

WELL CONSTRUCTION

WELLBORE CLEANING SERVICES

Enabling effective completions
through mechanical and
chemical wellbore cleaning



DRILLING & FORMATION EVALUATION

■ **WELL CONSTRUCTION**

COMPLETION & STIMULATION

PRODUCTION

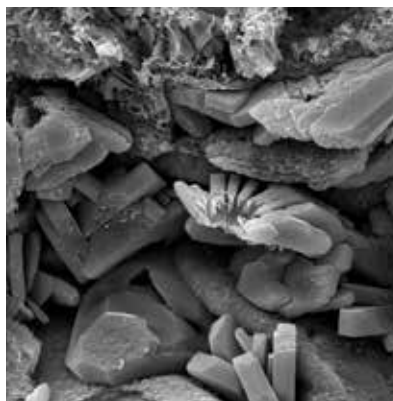


Weatherford[®]

A CLEAN WELLBORE CAN **MAKE OR BREAK YOUR COMPLETION**

Wellbore debris is a recurring problem for the life of every well. Though debris comes in many shapes and sizes—from drilling fluid residue to milling waste to perforation fragments—an insufficiently cleaned wellbore can damage completion equipment, cause production losses, and damage the formation.

Backed by a complete portfolio of CLEARMAX™ mechanical, chemical, and filtration-based technologies, we offer comprehensive wellbore cleaning services for the complete life cycle of any well. Our suite of technologies removes all well debris and residue, which leaves a clean, solids-free, and completion-ready wellbore.



The Weatherford advantage

We offer a unique combination of industry-leading technologies and experienced people. Cross-trained in fishing and cleanup procedures, our wellbore cleaning teams deliver both services with fewer people at your wellsite. Furthermore, our team includes liner engineers that are cross-trained for simultaneous liner-running and wellbore cleaning.

No matter the scope of your wellbore cleaning needs, our teams provide complete project analysis, planning, modeling, management, and execution.



With a global footprint and proven track-record of more than 2,000 jobs, we provide reliable, efficient, and cost-effective wellbore cleaning services in any part of the world. From simple cleaning jobs, such as preparing a packer-setting zone, to more complex, total cased-hole wellbore cleaning with simultaneous inflow testing, we help set the stage for maximum production.

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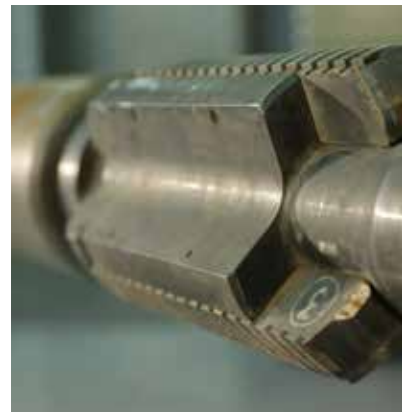
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MECHANICAL TOOLS

Remove solid contaminants



Our CLEARMAX™ mechanical tools provide a clear path for production by efficiently removing wellbore debris. These tools often complete the cleaning in just one trip, which can help you recoup your investment much faster by eliminating the need for multiple cleaning trips.

We offer a comprehensive and proprietary line of casing cleaning, debris-extraction, circulation, and wellbore-integrity-validation management tools that are designed for use in standard to challenging and complex wells. All CLEARMAX wellbore cleaning service tools are manufactured in house, which enables shorter delivery times, eliminates reliance on third parties, and provides the flexibility to respond to specific client requirements.



INFLOW TEST TOOLS



ISO-MAX™ Security Packer

Enables negative testing of a liner overlap and shoe track on the same run as the main wellbore cleanup

Applications

- Isolation of openhole or exposed reservoirs while conditioning mud systems or displacing
- Negative testing of liner laps
- Positive testing of casing
- Serving as a landing point to allow function of weight-set tools where a liner top is not present

Features and Benefits

- No liner top is required to set the packer, which is ideal for the conditioning of mud systems where a production screen test (PST) is required and equivalent circulating density (ECD) tolerance is low.
- Enables simultaneous, single-trip cleanup and inflow tests when included in the wellbore cleaning string.
- No additional forces are applied to the liner hanger when setting the packer or performing the inflow test.
- Unrestricted tripping speeds enable fast and efficient deployment.
- A unique pump-through capability, which enables conventional circulation through built-in bypass valves.
- Multiple tools can be run to allow the testing of multiple liner laps in a single trip.

Tool Description

The CLEARMAX™ ISO-MAX packer is a hydraulic-set packer that can isolate exposed reservoirs and limit the effects of ECD, or serve as an inflow test packer. It is one of two packers in the Weatherford family of CLEARMAX wellbore cleaning services.

SPECIFICATIONS

Mechanical

Connection	NC 50
Max RPM	120
Max makeup torque	35,600 ft/lb
Max flow rate (BPM)	15
Tool length	17.22 ft
Max hard OD range	8.2 to 9.19 in.
Drift ID	1.5 in.
Tensile yield	629,400 lb
Torsional yield	26,200 ft/lb
Materials	Alloy Steel 120 KSI Minimum Yield Strength





CLEARMAX™ Mechanical Inflow Test Packer

Enables unlimited re-setting and locking

Applications

- Negative testing of liner laps
- Positive testing of casing and liner
- Isolation of lower completion when circulating above

Features and Benefits

- Multiple re-set and lock capability
- Prevention of packer setting as the result of drag when running in hole
- Large flow area around the body that reduces equivalent circulating density (ECD) while circulating and reduces surge and swab pressures while tripping
- Unrestricted tripping speeds for fast, efficient deployment
- Integral lower slips that prevent differential loading of the liner lap during the inflow test

Tool Description

The CLEARMAX mechanical inflow test (MIT) packer is a mechanically set packer used primarily for inflow tests of the liner lap. Its unique design enables operators to re-set and lock the packer in position as many times as needed to perform multiple operations in a single trip. This capability helps to overcome unintended release because of heave or well conditions. Also, the packer can be locked against unset to a given emergency release value.

The CLEARMAX MIT and ISO-MAX™ packers can be run in combination to test multiple liner laps in a single trip. Moreover, if the MIT packer is included in the wellbore cleaning string, both the cleanup and inflow test can be performed in a single trip.

SPECIFICATIONS

Mechanical

Connection	NC 50	Drift ID	8.279 in.
Max RPM	120	Casing size	9-5/8 in.
Max makeup torque	35,600 ft/lb	Casing weight range	53.5 to 58.4 lb
Max flow rate (BPM)	15	Tensile yield (not set)	950,000 lb
Tool length, shoulder to shoulder	14.3 ft	Torsional yield (not set)	55,000 ft/lb
Max hard OD range	8.25 in.	Materials	Alloy Steel 120 KSI Minimum Yield Strength





CIRCULATING TOOLS



CLEARMAX™ Two-Ball Circulation Tool

Boosts circulation rates in holes with long liners and small-ID strings

Applications

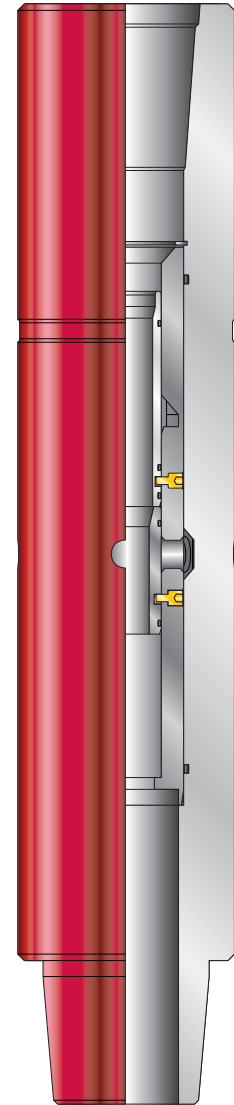
- Mud conditioning operations where no liner top is available to accept the set-down weight required to operate mechanical circulation tools
- Flushing blowout preventer(s) when pulling a drilling bottomhole assembly out of hole

Features and Benefits

- The tool is simple to operate and withstands any environment.
- A large flow area significantly reduces pump pressures seen when pumping to the liner.
- Multiple subs can be run to enable more than one open and close cycle, which increases displacement flexibility.

Tool Description

The CLEARMAX two-ball circulation tool (TBCT) provides a simple, effective way to boost circulation rates where pressure restrictions are caused by long liners and small ID strings. This simple ball-activated sub can be positioned in the string above the liner top. One operating ball is used to open the sub to the annulus, which enables increased pump rates that aid hole cleaning and mud conditioning. Once the operation requiring high pump rates is completed, the sub can be closed by dropping the second ball, which closes the tool and resumes flow to the bit.



