

# CITADEL

casing solutions





# ORDINARY IS OUR ENEMY.

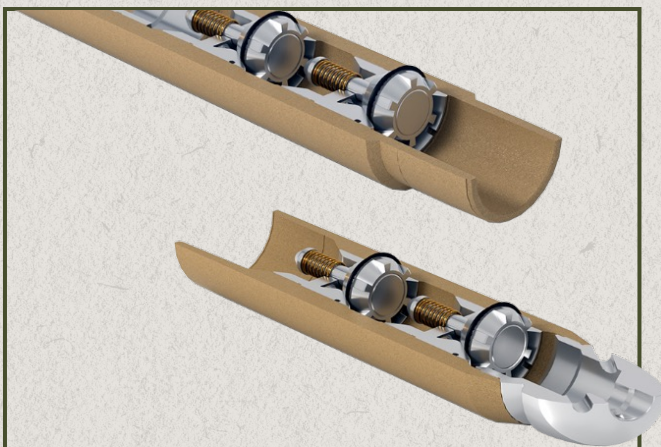
Thousands of feet beneath the earth's surface, the margin for error is small. We understand the forces of nature do not compromise. Neither do we.

At Citadel Casing Solutions, we understand first-hand the vital importance of high-quality, reliable downhole oil tools.

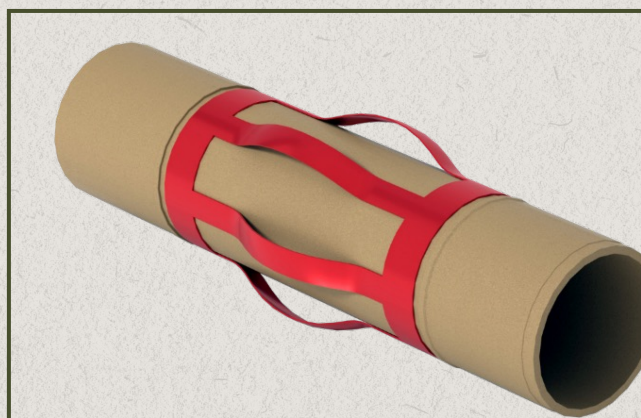
Our company was founded in 2016 by a team of industry experts driven by the shared desire to look beyond the ordinary, conquer the casing technology shortcomings that others overlook or accept, and bring casing technology firmly into the 21st Century through game-changing advancements.







**FLOAT EQUIPMENT**



**CENTRALIZATION**



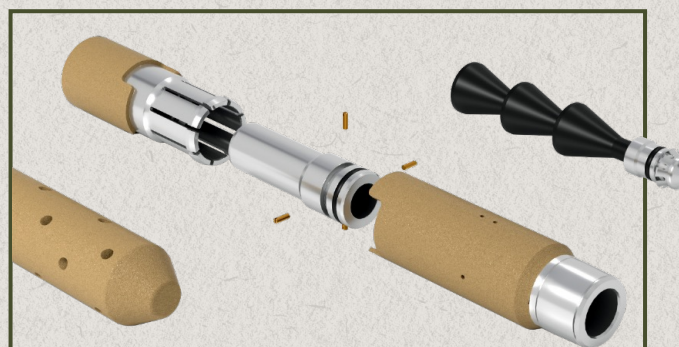
**GUIDING EQUIPMENT**



**COMPLETION SOLUTIONS**



**CEMENT HEADS**



**CEMENTING EQUIPMENT**





WE'RE CHANGING THE FUTURE OF

# FLOAT EQUIPMENT



# WHAT'S IN IT FOR YOU

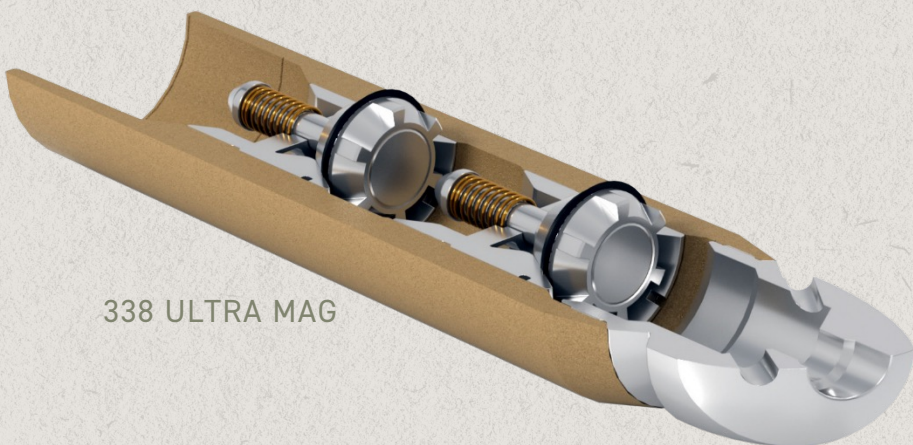
- Machined from a single piece of metal\* -OR- a fully composite valve.  
AKA - no cheap plastic options made from foreign countries (like our competitors)
- All valves designed and manufactured in house
- Ruggedized testing ensuring highest level of integrity and reliability
- A broad portfolio of valves for every application
- Engineered valves for specific solutions

\* Not all our valves are made of metal.

