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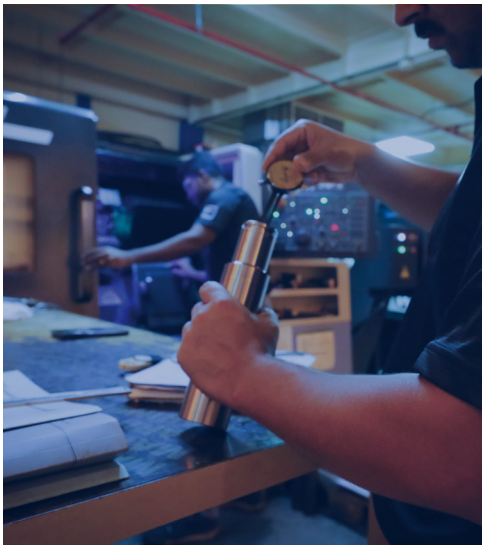
# TOOL CATALOGUE

TOOL CATALOGUE

# ABOUT US

## MISSION STATEMENT

WellEnTech is dedicated to engineering excellence, manufacturing and designing best in class coil tubing/thru tubing services equipment and tools with the highest integrity and accountability using state of the art techniques and innovative methods.



## VISION

WellEntech strives to establish itself as a leader among global intervention tool design & manufacturingcompanies by entering new markets, diversifying its activity, innovative solutions and ensuring reliable delivery times, economically competitive and best practises.

## CORE VALUES

Professionalism
Transparency
Profitability
Teamwork
Integrity

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## STANDARD TOOLS



## SURFACE TOOLS



## SPECIALTY



## FISHING



## ROTATING



## DRILLING

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# STANDARD TOOLS

# KNUCKLE JOINT – FULL ROTATION

## APPLICATION

- Jetting operations
- Clean out runs
- Debris circulation
- Nitrogen lifting
- Spotting operations
- Well Stimulation operations

## FEATURES

- Short, compact design
- Large through bore
- Full 360° rotation
- 15° axial deflection (30° included)
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech Knuckle Joint provides flexibility within a tool string while providing a large thru' bore and pressure integrity. The Knuckle is designed to provide a full 360° rotation and an angular deflection along the tools axis of 15° (30° included).

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | ID (Inches) | Connections | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|---|
| 1.688 | 6.50 | 0.75 | 1"AMMT | 38,900 | Std. | 146-1688-A002 |
| | | | | 29,000 | H2S | 146-1688-A001 |
| 1.750 | 7.00 | 0.75 | 1-1/4"AMMT | 38,900 | Std. | 146-1750-A002 |
| | | | | 29,000 | H2S | 146-1750-A001 |
| 1.750 | 7.00 | 0.25 * | 1-1/4"AMMT | 83,100 | Std. | 146-1750-A012 |
| | | | | 60,100 | H2S | 146-1750-A011 |
| 2.125 | 8.00 | 1.00 | 1-1/2"AMMT | 64,600 | Std. | 146-2125-A002 |
| | | | | 46,800 | H2S | 146-2125-A001 |
| 2.875 | 10.25 | 1.38 | 2-3/8"PAC | 125,800 | Std. | 146-2875-A002 |
| | | | | 91,500 | H2S | 146-2875-A001 |

## OPERATION

The Knuckle joint is ideal for operations where tight dog legs are encountered or flexibility is required in a tool string. The precision turned sphere provides a smooth, full rotation and a retained seal provides pressure integrity. It is made up to the tool string like any other cross over or connection.

Refer to data sheet DS-145a for Torque thru' version.

# KNUCKLE JOINT – TORQUE THRU'

## APPLICATION

- Jetting operations
- Clean out runs
- Debris circulation
- Nitrogen lifting
- Spotting operations
- Well Stimulation operations

## FEATURES

- Short, compact design
- Large through bore
- Rotationally locked
- 15° axial deflection (30° included)
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech Knuckle Joint provides flexibility within a tool string while providing a large thru' bore and pressure integrity. The Knuckle is designed to provide an angular deflection along the tools axis of 15° (30° included) while simultaneously being rotationally locked, making it ideal for operations where torque transmission is required.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | ID (Inches) | Connections | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|---|
| 1.688 | 6.50 | 0.75 | 1"AMMT | 28,900 | H2S | 145-1688-A001 |
| | | | | 39,800 | Std. | 145-1688-A002 |
| 1.750 | 7.00 | 0.75 | 1-1/4"AMMT | 28,900 | H2S | 145-1750-A001 |
| | | | | 39,800 | Std. | 145-1750-A002 |
| 2.125 | 8.00 | 1.00 | 1-1/2"AMMT | 46,800 | H2S | 145-2125-A001 |
| | | | | 64,300 | Std. | 145-2125-A002 |
| 2.875 | 10.25 | 1.38 | 2-3/8"PAC | 72,900 | H2S | 145-2875-A001 |
| | | | | 100,200 | Std. | 145-2875-A002 |

## OPERATION

The Knuckle joint is ideal for operations where tight dog legs are encountered or flexibility is required in a tool string. The precision turned sphere provides a smooth, angular deflection and a retained seal provides pressure integrity. It is made up to the tool string like any other cross over or connection. The Ball Bearings provide the means of torque transmission, a full rotation version of this tool is also available, refer to data sheet DS-146a for full details.

# ABRASIVE JETTING SUB

## APPLICATION

- Multiple port Abrasive Perforating
- Cutting Tubulars
- Acid Stimulation
- Open Hole Stimulation
- Gas Injection
- Regular Jetting Operations

## FEATURES

- One piece design
- Interchangeable nozzles
- Tool Joint Connections
- Suitable for all well environments
- Bespoke designs available

## ADDITIONAL INFORMATION

- Above sizes are examples only. Please contact WellEnTech with your specific requirements.
- Tools are manufactured from mild steel as standard. Other materials are available on request.

The WellEnTech Abrasive Jetting Subs and Heads are designed to be used for the deployment of abrasive, corrosive or stimulation fluids. They are designed to suit specific operational requirements and a variety of nozzle configurations are available. They can be deployed on jointed pipe or coiled tubing and can be used in conjunction with Downhole motors or indexing tools.

## TECHNICAL SPECIFICATION

Each operation is dependent on a number of variables and as a result, the technical specifications for the head or sub differs from job to job. Listed below are some examples of what can be achieved using the WellEnTech Abrasive Jetting Technology.

| Perforating | | | |
|---|---|---|---|
| Sub Dia. (Inches) | Connections | Tubular | No. of perforations |
| 3.00 | 2-3/8”PAC | 4-1/2” 12.6# L80 | 4 |
| 3.00 | 2-3/8”PAC | 4-1/2” 12.6# L80 cemented inside 7” 35# L80 | 6 |
| 3.63 | 2-3/8”PAC | 5-1/2” 23# P110 | 2 |
| 3.50 | 1-1/2”AMMT | 5-1/2” 26# Drill Pipe | 2 |

| Cutting | | | |
|---|---|---|---|
| Head Dia. (Inches) | Connections | Tubular | Time to cut (minutes) * |
| 3.50 | 1-1/2”AMMT | 5-1/2” 26# Drill Pipe | 15 |
| 2.13 | 1-1/2”AMMT | 3-1/2” 16.7# P110 | 9 |
| 2.88 | 1-1/2”AMMT | 5-1/2” 23# Drill Pipe | 25 |

## OPERATION

The Abrasive subs can be run as part of a tubing string or as part of a coiled tubing bottom hole assembly. The desired nozzle configuration is selected and fitted to the sub. Once at the required depth the fluid can be pumped through the carbide nozzles to produce multiple perforations. Alternatively when an abrasive jetting head is deployed below a motor fitted with the WellEnTech STS™ sealed bearing section, the BHA can be used to sever drill pipe or tubing. Single, dual or cemented casings can be cut in a single trip. The time taken to sever/perforate any given tubular depends on various factors such as the sub or head size, tubular size and weight. WellEnTech will provide an engineered solution as well as technical support to suit specific operational requirements.

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# DEPLOYMENT BAR

## APPLICATION

- Multiple BHA section
- deployment
- Fishing operations
- Milling operations
- Jetting operations

## FEATURES

- One piece
- Various lengths available
- Through bore
- Tool joint or service connections
- Diameter to match CT OD

## ADDITIONAL INFORMATION

- Typical examples shown above, other variations and sizes are available
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications

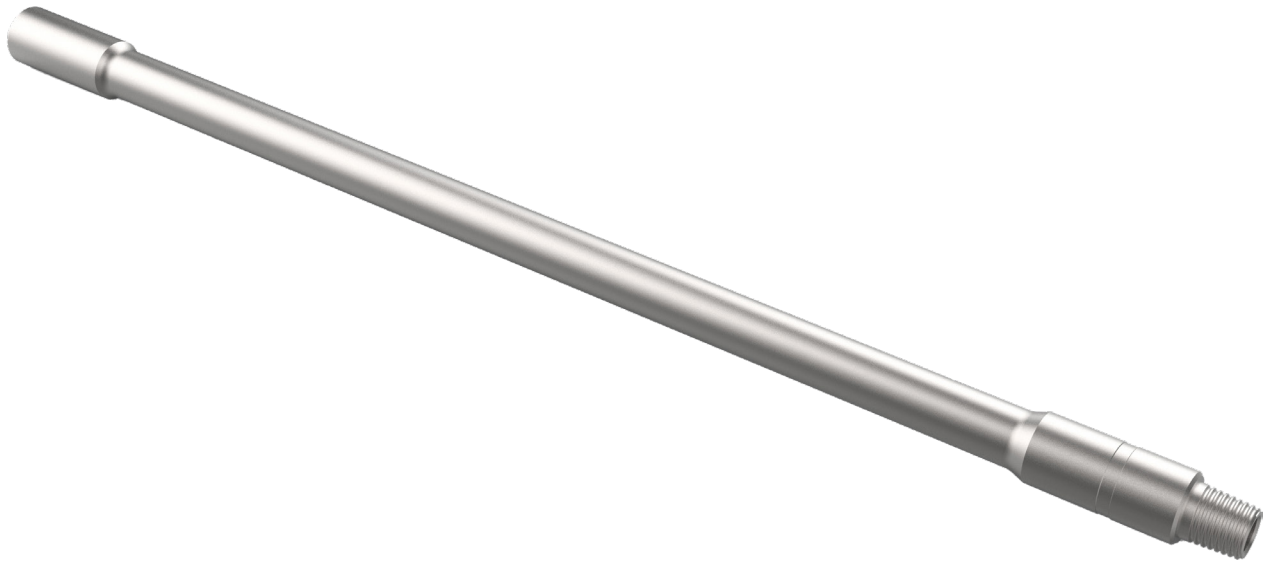
The WellEnTech Deployment Bar is used to deploy long bottom hole assemblies in a well. The Deployment Bar OD will match the coiled tubing OD to enable it to be held in the BOP rams while sections of the BHA are added or removed. Can be used in any Coiled Tubing application where a BHA cannot be accommodated inside a single section of riser.

## TECHNICAL SPECIFICATION

| OD (Inches) | ID (Inches) | Connections | Coil Diameter (Inches) | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|---|
| 1.688 | 0.75 | 1”AMMT | 1.25 | 62,400 | Std | 165-1688-ST05 |
| | | | | 45,400 | $H_2S$ | 165-1688-SH05 |
| | | | 1.50 | 62,400 | Std | 165-1688-ST15 |
| | | | | 45,400 | $H_2S$ | 165-1688-SH15 |
| 2.125 | 0.75 | 1-1/2”AMMT | 1.25 | 86,300 | Std | 165-2125-ST05 |
| | | | | 62,800 | $H_2S$ | 165-2125-SH05 |
| | | | 1.50 | 116,500 | Std | 165-2125-ST15 |
| | | | | 84,700 | $H_2S$ | 165-2125-SH15 |
| | | | 1.75 | 116,500 | Std | 165-2125-ST25 |
| | | | | 84,700 | $H_2S$ | 165-2125-SH25 |
| 2.875 | 1.00 | 2-3/8”PAC | 1.50 | 107,900 | Std | 165-2875-ST05 |
| | | | | 78,500 | $H_2S$ | 165-2875-SH05 |
| | | | 1.75 | 178,000 | Std | 165-2875-ST15 |
| | | | | 129,500 | $H_2S$ | 165-2875-SH15 |
| | | | 2.00 | 218,500 | Std | 165-2875-ST25 |
| | | | | 158,900 | $H_2S$ | 165-2875-SH25 |
| | | | 2.38 | 218,500 | Std | 165-2875-ST35 |
| | | | | 158,900 | $H_2S$ | 165-2875-SH35 |

## OPERATION

The Deployment Bar has no moving parts and consists of a connection at either end of a hollow bar. The reduced OD section of the Deployment Bar should match the Coiled Tubing OD so that it can be held in the BOP Rams/Slips. Other than the correct make-up torque of the connections there is no other operational data.



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# DIMPLE-ON CONNECTOR

## APPLICATION

- Standard fishing operations
- Heavy duty fishing operations
- Drilling and milling operations
- Jetting operations
- Stabbing and spooling

## FEATURES

- One piece
- Compact design
- Dual seal
- Torque compatible
- Suitable for drop balls
- Multi-function operation
- Maximised through bore
- Tool joint or service connection

## ADDITIONAL INFORMATION

- The sizes listed above are examples of common configurations.
- Bespoke designs available to suit job specific applications.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- The tensile strength of these Connectors depends on a variety of factors such as, the condition and spec of the coil it is made up to. As a general rule, the strength can be considered to be 60% of the Coiled Tubing.

The WellEnTech Dimple-On Connector is a cost effective means of providing a connection at the end of a string of Coiled Tubing. The robust one piece design is furnished with standard O-rings, has a large through bore and is easy to attach and remove from the Coiled Tubing. Available for all sizes of Coiled Tubing, including taper strings, and can be supplied with any type of threaded connection, shackle hole or winch wire configuration.

## TECHNICAL SPECIFICATION

| Coil Tubing Dia (Inches) | OD (Inches) | Connection | Wall thickness (Inches) | Service | Part No. |
|---|---|---|---|---|---|
| 1-1/4” | 1.563 | 1”AMMT Pin | 0.095 | Std | 080-1563-ST03 |
| | | | | $H_2S$ | 080-1563-SH03 |
| | | | 0.109 | Std | 080-1563-ST05 |
| | | | | $H_2S$ | 080-1563-SH05 |
| | | | 0.125 | Std | 080-1563-ST07 |
| | | | | $H_2S$ | 080-1563-SH07 |
| | | | 0.134 | Std | 080-1563-ST09 |
| | | | | $H_2S$ | 080-1563-SH09 |
| | | | 0.156 | Std | 080-1563-ST11 |
| | | | | $H_2S$ | 080-1563-SH11 |
| | | | 0.175 | Std | 080-1563-ST13 |
| | | | | $H_2S$ | 080-1563-SH13 |
| 1-1/2” | 1.688 | 1”AMMT Pin | 0.095 | Std | 080-1688-ST03 |
| | | | | $H_2S$ | 080-1688-SH03 |
| | | | 0.102 | Std | 080-1688-ST05 |
| | | | | $H_2S$ | 080-1688-SH05 |
| | | | 0.109 | Std | 080-1688-ST07 |
| | | | | $H_2S$ | 080-1688-SH07 |
| | | | 0.118 | Std | 080-1688-ST09 |
| | | | | $H_2S$ | 080-1688-SH09 |
| | | | 0.125 | Std | 080-1688-ST11 |
| | | | | $H_2S$ | 080-1688-SH11 |
| | | | 0.134 | Std | 080-1688-ST13 |
| | | | | $H_2S$ | 080-1688-SH13 |
| | | | 0.145 | Std | 080-1688-ST15 |
| | | | | $H_2S$ | 080-1688-SH15 |
| | | | 0.156 | Std | 080-1688-ST17 |
| | | | | $H_2S$ | 080-1688-SH17 |
| | | | 0.175 | Std | 080-1688-ST19 |
| | | | | $H_2S$ | 080-1688-SH19 |
| 1-3/4” | 2.125 | 1-1/2”AMMT Pin | 0.109 | Std | 080-2125-ST27 |
| | | | | $H_2S$ | 080-2125-SH27 |
| | | | 0.118 | Std | 080-2125-ST29 |
| | | | | $H_2S$ | 080-2125-SH29 |
| | | | 0.125 | Std | 080-2125-ST31 |
| | | | | $H_2S$ | 080-2125-SH31 |
| | | | 0.134 | Std | 080-2125-ST33 |
| | | | | $H_2S$ | 080-2125-SH33 |
| | | | 0.145 | Std | 080-2125-ST35 |
| | | | | $H_2S$ | 080-2125-SH35 |
| | | | 0.156 | Std | 080-2125-ST37 |
| | | | | $H_2S$ | 080-2125-SH37 |
| | | | 0.175 | Std | 080-2125-ST39 |
| | | | | $H_2S$ | 080-2125-SH39 |
| | | | 0.190 | Std | 080-2125-ST41 |
| | | | | $H_2S$ | 080-2125-SH41 |
| | | | 0.204 | Std | 080-2125-ST43 |
| | | | | $H_2S$ | 080-2125-SH43 |

## OPERATION

The Dimple-On Connector is fitted to dressed Coiled Tubing using a dimpling Jig*. The Coiled Tubing is deformed into the dimples producing an extremely strong and durable connection. The dimples facilitate both axial and rotational loading, there are also two O-rings, one primary and the other back up, giving peace of mind for high pressure applications. The Connector when fitted to the Coiled Tubing should be pull and pressure tested using a Pull Test Sub* to ensure it has been fitted correctly prior to running in hole. These Connectors are particularly suitable for milling operations.

* Dimpling Jigs, CT Reamer Assemblies and Pressure/Pull Test Subs are available from WellEnTech

## TECHNICAL SPECIFICATION

| Coil Tubing Dia (Inches) | OD (Inches) | Connection | Wall thickness (Inches) | Service | Part No. |
|---|---|---|---|---|---|
| 2” | 2.875 | 2-3/8”PAC Pin | 0.109 | Std | 080-2875-ST03 |
| | | | | $H_2S$ | 080-2875-SH03 |
| | | | 0.125 | Std | 080-2875-ST05 |
| | | | | $H_2S$ | 080-2875-SH05 |
| | | | 0.134 | Std | 080-2875-ST07 |
| | | | | $H_2S$ | 080-2875-SH07 |
| | | | 0.145 | Std | 080-2875-ST09 |
| | | | | $H_2S$ | 080-2875-SH09 |
| | | | 0.156 | Std | 080-2875-ST11 |
| | | | | $H_2S$ | 080-2875-SH11 |
| | | | 0.175 | Std | 080-2875-ST13 |
| | | | | $H_2S$ | 080-2875-SH13 |
| | | | 0.190 | Std | 080-2875-ST15 |
| | | | | $H_2S$ | 080-2875-SH15 |
| | | | 0.204 | Std | 080-2875-ST17 |
| | | | | $H_2S$ | 080-2875-SH17 |
| | | | 0.224 | Std | 080-2875-ST19 |
| | | | | $H_2S$ | 080-2875-SH19 |
| 2-3/8” | 2.875 | 2-3/8”PAC Pin | 0.109 | Std | 080-2875-ST27 |
| | | | | $H_2S$ | 080-2875-SH27 |
| | | | 0.125 | Std | 080-2875-ST29 |
| | | | | $H_2S$ | 080-2875-SH29 |
| | | | 0.134 | Std | 080-2875-ST31 |
| | | | | $H_2S$ | 080-2875-SH31 |
| | | | 0.145 | Std | 080-2875-ST33 |
| | | | | $H_2S$ | 080-2875-SH33 |
| | | | 0.156 | Std | 080-2875-ST35 |
| | | | | $H_2S$ | 080-2875-SH35 |
| | | | 0.165 | Std | 080-2875-ST37 |
| | | | | $H_2S$ | 080-2875-SH37 |
| | | | 0.175 | Std | 080-2875-ST39 |
| | | | | $H_2S$ | 080-2875-SH39 |
| | | | 0.190 | Std | 080-2875-ST41 |
| | | | | $H_2S$ | 080-2875-SH41 |
| | | | 0.204 | Std | 080-2875-ST43 |
| | | | | $H_2S$ | 080-2875-SH43 |
| | | | 0.214 | Std | 080-2875-ST45 |
| | | | | $H_2S$ | 080-2875-SH45 |
| | | | 0.224 | Std | 080-2875-ST47 |
| | | | | $H_2S$ | 080-2875-SH47 |

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# DIMPLE-ON SPOOLABLE CONNECTOR

## APPLICATION

- Designed for spooling Coiled Tubing onto a reel.

## FEATURES

- One piece
- Compact design
- Dual seal
- Torque compatible
- Suitable for drop balls
- Available for all coil sizes and materials

## ADDITIONAL INFORMATION

- The sizes listed above are examples of common configurations.
- Bespoke designs available to suit job specific applications.
- The tensile strength of these Spoolable Connectors depends on a variety of factors such as, the condition and spec of the coil it is made up to. As a general rule, the strength can be considered to be 60% of the Coiled Tubing.

The WellEnTech Dimple-On Spoolable Connector is a cost effective means of connecting two pieces of Coiled Tubing. The robust one piece design is furnished with standard O-rings, has a large through bore and is easy to make-up and remove from the Coiled Tubing. Available for all sizes of Coiled Tubing and taper strings.

## TECHNICAL SPECIFICATION

| Coil Tubing Dia (Inches) | OD (Inches) | Wall thickness (Inches) | Part No. |
|---|---|---|---|
| 1-1/4” | 1.25 | 0.095 | 081-1250-ST03 |
| | | 0.109 | 081-1250-ST05 |
| | | 0.125 | 081-1250-ST07 |
| | | 0.134 | 081-1250-ST09 |
| | | 0.156 | 081-1250-ST11 |
| | | 0.175 | 081-1250-ST13 |
| 1-1/2” | 1.50 | 0.095 | 081-1500-ST03 |
| | | 0.102 | 081-1500-ST05 |
| | | 0.109 | 081-1500-ST07 |
| | | 0.118 | 081-1500-ST09 |
| | | 0.125 | 081-1500-ST11 |
| | | 0.134 | 081-1500-ST13 |
| | | 0.145 | 081-1500-ST15 |
| | | 0.156 | 081-1500-ST17 |
| | | 0.175 | 081-1500-ST19 |
| 1-3/4” | 1.75 | 0.109 | 081-1750-DD03 |
| | | 0.118 | 081-1750-DD05 |
| | | 0.125 | 081-1750-DD12 |
| | | 0.134 | 081-1750-DD07 |
| | | 0.145 | 081-1750-DD11 |
| | | 0.156 | 081-1750-DD13 |
| | | 0.175 | 081-1750-DD17 |
| | | 0.188 | 081-1750-DD18 |
| | | 0.204 | 081-1750-DD19 |
| 2” | 2.00 | 0.109 | 081-2000-ST03 |
| | | 0.125 | 081-2000-ST05 |
| | | 0.134 | 081-2000-ST07 |
| | | 0.145 | 081-2000-ST09 |
| | | 0.156 | 081-2000-ST11 |
| | | 0.175 | 081-2000-ST13 |
| | | 0.188 | 081-2000-ST15 |
| | | 0.204 | 081-2000-ST17 |
| | | 0.224 | 081-2000-ST19 |

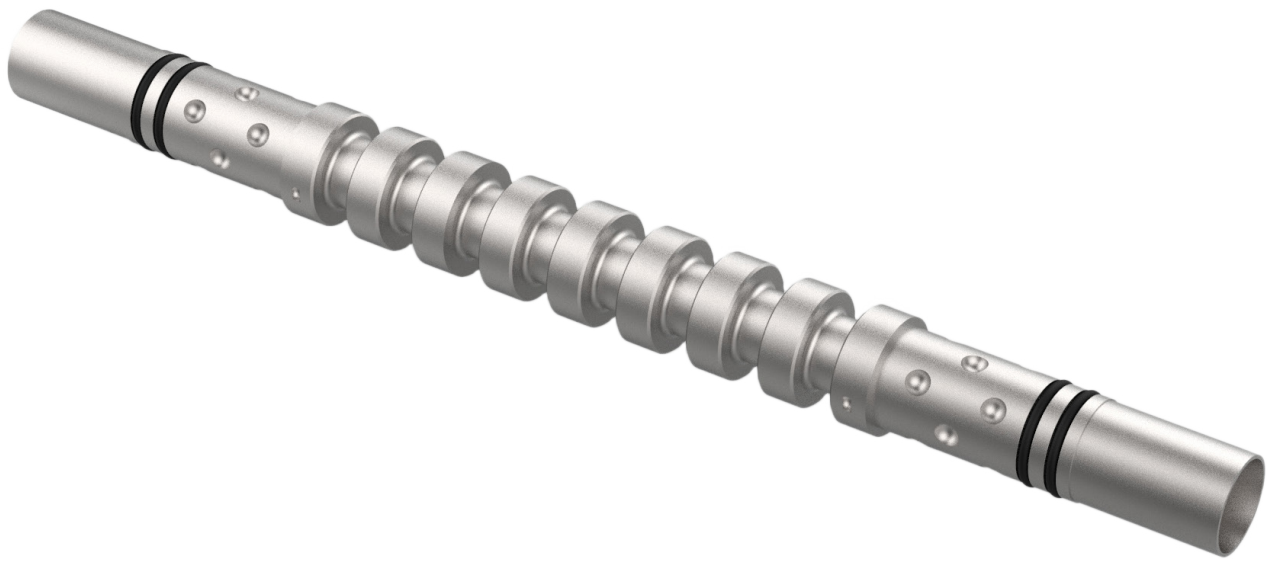
## OPERATION

The Dimple-On Spoolable Connector is fitted to dressed Coiled Tubing using a Dimpling Jig*. The Coiled Tubing is deformed into the dimples producing an extremely strong and durable connection at both ends. The two O-rings, one primary and the other back up, provides peace of mind for high pressure applications. The Spoolable Connector when fitted to the Coiled Tubing should be pressure tested to ensure it has been fitted correctly prior to spooling onto the reel.

* Dimpling Jigs and CT Reamer Assemblies and are available from WellEnTech

## TECHNICAL SPECIFICATION

| Coil Tubing Dia (Inches) | OD (Inches) | Wall thickness (Inches) | Part No. |
|---|---|---|---|
| 2-3/8” | 2.375 | 0.109 | 081-2375-ST03 |
| | | 0.125 | 081-2375-ST05 |
| | | 0.134 | 081-2375-ST07 |
| | | 0.145 | 081-2375-ST09 |
| | | 0.156 | 081-2375-ST11 |
| | | 0.165 | 081-2375-ST13 |
| | | 0.175 | 081-2375-ST15 |
| | | 0.188 | 081-2375-ST17 |
| | | 0.204 | 081-2375-ST19 |
| | | 0.214 | 081-2375-ST21 |
| | | 0.224 | 081-2375-ST23 |
| 2-7/8” | 2.875 | 0.145 | 081-2875-ST03 |
| | | 0.156 | 081-2875-ST05 |
| | | 0.175 | 081-2875-ST07 |
| | | 0.188 | 081-2875-ST09 |
| | | 0.204 | 081-2875-ST11 |
| | | 0.224 | 081-2875-ST13 |
| | | 0.250 | 081-2875-ST15 |
| | | 0.280 | 081-2875-ST17 |



# EXTERNAL DIMPLE CONNECTOR

## APPLICATION

- Standard fishing operations
- Heavy duty fishing operations
- Drilling and milling operations
- Jetting operations
- Stabbing and spooling

## FEATURES

- One piece
- Compact design
- Dual seal
- Torque compatible
- Multi-function operation
- Maximised through bore suitable for drop balls
- Tool joint or service connection

## ADDITIONAL INFORMATION

- The sizes listed above are examples of common configurations.
- Bespoke designs available to suit job specific applications.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- The tensile strength of these Connectors depends on a variety of factors such as, the condition and spec of the coil it is made up to. As a general rule, the strength can be considered to be 60% of the Coiled Tubing.