SPECIFICATIONS

Mechanical

Connection	NC 50	5-1/2 in. FH
Max RPM	120	120
Max makeup torque	22,300 ft/lb	42,000 ft/lb
Max flow rate (BPM)	30	30
Tool length	2.3 ft	2.3 ft
Max hard OD range	6-3/4 to 7 in.	7-1/2 in.
Drift ID	1-1/2 in.	2 in.
Tensile yield	860,830 lb	1,448,400 lb
Torsional yield	37,150 ft/lb	71,000 ft/lb
Max differential	5,000 psi	5,000 psi
Materials	Alloy Steel 120 KSI Minimum Yield Strength	



CLEARMAX™ Ported Relief Sub

Relieves swabbing caused by an annulus packoff

Applications

- Last-resort solution to swabbing caused by an overloaded junk basket
- String drainage, should string become plugged

Features and Benefits

- Simple to operate: a single ball drops to the piston, which applies pressure to open communication between the string and the annulus
- Robust and simple design
- Can be run in conjunction with all Weatherford CLEARMAX wellbore cleaning tools, or in a standalone application

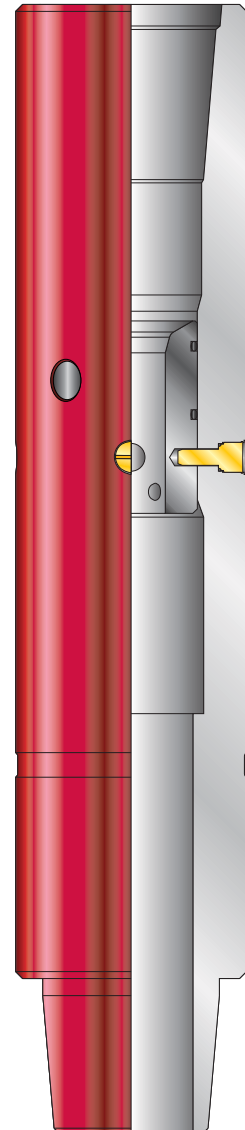
Tool Description

The CLEARMAX pressure relief sub is a simple and effective drop ball sub that relieves swabbing caused by an annulus packoff. On indication of pack off, such as trip tank gains, the activation ball is dropped to the PRS, whereupon pressure is applied. This shifts the ball seat and opens the ports, thus providing communication between annulus and string and alleviating the swab.

SPECIFICATIONS

Mechanical

Connection	NC 50	NC 38
Max RPM	120	120
Max makeup torque	24,400 ft/lb	11,500 ft/lb
Max flow rate (BPM)	30	15
Tool length	2.3 ft	2.3 ft
Max hard OD range	6-3/4 in.	4-3/4 in.
Drift ID	2-3/8 in.	1-7/8 in.
Tensile yield	1,022,600 lb	390,000 lb
Torsional yield	40,750 ft/lb	11,960 ft/lb
Max differential	5,000 psi	5,000 psi
Materials	Alloy Steel 120 KSI Minimum Yield Strength	





CLEARMAX™ Selective Rotation and Circulation Tool (SRCT)

Increases circulation rates for effective wellbore cleaning in holes with long and deviated small-diameter liners

Applications

- Wellbore cleaning operations where liner length, ID, and deviation may prohibit an effective operation because of pressure restrictions on annular velocity and torque limitations preventing rotation throughout the full length of drillstring

Features and Benefits

- Increases circulation rates during displacement operations
- Facilitates torque and fluid to be transmitted to the bit through a unique disengaging spline drive while tripping in the well
- Enables rotation above a liner top once the torque limits of the lower work string have been reached, such as when friction increases when the well changes from oil wet to water wet
- Cycles as many times as required with no need to drop a ball or dart

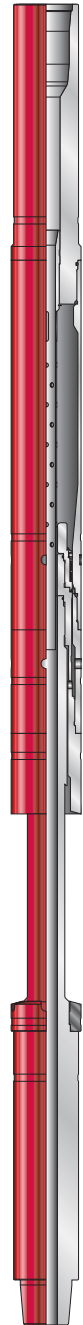
Tool Description

The CLEARMAX SRCT is a repeat-cycle, mechanically activated flow tool used in wellbore cleaning operations where there may be long and deviated small-diameter liners. The operator can cycle the sub as many times as required without the need to drop a ball or dart that can impair displacement efficiency and increase slop volume.

SPECIFICATIONS

Mechanical

Connection	NC 50
Max RPM	120
Max makeup torque	24,290 ft/lb
Max flow rate (BPM)	30 (open and closed)
Max compression and rotation open	50,000 lb, 120 rpm
Tool length	10.66 ft
Max OD	7 in.
Drift ID	1-3/4 in.
Tensile yield	665,000 lb
Torsional yield	33,330 ft/lb
Max differential	5,000 psi
Materials	Alloy Steel 120 KSI Minimum Yield Strength





CLEARMAX™ Selective Rotation and Circulation Re-Locking Tool (SRCT-RL)

Enables effective wellbore cleaning in holes with long and deviated small-diameter liner

Applications

- Wellbore cleaning operations that incorporate an inflow test packer
- Wellbore cleaning operations where liner length, ID, and deviation may prohibit an effective operation because of pressure restrictions on annular velocity and torque limitations preventing rotation throughout the full length of the drillstring

Features and Benefits

- Enables re-locking of the tool after its initial function to allow application of positive weight to compression-set tools
- Increases circulation rates during displacement operations
- Facilitates torque and fluid to be transmitted to the bit through a unique disengaging spline drive while tripping in the well
- Enables rotation above a liner top once the torque limits of the lower work string have been reached, such as when friction increases when the well changes from oil wet to water wet
- Cycles as many times as required with no need to drop a ball or dart

Tool Description

The CLEARMAX SRCT-RL is a repeat-cycle, mechanically activated flow and clutch tool used in wellbore cleaning operations where there may be long and deviated small-diameter liners. The re-locking portion of the tool allows the sub to be re-locked in the closed position at any time. This enables operating tools such as the mechanical inflow test (MIT) packer without the risk of cycling open the SRCT-RL and jeopardizing inflow test operation.



SPECIFICATIONS

Mechanical

Connection	NC 50 Box Pin
Max RPM	120
Max makeup torque	24,290 ft/lb
Max flow rate (BPM)	30 (open and closed)
Max compression and rotation	50,000 lb, 120 rpm
Tool length	11.79 ft
Max OD	7 in.
Drift ID	1-3/4 in.
Tensile yield	665,000 lb
Torsional yield	33,330 ft/lb
Max differential	5,000 psi
Materials	Alloy Steel 120 KSI Minimum Yield Strength



BOP AND MARINE RISER CLEANING



CLEARMAX™ BOP Jetting Sub

Cleans debris from BOP ram cavities without risking damage to the annular preventer element

Applications

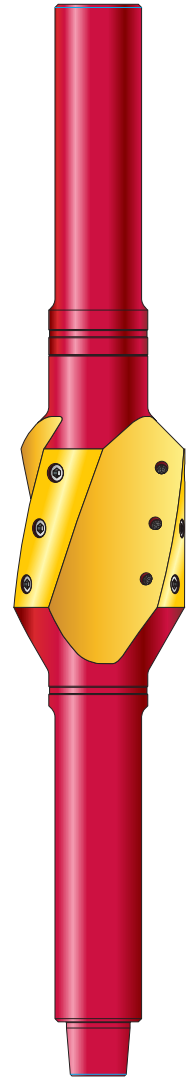
- Jetting subsea blowout preventers (BOPs)

Features and Benefits

- Unique jetting profile creates a vortex that pulls debris away from BOP ram cavities
- Jet flow profile eliminates the risk of damaging the BOP annular preventer element
- New design enables a higher flow rate compared to conventional jetting tools

Tool Description

The Weatherford CLEARMAX BOP jetting sub cleans debris from BOP ram cavities by creating a fluid vortex. Compared to conventional jetting tools that can unintentionally force debris into the ram cavities, this tool pulls debris out of the ram cavities and away from the BOP via the fluid vortex. This design eliminates the risk of damaging the BOP annular preventer element and enables a higher flow rate. The BOP jetting sub is part of the CLEARMAX suite of wellbore cleaning tools.



SPECIFICATIONS

Mechanical

Connection	NC 50	NC 38
Maximum RPM	120	120
Maximum makeup torque	34,000 ft/lb	15,000 ft/lb
Maximum flow rate	30 b/min	22 b/min
Tool length	6.85 ft	4.83 ft
Maximum hard OD	14.0 in.	6.625 in.
Drift ID	2.875 in.	2.375 in.
Tensile yield	1,023,767 lb	790,900 lb
Torsional yield	73,970 ft/lb	17,550 ft/lb
Materials	Alloy steel 120 KSI minimum yield strength	



CLEARMAX™ SENTINEL Tool

Prevents debris from falling downhole during BOP cleaning operations

Applications

- BOP cleaning operations

Features and Benefits

- Full-sealing wiper cup prevents debris from falling past the Sentinel
- Large-sump volume enables recovery of large quantities of debris
- Enables confirmation of size and type of debris at the surface
- Quick and easy emptying at the surface eliminates the need for a backup tool

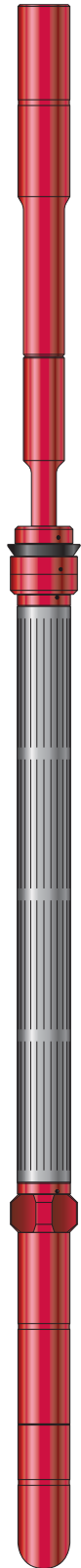
Tool Description

The CLEARMAX Sentinel captures debris during blowout preventer (BOP) cleanup operations and prevents dislodged junk from hindering completion operations. The simple design prevents debris dislodged from the ram cavities from falling downhole. The debris is easily recovered at the surface for analysis, at which point the tool can be run again.