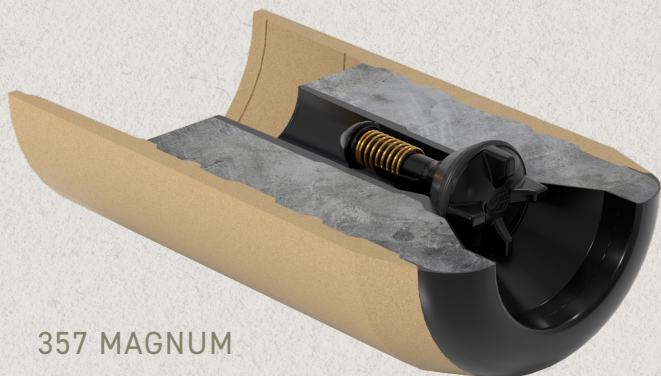


# VALVES

338 ULTRA MAG



357 MAGNUM



VALVE CLASSIFICATION	APPLICATION	SIZE RANGE	FEATURES AND BENEFITS	API 10F CLASSIFICATION
<b>ULTRA MAG</b> <b>338</b> <b>762</b>	Production Casing/Liner, Casing/Liner Flotation, HPHT, ERD, Geothermal	4.500 and larger  6.000 and larger	<ul style="list-style-type: none"> <li>• Gas-tight</li> <li>• Qualified as a well barrier</li> <li>• Proven in extreme environments</li> <li>• SS trim compatible with 30% HCl</li> </ul>	D36 R10 T400 P15 <ul style="list-style-type: none"> <li>• 10 bpm 36 hours</li> <li>• 15,000 psi</li> <li>• 400°F</li> </ul> D240 R20 T400 P15 <ul style="list-style-type: none"> <li>• 20 bpm 240 hours</li> <li>• 15,000 psi</li> <li>• 400°F</li> </ul>
<b>MAGNUM</b> <b>357</b>	Intermediate Casing, Deep Set Surface Casing	7.000 and larger	<ul style="list-style-type: none"> <li>• High strength composite construction</li> <li>• Industry leading flow endurance</li> <li>• PDC Drillout in less than 5 minutes</li> </ul>	D36 R10 T400 P7500 <ul style="list-style-type: none"> <li>• 10 bpm 36 hours</li> <li>• 7,500 psi</li> <li>• 400°F</li> </ul>
<b>RIMFIRE</b> <b>338</b>	Surface Casing	9.625 and larger	<ul style="list-style-type: none"> <li>• Industry leading flow endurance</li> <li>• PDC Drillout in less than 5 minutes</li> </ul>	D24 R10 T300 P3 <ul style="list-style-type: none"> <li>• 10 bpm 24 hours</li> <li>• 3,000 psi</li> <li>• 300°F</li> </ul>



# 338 ULTRA MAG VALVE

Citadel Casing Solutions' in-house engineered 338 ULTRA MAG 2.0 is an all-metal float valve developed for the most severe downhole applications. Whether floating production casing, or facing extreme bottom hole temperature and/or hydrostatic pressure, the bulletproof 338 ULTRA MAG 2.0 will hold up where others fail. Tested up to 18,000 psi at 400°F with nitrogen gas.

## SPECIFICATIONS

---

Size Range: **4.500 and larger**

---

API 10F Classification: **D36 R10 T400 P15**

---

Max Pressure<sup>1</sup> @ 400°F: **15,000 psi**

---

Min Flow Area: **3.38 in<sup>2</sup>**

---

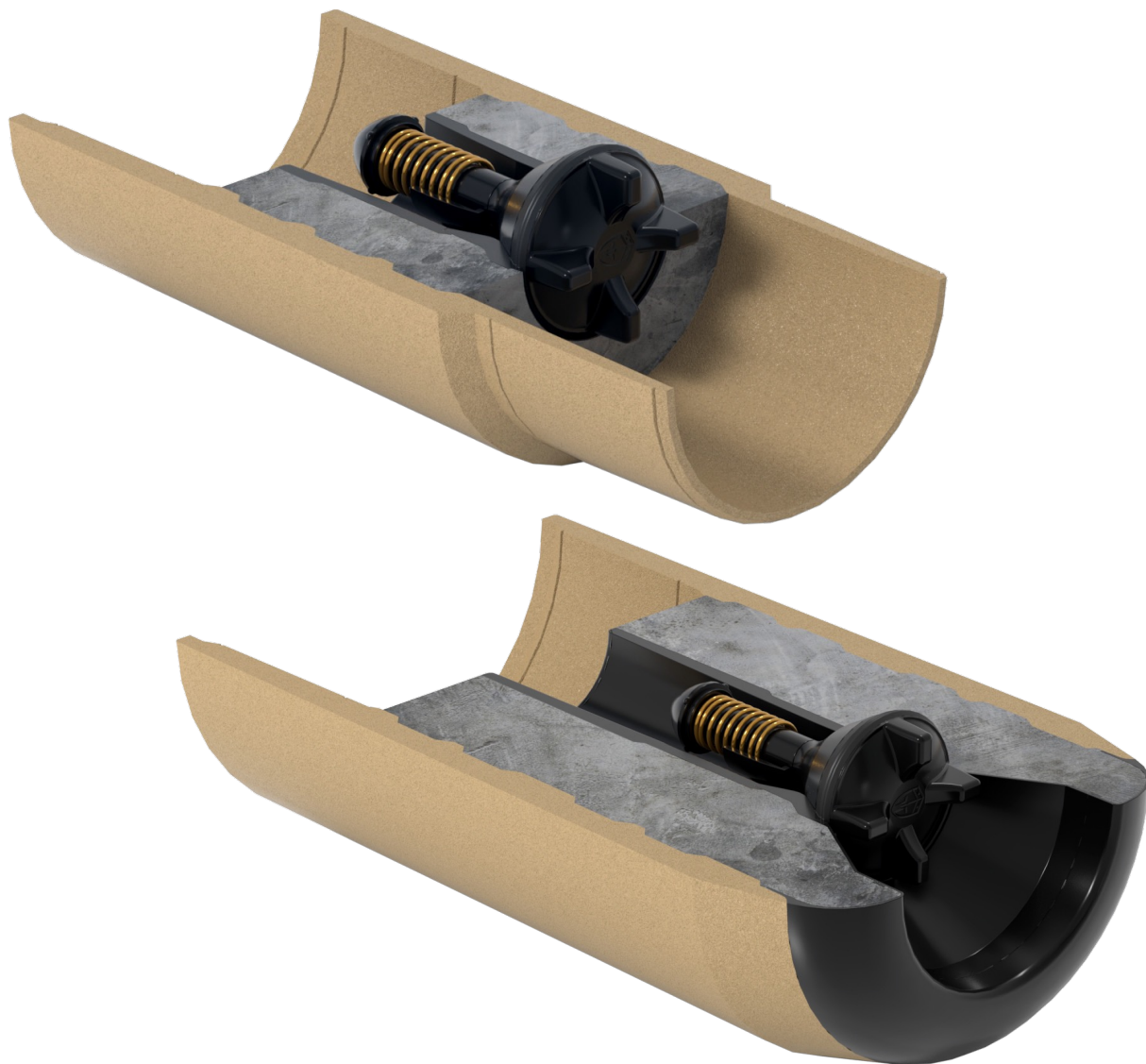
Max Flow Rate: **15 bpm for 8 hrs**

---

Flow Endurance: **10 bpm for 36 hrs**

---





# 357 MAGNUM VALVE

Citadel Casing Solutions' in-house engineered 357 MAGNUM VALVE is an all-composite float valve developed for downhole applications where drillability and performance merge. Whether deep set surface, intermediate casing, or production casing where moderate temperature and/or hydrostatic pressure performance is needed, the 357 MAGNUM is the go-to valve.