The WellEnTech External Dimple Connector provides a cost effective means of connecting a tool string to Coiled Tubing. The tool is supplied with Socket Set Screws which fit into preformed dimples on the Coiled Tubing. The dimples are formed using a specialised External Dimpling Jig Assembly, also available from WellEnTech.

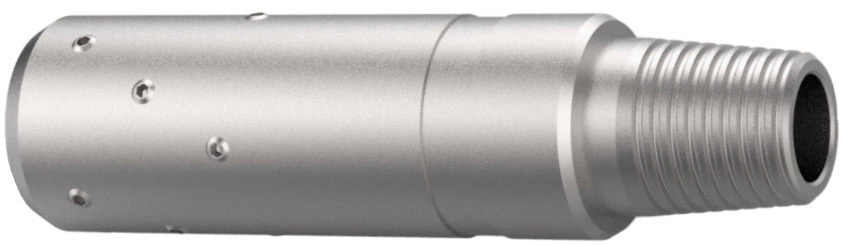
## TECHNICAL SPECIFICATION

| Coil Tubing Dia (Inches) | OD (Inches) | Connection | Service | Working Pressure (psi) | Part No. |
|---|---|---|---|---|---|
| 1-1/4” | 1.875 | 1”AMMT Pin | Std | 10,000 | 085-1875-A002 |
| | | | $H_2S$ | 10,000 | 085-1875-A001 |
| 1-1/2” | 2.125 | 1-1/2”AMMT Pin | Std | 10,000 | 085-2125-A004 |
| | | | $H_2S$ | 10,000 | 085-2125-A003 |
| | 2.875 | 2-3/8”PAC Pin | Std | 10,000 | 085-2875-A010 |
| | | | $H_2S$ | 10,000 | 085-2875-A009 |
| 1-3/4” | 2.125 | 1-1/2”AMMT Pin | Std | 10,000 | 085-2125-A002 |
| | | | $H_2S$ | 10,000 | 085-2125-A001 |
| | 2.250 | 1-1/2”AMMT Pin | Std | 10,000 | 085-2250-A002 |
| | | | $H_2S$ | 10,000 | 085-2250-A001 |
| | 2.875 | 2-3/8”PAC Pin | Std | 10,000 | 085-2875-A008 |
| | | | $H_2S$ | 10,000 | 085-2875-A007 |
| 2” | 2.500 | 1-1/2”AMMT Pin | Std | 10,000 | 085-2500-A002 |
| | | | $H_2S$ | 5,000 * | 085-2500-A001 |
| | 2.875 | 2-3/8”PAC Pin | Std | 10,000 | 085-2875-A006 |
| | | | $H_2S$ | 10,000 | 085-2875-A005 |
| 2-3/8” | 2.875 | 2-3/8”PAC Pin | Std | 10,000 | 085-2875-A002 |
| | | | $H_2S$ | 5,000 * | 085-2875-A001 |
| | 3.125 | 2-3/8”PAC Pin | Std | 10,000 | 085-3125-A002 |
| | | | $H_2S$ | 10,000 | 085-3125-A001 |

## OPERATION

The External Dimple Connector is fitted to dressed Coiled Tubing using an External Dimpling Jig Assembly*. The Coiled Tubing is deformed into the dimples producing an extremely strong and durable connection. The dimples facilitate both axial and rotational loading, there are also two O-rings, one primary and the other a back up, giving peace of mind for high pressure applications. The Connector when fitted to the Coiled Tubing should be pull and pressure tested using a Pull Test Sub* to ensure it has been fitted correctly prior to running in hole. These Connectors are particularly suitable for milling operations.

* External Dimpling Jig Assemblies and Pressure/Pull Test Subs are available from WellEnTech



# EXTERNAL SLIP TYPE CONNECTOR

## APPLICATION

- Standard fishing operations
- Heavy duty fishing operations
- Drilling and milling operations
- Jetting operations

## FEATURES

- Compact design
- Dual seal
- Torque compatible
- Suitable for drop balls
- Multi-function operation
- Maximised through bore
- Tool joint or service connection

## ADDITIONAL INFORMATION

- The sizes listed above are examples of common configurations.
- Bespoke designs available to suit job specific applications.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- The tensile strength of these connectors depends on a variety of factors such as, the condition and spec of the coil it is made up to. As a general rule, the strength can be considered to be 60% of the coiled tubing.

The WellEnTech External Slip Type connector is a cost effective means of providing a connection at the end of a string of coiled tubing. The robust construction is furnished with standard O-rings, has a large through bore and is easy to attach and remove from the coiled tubing. Available for all sizes of coiled tubing, including taper strings, and can be supplied with any type of threaded connection, shackle hole or winch wire configuration.

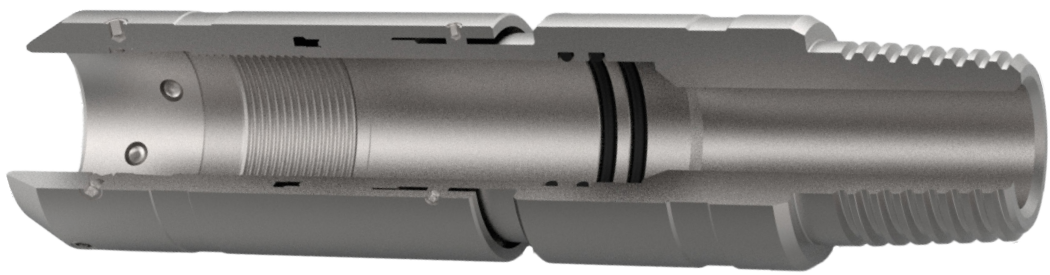
## TECHNICAL SPECIFICATION

| Coil Tubing Dia (Inches) | OD (Inches) | Connection | Working Pressure (Psi) | Service | Part No. |
|---|---|---|---|---|---|
| 1” | 1.500 | 1”AMMT Pin | 10,000 | $H_2S$ | 140-1500-A001 |
| | | | | Std | 140-1500-A002 |
| 1-1/4” | 1.750 | 1”AMMT Pin | 10,000 | $H_2S$ | 140-1750-A001 |
| | | | | Std | 140-1750-A002 |
| 1-1/2” | 2.125 | 1-1/2”AMMT Pin | 10,000 | $H_2S$ | 140-2125-A001 |
| | | | | Std | 140-2125-A002 |
| 1-3/4” | 2.250 | 1-1/2”AMMT Pin | 10,000 | $H_2S$ | 140-2250-A001 |
| | | | | Std | 140-2250-A002 |
| 2” | 2.875 | 2-3/8”PAC Pin | 10,000 | $H_2S$ | 140-2875-A001 |
| | | | | Std | 140-2875-A002 |
| 2-3/8” | 3.125 | 2-3/8”PAC Pin | 10,000 | $H_2S$ | 140-3125-A001 |
| | | | | Std | 140-3125-A002 |
| 2-5/8” | 3.375 | 2-3/8”PAC Pin | 10,000 | $H_2S$ | 140-3375-A001 |
| | | | | Std | 140-3375-A002 |

## OPERATION

The External Slip Type connector is fitted to dressed coiled tubing. The coiled tubing end should be smoothed off and polished with emery cloth. The bottom sub of the connector is rotated in order to compress the slip into the coiled tubing, a pull test* will confirm engagement and a final make-up of the bottom sub will ensure the connector has a firm hold of the tubing. There are two o-rings, one primary and the other back up, giving peace of mind for high pressure applications. The connector when fitted to the coiled tubing should also be pressure tested* to ensure it has been fitted correctly prior to running in hole. These connectors are suitable for all types of coiled tubing operations.

* Compatible Pull/Pressure test subs are also available from WellEnTech



# EXTERNAL SLIP TYPE CONNECTOR WITH EXTERNAL TEST PORT

## APPLICATION

- Standard fishing operations
- Heavy duty fishing operations
- Drilling and milling operations
- Jetting operations

## FEATURES

- Compact design
- Multiple seal
- External pressure test port
- Torque compatible
- Suitable for drop balls
- Maximised through bore
- Tool joint or service connection

## ADDITIONAL INFORMATION

- The sizes listed above are examples of common configurations.
- Bespoke designs available to suit job specific applications.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- The tensile strength of these connectors depends on a variety of factors such as, the condition and spec of the coil it is made up to. As a general rule, the strength can be considered to be 60% of the coiled tubing.

The WellEnTech External Slip Type connector with external test port provides a connection at the end of a string of coiled tubing. The robust construction is furnished with standard O-rings, has a large through bore and is easy to attach and remove from the coiled tubing. Available for all sizes of coiled tubing, including taper strings, and can be supplied with any type of threaded connection, shackle hole or winch wire configuration. The external pressure test port provides a means of pressure testing the connector without having to test the entire coiled tubing string. The test port is isolated from the tubing and annulus by two o-rings either side for added peace of mind.

## TECHNICAL SPECIFICATION

| Coil Tubing Dia (Inches) | OD (Inches) | Connection | Test Port Size | Working Pressure (Psi) | Service | Part No. |
|---|---|---|---|---|---|---|
| 1” | 2.125 | 1-1/2”AMMT Pin | 1/8”NPT | 10,000 | H2S | 142-2125-A001 |
| | | | | | Std | 142-2125-A002 |
| 1-1/4” | 2.375 | 1-1/2”AMMT Pin | 1/8”NPT | 10,000 | H2S | 142-2375-A001 |
| | | | | | Std | 142-2375-A002 |
| 1-1/2” | 2.625 | 1-1/2”AMMT Pin | 1/8”NPT | 10,000 | H2S | 142-2625-A001 |
| | | | | | Std | 142-2625-A002 |
| 1-3/4” | 2.875 | 2-3/8”PAC or PAC DS Pin | 1/8”NPT | 10,000 | H2S | 142-2875-A001 |
| | | | | | Std | 142-2875-A002 |
| 2” | 3.125 | 2-3/8”PAC or PAC DS Pin | 1/4”NPT | 10,000 | H2S | 142-3125-A001 |
| | | | | | Std | 142-3125-A002 |
| 2-3/8” | 3.125 | 2-3/8”PAC or PAC DS Pin | 1/4”NPT | 10,000 | H2S | 142-3125-A011 |
| | | | | | Std | 142-3125-A012 |
| 2-3/8” | 3.500 | 2-3/8”PAC or PAC DS Pin | 1/4”NPT | 10,000 | H2S | 142-3500-A001 |
| | | | | | Std | 142-3500-A002 |

## OPERATION

The External Slip Type connector is fitted to dressed coiled tubing. The coiled tubing end should be smoothed off and polished with emery cloth. The bottom sub of the connector is rotated in order to compress the slip into the coiled tubing, a pull test* will confirm engagement and a final make-up of the bottom sub will ensure the connector has a firm hold of the tubing. There are two o-rings, either side of the pressure test port, one primary and the other back up, giving peace of mind for high pressure applications. The connector, when fitted to the coiled tubing, can then be pressure tested using the external test port prior to running in hole.

* Compatible Pull test subs are also available from WellEnTech

# HUDTECH™ CONNECTOR

## APPLICATION

- Velocity Strings
- Standard fishing operations
- Heavy duty fishing operations
- Drilling and milling operations
- Jetting operations

## FEATURES

- Compact, high strength design
- Dual seal
- Torque compatible
- Suitable for drop balls
- Multi-function operation
- Maximised through bore
- Tool joint or service connection

## ADDITIONAL INFORMATION

- The sizes listed above are examples of common configurations.
- Bespoke designs available to suit job specific applications.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- The tensile strength of these connectors depends on a variety of factors such as, the condition and spec of the coil it is made up to.

The WellEnTech HUDTech™ connector provides a high strength connection at the end of a string of coiled tubing. The patent pending HUDTech™ connector has a unique Slip and Housing design which spreads the radial load evenly around the coiled tubing enabling it to withstand high axial loads. The robust construction is furnished with standard O-rings, has a large through bore and is easy to attach and remove from the coiled tubing. Available for all sizes of coiled tubing, including taper strings, and can be supplied with any type of threaded connection, shackle hole or winch wire configuration.

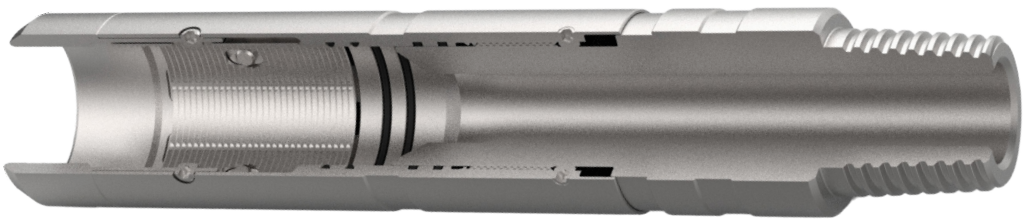
## TECHNICAL SPECIFICATION

| Coil Tubing Dia (Inches) | OD (Inches) | Connection | Working Pressure (Psi) | Service | Part No. |
|---|---|---|---|---|---|
| 1-1/2” | 2.125 | 1-1/2”AMMT Pin | 10,000 | $H_2S$ | 090-2125-A001 |
| | | | | Std | 090-2125-A002 |
| 1-3/4” | 2.500 | 1-1/2”AMMT Pin | 10,000 | $H_2S$ | 090-2500-A001 |
| | | | | Std | 090-2500-A002 |
| | 2.250 * | 1-1/2”AMMT Pin | 10,000 | $H_2S$ | 090-2250-A011 |
| | | | | Std | 090-2250-A012 |
| 2” | 2.875 | 2-3/8”PAC Pin | 10,000 | $H_2S$ | 090-2875-A001 |
| | | | | Std | 090-2875-A002 |
| | 2.500 * | 2-3/8”PAC Pin | 10,000 | $H_2S$ | 090-2500-A011 |
| | | | | Std | 090-2500-A012 |
| 2-3/8” | 3.125 | 2-3/8”PAC Pin | 10,000 | $H_2S$ | 090-3125-A001 |
| | | | | Std | 090-3125-A002 |
| | 2.875 * | 2-3/8”PAC Pin | 10,000 | $H_2S$ | 090-2875-A011 |
| | | | | Std | 090-2875-A012 |
| 2-7/8” | 3.625 | 2-3/8”PAC Pin | 10,000 | $H_2S$ | 090-3625-A001 |
| | | | | Std | 090-3625-A002 |

## OPERATION

The WellEnTech HUDTech™ connector is fitted to dressed coiled tubing. The coiled tubing end should be smoothed off and polished with emery cloth. The assembled connector is simply pushed onto the coiled tubing bottom sub of the connector is rotated in order to compress the slip into the coiled tubing, a pull test* will confirm engagement and a final make-up of the bottom sub will ensure the connector has a firm hold of the tubing. There are two o-rings, one primary and the other back up, giving peace of mind for high pressure applications. The connector when fitted to the coiled tubing should also be pressure tested* to ensure it has been fitted correctly prior to running in hole. These connectors are suitable for all types of coiled tubing operations.

* Compatible Pull/Pressure test subs are also available from WellEnTech



# QIKTECH™ – HEAVY DUTY

## APPLICATION

- Long tool string deployment
- Velocity strings
- Gas lift strings
- Any application where two sections cannot be rotated

## FEATURES

- Short, compact design
- Large through bore
- Torque tolerant design
- High tensile strength
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications

The WellEnTech QIKTech™ heavy duty connector provides a quick and easy means of connecting tool string components without the need to rotate either the upper or lower portions. The QIKTech™ is designed to be run as part of a toolstring where a connection is required as part of a long Bottom Hole Assembly which needs to be deployed in sections or as part of a Velocity String or Gas Lift String. The design incorporates torque transmission teeth which torsionally lock the tool string enabling it to withstand torque induced through drilling or the reactive torque experienced as a result of a motor stall. The QIKTech™ includes a Lock Sleeve which ensures the Connector Sleeve cannot back off when the tool is in use and retention threads hold the lock and connector sleeves up on the mandrel when being stabbed into the Bottom Sub.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | ID (Inches) | Connections | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|---|
| 1.688 | 12.00 | 0.75 | 1”AMMT | 41,000 | Std. | 315-1688-A002 |
| | | | | 29,000 | H2S | 315-1688-A001 |
| 1.750 | 12.00 | 0.75 | 1-1/4”AMMT | 41,000 | Std. | 315-1750-A002 |
| | | | | 29,000 | H2S | 315-1750-A001 |
| 2.125 | 19.13 | 1.00 | 1-1/2”AMMT | 88,700 | Std. | 315-2125-A002 |
| | | | | 64,600 | H2S | 315-2125-A001 |
| 2.875 | 20.00 | 1.25 | 2-3/8”PAC | 122,900 | Std. | 315-2875-A002 |
| | | | | 89,400 | H2S | 315-2875-A001 |

## OPERATION

The lower part of the tool string or completion would be held in the BOP rams with the QIKTech™ lower end looking up. The QIKTech™ upper end would be attached to the tool string or completion immediately below he injector. The upper end is then slowly introduced to the lower end and the torque transmission teeth are mated together. The Connector Sleeve is then made up and held in place using the Lock Sleeve.

# ROLL-ON CONNECTOR

## APPLICATION

- Standard fishing operations
- Heavy duty fishing operations
- Jetting operations
- Stabbing and spooling

## FEATURES

- One piece
- Compact design
- Dual seal
- Suitable for drop balls
- Multi-function operation
- Maximised through bore
- Tool joint or service connection

## ADDITIONAL INFORMATION

- The sizes listed above are examples of common configurations.
- Bespoke designs available to suit job specific applications.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- The tensile strength of these connectors depends on a variety of factors such as, the condition and spec of the coil it is made up to. As a general rule, the strength can be consider to be 60% of the Coiled Tubing.

The WellEnTech Roll-On Connector is a cost effective means of providing a connection at the end of a string of Coiled Tubing. The robust one piece design is furnished with standard O-rings, has a large through bore and is easy to attach and remove from the Coiled Tubing. Available for all sizes of Coiled Tubing, including taper strings, and can be supplied with any type of threaded connection, shackle hole or winch wire configuration.

## TECHNICAL SPECIFICATION

| Coil Tubing Dia (Inches) | OD (Inches) | Connection | Wall thickness (Inches) | Service | Part No. |
|---|---|---|---|---|---|
| 1-1/4” | 1.563 | 1”AMMT Pin | 0.095 | Std | 070-1563-ST03 |
| | | | | $H_2S$ | 070-1563-SH03 |
| | | | 0.109 | Std | 070-1563-ST05 |
| | | | | $H_2S$ | 070-1563-SH05 |
| | | | 0.125 | Std | 070-1563-ST07 |
| | | | | $H_2S$ | 070-1563-SH07 |
| | | | 0.134 | Std | 070-1563-ST09 |
| | | | | $H_2S$ | 070-1563-SH09 |
| | | | 0.156 | Std | 070-1563-ST11 |
| | | | | $H_2S$ | 070-1563-SH11 |
| | | | 0.175 | Std | 070-1563-ST13 |
| | | | | $H_2S$ | 070-1563-SH13 |
| 1-1/2” | 1.688 | 1”AMMT Pin | 0.095 | Std | 070-1688-ST03 |
| | | | | $H_2S$ | 070-1688-SH03 |
| | | | 0.102 | Std | 070-1688-ST05 |
| | | | | $H_2S$ | 070-1688-SH05 |
| | | | 0.109 | Std | 070-1688-ST07 |
| | | | | $H_2S$ | 070-1688-SH07 |
| | | | 0.118 | Std | 070-1688-ST09 |
| | | | | $H_2S$ | 070-1688-SH09 |
| | | | 0.125 | Std | 070-1688-ST11 |
| | | | | $H_2S$ | 070-1688-SH11 |
| | | | 0.134 | Std | 070-1688-ST13 |
| | | | | $H_2S$ | 070-1688-SH13 |
| | | | 0.145 | Std | 070-1688-ST15 |
| | | | | $H_2S$ | 070-1688-SH15 |
| | | | 0.156 | Std | 070-1688-ST17 |
| | | | | $H_2S$ | 070-1688-SH17 |
| | | | 0.175 | Std | 070-1688-ST19 |
| | | | | $H_2S$ | 070-1688-SH19 |
| 1-3/4” | 2.125 | 1-1/2”AMMT Pin | 0.109 | Std | 070-2125-ST27 |
| | | | | $H_2S$ | 070-2125-SH27 |
| | | | 0.118 | Std | 070-2125-ST29 |
| | | | | $H_2S$ | 070-2125-SH29 |
| | | | 0.125 | Std | 070-2125-ST31 |
| | | | | $H_2S$ | 070-2125-SH31 |
| | | | 0.134 | Std | 070-2125-ST33 |
| | | | | $H_2S$ | 070-2125-SH33 |
| | | | 0.145 | Std | 070-2125-ST35 |
| | | | | $H_2S$ | 070-2125-SH35 |
| | | | 0.156 | Std | 070-2125-ST37 |
| | | | | $H_2S$ | 070-2125-SH37 |
| | | | 0.175 | Std | 070-2125-ST39 |
| | | | | $H_2S$ | 070-2125-SH39 |
| | | | 0.190 | Std | 070-2125-ST41 |
| | | | | $H_2S$ | 070-2125-SH41 |
| | | | 0.204 | Std | 070-2125-ST43 |
| | | | | $H_2S$ | 070-2125-SH43 |

## OPERATION

The Roll-On Connector is fitted to dressed Coiled Tubing using a crimping tool*. The Coiled Tubing is deformed into the grooves producing an extremely strong and durable connection. The grooves have been designed to reduce any stress raisers produced during the rolling process, there are also two O-rings, one primary and the other back up, giving peace of mind for high pressure applications. The connector when fitted to the Coiled Tubing should be pull and pressure tested using a Pull Test Sub* prior to running in hole to ensure it has been fitted correctly. These connectors are not recommended for applications where they may be subjected to torque.

# TECHNICAL SPECIFICATION

| Coil Tubing Dia (Inches) | OD (Inches) | Connection | Wall thickness (Inches) | Service | Part No. |
|---|---|---|---|---|---|
| 2” | 2.875 | 2-3/8”PAC Pin | 0.109 | Std | 070-2875-ST03 |
| | | | | $H_2S$ | 070-2875-SH03 |
| | | | 0.125 | Std | 070-2875-ST05 |
| | | | | $H_2S$ | 070-2875-SH05 |
| | | | 0.134 | Std | 070-2875-ST07 |
| | | | | $H_2S$ | 070-2875-SH07 |
| | | | 0.145 | Std | 070-2875-ST09 |
| | | | | $H_2S$ | 070-2875-SH09 |
| | | | 0.156 | Std | 070-2875-ST11 |
| | | | | $H_2S$ | 070-2875-SH11 |
| | | | 0.175 | Std | 070-2875-ST13 |
| | | | | $H_2S$ | 070-2875-SH13 |
| | | | 0.190 | Std | 070-2875-ST15 |
| | | | | $H_2S$ | 070-2875-SH15 |
| | | | 0.204 | Std | 070-2875-ST17 |
| | | | | $H_2S$ | 070-2875-SH17 |
| | | | 0.224 | Std | 070-2875-ST19 |
| | | | | $H_2S$ | 070-2875-SH19 |
| 2-3/8” | 2.875 | 2-3/8”PAC Pin | 0.109 | Std | 070-2875-ST27 |
| | | | | $H_2S$ | 070-2875-SH27 |
| | | | 0.125 | Std | 070-2875-ST29 |
| | | | | $H_2S$ | 070-2875-SH29 |
| | | | 0.134 | Std | 070-2875-ST31 |
| | | | | $H_2S$ | 070-2875-SH31 |
| | | | 0.145 | Std | 070-2875-ST33 |
| | | | | $H_2S$ | 070-2875-SH33 |
| | | | 0.156 | Std | 070-2875-ST35 |
| | | | | $H_2S$ | 070-2875-SH35 |
| | | | 0.165 | Std | 070-2875-ST37 |
| | | | | $H_2S$ | 070-2875-SH37 |
| | | | 0.175 | Std | 070-2875-ST39 |
| | | | | $H_2S$ | 070-2875-SH39 |
| | | | 0.190 | Std | 070-2875-ST41 |
| | | | | $H_2S$ | 070-2875-SH41 |
| | | | 0.204 | Std | 070-2875-ST43 |
| | | | | $H_2S$ | 070-2875-SH43 |
| | | | 0.214 | Std | 070-2875-ST45 |
| | | | | $H_2S$ | 070-2875-SH45 |
| | | | 0.224 | Std | 070-2875-ST47 |
| | | | | $H_2S$ | 070-2875-SH47 |

# CHECK VALVE SUB

## APPLICATION

- Any Thru' Tubing operation where a dual pressure barrier is required
- Standard Jetting operations
- Clean out runs
- Milling operations

## FEATURES

- Robust two piece housing
- Dual seal barrier
- Replaceable flapper Check Valves*
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech Check Valve Sub contains two check valves which provide a pressure tight barrier between the well fluids and the tubing. The check valves are orientated in such a way as to permit flow down through the tubing but not allow the well fluids to enter back up into the tubing.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|
| 1.688 | 12.00 | 1"AMMT | 44,000 | H2S | 111-1688-A001 |
| | | | 60,500 | Std. | 111-1688-A002 |
| 1.750 | 12.50 | 1-1/4"AMMT | 44,000 | H2S | 111-1750-A001 |
| | | | 60,500 | Std. | 111-1750-A002 |
| 2.125 | 13.00 | 1-1/2"AMMT | 83,200 | H2S | 111-2125-A001 |
| | | | 114,400 | Std. | 111-2125-A002 |
| 2.875 | 15.75 | 2-3/8"PAC | 146,500 | H2S | 111-2875-A001 |
| | | | 201,400 | Std. | 111-2875-A002 |
| 3.125 | 18.50 | 2-7/8"PAC | 151,200 | H2S | 111-3125-A007 |
| | | | 207,900 | Std. | 111-3125-A008 |

## OPERATION

The Check Valve Sub consists of a simple two piece housing containing two flapper check valves. Both check valves are orientated as that fluid is permitted in one direction but not the other. Each flapper check valve creates a pressure tight barrier in one direction, preventing well fluids from entering the tubing.

* Tool supplied with two check valves, additional check valves available separately.

# DOWN HOLE FILTER SUB

## APPLICATION

- Any operation where filtration of fluid is required

## FEATURES

- Robust two piece housing
- Various filter size options
- Choice of tool lengths available
- Replaceable Filter Inserts*
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.
- Please specify filter type required at time of order.

