

COSSD PRODUCT CATALOGUE

for



Wellvention

This product catalogue has been downloaded from **COSSD.com**. Listed products/services and their descriptions are shown as supplied by the title company—**COSSD** does not guarantee the accuracy or completeness of the information presented. Hosting of the PDF does not constitute an endorsement by **COSSD** of the products/services being offered.

6
WAYS TO USE
COSSD.com



SMARTPHONE / WEBSITE / DIGITAL EDITION / BOOK / IPAD / GPS



Proof in Performance



CANADA
1-855-346-9788

USA
1-866-235-1899

CALGARY • GRANDE PRAIRIE • HOUSTON • MIDLAND • MINOT • RED DEER • SAN ANTONIO • WEYBURN

PRODUCTS

MOTORS

- 1 11/16
- 2 1/8
- 2 7/8
- 3 1/8

MILLING TOOLS & CLEANOUT ACCESSORIES

- External/Internal Dimple Connectors
- Spoolable Roll-On Connectors
- Motorhead Assemblies
- Bi-Directional Jars
- Chugger Friction Breakers
- Venturi Junk Baskets
- SpinCat™
- Eliminator Mills
- Bi-Center Mills

BEAR CLAW® COMPOSITE FRAC & BRIDGE PLUGS

FLOWMASTER

Casing Sizes

- 4 1/2
- 5
- 5 1/2

MILLING

Motors

At ALS Wellvention we run quality stators from Roper, Bico and Dynamax. We internally service and support our fleet of motors allowing for tighter quality and cost control resulting in increased efficiency and value for our customers. ALS Wellvention has 8 motors available:

- 1.688” (42.9mm) HyperDrill 5/6 2.3 Stage
- 2.125” (53.9mm) HyperDrill 5/6 6.0 Stage
- 2.875” (73.0mm) HyperDrill 5/6 3.5 Stage (2 Variations)
- 2.875” (73.0mm) HyperDrill Max 5/6 3.5 Stage
- 2.875” (73.0mm) HyperDrill Max 5/6 3.3 Stage
- 2.875” (73.0mm) HyperDrill Max 5/6 4.7 Stage
- 3.125” (79.4mm) HyperDrill Max 5/6 3.2 Stage

Motorhead Assembly (MHA)

The Motorhead Assembly is comprised of the dual flapper check valve, the heavy duty hydraulic disconnect and the dual activated circulation sub. The MHA does not dictate the tubing connector that must be used, it’s easy to assemble due to the reduced number of component parts and it’s cost effective to redress. The MHA is available in 3 sizes.

Bi-Centre Mill (The Original Offset Mill)

The ALS Wellvention Bi-Centre mill is an offset mill designed to pass through casing restrictions while retaining the ability to mill to FULL ID below. The Bi-Centre mill still produces small, manageable debris that would be expected from other ALS Wellvention designed mills. Combined with an ALS Wellvention high speed/high torque motor the Bi-Centre’s performance is unmatched. The Bi-Centre Mill is available in a variety of sizes.

Eliminator Mill

The Eliminator mill has a dressed face backed with full carbide row buttons, gauge protection for longevity, and back reaming capability. The eliminator mill is fully engineered and can be used for cement milling, frac seat milling, and composite plug milling. Multiple design options are used depending on the application. Specialty designs are also available.

FLOWMASTER

The DSI FlowMaster is a permanent, yet retrievable, plug intended to be left in the wellbore for production.

Pump down FlowMaster as usual on wireline or run in on coiled tubing if necessary. FlowMaster can be set by explosive charge or hydraulic force. Perforate as usual and then frac against our patent pending valve technology. No Ball involved; no timing issues and fluid losses, no early disintegration compromising pressure integrity. Guaranteed seal each and every time. Reduce your intervention costs and start producing your well!

THE CHUGGER

The ONLY generation of axial vibration tool that is capable of reaching the depths of today’s longest laterals. Specifically designed for success in plays that push the limits of today’s technologies. It has a steel body with stainless steel internals, large flow areas and is suitable for hostile environments. The ability to get to depth quicker with this tool will result in a time and cost savings.

BEAR CLAW® COMPOSITE FRAC & BRIDGE PLUGS

The Bear Claw® Composite Frac & Bridge Plugs are made from aerospace grade composite materials with high temperature and chemical resistance and include proven oilfield elastomers for reliable, rugged performance. Gray cast iron slips provide exceptional uniformity and strength for gripping the casing walls. A high glass transition temperature gives the plug unlimited downhole lifespan and consistent millout debris. There are several Bear Claw® Composite Frac and Bridge plug sizes available for various applications.

FIELD SERVICES

- Milling of Composite Plugs, Ball Seat Systems and Cement on Threaded Pipe or Coiled Tubing
- Confirmation Runs/Toe Checks
- Stage Tool & Debris Sub Removal
- Wellbore Cleanouts
- Fishing & Retrieval

TECHNICAL SERVICES

- Engineering
- Design
- Manufacturing
- Testing

R&D

- In Shop Testing Of:
 - Seat Removal
 - Plug Milling

MISSION STATEMENT

ALS Wellvention is committed to developing and providing reliable, innovative and cost effective services and solutions. We will be a market leader by providing a consistently superior level of customer service. We strive for continuous improvement and to deliver success to both our customers and to our company.

HEALTH AND SAFETY

ALS Wellvention is committed to providing a safe and healthy work environment for all employees, visitors and suppliers. ALS Wellvention management constantly strives to achieve this safe work environment by giving their personal commitment to take every reasonable and practicable precaution to protect the health and safety of all. Managers and workers are mutually responsible for minimizing accidents at our facilities and field work sites. In March of 2013 ALS Wellvention received their COR certificate and continues to comply with the rules and regulations of the AB, BC, SK and MB occupational Health and Safety Act, Regulation and Code.



GRANDE PRAIRIE

109, 6902 - 98th Street
Clairmont, AB T0H 0W0
Phone: 780-882-8839
Fax: 780-532-0108

HOUSTON

14103 Interdrive West
Houston, TX 77032
Phone: 1-866-235-1899

MIDLAND

2003 Commerce Drive
Midland Industrial Park
Midland, TX 79703
Phone: 1-866-235-1899

MINOT

3301 E Burdick Expressway
Minot, ND 58701
Phone: 1-866-235-1899

RED DEER

3 - 7679 Edgar Industrial Court
Red Deer, AB T4P 4E2
Phone: 403-346-9788
Fax: 403-346-9789

SAN ANTONIO

1620 Lillian Avenue
Jourdanton, TX 78026
Phone: 1-866-235-1899

WEYBURN

3 - 1605 Ebel Road
Weyburn, SK S4H 1V3
Phone: 306-842-3430

Wellvention ALS Oil & Gas

HEAD OFFICE - CALGARY, ALBERTA

830 444-5th Avenue SW
Calgary, AB T2P 2T8
T +1 855 346 9788
www.dsithrutubing.ca
www.alsoilandgas.com



Bear Claw®

Composite Bridge & Frac Plug Systems





SERVICE CENTERS

Calgary, **AB**
Grande Prairie, **AB**
Houston, **TX**
Midland, **TX**
Minot, **ND**
Red Deer, **AB**
San Antonio, **TX**
Weyburn, **SK**

CANADA

Toll Free Dispatch
855-346-9788

USA

Toll Free Dispatch
866-235-1899

SERVICES

2 1/8", 2 7/8" & 3 1/8" High Torque Even Layer Motors | Field proven Mills & Bits | Bi-centre Mills | Extended Reach Tool Premium Rotary wash tool (Spin Cat) | Venturi Jet Junk Baskets Bi-Directional Jars | Bi-Directional Intensifiers | Flow Bypass Subs | Hydraulic Impact Hammers | Anti-Stall Tools Fishing Tools

and more...

FEATURES AND BENEFITS

Bear Claw® Drillable Composite Plugs are cased hole composite plugs used for multiple zonal isolation. They are available for 4.5 and 5.5 diameter casing.

Materials

- Aerospace grade composite materials with high temperature & chemical resistance.
- High temperature thermoplastics replace brass and other non-ferrous metals.
- Proven oil field elastomeric element systems for reliable, rugged performance.
- Full circumference gray cast iron slips machined from bar stock for exceptional uniformity and strength.

Gripping Power

- More gripping teeth per slip compared to many competitive products.
- Serrated tooth design cuts through scale, grease and dirt.
- Mandrel is secured via a ratcheting mechanism in certain models.

Drill Out

- Does not contain tungsten carbide, large steel parts or other difficult-to-drill materials.
- Reduces drill out time and casing damage compared to cast iron plugs.
- Low density non-metallic cuttings circulate quickly and easily back to the surface.

Field Configurable

- Bear Claw® plug can be shipped from the factory as frac, drop ball or bridge plugs.
- Alternately, frac and drop ball plugs can be shipped depending on the needs of the operator.
- Drop ball operations are done by simply removing the ball retaining pin or using the ball in a separate kit.
- Density of standard phenolic ball is 1.32 g/cc. Other densities are available on request.

Running and Setting Procedures:

- Run speeds up to 300 feet/min [91 m/min] depending on well conditions.
- Composite plug attachment to setting tool uses tools and procedures familiar to wireline crews.
- 4.5 plugs use Baker No. 10 and Halliburton 2.5 Shorty setting tools.
- 5.5 plugs use Baker No. 20 or Titan 3 5/8 setting tools.
- Use quick burning or standard (less than 10 seconds) power charges.

Composite Plug Ratings:

- Bear Claw® Drillable Plugs are rated to various temperatures and pressures up to 350 °F [177 °C] and 14,000 psi [96.5 MPa] (above)/10,000 psi [68.9 MPa] (below).

Contact your ALS Wellvention sales representative to order the correct product for your well conditions and needs



BEAR CLAW® COMPOSITE PLUGS

A Style for Your Needs

Bear Claw® Composite Plugs come in a variety of styles and compositions to meet your many needs.

Casing Sizes

- 4.5 Casing Diameter in 11.6, 13.5 and 15.1 lb/ft [17.26, 20.09 and 22.47 kg/m] casing weights.
- 5.5 Casing Diameter in 17.0, 20.0 and 23.0 lb/ft [25.30, 29.76 and 34.23 kg/m] casing weights.

Plug Types

Bear Claw® 2 is a class of non-stroking plugs (i.e. ratcheting plug) for 4.5 and 5.5 vertical, deviated and horizontal wells. These plugs are rated for temperatures up to 350 °F [177°C] and pressures up to 14,000 psi [96.5 MPa] from above and 10,000 psi [68.9 MPa] from below. These plugs are designed to run and function like a cast iron drillable plug with drill out times comparable to the best composite plugs.

Plug Compositions and Backing Ring Designs

Bear Claw® 2 uses the same aerospace grade composite materials and premium elastomer elements as the Bear Claw® 1 plug but comes with several elastomer elements and backing ring systems designed for a variety of customer needs.

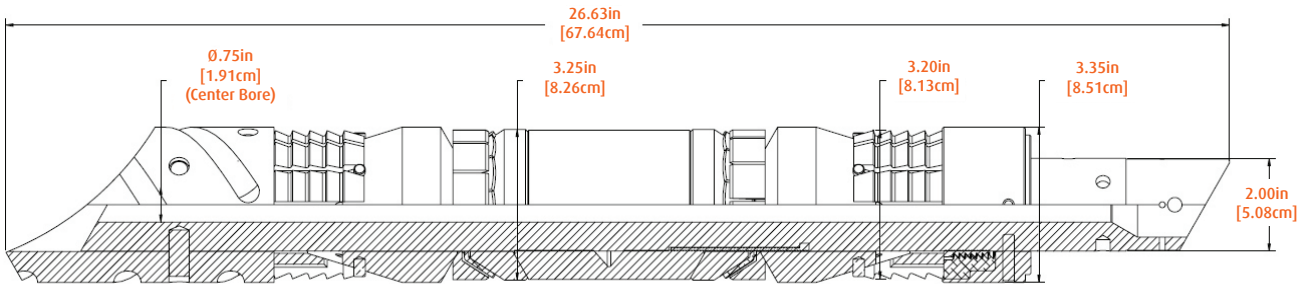
- Conventional Element System – designed for lowest cost and fastest drill out for wells up to 300 °F [149°C] and differential pressures up to 10,000 psi [68.9 MPa] (from above) and 8,000 psi [55.2 MPa] (from below). Elements are available in standard and chemical resistant grades depending on your well environments.
- Arcturus Array – designed as an advanced backing ring system for long duration frac operations or constant reservoir containment. The arrays use an elastomeric center element in standard or chemical resistant grades and lightweight metal/composite reinforced outer elements which give premium high temperature performance with easy drill out. Depending on casing diameter and the upper well temperature the Arcturus Arrays are available in temperature ratings up to 350°F [177 °C] and differential pressures up to 10,000 psi [68.9 MPa] (from above) and 8,000 psi [55.2 MPa] (from below).
- Ecner Array – designed using proven materials and processes pioneered in the retrievable packer industry. Ecner arrays use a premium, high temperature, chemically resistant center element with rubber/stainless steel mesh outer elements. Ecner Arrays are rated to 350 °F [177 °C] and differential pressures up to 14,000 psi [96.5 MPa] (from above) and 10,000 psi [68.9 MPa] (from below). This design has passed a week long endurance test of 10,000 psi [68.9 MPa] differential frac pressure at 300 °F [149 °C].

Contact your ALS Wellvention representative to decide which plug is right for your well conditions and completion strategy

The 4.5 Bear Claw® 3 conventional plugs are a non-stroking plug (i.e. ratcheting plug). The composite fiber and slip configuration combined with the element structure are designed to provide superior performance with industry leading drill out times. The Bear Claw® 3 now comes in a Drop Ball, Caged Ball or a Poppet style configuration.

Casing Size inch [mm]	Casing Weight lb/ft [kg/m]	Max Temperature °F [°C]	Max Frac Pressure (Top Down) psi [MPa]	Max Reservoir Pressure (Bottom Up) psi [MPa]
Frac Plug Assemblies				
4.5 [114.3]	15.1 [22.47]	270 [132]	10,000 [68.9]	N/A
Bridge Plug Assemblies				
4.5 [114.3]	15.1 [22.47]	270 [132]	10,000 [68.9]	6,400 [44.1]
Drop Ball Plug Assemblies*				
4.5 [114.3]	15.1 [22.47]	270 [132]	10,000 [68.9]	N/A

> All plugs used with 02623-001 Baker #10 setting kit.
* Used with a Captive Ball or Drop Ball.
† Chemically resistant.