## SPECIFICATIONS

---

Size Range: **7.000 and larger**

---

API 10F Classification: **D36 R10 T400 P7500**

---

Max Pressure<sup>1</sup> @ 400°F: **7,500 psi**

---

Min Flow Area: **3.57 in<sup>2</sup>**

---

Max Flow Rate: **15 bpm for 8 hrs**

---

Flow Endurance: **10 bpm for 36 hrs**



# 762 ULTRA MAG VALVE

The Citadel Casing Solutions in-house engineered 762 ULTRA MAG valve is an all-aluminum valve developed for the most severe downhole applications. Whether floating production casing or facing extreme bottom hole temperature and/or hydrostatic pressure, the bulletproof 762 ULTRA MAG valve will hold up where others fail. Tested to 18,000 psi at 400°F with nitrogen gas using zero bubble acceptance criteria listed in the latest edition of API 11D1/ISO 14310.

## SPECIFICATIONS

---

Size Range: **6.000 and larger**

---

API 10F Classification: **R20-D240-T400-P15**

---

Max Pressure<sup>1</sup> @ 400°F: **15,000 psi**

---

Min Flow Area: **7.62 in<sup>2</sup>**

---

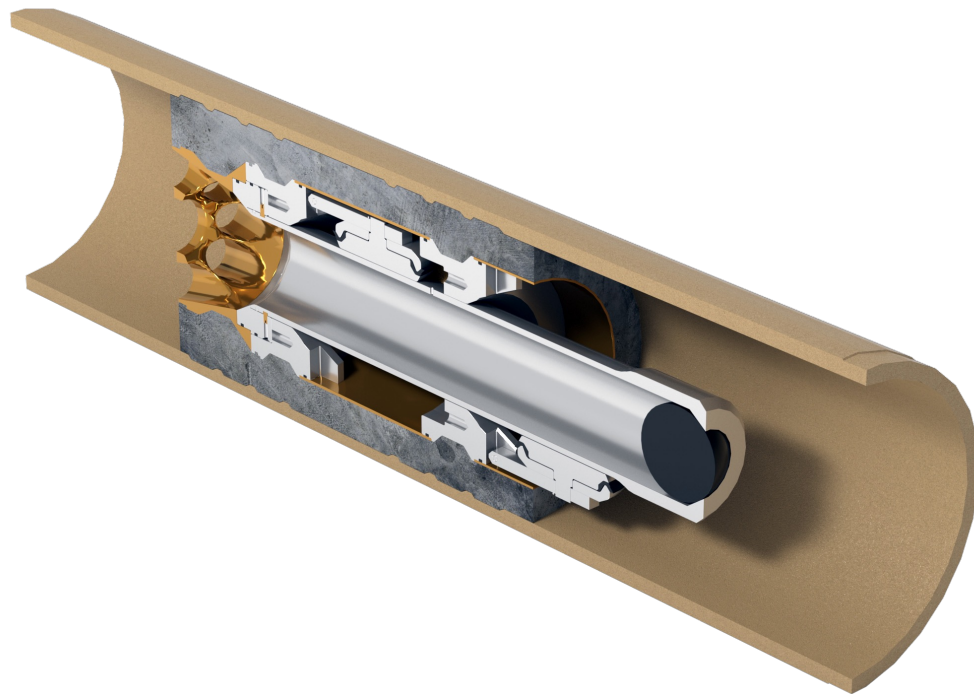
Max Flow Rate: **20 bbl/min**

---

Flow Endurance: **36 hrs**

---





# SPEARFISH FLOAT COLLAR

The Spearfish float collar is the ultimate autofill solution for surge reduction in close tolerance applications. The Citadel Devgru team has addressed the limitations of the marketplace of the day. The Spearfish Float Collar's forward-thinking design goes beyond surge reduction. It empowers casing and liner runs at higher speeds, especially within close annular tolerances, effectively minimizing mud losses and reducing rig time during operations.

## FEATURES

---

Built on the proven 762 Ultra Mag chassis

---

Costly surface fill time is reduced or eliminated.

---

Formation surges are reduced by allowing fluid to freely enter the casing.

---

Innovative patent pending design mitigates:

- Premature conversion
- Inability to deactivate autofill





WE'RE CHANGING THE FUTURE OF

**CENTRALIZATION**



# WHAT'S IN IT FOR YOU

- Largest US vendor of Centek Centralizers
- Fit for purpose offerings



# CENTRALIZERS



Centralizer Type	Solid Body/Rigid	Hinged Bow Spring	Slip on Bow Spring	Unibody Bow Spring	Premium Unibody Bow Spring	Close Tolerance
APPLICATION	Positive standoff without wellbore challenges	Centralizing vertical sections	Economic single piece centralizer	Tortuous wellbores, high deviation	No compromise solution	Under-ream, Offshore
FLEXIBILITY	N/A	GOOD	GOOD	BETTER	BEST	BEST
RUNABILITY	GOOD	GOOD	GOOD	BETTER	BEST	BEST
STRENGTH	BEST	GOOD	GOOD	BEST	BEST	BETTER

