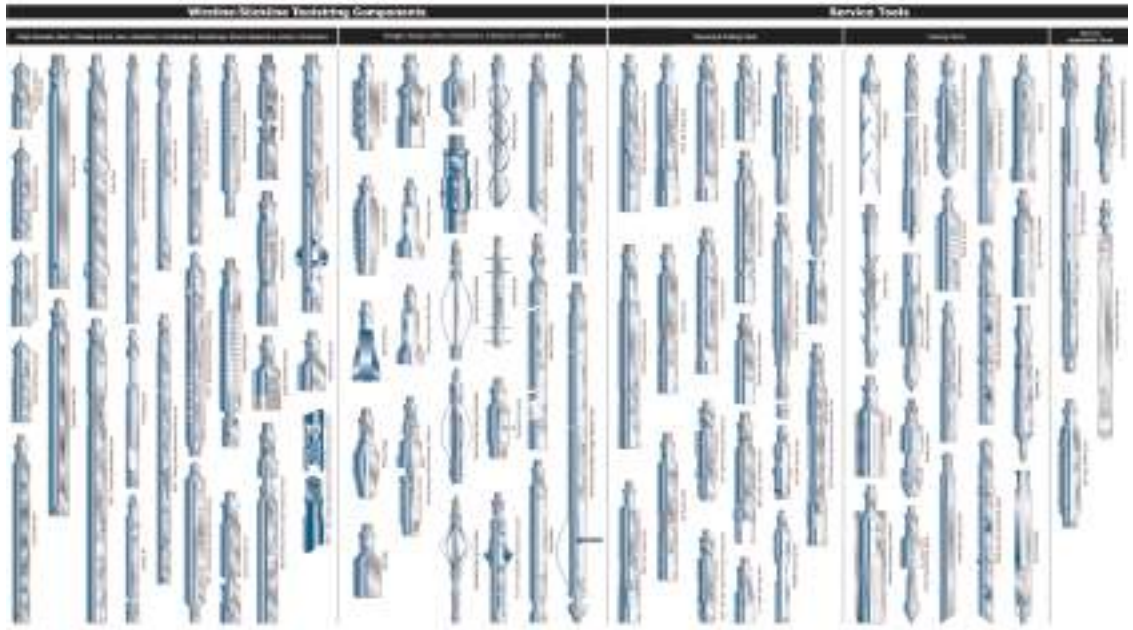
Well Intervention

Well Intervention

Slickline

As a trusted and reliable premier wireline company, Kodiak lives up to its reputation by providing custom and personalized solutions for complex client needs through its high-quality slickline services.

Kodiak offers a complete, well-maintained fleet of slickline units in various sizes, from ultralight to heavy-duty, and a wide selection of line size choices ranging from .160/.150/.140/.125/.108/.092/.066. Slickline is very beneficial to the easy of deployment and well control while servicing wells.



Examples of just some of the slickline tools available

Braided Line

Our industry leading high-corrosive resistant line service allows us to perform any type of heavy lifting required.

Our range of fishing line from 7/32" to

5/16" sour Dyform™ braided line is best used in situations with:

- Fishing services
- High-pressure
- Extremely deep wells
- Problem wells
- Or just when you need brute strength



Braided line retrieves a stuck perforating gun

Electronic Memory Recorders (EMRs)

EMRs come in a variety of sizes. From ½" to 1.25" ranging from 750 PSI strain gauges to 30 000 psi Quartz gauges. This coupled with plugs, locks or shut in tools are ideal for all your downhole formation monitoring requirements.



Digital Slickline

Allows the customer to achieve real time data at the same time reducing the cost of well control and well down time due to decreased deployment and retrieval times.

Is cold formed and then TIG welded. The weld is continuously evaluated by and eddy current tester for any flaws or defects.

The OD spec is quantified by a laser profilometer to be within +/- of 0.003 inches, which is the maximum tolerance of a ferrule based metal sealing system.

The 4mm (0.1575") cable has a stainless steel wall thickness of 0.030", which is actually greater than the standard wall thickness of 0.25" downhole instrumentation cable.



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Summary

World Map



Kodiak provides premier Wireline services through its client base as required anywhere

COUNTRIES

- Canada
- USA
- Middle East
- South America

CLIENT EXAMPLES



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Contact

Kodiak's team is responsive and adaptable when it comes to providing custom Wireline solutions for complex projects. Explore your options by contacting any of our locations.



LOCATIONS IN CANADA

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Whitecourt District

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