SPECIFICATIONS

Mechanical

Connection	NC 50
Max RPM	90
Max makeup torque	34,100 ft/lb
Max flow rate (BPM)	11
Tool length	16.3 ft
Max hard OD range	8.28 to 12.191 in.
Drift ID	1.375 in.
Tensile yield	1,056,000 lb
Torsional yield	31,000 ft/lb
Casing ranges	9 5/8 to 14 in.
Materials	Alloy Steel 120 KSI Minimum Yield Strength





CLEARMAX™ MAX-Trap™ Tool

Captures debris falling out of circulation as a result of reduced annular velocities in the marine riser

Applications

- Marine riser cleaning operations

Features and Benefits

- The large-capacity basket features a retaining screen in the base for enhanced debris collection.
- The MAX-Trap junk basket works in conjunction with the Weatherford line of blowout preventers (BOPs) and marine riser cleanup tools.
- Large volumes of debris can be collected in the catchment chamber, which helps to prevent mis-runs during completion operations.

Tool Description

The CLEARMAX MAX-Trap tool is a riser junk basket for use in marine-riser and BOP-cleanup operations. Generally positioned above the CLEARMAX Riser MAX-Brush tool, the Max-Trap junk basket collects any debris falling out of circulation as a result of reduced annular velocities in large-ID marine risers.



SPECIFICATIONS

Mechanical

Connection	Determined by location
Max RPM	120
Max makeup torque (ft/lb)	Dependent on connection
Max flow rate (BPM)	42
Tool length	6 ft
Max OD	17 in.
Drift ID	2-7/8 in.
Tensile yield	1,925,500 lb
Torsional yield	Dependent on connection
Bucket OD	17 in.
Materials	Alloy Steel 120 KSI Minimum Yield Strength



CLEARMAX™ RISER MAX-Brush Tool

Cleans heavy debris and mud cake buildup from the internal diameter of marine risers

Applications

- Run in cleanup string to remove solids from the internal diameter (ID) of the marine riser

Features and Benefits

- 360° brush coverage across the ID of the riser cleans the whole riser.
- The large bypass under the brush elements enables maximum flow rates.
- The nonrotating brushes minimize wear on brushes and the riser ID.
- Robust, wire-wrapped and welded bristles create tough reliable brushes.
- The tool is easy to size for any riser ID.

Tool Description

The CLEARMAX MAX-Brush is a simple, robust tool for cleaning heavy debris and mud cake buildup from the internal diameter of the marine riser. The large bypass and proven brush design provide a reliable method of preparing the riser for displacement operations.



SPECIFICATIONS

Mechanical

Connection	NC 50
Max RPM	120
Max makeup torque	34,000 ft/lb
Max flow rate (BPM)	37
Tool length, shoulder to shoulder	5.4 ft
Max hard OD range	14 to 15 in.
Drift ID	2-5/8 in.
Tensile yield	1,520,300 ft/lb
Torsional yield	62,100 ft/lb
Materials	Alloy Steel 120 KSI Minimum Yield Strength



CLEARMAX™ MAX-STRATA Tool

Provides a positive barrier between drilling fluids and seawater during displacement of the riser

Applications

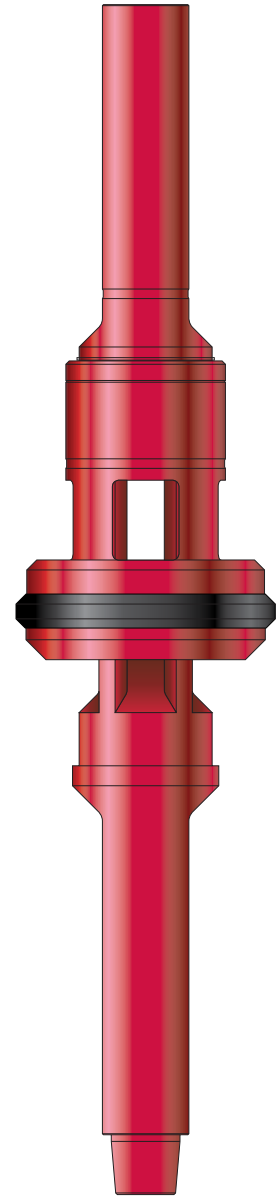
- Riser displacements prior to pulling and laying out marine riser
- Disconnecting marine riser

Features and Benefits

- Rubber wipers efficiently clean the riser ID and protect against potential contamination of drilling fluids.
- Fluid bypass ports protect against swab and surge pressures while running in hole and pulling out of hole.
- The tool seals the marine riser during displacement.
- The tool can be kept at the rig location and run by the rig crew.

Tool Description

The CLEARMAX MAX-Strata tool provides a positive barrier between drilling fluids and seawater during displacement of the riser. This provides minimal interface and significantly reduces the chance of fluid contamination by exposure to the marine environment.



SPECIFICATIONS

Mechanical

Connection	NC 50
Max RPM	40
Max makeup torque	22,300 ft/lb
Max flow rate (BPM)	65
Tool length	5 ft
Max hard OD	17.875 in.
Drift ID	3-5/8 in.
Tensile yield	37,160 lb
Torsional yield	939,100 ft/lb
Riser ID ranges (in.)	Sized to suit
Materials	Alloy Steel 120 KSI Minimum Yield Strength



CASING CLEANING AND PREPARATION TOOLS



CLEARMAX™ MAX-Brush™ Tool

Scours and polishes casing ID to prepare for packers and workover applications

Applications

- Casing and tubing cleaning operations
- Polishing of production-packer set points

Features and Benefits

- Rotational design reduces the chance of brush and casing wear
- 360° brush coverage of the casing ID, regardless of the well inclination
- Large flow area between the exterior of the tool and the casing ID, which reduces equivalent circulating density and guards against surge
- Integral centralizers maintain constant positive force on the casing ID

Tool Description

The CLEARMAX MAX-Brush is a robustly designed casing brush that will scour and polish the casing ID. Because of its tough design and large flow area, the MAX-Brush device thoroughly prepares the casing ID for low-tolerance HPHT packers and workover operations. Each tool model covers a range of casing sizes.

SPECIFICATIONS

Mechanical

Connection	6 5/8-in. REG	NC 50	NC38	2 7/8-in. HT PAC	2 3/8-in. REG
Max RPM	120	120	120	90	90
Max makeup torque	44,900 ft/lb	34,900 ft/lb	15,900 ft/lb	7,300 ft/lb	3,700 ft/lb
Max flow rate (BPM)	57	36	17	7	5
Tool length	6.18 to 7.37 ft	6.63 ft	6.63 ft	5.8 ft	5.8 ft
Max hard OD range	10.844 to 12.191 in.	8.125 to 9.504 in.	5.879 to 6.50 in.	5.25 to 4.653 in.	3.615 to 4.150 in.
Drift ID	3.375 in.	2.625 in.	2 in.	1.125 in.	0.879 in.
Tensile yield	1,792,420 lb	1,551,700 lb	488,000 lb	493,800 lb	322,700 lb
Torsional yield	82,350 ft/lb	63,400 ft/lb	21,900 ft/lb	11,000 ft/lb	5,800 ft/lb
Materials	Alloy Steel 120 KSI Minimum Yield Strength				





CLEARMAX™ MAX-Blade™ Tool

Removes debris from the inside casing wall

Applications

- Casing and tubing cleaning operations in vertical and deviated wells

Features and Benefits

- 360° scraping coverage
- Rotational design that reduces the likelihood of casing damage
- Large flow area between the exterior of the tool and the casing ID, which reduces equivalent circulating density (ECD) and guards against surge
- Self-cleaning scraper blades
- Integral centralizers and springs that maintain tool concentricity in a range of casing weights and hole angles

Tool Description

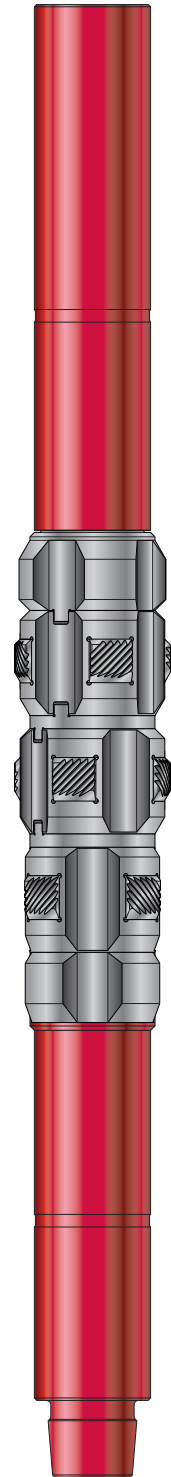
The CLEARMAX MAX-Blade tool is a casing scraper that removes debris from the casing ID. The rotational design of the tool reduces the chance of casing wear and provides 360° scraping coverage regardless of the well inclination. Angled at 45°, the blades self-clean as the tool is being tripped in hole.

Because of its robust design and large flow area, the MAX-Blade tool can be incorporated in a cleanup bottomhole assembly (BHA) even when cement or mechanical barriers are encountered.