## OPERATION

The WellEnTech Down Hole Filter Sub can be inserted anywhere within a tool string in order to filter pumped fluids downstream of the Sub. The tool is made up to the BHA in the same way as any other tool. The elongated filter design maximises the amount of debris which can be collected, shorted versions are available for operations where there are height restrictions and BHA lengths have to be kept to a minimum. To swap out the filter or remove it, the top sub is simply removed and the filter pulled out. The filter can be flushed through, reused and re-assembled for future operations.

The WellEnTech Downhole Filter Sub provides a means of filtering fluid within a Bottom Hole Assembly. It prevents any foreign objects, debris or scale from interfering with critical components within a tool string. Particularly useful for the preservation of motors, jetting tools, ESP's, Setting Tools etc. The stainless steel Filter is designed to be reused and is easy to install and remove. A variety of filter sizes are available to filter any size of debris. Various lengths can also be supplied to suit operational requirements.

## TECHNICAL SPECIFICATION

| OD (Inches) | Connection | Length (Inches) | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|
| 1.688 | 1"AMMT | 36.00 | 44,000 | H2S | 228-1688-A001 |
| | | | 60,500 | Std. | 228-1688-A002 |
| | | 18.00 | 44,000 | H2S | 228-1688-A011 |
| | | | 60,500 | Std. | 228-1688-A012 |
| 1.750 | 1-1/4"AMMT | 36.00 | 54,400 | H2S | 228-1750-A001 |
| | | | 74,800 | Std. | 228-1750-A002 |
| | | 18.00 | 54,400 | H2S | 228-1750-A011 |
| | | | 74,800 | Std. | 228-1750-A012 |
| 2.125 | 1-1/2"AMMT | 44.00 | 83,200 | H2S | 228-2125-A001 |
| | | | 114,400 | Std. | 228-2125-A002 |
| | | 24.00 | 83,200 | H2S | 228-2125-A011 |
| | | | 114,400 | Std. | 228-2125-A012 |
| 2.875 | 2-3/8"PAC | 46.00 | 146,500 | H2S | 228-2875-A001 |
| | | | 201,400 | Std. | 228-2875-A002 |
| | | 28.00 | 146,500 | H2S | 228-2875-A011 |
| | | | 201,400 | Std. | 228-2875-A012 |
| 3.125 | 2-7/8"PAC | 46.00 | 151,200 | H2S | 228-3125-A001 |
| | | | 207,900 | Std. | 228-3125-A002 |
| | | 28.00 | 151,200 | H2S | 228-3125-A011 |
| | | | 207,900 | Std. | 228-3125-A012 |

## FILTER OPTIONS

| Type | Micron | Inches | Typical Impurities |
|---|---|---|---|
| D | 1000 - 1200 | 0.045" | Course sand and Debris |
| M | 600 - 700 | 0.025" | Silt and Sediment |
| X | 200 - 300 | 0.009" | Fine Sand and Silt |
| XF | 100 - 150 | 0.004" | Very Fine Sand and Dust |

WELL EN TECH
WELL ENGINEERING TECHNOLOGY

# DROP BALL FLAPPER SUB

## APPLICATION

- Reverse circulation applications
- Any Well operations where a double barrier is required

## FEATURES

- Flappers held open
- Fully retained shear screws
- Drop ball activated
- Fluid flow down thru' tool when flapper activated
- Double barrier to well bore fluids when activated
- No specialist assembly tools required
- Fully adjustable activation pressure
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Tools are supplied with a blank disc as standard. Additional Rupture discs are available to suit a range of pressures.

The WellEnTech Drop Ball Flapper Sub is a tool which contains two flapper check valves. These check valves are held open until required. Ideally suited for reverse circulation operations where check valves are not required during circulation but are required when tripping out of hole so that the retrieved tubing sting incorporates a double barrier against well fluids. When activated the flappers permit flow down through the tubing but prevents flow back up through the tubing.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|
| 1.688 | 22.00 | 1"AMMT | 41,200 | H2S | 113-1688-A001 |
| | | | 56,800 | Std. | 113-1688-A002 |
| 1.750 | 22.00 | 1-1/4"AMMT | 42,800 | H2S | 113-1750- A001 |
| | | | 59,900 | Std. | 113-1750- A002 |
| 2.125 | 26.00 | 1-1/2"AMMT | 54,000 | H2S | 113-2125- A001 |
| | | | 74,200 | Std. | 113-2125- A002 |
| 2.375 | 29.00 | 1-1/2"AMMT | 62,600 | H2S | 113-2375- A001 |
| | | | 86,000 | Std. | 113-2375- A002 |
| 2.875 | 35.00 | 2-3/8"PAC | 158,900 | H2S | 113-2875- A001 |
| | | | 218,500 | Std. | 113-2875- A002 |

## OPERATION

The WellEnTech Drop Ball Flapper Sub is configured at surface to the required shear value. The tool is attached to the Bottom Hole Assembly and remains redundant in the tubing string until required. When the reverse circulation operation is complete. A drop ball is pumped down the tubing sting until it lands off on the ball seat in the stinger. Pressure is then applied, which shears the shear screws and drives the stinger down which activates the Flapper Check Valves. From this point on, no flow is permitted back up the tubing string enabling safe retrieval of the tool sting to surface.

# FIXED BLADE STABILISERS

## APPLICATION

- Standard and heavy duty fishing operations
- Jetting operations
- Centralisation in milling, cutting and reaming operations
- Provide a no-go for a tool string
- Reverse circulation operations

## FEATURES

- Robust, single piece design
- Full range of OD's available
- Large through bore
- Field redressable

## ADDITIONAL INFORMATION

- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Many other sleeve sizes are available.
- * Sleeve part numbers listed are universal service

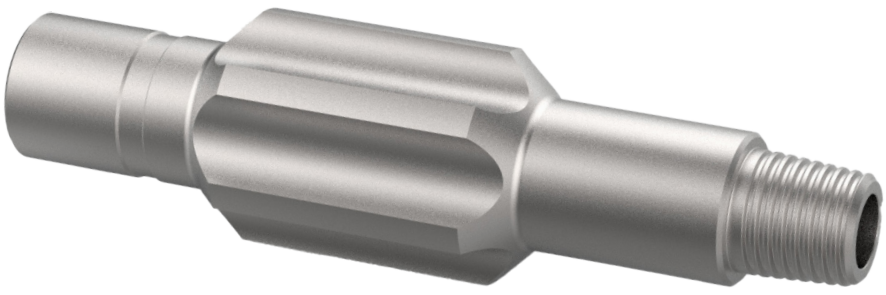
## OPERATION

The Fixed Blade Stabiliser is a one piece component with tong areas above and below the stabiliser blades. The Stabilisers are available in a range of OD's.

The WellEnTech Fixed Blade Stabiliser provides centralisation for a tool string. The stabiliser blades are integral to the tool mandrel which results in the strongest type of well bore centralisation device where the tool strength is only limited by the strength of the tool string connections. The Fixed Blade Stabiliser has the additional bonus of protecting the tool string from wear while tripping in and out of hole.

## TECHNICAL SPECIFICATION

| Body OD (Inches) | Connections | ID (Inches) | Length (Inches) | Service | Tensile Strength (lbs) | Stabiliser OD (Inches) | Part No. |
|---|---|---|---|---|---|---|---|
| 1.688 | 1"AMMT | 0.75 | 14.25 | Std | 62,400 | 1.88 | 178-1688-SH19 |
| | | | | | | 2.00 | 178-1688-SH20 |
| | | | | | | 2.25 | 178-1688-SH22 |
| | | | | | | 2.50 | 178-1688-SH25 |
| | | | | | | 2.75 | 178-1688-SH27 |
| | | | | | | 3.00 | 178-1688-SH30 |
| | | | | | | 3.25 | 178-1688-SH32 |
| | | | | H2S | 45,400 | 3.50 | 178-1688-SH35 |
| | | | | | | 3.75 | 178-1688-SH37 |
| | | | | | | 4.00 | 178-1688-SH40 |
| | | | | | | 4.25 | 178-1688-SH42 |
| | | | | | | 4.50 | 178-1688-SH45 |
| | | | | | | 4.75 | 178-1688-SH47 |
| | | | | | | 5.00 | 178-1688-SH50 |
| 2.125 | 1-1/2"AMMT | 1.00 | 16.81 | Std | 116,500 | 2.25 | 178-2125-SH22 |
| | | | | | | 2.50 | 178-2125-SH25 |
| | | | | | | 2.75 | 178-2125-SH27 |
| | | | | | | 3.00 | 178-2125-SH30 |
| | | | | | | 3.25 | 178-2125-SH32 |
| | | | | | | 3.50 | 178-2125-SH35 |
| | | | | H2S | 84,700 | 3.75 | 178-2125-SH37 |
| | | | | | | 4.00 | 178-2125-SH40 |
| | | | | | | 4.25 | 178-2125-SH42 |
| | | | | | | 4.50 | 178-2125-SH45 |
| | | | | | | 4.75 | 178-2125-SH47 |
| | | | | | | 5.00 | 178-2125-SH50 |
| 2.875 | 2-3/8"PAC | 1.38 | 18.88 | Std | 247,500 | 3.25 | 178-2875-SH32 |
| | | | | | | 3.50 | 178-2875-SH35 |
| | | | | | | 3.75 | 178-2875-SH37 |
| | | | | | | 4.00 | 178-2875-SH40 |
| | | | | | | 4.25 | 178-2875-SH42 |
| | | | | | | 4.50 | 178-2875-SH45 |
| | | | | H2S | 180,000 | 5.00 | 178-2875-SH50 |
| | | | | | | 5.50 | 178-2875-SH55 |
| | | | | | | 6.00 | 178-2875-SH60 |
| | | | | | | 6.25 | 178-2875-SH62 |
| | | | | | | 6.50 | 178-2875-SH65 |
| | | | | | | 7.00 | 178-2875-SH70 |



# FLAPPER CHECK VALVE

## APPLICATION

- Flapper Check Valve Subs
- Motorhead Assemblies
- Injection subs
- Cable Head Assemblies
- Drop Ball Flapper Sub

## FEATURES

- Stainless Steel Construction
- Strong Spring and Hinge Pin
- Unidirectional operation
- Low maintenance design
- High Pressure applications
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Flapper Check Valve are manufactured from Stainless Steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech flapper check valve is an assembly with a uni-directional pressure tight barrier. Typically used for well control applications where flow is permitted in only a single direction.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Bore (Inches) | Part No. |
|---|---|---|---|
| 0.750 | 1.35 | 0.375 | 110-0750-A001 |
| 1.125 | 2.00 | 0.594 | 110-1125-A001 |
| 1.313 | 2.375 | 0.720 | 110-1310-A001 |
| 1.325 | 2.230 | 0.781 | 110-1325-A001 |
| 1.625 | 2.625 | 1.000 | 110-1625-A001 |
| 1.815 | 3.130 | 1.030 | 110-1815-A001 |
| 2.688 | 4.000 | 1.530 | 110-2688-A001 |
| 4.125 | 5.500 | 2.500 | 110-4125-A001 |

## OPERATION

The WellEnTech Flapper Check Valve is designed to provide a pressure tight, single direction barrier within a tool seal bore. The Flapper pivots about a hinge pin and is held closed with a powerful spring. Fluid flow, applied pressure or a stinger can be employed to open the flapper allowing fluid to pass thru' the bore.

# FREE TRAVEL TOOL

## APPLICATION

- Permits Axial Movement of BHA
- Space Out operations
- Bumper sub applications
- Velocity Strings
- Heater String operations

## FEATURES

- Compact design
- Maximised Stroke
- Compression/Tension Operation
- Thru' bore
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech Free Travel Tool is a device which provides a means of axial movement of a tool string while maintaining pressure integrity. It is ideally suited for applications where movement is anticipated downhole and thus avoid putting the BHA under any adverse loading conditions. The design also allows full flow through and full pressure integrity. A thru' bore allows drop balls to pass through the tool to BHA components below.

## TECHNICAL SPECIFICATION

| OD (Inches) | ID (Inches) | Length (Inches) | Stroke (Inches) | Connections | Service | Tensile Yield (lbs) | Part No. |
|---|---|---|---|---|---|---|---|
| 1.500 | 0.53 | 15.00 | 6.00 | 1.125" 10 TPI STUB ACME | H2S | 18,900 | 227-1500-A001 |
| | | | | | Std. | 26,100 | 227-1500-A002 |
| 1.688 | 0.56 | 17.50 | 7.00 | 1"AMMT | H2S | 25,400 | 227-1688-A001 |
| | | | | | Std. | 35,000 | 227-1688-A002 |
| 1.750 | 0.56 | 17.50 | 7.00 | 1-1/4"AMMT | H2S | 25,400 | 227-1750-A001 |
| | | | | | Std. | 35,000 | 227-1750-A002 |
| 2.125 | 0.75 | 21.25 | 8.00 | 1-1/2"AMMT | H2S | 26,900 | 227-2125-A001 |
| | | | | | Std. | 37,000 | 227-2125-A002 |
| 2.875 | 1.38 | 29.00 | 10.00 | 2-3/8"PAC | H2S | 100,200 | 227-2875-A001 |
| | | | | | Std. | 138,000 | 227-2875-A002 |

## OPERATION

The WellEnTech Free Travel Tool as part of a typical BHA gives the operator orientation flexibility, by allowing the tool string to be broken and made-up below the joint, without the need to disconnect from the coiled Tubing. The tool operates while in tension or compression. The debris tolerant design ensures reliable and dependable operation and the tool is easily striped and redressed.

# HEAVY DUTY MOTORHEAD ASSEMBLY

## APPLICATION

- Suitable for use on all types of Thru' Tubing operations
- Jarring operations
- Scale Milling and well bore cleanout
- Impact hammer applications

## FEATURES

- Short, robust design
- High torsional and tensile yield
- Debris tolerant
- Fully adjustable release value
- Burst disc
- Easy to assemble and redress

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- A blank burst disc is supplied as standard and a range of rupture discs with specific burst pressures are available.

The WellEnTech Heavy Duty Motorhead Assembly is a compact tool string comprising of Double flapper Check Valves, a disconnect, a circ sub and a rupture disc. Designed to be as short as possible without compromising on functionality or strength, it is easy to assemble and redress without the need for specialist tools. The fishing neck is completely isolated from well fluids thus eliminating the potential of debris build up and is also compatible with all standard GS type pulling tools. Torque transmission is made possible by the inclusion of castellations. The WellEnTech Heavy Duty Motorhead Assembly is one of the shortest and strongest tools of its type available on the market.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connections | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|
| 1.688 | 24.03 | 1"AMMT | 37,500 | H2S | 100-1688-A001 |
| | | | 51,500 | STD | 100-1688-A002 |
| 1.750 | 24.53 | 1-1/4"AMMT | 37,500 | H2S | 100-1750-A001 |
| | | | 51,500 | STD | 100-1750-A002 |
| 2.125 | 25.36 | 1-1/2"AMMT | 63,000 | H2S | 100-2125-A001 |
| | | | 86,600 | STD | 100-2125-A002 |
| 2.875 | 30.45 | 2-3/8"PAC | 130,000 | H2S | 100-2875-A001 |
| | | | 200,000 | STD | 100-2875-A002 |
| 3.125 | 32.25 | 2-3/8"PAC | 130,000 | H2S | 100-3125-A001 |
| | | | 178,700 | STD | 100-3125-A002 |

## OPERATION

The main components of the design each serve a unique function. The double flapper check valves permit flow down through the tool but prevent well fluids entering the tubing. Castellations provide torque thru' capabilities, ideal for milling operations. Should the tool string become stuck in hole, the disconnect is activated with a drop ball and when disconnected a standard internal fishing neck is left looking up for future retrieval attempts. There is a rupture disc designed to re-establish circulation should circulation be lost and a circ sub to open up a larger flow area.

# HYDRAULIC BOW SPRING CENTRALISER

## APPLICATION

- BHA centralisation
- Logging runs
- Pipe Cutting
- Jetting operations
- Abrasive perforating/cutting

## FEATURES

- Compact design
- Hydraulic operation
- Hard wearing leaf springs
- Easily adjusted for a range of diameters
- Thru' bore
- Easily assembled and redressed

## ADDITIONAL INFORMATION

- The sizes listed above are examples of common configurations.
- Bespoke designs available to suit job specific applications.
- Tools are manufactured from mild steel as standard. Other materials are available on request.

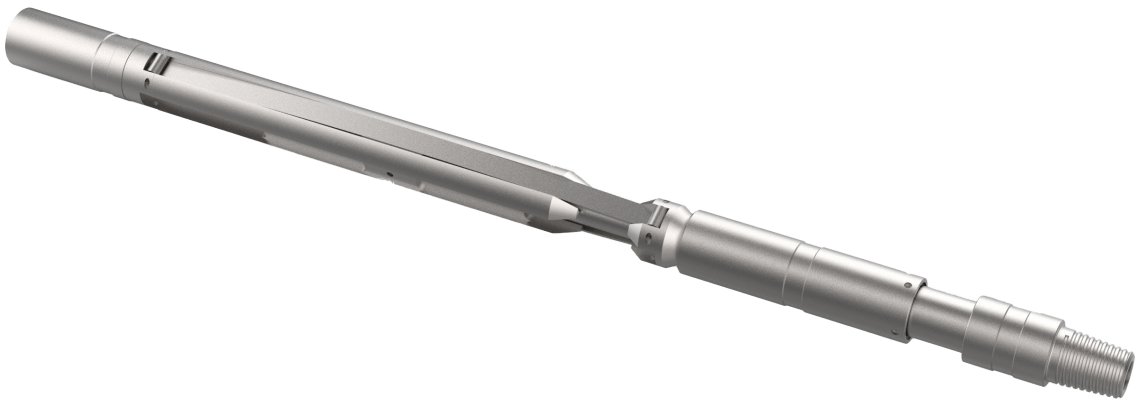
The WellEnTech Hydraulic Bow Spring Centraliser provides a cost effective means of centralising a Coiled Tubing BHA within a well bore or Tubing String. Furnished with four hard wearing spring steel leaf springs, which are designed to only contact the well bore when required, reduces spring wear ensuring prolonged service life and reliable operation. The adjustment sleeve enables quick and easy adjustment of the spring diameter. The simple, robust design has minimal parts, making assembly and redress extremely quick and easy.

## TECHNICAL SPECIFICATION

| Tool Body OD (Inches | ID range (Inches) | Length (Inches) | Connection | Assembly No. |
|---|---|---|---|---|
| 1.688" | 1.75 to 6 | 33.00" | 1"AMMT | 442-1688-A001 |
| 2.125" | 2.25 to 7.5 | 33.00" | 1-1/2"AMMT | 442-2125-A001 |
| 2.875" | 3.00 to 8.00 | 34.20" | 2-3/8"PAC | 442-2875-A001 |

## OPERATION

The WellEnTech Hydraulic Bow Spring Centraliser is assembled as part of a Coiled Tubing BHA. It is fitted to the BHA in the desired position and run in hole. The Adjustment sleeve enables the spring diameter to be set. When required, the tool is functioned by increasing flow through the tool, this energises the leaf springs and so provides centralisation within the well bore. To de-activate the tool, simply reduce flow or stop flowing and the springs return to the retracted position. To redress, the bottom sub is backed off, the actuation piston can be removed and the springs along with the spring supports can also be removed.



# JETTING NOZZLE

## APPLICATION

- Standard Jetting operations
- Clean out runs
- Debris circulation
- Nitrogen lifting
- Spotting operations
- Well Stimulation operations

## FEATURES

- One piece design
- Multi-function operation
- No redress required

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech Jetting Nozzle is a ported sub which is run at the bottom of a tool string. It provides a means of directing high velocity fluid exactly where it is needed. There are numerous port location options available, to enable the user to select the most suitable flow pattern for a specific jetting operation.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Tensile Strength (lbs) | Service |
|---|---|---|---|---|
| 1.688 | 6.50 | 1”AMMT Box | 62,400 | Std. |
| | | | 45,400 | H2S |
| 1.750 | 6.50 | 1-1/4”AMMT Box | 76,000 | Std. |
| | | | 55,200 | H2S |
| 2.125 | 8.00 | 1-1/2”AMMT Box | 116,500 | Std. |
| | | | 84,700 | H2S |
| 2.875 | 9.50 | 2-3/8”PAC Box | 218,500 | Std. |
| | | | 158,900 | H2S |

## OPERATION

The type of Jetting Nozzle is selected at surface to provide the required flow area and jetting orientation of the nozzles e.g. up jetting, side jetting, down jetting or displacement. The Jetting Nozzle is then fitted to the bottom of the tool string and deployed to the required location for jetting to commence.

DOWN JETTING

SIDE JETTING

UP JETTING

DISPLACEMENT

# MECHANICAL BOW SPRING CENTRALISER

## APPLICATION

- BHA centralisation
- Logging runs
- Pipe Cutting
- Jetting operations
- Abrasive perforating/cutting

## FEATURES

- Compact design
- Mechanical operation
- Hard wearing leaf springs
- Thru' bore
- Easily assembled and redressed

## ADDITIONAL INFORMATION

- The sizes listed above are examples of common configurations.
- Bespoke designs available to suit job specific applications.
- Tools are manufactured from mild steel as standard. Other materials are available on request.

The WellEnTech Mechanical Bow Spring Centraliser provides a cost effective means of centralising a Coiled Tubing BHA within a well bore or Tubing String. Furnished with 4 hard wearing spring steel leaf springs, ensures prolonged service life and reliable operation. The simple, robust design has minimal parts, making assembly and redress extremely quick and easy.

## TECHNICAL SPECIFICATION

| Tool Body OD (Inches | ID range (Inches) | Length (Inches) | Connection | Assembly No. |
|---|---|---|---|---|
| 1.688” | 1.75 to 6 | 24” | 1”AMMT | 440-1688-A001 |
| 2.125” | 2.25 to 7.5 | 27.75” | 1-1/2”AMMT | 440-2125-A001 |
| 2.875” | 3.00 to 8.75 | 29.75” | 2-3/8”PAC | 440-2875-A001 |

## OPERATION

The WellEnTech Mechanical Bow Spring Centraliser is assembled as part of a Coiled Tubing BHA. It is fitted to the BHA in the desired position and run in hole. Because it is a mechanical tool, there is no flow required to enable it to operate. The leaf springs provide centralisation as soon as the BHA enters the well bore. To redress, the bottom sub is backed off and the springs along with the spring supports can be removed.

# NON-ROTATING SLEEVE STABILISERS

## APPLICATION

- Standard and heavy duty fishing operations
- Jetting operations
- Centralisation in milling, cutting and reaming operations
- Provide a no-go for a tool string
- Reverse circulation operations

## FEATURES

- Robust two piece mandrel design
- Interchangeable sleeve sizes
- Large through bore
- Field redressable

## ADDITIONAL INFORMATION

- Tools are manufactured from mild steel as standard. Other materials are available on request.

  Many other sleeve sizes are available.

- * Sleeve part numbers listed are universal service

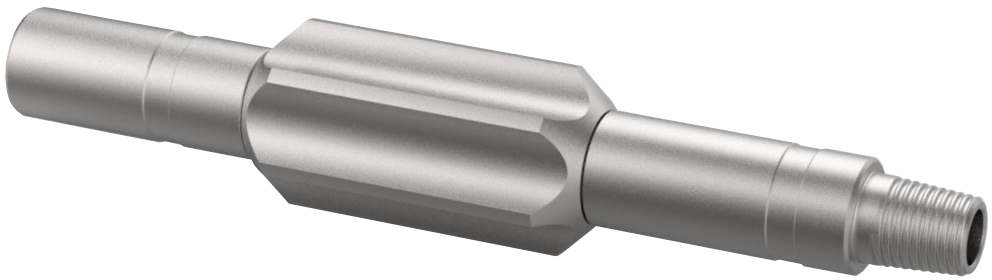
## OPERATION

The Non-rotating Sleeve Stabiliser consists of only three main components. The mandrel and bottom sub are threaded together with an interchangeable stabiliser sleeve which is free to rotate. A selection of sleeves with a range of OD's can be supplied and are easily swapped out by removing the bottom sub.

The WellEnTech Non-rotating Sleeve Stabiliser provides centralisation for a tool string. The stabiliser blades are free to rotate in relation to the inner mandrel which prevents wear to the well bore caused by rotation. It has the additional bonus of protecting the tool string from wear while tripping in and out of hole.

## TECHNICAL SPECIFICATION

| Body OD (Inches) | ID (Inches) | Length (Inches) | Service | Tensile Strength (lbs) | Assembly Part No. | Sleeve OD (Inches) | Sleeve * Part No. |
|---|---|---|---|---|---|---|---|
| 1.688 | 0.50 | 14.25 | Std | 62,400 | 175-1688-A002 | 1.88 | 175-1688-SH19 |
| | | | | | | 2.00 | 175-1688-SH20 |
| | | | | | | 2.25 | 175-1688-SH22 |
| | | | | | | 2.50 | 175-1688-SH25 |
| | | | | | | 2.75 | 175-1688-SH27 |
| | | | | | | 3.00 | 175-1688-SH30 |
| | | | | | | 3.25 | 175-1688-SH32 |
| | | | H2S | 45,400 | 175-1688-A001 | 3.50 | 175-1688-SH35 |
| | | | | | | 3.75 | 175-1688-SH37 |
| | | | | | | 4.00 | 175-1688-SH40 |
| | | | | | | 4.25 | 175-1688-SH42 |
| | | | | | | 4.50 | 175-1688-SH45 |
| | | | | | | 4.75 | 175-1688-SH47 |
| | | | | | | 5.00 | 175-1688-SH50 |
| 2.125 | 1.00 | 16.81 | Std | 116,300 | 175-2125-A002 | 2.25 | 175-2125-SH22 |
| | | | | | | 2.50 | 175-2125-SH25 |
| | | | | | | 2.75 | 175-2125-SH27 |
| | | | | | | 3.00 | 175-2125-SH30 |
| | | | | | | 3.25 | 175-2125-SH32 |
| | | | | | | 3.50 | 175-2125-SH35 |
| | | | H2S | 84,600 | 175-2125-A001 | 3.75 | 175-2125-SH37 |
| | | | | | | 4.00 | 175-2125-SH40 |
| | | | | | | 4.25 | 175-2125-SH42 |
| | | | | | | 4.50 | 175-2125-SH45 |
| | | | | | | 4.75 | 175-2125-SH47 |
| | | | | | | 5.00 | 175-2125-SH50 |
| 2.875 | 1.38 | 18.88 | Std | 247,500 | 175-2875-A002 | 3.25 | 175-2875-SH32 |
| | | | | | | 3.50 | 175-2875-SH35 |
| | | | | | | 3.75 | 175-2875-SH37 |
| | | | | | | 4.00 | 175-2875-SH40 |
| | | | | | | 4.25 | 175-2875-SH42 |
| | | | | | | 4.50 | 175-2875-SH45 |
| | | | H2S | 180,000 | 175-2875-A001 | 5.00 | 175-2875-SH50 |
| | | | | | | 5.50 | 175-2875-SH55 |
| | | | | | | 6.00 | 175-2875-SH60 |
| | | | | | | 6.25 | 175-2875-SH62 |
| | | | | | | 6.50 | 175-2875-SH65 |
| | | | | | | 7.00 | 175-2875-SH70 |



# PORTED CROSSOVER

## APPLICATION

- Connection of Wireline tools to Coiled Tubing tools

## FEATURES

- Short robust construction
- No moving parts
- Multiple flow ports
- Low maintenance design
- Numerous connection options

## ADDITIONAL INFORMATION

- Example sizes are shown above, other sizes available on request.
- Tools are manufactured from mild steel as standard, other materials are available on request.
- Bespoke designs available to suit job specific applications

The WellEnTech Ported Crossovers provide a means of connecting wireline tools to a thru' tubing tool string. They are designed to suit all types of coiled tubing and wireline connections but can also be designed to suit bespoke threads. They are ported which provides a means of circulating while running in and out of hole.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Upper Connection | Lower Connection | Service | Part No. |
|---|---|---|---|---|---|
| 1.563 | 8.00 | 1"AMMT Box | 15/16"-10 UNS Sucker Rod Box | Std. | 158-1563-ST01 |
| | | | | H2S | 158-1563-SH01 |
| 1.688 | 5.75 | 1"AMMT Box | 5/8"-11 UNC Sucker Rod Box | Std. | 158-1688-ST01 |
| | | | | H2S | 158-1688-SH01 |
| 1.750 | 6.50 | 1-1/4"AMMT Box | 1-1/16"-10 UNS Sucker Rod Box | Std. | 158-1750-ST02 |
| | | | | H2S | 158-1750-SH02 |
| 2.000 | 4.00 | 1-1/2"AMMT Pin | 15/16"-10 UNS Sucker Rod Pin | Std. | 158-2000-ST01 |
| | | | | H2S | 158-2000-SH01 |
| 2.125 | 7.50 | 1-1/2"AMMT Box | 3/4"-10 UNC Sucker Rod Box | Std. | 158-2125-ST01 |
| | | | | H2S | 158-2125-SH01 |
| 2.875 | 8.00 | 2-3/8"PAC Box | 1-1/16"-10 UNS Sucker Rod Box | Std. | 158-2875-ST02 |
| | | | | H2S | 158-2875-SH02 |

## OPERATION

The Ported Crossover is fitted into the desired position within the BHA. It is made up to the tool string with the correct amount of applied torque, as per the threaded connection on the tool. The tool is then run in hole and the ports enable circulation.