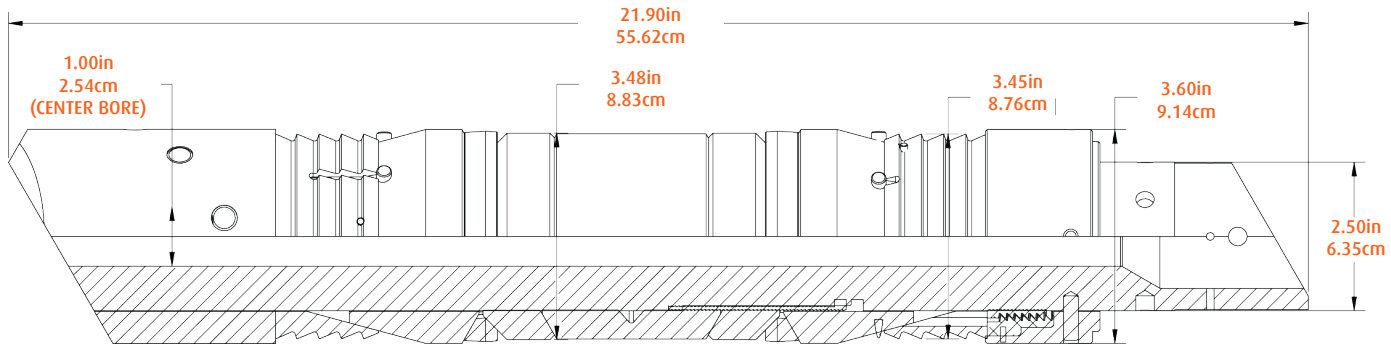


4.5 BEAR CLAW® 2 CONVENTIONAL PLUG

The 4.5 Bear Claw® 2 conventional plugs are a non-stroking plug (i.e. ratcheting plug) designed to run and function like a cast iron plug with drill out times comparable to the best composite plugs. The conventional element system is designed for lowest cost and fastest drill out. Elements are available in standard and chemical resistant grades.

Casing Size inch [mm]	Casing Weight lb/ft [kg/m]	Max Temperature °F [°C]	Max Frac Pressure (Top Down) psi [MPa]	Max Reservoir Pressure (Bottom Up) psi [MPa]
Frac Plug Assemblies				
4.5 [114.3]	11.6-15.1 [17.26-22.47]	270 [132]	8,000 [55.2]	N/A
4.5 [114.3]	11.6-15.1 [17.26-22.47]	300 [149]	10,000 [68.9]	N/A
Bridge Plug Assemblies				
4.5 [114.3]	11.6-15.1 [17.26-22.47]	270 [132]	8,000 [55.2]	6,400 [44.1]
4.5 [114.3]	11.6-15.1 [17.26-22.47]	300 [149]	10,000 [68.9]	8,000 [55.2]
Plug Assembly*				
4.5 [114.3]	11.6-15.1 [17.26-22.47]	270 [132]	8,000 [55.2]	N/A
4.5 [114.3]	11.6-15.1 [17.26-22.47]	300 [149]	10,000 [68.9]	N/A

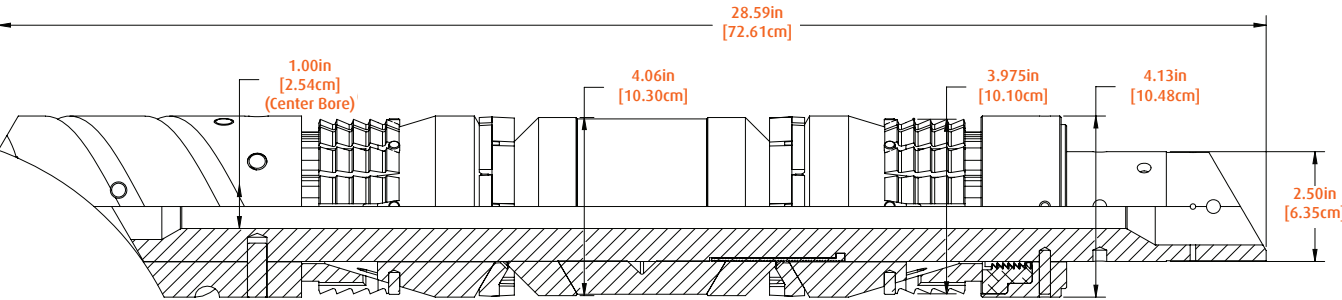
> All plugs used with 02299-002 Baker #10 setting kit or 02324-002 Halliburton 2½ Shorty setting kit.
* Used with a Drop Ball or Melt Kit.
† Chemically resistant.



The 5.0 Bear Claw® 2 conventional plugs are a non-stroking plug (i.e. ratcheting plug) designed to run and function like a cast iron plug with drill out times comparable to the best composite plugs. The conventional element system is designed for lowest cost and fastest drill out. Elements are available in standard and chemical resistant grades. These are designed specifically for captive ball, or drop ball operations commonly used in horizontal wells.

Casing Size inch [mm]	Casing Weight lb/ft [kg/m]	Max Temperature °F [°C]	Max Frac Pressure (Top Down) psi [MPa]	Max Reservoir Pressure (Bottom Up) psi [MPa]
Frac Plug Assemblies				
5.0 [127.0]	11.5-13.0 [17.11-19.35]	220 [104]	10,000 [68.9]	N/A
5.5 [139.7]	17.0-23.0 [25.30-34.23]	220 [104]	10,000 [68.9]	N/A
Bridge Plug Assemblies				
5.0 [127.0]	11.5-13.0 [17.11-19.35]	220 [104]	10,000 [68.9]	8,000 [55.2]
5.5 [139.7]	17.0-23.0 [25.30-34.23]	220 [104]	10,000 [68.9]	8,000 [55.2]
Drop Ball Plug Assemblies				
5.0 [127.0]	11.5-13.0 [17.11-19.35]	220 [104]	10,000 [68.9]	N/A
5.5 [139.7]	17.0-23.0 [25.30-34.23]	220 [104]	10,000 [68.9]	N/A

> All plugs used with 02574-001 Baker #20 setting kit.
* Used with a Captive Ball, Drop Ball or Melt Kit.
† Chemically resistant.

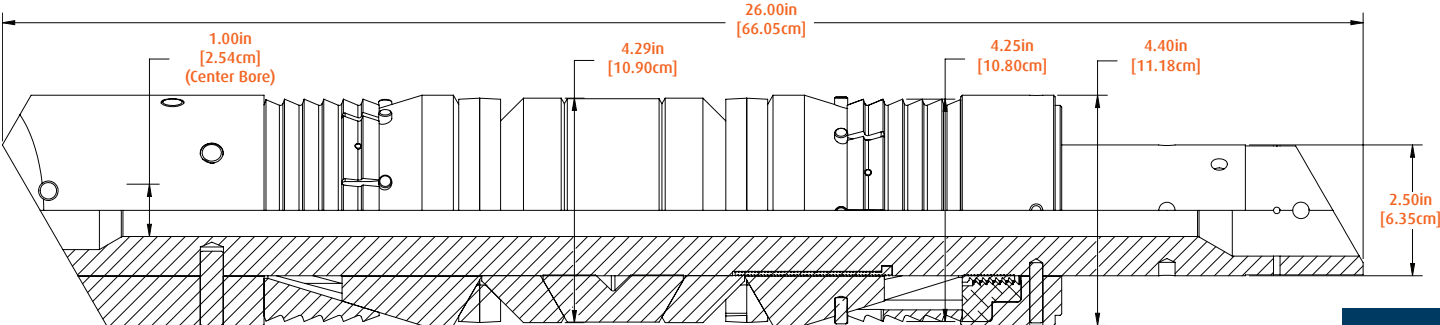


5.5 BEAR CLAW® 2 CONVENTIONAL PLUG

The 5.5 Bear Claw® 2 conventional plugs share the same non-stroking (i.e. ratcheting plug) design as the 4.5 plugs. These are designed specically for captive ball, or drop ball operations commonly used in horizontal wells.

Casing Size inch [mm]	Casing Weight lb/ft [kg/m]	Max Temperature °F [°C]	Max Frac Pressure (Top Down) psi [MPa]	Max Reservoir Pressure (Bottom Up) psi [MPa]
Frac Plug Assemblies				
5.5 [139.7]	17.0-23.0 [25.30-34.23]	270 [132]	8,000 [55.2]	N/A
5.5 [139.7]	17.0-23.0 [25.30-34.23]	270 [132]	10,000 [68.9]	N/A
5.5 [139.7]	17.0-23.0 [25.30-34.23]	300 [149]	10,000 [68.9]	N/A
Bridge Plug Assemblies				
5.5 [139.7]	17.0-23.0 [25.30-34.23]	270 [132]	8,000 [55.2]	6,400 [44.1]
5.5 [139.7]	17.0-23.0 [25.30-34.23]	270 [132]	10,000 [68.9]	8,000 [55.2]
5.5 [139.7]	17.0-23.0 [25.30-34.23]	300 [149]	10,000 [68.9]	8,000 [55.2]
Drop Ball Plug Assemblies				
5.5 [139.7]	17.0-23.0 [25.30-34.23]	270 [132]	8,000 [55.2]	N/A
5.5 [139.7]	17.0-23.0 [25.30-34.23]	270 [132]	10,000 [68.9]	N/A
5.5 [139.7]	17.0-23.0 [25.30-34.23]	300 [149]	10,000 [68.9]	N/A

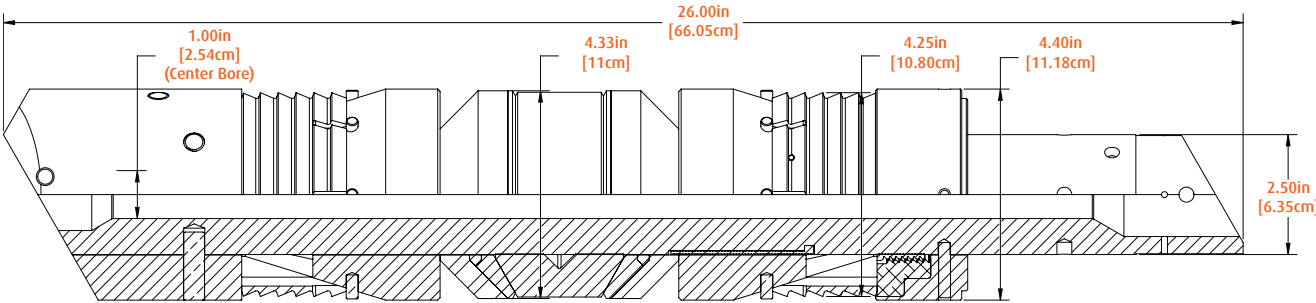
> All plugs used with 02427-001 Baker #20 setting kit or 02543-001 Titan 3 5/8 setting kit.
* Used with a Captive Ball, Drop Ball or Melt Kit.
† Chemically resistant.



Ecner Array – designed using proven materials and processes pioneered in the retrievable packer industry. Ecner arrays use a premium, high temperature, chemically resistant center element with rubber/stainless steel mesh outer elements. Ecner Arrays are rated to 350 °F [177 °C] and differential pressures up to 14,000 psi [96.5 MPa] (from above) and 10,000 psi [68.9 MPa] (from below). This design has passed a week long endurance test of 10,000 psi [68.9 MPa] differential frac pressure at 300 °F [149 °C].

Casing Size inch [mm]	Casing Weight lb/ft [kg/m]	Max Temperature °F [°C]	Max Frac Pressure (Top Down) psi [MPa]	Max Reservoir Pressure (Bottom Up) psi [MPa]
Frac Plug Assemblies				
5.5 [139.7]	17.0-23.0 [25.30-34.23]	300 [149]	14,000 [96.5]	N/A
5.5 [139.7]	17.0-23.0 [25.30-34.23]	350 [177]	12,000 [82.7]	N/A
Bridge Plug Assemblies				
5.5 [139.7]	17.0-23.0 [25.30-34.23]	300 [149]	14,000 [96.5]	10,000 [68.9]
5.5 [139.7]	17.0-23.0 [25.30-34.23]	350 [177]	12,000 [82.7]	10,000 [68.9]
Plug Assemblies*				
5.5 [139.7]	17.0-23.0 [25.30-34.23]	300 [149]	14,000 [96.5]	N/A
5.5 [139.7]	17.0-23.0 [25.30-34.23]	350 [177]	12,000 [82.7]	N/A

> All plugs used with 02427-001 Baker #20 setting kit or 02543-001 Titan 3 5/8 setting kit.
* Used with a Captive Ball or Drop Ball.
† Chemically resistant.



5.5 BEAR CLAW® 2 ECNER ARRAY PERFORMANCE DATA

5.5 Bear Claw® 2 plugs with the Ecner Array are high performance, long endurance plugs for your difficult well environments. A summary of a week long endurance test performed on this plug is given below.

Introduction

In July 2010, the 5.5 Bear Claw® 2 Ecner Array Plug successfully completed a 96 hour endurance test done at 300 °F [149 °C] and 10,000 psi [68.9 MPa] top down pressure. The setting operations and endurance test were performed by an experienced oil tool testing company in Texas. The test plug was set using a hydraulic setting tool configured as a Baker No. 20. The endurance test is described below.

Endurance Test Requirements

Specific steps in the test are given below:

1. Soak tool for 1 hour at temperature of 300 °F [149 °C].
2. Keep entire tool soaked at minimum 300 °F [149 °C] during entire test (4+ days).
3. Set the tool in a P-110, 5.5", ID = 4.778" [121 mm], 20 lb/ft test casing [29.76 kg/m]. Record pressure and temperature digitally to obtain frequent data points.
4. Apply 1,000 psi [6.9 MPa] from below and hold for 5 min.
5. Apply 2,000 psi [13.8 MPa] from below and hold for 5 min.
6. Bleed off all pressure, then bring up pressure again slowly by 1,000 psi [6.9 MPa] per min.
7. Apply 1,000 psi [6.9 MPa] from above and hold for 5 min.
8. Apply 2,000 psi [13.8 MPa] from above and hold for 5 min.
9. Bleed off all pressure, then bring up pressure again slowly by 1,000 psi [6.9 MPa] per min.
10. Apply 3,000 psi [20.7 MPa] from below and hold for 5 min.
11. Apply 4,000 psi [27.6 MPa] from below and hold for 5 min.
12. Apply 5,000 psi [34.5 MPa] from below and hold for 5 min.
13. Bleed off all pressure, then bring up pressure again slowly by 1,000 psi [6.9 MPa] per min.
14. Apply 3,000 psi [20.7 MPa] from above and hold for 5 min.
15. Apply 4,000 psi [27.6 MPa] from above and hold for 5 min.
16. Apply 5,000 psi [34.5 MPa] from above and hold for 5 min.
17. Bleed off all pressure, then bring up pressure again slowly by 1,000 psi [6.9 MPa] per min.
18. Apply 6,000 psi [41.4 MPa] from below and hold for 5 min.
19. Apply 7,000 psi [48.3 MPa] from below and hold for 5 min.
20. Apply 8,000 psi [55.2 MPa] from below and hold for 5 min.
21. Apply 9,000 psi [62.0 MPa] from below and hold for 5 min.
22. Apply 10,000 psi [68.9 MPa] from below and hold for 5 min.
23. Bleed off all pressure, then bring up pressure again slowly by 1,000 psi [6.9 MPa] per min.
24. Apply 6,000 psi [41.4 MPa] from above and hold for 5 min.
25. Apply 7,000 psi [48.3 MPa] from above and hold for 5 min.
26. Apply 8,000 psi [55.2 MPa] from above and hold for 5 min.
27. Apply 9,000 psi [62.0 MPa] from above and hold for 5 min.
28. Apply 10,000 psi [68.9 MPa] from above and hold for 4 days at a constant temperature of 300 °F [149 °C].
29. Monitor pressure constantly via digital recorders. If the pressure has bled down to 9,500 psi [65.5 MPa] or lower, bump up the pressure back to 10,000 psi [68.9 MPa].
30. After the 96 hour hold at 10,000 psi [68.9 MPa] is complete, increase the pressure (from above) in 1,000 psi [6.9 MPa] increments and hold for 10 minutes each until plug destruction.