SPECIFICATIONS

Mechanical

Connection	6 5/8 in. REG	NC 50	NC38	2 7/8 in. HT PAC	2 3/8 in. REG
Max RPM	120	120	120	90	90
Max make-up torque (ft/lb)	44,900	34,900	15,900	7,300	4,400
Max flow rate (BPM)	57	36	17	7	5
Tool length (ft)	6.18 to 7.37	6.63	6.63	5.8	5.8
Max hard OD range (in.)	10.13 to 20	7.7 to 9.126	5.5 to 6.75	4.15 to 4.653	3.515 to 4.150
Drift ID (in.)	3.375	2.625	2	1.125	0.879
Tensile yield (lb)	1,792,420	1,551,700	488,000	493,800	322,700
Torsional yield (ft/lb)	74,350	63,400	22,650	4,160 to 11,000	4,160 to 5,800
Materials	Alloy Steel 120 KSI Minimum Yield Strength				Alloy Steel 110 KSI Minimum Yield Strength





CLEARMAX™ Debur Mill

Removes potentially damaging perforation burrs from the ID of production casing

Applications

- Removal of post-perforation burrs before running lower completion components

Features and Benefits

- Robust spring-loaded mill blades efficiently and safely remove perforation burrs without causing wear to the casing.
- Retractable blades allow for performing subsequent operations without risk of causing casing wear.
- This mill can be run in conjunction with all Weatherford CLEARMAX cleanup tools, which saves trips and rig time.
- The blades can be de-activated by means of a single drop ball.

Tool Description

The CLEARMAX deburr mill removes damaging perforation burrs from the ID of the production casing. The deburr mill leaves a smooth, flush finish on the casing ID for deployment of lower completion products, such as screens and completion packers.

SPECIFICATIONS

Mechanical

Connection	NC 38
Max RPM	90
Max makeup torque	15,600 ft/lb
Max flow rate (BPM)	11
Tool length	10 ft
Max hard OD range	5.795 to 6.151 in.
Drift ID	1-3/8 in.
Tensile yield	509,400 lb
Torsional yield	22,700 ft/lb
Materials	Alloy Steel 120 KSI Minimum Yield Strength

*Also available in larger sizes





CLEARMAX™ MAX-Combo Tool

Removes debris, scours, and polishes casing IDs to prepare for packers and workover applications

Applications

- Casing cleaning operations in vertical and deviated wells
- Polishing of production packer set points

Features and Benefits

- Rotational design that reduces the likelihood of casing wear
- 360° scraping and milling coverage
- Large flow area between the exterior of the scraping block, brush, and casing ID, which reduces equivalent circulating density (ECD) and guards against surge
- Self-cleaning scraper blades
- Integral centralizers and springs that maintain tool concentricity in a range of casing weights and hole angles

Tool Description

The CLEARMAX MAX-Combo tool is a robustly designed casing scraper and brush that will scour and polish the casing ID. The rotational design of the tool reduces the chance of casing wear and provides 360° scraping coverage regardless of the well inclination. Angled at 45°, the blades self-clean as the tool is being tripped in hole.

Because of its robust design and large flow area, the MAX-Combo tool can be incorporated in a cleanup bottomhole assembly (BHA) even when cement or mechanical barriers are encountered.

SPECIFICATIONS

Mechanical

Connection	6 5/8 in. REG	NC 50	NC38	Blank end
Max RPM	120	120	120	90
Max makeup torque (ft/lb)	44,900	34,900	15,900	Please ask*
Max flow rate (BPM)	57	36	17	5
Tool length (ft)	9.83	8.83	8	8.83
Max hard OD range (in.)	12.191	8.379	5.969	3.701
Drift ID (in.)	3.375	2.625	1.75	.875
Tensile yield (lb)	1,792,420	1,551,700	488,000	322,700
Torsional yield (ft/lb)	74,800	63,400	22,500	2,835
Materials	Alloy Steel 120 KSI Minimum Yield Strength			

*Depends on operational location and conditions





CLEARMAX™ Milling Scraper

Mills and breaks down junk that will not pass standard scraping tools

Applications

- Casing cleaning operations in vertical and deviated wells

Features and Benefits

- 360° scraping and milling coverage
- Milling centralizer that is fixed to the mandrel
- Rotational design that reduces the likelihood of casing damage
- Large flow area between the exterior of the tool and the casing ID, which reduces equivalent circulating density (ECD) and guards against surge
- Self-cleaning scraper blades
- Integral centralizers and springs that maintain tool concentricity in a range of casing weights and hole angles

Tool Description

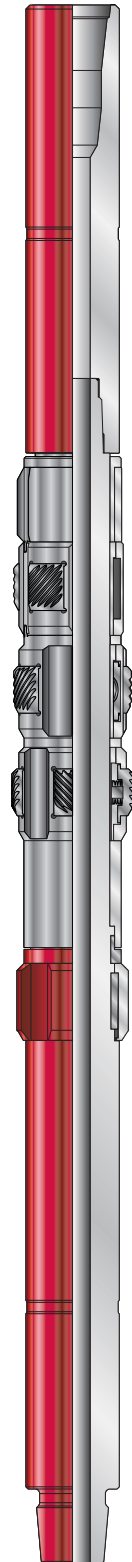
The CLEARMAX milling scraper mills and removes junk that will not pass standard scraping tools. It combines a robust casing scraper with a fixed lower milling centralizer to promote efficient debris and junk removal from the casing ID. The rotational design of the tool reduces the chance of casing wear and provides 360° scraping coverage regardless of the well inclination. Angled at 45°, the blades self-clean as the tool is being tripped in hole.

Because of its robust design and large flow area, the milling scraper can be incorporated in a cleanup bottomhole assembly (BHA) even when cement or mechanical barriers are encountered.

SPECIFICATIONS

Mechanical

Connection	NC 50	NC 38
Max RPM	120	120
Max makeup torque	34,900 ft/lb	15,900 ft/lb
Max flow rate (BPM)	36	16
Tool length	7.42 ft	6.63 ft
Max hard OD range	8.279 to 8.599 in.	5.5 to 6.75 in.
Drift ID	2.625 in.	1.75 in.
Tensile yield	1,413,717 lb	488,000 lb
Torsional yield	63,400 ft/lb	22,650 ft/lb
Materials	Alloy Steel 120 KSI Minimum Yield Strength	





CLEARMAX™ Drift Sub

Confirms drift clearance

Applications

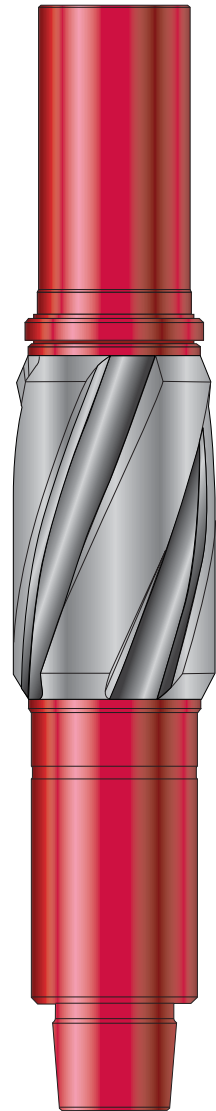
- Verify inside diameter of the casing before running completions

Features and Benefits

- 12-in. drift length per API requirements
- Flow-through rotational configuration
- Simple, robust design with no external fittings or parts
- Can be sized to suit any required casing drift
- Positive confirmation of casing drift while reducing casing wear
- Complements CLEARMAX wellbore cleaning package

Tool Description

The CLEARMAX drift sub confirms that the casing diameter has the required drift. The sub consists of a drift sleeve supported by two brass bearing rings that are secured by an upper stop assembly. The drift sleeve serves to confirm casing drift while maintaining the maximum flow area around the tool.