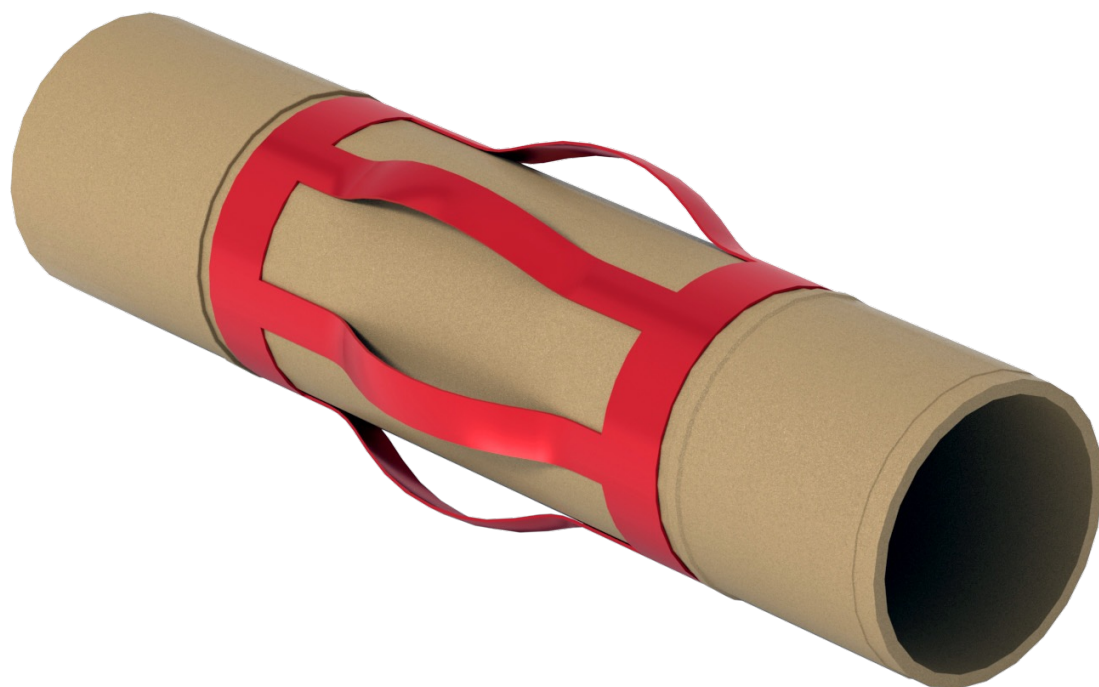


# ALL COMPOSITES LINE



Centralization			Protection		Special Tool
HELIX™	MAXLOCK® ERD	MAXLOCK®	MAXDRILL® F	MAXDRILL® NR	MAXSTOP™
<ul style="list-style-type: none"> <li>• Offset Composite Centralizer</li> <li>• Staggered pad placement</li> <li>• Extreme low friction coefficient</li> <li>• Highly abrasion resistant surface</li> <li>• Maximum fluid bypass</li> </ul>	<ul style="list-style-type: none"> <li>• All-Composite Centralizer</li> <li>• Designed specifically for challenging ERD applications</li> <li>• Reduction of annular restriction</li> <li>• Significant benefits for ERD and horizontal completions</li> </ul>	<ul style="list-style-type: none"> <li>• All-Composite Centralizer</li> <li>• Optimizes fluid bypass</li> <li>• Highly abrasion resistant surface</li> <li>• Outstanding physical properties</li> </ul>	<ul style="list-style-type: none"> <li>• All-Composite Drillpipe Protector</li> <li>• Rotates with the pipe</li> <li>• Casing and drillpipe protection</li> </ul>	<ul style="list-style-type: none"> <li>• All-Composite Non-Rotating Drillpipe Protector</li> <li>• Propriety inner bearing system</li> <li>• Extremely low torque characteristics</li> <li>• Base plate ensures protection of base pipe</li> </ul>	<ul style="list-style-type: none"> <li>• All-Composite Stop Collar</li> <li>• No screws or mechanical fixings</li> <li>• Outstanding holding forces</li> <li>• Suitable for tight and standard tolerances</li> <li>• Not impacted by non-ovality and pipe API tolerances</li> </ul>





# NAUTILUS™ CENTRALIZER SUB

The NAUTILUS™ Centralizer Sub was designed to solve one of our industry's most challenging centralization problems encountered when running casing into close tolerance, under reamed hole sections.

The NAUTILUS centralizer sub is specifically designed to be run as an integral part of almost any casing string. Bow spring can be supplied in almost any casing size, weight, grade, or thread and for use in the most challenging wellbore configurations while being able to rotate casing to bottom.

## FEATURES

---

Centek UROS-SUB or TUR-SUB centralizer for maximum standoff

---

Designed specifically for ultra-tight tolerance applications

---

Built to match customer designed casing requirements





# STOP COLLARS

Partnering with Centek Group, the #1 manufacturer of centralizers, we offer a full range of stop collars. We will work with you to find the best fit product for the job, balancing performance with economic factors.

OSO slip on stop collars are developed for use in less challenging wells as a method of securing centralizers on to the pipe and support primary cementing.

Set screw design provides high holding forces without excessive marring of wellbore tubulars.

## FEATURES

---

Centek QA

---

Anti-vibration screw retention

---

For use with standard casing grades





WE'RE CHANGING THE FUTURE OF

# **GUIDING EQUIPMENT**



# WHAT'S IN IT FOR YOU

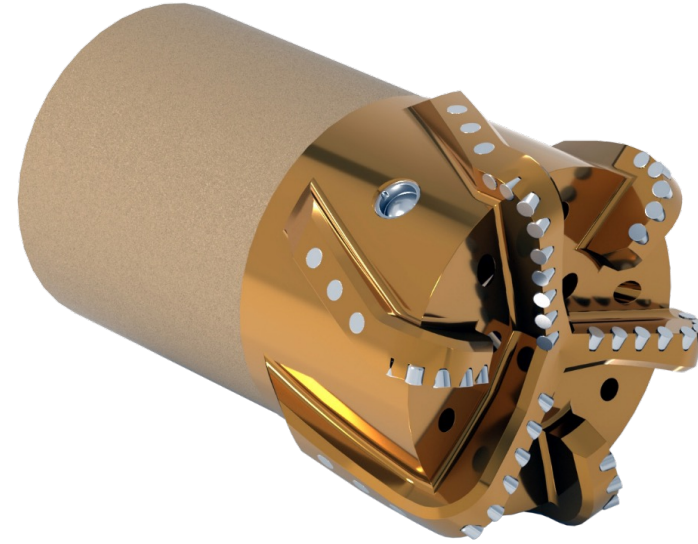
- Land casing faster and reduce torque
- Enhanced structural integrity designed to withstand even the most unpredictable of wellbore conditions





## SHARKNADO™

- The ultimate casing running accelerator
- Tungsten carbide hemispheres reduce friction and won't damage casing
- Torque reducing counter-clockwise vanes
- Available in 4.500 through 13.375



## DRILLSHOE™

- For Drilling With Casing (DWC) through soft to medium hardness formations
- Drillable with PDC or roller cone bits
- Bypass ports for use with high solids or LCM content
- Available in 7.000 through 20.000