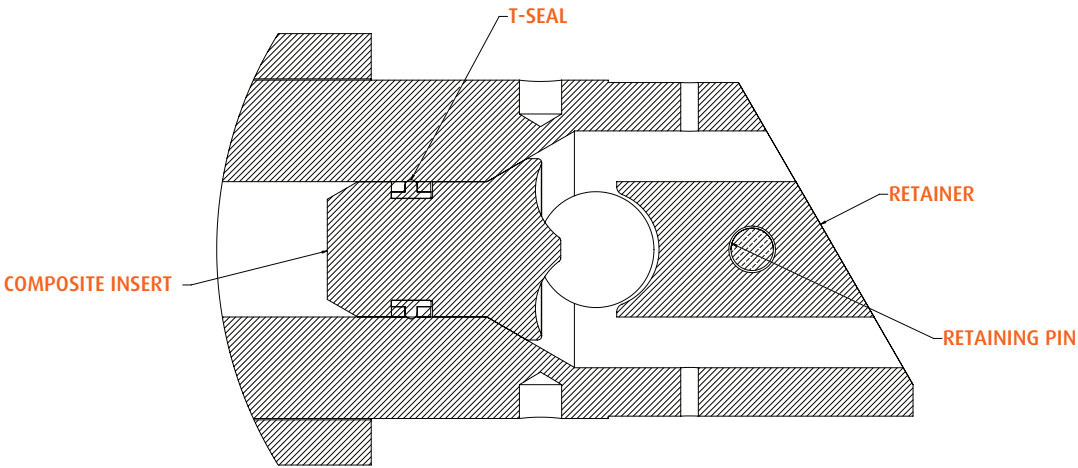
The **Bear Claw® Melt Kit** is a patent pending design that allows one to change a plug assembly into a bridge plug that converts to a frac plug in a matter of hours or days depending on your well geology and completion strategy. The kit uses water soluble balls that dissolve at different rates depending on fluid, temperature and type of ball used. Flow back times are selected by the company man and are designed to match the time when the well is to flow back after the next stage is perforated and fractured. The following table gives estimated times to flow back.

Ball Color	Material	Dissolve Time at 175 °F	Dissolve Time at 200 °F
Green	PVA, PVOH, PEO and PPO5 hrs		2 hrs
Opaque	PEO, PPO and PLA	unknown	14 hrs
Blue	PE, PB, PO and PS	unknown	36 hrs

Compared to a flow through plug (aka frac plug), a Bear Claw Melt® plug has the following advantages:

- It can reduce the risks of sand and water from the lower stages prematurely entering the upper stages. If problems cause delays in the next frac stage, the Melt® plug can prevent well flow.
- If the well is opened there will be no flow from the lower stage for a user-determined period of time until the next stage is ready to be flowed back. This is an added safety benefit to make sure the next stage is fractured prior to allowing the lower stages to flow.
- The Melt plug uses a check type seal vs. a ball so NO balls are floating in the well.

Item No.	Description
1	4.5 Melt Kit
2	5.5 Melt Kit
3	Green
4	Opaque
5	Blue



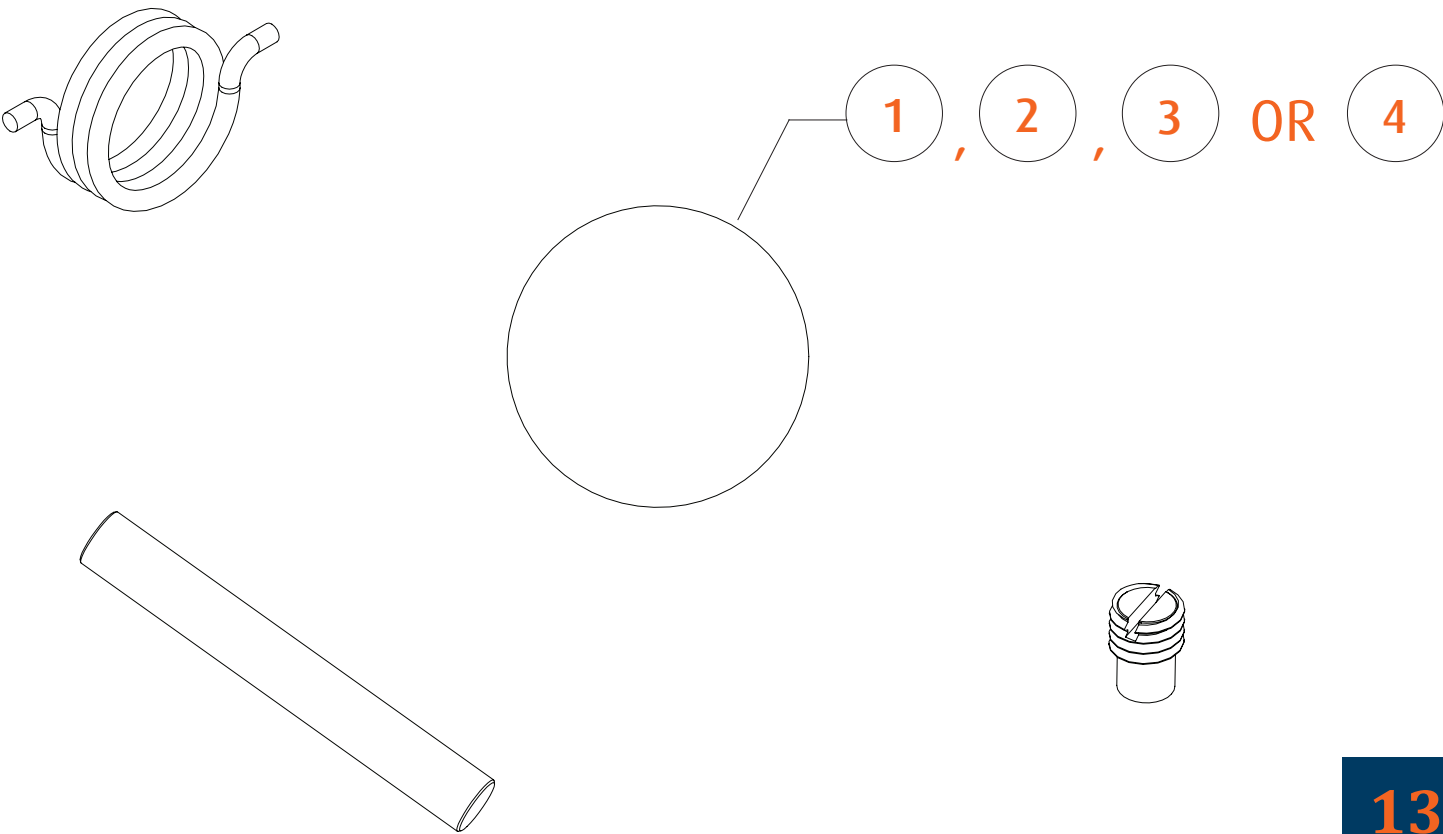
Bear Claw® melt kits are used with the soluble balls to control the time at which the plug converts from a bridge plug to a frac plug. The kit includes the composite insert, T-seal, retainer and retaining pin, the soluble balls are sold separatley.

4.5 AND 5.5 DROP BALL KITS

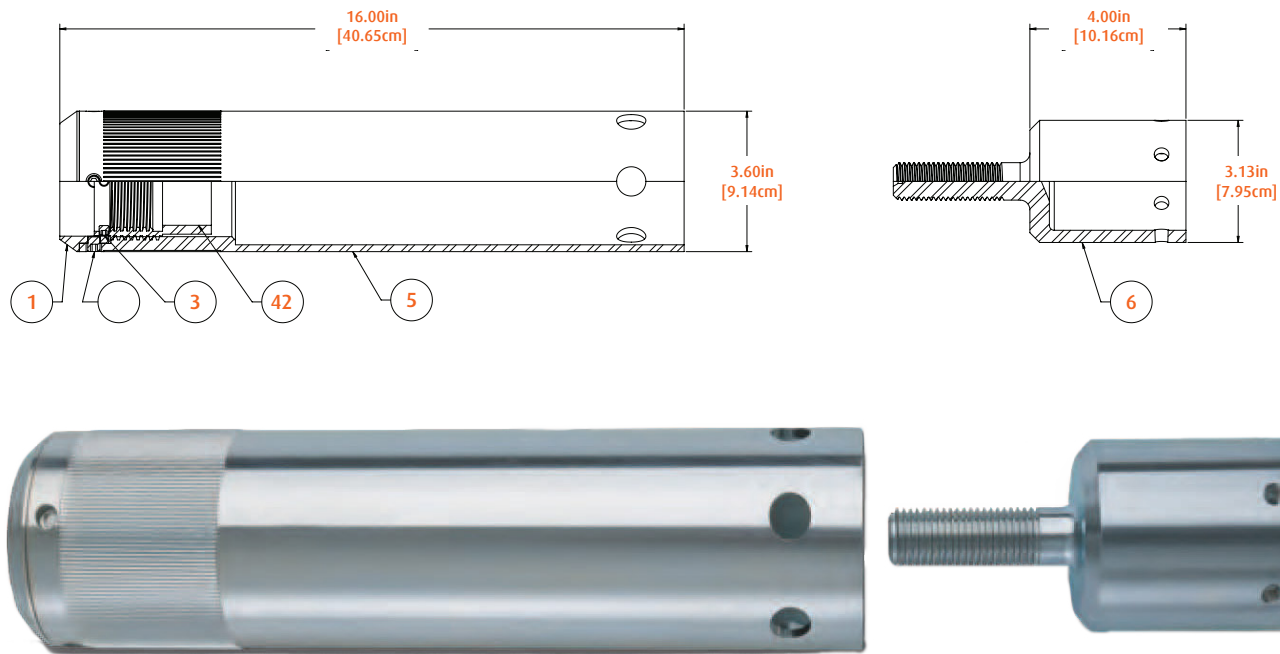
Bear Claw® Drop Ball Kits allow the operator to control the time at which a plug is converted from a flow through plug to a frac plug. The kit includes shear screws, a 1.5 inch (38.1 mm) drop ball of select density (1.32 g/cc or 1.94 g/cc), a safety spring, blocking pin and instruction sheet.

The wireline operator should follow the well owner’s requirements for drop ball operations.

Item No.	Description	Max. O.D. in [cm]
1	4.5 Drop Ball 1.32 g/cc ball	1.5 [3.81]
2	4.5 Drop Ball 1.94 g/cc ball	1.5 [3.81]
3	5.5 Drop Ball 1.32 g/cc ball	1.5 [3.81]
4	5.5 Drop Ball 1.94 g/cc ball	1.5 [3.81]



Bear Claw® 2 4.5 Setting Kit – 02299-002



Item No.	Description	Max.O.D. In [cm]	Quantity
1	Set Sleeve Cap	3.60 [9.14]	1
2	0.3125-18 Set Screw	N/A	4
3	0.25-20 Set Screw	N/A	4
4	Adapter Nut	3.00 [7.62]	1
5	Set Sleeve	3.60 [9.14]	1
6	Tension Sub	3.13 [7.95]	1

Features and Benefits

Bear Claw® setting kits are designed to be reliable and durable.

Materials

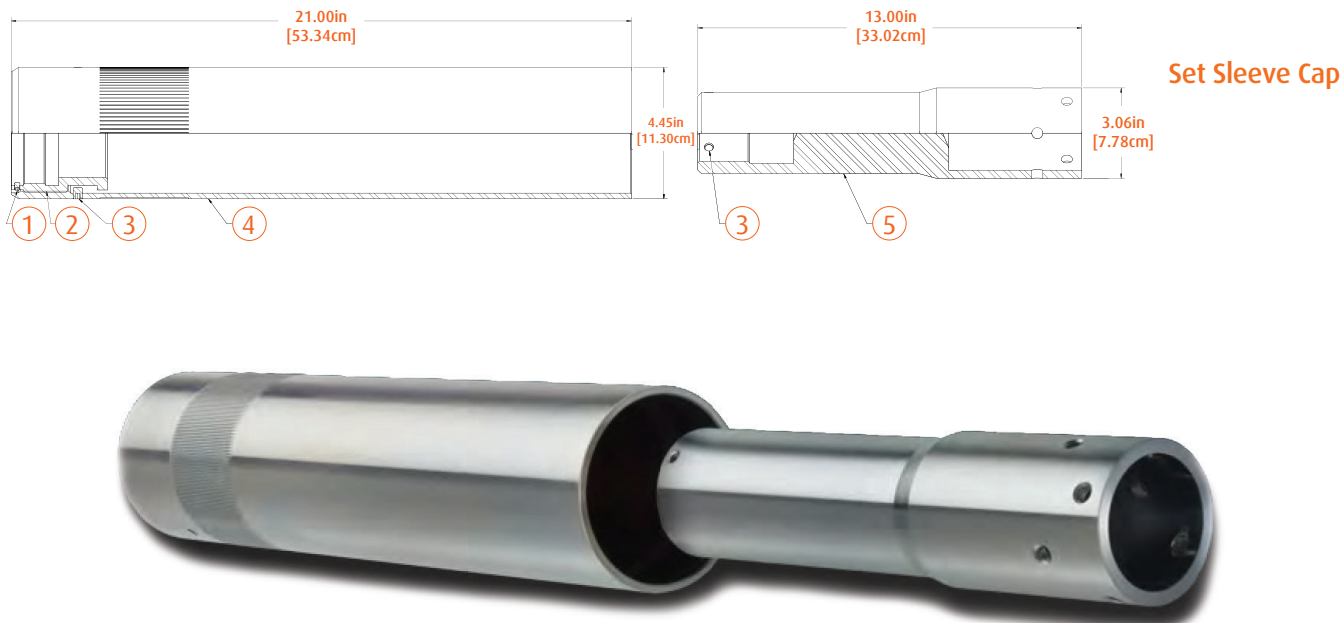
- Each part is made of high alloy steel.
- High hardness gives strength, durability and wear resistance for maximum tool life.
- Galvanic coatings provide corrosion resistance.