SPECIFICATIONS

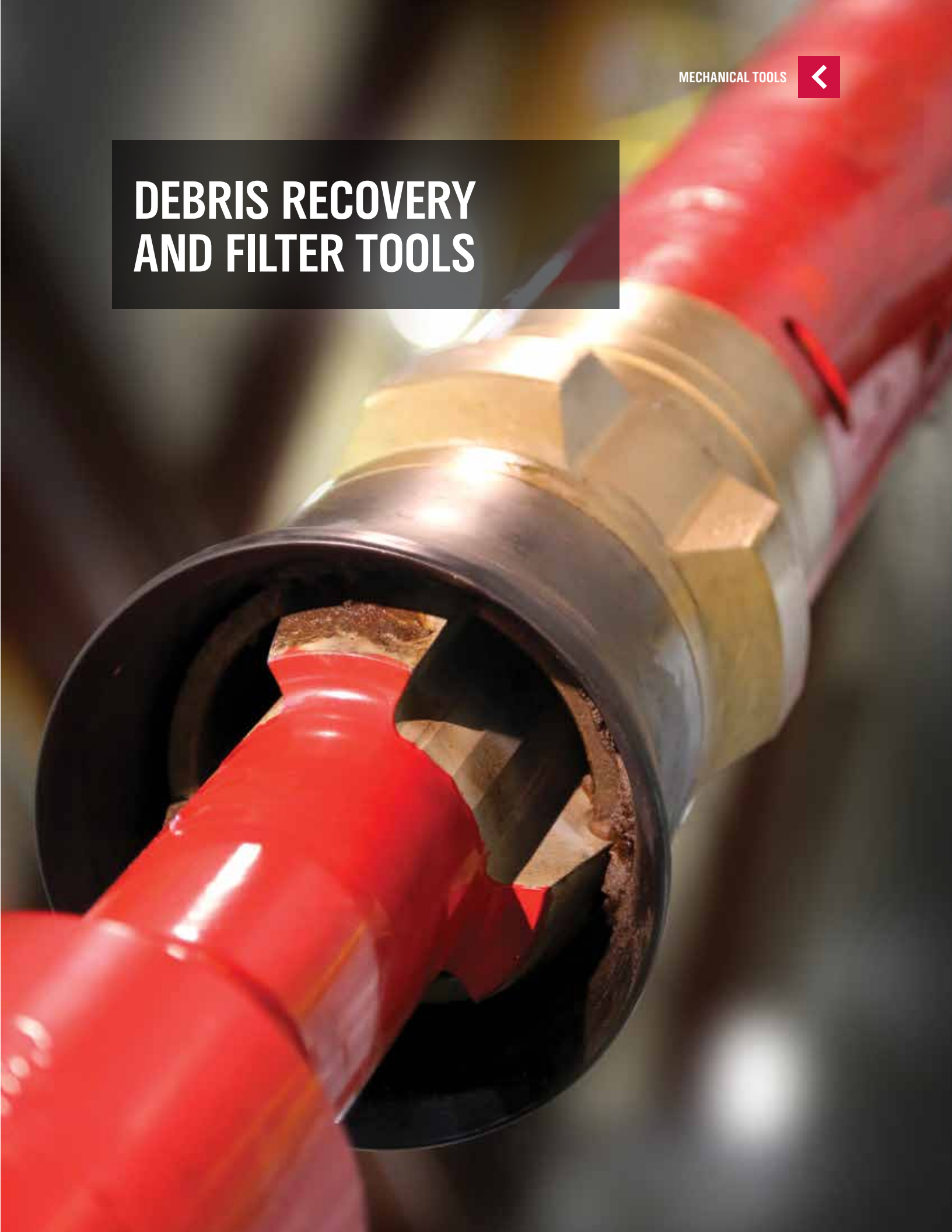
Mechanical

Connection	NC 50	NC 38	Blank (3 3/8-in. OD)
Tool size range	8.374 to 9.599 in.	5.79 to 6.236 in.	4.762 to 5.5 in.
Max RPM	120	120	120
Max makeup torque	30,100 ft/lb	11,500 ft/lb	Please ask
Max flow rate (BPM)	24	24	11
Tool length	6 ft	5.5 ft	5 ft
Drift ID	2.375 in.	2.125 in.	1.375 in.
Tensile yield	1,675,400 lb	790,900 lb	Please ask
Torsional yield	50,150 ft/lb	17,550 ft/lb	Please ask
Materials	Alloy Steel 120 KSI Minimum Yield Strength		

*All drift subs can be sized to suit casing requirements.



DEBRIS RECOVERY AND FILTER TOOLS





CLEARMAX™ Downhole Fluid Filter

Extracts debris from wellbore fluids

Applications

- Filtration of completion fluids
- Debris extraction

Features and Benefits

- The tool features a one-piece mandrel and has non-rotating centralizers and components.
- Outer filtration cup allows a large circulating flow area around the tool and maintains casing ID contact while pulling out of hole (POOH).
- The system is self-activating by POOH. No ball or dart is required.
- Internal wire-wrapped screen is protected by a steel skin.
- The integral pressure relief system can be set according to well conditions, which prevents swabbing if the tool fills with debris.

Tool Description

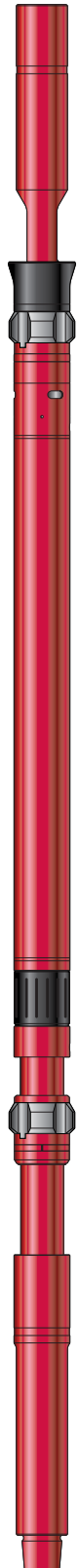
The CLEARMAX downhole fluid filter is a drillpipe-conveyed, POOH-activated downhole filter that removes debris from the wellbore fluids. It does not require activation via ball or dart. Its unique expanding and retracting wiper cup provides positive contact between tool OD and the casing ID as the tool is POOH, which enables filtering 100% of the wellbore fluid through the integral system.

All filtered debris is captured inside the solid debris catchment area and can be emptied at surface by loosening a single bolt. Once emptied and inspected, the tool can be re-run, if required.

SPECIFICATIONS

Mechanical

Connection	NC 50
Max RPM	120
Max makeup torque	33,100 ft/lb
Max flow rate (BPM)	25
Tool length	16.6 ft
Max OD (in.)	Determined by casing drift
Drift ID	2.25 in.
Tensile yield	978,700 lb
Torsional yield	61,000 ft/lb
Cup size	Determined by casing ID
Filter screen size (gauge)	25
Debris sump capacity	4.1 gal
Temperature rating	300°F (149°C)
Materials	Alloy Steel 120 KSI Minimum Yield Strength





MAX-Force™ HD String Magnet

Removes ferrous debris from wellbore fluids

Applications

- Removing ferrous metals during wellbore-cleaning operations
- Capturing and removing cuttings during drilling or milling operations

Features and Benefits

- The MAX-Force HD string magnet is rated for use in temperatures up to 300°F (149°C).
- High temperature model also available.
- Bar magnets are arranged in rows around the mandrel to provide metal-retention forces.
- The magnets are triple coated to minimize corrosion issues.
- The design enables drillstring rotation while the magnet section remains stationary, which reduces casing wear and minimizes the risk of debris becoming detached.

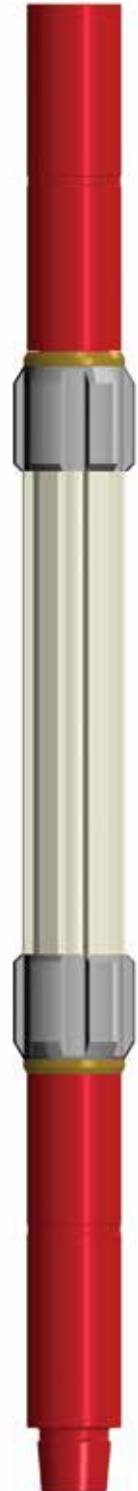
Tool Description

The Weatherford MAX-Force HD string magnet is a heavy-duty, bar-type tool used to remove ferrous debris from wellbore fluids. Part of the CLEARMAX™ suite of wellbore-cleaning tools, the MAX-Force HD tool comprises rows of high-strength bar magnets arranged longitudinally along the mandrel of the tool. The magnet polarities are aligned in such a way that the majority of ferrous debris collects in the valleys between the rows of magnets, thereby maximizing the total flow area around the tool even when it is filled with ferrous debris.

SPECIFICATIONS

Mechanical

Casing size	≥ 9.625 in.	9.625 to 13.375 in.	7 to 9.625 in.
Overall length	98 in. (249 cm)	98 in. (249 cm)	79 in. (200.66 cm)
Fishing neck OD	7 in. (18 cm)	6.5 in. (16.5 cm)	4.75 in. (12 cm)
Centralizer OD	8.375 to 12.25 in. (21 to 31 cm)	8.375 in. (21 cm)	5.790 in. (15 cm)
Throughbore	2.5 in. (6 cm)	2.5 in. (6 cm)	2 in. (5 cm)
Connection	NC50 box-pin	NC50 box-pin	NC38 box-pin
Maximum debris collection	202 to 360 lb (92 to 163 kg)	202 lb (92 kg)	73 lb (33 kg)
Number of ribs	6	6	6
Tensile yield	978,700 lb	928,200 lb	443,770 lb
Torsional yield	61,000 ft/lb	28,000 ft/lb	17,000 ft/lb





SPECIALTY TOOLS





CLEARMAX™ Landing Sub

Confirms depth of liner top and serves as a land-off point

Applications

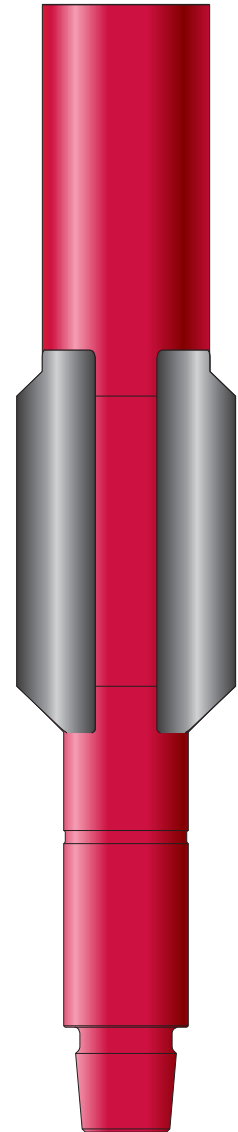
- Verify the depth of the liner top
- Act as a no-go to allow activation of weight-set tools

Features and Benefits

- Available shear type provides positive indication that the polished bore receptacle (PBR) has been engaged
- The sub can be sized to suit the PBR in place
- Shear force can be set as required by changing shear rings
- The landing sub complements the CLEARMAX wellbore cleaning package

Tool Description

The CLEARMAX landing sub enables confirmation of the depth of the liner top. It also acts as a land-off point for activation of CLEARMAX tools, such as the Selective Rotational Circulating Tool (SRCT), which require setting down weight against the liner top for activation. The sub features a simple, robust design with no external fittings or parts.