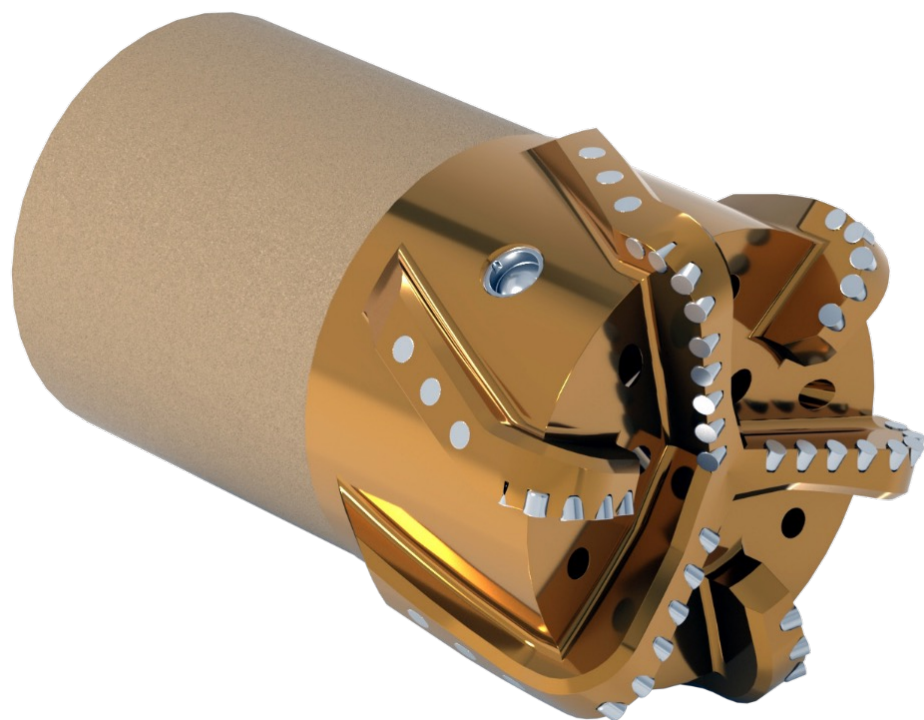
# SHARKNADO™

## The Ultimate Casing Running Accelerator

No matter the wellbore condition, the SHARKNADO™ will get casing to total depth quickly and consistently. 100% axial and circumferential reaming coupled with multi-directional jetting gets you to TD faster while improving annular cleanout and cement integrity.

- Complete axial reaming coverage for rotating through tight spots
- 360° circumferential coverage for reaming without rotation
- Standard with our 15 ksi gas-tight ULTRA MAG float valve (single or double)
- Any API or premium connection available
- P-110 standard grade, other grades available upon request





## FEATURES

---

Allows DWC operations to be performed through soft to medium formations or reaming through swelling formations or other tight spots in the wellbore

---

Drillable with conventional PDC and roller cone bits

---

Available with optional bypass ports for high solids or LCM content fluids will be used

# DRILLSHOE™

The Drillshoe™ is a PDC drillable drillshoe designed for use in Drilling W/Casing (DWC) operations through soft to medium formations. The MS Drillshoe is designed for all casing/hole configurations from 7.000-inch through 20.000-inch casing and can be supplied as a blank for local casing threading or pre-threaded.

Designed for DWC or conventional casing running operations where aggressive cutters are on the face of the shoe to work past ledges/obstructions/solids in the wellbore. This tool incorporates an aluminum bronze drill nose with tungsten carbide inserts configured to provide 100 percent drill face coverage. Additionally, carbide inserts are fitted onto the shoulder gage OD to provide wear resistance for the extended rotation experienced during DWC operations.





WE'RE CHANGING THE FUTURE OF

# COMPLETION SOLUTIONS



# WHAT'S IN IT FOR YOU

- Consolidated shoe track with optional casing test configurations
- Increase your completable reservoir
- Minimize connections and crossovers
- 100% acid compatible options





# MOTHER OF ALL SHOES™ (M.O.A.S™)

- **Ultra Mag Valve** – 15 ksi gas-tight “bulletproof” float valve qualifies as primary well barrier
- **Optional Debris Management System** – Compatible with debris creating burst/rupture discs
- **Onelatch™ Plug System** – Enhanced reliability for casing pressure tests/tool actuation
- **Sharknado™** – Eccentric multi-directional jetting nose facilitates casing running
- **Plug and Play** – Customizable fit for purpose configurations for any application
- **High Flow** – Optional patent pending valve configuration for flow rates higher than 10 bpm
- **Any API** or premium connection available (fully threaded or blanked)
- **Matches casing grade** and meets or exceeds casing/thread strength

- ▶ **ENTIRE SHOE TRACK IN ONE**
- ▶ **REDUCE OVERALL DRILLING/COMPLETION COSTS**
- ▶ **INSTANTLY UNLOCK ADDITIONAL 40+ FEET IN RESERVOIR EXPOSURE**



# TORPEDO LINER PLUG

The TORPEDO™ Plug is an engineered liner/casing wiper plug designed for sub-surface launch applications where reliable casing wiping efficiency is critical. The collet retained wiping system is conveyed into the well below the liner or casing hanger running tool.

Equalization ports within the releasing assembly minimize differential pressures acting on the wiper plug from above as a result of fluid circulation, pressure cycles within the string, etc. Allowing for predictable pressure indication at plug release.

## FEATURES

- Surface/intermediate casing or production liners from 4.000-inch through 20.000-inch
- Plug landing pressure up to 15,000 psi when used with Citadel Ultra Mag production floats and landing collars
- Configurable release pressure up to 2320 psi
- Modular plug/wiping configurations for
- Monobore or tapered string applications
- Ball catcher nose available
- Landing collar not required when utilized with Citadel float collar





# TRENCHFOOT™ ENGINEERED WET SHOE SYSTEM

Zero Compromise Toe Initiation Solution





# TRENCHFOOT™ ENGINEERED WET SHOE SYSTEM

## FEATURES

- Gas-tight Ultra Mag valve qualified and proven as independent well barrier
- Single piece M.O.A.S. (Mother of All Shoes) configuration consolidates shoe track length and cost
- Primary and contingency casing pressure test mechanisms up to 15 ksi/400°F
- Configurable with 2 to 4 valves, and 1 to 4 plugs
- Acid compatible system qualified for use with up to 30% HCl

## BENEFITS

- Increases per well NPV by \$50k to \$250k
- Reduces drilling cost by \$8,000 to \$40,000
- 99.7% injection reliability
- 99% casing test and re-entry reliability
- Upgraded float equipment increases reliability for casing flotation, casing running, and cementing