Design

- Each part is one piece machined from a high alloy steel tube or bar stock.
- Each component has been field tested on the setting tools for which it has been designed.
- Straight knurl on setting sleeves provides crews with the proper wrenching location and an optimum wrenching surface.
- The 02299-002 setting kit is designed for the 4.5 Bear Claw® 2 plug.

5.5 SETTING KITS – BAKER NO. 20

Bear Claw® 2 5.5 Setting Kit – 02427-001



Features and Benefits

Bear Claw® setting kits are designed to be reliable and durable.

Materials

- Each part is made of high alloy steel.
- High hardness gives strength, durability and wear resistance for maximum tool life.
- Galvanic coatings provide corrosion resistance.

Design

- Each part is one piece machined from a high alloy steel tube or bar stock.
- Each component has been field tested on the setting tools for which it has been designed.
- Straight knurl on setting sleeves provides crews with the proper wrenching location and an optimum wrenching surface.
- The 02427-001 setting kit is designed for the 5.5 Bear Claw® 2 plug.

Item No.	Description	Max.O.D. In [cm]	Quantity
1	10-24 Set Screw	N/A	2
2	Adapter Nut	4.00 [10.16]	1
3	0.3125-18 Set Screw	N/A	5
4	Set Sleeve	4.45 [11.30]	1
5	Tension Sub	3.06 [7.78]	1

The Bear Claw® Composite Plugs are designed to be rugged and reliable. The following guidelines will assure the plugs perform as expected in your particular well. Though conditions vary and not all problems may be foreseen, the recommendations below will help achieve a good set. In every case, past experience and common sense should be used. Bear Claw® can make no claims of functionality or consider warranty claims if these guidelines are not followed.

1. Plug Selection:

Use the correct plug for each well temperature and application. DO NOT exceed temperature and pressure ratings. Make sure the casing size and weight correspond to the plug's specifications. The plug rating changes depending on the quality of the casing.

2. Casing Conditions:

Casing should be cement bonded before plug use.

3. Casing Cleaning:

Use a casing scraper to remove scale, mud and any other foreign material from the casing wall. The plug cannot seal properly against a dirty casing wall.

4. Casing I.D.:

Run the appropriate size Gage Ring with a Junk Basket to ensure the well bore is large enough to permit passage of the plug.

5. Setting Tools:

Use only the setting tool or its equivalent for which the setting sleeve and tension sub were designed. **DO NOT SUBSTITUTE SETTING TOOLS.**

6. Setting Tool Maintenance:

The setting tool should be well maintained, oiled, cleaned, inspected and repacked before each setting operation. Replace O-rings after every use. Oil levels, O-ring materials and tool setting should be in accordance with the manufacturers' instructions for your well environment. DO NOT use setting tools with loose bottom adapters or pistons.

7. Power Charges:

Use Standard or fast burning power charges with burn times less than ten seconds. Some brands of slow burning charges don't provide enough energy at the end of stroke to assure clean separation.

8. Setting Adapters:

Setting adapters consist of a setting sleeve and tension sub. Use only setting adapters designed specifically for Bear Claw® plugs and the setting tool you are using.

9. Tension Sub Preparation:

Apply a light coating of petroleum based lubricant to the inside diameter of the tension sub. This prevents rust from forming between the tension sub and composite mandrel in the event that the assembled hardware gets wet and is left to sit for several days before use. If applicable, thread the safety spring or lock washer on the end of the tension sub.

10. Shear Screw Installation:

Use ALL custom 3/8-16 UNC-2A dog point shear screws provided with the plug. DO NOT use substitute shear screws. Each shear screw must be fully threaded into the hole to shear properly. Tighten each screw until it lightly touches the bottom of the hole. DO NOT over-tighten. If fewer than all six (4.5" plugs) or all eight (5.5" plugs) shear screws are used, there may be a corresponding reduction in pack off energy transferred to the element system.

11. Setting Sleeve Installation:

Apply a generous amount of lubricant on the threads. This keeps sand out of the threads. The amount of sand getting into the threads can be reduced by applying a couple of layers of electrical tape or similar over the gap between the sleeve and setting tool outer diameter. Thread the setting sleeve until it is securely fastened to the setting tool and lightly touches the push sleeve. HAND TIGHTEN; DO NOT wrench. For Baker #10 and #20 setting tools, back off the sleeve 1/4 to 1/2 turn. This reduces the chances of premature set if the Baker setting tool strokes while being lowered into the well.

12. Plug Handling:

Bear Claw® plugs are built to be rugged but should not be abused. To avoid potential problems it is best to not allow the Setting Tool weight to rest on the Plug which may crack the slips and cause premature setting.

13. Well Conditions:

The well should be thoroughly flushed and free of sand at the target setting depth. ALS Wellvention recommends the well be flushed after fracturing with twice the well's volume of water and/or that one wait a minimum of four (4) hours after fracturing before running the next plug to allow sand to settle from the casing. A poor flush or failure to wait the recommended time increases the risk of: 1) premature set due to a collision with sand bridges; 2) the setting tool being "sanded in" and becoming locked inside the casing. Set the plug at the desired depth under static well conditions.

14. Casing Collars:

Never set a plug in casing collar.

15. Run Speed:

Guide the Plug and Setting Tool through the lubricators, wellhead and blowout preventer. The wireline operator should follow the well owner's requirements on plug run speeds. If the well owner has no requirements, then the wireline operator should follow their best judgment in choosing a run speed based on the well conditions. Bear Claw® plugs have been successfully run under the following conditions:

Well Description	Max Run Speed [m/min]		
	4.5 ft/min [m/min]	5.0 ft/min [m/min]	5.5 ft/min [m/min]
Vertical wells that have been cleaned and flushed:	300 [91]	200 [61]	200 [61]
Vertical wells that have experienced flow back with sand:	200 [61]	150 [46]	150 [46]
Deviated wells that have been cleaned and flushed:	250 [76]	150 [46]	150 [46]
Deviated wells that have experienced flow back with sand:	150 [46]	150 [31]	150 [31]

Note: Slow down for liners, bends and other restrictions. Avoid colliding with the well bottom, other tools, etc.

16. Pump Down Parameters:

4.5 Bear Claw® plugs are routinely pumped down at 4 to 7 BPM [0.64 to 1.1 m3 /min]. in 11.6 to 15.1 lb/ft [17.26 to 22.47 kg/m]. 5.5 Bear Claw® plugs are pumped down at 12 to 15 BPM [1.9 to 2.4 m3 /min] in 20 lb/ft [29.76 kg/m] casing.

18. Setting Sleeve Removal:

Once pulled from the well, the setting sleeve can be removed using a pair of pipe wrenches. Rotate the sleeve back and forth to break loose any trapped sand. Lightly bang on the sleeve above the threads to break loose sand particles. Clean the sleeve's threads using a toilet brush and a bucket of water or diesel fuel to remove the remaining sand.

17. Retrieval Speed:

In the event of a setting tool misfire or other problem, the wireline operator should follow the well owner's requirements for plug retrieval speeds. If the well owner has no requirements then the wireline operator should follow their best judgment in choosing a retrieval speed based on well conditions. In lieu of any other well information ALS Wellvention recommends the following retrieval speeds:

Vertical wells that have been clean and flushed:
200 feet [61 m] per minute max.

Deviated wells that have been clean and flushed:
100 feet [31 m] per minute max.

19. Tension Sub Removal:

The tension sub can be unscrewed by hand or with a pipe wrench. Remove the safety spring using a pair of pliers. Brush the threads to remove any sand. Remove the shear screws by turning them clockwise until they fall into the tension sub. The tension sub is now ready for use.

The purpose of this document is to provide a written procedure for composite bridge plug removal using ALS Wellvention equipment and personnel in Canada.

Responsibilities

- It is the responsibility of Top Management that this procedure is implemented in full.
- It is the responsibility of District Personnel to follow this procedure.
- If there is a need to deviate from the following procedure, personnel are to contact their supervisor for approval and record the deviation in the job log.

Detailed Procedure

NOTE: All critical dimensions of equipment shall be recorded prior to deployment into the well using the Load-out Worksheet and kept with the well file.

1. Set up Hydraulic Disconnect to conform to well parameters; do the same for the Dual Actuated Circulating Valve.
2. Make up Coiled Tubing Connector to coiled tubing. Pull test the Coiled Tubing Connector to a value as per the operator's procedures. Pump the largest ball necessary for the operation through the coiled tubing reel to ensure the tubing is free of restrictions (If applicable).
3. Install Pull Plate and pressure test Coil Connector as per well requirements.

Make up the rest of the tool string as follows or as instructed by Calgary operations:
ALS Wellvention Dual Flapper Check Valve
ALS Wellvention Hydraulic Bi-Directional Jar
ALS Wellvention Hydraulic Disconnect
ALS Wellvention Dual Actuated Circulating Sub
ALS Wellvention Fixed Blade Stabilizer
ALS Wellvention HyperDrill Max Motor
ALS Wellvention Eliminator Plug Mill
(Other tools may be ran in string. e.g. junk baskets, friction breaker, bypass subs, anti-stall tool, etc)

4. Pick tool string up into lubricator and test lubricator as per operating company's procedures. Bleed off pressure test and open master valve. RIH.
5. Run tools in hole at moderate rate of speed, slow running-speed at all tubing restrictions. Take up & down weight readings every 300 meters (as per coil requirements). Circulation through the coiled tubing is possible while running in the hole. Keep circulation rate moderate while running in the hole.

6. At anticipated plug depth slow down and tag lightly. Pick up after tag at least 10m and bring pump rate up to desired rate (as per Motor specs) and establish off bottom pressure and weights.

7. RIH slowly and lightly tag plug and begin milling. Use minimal set down weight and observe operating differential specs.

NOTE: Should a stall occur then shut down pumps and allow tubing pressure to fall. When tubing pressure is down pick up off bottom and re-start pumps and again establish off bottom pressure and weights. Then continue with milling.

8. When the plug is milled off chase remains down to next plug, continue to mill bottom of top plug and the next plug.

9. Continue steps 1 through 9 on additional plugs. Utilize ALS Wellvention field personnel guidance for well cleaning, debris management, and wiper trips between plugs. When last plug is drilled circulate well clean.

NOTE: Should there be a need to kick the well around with Nitrogen, or to spot chemical, then launch required ball for the Dual Actuated Circulating valve and shift the valve into the open position and circulate freely with Nitrogen. This prevents the nitrogen from passing through the motor.

NOTE: Once the Dual Actuated Circulating valve has been shifted there is no longer a flow path to the motor. Therefore there is no longer an option to mill. Once the valve is shifted all drilling/ milling operations are ceased.

10. Pull out of the hole. Break down tools as per ALS Wellvention field personnel on location.

11. Records: All milling records are retained and copies delivered to customer.

Examples of cuttings from properly milled Bear Claw® plugs.



NOTE:

It is preferred to take a less aggressive approach and mill or grind the plug into small pieces to minimize debris size for particle management.

Be warned that excessive pump rates may lift the drill string and mill off the plug (aka hydraulic lock). This will lead to increased milling times.

PRODUCT ADVISORY

ALS Wellvention has received reports where users of 4.5" Bear Claw® Composite Plugs have experienced problems separating from the setting tool after set. The problem is limited to 4.5" Composite Plugs with Baker No. 10 setting tools or equivalent and some slow burning charges including the Diamondback Industries BPC-1300-010 / #10 Slow Set Power Charge and the Titan Specialties Slow Burn Power Charges.

The problem is that although the plug has been properly set and the shear screws have performed as designed, there is not enough force left in the setting tool at the end of the stroke to push the tension sub completely off the end of the plug's composite mandrel. This leaves the tool string lightly stuck to the end of the plug.

Wireline crews have achieved complete separation from the plug by pulling 1,000 to 2,000 lbs. tension on the wireline. In some cases, it has been necessary to flow water and pressurize the casing above the plug to 800 to 1,800 psi. In no case have they been forced to break the wireline and fish the tool string.

ALS Wellvention strongly suggests the following measures to prevent such an occurrence.

- 1. Power Charges:** Use only standard or fast burning power charges!
- 2. Shear Screw Installation:** Each shear screw must be fully threaded into the hole to shear properly. *Tighten each screw until it lightly touches the bottom of the hole.* DO NOT over-tighten.
 - If setting a bridge or kill plug use **ONLY standard or fast burning charges and ALL SIX (6) custom** 3/8 x 16 UNC -2A dog point shear screws provided with the plug.
 - If circumstances dictate using a frac or Melt plug AND a slow burning charge install the Tension Sub using **ONLY FIVE (5) custom** shear screws provided with the plug.
 - Otherwise, 4.5" Bear Claw® frac, melt and bridge plugs should be set with **standard or fast burning charges and ALL SIX (6) custom** shear screws provided with the plug.
- 3. Setting Tools:** Use only the setting tool or its EQUIVALENT for which the setting sleeve and tension sub were designed. Setting adapters are available for Baker No. 10 and Halliburton 2 1/2 Shorty setting tools. **DO NOT SUBSTITUTE SETTING TOOLS!**

- 4. Setting Tool Maintenance:** The setting tool should be well maintained, oiled, cleaned, inspected and repacked before each setting operation. Replace O-rings after every use. Oil levels, O-ring materials and tool settings should be in accordance with the manufacturers' instructions for your well environment. Do NOT use setting tools with loose bottom adapters or pistons.
- 5. Setting Adapters:** Setting adapters consist of a setting sleeve and tension sub (i.e. mandrel). Use only setting adapters designed specifically for Bear Claw® plugs and the setting tool you are using.
- 6. Tension Sub Preparation:** Apply a light coating of low viscosity petroleum based lubricant to the inside diameter of the tension sub. The lubricant reduces the load needed to push the tension sub off the plug's composite mandrel after the shear screws have sheared off.
- 7. Setting Sleeve Installation:** Thread the Setting Sleeve until it is securely fastened to the setting tool and lightly touches the slips. **Hand tighten; DO NOT wrench! For Baker No. 10 setting tools, back off the sleeve 1/4 to 1/2 turn.** This reduces the chances of a premature set if the Baker setting tool strokes while being lowered into the well.