# PROPULSE™ JETTING NOZZLE

## APPLICATION

- Tubular jetting operations
- Fishing neck clean outs
- Sand screen cleaning
- Debris circulation
- Correct placement of treatment chemicals

## FEATURES

- Short robust construction
- No moving parts
- Dynamic flow jet
- Low maintenance design

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

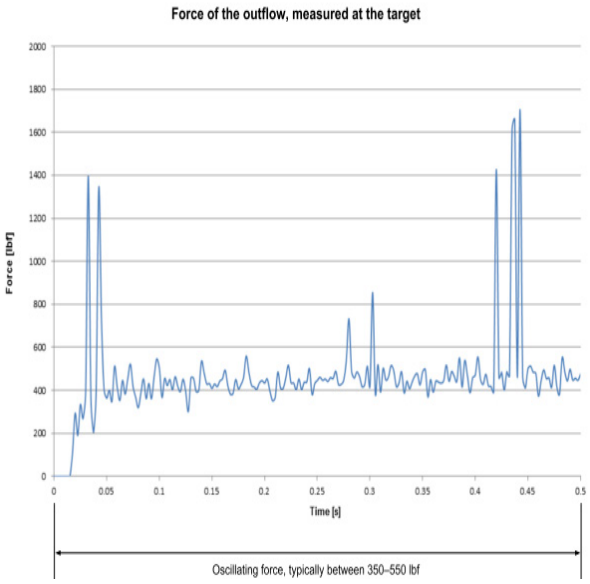
The WellEnTech ProPulse™ Jetting Nozzle creates pulsating pressure waves. These pressure waves remove debris build up and scale within tubulars, break up near wellbore damage as well as restore and enhance the permeability of the perforations and surrounding wellbore area. The internal chamber has been designed using computational fluid dynamics and has no moving parts. The short robust construction makes it ideal for jetting operations where BHA lengths are limited.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|
| 1.688 | 4.75 | 1"AMMT Box | 62,400 | Std. | 135-1688-A002 |
| | | | 45,400 | H2S | 135-1688-A001 |
| 2.125 | 6.00 | 1-1/2"AMMT Box | 116,500 | Std. | 135-2125-A002 |
| | | | 84,700 | H2S | 135-2125-A001 |
| 2.875 | 8.50 | 2-3/8"PAC Box | 218,500 | Std. | 135-2875-A002 |
| | | | 158,900 | H2S | 135-2875-A001 |

## OPERATION

The ProPulse™ Jetting Nozzle is fitted to the bottom of a BHA like any other regular jetting nozzle. It is made up to the tool sting with the correct amount of applied torque, as per the threaded connection on the tool. Pumping fluid through the tool will produce a fluid jet with pulsating pressure waves. The Pulsating Jetting Nozzle is ideal for all operations since the kinetic energy of the pressure pulse travels through the wellbore fluid with negligible energy loss improving the fluid jet force. It is only after the pressure waves contact the formation that this energy is dissipated.




# PUMP THRU' SWIVEL

## APPLICATION

- Tool String Orientation
- Restriction access
- Aid Tool String Make-up/Break out

## FEATURES

- Short, compact design
- Compression/Tension Operation
- Thru' bore
- Full Rotation
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

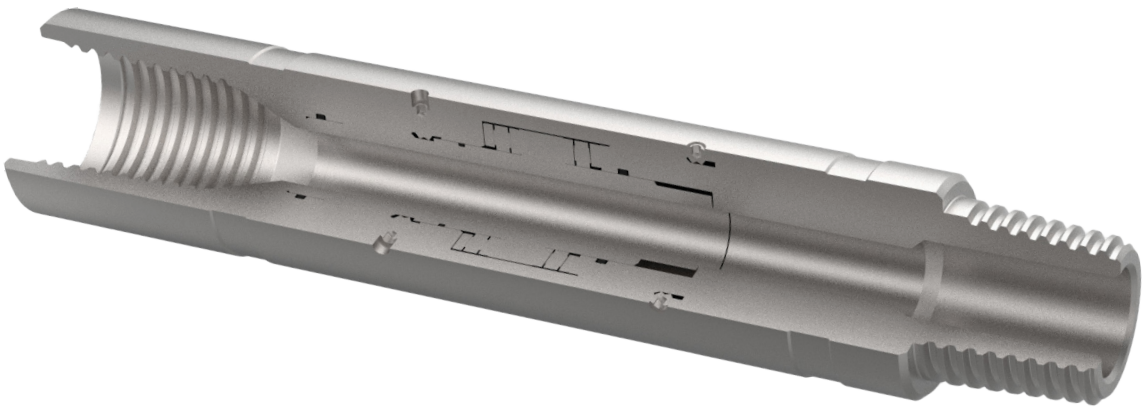
The WellEnTech Pump Thru' Swivel is a sub which provides free rotation of the tool string below. It is ideally suited when rotation of the BHA is required downhole, such as for orientation of the lower end of the BHA or to help with access through downhole restrictions, etc. The design also allows full flow through and full pressure integrity. A thru' bore allows drop balls to pass through the swivel to BHA components below. The tool is furnished with brass bearings as standard but, Ball or Roller bearings can be fitted if desired.

## TECHNICAL SPECIFICATION

| OD (Inches) | ID (Inches) | Length (Inches) | Connections | Service | Tensile Yield (lbs) | Part No. |
|---|---|---|---|---|---|---|
| 1.688 | 0.56 | 8.00 | 1"AMMT | H2S | 25,400 | 319-1688-A001 |
| | | | | Std. | 35,000 | 319-1688-A002 |
| 1.750 | 0.56 | 8.00 | 1-1/4"AMMT | H2S | 25,400 | 319-1750-A001 |
| | | | | Std. | 35,000 | 319-1750-A002 |
| 2.125 | 0.75 | 9.50 | 1-1/2"AMMT | H2S | 26,900 | 319-2125-A001 |
| | | | | Std. | 37,000 | 319-2125-A002 |
| 2.875 | 1.38 | 12.00 | 2-3/8"PAC | H2S | 100,200 | 319-2875-A001 |
| | | | | Std. | 138,000 | 319-2875-A002 |

## OPERATION

The WellEnTech Pump Thru' Swivel as part of a typical BHA gives the operator orientation flexibility, by allowing the tool string to be broken and made-up below the joint, without the need to disconnect from the coiled Tubing. The tool operates while in tension or compression. The debris tolerant bearing section ensures reliable and dependable operation and the tool is easily striped and redressed.



# SPIROJET™

## APPLICATION

- Tubular and Wellbore jetting operations
- Top of fish and profile clean outs
- Sand screen and SSD cleaning
- Debris circulation

## FEATURES

- Short robust construction
- No external moving parts
- Dynamic flow jet technology
- Low maintenance design

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard, other materials are available on request.
- Bespoke designs available to suit job specific applications

The WellEnTech SpiroJet™ is a dynamic jetting nozzle which produces a rotating jetting action without the need for externally rotating or moving parts. The fluid jet which exits the tool produces a rotating, conical jet which removes scale and debris more effectively than a standard jetting nozzle. The short robust construction makes it ideal for jetting operations where BHA lengths are limited. Since all moving parts are contained internally, The SpiroJet™ is ideal for operations where the tool may be subjected to tagging fill or side loading in deviated sections which may prevent a conventional rotating head from rotating.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|
| 1.688 | 5.00 | 1”AMMT Box | 62,400 | Std. | 131-1688-ST01 |
| | | | 45,400 | H2S | 131-1688-SH01 |
| 2.125 | 6.00 | 1-1/2”AMMT Box | 116,500 | Std. | 131-2125-ST01 |
| | | | 84,700 | H2S | 131-2125-SH01 |
| 2.875 | 8.00 | 2-3/8”PAC Box | 218,500 | Std. | 131-2875-ST01 |
| | | | 158,900 | H2S | 131-2875-SH01 |
| 4.750 | 8.00 | NC38 Box | 538,000 | Std. | 131-4750-ST01 |
| | | | 391,300 | H2S | 131-4750-SH01 |

## OPERATION

The SpiroJet™ is fitted to the bottom of a BHA like any other regular jetting nozzle. It is made up to the tool sting with the correct amount of applied torque, as per the threaded connection on the tool. Pumping fluid through the SpiroJet™ will produce the rotating flow pattern.

# STRAIGHT BAR

## APPLICATION

- Standard fishing operations
- Heavy duty fishing operations
- Jetting perations
- BHA space out

## FEATURES

- One piece
- Various lengths available
- Multi-function operation
- Through bore
- Tool joint or service connections

## ADDITIONAL INFORMATION

- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications

## OPERATION

The straight bar has no moving parts and consists of a connection at either end of a hollow bar. Other than the correct make–up torque of the connections there is no other operational data.

The WellEnTech Straight bar (often referred to as weight stem) is simply used to add extra mass and/or length to a bottom hole assembly used on a fishing, running or pulling operations.

## TECHNICAL SPECIFICATION

| OD (Inches) | ID (Inches) | Length (feet) | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|
| 1.688 | 0.75 | 1 | 62,400 | Std | 155-1688-ST01 |
| | | | 45,400 | $H_2S$ | 155-1688-SH01 |
| | | 2 | 62,400 | Std | 155-1688-ST02 |
| | | | 45,400 | $H_2S$ | 155-1688-SH02 |
| | | 3 | 62,400 | Std | 155-1688-ST03 |
| | | | 45,400 | $H_2S$ | 155-1688-SH03 |
| | | 4 | 62,400 | Std | 155-1688-ST04 |
| | | | 45,400 | $H_2S$ | 155-1688-SH04 |
| | | 5 | 62,400 | Std | 155-1688-ST05 |
| | | | 45,400 | $H_2S$ | 155-1688-SH05 |
| | | 6 | 62,400 | Std | 155-1688-ST06 |
| | | | 45,400 | $H_2S$ | 155-1688-SH06 |
| 2.125 | 1.00 | 1 | 116,500 | Std | 155-2125-ST01 |
| | | | 84,700 | $H_2S$ | 155-2125-SH01 |
| | | 2 | 116,500 | Std | 155-2125-ST02 |
| | | | 84,700 | $H_2S$ | 155-2125-SH02 |
| | | 3 | 116,500 | Std | 155-2125-ST03 |
| | | | 84,700 | $H_2S$ | 155-2125-SH03 |
| | | 4 | 116,500 | Std | 155-2125-ST04 |
| | | | 84,700 | $H_2S$ | 155-2125-SH04 |
| | | 5 | 116,500 | Std | 155-2125-ST05 |
| | | | 84,700 | $H_2S$ | 155-2125-SH05 |
| | | 6 | 116,500 | Std | 155-2125-ST06 |
| | | | 84,700 | $H_2S$ | 155-2125-SH06 |
| 2.875 | 1.375 | 1 | 218,500 | Std | 155-2875-ST01 |
| | | | 158,900 | $H_2S$ | 155-2875-SH01 |
| | | 2 | 218,500 | Std | 155-2875-ST02 |
| | | | 158,900 | $H_2S$ | 155-2875-SH02 |
| | | 3 | 218,500 | Std | 155-2875-ST03 |
| | | | 158,900 | $H_2S$ | 155-2875-SH03 |
| | | 4 | 218,500 | Std | 155-2875-ST04 |
| | | | 158,900 | $H_2S$ | 155-2875-SH04 |
| | | 5 | 218,500 | Std | 155-2875-ST05 |
| | | | 158,900 | $H_2S$ | 155-2875-SH05 |
| | | 6 | 218,500 | Std | 155-2875-ST06 |
| | | | 158,900 | $H_2S$ | 155-2875-SH06 |

# VARIABLE JETTING NOZZLE

## APPLICATION

- Standard Jetting operations
- Clean out runs
- Debris circulation
- Nitrogen lifting
- Spotting operations
- Well Stimulation operations

## FEATURES

- One piece design
- Standard NPT ports
- Multi-function operation
- Fully adjustable jet orientation and size
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech Variable jetting nozzle is a ported sub which is run at the bottom of a tool string. It provides a means of directing high velocity fluid exactly where it is needed. The numerous port locations enable the user to select orifice size and location to enable numerous jetting operations, without need to use different tools for each run.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Nozzle | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|---|
| 1.688 | 6.50 | 1”AMMT Box | 12 x 1/8” NPT | 62,400 | Std. | 130-1688-ST01 |
| | | | | 45,400 | H2S | 130-1688-SH01 |
| 1.750 | 6.50 | 1-1/4”AMMT Box | 12 x 1/8” NPT | 76,000 | Std. | 130-1750-ST01 |
| | | | | 55,200 | H2S | 130-1750-SH01 |
| 2.125 | 8.00 | 1-1/2”AMMT Box | 17 x 1/8” NPT | 116,500 | Std. | 130-2125-ST01 |
| | | | | 84,700 | H2S | 130-2125-SH01 |
| 2.875 | 9.50 | 2-3/8”PAC Box | 17 x 1/4” NPT | 218,500 | Std. | 130-2875-ST01 |
| | | | | 158,900 | H2S | 130-2875-SH01 |

## OPERATION

The jetting nozzle is configured at surface. The operator decides, prior to running in hole, what flow area is required and in what orientation the nozzles need to be, e.g. up jetting, down jetting, side jetting or a combination. The ports which are not required are simply blanked off using standard NPT plugs. With the nozzles being NPT threads they can be readily fitted and replaced.

# VORTECH™ JETTING NOZZLE

## APPLICATION

- Standard Jetting operations
- Clean out runs
- Debris circulation
- Nitrogen lifting
- Spotting operations
- Well Stimulation operations

## FEATURES

- One piece design
- Standard NPT ports
- Fully adjustable jet size
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech VorTech™ jetting nozzle is a ported sub which is run at the bottom of a tool string. It provides a means of directing high velocity fluid exactly where it is needed. The ports are angled and off set to the tool axis which works in conjunction with the tubing geometry to produce a 'swirling' fluid pattern for a more effective cleaning action. The NPT ports enable the user to select different orifice sizes without need to use different tools for each run.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Nozzle | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|---|
| 1.688 | 6.50 | 1"AMMT Box | 3 x 1/8" NPT | 62,400 | Std. | 133-1688-ST01 |
| | | | | 45,400 | H2S | 133-1688-SH01 |
| 2.125 | 8.00 | 1-1/2"AMMT Box | 4 x 1/8" NPT | 116,500 | Std. | 133-2125-ST01 |
| | | | | 84,700 | H2S | 133-2125-SH01 |
| 2.875 | 9.50 | 2-3/8"PAC Box | 4 x 1/4" NPT | 218,500 | Std. | 133-2875-ST01 |
| | | | | 158,900 | H2S | 133-2875-SH01 |

## OPERATION

The WellEnTech VorTech™ jetting nozzle is configured at surface. The operator decides, prior to running in hole, what flow area is required. With the nozzles being NPT threads they can be readily fitted and replaced. The Nozzle is then fitted to the bottom of the tool string and run in hole.

WELL EN TECH

WELL ENGINEERING TECHNOLOGY

# SURFACE TOOLS

# SAFETORQCT™

## APPLICATION

- Make-up/Break-out of Tool Joints
- Make-up/Break-out of service connections

## FEATURES

- Enables safe make up and break out of connections
- Light weight
- Easy to operate
- Bi-directional Hydraulic Cylinder
- Hand Pump operated; no other power source required.
- Easy to change replaceable dies.
- Adjustable to suit a range of diameters.

## ADDITIONAL INFORMATION

- The SafeTorqCT is supplied in a flight case which contains everything required to enable connections to be made-up/break a connection.
- Extended length hydraulic hoses are available on request.
- Total weight of transportation case with complete SafeTorqCT ™ kit inside is 60kgs.

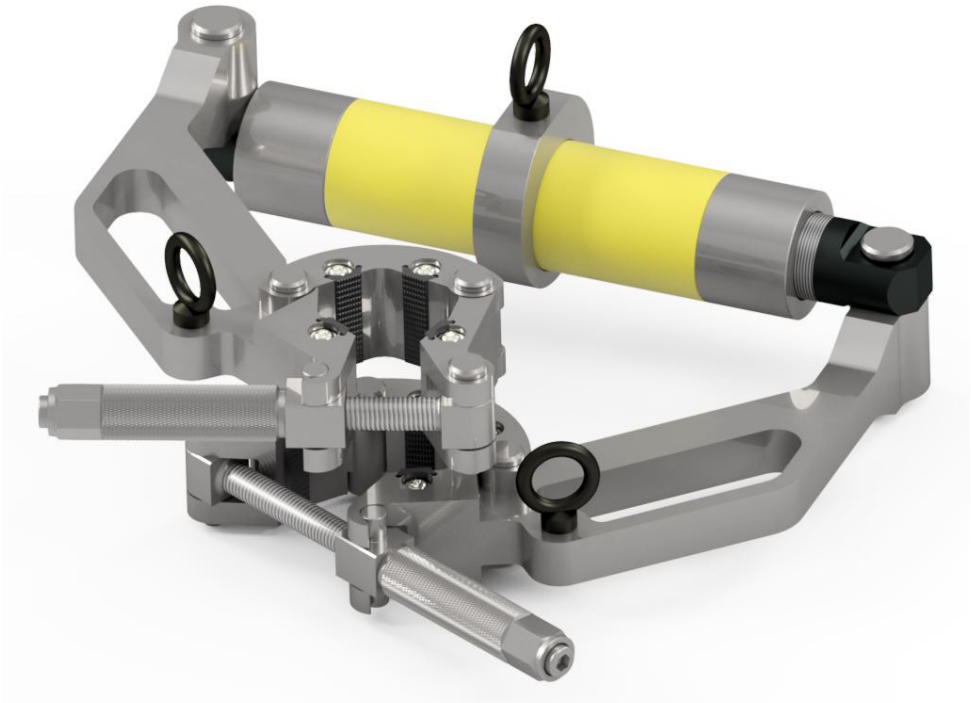
The WellEnTech SafeTorqCT™ is a device for the make-up and break-out of threaded connections. The design permits torque to be applied while the operator can remain at a safe distance during force transmission. The SafeTorqCT™ comes complete with a Hydraulic Hand Pump and Bi-directional Hydraulic Cylinder. The heat-treated Dies are designed for longevity and are easy to replace. The design enables thread make-up / break-out of vertical and horizontal tool strings making it ideal for both workshop and rig site locations. The SafeTorqCT™ is supplied with hoses and suspension sling all contained within a hard-wearing transportation case, to provide a fully "out of the box" solution for all torqueing requirements.

## TECHNICAL SPECIFICATION

| Clamp Range (Inches) | Weight (Kg) | Max Working Pressure (psi) | Max Torque (ft.lbs) | Assembly No. |
|---|---|---|---|---|
| 1-11/16" to 3-1/8 | 15 | 9,000 | 8,300 | 505-0300-A001 |

## OPERATION

The WellEnTech SafeTorqCT™ consists of two separate clamping components connected via a Bi-directional Hydraulic Cylinder. The clamps are opened and attached to either side of a connection. The clamps are then tightened, and the hoses fitted to the Hydraulic Cylinder. The application of hydraulic pressure produces a torque which can be used to make-up or break a connection under fully monitored and safe conditions.



# 3T TUBING CLAMP

## APPLICATION

- Coiled Tubing surface manipulation.
- Suitable for all grades of coiled tubing

## FEATURES

- Compact design.
- Interchangeable Slips.
- Standard hex head sizes.
- Compatible for a range of Tubing diameters.

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Tools are supplied with a blank disc as standard. Additional Rupture discs are available to suit a range of pressures.

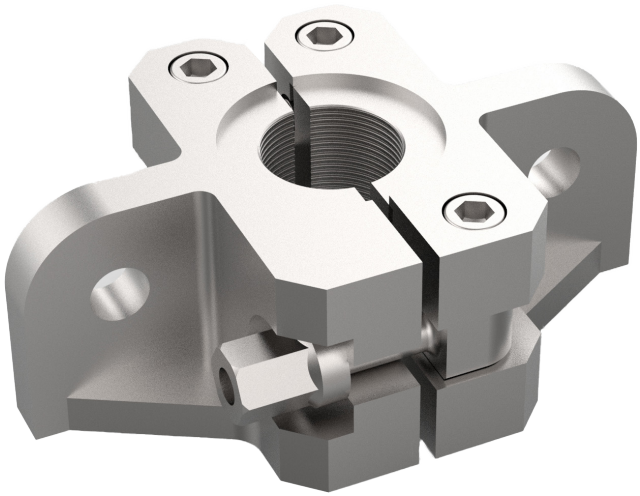
The WellEnTech 3tTubing Clamp is a device for fitting to Coiled Tubing in order to secure the tubing during pulling or to assist while the Coiled Tubing is being fed on or off of the reel. A range of slips are available to suit various tubing diameters and are easily swapped out without the need to disassemble the Tubing Clamp. The taper slip bore, ensures the clamp bites as load is increased.

## TECHNICAL SPECIFICATION

| Body OD (Inches) | Length (Inches) | Assembly No. | Slip Size To suit Tubing | Part No. |
|---|---|---|---|---|
| 6.25 | 9.50 | 044-0010-A001 | 1” | 044-1000-ST01 |
| | | | 1-1/4” | 044-1250- ST01 |
| | | | 1-1/2” | 044-1500- ST01 |
| | | | 1-3/4” | 044-1750- ST01 |
| | | | 2” | 044-2000- ST01 |
| | | | 2-3/8” | 044-2375- ST01 |
| | | | 2-7/8” | 044-2875- ST01 |

## OPERATION

The WellEnTech Tubing Clamp consists of two halves which are connected by a hinge. The Clamp Nut is backed off allowing the Clamp Pin to swing open. The Clamp Body can then be opened, enabling access to the slips which can be swapped out for a range of different sizes. The slips are held in place with 4 screws. Having selected the correct Slip size to suit the tubing and the Slips secured in Place, the Tubing Clamp can be fitted to the tubing. Both halves are then brought together around the tubing and secured in place by tightening the Clamp Nut.



# CRIMPER TOOL

## APPLICATION

- Roll-on of Coiled Tubing to Roll-On Connector.
- Suitable for all grades of coiled tubing.
- Cutting of Coiled Tubing

## FEATURES

- Forged Steel Body
- Spring Pressure System
- Broad Support Rollers
- Roll-on and Cutter wheels available
- Quick and easy wheel change out.
- Compatible for a range of Tubing diameters.

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.

The WellEnTech Crimper Tool is primarily designed to crimp coiled tubing onto Roll-On Connectors (Refer to Data Sheet DS-070). The design ensures secure pipe guidance by means of broad support rollers and the spring pressure system improves the roll-on wheel service life. The roller carriage is also designed to eliminate jamming when adjusting the roll-on wheel depth. The roll-on wheel can be changed out quickly and easily by means of a ball lock pin. Cutter wheels are also available for tubing cutting requirements.

## TECHNICAL SPECIFICATION

| Coiled Tubing Size | Assembly No. | Wheel Type | Part No. |
|---|---|---|---|
| 1" to 2" | 585-0010-A001 | Cutter Wheel | 585-0010-ST03 |
| | | Roll-On Wheel | 585-0010-ST02 |
| 2-3/8" to 4-1/2" | 585-0020-A001 | Cutter Wheel | 585-0020-ST03 |
| | | Roll-On Wheel | 585-0020-ST02 |

## OPERATION

Having dressed the Coiled Tubing with the WellEnTech CT Reamer Assembly (Ref Data Sheet DS-590). The Roll-On Connector is placed beside the section of Coiled Tubing it is to be fitted to and the position of the roll-on grooves are marked onto the tubing. The Connector is then inserted into the Coiled Tubing and the Crimper Tool is fitted and aligned with the marks on the tubing. The Crimper Tool Handle is rotated to clamp it onto the tubing. The whole Crimper tool is rotated and the handle is further tightened. This process is repeated until the roll-on groove is formed in each of the three locations.

# CT REAMER ASSEMBLY

## APPLICATION

- Coiled Tubing Preparation
- Can be used on a range of Coiled Tubing diameters and wall thicknesses
- Suitable for use with both Roll-on and Dimple-on Connectors

## FEATURES

- Thru' bore to accommodate wireline
- No specialist assembly tools required
- Interchangeable reamers and coil inserts
- Compatible for a range of sizes and wall thicknesses

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.

The WellEnTech CT Reamer Assembly provides a means of preparing Coiled Tubing prior to assembling either a Roll-on or Dimple-on type Connector. The reamer assembly enables the operator to remove the coiled tubing internal bead and cut a chamfer on the end face to facilitate the fitting and sealing of O-rings within the bore of the tubing.