## CASE STUDY

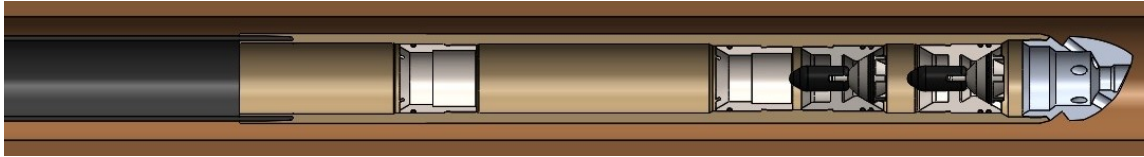
- Super Major US operator
- 400 TrenchFoot™ wet shoe installations since 2020
- 100% reliability as formation barrier and toe initiation mechanism
- Saved 11,800' of drilled depth, casing, and toe sleeves
- \$4,300,000 net savings
- Unlocked additional 237 frac stages
- \$47,500,000 net NPV uplift
- System yielded improved reliability and \$130,000 per well net benefit





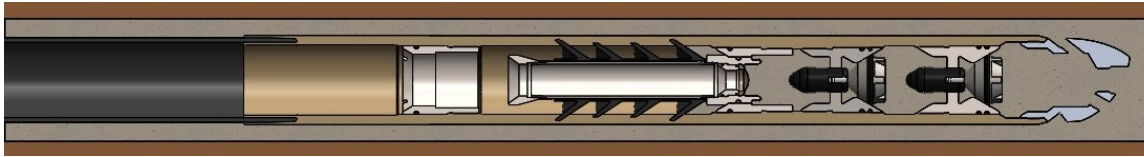
# TRENCHFOOT™ IN ACTION

## STEP 1



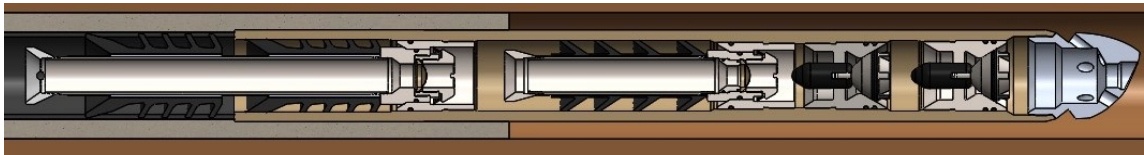
Run in Hole Configuration – Double valve configuration with dual plug bunkers and integral ball seat

## STEP 2



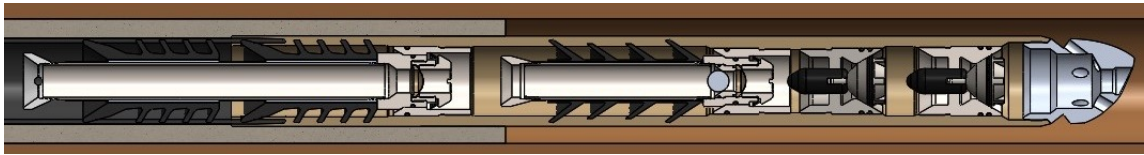
First plug lands behind cement, 1500 psi rupture disc

## STEP 3



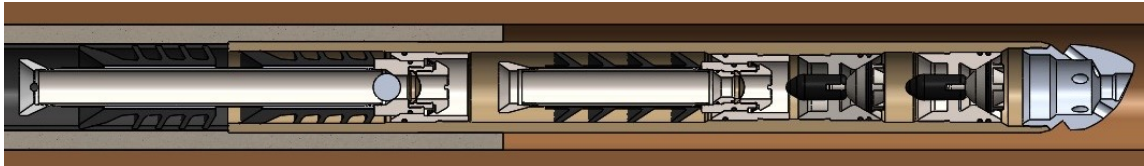
Second plug lands behind tuned over displacement fluid, 2250 psi rupture disc, additional volume pumped as secondary flush

## STEP 4



Toe prep – 1.375 diameter dissolvable ball displaced to lead plug, up to 15 ksi CIT

## STEP 5



Toe prep – 1.750 contingency dissolvable ball displaced to tail plug, up to 15 ksi CIT. If not required for contingency, used as first stage diverter





WE'RE CHANGING THE FUTURE OF

**CEMENTING HEADS**



# WHAT'S IN IT FOR YOU

- Extended length plug chambers eliminate shutdowns during primary cement job
- Optional integral Full-Opening TIW Safety Valve
- Self-balancing head reduces rig up time
- Standard high-pressure rating (12K plus)