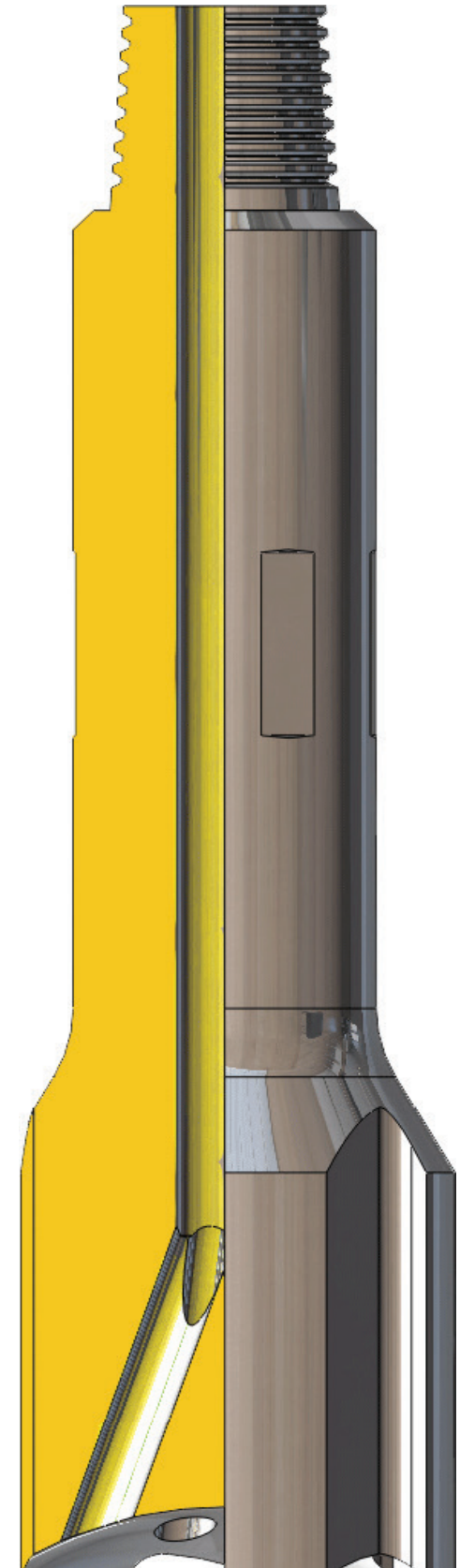
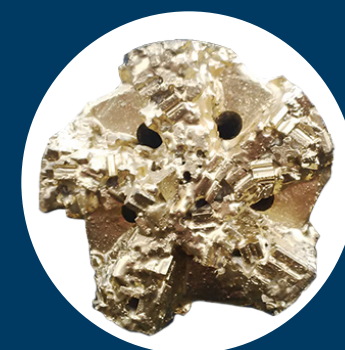
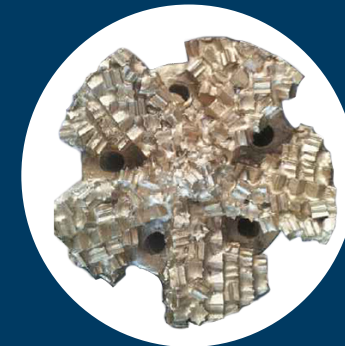
ELIMINATOR MILL

Description

Starbide dressed face backed with full carbide row buttons and gauge protection for longevity. All mills built with back milling capability. Unmatched performance for both individual and multiple plug removal applications.

Features and Benefits

- Fully engineered
- Cement milling
- Frac Seat milling
- Composite plug milling
- Specialty designs and sizes available





Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

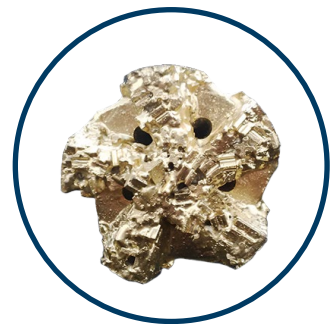
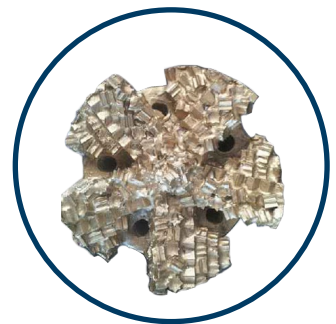
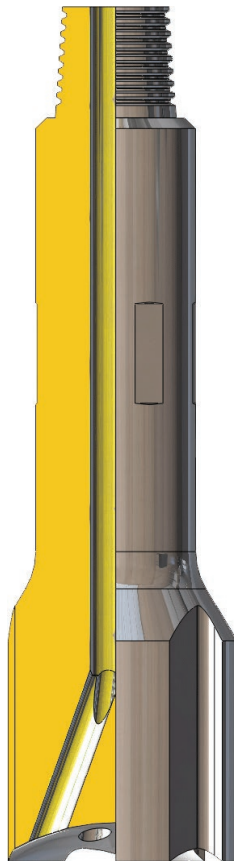
www.dsithrutubing.ca

www.alsoilandgas.com

Eliminator Mill

Starbide dressed face backed with full carbide row buttons and gauge protection for longevity.

All mills built with back milling capability. Unmatched performance for both individual and multiple plug removal applications.



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

ERT-Pro Extended Reach Tool

Revolutionary Extended Reach Tool utilizing a combination of jet-pulse and eccentric rotational technology to create forces effectively breaking static friction in wellbores.

FEATURES AND BENEFITS

- Steel Body and Internals (Nitrogen Friendly)
- Long Run Life (10-15 run minimum per unit)
- Simple Maintenance When Not In Use
- Multi-Fluid Compatibility
- Higher Flow Areas for High Solids Compatibility
- Short Make-Up Length for Overall Shorter BHA

TECHNICAL SPECIFICATIONS

DIAMETER	2.125" (54MM)	2.875" (73MM)
THREAD CONNECTION	1.50" AMMT	2.38" PAC
OVERALL LENGTH/WEIGHT	17.75"/13 LBS	24"/30 LBS
OPERATING RANGE	1 BPM - 2.5 BPM	2 - 4 BPM
PRESSURE DROP RANGE	350 - 450 PSI	350 -0450 PSI
MAX OVERPULL	80,000 LBS	110,000 LBS
MAX OVERPULL TEMP	500°	500°



Wellvention
ALS Oil & Gas

830 444-5th Avenue S.W
Calgary, AB, T2P 2T8
T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

External Dimple Coil Connector

The External Dimple Coil Connector is used for connecting the BHA to the coiled tubing.

Recesses are formed using a dimpling bolt to dimple the tubing wall prior to installing the grub screws into the coil connector. The screws are then tightened through the body of the connector into the recesses in the coiled tubing OD.

FEATURES AND BENEFITS

- Compact one piece design
- Dual internal seals
- Standard o-rings and U-cup seals make redressing simple and cost-effective
- Available in a variety of sizes



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

FlowMaster

FLOWMASTER

FEATURES AND BENEFITS

- Large Bore
- Simple Design
- Drop Balls Optional
- Rated for up to 600°F
- Rated for 10,000 psi (68.9MPa) Frac Pressure
- Internal Pressure Assisted Anchoring
- Proven Technology
- Easily Milled if Required



AVAILABLE SIZES

Casing Size	Casing Weight	Casing ID	Tool OD	Tool ID
in (mm)	lb/ft (kg/m)	in (mm)	in (mm)	in (mm)
4.5 (114.3)	9.5 - 13.5 (14.14 - 20.09)	3.920 - 4.090 (99.60 - 103.90)	3.750 (95.25)	2.668 (67.77)
	15.1 (22.47)	3.826 (97.20)	3.600 (91.44)	2.500 (63.50)
5.0 (127.0)	15.0 - 21.4 (22.32 - 31.85)	4.126 - 4.408 (111.96 - 104.80)	3.968 (100.79)	2.668 (67.77)
5.5 (139.7)	13.0 - 17.0 (19.35 - 25.30)	4.892 - 5.044 (124.30 - 128.12)	4.532 (115.11)	3.000 (76.20)
	17.0 - 23.0 (25.30 - 34.23)	4.670 - 4.892 (118.60 - 124.30)	4.438 (112.73)	3.000 (76.20)
	23.0 - 26.0 (34.23 - 38.69)	4.548 - 4.670 (115.50 - 118.60)	4.250 (107.95)	2.668 (67.77)



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

HyperDrill 1.688" (43mm) 5/6 2.3 Stage

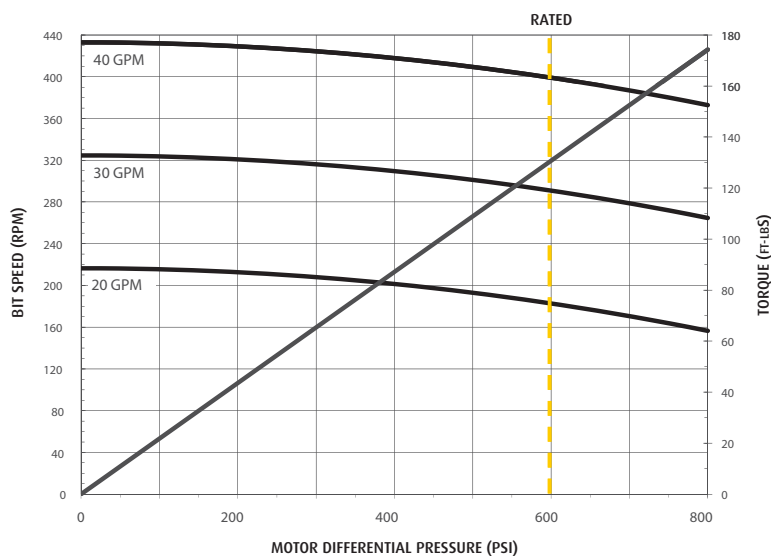
PERFORMANCE SUMMARY

Recommended Operating Limits	
FLOW RANGE GPM (LPM)	20-40 (76-151)
SPEED (RPM)	216-433
ROTATION REV/GAL (REV/L)	10.82 (2.86)
OFF-BOTTOM PSI (KPA)	150 (1034)

ELASTOMETER		STD
PRESSURE	OPTIMAL LOAD	600 (4137)
PSI (KPA)	STALL	800 (5516)
TORQUE	OPTIMAL LOAD	131 (178)
FT-LBS (NM)	STALL	175 (237)

SPECIFICATIONS

OVERALL MOTOR LENGTH FT (M)	7.8 (2.4)
OVERALL MOTOR WEIGHT LBS (KG)	40 (18)
ON BOTTOM LOAD CAP LBS (DAN)	3000 (1350)
OFF BOTTOM LOAD CAP LBS (DAN)	1000 (450)
MAX PULL AT BIT TO FAIL BEARING LBS (DAN)	31400 (14000)
MAX PULL AT BODY TO YIELD LBS (DAN)	52000 (23130)
MAX TEMP °F (°C)	300 (150)
MATERIAL	4140 HT L80
ROTOR COATING	CHROME
THREAD	1" MT BOX X 1" MT BOX



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

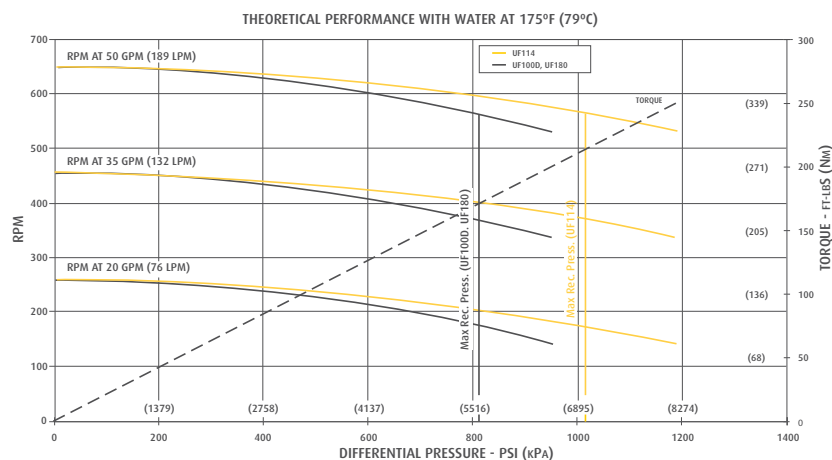
HyperDrill 2.125" (54mm) 5/6 6.0 Stage

PERFORMANCE SUMMARY

Recommended Operating Limits		ELASTOMETER		STD
FLOW RANGE GPM (LPM)	20-50 (75-190)	PRESSURE	OPTIMAL LOAD	1050 (7240)
SPEED (RPM)	260-650	PSI (KPA)	STALL	1200 (8275)
ROTATION REV/GAL (REV/L)	13.02 (3.44)	TORQUE	OPTIMAL LOAD	230 (312)
OFF-BOTTOM PSI (KPA)	97 (670)	FT-LBS (NM)	STALL	255 (346)

SPECIFICATIONS

OVERALL MOTOR LENGTH FT (M)	11.58 (3.53)
OVERALL MOTOR WEIGHT LBS (KG)	92.5 (41.96)
ON BOTTOM LOAD CAP LBS (DAN)	9300 (4136)
OFF BOTTOM LOAD CAP LBS (DAN)	9300 (4136)
MAX PULL AT BIT TO FAIL BEARING LBS (DAN)	26500 (11700)
MAX PULL AT BODY TO YIELD LBS (DAN)	149625 (66556)
MAX TEMP °F (°C)	300 (150)
MATERIAL	17-4 STAINLESS STEEL
ROTOR COATING	CHROME
THREAD	1 1/2" MT BOX X 1 1/2" MT BOX