## TECHNICAL SPECIFICATION

| Body OD (Inches) | Length (Inches) | Coil Size Range | Part No. |
|---|---|---|---|
| 3.38 | 13.25 | 1" to 1-1/4" | 590-0100-A003 |
| 4.00 | 13.25 | 1-1/2" to 2-3/8" | 590-0100-A002 |
| 3.38 | 13.25 | 1-1/2" to 2-7/8" | 590-0100-A001 |

## OPERATION

The WellEnTech CT Reamer Assembly is fitted with a suitable Coil Insert (to match the tubing OD) and a Reamer (to suit the tubing ID). The Threaded Sleeve is backed off and the assembly is attached to the Coiled Tubing with a set screw which sits through the Coil Insert. The Reamer Mandrel of the tool can then be rotated using the ergonomically designed handles and the Threaded Sleeve gradually made up until the bead running up the ID of the tubing has been removed. A Bevel Cutter is available for the tool which replaces the Reamer in order to cut an internal chamfer in the end of the tubing.

# DIMPLE-ON STABBING GUIDE

## APPLICATION

- Stabbing and spooling operations

## FEATURES

- One piece
- Tapered design
- Dimple On profiles
- Can be fitted to undressed coil
- Ideal for Stabbing operations

## ADDITIONAL INFORMATION

- The sizes listed above are examples of common configurations.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- The tensile strength of these connectors depends on a variety of factors such as, the condition and spec of the coil it is made up to. As a general rule, the strength can be consider to be 60% of the Coiled Tubing.

## OPERATION

The Dimple-On Stabbing Guide is fitted directly to the Coiled Tubing using either a manual or Hydraulic dimpling tool*. The Coiled Tubing is deformed into the dimples producing an extremely strong and durable connection. The dimples have been designed to reduce any stress raisers produced during the dimpling process. The Stabbing Connector has a tapered profile to facilitate the stabbing process. The Stabbing Guide is cut off of the Coiled Tubing after use.

* Dimple tools and Pressure/Pull Test Subs are available from WellEnTech

The WellEnTech Dimple-On Stabbing Guide is a cost effective means of providing a tapered end profile to a Coiled Tubing string which can be easily fed through the coiled tubing injector. The robust one piece design is furnished with dimple on profiles for attaching to the coil and a milled slot to accommodate the coiled tubing bead, negating the need to ream out the bead before fitting. Available for all sizes of Coiled Tubing and wall thickness sizes.

## TECHNICAL SPECIFICATION

| Coil Tubing Dia (Inches) | Wall thickness (Inches) | Part No. |
|---|---|---|
| 1-1/4” | 0.095 | 082-1250-ST09 |
| | 0.109 | 082-1250-ST10 |
| | 0.125 | 082-1250-ST12 |
| | 0.134 | 082-1250-ST13 |
| | 0.156 | 082-1250-ST15 |
| | 0.175 | 082-1250-ST17 |
| 1-1/2” | 0.095 | 082-1500-ST09 |
| | 0.109 | 082-1500-ST10 |
| | 0.118 | 082-1500-ST11 |
| | 0.125 | 082-1500-ST12 |
| | 0.134 | 082-1500-ST13 |
| | 0.145 | 082-1500-ST14 |
| | 0.156 | 082-1500-ST15 |
| | 0.175 | 082-1500-ST17 |
| | 0.190 | 082-1500-ST19 |
| 1-3/4” | 0.109 | 082-1750-ST10 |
| | 0.118 | 082-1750-ST11 |
| | 0.125 | 082-1750-ST12 |
| | 0.134 | 082-1750-ST13 |
| | 0.145 | 082-1750-ST14 |
| | 0.156 | 082-1750-ST15 |
| | 0.175 | 082-1750-ST17 |
| | 0.190 | 082-1750-ST19 |
| | 0.204 | 082-1750-ST20 |
| 2” | 0.109 | 082-2000-ST10 |
| | 0.125 | 082-2000-ST12 |
| | 0.134 | 082-2000-ST13 |
| | 0.145 | 082-2000-ST14 |
| | 0.156 | 082-2000-ST15 |
| | 0.175 | 082-2000-ST17 |
| | 0.190 | 082-2000-ST19 |
| | 0.204 | 082-2000-ST20 |
| 2-3/8” | 0.109 | 082-2000-ST10 |
| | 0.125 | 082-2000-ST12 |
| | 0.134 | 082-2000-ST13 |
| | 0.145 | 082-2000-ST14 |
| | 0.156 | 082-2000-ST15 |
| | 0.175 | 082-2000-ST17 |
| | 0.190 | 082-2000-ST19 |
| | 0.204 | 082-2000-ST20 |
| | 0.214 | 082-2000-ST21 |
| | 0.224 | 082-2000-ST22 |

# EXTERNAL DIMPLE JIG ASSEMBLY

## APPLICATION

- For dimpling coiled tubing to suit External Dimple Connectors*.
- Suitable for all grades of coiled tubing

## FEATURES

- Compact design.
- Standard hex head sizes.
- Compatible for a range of coil wall thicknesses.

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- A variety of Removal Subs are available to suit common threads. Bespoke versions available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.

The WellEnTech External Dimple Jig Assembly provides a means of dimpling Coiled Tubing prior to fitting External Dimple Connectors, which are also available from WellEnTech (Ref Data Sheet DS-085). The External Dimple Jig Assembly consists of a Dimple Sub, for dimpling the Coiled Tubing, a slide Hammer for knocking the Assembly on and off of the tubing and a Removal Sub for attaching to the Connector during its removal. Each Jig is designed to suit a specific diameter of Coiled Tubing and will dimple a range of wall thicknesses. The Removal Subs are furnished with a range of threaded connections

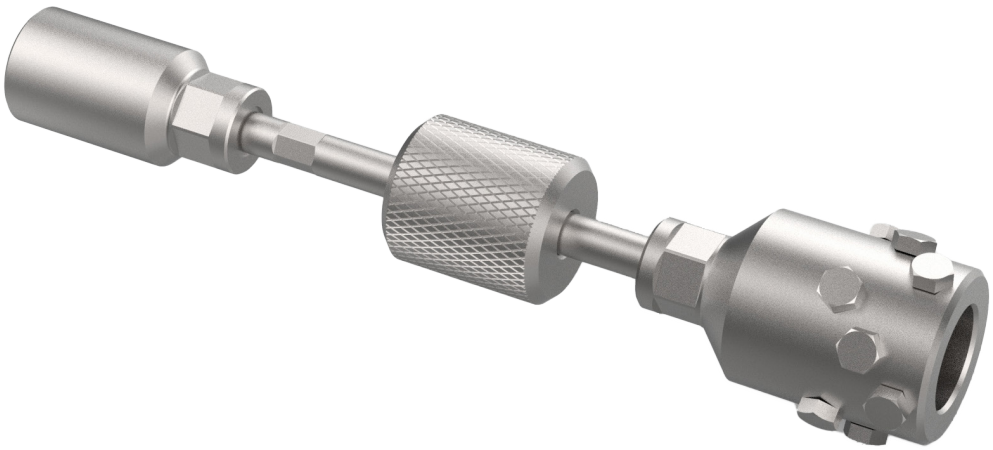
## TECHNICAL SPECIFICATION

| O/A Length (Inches) | Dimple Sub OD (Inches) | Coil Size | Assembly No. |
|---|---|---|---|
| 21.25” | 2.87 | 1-1/4” | 560-1250-A001 # |
| | 3.12 | 1-1/2” | 560-1500-A001 # |
| | 3.37 | 1-3/4” | 560-1750-A001 # |
| | 3.63 | 2” | 560-2000-A001 # |
| | 4.00 | 2-3/8” | 560-2375-A001 # |
| | 4.50 | 2-7/8” | 560-2875-A001 # |

# Note : The assembly numbers listed above include a removal sub with 2-3/8”PAC Box thread.

## OPERATION

The WellEnTech External Dimple Jig Assembly consists of two three distinct components, the Dimple Sub, the Hammer and the Removal Sub. The Dimple Sub creates the Dimples on the Coiled Tubing, this is achieved by tightening hardened Dimple Screws which produce a uniform dimple of the exact size to suit the External Dimple Connector. The Hammer is used to knock on and off the Dimple Sub, Knock on the External Dimple Connector or also remove the Connector. The Removal Sub provided a means of holding onto the Connector during fitting and removal. A pull test will confirm the External Dimple Connector has been fitted correctly and a pressure test will verify that a seal has been maintained.



# HYDRAULIC C-PLATE

## APPLICATION

- Supporting and manipulation of BHA
- Assisting with connection make-up
- QIKTech™ Stabbing and make-up.

## FEATURES

- Compact lightweight design
- 2 tonne safe working load
- Compatible for use with tools up to 3-1/8"OD
- Easy to maintain and redress.
- Interchangeable Top and Base Plates

## ADDITIONAL INFORMATION

- The Hydraulic C-Plate is supplied with a Hydraulic Hand Pump as standard.
- Alternative Base Plates and Top Plates are available to suit specific operational requirements.

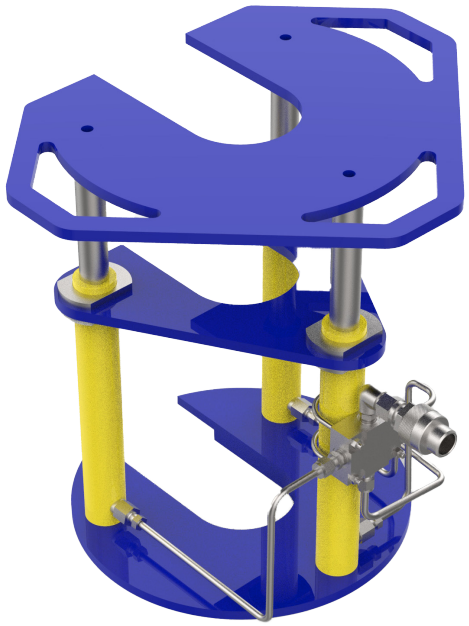
The WellEnTech Hydraulic C-Plate is designed to assist with tool string manipulation and reduce manual handling. It provides a means of supporting a tool string and enables slow controlled movement when stabbing a connection or assembling a QIKTech™. It is operated using a hydraulic pressure to raise and lower the Top Plate without the need to move the coiled tubing string.

## TECHNICAL SPECIFICATION

| Specifications | | | Part No. |
|---|---|---|---|
| Parameter | Imperial | Metric | |
| Height Max | 19.15" | 486 cm | 550-0001-A001 |
| Height Min | 12.15" | 308 cm | |
| Stroke | 5.50" | 140 mm | |
| Max Working Pressure | 1,500 psi | 103 Bar | |
| Max Working Load | 4,400 lbs | 2 tonnes | |
| Weight | 47 lbs | 21.3 Kg | |

## OPERATION

The WellEnTech Hydraulic C-Plate is placed in the desired location. The Hydraulic Hand Pump and hose are then connected to the Female Coupler on the hydraulic C-Plate. With a suitable Tool Clamp fitted to the Lower half of the tool String, the BHA can be hung off from the top plate. Slowly apply pressure to raise the top plate to raise the lower half of the tool string closer to the upper half of the tool String enabling both halves of the BHA to be made up as per operational procedures. To remove, simply bleed off the hydraulic pressure to allow Hydraulic C-Plate to retract.



# HYDRAULIC DIMPLE SYSTEM

## APPLICATION

- For dimpling Coiled Tubing onto Dimple-on Coil Connectors*.
- Suitable for all grades of Coiled Tubing

## FEATURES

- Compact design
- Robust construction
- Compatible for a range of coil wall thicknesses.
- Easy to maintain and redress.

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard.

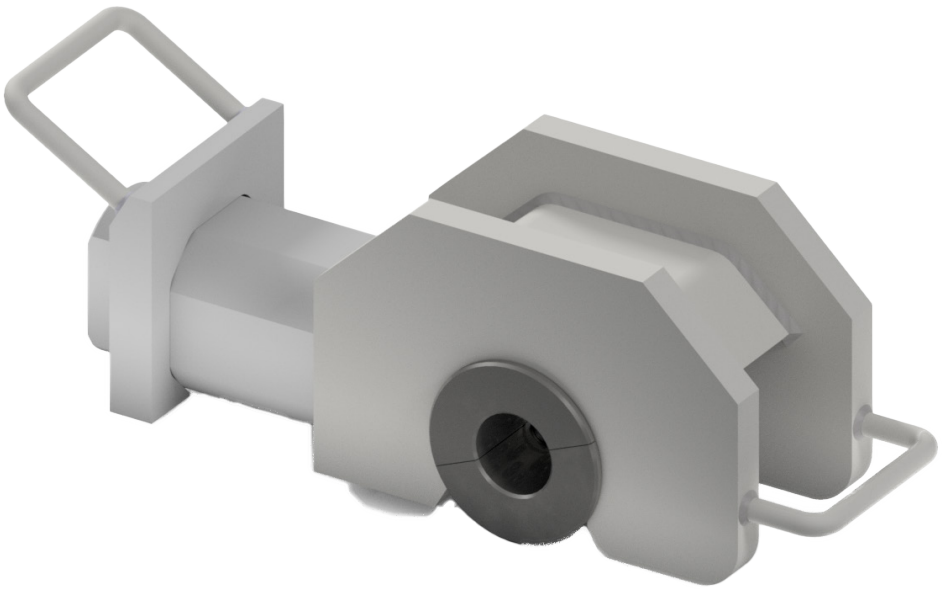
The WellEnTech Hydraulic Dimple System provides a means of dimpling Coiled Tubing onto a Dimple-on Coil Connector*. The assembly is a single compact unit which consists of a hydraulic cylinder and yoke arrangement which can be operated using a hand pump or hydraulic power pack. The Hydraulic Dimple System enables the dimpling process to be carried out quickly and safely. A selection of Dimple Jigs are available to suit a range of Coiled Tubing diameters.

## TECHNICAL SPECIFICATION

| Hydraulic Dimple Assembly | | Dimple Jig | |
|---|---|---|---|
| Specifications | Part No. | Coil Size | Part No. |
| 16.15” Long<br>5.10” Wide<br>6.50” High<br>17 kg | 570-0010-A001 | 1” | 570-1000-A001 |
| | | 1-1/4” | 570-1250-A001 |
| | | 1-1/2” | 570-1500-A001 |
| | | 1-3/4” | 570-1750-A001 |
| | | 2” | 570-2000-A001 |
| | | 2-3/8” | 570-2375-A001 |

## OPERATION

The WellEnTech Hydraulic Dimple System can be used with either a hand pump or hydraulic power pack. Having selected a suitable Dimple Jig to suit the Coiled Tubing to be dimpled, it is then fitted to the Connector and the prepared Coiled Tubing and secured in place. There are two grub screws, one for orientation on the Connector and one for securing the jig onto the Coiled Tubing. The Hydraulic Dimple Assembly can then be placed onto the Dimple Jig and is automatically orientated by flats. The application of hydraulic pressure results in the forming of dimples onto the Dimple-on Coil Connector. This process is repeated until all the dimples are formed. A pull test will confirm the Connector has been fitted correctly and a pressure test will verify that a seal has been maintained. It is recommended that the Coiled Tubing is prepared with a WellEnTech CT Reamer Assembly* prior to installing the Connector.



# HYDRAULIC EXTERNAL DIMPLE SYSTEM

## APPLICATION

- For dimpling Coiled Tubing for External Dimple Connectors*.
- Suitable for all grades of Coiled Tubing

## FEATURES

- Compact design.
- Integral Slide Hammer and Sub.
- Compatible for a range of coil wall thicknesses.
- Easy to maintain and redress.

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard.

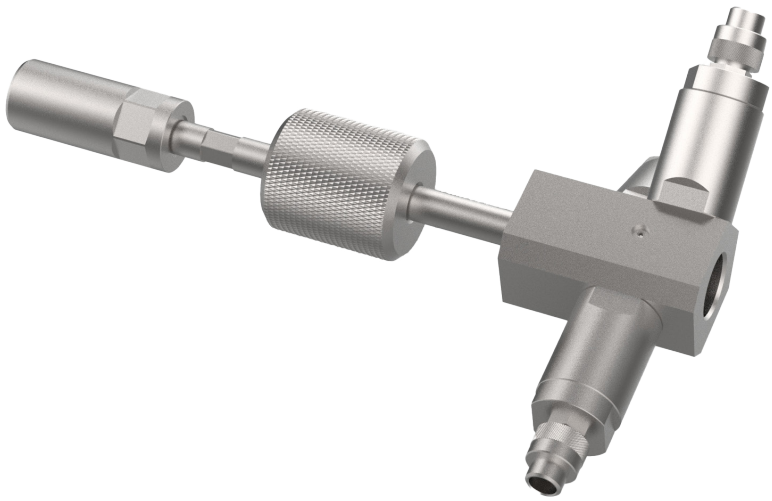
The WellEnTech Hydraulic External Dimple System provides a means of hydraulically dimpling Coiled Tubing to facilitate the assembly of an External Dimple Connector*. The assembly is a single compact unit which consists of 3 hydraulic cylinders, a slide Hammer and Removal Sub. The Hydraulic External Dimple System is operated using a hand pump. The Hydraulic Dimple System enables the dimpling process to be carried out quickly and safely. One system covers all wall thickness sizes for a single size of Coiled Tubing.

## TECHNICAL SPECIFICATION

| Specifications | Coil Size | Part No. |
|---|---|---|
| 14.50” Long<br>8.50” Wide<br>21.00” High<br>15.5 kg | 1” | 565-1000-A001 |
| | 1-1/4” | 565-1250-A001 |
| | 1-1/2” | 565-1500-A001 |
| | 1-3/4” | 565-1750-A001 |
| | 2” | 565-2000-A001 |
| | 2-3/8” | 565-2375-A001 |

## OPERATION

The WellEnTech Hydraulic External Dimple System should be used with a hydraulic hand pump. Having selected a suitable System to suit the Coiled Tubing to be dimpled, it is then fitted to the Coiled Tubing and secured in place with a Socket Set Screws. The application of hydraulic pressure results in the forming of dimples onto the Coiled Tubing. The screws are backed off and the Dimple System rotated 90°.The dimpling process is repeated until all the dimples are formed. A pull test will confirm the Connector has been fitted correctly and a pressure test will verify that a seal has been maintained. The WellEnTech Hydraulic External Dimple System is supplied with a Slide Hammer and Threaded Sub to assist with the fitting and removal of the External Dimple Connector.



WELL EN TECH
WELL ENGINEERING TECHNOLOGY

# JAR TESTER

## APPLICATION

- Jar testing
- Shear testing
- Tensile or compressive testing

## FEATURES

- **Hydraulic hoses:** 2 x 5000 mm long hoses of the appropriate rating are included.
- **Control Console:** See attached drawing for console detail
- **Electric Motor:** 3-phase, 380 /415 volts, 50/60 Hz, 1450/1800 rpm.
- **Pump:** Variable displacement Piston pump.
- **Ton gauge:** Dia. 6 inches dial size, calibrated, readings for line pull in extension & retraction. Calibration valid for a period of 1 year from certificate date.
- **Cooling:** An electric motor driven fan type cooler, to be integrated with the Power Pack.
- **Output:** Output from the Power Pack to be terminated on the frame, these terminations will be 1" NPT.

## ADDITIONAL INFORMATION

- Certification: The entire structure to be tested for line pull in extension & retraction through a certified third party and a certificate issued.
- Painting: All steelwork to be sand blasted and epoxy painted, paint colour to be specified at time of order. Pre-painted components will not be painted.

The WellEnTech Jar Tester is designed to exert push/pull loads to a variety of tools with outer diameters up to 3-1/2 inches. The Jar Tester is capable of exerting tension or compression loads in a controlled manner. The Jar Tester provides an effective and accurate means for shop testing Hydraulic Jars, Bait Subs, Safety Joints, Bumper subs and other similar tools.

## TECHNICAL SPECIFICATION

### Hydraulic cylinder:

| | |
|---|---|
| Type: | Double acting. |
| Stroke: | 800 mm |
| Line pull (Extension/Push): | 37,325 lbs @ 150bar. |
| Line pull (Retraction /Pull): | 37,325 lbs @200bar. |
| Speed in Extension (Full Stroke) = | 24 secs |
| Speed in Retraction (Full Stroke) = | 18 secs |
| Front end: | Flanged, to interface with the steel structure. |
| Rod end: | Threaded, to suit the hanger chuck. |
| Test pressure: | 250 bar |

The outlet of the load holding valve will be fitted with QRCS, loose supply of hose of 5.0 metres length with QRC (mating part of the valve) is included.

## JAR TESTER STRUCTURE:

Manufactured of a Rectangular Hollow section of size 15 x 200 x 10 mm thick of length 6 metres in lengths of 3 metres, each with a bolted joint in the centre ( all as per drawing supplied 985-0100-L001a), this section to be mounted through bolts onto the support legs of rectangular hollow section size 80 x 80 x 6 mm , these legs to be bolted on to the ground through anchors.

The above members to be provided with drilled holes, all as per the drawing, to suit pin fitment.
The supply of a pins and carriage fabrication is also included.

Hanger chuck: The manufacture of a suitable hanger chuck of fabricated construction is included. The chuck to be integrated with the cylinder rod and to be moved in tandem on to the rectangular hollow section.

# LIFT SUB

## APPLICATION

- Lifting Tools
- BHA manipulation

## FEATURES

- One piece
- Industry standard shackle hole
- Box or Pin thread connections available
- Tool joint or service connections

## ADDITIONAL INFORMATION

- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications

The WellEnTech Lift Sub is simply used as a device to lift and manipulate tools or bottom hole assemblies at surface during Thru' Tubing operations.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | SWL (Tonnes) | Part No. |
|---|---|---|---|---|
| 1.688 | 7.00 | 1"AMMT Pin | 3 | 048-1688-ST01 |
| 1.750 | 7.50 | 1-1/4"AMMT Pin | 3 | 048-1750-ST01 |
| 2.125 | 8.00 | 1-1/2"AMMT Pin | 5 | 048-2125-ST01 |
| 2.875 | 9.00 | 2-3/8"PAC Pin | 5 | 048-2875-ST01 |
| 3.125 | 10.00 | 2-3/8"PAC Pin | 5 | 048-3125-ST01 |
| 4.375 | 11.25 | 2-7/8"IF Pin | 9.5 | 048-4375-ST02 |

## OPERATION

The Lift Sub has no moving parts and consists of a connection at one end and a hole at the other to suit an industry standard shackle. Ensure the correct size of shackle is fitted to the Lift Sub and that it is securely made up to the tool or tool string. All Lift subs supplied by WellEnTech are load tested and come complete with certification.

# MANUAL DIMPLE JIG ASSEMBLY

## APPLICATION

- For dimpling coiled tubing onto Dimple-on Coil Connectors*.
- Suitable for all grades of coiled tubing

## FEATURES

- Compact design.
- Standard hex head sizes.
- Compatible for a range of coil wall thicknesses.

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.

The WellEnTech Manual Dimple Jig Assembly provides a means of manually dimpling coiled tubing onto a Dimple-on Coil Connector*. This cost effective jig enables the dimpling process to be carried out without the need for a hydraulic pump or hefty yolk arrangement.

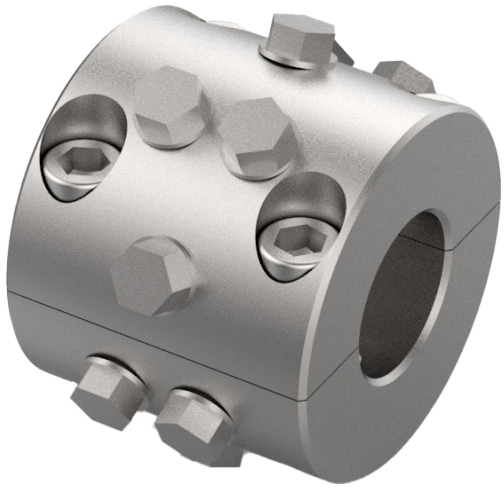
## TECHNICAL SPECIFICATION

| Body OD (Inches) | Length (Inches) | Coil Size | Part No. |
|---|---|---|---|
| 3.75 | 3.50 | 1” | 580-1000-A001 |
| 3.75 | 3.50 | 1-1/4” | 580-1250-A001 |
| 4.00 | 3.50 | 1-1/2” | 580-1500-A001 |
| 4.00 | 3.50 | 1-3/4” | 580-1750-A001 |
| 4.00 | 3.50 | 2” | 580-2000-A001 |
| 4.38 | 3.50 | 2-3/8” | 580-2375-A001 |
| 5.00 | 4.50 | 2-7/8” | 580-2875-A001 |

## OPERATION

The WellEnTech Manual Dimple Jig Assembly consists of two halves which are bolted together. There are two grub screws, one for orientation on the Connector and one for securing the jig onto the Coiled Tubing. Each of the Dimple Screws are then tightened to a specific torque value, which results in the forming of dimples onto the Dimple-on Coil Connector. A pull test will confirm the connector has been fitted correctly and a pressure test will verify that a seal has been maintained. It is recommended that the Coiled Tubing is prepared with a WellEnTech CT Reamer Assembly* prior to installing the Connector.

* Dimple-on Coil Connectors, Pressure Test Subs, Pull Test Subs and CT Reamer Assemblies are all available from Wellentech.



# PULL TEST SUB

## APPLICATION

- Pull Testing Coiled Tubing Connectors
- Pressure testing
- Fitting a Coiled Tubing Connector

## FEATURES

- Robust Construction
- A range of threaded connections available
- Multi-function operation
- Removable Pull Plate (2 piece design)
- No redress required

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.
- 2 Piece Pull Test Subs come with an 8"dia plate as standard, unless otherwise specified.

## OPERATION

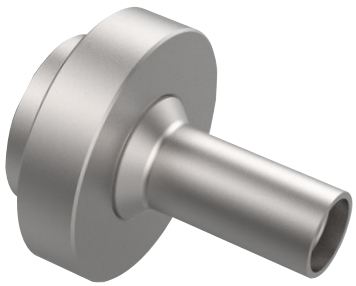
The WellEnTech Pull Test Subs are made up to coiled tubing connectors which are installed onto a coiled tubing string. The Coiled Tubing is then slowly fed back onto the coiled tubing real until the Pull Test Sub flange contacts the bottom of the Riser. At which point a predetermined load is applied to the connector to ensure it is fitted correctly. The connector can then be pressure tested filling the Coiled Tubing with fluid or against check valves in the BHA by attaching a pump to the NPT port in the Pull Test Sub.

The WellEnTech Pull Test Subs are designed to enable an operator to pull test and pressure test a Coil Connector when fitted to a Coiled Tubing string. They are used to ensure a Coil Connector is fitted to the Coiled Tubing correctly and can with stand the pressure and tensile loads that the connector is likely to see during an operation. Each Pull Test Sub is designed to fit directly onto the coiled tubing connector and the NPT test port is recessed to protect the NPT threads. The Pull Test Sub can also be used to knock a connector onto or inside a piece of Coiled Tubing should the connector prove difficult to fit. Available in two designs; integral and two piece. The 2 piece design having the added advantage of having a removable Pull Plate for ease of handling when using the Main Body for purely pressure test applications or as a knock on sub.