## SPECIFICATIONS

Max Working Pressure: **12,000 psi**

Plug Container ID: **6.00 in**

Minimum ID for Plug: **5.38 in**

Bottom Plug Length (Max.): **26.00 in**

Top Plug Length (Max.): **34.44 in**

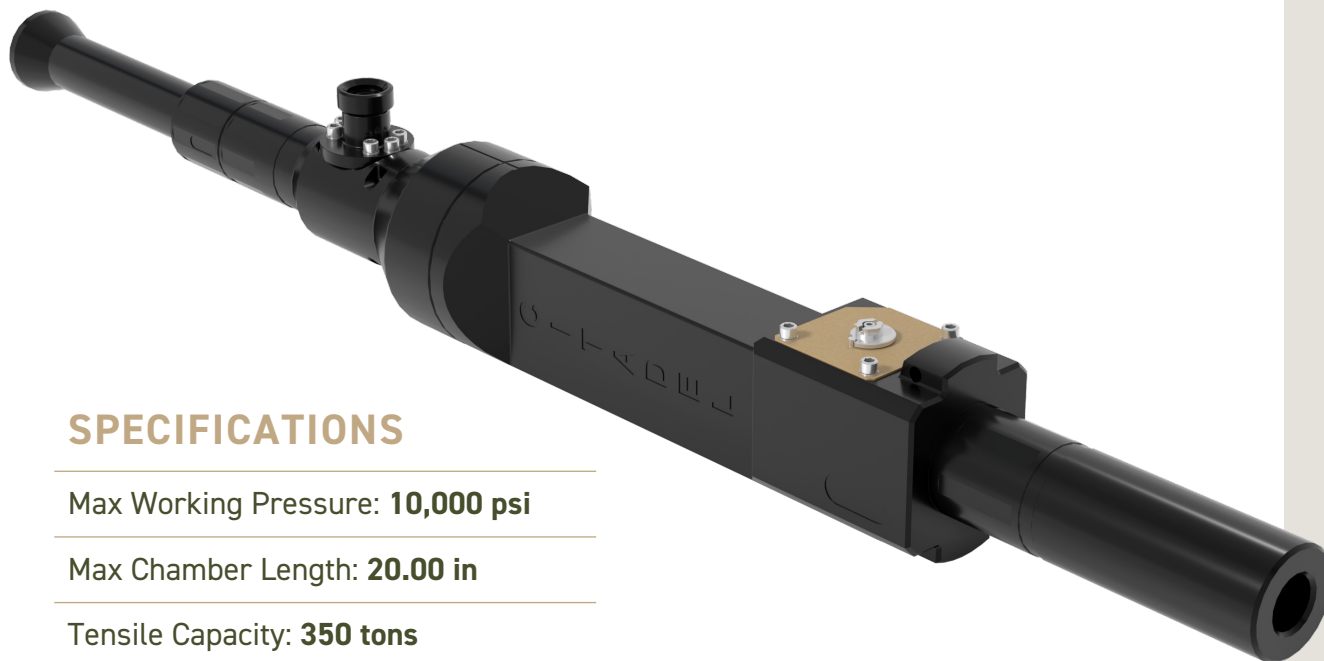
Overall Length: **170.17 in**

Overall Length: **2,805 lb.**

# BACH™ OLYMPUS CEMENT HEAD

- The BACH™ Olympus Production Casing Cement Head improves operational safety and reliability when launching cement plugs during production casing cementing and/or pressure testing operations. The same head works for 5.00, 5-1/2 and 6.00 inch production casing (at surface). This BACH™ includes:
- SPEED LOK™ connection, a quick connect adapter that eliminates threading or hammering – easy 360° orientation
- Plug-and-play configuration
- Citadel's integral manifold enables simple quarter-turn functionality and keeps the center of gravity close to the centerline for easier and safer lifting
- Mechanical plug launch indicator below the FOSV
- Releasing plunger rods do not extrude when launching cement plugs
- Non welded assembly allows for improved maintenance to be performed to ensure extend the service life of the head





## SPECIFICATIONS

Max Working Pressure: **10,000 psi**

Max Chamber Length: **20.00 in**

Tensile Capacity: **350 tons**

Main Bore Flow Area: **22.15 in<sup>2</sup>**

Bypass Flow Area: **3.14 in<sup>2</sup>**

Max Main Bore Flow Rate: **16 bbl/min**

Max Bypass Flow Rate: **8 bbl/min**

Main Bore ID: **5.31 in**

Bypass Bore ID: **2.00 in**

Overall Length: **183.1 in**

Overall Weight: **2,448 lb**

# EZ DINGHY™ DART LAUNCHER

Citadel Casing Solutions' in-house engineered Double EZ DINGHY™ Dart Launcher cement head is the fastest and safest way to launch cementing darts/plugs and foam/solid balls. A simpler, faster, and safer alternative to circulating iron manifolds. The double EZ DINGHY™ Dart Launcher features a quick casing connect adapter to adapt to the drill pipe, tubing, or casing being used. A super double compact dinghy that is super EZ to use.

- Available as a single and double configuration
- Easy plug launch with single valve 90 degree rotation
- Optional plug launch indicator
- Ideal for DWC operations where quick transition from casing running to cementing is required





# MAN-O-WAR™ TOP DRIVE CEMENT HEAD

Rated to an **INDUSTRY FIRST** combined simultaneous load of 10,000 psi at 2,000,000 lbf tensile with 110,000 ft-lb applied torque.

## SPECIFICATIONS

Rated Hookload: **3,000,000 lbf**

Rated Hookload (combined): **2,000,000 lbf**

Rated MAWP (combined): **10,000 psi**

Rated Torque (combined): **110,000 ft-lbf**

Swivel Rated RPM: **50 rpm**

Flow Rate (Top Drive): **35 bbl/min**

Flow Rate (Swivel): **16 bbl/min**

Tool Weight: **4,914 lb**

Tool Length: **13.4 feet**

- Adaptable pin connector facilitates quick and hassle-free field redressing of the bottom connection to accommodate any drill pipe specific connection/sizes
- 5.75-inch chamber I.D. mitigates compression set of darts prior to job
- Fully independent remote system with safety features that control safety valves, release valves, ball drop, and launch indicators
- Mechanical electric over hydraulic plug departure indicators
- Modular design: add or remove chambers to accommodate additional plugs/balls or for extended length plugs
- Engineered for field loading, redress, and maintenance using the innovative offshore basket with integral skid design
- Contingency manual operation
- Wireless Remote System ATEX Zone 1 & UL Class I Div. II Certified:
  - Worldwide Remote Actuation
  - Augmented reality for ultimate remote support
- DNV Certified