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

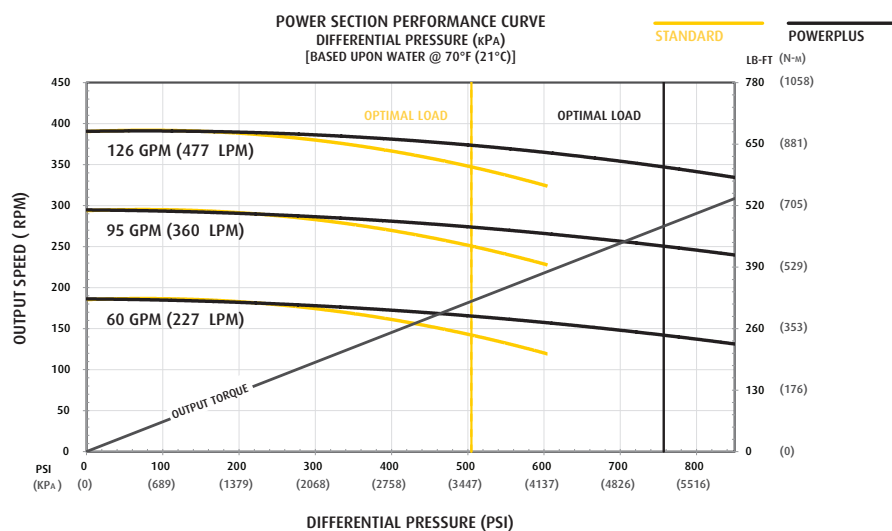
HyperDrill 2.875" (73mm) 5/6 3.5 Stage

PERFORMANCE SUMMARY

Recommended Operating Limits		ELASTOMETER		STD	POWER PLUS
FLOW RANGE GPM (LPM)	60-126 (227-477)	PRESSURE	OPTIMAL LOAD	505 (3480)	757 (5220)
SPEED (RPM)	186-391	PSI (KPA)	STALL	1338 (9225)	2006 (13830)
ROTATION REV/GAL (REV/L)	3.1 (0.82)	TORQUE	OPTIMAL LOAD	315 (427)	472 (640)
OFF-BOTTOM PSI (KPA)	95 (655)	FT-LBS (NM)	STALL	834 (1130)	1251 (1695)

SPECIFICATIONS

OVERALL MOTOR LENGTH FT (M)	12.1 (3.68)
OVERALL MOTOR WEIGHT LBS (KG)	135 (61)
ON BOTTOM LOAD CAP LBS (DAN)	8000 (3560)
OFF BOTTOM LOAD CAP LBS (DAN)	2200 (1000)
MAX PULL AT BIT TO FAIL BEARING LBS (DAN)	40000 (17780)
MAX PULL AT BODY TO YIELD LBS (DAN)	90000 (40000)
MAX TEMP °F (°C)	329 (165)
MATERIAL	4140 HT L80
ROTOR COATING	CARBIDE OR CHROME
THREAD	2 3/8" PAC BOX X 2 3/8" PAC BOX



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

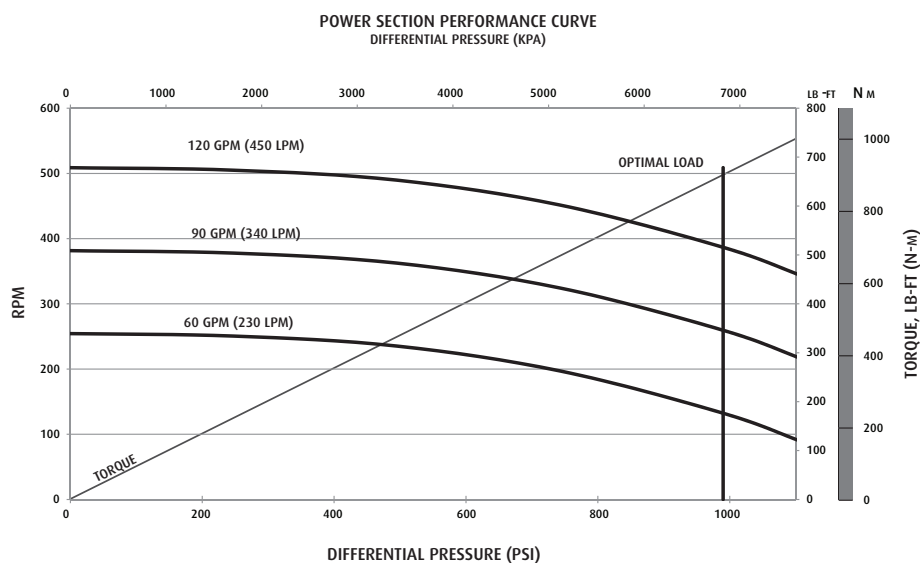
HyperDrill MAX 2.875" (73mm) 5/6 3.3 Stage

PERFORMANCE SUMMARY

Recommended Operating Limits		ELASTOMETER		ERZ - HP
FLOW RANGE GPM (LPM)	60-120 (230-450)	PRESSURE	OPTIMAL LOAD	990 (6830)
SPEED (RPM)	250-510	PSI (KPA)	STALL	1490 (10270)
ROTATION REV/GAL (REV/L)	4.24 (1.12)	TORQUE	OPTIMAL LOAD	660 (895)
OFF-BOTTOM PSI (KPA)	150 (1034)	FT-LBS (NM)	STALL	1000 (1356)

SPECIFICATIONS

OVERALL MOTOR LENGTH FT (M)	11.5 (3.49)
OVERALL MOTOR WEIGHT LBS (KG)	130 (59)
ON BOTTOM LOAD CAP LBS (DAN)	13280 (5910)
OFF BOTTOM LOAD CAP LBS (DAN)	13280 (5910)
MAX PULL AT BIT TO FAIL BEARING LBS (DAN)	37000 (16460)
MAX PULL AT BODY TO YIELD LBS (DAN)	145000 (64500)
MAX TEMP °F (°C)	329 (165)
MATERIAL	4140 HT L80
ROTOR COATING	CARBIDE OR CHROME
THREAD	2 3/8" PAC BOX X 2 3/8" PAC BOX



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

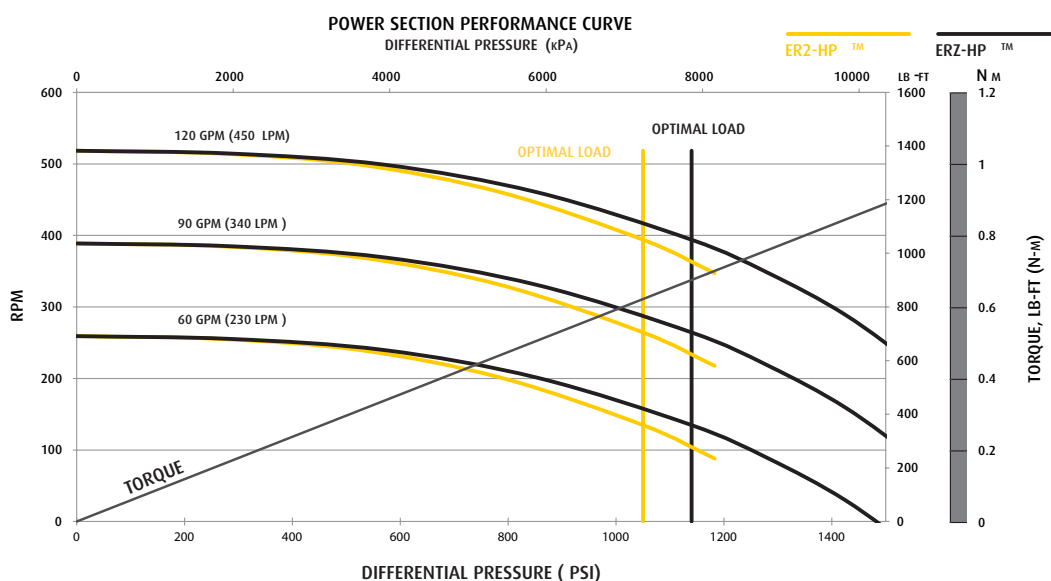
HyperDrill MAX 2.875" (73mm) 5/6 3.5 Stage

PERFORMANCE SUMMARY

Recommended Operating Limits		ELASTOMETER		ER2-HP	ERZ-HP
FLOW RANGE GPM (LPM)	60-120 (230-450)	PRESSURE	OPTIMAL LOAD	1050 (7240)	1140 (7860)
SPEED (RPM)	260-520	PSI (kPA)	STALL	1580 (10890)	1710 (11790)
ROTATION REV/GAL (REV/L)	4.32 (1.14)	TORQUE	OPTIMAL LOAD	830 (1125)	900 (1220)
OFF-BOTTOM PSI (KPA)	50 (345)	FT-LBS (NM)	STALL	1250 (1695)	1350 (1830)

SPECIFICATIONS

OVERALL MOTOR LENGTH FT (M)	12.1 (3.68)
OVERALL MOTOR WEIGHT LBS (KG)	135 (61)
ON BOTTOM LOAD CAP LBS (DAN)	8000 (3560)
OFF BOTTOM LOAD CAP LBS (DAN)	2200 (1000)
MAX PULL AT BIT TO FAIL BEARING LBS (DAN)	40000 (17780)
MAX PULL AT BODY TO YIELD LBS (DAN)	90000 (40000)
MAX TEMP °F (°C)	329 (165)
MATERIAL	4140 HT L80
ROTOR COATING	CARBIDE OR CHROME
THREAD	2 3/8" PAC BOX X 2 3/8" PAC BOX



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

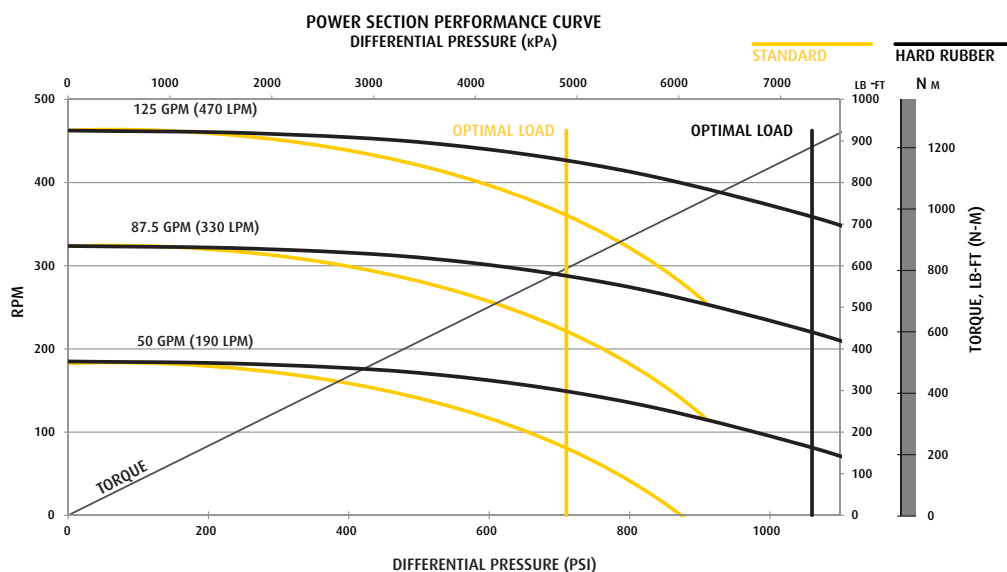
HyperDrill MAX 2.875" (73mm) 5/6 4.7 Stage

PERFORMANCE SUMMARY

Recommended Operating Limits		ELASTOMETER		STD	HR
FLOW RANGE GPM (LPM)	50-148 (190-560)	PRESSURE	OPTIMAL LOAD	710 (4900)	1060 (7310)
SPEED (RPM)	190-460	PSI (kPA)	STALL	1070 (7380)	1590 (10960)
ROTATION REV/GAL (REV/L)	3.7 (0.98)	TORQUE	OPTIMAL LOAD	590 (800)	880 (1193)
OFF-BOTTOM PSI (KPA)	50 (345)	FT-LBS (NM)	STALL	890 (1207)	1320 (1790)

SPECIFICATIONS

OVERALL MOTOR LENGTH FT (M)	11.9 (3.63)
OVERALL MOTOR WEIGHT LBS (KG)	138 (63)
ON BOTTOM LOAD CAP LBS (DAN)	8000 (3560)
OFF BOTTOM LOAD CAP LBS (DAN)	2200 (1000)
MAX PULL AT BIT TO FAIL BEARING LBS (DAN)	40000 (17780)
MAX PULL AT BODY TO YIELD LBS (DAN)	90000 (40000)
MAX TEMP °F (°C)	329 (165)
MATERIAL	4140 HT L80
ROTOR COATING	CARBIDE OR CHROME
THREAD	2 3/8" PAC BOX X 2 3/8" PAC BOX



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

HyperDrill 2.875" (73mm) 5/6 3.5 Stage

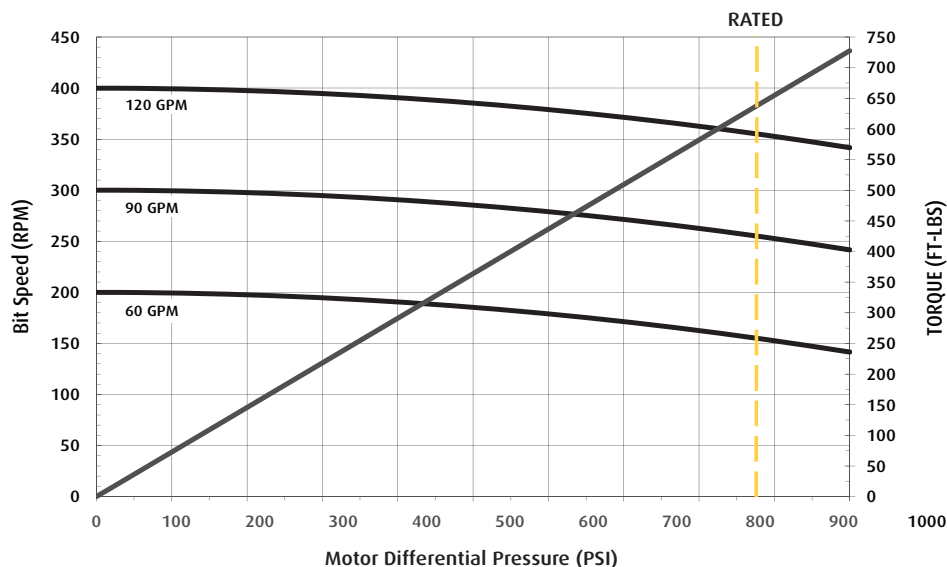
PERFORMANCE SUMMARY

Recommended Operating Limits	
FLOW RANGE GPM (LPM)	60-120 (225-477)
SPEED (RPM)	200-400
ROTATION REV/GAL (REV/L)	3.33 (0.88)
OFF-BOTTOM PSI (KPA)	75 (517)

ELASTOMETER		STD
PRESSURE	OPTIMAL LOAD	875 (6033)
PSI (KPA)	STALL	1000 (6895)
TORQUE	OPTIMAL LOAD	637 (864)
FT-LBS (NM)	STALL	730 (990)

SPECIFICATIONS

OVERALL MOTOR LENGTH FT (M)	12.0 (3.7)
OVERALL MOTOR WEIGHT LBS (KG)	205 (93)
ON BOTTOM LOAD CAP LBS (DAN)	8000 (3560)
OFF BOTTOM LOAD CAP LBS (DAN)	2200 (1000)
MAX PULL AT BIT TO FAIL BEARING LBS (DAN)	40000 (17780)
MAX PULL AT BODY TO YIELD LBS (DAN)	90000 (40000)
MAX TEMP °F (°C)	329 (165)
MATERIAL	4140 HT L80
ROTOR COATING	CARBIDE OR CHROME
THREAD	2 3/8" PAC BOX X 2 3/8" PAC BOX