SPECIFICATIONS

Mechanical

Connection	NC 50 x NC38
Max RPM	120
Max makeup torque	30,300 ft/lb (NC 50) 11,200 ft/lb (NC 38)
Max flow rate (BPM)	24
Tool length	3.25 ft
Max OD	8.25 in. (standard tool)
Drift ID	2 3/8 in.
Tensile yield	670,000 lb
Torsional yield	19,200 ft/lb
Materials	Alloy Steel 120 KSI Minimum Yield Strength



CLEARMAX™ Torque Limiter

Prevents lower-string torque from exceeding pre-set limits

Applications

- Preventing lower-string twist-offs during displacement operations

Features and Benefits

- Enables setting torque limit values at the rotary table
- Enables continuous rotation without risk to the lower or upper string, which aids in the removal of debris and ensures displacement efficiency even if the tool is sheared

Tool Description

The Weatherford CLEARMAX torque limiter prevents lower-string torque from exceeding limits set by the user. With the maximum torque values set at the rotary table in increments of 1,000 ft/lb (1,356 N·m), the tool enables continuous rotation without risking damage to the lower string, including twist-offs. The torque limiter is part of the CLEARMAX suite of wellbore cleaning tools.

SPECIFICATIONS

Mechanical

Tool joint type	NC 38
Casing size	7 in.
Casing weight	17 to 58 lb/ft
Maximum OD	5 in. (127 mm)
O.A.L. length	12 ft (3.67 m)
Weight	680 lb (308 kg)
Tool joint OD	5 in. (127 mm)
Tool ID	1.75 in. (44.45 mm)
Temperature rating	350°F (177°C)
Tensile yield	423,040 ft/lb (573,565 N·m)
Torsional yield	15,412 ft/lb (20,896 N·m)
Maximum rotating speed	120 rpm
Pre-set torque limit	1,000 to 12,000 ft/lb (1,356 to 16,270 N·m)
Torque-limit increments	1,000 ft/lb (1,356 N·m)





CLEARMAX™ TOL/PBR Scraper

Cleans debris from the casing ID above the liner top/PBR without milling

Applications

- Cleaning the casing inside diameter (ID) at the top-of-liner (TOL)/polished-bore receptacle (PBR)
- Preparing for a liner tie-back packer

Features and Benefits

- The scraping blades clean the entire 360° circumference of the casing ID.
- Expanding scraping blades are activated and contracted by contacting the TOL/PBR.
- The tool includes a tattle-tail port to identify blade engagement at the surface.
- The blade engagement/disengagement cycle is repeatable.

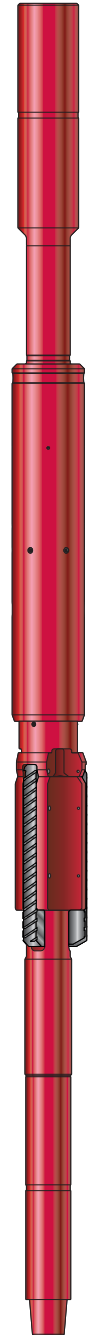
Tool Description

The Weatherford CLEARMAX TOL/PBR scraper cleans debris away from the casing ID at the TOL/PBR, an area which was previously accessible only by milling. By scraping the full 360° of the casing ID—compared to cleaning only the drift diameter via milling—the tool scrapes and grooms the TOL/PBR area in preparation for operations that include setting a liner tie-back packer.

SPECIFICATIONS

Mechanical

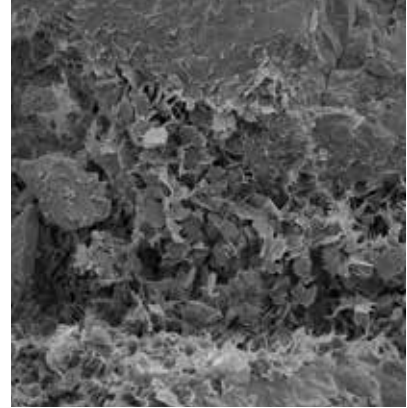
Tool size	9-5/8 in.
Tool OD	8.125 in. (206.4mm)
Length	11.58 ft (3.53 m)
Connection type	4 1/2-in. IF box × 3 1/2-in. IF pin
Tool joint OD	6.5 in. (165 mm)
Tool ID	2 in. (50.8 mm)
Temperature rating	300°F (148.8°C)
Tensile yield	746,400 ft/lb (31,977 N·m)
Torsional yield	23,600 ft/lb (31,997 N·m)





CHEMICALS

Remove drilling fluid contaminants



Our CLEARMAX™ wellbore chemical-cleaning solutions provide a smooth and complete transition from drilling to completion fluid. We customize spacer trains to your well by taking into consideration volume, chemical concentration, and contamination simulations.

We use industry-leading, independently verified displacement chemicals that are field-proven throughout the world. We begin each job with thorough mud testing followed by modeling in our proprietary software system, which provides the optimal pill train for your well. Our specialists can then recommend a drilling-fluid cleanup solution that includes filter-cake breakers, water-wetting surfactants, oil-base mud thinners, and pipe-dope solvents.



CLEARMAX™ Wash-R Chemical

Removes mud, oil, dirt, and grime from rig-floor surfaces and equipment

Applications

- Cleaning rig-floor surfaces and equipment with high-pressure jetting machines
- Freshwater and saltwater systems

Features and Benefits

- The formula cleans effectively without harming paint or galvanized structures.
- The environmentally friendly chemical has a gold rating from the Centre for Environment, Fisheries, and Aquaculture Science (CEFAS).

Product Description

The Weatherford CLEARMAX Wash-R chemical safely removes mud, oil, dirt, and grime from rig-floor surfaces and equipment.

SPECIFICATIONS

Chemical

Specific gravity	1.08 to 1.12
Flash point	>142°F (>61°C)
Appearance	Clear liquid
Color	Pale yellow
pH	11 to 13
Viscosity	<10 cP





CLEARMAX-Vis Viscosifier

Assists in the displacement of fluids, mud, and debris from wellbores

Applications

- Chemical that assists in cleaning wellbores
- Creation of a spacer pill for completion fluid systems

Features and Benefits

- The CLEARMAX-Vis viscosifier enables users to easily create solids-free spacers that improve displacement efficiency and wellbore cleanout.
- The viscosifier can be used in fresh water and a wide range of brines.
- The viscosifier is a liquid-based polymer additive rather than a powder-based additive; therefore, it disperses rapidly without leaving behind clumps of the condensed viscosifying agent in the wellbore.

Product Description

The Weatherford CLEARMAX-Vis viscosifier—a suspension of xanthan gum in an organic solvent gel—assists in the displacement of fluids, mud, and debris from wellbores.



SPECIFICATIONS

Chemical

Specific gravity	0.97
Flash point	>158°F (>70°C)
Appearance	Liquid
Color	Cream
pH	5.5 to 8.5
Viscosity	50 cP



CLEARMAX™ Clean Plus Chemical

Assists with removing mud solids and residue from wellbores using any drilling-fluid system

Applications

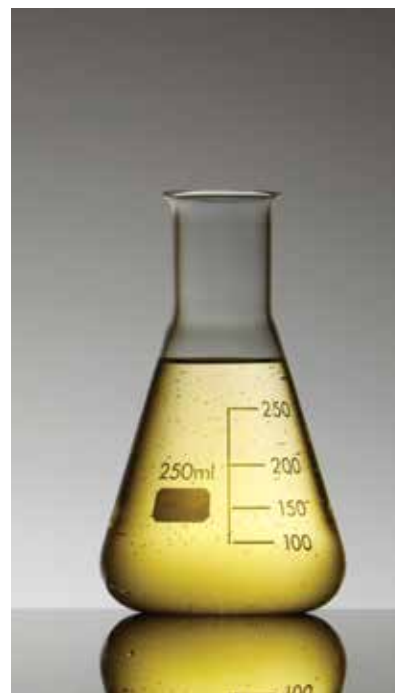
- Wellbore cleaning in a broad range of temperatures

Features and Benefits

- The combined action of the solvents and surfactants in the CLEARMAX Clean Plus chemical releases the solids and mud residue from downhole surfaces and flocculates (or collects) them, which facilitates removal from the wellbore.
- The all-in-one displacement chemical eliminates the need for separate solvent, surfactant, and flocculent products.
- The environmentally acceptable chemical has a gold rating for the United Kingdom North Sea sector from the Centre for Environment, Fisheries, and Aquaculture Science (CEFAS). It also has a yellow rating for Norway from OSPAR, a commission that involves 15 governments and the European Union to protect the nearby marine environment.

Product Description

The Weatherford CLEARMAX Clean Plus chemical—a mixture of non-ionic surfactant in a hydrotreated distillate and glycol solvent—is a highly effective aid to displacement. The chemical is used in high-viscosity pills to remove heavy solids from the wellbore before pumping the main cleanup pill. The chemical remains active across a broad range of temperature environments—from deepwater to high-pressure and high-temperature wells. It is just one offering in a wide portfolio of Weatherford wellbore cleaning products developed to meet the requirements of various drilling systems.