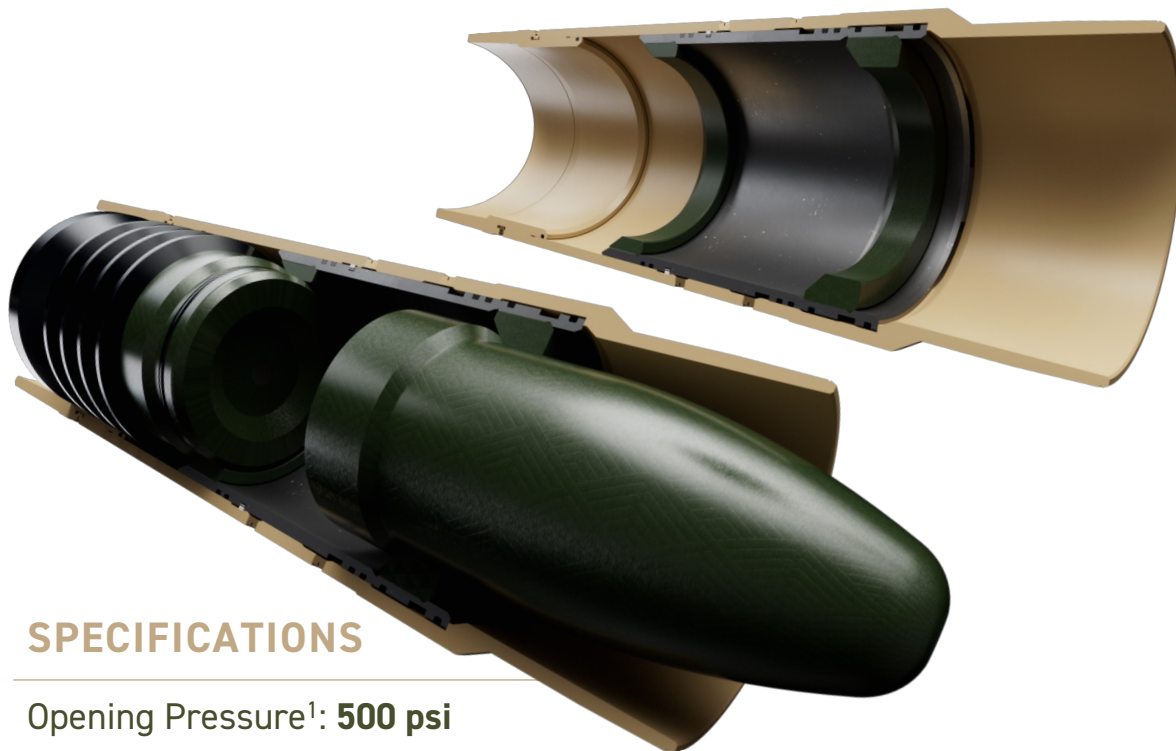




WE'RE CHANGING THE FUTURE OF

# CEMENTING EQUIPMENT





## SPECIFICATIONS

Opening Pressure<sup>1</sup>: **500 psi**

Closing Pressure<sup>2</sup>: **1,000 psi**

Total Port Flow Area: **3.14 in<sup>2</sup> for 4.500 – 5.500**  
**4.91 in<sup>2</sup> for 7.000 – 10.750**  
**7.36 in<sup>2</sup> for 13.375 – 16.000**  
**9.82 in<sup>2</sup> for 18.625 – 20.000**

<sup>1</sup> Approximations, actual pressures will vary slightly based on size.

<sup>2</sup> Can be set up for a two-stage or three-stage job.

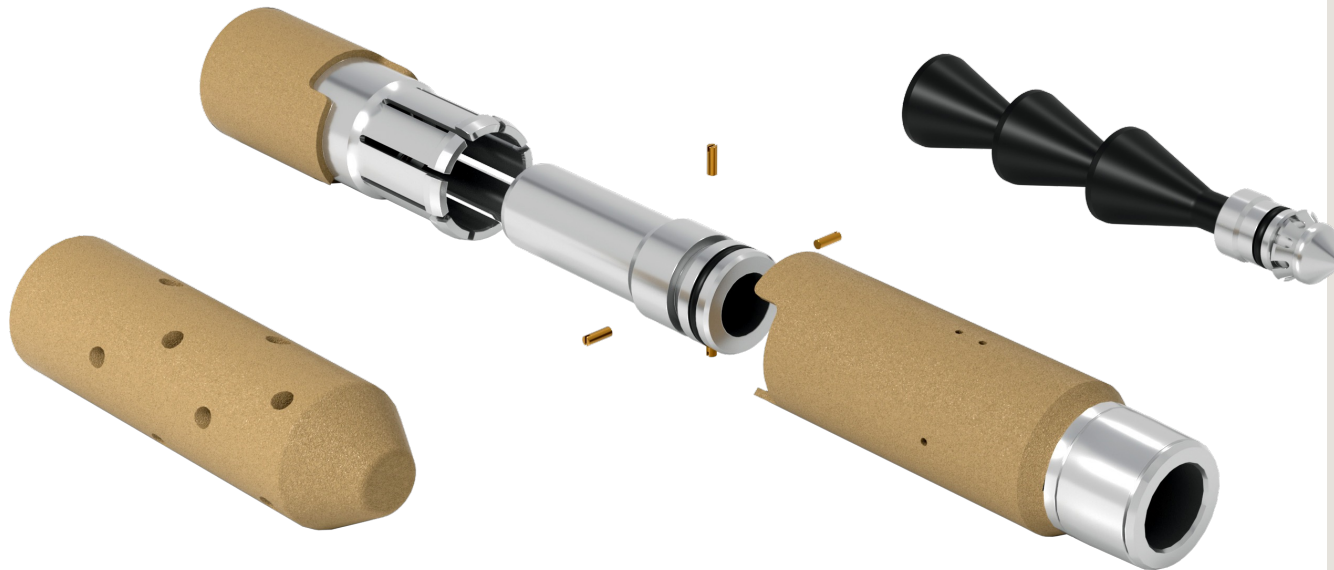
# ACE STAGE TOOL

Citadel Casing Solutions' ACE is the go-to stage tool, setting a new standard in the way cementing operations are conducted. The DEVGRU team at Citadel used real-world data and experience to optimize reliability and drillability. With one of the quickest drill-out times on the market, the ACE reduces rig downtime, helping you to sleep at night. The ACE is available in plug or hydraulically operated configurations.

## FEATURES

- **INDUSTRY FIRST:** API coupling OD stage tool– eliminating annular restriction concerns and impact on ECD
- **FASTER DRILL OUT:** 100% composite plug and seat construction for rapid drill out
- **ENHANCED RELIABILITY:** No welds and steel sleeves mitigate premature opening, seizing, and leaking after drillout
- **HD EDITION:** V0 qualified configuration for completion and production environments





# PRENUP™ PLUG PLACEMENT AID

The Prenup™ line of plug placement aids have industry leading strength and torque ratings. The Citadel Prenup™ disconnect is viable in even the most rigorous operations. With the use of our plug placement aids and sacrificial pipe or tubing, the placement of cement plugs and removal of the work-string is simple and safe.

## FEATURES

- Available in fully drillable aluminum (PDC or Roller Cone) or high strength steel
- Available in any combination of drill pipe/tubing threads (other combinations upon request):
- Workstring (box): 2.375 EU, 2.875 EU, 3.500 EU, NC38, NC50, 5.500 FH, 6.625 FH
- Tailpipe (pin): 2.375 EU, 2.875 EU, 3.500 EU, NC38, NC50
- Tensile rating between 10,000 lbs and 160,000 lbs depending on size and drillability requirements
- Suitable for applications that require rotation of the work string
- Released with applied pressure rather than over pull, improving cement plug integrity



THANK YOU.

**READY TO CHANGE YOUR FUTURE?**

Contact us for more information:

[sales@citadelcasingsolutions.com](mailto:sales@citadelcasingsolutions.com)

+1 832-995-9958