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

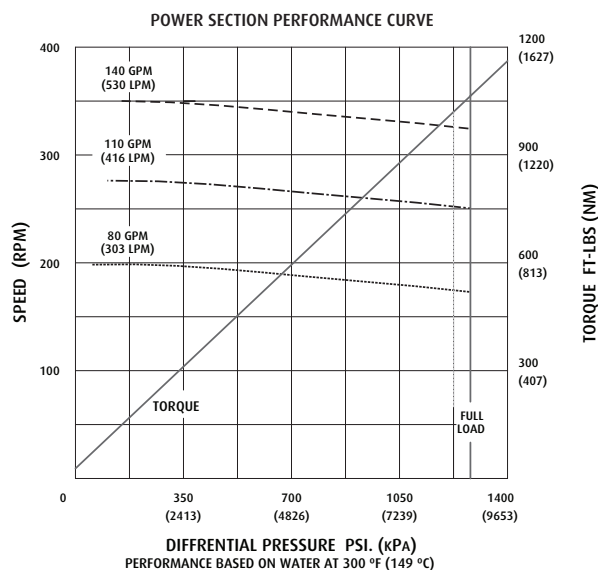
HyperDrill MAX 3.125" (79mm) 5/6 3.2 Stage

PERFORMANCE SUMMARY

Recommended Operating Limits		ELASTOMETER		STD
FLOW RANGE GPM (LPM)	50-153 (190-580)	PRESSURE	OPTIMAL LOAD	1100 (7584)
SPEED (RPM)	173-350	PSI (kPA)	STALL	1500 (10342)
ROTATION REV/GAL (REV/L)	2.24 (0.59)	TORQUE	OPTIMAL LOAD	975 (1322)
OFF-BOTTOM PSI (KPA)	125 (862)	FT-LBS (NM)	STALL	1200 (1627)

SPECIFICATIONS

OVERALL MOTOR LENGTH FT (M)	13.7 (4.18)
OVERALL MOTOR WEIGHT LBS (KG)	291 (132)
ON BOTTOM LOAD CAP LBS (DAN)	28230 (12832)
OFF BOTTOM LOAD CAP LBS (DAN)	28230 (12832)
MAX PULL AT BIT TO FAIL BEARING LBS (DAN)	83000 (37727)
MAX PULL AT BODY TO YIELD LBS (DAN)	150000 (68182)
MAX TEMP °F (°C)	320 (160)
MATERIAL	4140 HT L80
ROTOR COATING	CHROME
THREAD	2 3/8" REG BOX X 2 3/8" REG BOX



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

Motorhead Assembly

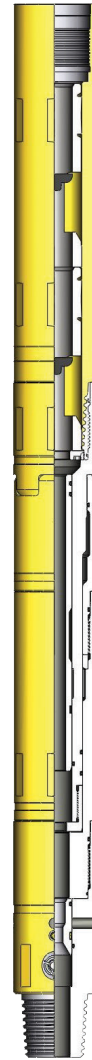
The Motorhead Assembly combines the dual flapper check valve with the heavy duty hydraulic disconnect, as well as a dual activated circulation sub.

The choice of tubing connector is not dictated by the Motorhead, therefore giving the operator the flexibility to choose the most appropriate connector to suit the application. With a considerable reduction in the number of component parts, seals and thread connections, the Motorhead Assembly is uncomplicated to assemble/ disassemble and inexpensive to redress.

Features and Benefits

- Includes ball operated circulation sub with burst disk backup
- Dual flapper check valves
- Heavy duty hydraulic disconnect
- Dual circulation

TOOL OD INCHES (MM)	TOOL ID INCHES (MM)	CONNECTIONS	TEMP RATING F° (C°)	PSI (MPA)
1.688 (42.9)	.50 (12.7)	As Requested	302° (150°)	10,000 (70)
2.125 (53.9)	.60 (15.2)	As Requested	302° (150°)	10,000 (70)
2.375 (60.32)	.75 (19)	As Requested	302° (150°)	10,000 (70)
2.875 (73.9)	.75 (19)	As Requested	302° (150°)	10,000 (70)



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

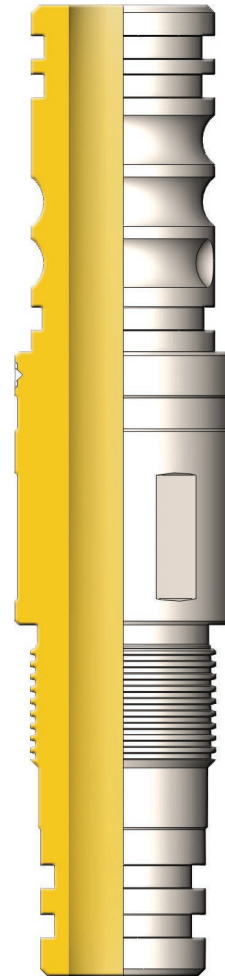
Roll-On Connector

The coiled tubing Roll-On Connector connects coiled tubing to the tool string.

To install, the weld bead and burrs are removed from the end of the coiled tubing and the Roll-On Connector is inserted through the end. A hardened roller wheel on the installation tool crimps the coiled tubing into the connector grooves.

Features and Benefits

- Safe and cost-effective method of joining coiled tubing and tool strings
- Available as a thread-down or box-down configuration
- Roll-on x Roll-on features three roll-on groove per side, providing a high-strength joint
- Easy field service
- Complete range of sizes and configurations available



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

SpinCat™ Rotary Tool

The SpinCat™ family features four models, each one specific to different coil tubing sizes.

Our newest model is the SC-287 (See the chart below). All SpinCat™ models are self-rotating and easy to maintain in the field.

FEATURES AND BENEFITS

- Rotating assembly for Complete Coverage
- Simple Maintenance - Field Serviceable
- Durable Fluoro-Elastomer Seals
- Replaceable 1/8" Attack-Tip™ Nozzles
- Computerized Diagnostic Analysis
- Controlled Rotation - Increases Dwell Time



SpinCat™ Specifications

Model	SC-168™	SC-212™	SC-250™	SC-287™
Max. Pressure	5,000 psi 345 bar	5,000 psi 345 bar	5,000 psi 345 bar	5,000 psi 345 bar
Flow Range	0.7 - 1.3 bpm 111 - 207 lpm	0.8 - 2.0 bpm 127 - 318 lpm	1.0 - 3.0 bpm 160 - 480 lpm	1.0 - 3.0 bpm 160 - 480 lpm
Flow Rating	2.3 Cv	4.6 Cv	7.5 Cv	7.5 Cv
Outside Diam.	1.68 in 43 mm	2.12 in 54 mm	2.50 in 64 mm	2.87 in 73 mm
Overall Length	9.8 in 250 mm	12.3 in 312 mm	16 in 406 mm	15.6 in 396 mm
Inlet	1" AMMT	1-1/2" AMMT	1-1/2" AMMT	2-3/8" PAC
Rotation Speed	150-200 rpm	150-200 rpm	80-150 rpm	80-150 rpm
Weight	4.6 lbs 2 kg	8.9 lbs 4 kg	15.9 lbs 7.2kg	20 lbs 9.1 kg
PSI Loss @ 1 bpm	330 psi 23 bar	83 psi 6 bar	31 psi 2 bar	31 psi 2 bar
Maximum Temp	390°F 200°C	390°F 200°C	390°F 200°C	390°F 200°C



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

The Chugger

The **ONLY** generation of axial vibration tool that is capable of reaching depths of today's longest laterals. Specifically designed for success in plays that push the limits of today's technologies.

FEATURES

- Steel body, stainless steel internal components
- No elastomers
- Large flow areas
- Short overall length

BENEFITS

- Suitable for hostile environments including high temperature applications, H₂S, Acid and other aggressive fluid conditions
- Time and cost savings reaching PBD
Quicker to Depth = Quicker to Surface
- Longer life and easy maintenance due to the simplistic design of the internal moving components
- Shorter BHA
- Get to DEPTH!

SPECIFICATIONS

Tool Body OD in (mm)	2.875 (73.0)
Thread Connection	2 3/8 PAC
Length in (mm)	31.6 (805.0)
Flow Range gpm (lpm)	79-132 (300-500)
Pressure Drop Range psi (MPa)	435-1200 (3-8.3)
Temperature Rating °F (°C)	300 (150)



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

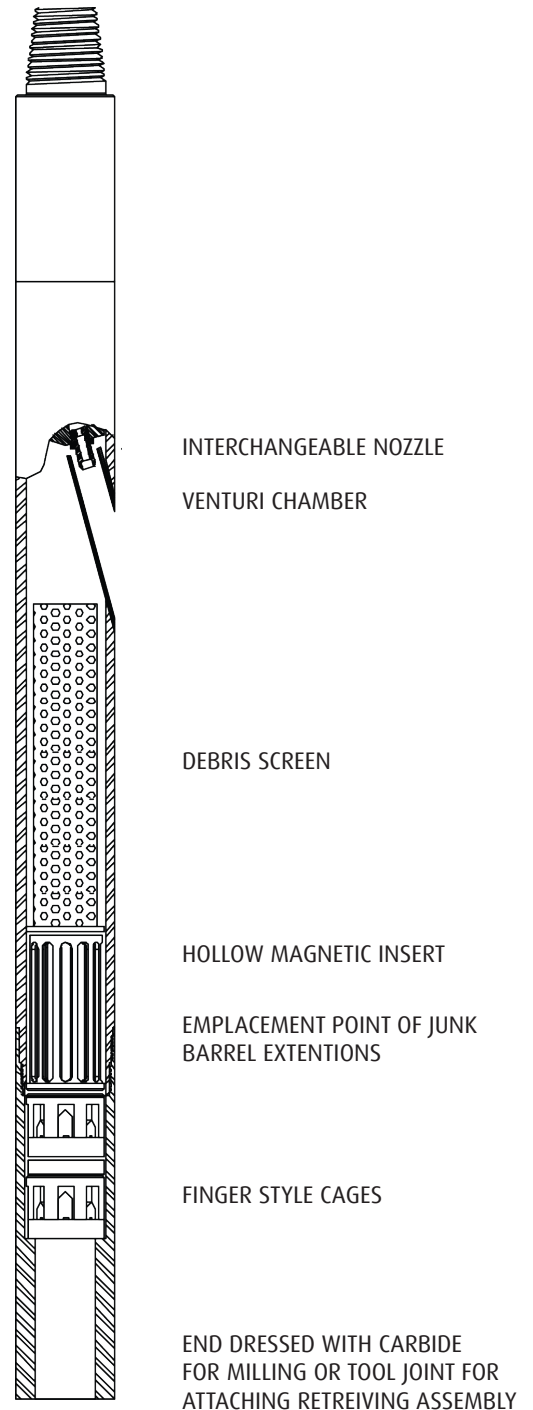
T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

Venturi Junk Basket

The tool is a high powered vacuum cleaner that may be used with fluid, nitrogenated fluids or gases.

The nozzles in the tool are simply changed out for the available pump rate, fluid, or gas. A debris screen is emplaced before the venturi chamber to prevent debris from plugging off of the venturi tubes. A hollow magnetic insert and finger style cages are used to trap and catch debris so that it may be carried out of the well inside of the tool.



Venturi Junk Basket

TOOL SPECIFICATIONS

Tool Name: 1-11/16" O.D. Venturi Jet Junk Basket	
Tool O.D.: 1.688"	Tool I.D.: 1.031"
Material Yield AISI 4140 HT	Tool Length: 32" w/ 1" MT Pin
Minimum Yield 100,000 PSI	
STRENGTH PROPERTIES OF TOOL	
Minimum Yield Point & Load to Yield: Pin Connection on Venturi Section PN-TT0320-168B-001 Load to Yield: 67,555 lbs	
Burst Point & Burst Pressure: N/A	
Torsional Weak Point & Ft-Lbs to Yield: 1-11/16" CWP connections	
Torsional: 688 ft-lbs	
RECOMMENDED MAKE UP TORQUE	
1st Connection: 1-11/16" CWP - 172 ft-lbs	

Tool Name: 2-5/8" O.D. Venturi Jet Junk Basket	
Tool O.D.: 2.625"	Tool I.D.: N/A
Material Yield AISI 4140 HT 285-341 Bhn	Tool Length: 45"
Minimum Yield 100,000 PSI	
STRENGTH PROPERTIES OF TOOL	
Minimum Yield Point & Load to Yield: Pin Connection on CWP Wash Pipe Connection 116,000 lbs. (Top Connection on tool is not taken into account since the top connection varies per customer request)	
Burst Point & Burst Pressure: Top Sub & Nozzle Carrier Rotational Connecton - 11,770 PSI, CWP Box Connection - 6,090 PSI	
Torsional Weak Point & Ft-Lbs to Yield: CWP Connections 1788 ft/lbs	
RECOMMENDED MAKE UP TORQUE	
1st Connection: Top Sub & Venturi Section CWP Connection - 450 ft/lbs	
2nd Connection: Venturi Section & Screen Housing CWP Connecton - 450 lbs.	
3rd Connection: Screen Housing & Cage Howsing CWP Connection - 450 ft/lbs	

Tool Name: 2-1/16" O.D. Venturi Jet Junk Basket	
Tool O.D.: 2.063"	Tool I.D.: 1.28"
Material Yield AISI 4140 HT	Tool Length: 38"
Minimum Yield 100,000 PSI	
STRENGTH PROPERTIES OF TOOL	
Minimum Yield Point & Load to Yield: Pin Connection on Venturi Section PN-TT0320-206A-006 Load to Yield: 86,883 lbs	
Burst Point & Burst Pressure: N/A	
Torsional Weak Point & Ft-Lbs to Yield: 2-1/16" CWP Connections	
Torsional: 1,067 ft-lbs	
RECOMMENDED MAKE UP TORQUE	
1st Connection: 2-1/16" CWP - 267 ft-lbs	

Tool Name: 3-1/8" O.D. Venturi Jet Junk Basket	
Tool O.D.: 3.13"	Tool I.D.: N/A
Material Yield AISI 4140 HT 285-341 Bhn	Tool Length: 42"
Minimum Yield 100,000 PSI	
STRENGTH PROPERTIES OF TOOL	
Minimum Yield Point & Load to Yield: 3-1/8" CWP Box Connection at 141,081 lbs. (Top Connection on tool is not taken into account since the top connection varies per customer request)	
Burst Point & Burst Pressure: Top Sub & Nozzle Carrier Rotational Connecton - 16,933 PSI, 3-1/8" CWP Box Connection - 5,091 PSI	
Torsional Weak Point & Ft-Lbs to Yield: CWP Connections 4825 ft/lbs	
RECOMMENDED MAKE UP TORQUE	
1st Connection: Top Sub & Venturi Section CWP Connection - 1206 ft/lbs	
2nd Connection: Venturi Section & Screen Housing CWP Connecton - 1206 lbs.	
3rd Connection: Screen Housing & Cage Howsing CWP Connection - 1206 ft/lbs	



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

Bear Claw Composite Frac & Bridge Plugs

Bear Claw Composite Frac & Bridge Plugs 3.35 Conventional

Materials

- Aerospace grade composite materials with high temperature & chemical resistance.
- High temperature thermoplastics replace brass and other non-ferrous metals.
- Proven oil field elastomeric packers for reliable, rugged performance.
- Full circumference gray cast iron slips machined from bar stock for exceptional uniformity and strength.