SPECIFICATIONS

Chemical

Specific gravity	0.86 to 0.90
Flash point	>151°F (>66°C)
Appearance	Clear liquid
Color	Pale yellow
pH	8 to 10
Viscosity	>50 cP



FILTRATION

Maintains a solids-free wellbore



Our CLEARMAX™ filtration services provide effective solids removal. We offer a complete line of integrated or standalone filtration services that remove bacteria, scale, clay, rust, and pipe dope—all of which potentially cause formation damage and reduce production potential.



DE Filter Press Unit

Removes heavy-solids contamination from high volumes of brines

Applications

- High-specific-gravity brines
- Heavily contaminated brines
- Well-completion fluids
- Workover fluids
- Gravel-pack fluids
- Produced water
- Wastewater treatment

Features and Benefits

- A polypropylene-recessed-style plate pack is 100% drip free, which results in low turbidity readings.
- The double-acting hydraulic ram maintains pressure on the system to minimize pressure release and restart of the precoat.
- The air and oil closing system maintains pressure if the air or oil supply fails.
- The SS316L stainless-steel piping manifold is corrosion resistant to provide a long manifold life, even when working with acidic chemicals.
- Fire-resistant side-splash curtains and an integrated slurry pan for wash-down of filter cake retain the fluids to prevent environmental spills.
- The compact stackable system, which incorporates the slurry tank and the dual-pod cartridge system, provides a small, user-friendly storage footprint.

Product Description

The Weatherford DE filter press unit is the first point of filtration to remove heavy-solids contamination from high volumes of brines. The filter press uses diatomaceous earth (DE) filter media and can reduce the average particle size to less than 1 μ with associated high flow rates and high solids loadings. The DE filter units have a surface area of 600 to 1,200 ft² (74.3 to 148.6 m²) to provide filtration at low operating costs in a robust and easily maintained package.



Part of Weatherford CLEARMAX™ filtration services, the DE filter press can remove heavy solids from completion, workover, and gravel-pack fluids; produced and waste water; and brines.

SPECIFICATIONS

Mechanical

Filtration area	600 to 1,200 ft ² (74.3 to 148.6 m ²)
Filter plate dimensions	47.2 × 47.2 in. (1.2 × 1.2 m)
Maximum flow rate	14 bbl/min (2.25 m ³ /min)
Maximum working pressure	100 psi (700 kPa)
Lifting frame	DNV2.7-1 / BS EN 12079
Outlet connections	4 in. (10.1 cm)
Fire-resistant side-splash curtains	Polypropylene plates and cloths
Weight (empty)	19,841 lb (9,000 kg)
Dimensions	207.0 × 68.9 × 86.6 in. (5.25 × 1.75 × 2.20 m)



Dual-Filter Press Slurry Tank

Enables continuous operation of two DE filter-press units

Applications

- Well-completion fluids
- Brines and brine reclamation
- Gravel-pack fluids
- Workover fluids
- Stimulation fluids
- Produced water
- Seawater intake
- Wastewater cleanup

Features and Benefits

- The small footprint provides a single lift point and reduces deck-space requirements.
- The user-friendly layout places all valves, connections, and components within easy reach.
- All wetted parts are constructed from corrosion-resistant SS316L stainless steel to provide a long unit life even in acidic environments.
- The unit features integral forklift pockets for easier loading.

Tool Description

The Weatherford dual-filter press slurry tank enables continuous operation of two DE (Diatomaceous Earth) filter-press units from a single process unit. The unit houses and protects all pumps, air receivers, manifolds, and valves within a single, DNV 2.7-1 certified oilfield skid.

Options include a flowmeter and an integrated hose basket.



The Weatherford dual-filter press slurry tank provides easy lifting and operation from a single oilfield skid.

SPECIFICATIONS

Measurement

Overall dimensions	141.7 × 86.6 × 78.7 in. (3.6 × 2.2 × 2.0 m)
Weight	6,614 lb (3,000 kg)
Stainless steel diverting manifolds	4 in. (10.2 cm)
Equalizing manifold/drain	3 in. (7.6 cm)
Body-feed pump	2 in. (5.1 cm)
Stainless steel agitating line	1 in. (2.5 cm)



Feed Pump Unit

Provides reliable fluid pumping with minimal maintenance

Applications

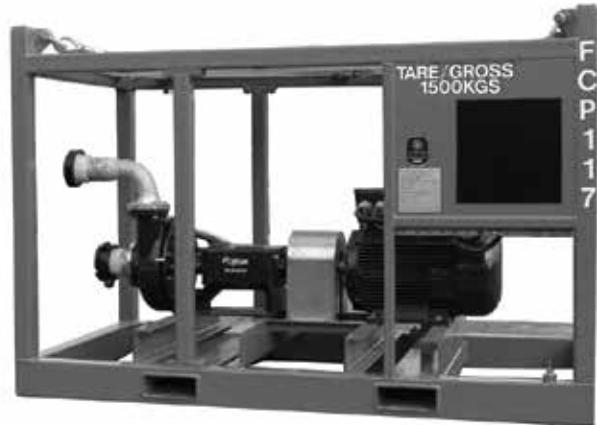
- Filter-press precoat operations
- Fluid transfer operations
- Boosting filtration-package process rate
- Boosting fluid flow rates in an existing rig system, especially with high-specific-gravity fluids

Features and Benefits

- The pump provides simple, reliable operation with minimal maintenance.
- The compact, robust skid is DNV-certified for offshore use.
- The unit features integral forklift pockets for easier loading.
- The sturdy construction of the unit withstands all oilfield environments and frequent transport.

Tool Description

The Weatherford feed pump features a 4- × 3-in. (101- × 76-cm) electrically driven, centrifugal pump that provides reliable fluid pumping. The unit is housed within a compact and robust DNV-certified oilfield skid.



The Weatherford feed pump unit is DNV-certified for offshore use.

SPECIFICATIONS

Measurements

Overall dimensions	94 × 47 × 62 in. (2.4 × 1.2 × 1.6 m)
Weight	3,306 lb (1,500 kg)
Pump power	50 hp (37.3 kw) centrifugal
Pump size	4 × 3 × 13 in. (101 × 76 × 330 mm)
Pump casing material	Cast iron
Maximum flow rate	1,150 gal/min (4.3 m ³ /min)
Maximum operating pressure	100 psi (690 kPa)
Power supply options	Diesel zone II, Electric zone I400 to 440 V (50 to 60 Hz)



Combination VPL/Cartridge Filter Unit

Reduces downtime by up to 90% compared to conventional equipment and requires no separate hook-up of the cartridge unit

Applications

- Offshore rigs
- Completion fluids
- Workover fluids
- Brines
- Seawater
- Wastewater treatment



The self-contained Weatherford combination VPL/cartridge filter unit has many safety features, including railings, a ladder, and a service platform.

Features and Benefits

- The pneumatic- or hydraulic-driven cake-washdown mechanism provides uninterrupted and reliable cake washing, which minimizes downtime of the filter unit and overall rig time.
- All internal components are fabricated from stainless steel to eliminate corrosion in aggressive brine environments.
- The polypropylene filter cloth enables quick and easy replacement.
- The filter unit has safety railings, a ladder, and a service platform to enhance personnel safety and mitigate health, safety, and environmental risks.
- All major connections are located on one side of the unit for ease of use and for a smaller footprint.
- The compact skid, hoisting slings, lifting lugs, and forklift pockets are DNV-certified for offshore use.

Tool Description

The Weatherford combination vertical pressure leaf (VPL)/cartridge filter unit is a completely self-contained, one-frame system equipped with all necessary components to perform an effective filter job. The combination filter unit has an integrated cartridge unit to save floor space on offshore rigs and requires no separate hook-up of the cartridge unit.

Compared to conventional VPL systems and filter presses, the combination filter unit reduces downtime by up to 90%. The large filtration area of the unit enables filtering fluids with a high dirt load at a high flow rate down to a low nephelometric turbidity unit (NTU). The mixing system enables a laminar flow through the filter vessel and leaves, which results in a long filtration cycle and the lowest possible NTU output. The VPL filter vessel does not need to be open during cleanout.