## TECHNICAL SPECIFICATION

| Integral Pull Test Sub | | | | | |
|---|---|---|---|---|---|
| OD (Inches) | Length (Inches) | Connection | Tensile Strength (lbs) | Service | Part No. |
| 8.00 | 7.00 | 1"AMMT Box | 62,400 | Std. | 050-1000-ST02 |
| | 7.00 | 1-1/4"AMMT Box | 105,400 | Std. | 050-1250-ST02 |
| | 7.00 | 1-1/2"AMMT Box | 116,500 | Std. | 050-1500-ST02 |
| | 10.00 | 2-3/8"PAC Box | 218,500 | Std. | 050-2375-ST02 |

| 2 Piece Pull Test Sub | | | | | |
|---|---|---|---|---|---|
| OD (Inches) | Length (Inches) | Connection | Tensile Strength (lbs) | Service | Part No. |
| 4.00 | 7.00 | 1"AMMT Box | 62,400 | Std. | 050-1000-ST01 |
| | | 1-1/4"AMMT Box | 105,400 | Std. | 050-1250-ST01 |
| | | 1-1/2"AMMT Box | 116,500 | Std. | 050-1500-ST01 |
| | | 2-3/8"PAC Box | 218,500 | Std. | 050-2375-ST01 |
| Pull Plate | | | | | |
| 6.00 | n/a | | | Std. | 050-0015-ST06 |
| 8.00 | n/a | | | Std. | 050-0015-ST08 |
| 12.00 | n/a | | | Std. | 050-0015-ST12 |



# ROLL-ON STABBING GUIDE

## APPLICATION

- Stabbing and spooling operations

## FEATURES

- One piece
- Tapered design
- Dual Roll On Groove
- Can be fitted to undressed coil
- Ideal for Stabbing operations

## ADDITIONAL INFORMATION

- The sizes listed above are examples of common configurations.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- The tensile strength of these connectors depends on a variety of factors such as, the condition and spec of the coil it is made up to. As a general rule, the strength can be consider to be 60% of the Coiled Tubing.

## OPERATION

The Roll-On Stabbing Guide is fitted directly to the Coiled Tubing using a crimping tool*. The Coiled Tubing is deformed into the grooves producing an extremely strong and durable connection. The grooves have been designed to reduce any stress raisers produced during the rolling process. The Stabbing Connector has a tapered profile to facilitate the stabbing process. These connectors are not recommended for applications where they may be subjected to torque. To remove the Stabbing Guide is should be cut off of the Coiled Tubing.

* Crimping tools and Pressure/Pull Test Subs are available from WellEnTech

The WellEnTech Roll-On Stabbing Guide is a cost effective means of providing a tapered end profile to a Coiled Tubing string which can be easily fed through the coiled tubing injector. The robust one piece design is furnished two roll on profiles for attaching to the coil and a milled slot to accommodate the coiled tubing bead, negating the need to ream out the bead before fitting. Available for all sizes of Coiled Tubing and wall thickness sizes.

## TECHNICAL SPECIFICATION

| Coil Tubing Dia (Inches) | Wall thickness (Inches) | Part No. |
|---|---|---|
| 1-1 /4" | 0.095 | 072-1250-ST09 |
| | 0.109 | 072-1250-ST10 |
| | 0.125 | 072-1250-ST12 |
| | 0.134 | 072-1250-ST13 |
| | 0.156 | 072-1250-ST15 |
| | 0.175 | 072-1250-ST17 |
| 1-1 /2" | 0.095 | 072-1500-ST10 |
| | 0.109 | 072-1500-ST12 |
| | 0.118 | 072-1500-ST13 |
| | 0.125 | 072-1500-ST14 |
| | 0.134 | 072-1500-ST15 |
| | 0.145 | 07 2-1500-ST16 |
| | 0.156 | 072-1500-ST17 |
| | 0.175 | 072-1500-ST19 |
| | 0.190 | 072-1500-ST20 |
| 1-3/4" | 0.109 | 072-1750-ST10 |
| | 0.118 | 072-1750-ST11 |
| | 0.125 | 072-1750-ST12 |
| | 0.134 | 072-1750-ST13 |
| | 0.145 | 072-1750-ST14 |
| | 0.156 | 072-1750-ST15 |
| | 0.175 | 072-1750-ST17 |
| | 0.190 | 072-1750-ST19 |
| | 0.204 | 072-1750-ST20 |
| 2" | 0.109 | 072-2000-ST10 |
| | 0.125 | 072-2000-ST12 |
| | 0.134 | 072-2000-ST13 |
| | 0.145 | 072-2000-ST14 |
| | 0.156 | 072-2000-ST15 |
| | 0.175 | 072-2000-ST17 |
| | 0.190 | 072-2000-ST19 |
| 2- 3/8" | 0.204 | 072-2000-ST20 |
| | 0.109 | 072-2375-ST10 |
| | 0.125 | 072-2375-ST12 |
| | 0.134 | 072-2375-ST13 |
| | 0.145 | 072-2375-ST14 |
| | 0.156 | 072-2375-ST15 |
| | 0.175 | 072-2375-ST17 |
| | 0.190 | 072-2375-ST19 |
| | 0.204 | 072-2375-ST20 |
| | 0.214 | 072-2375-ST21 |
| | 0.224 | 072-2375-ST22 |

# SLIP TYPE BALL/PIG CATCHER

## APPLICATION

- Pigging Operations

## FEATURES

- Short, compact design
- Large catch chamber
- Ported bottom sub
- Rupture disk, bleed screw optional
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech Slip Type Ball/Pig Catcher is a tool which is attached directly to the end of the coiled tubing during pigging (cleaning the coiled tubing string). As well as the slip type connector at one end, it has a WECO connection at the other so it can be connected to flow lines to facilitate the contained circulation of the pigging fluid. An elongated catch chamber and ported ID ensure the pig or ball is safely held within the chamber with sufficient flow by-pass to prevent pressure build up.

## TECHNICAL SPECIFICATION

| Coil Size (Inches) | OD (Inches) | Connection | Length (Inches) | Features | Part No. |
|---|---|---|---|---|---|
| 1-1/4 | 1.750 | 2"WECO 1502 | 19.75 | Standard Version | 525-1250-A001 |
| | | | 20.63 | c/w Rupture Port & Bleed Screw | 525-1250-A002 |
| 1-1/2 | 2.125 | 2"WECO 1502 | 20.38 | Standard Version | 525-1500-A001 |
| | | | 21.20 | c/w Rupture Port & Bleed Screw | 525-1500-A002 |
| 1-3/4 | 2.500 | 2"WECO 1502 | 22.00 | Standard Version | 525-1750-A001 |
| | | | 22.92 | c/w Rupture Port & Bleed Screw | 525-1750-A002 |
| 2 | 2.875 | 2"WECO 1502 | 21.50 | Standard Version | 525-2000-A001 |
| | | | 22.36 | c/w Rupture Port & Bleed Screw | 525-2000-A002 |
| 2-3/8 | 3.125 | 2"WECO 1502 | 21.50 | Standard Version | 525-2375-A001 |
| | | | 22.36 | c/w Rupture Port & Bleed Screw | 525-2375-A002 |

## OPERATION

The WellEnTech Slip Type Ball/Pig Catcher is fitted to the end of a coiled tubing string. The assembly is pushed onto the end of the coiled tubing, The Top Sub is held stationary and the Catcher Sub of the tool is rotated to enable the Slip to bite into the coiled tubing. Screws provide added security. The connection on the end of the Ball/Pig Catcher is them made up to a hose connector to a tank and the pigging operation can begin. The Ball or Pig is then introduced at the other end of the coil at the reel and the pigging operation can begin. Pressure throughout the pigging operation will remain relatively constant though out the operation and a sudden pressure drop will be witnessed when the Ball or Pig lands out in the Catcher Sub. The design can incorporate a rupture disc and a bleed screw to release any trapped pressure.

# STABBING CONNECTOR

## APPLICATION

- Stabbing and spooling operations

## FEATURES

- Compact design
- Dual groove for added security
- No dressing of the tubing is required.
- Multiple connection options
- Quick to install and remove

## ADDITIONAL INFORMATION

- The sizes listed above are examples of common configurations.
- Bespoke designs available to suit job specific applications.
- Tools are manufactured from mild steel as standard. Other materials are available on request.

## OPERATION

The WellEnTech Stabbing Connector is fitted to Coiled Tubing using a crimping tool*. The Coiled Tubing is deformed into the grooves producing a strong and dependable connection. The grooves have been designed to reduce any stress raisers produced during the rolling process. Having completed the spooling procedure the connector along with the deformed tubing is removed from the tubing string. The Stabbing Connector is quickly removed from the tubing by knocking the core back into the bore allowing the connector fingers to collapse and pull free of the coil.

* Crimping tools are available from WellEnTech

The WellEnTech Stabbing Connector is a cost effective means of providing a connection at the end of a string of Coiled Tubing for 'Stabbing' Coiled Tubing. That is, feeding off of a reel, over a goose neck and through the injector. Designed specifically for surface handling operations, it is available for all sizes of Coiled Tubing, including taper strings, and can be supplied with any type of threaded connection, shackle hole or winch wire configuration (illustration shown). It is easy to install, can be quickly removed and reused for future operations.

## TECHNICAL SPECIFICATION

| Coil Tubing Dia (Inches) | OD (Inches) | Wall thickness (Inches) | Connection type | Part No. |
|---|---|---|---|---|
| 1-1/4" | 1.250 | 0.156 | Winch wire end | 075-1250-A001 |
| | | 0.134 | Winch wire end | 075-1250-A003 |
| | | 0.125 | Winch wire end | 075-1250-A005 |
| | | 0.118 | Winch wire end | 075-1250-A007 |
| | | 0.109 | Winch wire end | 075-1250-A009 |
| | | 0.095 | Winch wire end | 075-1250-A011 |
| 1-1/2" | 1.5 | 0.134 | Winch wire end | 075-1500-A001 |
| | | 0.134 | 1" AMMT | 075-1500-A002 |
| | | 0.125 | Winch wire end | 075-1500-A003 |
| | | 0.125 | 1" AMMT | 075-1500-A004 |
| | | 0.118 | Winch wire end | 075-1500-A005 |
| | | 0.118 | 1" AMMT | 075-1500-A006 |
| | | 0.109 | Winch wire end | 075-1500-A007 |
| | | 0.109 | 1" AMMT | 075-1500-A008 |
| | | 0.095 | Winch wire end | 075-1500-A011 |
| 1-3/4" | 1.75 | 0.134 | 1" AMMT | 075-1750-A001 |
| | | 0.134 | 1-1/4" AMMT | 075-1750-A002 |
| | | 0.134 | Winch wire end | 075-1750-A003 |
| | | 0.109 | 1" AMMT | 075-1750-A004 |
| | | 0.109 | 1-1/4" AMMT | 075-1750-A005 |
| | | 0.109 | Winch wire end | 075-1750-A006 |
| | | 0.095 | 1" AMMT | 075-1750-A007 |
| | | 0.095 | 1-1/4" AMMT | 075-1750-A008 |
| | | 0.095 | Winch wire end | 075-1750-A009 |
| | | 0.125 | 1" AMMT | 075-1750-A010 |
| | | 0.125 | 1-1/4" AMMT | 075-1750-A011 |
| 2" | 2 | 0.134 | 1" AMMT | 075-2000-A001 |
| | | 0.134 | 1-1/2" AMMT | 075-2000-A002 |
| | | 0.134 | Winch wire end | 075-2000-A003 |
| | | 0.145 | Winch wire end | 075-2000-A004 |
| | | 0.145 | 1-1/2" AMMT | 075-2000-A005 |
| | | 0.175 | Winch wire end | 075-2000-A006 |
| | | 0.156 | 1" AMMT | 075-2000-A007 |
| | | 0.109 | 1-1/2" AMMT | 075-2000-A010 |
| | | 0.109 | Winch wire end | 075-2000-A012 |
| 2-3/8" | 2.375 | 0.134 | 1-1/2" AMMT | 075-2375-A001 |
| | | 0.134 | 1" AMMT | 075-2375-A002 |
| | | 0.134 | Winch wire end | 075-2375-A003 |
| | | 0.175 | Winch wire end | 075-2375-A004 |
| | | 0.175 | 1" AMMT | 075-2375-A005 |
| | | 0.175 | 1-1/2" AMMT | 075-2375-A006 |
| | | 0.125 | Winch wire end | 075-2375-A007 |
| | | 0.125 | 1" AMMT | 075-2375-A008 |
| | | 0.125 | 1-1/2" AMMT | 075-2375-A009 |
| | | 0.109 | Winch wire end | 075-2375-A010 |
| | | 0.109 | 1" AMMT | 075-2375-A011 |

# STABBING PULLEY

## APPLICATION

- Assist with coiled tubing spooling operations

## FEATURES

- Reduces manual handling and working at height.
- Quick make-up time
- No additional hand tools required
- Lightweight design

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- A variety of Removal Subs are available to suit common threads. Bespoke versions available on request.

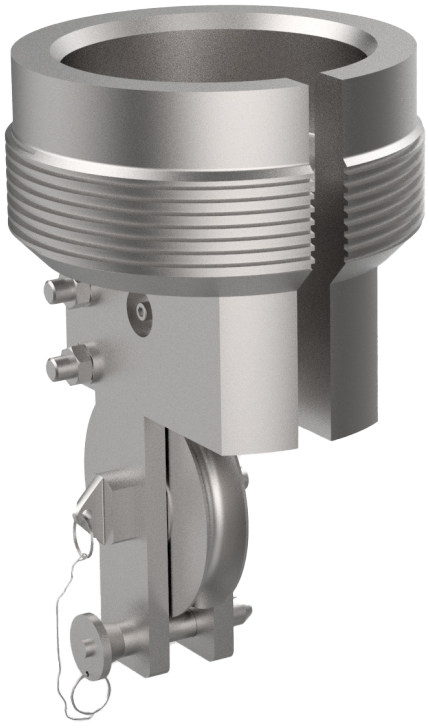
The WellEnTech Stabbing Pulley is a device designed to assist when feeding coiled tubing from the reel into an Injector Head or for feeding the tubing back onto the reel. Used in conjunction with a winch, wire and suitable coiled tubing connector, the wire is easily installed via a slot in the side of the main body. Meaning, the Stabbing Pulley can be installed and removed from the riser with the wire still installed and the lightweight design and short thread profile makes manual handling extremely easy and facilitates quick make-up.

## TECHNICAL SPECIFICATION

| O/A Dimensions | Connection | Assembly No. |
|---|---|---|
| 13.5" x 8.25"dia<br><br>Approx. weight 12Kg | 5.75"- 4 Otis | 280-5750-A001 |
| | 7.00"- 5 Bowen | 280-7000-A001 |
| | 8.25"-4x2 Bowen | 280-8250-A001 |

## OPERATION

With a suitable Connector* fitted to the end of the coiled tubing, the wire can be fed through the riser and injector and attached to the coiled tubing. The WellEnTech Stabbing Pulley can then be installed at the bottom of the riser. The stabbing Pulley has a slot to allow passage of the wire which is retained by a replaceable brass wear bush in the bore and a ball lock pin secures the wire on the Sheave. With the Sheave aligned with the winch, the coiled tubing can then be fed down into and out of the bottom of the riser.



# SURFACE FILTER

## APPLICATION

- Any fluid pumping operations

## FEATURES

- Compact design.
- Easy to install/remove
- Fits all sizes of WECO hammer lug Union
- Stainless Steel construction

## ADDITIONAL INFORMATION

- WellEnTech Surface Filters are available to suit a wide range of filtration requirements. Listed above are the most common sizes to suit most pumping applications, however bespoke sizes can be produced for specific operations.

The WellEnTech Surface filter is designed to fit inside surface pipe work or treating iron to filter debris from pumped fluids. It can be installed in any size of WECO Hammer Lug Union without the need for modification of the union. They are manufactured from Stainless Steel to prevent corrosion and to prolong the service life of the filter. Various filter size options are available to suit all operational requirements

## TECHNICAL SPECIFICATION

| Type | Micron | Inches | Typical Impurities |
|---|---|---|---|
| D | 1000 - 1200 | 0.045” | Course sand and Debris |
| M | 600 - 700 | 0.025” | Silt and Sediment |
| X | 200 - 300 | 0.009” | Fine Sand and Silt |
| XF | 100 - 150 | 0.004” | Very Fine Sand and Dust |

## OPERATION

The Surface Filter is inserted into the WECO hammer lug union without the need for any specialized installation tools. The Hammer Lug Union can then be made up as normal and operations can proceed. The elongated filter design maximises the amount of debris which can be collected. To swap out the filter or remove it, the Hammer Lug Union is broken out and the filter pulled out of the treating iron. Flats and a drilled hole are included to ease disassembly.

# SURFACE HANDLING TOOL

## APPLICATION

- Spooling and stabbing operations

## FEATURES

- Short, compact design
- Modular construction
- Full 360° rotation
- 45° axial deflection as standard
- High Load capabilities

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications

The WellEnTech Surface Handling Tool provides flexibility when spooling Coiled Tubing onto and off of a reel. It includes three Knuckles as standard which gives a 45°flex. However, being a modular design, it has the added benefit of enabling the operator to include additional knuckles to provide improved flexibility where required. The Knuckles also provide a full 360° rotation and provide a smooth OD transition when knuckled over, ensuring there are no snagging points when running over the gooseneck. They can supplied with industry standard wireline or coiled tubing connections as well as winch wire of shackle sub ends.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connections | Tensile Strength (lbs) | Assembly Part No. | Additional Knuckles Part No. |
|---|---|---|---|---|---|
| 1.250 | 13 | 1” 12 UNF | 17,000 | 409-1250-A001 | 409-1250-A010 |
| 1.500 | 18 | 1” AMMT | 21,800 | 409-1500-A001 | 409-1500-A010 |
| 1.750 | 18 | 1-1/4” AMMT | 56,500 | 409-1750-A001 | 409-1750-A010 |
| 2.000 | 20 | 1-1/2” AMMT | 95,200 | 409-2000-A001 | 409-2000-A010 |
| 2.375 | 25 | 1-1/2” AMMT | 124,300 | 409-2375-A001 | 409-2375-A010 |
| 2.875 | 30 | 2-3/8”PAC | 134,100 | 409-2875-A001 | 409-2875-A010 |

## OPERATION

The WellEnTech Surface Handling Tool is ideally suited to Coiled Tubing spooling operations and is generally the link between the coil connector and the winch wire. The precision turned spheres provide a smooth, full rotation and are easily added and removed with standard hand tools. It is made up to the tool string like any other cross over or connection.

# TOOL CLAMP

## APPLICATION

- Tool string manipulation.
- Landing off tool string

## FEATURES

- Compact design.
- Interchangeable Slips.
- Standard hex head sizes.
- Compatible for a range of tool diameters.

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.

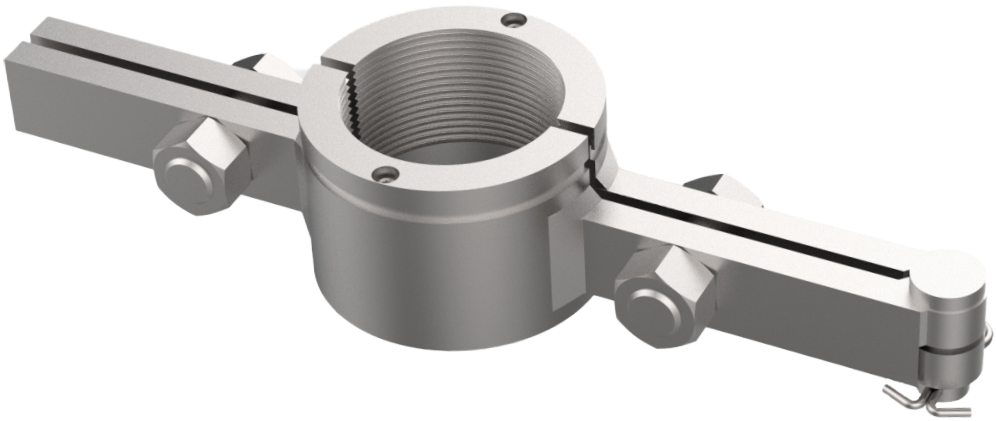
The WellEnTech Tool Clamp is a device for fitting to a tool string and provides a means of suspending the tool string during initial deployment. The Tool Clamp can also be used to secure Coiled Tubing during pulling or to assist while the Coiled Tubing is being fed off of the reel. A range of slips are available to suit various diameters and are easily swapped out without the need to disassemble the Tool Clamp.

## TECHNICAL SPECIFICATION

| Body OD (Inches) | Length (Inches) | Assembly No. | Slip Size To suit Tubing | Part No. |
|---|---|---|---|---|
| 4.25 | 15.00 | 046-3125-A001 | 1.563” | 046-1563-ST01 |
| | | | 1.688” | 046-1688- ST01 |
| | | | 1.750” | 046-1750- ST01 |
| | | | 2.125” | 046-2125- ST01 |
| | | | 2.500” | 046-2500- ST01 |
| | | | 2.750” | 046-2750- ST01 |
| | | | 2.875” | 046-2875- ST01 |
| | | | 3.000 | 046-3000- ST01 |
| | | | 3.125 | 046-3125- ST01 |

## OPERATION

The WellEnTech Tool Clamp consists of two halves which are connected by arms and a hinge. The Arms are simply bolted together making operation extremely simple. The slips, which can be swapped out for a range of different sizes, can be removed and replaced without the need to strip or open the clamp. The slips are held in place with 2 screws. Having selected the correct Slip size to suit the tool string and the Slips secured in Place, the Tool Clamp can be fitted to the tool string. Both halves are then brought together and secured in place by tightening the nut and bolt arrangements.



# ROLL-ON SPOOLABLE CONNECTOR

## APPLICATION

- Designed for spooling Coiled Tubing onto a reel.

## FEATURES

- One piece
- Compact design
- Dual seal
- Suitable for drop balls
- Available for all coil sizes and materials

## ADDITIONAL INFORMATION

- The sizes listed above are examples of common configurations.
- Bespoke designs available to suit job specific applications.
- The tensile strength of these Spoolable Connectors depends on a variety of factors such as, the condition and spec of the coil it is made up to. As a general rule, the strength can be considered to be 60% of the Coiled Tubing.

The WellEnTech Roll-On Spoolable Connector is a cost effective means of connecting two pieces of Coiled Tubing. The robust one piece design is furnished with standard O-rings, has a large through bore and is easy to make-up and remove from the Coiled Tubing. Available for all sizes of Coiled Tubing and taper strings.

## TECHNICAL SPECIFICATION

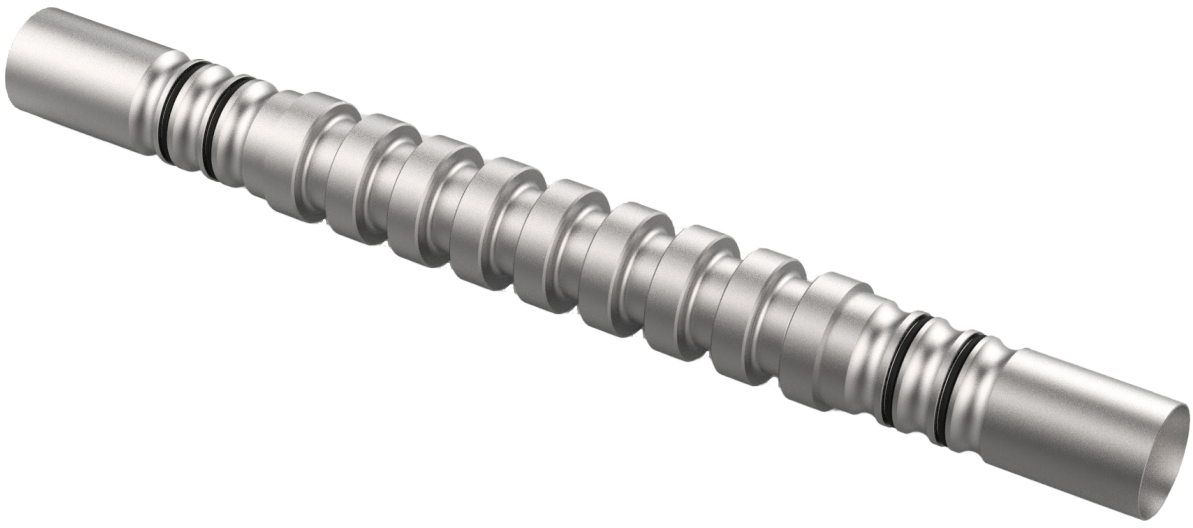
| Coil Tubing Dia (Inches) | OD (Inches) | Wall thickness (Inches) | Part No. |
|---|---|---|---|
| 1-1/4” | 1.25 | 0.095 | 071-1250-ST03 |
| | | 0.109 | 071-1250-ST05 |
| | | 0.125 | 071-1250-ST07 |
| | | 0.134 | 071-1250-ST09 |
| | | 0.156 | 071-1250-ST11 |
| | | 0.175 | 071-1250-ST13 |
| 1-1/2” | 1.50 | 0.095 | 071-1500-ST01 |
| | | 0.109 | 071-1500-ST03 |
| | | 0.125 | 071-1500-ST05 |
| | | 0.134 | 071-1500-ST07 |
| | | 0.145 | 071-1500-ST09 |
| | | 0.156 | 071-1500-ST11 |
| | | 0.175 | 071-1500-ST15 |
| 1-3/4” | 1.75 | 0.109 | 071-1750-DD03 |
| | | 0.118 | 071-1750-DD05 |
| | | 0.125 | 071-1750-DD07 |
| | | 0.134 | 071-1750-DD09 |
| | | 0.145 | 071-1750-DD11 |
| | | 0.156 | 071-1750-DD13 |
| | | 0.175 | 071-1750-DD15 |
| | | 0.188 | 071-1750-DD17 |
| | | 0.204 | 071-1750-DD19 |
| 2” | 2.00 | 0.109 | 071-2000-ST03 |
| | | 0.125 | 071-2000-ST05 |
| | | 0.134 | 071-2000-ST07 |
| | | 0.145 | 071-2000-ST09 |
| | | 0.156 | 071-2000-ST11 |
| | | 0.175 | 071-2000-ST13 |
| | | 0.188 | 071-2000-ST15 |
| | | 0.204 | 071-2000-ST17 |
| | | 0.224 | 071-2000-ST19 |

## OPERATION

The Roll-On Spoolable Connector is fitted to dressed Coiled Tubing using a Crimper Tool*. The Coiled Tubing is deformed into the roll on grooves producing an extremely strong and durable connection at both ends. The two O-rings, one primary and the other back up, provides peace of mind for high pressure applications. The Spoolable Connector when fitted to the Coiled Tubing should be pressure tested to ensure it has been fitted correctly prior to spooling onto the reel.