Easily Drillable

- Does not contain tungsten carbide, large steel parts or other difficult-to-drill materials.
- High Glass Transition Temperature means unlimited downhole lifespan and consistent millout debris.
- Low density non-metallic cuttings circulate quickly and easily back to the surface.
- Reduces drill out time and casing damage compared to cast iron plugs.

Dimensional Data

The 3.35 Bear Claw® 2 conventional plugs are a non-stroking plug (i.e. ratcheting plug) designed to run and function like a cast iron plug with drill out times comparable to the best composite plugs. The conventional element system is designed for lowest cost and fastest drill out. Elements are available in standard and chemical resistant grades. These are designed specifically for captive ball, or drop ball operations commonly used in horizontal wells.



Bear Claw Composite Frac & Bridge Plugs

3.35 OD – 4.5 Bear Claw®

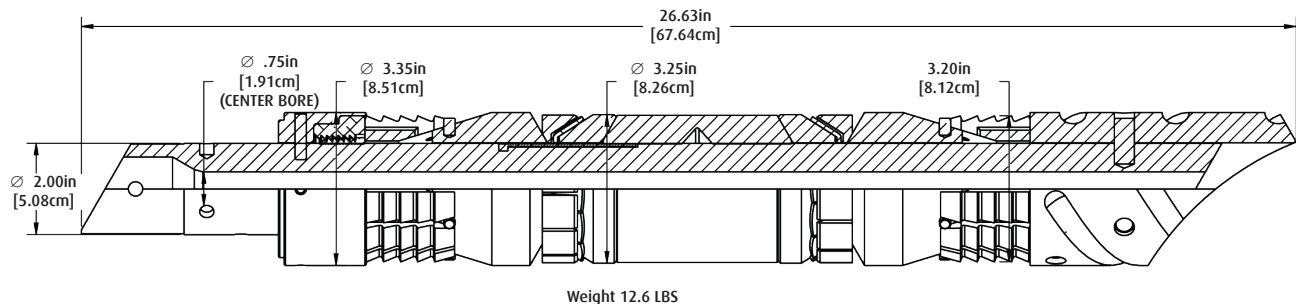
Casing Size Inch (mm)	Casing Weight lb/ft (kg/m)	Max Temperature °F (°C)	Max Frac Pressure (Top Down) psi [MPa]	Max Reservoir Pressure (Bottom Up) psi [MPa]
Frac Plug Assemblies				
4.5 [114.3]	11.6-15.1 [17.26-22.47]	300 [149]	10,000 [68.9]	N/A
Bridge Plug Assemblies				
4.5 [114.3]	11.6-15.1 [17.26-22.47]	300 [149]	10,000 [68.9]	8,000 [55.2]
Drop Ball Plug Assemblies*				
4.5 [114.3]	11.6-15.1 [17.26-22.47]	300 [149]	10,000 [68.9]	N/A

> All plugs used with 02623-001 Baker #10 setting kit.

* Used with a Captive Ball, Drop Ball or Melt Kit.

† Chemically resistant. # Preliminary Rating.

Preliminary Rating.



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

Bear Claw Composite Frac & Bridge Plugs

Bear Claw Composite Frac & Bridge Plugs 5.5 Conventional

Materials

- Aerospace grade composite materials with high temperature & chemical resistance
- High temperature thermoplastics replace brass and other non-ferrous metals.
- Proven oil field elastomeric packers for reliable, rugged performance.
- Full circumference gray cast iron slips machined from bar stock for exceptional uniformity and strength.

Easily Drillable

- Does not contain tungsten carbide, large steel parts or other difficult-to-drill materials.
- High Glass Transition Temperature means unlimited downhole lifespan and consistent millout debris.
- Low density non-metallic cuttings circulate quickly and easily back to the surface.
- Reduces drill out time and casing damage compared to cast iron plugs.

Dimensional Data

The 5.5 Bear Claw® 2 conventional plugs share the same non-stroking (i.e. ratcheting plug) design as the Ø4.5 plugs. These are designed specifically for captive ball, or drop ball operations commonly used in horizontal wells.



Bear Claw Composite Frac & Bridge Plugs

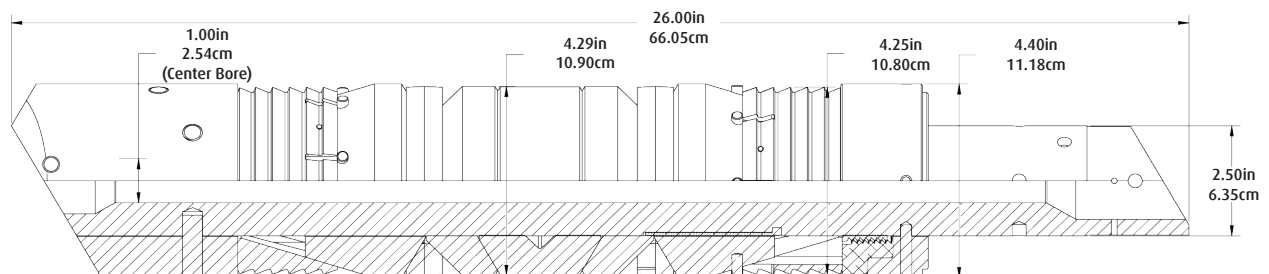
5.5 Bear Claw® 2 Conventional Plugs

Casing Size Inch (mm)	Casing Weight lb/ft (kg/m)	Max Temperature °F (°C)	Max Frac Pressure (Top Down) psi [MPa]	Max Reservoir Pressure (Bottom Up) psi [MPa]
Frac Plug Assemblies				
5.5 [139.7]	17.0-23.0 [25.30-34.23]	270 [132]	8,000 [55.2]	N/A
5.5 [139.7]	17.0-23.0 [25.30-34.23]	270 [132]	10,000 [68.9]	N/A
5.5 [139.7]	17.0-23.0 [25.30-34.23]	300 [149]	10,000 [68.9]	N/A
Bridge Plug Assemblies				
5.5 [139.7]	7.0-23.0 [25.30-34.23]	270 [132]	8,000 [55.2]	6,400 [44.1]
5.5 [139.7]	7.0-23.0 [25.30-34.23]	270 [132]	10,000 [68.9]	8,000 [55.2]
5.5 [139.7]	7.0-23.0 [25.30-34.23]	300 [149]	10,000 [68.9]	8,000 [55.2]
Drop Ball Plug Assemblies				
5.5 [139.7]	17.0-23.0 [25.30-34.23]	270 [132]	8,000 [55.2]	N/A
5.5 [139.7]	17.0-23.0 [25.30-34.23]	270 [132]	10,000 [68.9]	N/A
5.5 [139.7]	17.0-23.0 [25.30-34.23]	300 [149]	10,000 [68.9]	N/A

> All plugs used with 02427-001 Baker #20 setting kit or 02543-001 Titan 3 5/8 setting kit.

* Used with a Captive Ball, Drop Ball or Melt Kit.

† Chemically resistant.



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com



Bear Claw Composite Frac & Bridge Plugs

Bear Claw Composite Frac & Bridge Plugs 4.5 Conventional

Materials

- Aerospace grade composite materials with high temperature & chemical resistance
- High temperature thermoplastics replace brass and other non-ferrous metals.
- Proven oil field elastomeric packers for reliable, rugged performance.
- Full circumference gray cast iron slips machined from bar stock for exceptional uniformity and strength.

Easily Drillable

- Does not contain tungsten carbide, large steel parts or other difficult-to-drill materials.
- High Glass Transition Temperature means unlimited downhole lifespan and consistent millout debris.
- Low density non-metallic cuttings circulate quickly and easily back to the surface.
- Reduces drill out time and casing damage compared to cast iron plugs.

Dimensional Data

The 4.5 Bear Claw® 2 conventional plugs are a non-stroking plug (i.e. ratcheting plug) designed to run and function like a cast iron plug with drill out times comparable to the best composite plugs. The conventional element system is designed for lowest cost and fastest drill out. Elements are available in standard and chemical resistant grades.



Bear Claw Composite Frac & Bridge Plugs

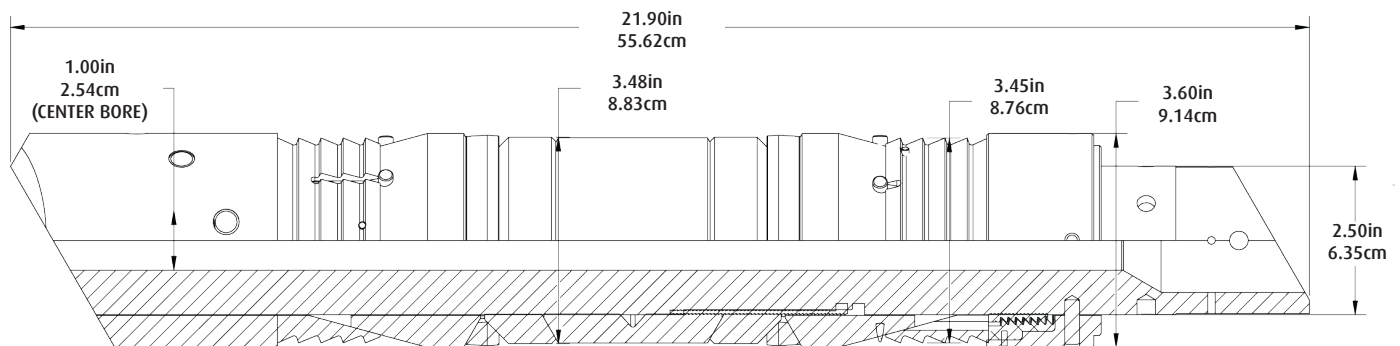
4.5 Bear Claw® 2 Conventional Plugs

Casing Size Inch (mm)	Casing Weight lb/ft (kg/m)	Max Temperature °F (°C)	Max Frac Pressure (Top Down) psi [MPa]	Max Reservoir Pressure (Bottom Up) psi [MPa]
Frac Plug Assemblies				
4.5 [114.3]	11.6-15.1 [17.26-22.47]	270 [132]	8,000 [55.2]	N/A
4.5 [114.3]	11.6-15.1 [17.26-22.47]	300 [149]	10,000 [68.9]	N/A
Bridge Plug Assemblies				
4.5 [114.3]	11.6-15.1 [17.26-22.47]	270 [132]	8,000 [55.2]	6,400 [44.1]
4.5 [114.3]	11.6-15.1 [17.26-22.47]	300 [149]	10,000 [68.9]	8,000 [55.2]
Drop Ball Plug Assemblies*				
4.5 [114.3]	11.6-15.1 [17.26-22.47]	270 [132]	8,000 [55.2]	N/A
4.5 [114.3]	11.6-15.1 [17.26-22.47]	300 [149]	10,000 [68.9]	N/A

> All plugs used with 02299-002 Baker #10 setting kit or 02324-002 Halliburton 2½ Shorty setting kit.

* Used with a Captive Ball, Drop Ball or Melt Kit.

† Chemically resistant.



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

Bi-Centre Mill

The DSI Bi-Centre mill is an innovative offset mill designed to pass through restrictions (including casing damage & deformation, over torqued collars, etc.) while retaining the ability to mill to FULL ID below*

DSI has successfully deployed this proprietary technology on frac seats (ball drop) systems, composite bridge plugs & cement giving us a proven track record of success in tough Canadian applications. The DSI Bi-Centre still produces small, manageable debris that you'd expect from other DSI designed mills such as the Eliminator & Eliminator WP. Combined with a high speed/high torque DSI motor the Bi-Centre's performance is unmatched.



For more information including pictures and run history please contact your DSI representative. In Calgary call 403-452-8337 or toll free anywhere call 1-855-346-9788.

*In most cases. Every wellbore is different. For calculations on your wellbore please call us anytime.



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com

Bi-Directional Jar

The Bi-Directional Jar is a straight push up or pull down jarring tool that involves a combination of proven principles of mechanics and hydraulics

The unique design permits easy and dependable operation. The Jar can deliver a wide range of low to very high impact and impulse forces that can be varied easily by changing the applied load.

FEATURES AND BENEFITS

- Capable of applying up only, down only or up and down forces in sequence
- The large ID of the jar allows the use of drop balls
- Internal chambers of the jar are sealed at both ends preventing the lubricating and operating fluids from escaping and the well fluids from entering the chamber

SPECIFICATIONS

JAR OD IN (MM)	2.875 (73.0)
JAR ID IN (MM)	1.0 (25.4)
ASSEMBLY PART NUMBER	504980
STANDARD CONNECTION	2 3/8 PAC
LENGTH - CLOSED FT (M)	6.08 (1.85)
TOTAL STROKE IN (MM)	12 (304.8)
APPROXIMATE WEIGHT LB (KG)	93 (42.18)
MAXIMUM OVERPULL LB (DAN)	32000 (14234)
MAXIMUM OVERPUSH LB (DAN)	32000 (14234)
AFTER JARRING LB (DAN)	195000 (86740)
(86740) TORSIONAL YIELD FT-LB (N-M)	2700 (3661)
TESTING PULL LOAD LB (DAN)	20000 (8896)
TESTING PUSH LOAD LB (DAN)	10000 (4448)
PUMP OPEN AREA IN ² (MM ²)	2.3 (1483.87)
FLUID BLEED VOLUME OZ (ML)	0.74 - 1.08 (22-32)

MAXIMUM RECOMMENDED MAKE-UP TORQUES FT-LB (N-M)

BOTTOM SUB TO SPLINE MANDREL	1400 (1898)
MANDREL BODY TO SPLINE BODY	2000 (2712)
SPLINE BODY TO PRESSURE BODY	2000 (2712)
PRESSURE BODY TO WASHPIPE BODY	2000 (2712)
SPLINE MANDREL TO WASHPIPE	450 (610)



Wellvention

ALS Oil & Gas

830 444-5th Avenue S.W

Calgary, AB, T2P 2T8

T +1 855 346 9788

www.dsithrutubing.ca www.alsoilandgas.com