SPECIFICATIONS

Vertical Pressure Leaf Unit

Filter area	800 or 1,000 ft ² (74.3 or 92.9 m ²)
Number of filter leaves	20
Material of filter leaves	Stainless steel 316 L with polypropylene filter cloth
Maximum recommended flow	15 bbl/min (145 m ³ /hr)
Maximum working pressure	105 psi (0.7 MPa)
Material of wetted parts	Stainless steel 316 L
Volume of mixing vessel	10 bbl (1.6 m ³)
Safety valve set point	105 psi (0.7 MPa)
Cleaning device	Pneumatic-driven rotating device with high-efficiency spray nozzles
Pre-coat pump	3-in. (76.2-mm) air-driven diaphragm pump
Body-feed pump	1 1/4-in. (31.75-mm) air-driven diaphragm pump
Main valves	4-in. (101.6-mm) butterfly valve (BFV) air-operated from control board
Instruments	Inlet/outlet pressure gauge, pressure-relief valve set at 105 psi (0.7 MPa), and flow indicator
Operation	Central pneumatic control panel; all main valves are operated by pneumatics

Connections

Inlet/outlet connection	4-in. (101.6-mm) stainless steel union for 100-psi (0.69-MPa) working pressure
Dump connection	
Washwater inlet	2-in. (50.8-mm) stainless steel union for 100-psi (0.69-MPa) working pressure

Cartridge Filter Unit

Cartridge outside diameter	2.5 in. (63.5 mm)	6 in. (152.4 mm)
Number of cartridges	50	7
Flow rate	12.6 bbl/min (120 m ³ /min)	13.9 bbl/min (133 m ³ /min)
Maximum working pressure	105 psi (0.7 MPa)	
Maximum working temperature	158°F (70°C)	
Instruments: inlet/outlet pressure gauges	0 to 150 psi (0 to 1.03 MPa)	
Design code	ASME VIII Div. 1 CE pressure equipment directive	
Design code frame	EN 12079	
Drain	1.5-in. (38.1-mm) pipe work-flange terminated	
Weight (empty)	3,968 lb (1,800 kg)	
Unit dimensions	83 x 47 x 83 in. (2,108.2 x 1,193.8 x 2,108.2 mm)	



Duplex (Dual-Pod) Cartridge Filtration Unit

Cleans most common oilfield fluids and fluid-waste streams

Applications

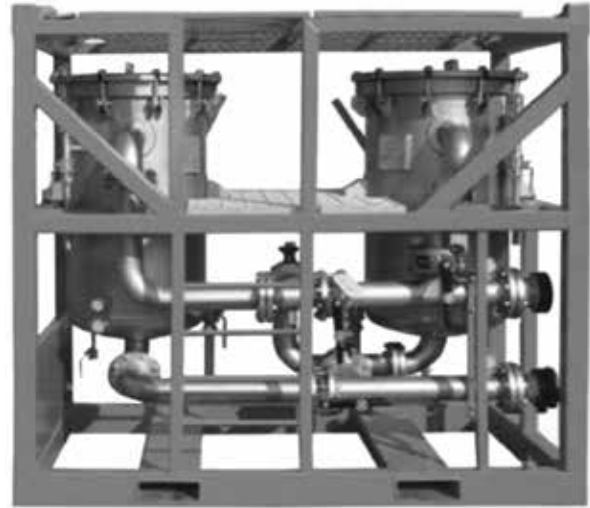
- Well-completion fluids
- Brines
- Gravel-pack fluids
- Workover fluids
- Stimulation fluids
- Produced water
- Seawater intake
- Oily water cleanup

Features and Benefits

- The standard serial and parallel configuration of the unit can process the fluid through both filtration pods.
- The user-friendly layout places all valves, connections, and components in the front of the unit and within easy reach.
- All wetted parts are constructed from corrosion-resistant SS316L stainless steel to provide a long unit life even in acidic environments.
- A pressure-relief valve prevents pressurization above 105 psi (700 kPa).
- A self-sealing vessel-cover gasket enables pressurization with minimal manual handling.
- Certified hoisting slings and integral forklift pockets ease loading.
- The unit maintains filtration during cartridge changes: one pod filters while the spent cartridges within the other pod are changed.

Tool Description

The Weatherford duplex (dual-pod) cartridge filtration unit is a compact, offshore, skid-mounted filter that cleans most common oilfield fluids and fluid-waste streams.



The Weatherford duplex (dual-pod) cartridge filtration unit can process the fluid through both filtration pods.

SPECIFICATIONS

Measurements

Overall dimensions	83 × 47 × 83 in. (2.1 × 1.2 × 2.1 m)
Weight	3,968 lb (1,800 kg)
Total cartridges	50
Cartridge dimensions	40 × 2.5 in. (101.6 × 6.3 cm)
Maximum flow rate	12.6 B/min (120 m ³)
Maximum working pressure	105 psi (700 kPa)

Maximum temperature	158°F (70°C)
Pressure gauge instrumentation	0 to 150 psi (0 to 1,000 kPa)
Design code	ASME VIII div. 1 CE Pressure Equipment Directive
Design code frame	EN 12079
Drain	1.5-in. pipe work-flange terminated
Maximum working pressure	105 psi (700 kPa)



Nominal Filtration Cartridge 2.5 in. (65 mm)

Provides high-flow rates during wellbore cleaning filtration

Applications

- Wellbore cleaning filtration

Features and Benefits

- The precision-wound cartridges deliver substantial dirt-holding capacity, which enables high flow rates and low pressure drop.
- Although disposable, the filter can be back-washed and reused under certain conditions.



Tool Description

Weatherford precision-wound depth-filter cartridges are manufactured to deliver substantial dirt-holding capacity, which helps to maintain high flow rates and low pressure drop. The elements consist of a perforated plastic support with yarn wound at a distinctive and pre-set rate, which provides optimal performance. The filters can accommodate higher temperatures and differential pressures by upgrading to stainless-steel cores and end caps.

SPECIFICATIONS

Measurements

Filter media	Polypropylene, nylon, polyester, glass fiber
End-cap material	Polypropylene and stainless steel
Core material	Stainless steel
Outside diameter	2.5 in. (65 mm)
Length	39 in. (1 m)
Seal material	Buna, neoprene, Viton, and nitrile
End details	A range of end fittings are available
Micron ratings	1, 2, 5, 10, 20, and 50 μ
Flow area	16 ft. ² (1.52 m ²)
Flow rate	15 B/hr (2.4 m ³ /hr)
Recommended operating temperature	180°F (82°C)
Maximum change differential pressure	78 psi (540 kPa)



Absolute Filtration Cartridge 2.5 in. (65 mm)

Withstands high-pressure, high-differential flow during wellbore cleaning filtration

Applications

- Wellbore cleaning filtration

Features and Benefits

- Fixed-pore construction eliminates dirt unloading at maximum differential pressures, which improves filtration reliability.
- The uniform pore size delivers a 99.98% removal efficiency.
- The engineered media and increased surface deliver substantial dirt-holding capacity, which enables high flow rates and low pressure drop.



Tool Description

Weatherford absolute-rated, pleated-filter elements withstand high-pressure, high-differential flow environments. The design provides maximum-usable-filter area with a durable construction that enhances filter integrity even in demanding conditions. The filter elements are available in cellulose, glass fiber, and polypropyl media options and in ratings of 2, 5, 10, 20, and 35 microns (μ) with a Beta ratio of 5,000.

SPECIFICATIONS

Measurements

Filter media	Glass fiber/polyester
Core material	Stainless steel
Outside diameter	2.5 in. (65 mm)
Length	39 in. (1 m)
Seal material	Nitrile, buna, and Viton
End details	High-pressure fitting with a single closed end and a single open end
Micron ratings	1, 2, 5, 10, 20, and 35 μ
Flow area	16 ft (1.52 m ³)
Flow rate	15 B/hr (2.4 m ³ /hr)
Recommended operating temperature	180°F (82°C)
Maximum change differential pressure	78 psi (540 kPa)



CLEARMAX™ Diatomaceous Earth

Increases filter life and efficiency

Applications

- Wellbore cleaning filtration.

Features and Benefits

- Low permeation and high throughputs increase filter life.
- Excellent stress-crack resistance improves filter efficiency.
- High dirt-load capacity improves flow rates.

Tool Description

Weatherford diatomaceous earth delivers optimum performance for filtration of completion fluids with a fluid weight up to 22 lb/gal (2,636 g/L).

Diatomaceous earth (DE) is a nonmetallic mineral composed of the skeletal remains of microscopic, single-cell aquatic plants called diatoms. They are rigid, chemically inert, and insoluble in oilfield completion fluids. As a result, diatomaceous earth forms a highly permeable, stable, and incompressible filter cake. It improves filter efficiency, increases filter life, and improves flow rates. Deposits of these skeletal remains are mined and treated to suit various filtration needs.



SPECIFICATIONS

Technical

Physical state	Powder
Permeability	3.5 to 5.5 Darcy
Cake density	≤ 0.014 lb/in. (0.405 g/cm ³)
Retain on 80 μM	≤ 30%
pH (10%) in water (depending on quality)	9 to 10.5
Loss of ignition	≤ 0.5%
Moisture	≤ 0.5%
Specific gravity	2.200 to 2.300 SG
Melting point	> 1,832°F (> 1,000°C)
Packaging	55-lb (25-kg) bags, 39 bags per pallet

Chemical Analysis

Silicon dioxide (SiO₂)	87.30%
Aluminum oxide (Al₂O₃)	3.11%
Iron oxide (Fe₂O₃)	2.23%
Titanium oxide (TiO₂)	0.49%
Calcium oxide (CaO)	0.60%
Magnesium oxide (MgO)	0.35%
Potassium oxide (K₂O)	0.28%
Sodium oxide (Na₂O)	5.04%
Diphosphorus pentoxide (P₂O₅)	0.84%
Sulfur trioxide (SO₃)	0.24%

Particle Distribution (% volume)

>1 μ	99.0%
>5 μ	96.1%
>10 μ	92.8%
>20 μ	83.8%
>35 μ	68.9%
>50 μ	55.8%
>75 μ	37.9%
>100 μ	25.2%
>200 μ	5.7%
>350 μ	1.3%
>500 μ	0.3%



By means of mechanical, chemical, and filtration-based technologies, our wellbore cleaning services fully prepare your wells for effective completions. For details on how our global services can help you, contact your local Weatherford representative or visit weatherford.com



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