* Crimper Tools and CT Reamer Assemblies and are available from WellEnTech

| Coil Tubing Dia (Inches) | OD (Inches) | Wall thickness (Inches) | Part No. |
|---|---|---|---|
| 2-3/8” | 2.375 | 0.109 | 071-2375-ST03 |
| | | 0.125 | 071-2375-ST05 |
| | | 0.134 | 071-2375-ST07 |
| | | 0.145 | 071-2375-ST09 |
| | | 0.156 | 071-2375-ST11 |
| | | 0.165 | 071-2375-ST13 |
| | | 0.175 | 071-2375-ST15 |
| | | 0.188 | 071-2375-ST17 |
| | | 0.204 | 071-2375-ST19 |
| | | 0.214 | 071-2375-ST21 |
| | | 0.224 | 071-2375-ST23 |
| 2-7/8” | 2.875 | 0.145 | 071-2875-ST03 |
| | | 0.156 | 071-2875-ST05 |
| | | 0.175 | 071-2875-ST07 |
| | | 0.188 | 071-2875-ST09 |
| | | 0.204 | 071-2875-ST11 |
| | | 0.224 | 071-2875-ST13 |
| | | 0.250 | 071-2875-ST15 |
| | | 0.280 | 071-2875-ST17 |



WELL
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# SPECIALITY TOOLS

# FOX™ VALVE

## APPLICATION

- CT Milling operations
- Circulation of solids
- Whipstock operations
- Bridge Plug deployment and setting
- Drill Stem Testing
- Acidising and Injection operations

## FEATURES

- Flow activated design. No need for drop balls
- Adjustable operating pressure
- Multicycle operation
- Low maintenance design
- Numerous tool configurations and lengths possible
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The patented WellEnTech FOX™ Valve is a Flow Operated Circulating Sub which enables the operator to change flow from annular flow to tubing flow and vice versa without the need to drop balls or darts. It is a multicycle tool which can be used for numerous downhole applications where switching flow through the tool to annulus is required. The High Flow version enables high flow to either the annulus or tubing without causing the tool to switch. This feature is particularly useful for circulating debris or cuttings up the annulus. The FOX Valve activation flow rate can be adjusted to suit operational requirements, and when in the 'open to tubing' mode, the drill string or CT string can hold static pressure, enabling the tubing to be pressure tested or the application of pressure can be used to set a hydroset Plug or Packer.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connections | Max. Flow Area (Inches²) | Tensile Strength (lbs) | Part No. |
|---|---|---|---|---|---|
| 1.688 | 21.25 | 1"AMMT | 0.11 | 73,100 | 118-1688-A001 |
| 2.125 | 25.00 | 1-1/2"AMMT | 0.17 | 95,100 | 118-2125-A001 |
| 2.875 | 29.50 | 2-3/8"PAC | 0.31 | 128,000 | 118-2875-A001 |
| 4.750 | 50.00 | NC 38 | 0.79 | 156,700 | 118-4750-A001 |
| 6.50 | 64.50 | NC 46 | 1.47 | 600,700 | 118-6500-A001 |
| 8.25 | 72.00 | NC 50 | 2.13 | 629,300 | 118-8125-A001 |

## OPERATION

The WellEnTech FOX™ Valve is run as part of a Drill String or Coiled Tubing BHA. Depending on the particular operation, the valve can be deployed either open to annulus or open to tubing. The valve remains in the chosen mode until flow is increased and then choked back or stopped. At which point, the valve will switch to the next position. To adjust the activation pressure, the nozzle can be swapped out for a different sized orifice.

# BACK PRESSURE VALVE

## APPLICATION

- Low well pressure operations
- Gas well applications
- Underbalance drilling

## FEATURES

- Short, compact design
- Externally adjustable
- Large pressure activation range
- Hardened seat and poppet to prolong tool life
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech Back Pressure Valve maintains a column of fluid within a tubing string for operations where there is little or no well pressure. That is, applications where the Hydrostatic pressure within the tubing needs to be higher than the pressure in the annulus. Unlike similar type tools on the market, the WellEnTech Back Pressure Valve can be adjusted to the required pressure setting without the need to strip the tool.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Flow area ($In^2$) | Connections | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|---|
| 1.750 | 22.10 | 0.17 | 1”AMMT | 47,000 | H2S | 225-1750-A001 |
| | | | | 64,600 | Std. | 225-1750-A002 |
| 2.125 | 19.50 | 0.31 | 1-1/2”AMMT | 70,700 | H2S | 225-2125-A001 |
| | | | | 97,200 | Std. | 225-2125-A002 |
| 2.875 | 24.50 | 0.44 | 2-3/8”PAC or PAC DS | 125,700 | H2S | 225-2875-A001 |
| | | | | 171,900 | Std. | 225-2875-A002 |
| 3.125 | 26.00 | 0.44 | 2-3/8”PAC or PAC DS | 136,000 | H2S | 225-3125-A001 |
| | | | | 187,600 | Std. | 225-3125-A002 |

## OPERATION

The Back Pressure Valve is assembled to a tool string where a column of hydrostatic fluid needs to be maintained within the tubing string. Rotation of the Setting Sleeve adjusts the load produced by the spring stack, thereby changing the required pressure to move the Poppet off of the Poppet Seat. The required setting pressure can be viewed through the milled window in the valve body. Once set, set screws lock the Setting Sleeve in position. At this point any pressure in excess of the set pressure will be vented through the tool bore to the tubing or tool string below. Continued pumping over and above the set pressure permits flow down through the tool until the pumps are stopped and the pressure drops below the set pressure. The tool then resets and is ready to be functioned again any number of times.

# CIRCULATION SUB

## APPLICATION

- Standard Jetting operations
- Clean out runs
- Debris circulation
- Well Stimulation operations
- Any flow dependent well operations

## FEATURES

- One piece body
- Interchangeable Ball Seat
- No specialist assembly tools required
- Fully adjustable activation pressure
- Burst Disc as standard
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Tools are supplied with a blank disc as standard. Additional Rupture discs are available to suit a range of pressures.

The WellEnTech Circulation Sub is designed to be used as part of a Thru' Tubing Bottom Hole Assembly. It is a drop ball activated device which provides a flow path down through the tool during initial operation but enables flow to the annulus to be activated when a ball is dropped. Applied pressure moves the Circ. Sub Ball Seat down opening the annular ports.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | ID (Inches) | Connections | Internal Ball Size | Service | Part No. |
|---|---|---|---|---|---|---|
| 1.688 | 8.00 | 0.406 | 1"AMMT | 1.1/2" | H2S. | 108-1688-A001 |
| | | | | | Std. | 108-1688-A002 |
| 1.750 | 9.00 | 0.406 | 1-1/4"AMMT | 1.1/2" | H2S. | 108-1750-A001 |
| | | | | | Std. | 108-1750-A002 |
| 2.125 | 9.00 | 0.563 | 1-1/2"AMMT | 2" | H2S. | 108-2125-A001 |
| | | | | | Std. | 108-2125-A002 |
| 2.875 | 9.25 | 0.469 | 2-3/8"PAC | 3" | H2S. | 108-2875-A001 |
| | | | | | Std. | 108-2875-A002 |

## OPERATION

The WellEnTech Circulation Sub is configured at surface. A suitably sized ball seat is secured in place with Shear Screws. The shear value can be adjusted depending on how many Shear Screws are assembled. The Circulation Sub also comes with a burst disc port as standard incase circulation is lost during operations. The Burst discs are easily assembled and removed using a standard Allen key. A burst disc is inserted into the tool which is rated at a pressure value in excess of pressures anticipated during well operations. A pumped Drop Ball will land on the Ball Seat and shear out the ball seat to establish a flow path between the tubing and annulus.

# GAUGE CARRIER – CT TYPE

## APPLICATION

- Facilitate the deployment of gauges for reservoir Pressure and Temperature

## FEATURES

- Robust construction
- Flow thru' design
- Gauges held securely held within carrier
- Gauges protected from well fluids
- Multiple top and bottom sub configurations available
- Easy to redress, remove and replace gauges

## ADDITIONAL INFORMATION

- Typical examples of single gauge carriers shown above. Tool length is dependent on gauges fitted.
- Tools are manufactured from mild steel as standard. Stainless and exotic materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech CT Type Gauge Carrier is a thru' tubing deployed sub which can accommodate up to two gauges for well bore sampling operations. The gauge is isolated from annular fluids and is contained within a pressure retaining housing. Flow is permitted past the gauge which is supported by the ported top sub and centralized within the housing with a centraliser ring. The design is flexible enough to accommodate two gauges if required.

## TECHNICAL SPECIFICATION

| Tool OD (Inches) | Length (Inches) | Connections | Part No. |
|---|---|---|---|
| 1.688 | 30.00 | 1"AMMT | 407-1688-A001 |
| 2.125 | 38.50 | 1-1/2"AMMT | 407-2125-A001 |
| 2.875 | 45.00 | 2-3/8"PAC | 407-2875-A001 |

## OPERATION

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The WellEnTech CT Type Gauge Carrier is deployed as part of a standard thru' tubing BHA. The gauge is made up to the ported top sub and inserted into the housing. With the bottom sub made up, the gauge is fully protected while tripping in and out of hole. The assembled carrier can then be placed in the desired position within the BHA without effecting the other tools in the string.

# GAUGE CARRIER – DRILL STEM TESTING

## APPLICATION

- To acquire Pressure and Temperature Data during Well Testing Operations

The WellEnTech Drill Stem Testing Gauge Carrier is used for deploying gauges down hole as part of a test string. It can accommodate 2 gauges for external sampling and has a removable inner cartridge which can accommodate up to 4 gauges for sampling within the test string bore.

The robust design includes extended length saver subs top and bottom to facilitate rig tongs as well as provide sufficient length for tool joint re-cuts.

## FEATURES

- Robust construction
- Extended length saver subs top and bottom
- Easily accessible external gauges
- Internal gauges secured within removable carrier.
- Service connections include dual seals and torque shoulders.
- Easy to redress and replace gauges

## TECHNICAL SPECIFICATION

| Tool OD (Inches) | Tool ID (Inches) | Length (Inches) | Connections | Material | Pressure Rating | Temp. Rating | Part No. |
|---|---|---|---|---|---|---|---|
| 5.00 | 2.25 | 60.00 | NC38 (3-1/2"IF) | AISI 4140 TO NACE MR 0175 | 15,000 psi | 200°C (390°F) | 405-5000-A001 |
| 5.00 | 2.25 | 60.00 | 3.50" 15.8# PH-6 | AISI 4140 TO NACE MR 0175 | 15,000 psi | 200°C (390°F) | 405-5000-A003 |

## OPERATION

The WellEnTech Drill Stem testing Gauge Carrier is run in hole as part of a test string. The required internal gauges are fitted to the carrier insert which is then inserted into the bore of the gauge carrier body, the service connection when made-up ensures the gauges are securely held in position within the carrier bore. The external gauges are secured in place with external clamps making them easily accessible.

## ADDITIONAL INFORMATION

- Other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

# GAUGE CARRIER – SLICKLINE TYPE

## APPLICATION

- To carry out downhole surveys of reservoir Pressure and Temperature

## FEATURES

- Robust construction
- Dual gauge carrier
- Gauges held securely
- Elongated slots to assist well fluid circulation
- Multiple top and bottom sub configurations available
- Easy to redress, remove and replace gauges

## ADDITIONAL INFORMATION

- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech Slickline Type Gauge Carrier is a wireline deployed sub which can accommodate up to two gauges for well bore sampling operations. The gauges are securely held in place with a central plug, along with top and bottom subs which sandwich the gauges within the housing. The main body of the tool has elongated slots milled along its length to enable free circulation of well fluids around the gauges.

## TECHNICAL SPECIFICATION

| Tool OD (Inches) | Length (Inches) | Connection | Material | Part No. |
|---|---|---|---|---|
| 1.50 | 22.50 | 15/16” 10 UNS S/R PIN | AISI 4140 | 406-1500-A001 |
| 2.00 | 24.00 | 3/4” 10 UNS S/R PIN | AISI 4140 | 406-2000-A001 |
| 2.25 | 30.00 | 1-1/2” 10 UNS S/R PIN | AISI 4140 | 406-2250-A001 |

## OPERATION

The WellEnTech Slickline Type Gauge Carrier can be run in hole individually or as part of a wireline BHA. The gauges are made up to the central plug and inserted into the carrier housing. The top and Bottom subs are then made up, securing the gauges safely within the carrier.

# HYDRAULIC TUBING END/NIPPLE LOCATOR

## APPLICATION

- Nipple location
- Tubing end location

## FEATURES

- Short, compact design
- Adjustable indication load
- Multiple use
- Interchangeable dogs to suit range of sizes
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech Hydraulic Tubing End/Nipple Locator provides a means of locating the end of a tubing string or nipples within a wellbore. The tool is activated by hydraulic pressure. Meaning the dogs are retracted while running in and out of hole thereby reducing drag forces and preventing the dogs from rubbing against the casing wall. The spring loaded Dogs provide a positive indication that the tubing end or nipple has been located.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Dog OD (Inches) | Connections | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|---|
| 1.688 | 18.5 | 1.875 to 2.25 | 1”AMMT | 30,000 | H2S | 216-1688-A001 |
| | | | | 41,200 | Std. | 216-1688-A002 |
| 2.125 | 22.6 | 2.25 to 3.25 | 1-1/2”AMMT | 49,500 | H2S | 216-2125-A001 |
| | | | | 68,000 | Std. | 216-2125-A002 |
| 2.875 | 32.5 | 3.25 to 5.25 | 2-3/8”PAC | 66,900 | H2S | 216-2875-A001 |
| | | | | 92,200 | Std. | 216-2875-A002 |

## OPERATION

The WellEnTech Hydraulic Tubing End/Nipple Locator is deployed as part of a tool string where a tubing nipple or tubing end needs to be located for depth correlation. The tool is run in hole in the collapsed position and is generally run past the assumed position of the nipple or tubing end. Flow through the tool is increased and the pressure generated by the Nozzle pushes the Piston and Mandrel upwards energising the Dogs. The tools string can then be manipulated upwards until an over pull is witnessed. At a predetermined over pull the dog will release from the Nipple or tubing end. Manipulation of the tubing both upwards and downwards will produce the same result, verifying the position of the nipple or tubing End. Once completed, flow is stopped and the dogs are retracted back into the tool.

# IN-LINE RUPTURE DISC SUB

## APPLICATION

- Debris circulation
- Reverse circulation applications
- Well Stimulation operations
- Any flow dependent well operations

## FEATURES

- One piece design
- No specialist assembly tools required
- Fully adjustable activation pressure
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Tools are supplied with a blank disc as standard. Additional Rupture discs are available to suit a range of pressures.

The WellEnTech In-line Rupture Disc Sub provides a means of communicating with the tubing below the sub. Ideally suited for operations where the internals of the tubing string needs to be isolated from well fluids such as acid injection applications or reverse circulation. The tool can be supplied with a range of calibrated Rupture discs which provide a choice of activation pressures to suit operational requirements.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|
| 1.688 | 5.00 | 1”AMMT | 45,400 | H2S | 160-1688-A001 |
| | | | 62,400 | Std. | 160-1688-A002 |
| 1.750 | 5.00 | 1-1/4”AMMT | 46,400 | H2S | 160-1750-A001 |
| | | | 63,800 | Std. | 160-1750-A002 |
| 2.125 | 5.00 | 1-1/2”AMMT | 84,700 | H2S | 160-2125-A001 |
| | | | 116,400 | Std. | 160-2125-A002 |
| 2.875 | 6.00 | 2-3/8”PAC | 158,900 | H2S | 160-2875-A001 |
| | | | 218,500 | Std. | 160-2875-A002 |

## OPERATION

The WellEnTech Rupture Disc Sub is configured at surface. Burst discs are easily assembled and removed using a standard Allen key. A burst disc is inserted into the tool which is rated at a pressure value in excess of pressures anticipated during well operations. If however, when required, the Rupture Disc Sub enables the operator to apply a predetermined pressure and rupture the disc, thereby opening up a communication path through the tubing string.

# MECHANICAL TUBING END/NIPPLE LOCATOR

## APPLICATION

- Nipple location
- Tubing end location

## FEATURES

- Short, compact design
- Adjustable indication load
- Multiple use
- Interchangeable dogs to suit range of sizes
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech Mechanical Tubing End/Nipple Locator provides a means of locating the end of a tubing string or nipples within a wellbore. The spring loaded Dogs provide a positive indication that the tubing end or nipple has been located. For added security, the tool has a shear release mechanism to enable the dogs to release should any well problems occur.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Dog OD (Inches) | Connections | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|---|
| 1.688 | 15.00 | 1.875 to 2.25 | 1”AMMT | 30,000 | H2S | 215-1688-A001 |
| | | | | 41,200 | Std. | 215-1688-A002 |
| 2.125 | 18.75 | 2.25 to 3.25 | 1-1/2”AMMT | 49,500 | H2S | 215-2125-A001 |
| | | | | 68,000 | Std. | 215-2125-A002 |
| 2.875 | 25.00 | 3.25 to 5.25 | 2-3/8”PAC | 66,900 | H2S | 215-2875-A001 |
| | | | | 92,200 | Std. | 215-2875-A002 |

## OPERATION

The WellEnTech Hydraulic Tubing End/Nipple Locator is deployed as part of a tool string where a tubing nipple or tubing end needs to be located for depth correlation. The tool is run in hole and is generally run past the assumed position of the nipple or tubing end. As the tool string is manipulated both upwards and downwards through the nipple profile an increased pull push load will be witnessed at surface, verifying the position of the nipple. Likewise the tubing end can be correlated when an over pull is witnessed as the tool moves back into the tubing end. If for any reason, the tool becomes stuck in hole, a predetermined over pull will result in the shear screws shearing and de-supporting the dogs. The tool can then be retrieved to surface.

# PUMP-OUT CHECK VALVE SUB

## APPLICATION

- Velocity Strings
- Injection operations
- Well Kill or Stimulation applications

## FEATURES

- Compact design
- Dual barrier design
- Multi-function operation
- Maximised through bore
- Integral well control barriers
- Connection to suit tool joint or coil connector

## ADDITIONAL INFORMATION

- Bespoke designs available to suit job specific applications.
- Tools are manufactured from mild steel as standard. Other materials are available on request.

The WellEnTech Pump-Out Check Valve Sub is a device designed to be placed at the end of a tubing string to provide a means of isolating the tubing bore from well fluids until the Pump-Out Sub is activated. The design is particularly suited to velocity strings where the production conduit is coiled tubing. The activation pressure is fully adjustable and the tool is designed so that only the application of tubing pressure will activate the tool. A ball seat within the tool has a stinger which holds open double flapper check valves. These check valves can be activated when required by simply dropping a ball, providing a well barrier when removing the string from the well. The Pump-Out Check Valve Sub can be attached directly to jointed pipe or to coiled tubing via a suitable connector. It can also be supplied with or without a catcher depending on operational requirements.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Min Flow Dia (Inches) | Service | Part No. |
|---|---|---|---|---|---|
| 2.125 | 20.00 | 1-1/2”AMMT Box | 0.25 | $H_2S$ | 226-2125-A011 |
| | | | | Std | 226-2125-A012 |
| 2.250 | 20.00 | 1-1/2”AMMT Box | 0.25 | $H_2S$ | 226-2250-A011 |
| | | | | Std | 226-2250-A012 |
| 2.875 | 24.00 | 2-3/8”PAC Box | 0.52 | $H_2S$ | 226-2875-A011 |
| | | | | Std | 226-2875-A012 |

## OPERATION

Prior to running in hole, the WellEnTech Pump-Out Check Valve Sub is dressed with the required amount of shear screws. The Sub can then be fitted to the t ubing and run in hole to the required depth. A predetermined pressure is then applied to the tubing string, resulting in the Pump Out Plug shearing and dropping into the well bore or catcher, permitting well fluid to circulate up though the tubing in the case of a velocity string application. To activate the check valves, a ball is dropped which shears the stinger which moves out from the check valve bore allowing the Check Valves to close, providing a well barrier for retrieval purposes.

# PUMP-OUT SUB

## APPLICATION

- Velocity Strings
- Injection operations
- Well Kill or Stimulation applications

## FEATURES

- Compact design
- Dual barrier design
- Multi-function operation
- Maximised through bore
- Connection to suit tool joint or coil connector

## ADDITIONAL INFORMATION

- Bespoke designs available to suit job specific applications.
- Tools are manufactured from mild steel as standard. Other materials are available on request.

## OPERATION

Prior to running in hole, the WellEnTech Pump-Out Sub is dressed with the required amount of shear screws. The Sub can then be fitted to the tubing and run in hole to the required depth. A predetermined pressure is then applied to the tubing string, resulting in the Pump Out Plug shearing and dropping into the catcher or well bore, permitting well fluid to circulate up though the tubing in the case of a velocity string application.

The WellEnTech Pump-Out Sub is a device designed to be placed at the end of a tubing string to provide a means of isolating the tubing bore from well fluids until the Pump-Out Sub is activated. The design is particularly suited to velocity strings where the production conduit is coiled tubing. The activation pressure is fully adjustable and the tool is designed so that only the application of tubing pressure will activate the tool. Alternatively a ball seat can be fitted to facilitate tubing fill when running in hole. The Pump-Out Sub can be attached directly to jointed pipe or to coiled tubing via a suitable connector. It can also be supplied with or without a catcher depending on operational requirements. A range of catcher types and styles are available. The illustrations below shows a Pump-out Plug Version complete with Catcher.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Min Flow Dia (Inches) | Pump-Out Sub Type | Service | Part No. |
|---|---|---|---|---|---|---|
| 1.500 | 12.00 | 1.281” 10 SA Box | 1.00 | Drop Ball | H2S | 226-1500-A001 |
| | | | | | Std | 226-1500-A002 |
| 1.688 | 12.50 | 1.375” 10 SA Box | 1.25 | Pump-Out Plug | H2S | 226-1688-A001 |
| | | | | | Std | 226-1688-A002 |
| 2.125 | 19.13 | 1.813” 10 SA Box | 1.40 | Drop Ball | H2S | 226-2125-A001 |
| | | | | | Std | 226-2125-A002 |
| 2.25 | 19.13 | 1-1/2”AMMT Box | 1.00 | Drop Ball | H2S | 226-2250-A001 |
| | | | | | Std | 226-2250-A002 |
| 2.375 | 18.25 | 1-1/2”AMMT Box | 1.00 | Pump-Out Plug | H2S | 226-2375-A001 |
| | | | | | Std | 226-2375-A002 |
| 2.875 | 22.25 | 2-3/8”PAC Box | 1.375 | Pump-Out Plug | H2S | 226-2875-A001 |
| | | | | | Std | 226-2875-A002 |
| 3.125 | 24.00 | 2-3/8”PAC Box | 1.375 | Drop Ball | H2S | 226-3125-A001 |
| | | | | | Std | 226-3125-A002 |

# RUPTURE DISC SUB

## APPLICATION

- Standard Jetting operations
- Clean out runs
- Debris circulation
- Well Stimulation operations
- Any flow dependent well operations

## FEATURES

- One piece design
- No specialist assembly tools required
- Fully adjustable activation pressure
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Tools are supplied with a blank disc as standard. Additional Rupture discs are available to suit a range of pressures.

The WellEnTech Rupture Disc Sub provides a means of communicating with the annulus should a loss of circulation through a tool string occur. The tool can be supplied with a range of calibrated Rupture discs which provide a choice of activation pressures to suit operational requirements.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|
| 1.688 | 5.00 | 1”AMMT | 45,400 | H2S | 159-1688-A001 |
| | | | 62,400 | Std. | 159-1688-A002 |
| 1.750 | 5.00 | 1-1/4”AMMT | 46,400 | H2S | 159-1750-A001 |
| | | | 63,800 | Std. | 159-1750-A002 |
| 2.125 | 5.00 | 1-1/2”AMMT | 84,700 | H2S | 159-2125-A001 |
| | | | 116,400 | Std. | 159-2125-A002 |
| 2.875 | 6.00 | 2-3/8”PAC | 158,900 | H2S | 159-2875-A001 |
| | | | 218,500 | Std. | 159-2875-A002 |

## OPERATION

The WellEnTech Rupture Disc Sub is configured at surface. Burst discs are easily assembled and removed using a standard Allen key. A burst disc is inserted into the tool which is rated at a pressure value in excess of pressures anticipated during well operations. If however, during the operation, circulation is lost, the Rupture Disc Sub enables the operator to apply a predetermined pressure and rupture the disc, thereby opening up a communication path between the tool string ID and the annulus.

# SHIFTING TOOL

## APPLICATION

- Sliding Side Door Valves
- Sub Surface Safety Valves
- Completion Barrier Ball Vales
- Shifting a sleeve in any well product which has a shifting profile

## FEATURES

- Suitable for use with Jars and Impact Hammers
- Dogs activated with flow
- Single and Bi-directional use
- A single tool can be used for various profiles
- Through bore
- Tool joint or service connections

## ADDITIONAL INFORMATION

- The sizes listed above are examples of common configurations.
- Uni-Directional Dogs are listed above. Bi-directional Dogs are also available.
- Bespoke designs available to suit job specific applications and profiles.
- Tools are manufactured from mild steel as standard. Other materials are available on request.

The WellEnTech Shifting Tool is a flow operated device used for engaging and moving standard shifting profiles, typically found in Sliding Side Door Valves, Sub Surface Saftey Valves and Completion Ball Valves. The Dogs are designed to engage specific profiles and release from that profile when the sleeve to be shifted has completed its stroke. Dogs can be fitted to either open or close a sleeve. Or, Bi-directional Dogs can be fitted to perform a series of open and close operations in a single trip in hole.

## TECHNICAL SPECIFICATION

| Tool Chassis OD | Length (Inches) | Connection | Assembly No. | Profile Size | Dog Part No. |
|---|---|---|---|---|---|
| 1.688” | 20.00 | 1”AMMT Box x Pin | 180-1688-A001 | 1.875 | 180-1688-SH06 |
| | | | | 2.188 | 180-1688-SH09 |
| 2.125 | 22.50 | 1-1/2”AMMT Box x Pin | 180-2125-A001 | 2.313 | 180-2125-SH06 |
| | | | | 2.562 | 180-2125-SH09 |
| | | | | 2.813 | 180-2125-SH15 |
| 3.000 | 26.75 | 2-3/8”PAC Box x Pin | 180-3000-A001 | 3.125 | 180-3000-SH06 |
| | | | | 3.250 | 180-3000-SH09 |
| | | | | 3.313 | 180-3000-SH12 |
| | | | | 3.437 | 180-3000-SH15 |
| | | | | 3.688 | 180-3000-SH18 |
| | | | | 3.813 | 180-3000-SH21 |
| | | | | 4.313 | 180-3000-SH24 |
| | | | | 4.562 | 180-3000-SH27 |

## OPERATION

The WellEnTech Shifting Tool is configured with suitable Dogs and retaining sleeves to suit the profile to be shifted within the completion string The Dogs remain within the retaining sleeves until flow through the tool pumps the retaining sleeves back to activate the Dogs. The spring loaded Dogs can then engage a profile and either upward or downward movement will shift the sleeve. The Dog design will then release from the profile once it has completed its travel. When flow through the tool is stopped the Disc Springs return the retaining sleeves pulling the Dogs back into the tool.

# VENTURI JET JUNK BASKET

## APPLICATION

- Wellbore clean out runs
- Sand/fill removal
- Small object retrieval

## FEATURES

- Simple robust construction
- Interchangeable Nozzles and Filter
- Dual Finger Cages as standard
- Low maintenance design
- Numerous tool configurations and lengths possible
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.
- Various other extension lengths are available.

The WellEnTech Venturi Jet Junk Basket is a device used for the removal and containment of well bore debris. The tool design which, in effect, vacuums debris from a well bore includes Dual Finger Cages at the bottom end of the assembly to trap debris within the body of the tool and a Filter at the top to prevent the re-circulation of the contained debris. The powerful suction generated can pick up objects such as pulling tool fingers, pins, grapples, screws etc. The tool design incorporates two step threads and is therefore robust enough to have washover shoes fitted to the lower thread.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|
| 1.688 | 28.00 * | 1”AMMT Box | 53,200 | H2S | 230-1688-A001 |
| | | | 73,100 | Std. | 230-1688-A002 |
| 2.063 | 35.00 * | 1-1/2”AMMT Box | 84,700 | H2S | 230-2063-A001 |
| | | | 95,100 | Std. | 230-2063-A002 |
| 2.625 | 37.25 * | 1-1/2”AMMT Box | 93,100 | H2S | 230-2625-A001 |
| | | | 128,000 | Std. | 230-2625-A002 |
| 3.125 | 42.50 * | 2-3/8”PAC Box | 114,000 | H2S | 230-3125-A001 |
| | | | 156,700 | Std. | 230-3125-A002 |
| 4.500 | 118.50 ** | NC38 Box | 121,400 | H2S | 230-4500-A001 |
| | | | 167,000 | Std. | 230-4500-A002 |
| 5.500 | 132.63 ** | NC38 Box | 125,100 | H2S | 230-5500-A001 |
| | | | 172,100 | Std. | 230-5500-A002 |
| 8.125 | 136.63 ** | NC50 Box | 271,900 | H2S | 230-8125-A001 |
| | | | 373,900 | Std. | 230-8125-A002 |

## OPERATION

The WellEnTech Venturi Jet Junk Basket is run in hole to the required depth and is operated by flowing down through the tool. The fluid flow through the Nozzles, creates a pressure drop at the exit point immediately downstream of the Nozzle. The fluid down stream then equalises with the fluid exiting from the Nozzles inducing a circulation of fluid through the tool producing a suction effect. The effective suction force can be adjusted by altering the Nozzle sizes which can be achieved without the need to strip the tool. The amount of debris collected is determined by the length of Extensions ran and the size of debris collected is governed by the size of Filter fitted within the tool.

WELL EN TECH

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# FISHING TOOLS

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# IFR PULLING TOOL

## APPLICATIONS

- Standard fishing operations
- Heavy duty fishing operations
- Jetting and pick up operations
- Tool deployment

## FEATURES

- Flow activated
- Enclosed spring design
- Multi-function operation
- Fully adjustable activation pressure
- Easily redressed
- Compact and rugged design
- Ported Grapple housing to prevent hydraulic lock up

## ADDITIONAL INFORMATION

- All tools are supplied with Viton O-rings and music wire springs. Other options available on request.
- Larger diameter, fluted Grapple Housings are available for large bore operations.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit no standard profiles and job specific applications.

The WellEnTech Internal Flow-Release (IFR) Pulling tool is a device for locating, engaging and pulling internal fishing neck profiles (Commonly referred to as GS profiles) or can be used to deploy tools and equipment down hole. The Grapple can be functioned either mechanically or hydraulically in order to engage the fishing neck and a strong spring ensures the grapple is fully supported when located within the fishing neck. Flow through the tool and a pull load disengages the tool from the profile.

## TECHNICAL SPECIFICATION

| F/N Size | OD (Inches) | Length (Inches) | Connection | Activation Pressure (psi) | Max Pull Load (lbs) | Tensile Strength (lbs) | Service | Assembly No. | Redress kit No. |
|---|---|---|---|---|---|---|---|---|---|
| 1-1/2" | 1.563 | 12.65 | 1"AMMT Box | 310 | 20,400 | 23,900 | H2S | 170-1563-A001 | 170-1563-R001 |
| | | | | | 28,800 | 32,800 | Std. | 170-1563-A002 | 170-1563-R002 |
| | 1.688 | 12.65 | 1"AMMT Box | 310 | 20,400 | 23,900 | H2S | 170-1688-A001 | 170-1688-R001 |
| | | | | | 28,800 | 32,800 | Std. | 170-1688-A002 | 170-1688-R002 |
| 2" | 1.750 | 14.41 | 1-1/4"AMMT Box | 220 | 40,000 | 40,300 | H2S | 170-1750-A001 | 170-1750-R001 |
| | | | | | 55,000 | 55,400 | Std. | 170-1750-A002 | 170-1750-R002 |
| 2-1/2" | 2.250 | 14.28 | 1-1/2"AMMT Box | 180 | 43,000 | 73,200 | H2S | 170-2250-A001 | 170-2250-R001 |
| | | | | | 59,100 | 100,600 | Std. | 170-2250-A002 | 170-2250-R002 |
| 3" | 2.875 | 16.84 | 2-3/8"PAC Box | 160 | 52,300 | 113,600 | H2S | 170-2875-A001 | 170-2875-R001 |
| | | | | | 71,900 | 156,200 | Std. | 170-2875-A002 | 170-2875-R002 |
| 3-1/2" | 3.000 | 17.18 | 2-3/8"PAC Box | 150 | 74,500 | 113,600 | H2S | 170-3000-A001 | 170-3000-R001 |
| | | | | | 102,400 | 156,200 | Std. | 170-3000-A002 | 170-3000-R002 |
| 4" | 3.625 | 19.56 | 2-3/8"PAC Box | 100 | 84,300 | 159,800 | H2S | 170-3625-A001 | 170-3625-R001 |
| | | | | | 115.900 | 219,700 | Std. | 170-3625-A002 | 170-3625-R002 |
| 5" | 4.500 | 20.08 | 2-3/8"PAC Box | 100 | 91,500 | 226,700 | H2S | 170-4500-A001 | 170-4500-R001 |
| | | | | | 125,800 | 311,700 | Std. | 170-4500-A002 | 170-4500-R002 |

## OPERATION

To mechanically function the tool, axial load (in excess of the spring force) enables the Grapple to automatically engage the fishing neck profile. Once inside the fishing neck the Spring pushes the Grapple back to the supported position on the Core and an over pull will verify engagement within the profile.

To release, fluid flow through a nozzle fitted to the nose of the Core creates an internal pressure which pumps the Grapple back to the de-supported position enabling the grapple to be pulled free from the profile. The pressure at which activation occurs is adjusted by simply changing out the nozzle orifice dia.

# C-TYPE OVERSHOT

## APPLICATION

- Catching and pulling slick OD fish

## FEATURES

- Mechanically operated
- High pull loads achievable
- Simple to assemble, redress and operate
- No redress required

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications. 2 Piece Pull Test Subs Come with an 8"dia plate as standard, unless otherwise specified.

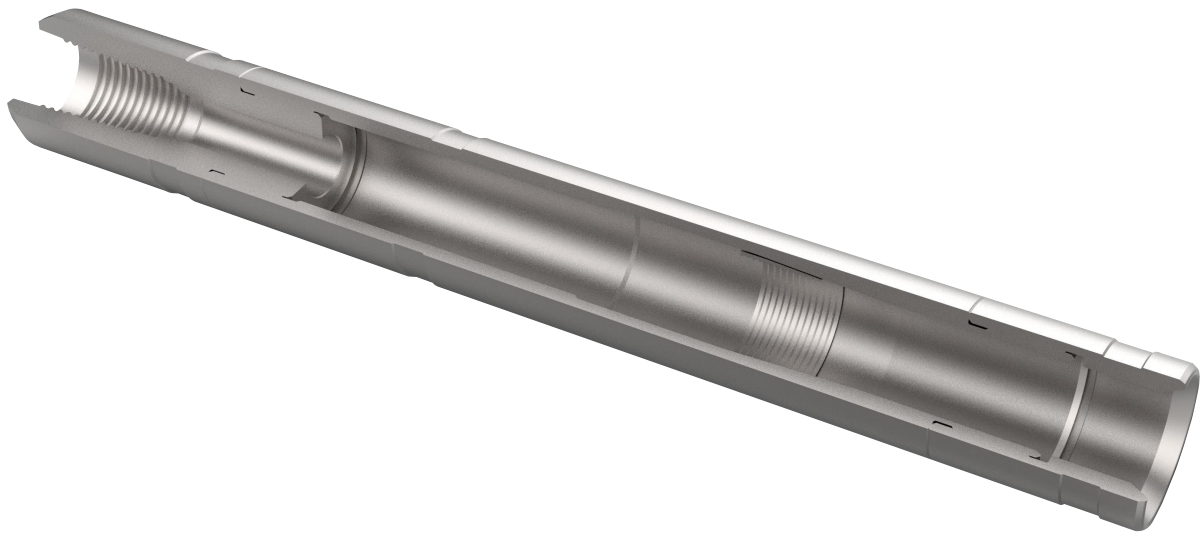
The WellEnTech C-Type Overshot is a fishing tool designed to engage slick OD fish. The cost effective design requires no flow or pressure to operate. It is a mechanically operated tool and is designed to provide a means of permanently engaging a fish enabling high pull loads and jarring forces to be applied directly to the stuck tool string or tubular to be retrieved from the well bore. Can be supplied with a thread down to suit a variety of guides e.g. plain end, cut lip or muleshoe etc.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|
| 8.00 | 7.00 | 1"AMMT Box | 62,400 | Std. | 050-1000-ST02 |
| | 7.00 | 1-1/4"AMMT Box | 105,400 | Std. | 050-1250-ST02 |
| | 7.00 | 1-1/2"AMMT Box | 116,500 | Std. | 050-1500-ST02 |
| | 10.00 | 2-3/8"PAC Box | 218,500 | Std. | 050-2375-ST02 |

## OPERATION

The WellEnTech C-Type Overshot is a mechanically operated tool. It is easily assembled and requires no flow or pressure to operate. The fish is fed through the bottom end of the tool and through the slip, the slip expands into the housing as the fish moves up into the bore. The slip allows the fish to slide up into the tool bore and grips the fish if pulled against the taper in the housing. The gradually tapering bore produces a uniform load area on the fish OD reducing the likely hood of collapsing the fish as a result of high pull loads.



# FLOW RELEASE OVERSHOT

## APPLICATION

- Standard fishing operations
- Heavy duty fishing operations
- Jetting and pick up operations

## FEATURES

- Flow activated
- Enclosed spring design
- Multi-function operation
- Fully adjustable activation pressure
- Easily redressed
- Compact and rugged design
- Interchangeable grapples

## ADDITIONAL INFORMATION

- All tools are supplied with Viton o-rings and music wire springs. Other options available on request.
- Larger diameter, fluted grapple housings are available for large bore operations.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit specific diameters and job specific applications

The WellEnTech Flow-Release Overshot is a device for locating, engaging and pulling slick tool OD's and tubulars. The grapple can be functioned either mechanically or hydraulically in order to engage the fish and a strong spring ensures the grapple is fully supported when located on the fish. Flow through the tool and a pull load disengages the tool from the fish.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Activation Pressure (psi) | Catch range (Inches) | Tensile Strength (lbs) | Service | Assembly No. | Redress kit No. |
|---|---|---|---|---|---|---|---|---|
| 1.750 | 18.75 | 1-1/4"AMMT Box | 250 | 0.438 to 1.250 | 62,000 | H2S | 190-1750-A001 | 190-1750-R001 |
| | | | | | 45,300 | Std. | 190-1750-A002 | 190-1750-R002 |
| 2.250 | 19.50 | 1-1/2"AMMT Box | 250 | 1.250 to 1.750 | 66,000 | H2S | 190-2250-A001 | 190-2250-R001 |
| | | | | | 48,000 | Std. | 190-2250-A002 | 190-2250-R002 |
| 2.875 | 21.00 | 2-3/8"PAC Box | 150 | 1.500 to 2.250 | 110,100 | H2S | 190-2875-A001 | 190-2875-R001 |
| | | | | | 81,000 | Std. | 190-2875-A002 | 190-2875-R002 |
| 3.500 | 24 | 2-3/8"PAC Box | 150 | 1.500 to 2.500 | 118,000 | H2S | 190-3500-A001 | 190-3500-R001 |
| | | | | | 85,900 | Std. | 190-3500-A002 | 190-3500-R002 |
| 4.000 | 24.00 | 2-3/8"PAC Box | 100 | 2.000 to 3.125 | 263,600 | H2S | 190-4000-A001 | 190-4000-R001 |
| | | | | | 191,700 | Std. | 190-4000-A002 | 190-4000-R002 |
| 4.750 | 24.00 | 2-3/8"PAC Box | 100 | 2.875 to 3.625 | 263,600 | H2S | 190-4750-A001 | 190-4750-R001 |
| | | | | | 191,700 | Std. | 190-4750-A002 | 190-4750-R002 |

## OPERATION

To mechanically function the tool, an axial downward load (in excess of the spring force) enables the grapple to automatically engage the fish. The spring then pushes the grapple back to the supported position, and an applied axial load causes the grapple to bite into the fish, this over pull will verify engagement with the fish.

To release, fluid flow through a nozzle fitted to the nose of the stem creates an internal pressure which pumps the grapple back to the de-supported position enabling the grapple to be pulled free from the fish. The pressure at which activation occurs is adjusted by simply changing out the nozzle orifice dia.

# FLOW RELEASE SPEAR

## APPLICATIONS

- Standard fishing operations
- Heavy duty fishing operations
- Jetting and pick up operations

## FEATURES

- Flow activated
- Enclosed Spring design
- Multi-function operation
- Fully adjustable activation pressure
- Easily redressed
- Compact and rugged design
- Interchangeable Grapples

## ADDITIONAL INFORMATION

- All tools are supplied with Viton O-rings and music wire Springs. Other options available on request.
- Larger diameter, fluted Grapple housings are available for large bore operations.
- Interchangeable Grapples enable each tool size to catch a large range diameters.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit specific diameters and job specific applications

The WellEnTech Flow-Release Spear is a device for locating, engaging and pulling slick tool ID's and tubulars. The Grapple can be functioned either mechanically or hydraulically in order to engage the fish and a strong Spring ensures the Grapple is fully supported when located inside the fish. Flow through the tool and a pull load disengages the tool from the fish.

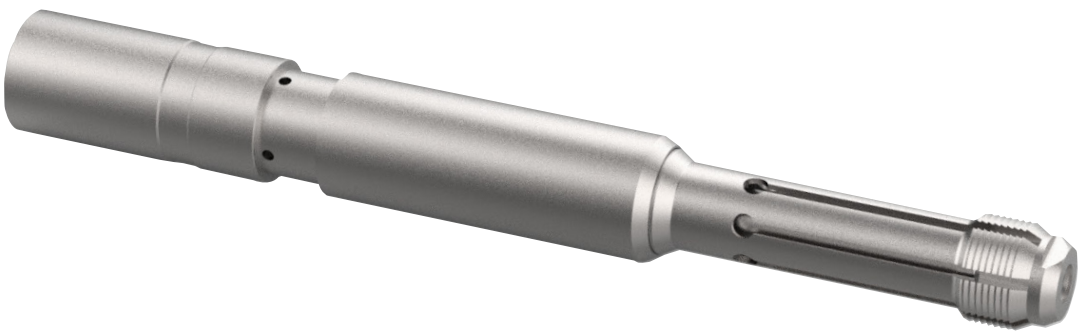
## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Catch range (Inches) | Tensile Strength (lbs) | Service | Assembly No. | Redress kit No. |
|---|---|---|---|---|---|---|---|
| 1.750 | 17.82 | 1-1/4"AMMT Box | 1.000 to 1.625 | 15,400 | H2S | 185-1750-A001 | 185-1750-R001 |
| | | | | 21,170 | Std. | 185-1750-A002 | 185-1750-R002 |
| 2.000 | 17.34 | 1-1/4"AMMT Box | 1.390 to 1.938 | 45,800 | H2S | 185-2000-A001 | 185-2000-R001 |
| | | | | 63,000 | Std. | 185-2000-A002 | 185-2000-R002 |
| 2.375 | 17.50 | 1-1/2"AMMT Box | 1.813 to 2.500 | 61,700 | H2S | 185-2375-A001 | 185-2375-R001 |
| | | | | 84,800 | Std. | 185-2375-A002 | 185-2375-R002 |
| 2.875 | 21.30 | 2-3/8"PAC Box | 1.968 to 2.750 | 87,200 | H2S | 185-2875-A001 | 185-2875-R001 |
| | | | | 120,00 | Std. | 185-2875-A002 | 185-2875-R002 |
| 3.125 | 24.00 | 2-3/8"PAC Box | 2.250 to 3.000 | 97,800 | H2S | 185-3125-A001 | 185-3125-R001 |
| | | | | 134,500 | Std. | 185-3125-A002 | 185-3125-R002 |
| 4.250 | 25.25 | 2-3/8"PAC Box | 3.188 to 4.125 | 120,100 | H2S | 185-4250-A001 | 185-4250-R001 |
| | | | | 165,000 | Std. | 185-4250-A002 | 185-4250-R002 |
| 5.500 | 31.00 | 2-3/8"PAC Box | 4.813 to 5.500 | 218,500 | H2S | 185-5500-A001 | 185-5500-R001 |
| | | | | 300,400 | Std. | 185-5500-A002 | 185-5500-R002 |

## OPERATION

To mechanically function the tool, an axial downward load (in excess of the Spring force) enables the Grapple to automatically engage the fish. The Spring then pushes the Grapple back to the supported position, and an applied axial load causes the Grapple to bite into the fish, this over pull will verify engagement.

To release, fluid flow through a Nozzle fitted to the nose of the Core creates an internal pressure which pumps the Grapple back to the de-supported position enabling the Grapple to be pulled free from the fish. The pressure at which activation occurs is adjusted by simply changing out the Nozzle orifice dia.



# HEAVY DUTY DISCONNECT

## APPLICATIONS

- Fishing operations
- Milling, cutting and underreaming operations
- Debris circulation
- Impact Hammer and Heavy Duty Jarring

## FEATURES

- Short, robust design
- High torsional and tensile yield
- Debris tolerant
- Fully adjustable release value
- Burst disc
- Easy to assemble and redress

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- A range of ball seat sizes are also available.

The WellEnTech Heavy Duty Disconnect is designed to be as short as possible without compromising on functionality or strength. It enables a tool string to detach at a predetermined point via the deployment of a suitable drop ball through the coiled tubing.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connections | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|
| 1.688 | 14.75 | 1”AMMT | 37,500 | H2S | 105-1688-A001 |
| | | | 56,000 | Std. | 105-1688-A002 |
| 1.750 | 14.75 | 1-1/4”AMMT | 37,500 | H2S | 105-1750-A001 |
| | | | 56,000 | Std. | 105-1750-A002 |
| 2.125 | 16.50 | 1-1/2”AMMT | 63,000 | H2S | 105-2125-A001 |
| | | | 96,000 | Std. | 105-2125-A002 |
| 2.875 | 19.75 | 2-3/8”PAC | 130,000 | H2S | 105-2875-A001 |
| | | | 200,000 | Std. | 105-2875-A002 |
| 3.125 | 20.25 | 2-3/8”PAC | 130,000 | H2S | 105-3125-A001 |
| | | | 200,000 | Std. | 105-2875-A002 |

## OPERATION

The WellEnTech Heavy Duty Disconnect is assembled without the need for any special tools. There are castellation’s in the tool which permit torque transmission. There is a rupture disc (available with a range of rupture pressures) which provides a flow path should a loss of circulation occur. To function the tool a drop ball locates on the release ball seat, applied pressure shears the shear screws, allowing the release piston to move and disconnect the tool. The release piston forces the tool apart without having to apply any axial load. Large flow bypass ports are opened up and circulation is immediately returned to the tool string, providing a surface indication of a positive disconnect. The release piston and drop ball are returned to surface leaving a standard 'GS' internal fishing neck for retrieval purposes.

# LEAD IMPRESSION BLOCK

## APPLICATION

- Obtaining impressions of fish or downhole components
- Debris circulation

## FEATURES

- Short robust construction
- No moving parts
- Multiple flow ports
- Low maintenance design
- Can be redressed after use

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech Lead Impression Block, often referred to as an LIB, is used for obtaining impression details of a fish or component within a well bore. The ports permit circulation while running in and out of hole as well as enable circulation of debris away from the target fish.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|
| 1.688 | 6.00 | 1”AMMT Box | 62,400 | Std. | 412-1688-ST01 |
| | | | 45,400 | H2S | 412-1688-SH01 |
| 1.750 | 6.00 | 1”AMMT Box | 62,400 | Std. | 412-1750-ST01 |
| | | | 45,400 | H2S | 412-1750-SH01 |
| 2.000 | 6.00 | 1-1/2”AMMT Box | 116,500 | Std. | 412-2000-ST01 |
| | | | 84,700 | H2S | 412-2000-SH01 |
| 2.125 | 6.00 | 1-1/2”AMMT Box | 116,500 | Std. | 412-2125-ST01 |
| | | | 84,700 | H2S | 412-2125-SH01 |
| 2.500 | 6.00 | 1-1/2”AMMT Box | 116,500 | Std. | 412-2500-ST01 |
| | | | 84,700 | H2S | 412-2500-SH01 |
| 2.875 | 8.00 | 2-3/8”PAC Box | 218,500 | Std. | 412-2875-ST01 |
| | | | 158,900 | H2S | 412-2875-SH01 |

## OPERATION

The Lead Impression Block is fitted to the bottom of a BHA. It is made up to the tool string with the correct amount of applied torque, as per the threaded connection on the tool. The tool is then run in hole and the ports enable circulation. Once at target depth, the flow rate can be increased to circulate debris away from the fish. The tool is then run into the fish with either a single jar impact or set down weight, which leaves an indentation on the face of the LIB, which can then be looked at and interpreted when the tool is retrieved to surface.

# PORTED MAGNET SUB

## APPLICATIONS

- Fishing of ferrous metallic components
- Debris circulation

## FEATURES

- Short robust construction
- No moving parts
- Multiple flow ports
- Low maintenance design
- Shrouded magnet design

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech Ported Magnet sub is used for fishing small magnetic components from a well bore. The ports permit circulation while running in and out of hole as well as enable circulation of debris away from the target fish. The magnet is surrounded by nonmagnetic retaining components which assist with deployment, only the end face is exposed directing the magnetic field where it is needed.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Tensile Strength (lbs) | Service | Part No. |
|---|---|---|---|---|---|
| 1.688 | 8.00 | 1”AMMT Box | 62,400 | Std. | 446-1688-A001 |
| | | | 45,400 | H2S | 446-1688-A002 |
| 1.750 | 8.00 | 1”AMMT Box | 62,400 | Std. | 446-1750-A001 |
| | | | 45,400 | H2S | 446-1750-A002 |
| 2.125 | 9.50 | 1-1/2”AMMT Box | 116,500 | Std. | 446-2125-A001 |
| | | | 84,700 | H2S | 446-2125-A002 |
| 2.250 | 9.50 | 1-1/2”AMMT Box | 116,500 | Std. | 446-2250-A001 |
| | | | 84,700 | H2S | 446-2250-A002 |
| 2.875 | 12.00 | 2-3/8”PAC Box | 218,500 | Std. | 446-2875-A001 |
| | | | 158,900 | H2S | 446-2875-A002 |

## OPERATION

The Ported Magnet sub is fitted to the bottom of a BHA. It is made up to the tool string with the correct amount of applied torque, as per the threaded connection on the tool. The tool is then run in hole and the ports enable circulation. Once at depth, the flow rate can be increased to circulate debris away from the fish, allowing it to be collected by the magnet and retrieved to surface.

# SLIMLINE XFR PULLING TOOL

## APPLICATION

- Standard fishing operations
- Fishing operations with well bore restrictions
- Jetting and pick up operations

## FEATURES

- Slimline design
- Flow activated
- Enclosed Spring
- Multi-function operation
- Fully adjustable activation pressure
- Easily redressed
- Interchangeable Grapples

## ADDITIONAL INFORMATION

- All tools are supplied with Viton O-rings and music wire Springs. Other options available on request.
- Larger diameter, fluted Grapple housings are available for large bore operations.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit specific diameters and job specific applications

The WellEnTech Slimline eXternal Flow-Release (XFR) Pulling Tool is a device for locating, engaging and retrieving tools with standard external fishing necks where restrictions in the well bore prevent standard XFR access. The Grapple can be functioned either mechanically or hydraulically in order to engage the fish and a strong spring ensures the Grapple is fully supported when located on the fish. Flow through the tool and a pull load disengages the tool from the fish.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Activation Pressure (psi) | Nominal External Fishing Neck Size | Tensile Strength (lbs) | Service | Assembly No. | Redress kit No. |
|---|---|---|---|---|---|---|---|---|
| 2.18 | 11.80 | 1-1/2"AMMT Box | 150 | 1.750 | 37,100 | Std. | 173-2180-A001 | 173-2180-R001 |
| | | | | | 27,000 | H2S | 173-2180-A002 | 173-2180-R002 |
| 2.720 | 11.80 | 1-1/2"AMMT Box | 150 | 2.312 | 42,600 | Std. | 173-2720-A001 | 173-2720-R001 |
| | | | | | 31,000 | H2S | 173-2720-A002 | 173-2720-R002 |
| 3.115 | 15.13 | 1-1/2"AMMT Box | 100 | 2.750 | 55,100 | Std. | 173-3115-A001 | 173-3115-R001 |
| | | | | | 40,100 | H2S | 173-3115-A002 | 173-3115-R002 |
| 3.600 | 15.31 | 2-3/8"PAC Box | 100 | 3.125 | 71,700 | Std. | 173-3600-A001 | 173-3600-R001 |
| | | | | | 52,200 | H2S | 173-3600-A002 | 173-3600-R002 |

## OPERATION

To mechanically function the tool, an axial downward load (in excess of the spring force) enables the Grapple to automatically engage the fish. The Spring then pushes the Grapple back to the supported position and an applied axial load causes the Grapple to become supported by the Main Body. This over pull will verify engagement with the fish.

To release, fluid flow through a Nozzle fitted to the nose of the stem creates an internal pressure which pumps the Grapple back to the de-supported position enabling the Grapple to be pulled free from the fish. The pressure at which activation occurs is adjusted by simply changing out the Nozzle orifice dia.

# STRAIGHT PULL DISCONNECT

## APPLICATION

- Milling operations
- Clean out runs
- Fishing applications
- Baiting operations

## FEATURES

- Short, compact design
- Adjustable shear load
- Torque thru' design
- Standard internal fishing neck
- Debris tolerant
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech Straight Pull Disconnect provides a cost effective means of disconnecting from a stuck tool String. No flow or drop ball is required in order to function the tool. The tool can transmit torque, via anti-rotation lugs, the tool is also furnished with Shear Screws and when sheared, reveals a standard internal fishing neck looking up hole to facilitate future fishing operations.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | ID (Inches) | Connections | Internal GS Size | Service | Part No. |
|---|---|---|---|---|---|---|
| 1.688 | 8.00 | 0.56 | 1"AMMT | 1-1/2" | H2S. | 108-1688-A001 |
| | | | | | Std. | 108-1688-A002 |
| 1.750 | 8.00 | 0.56 | 1-1/4"AMMT | 1-1/2" | H2S. | 108-1750-A001 |
| | | | | | Std. | 108-1750-A002 |
| 2.125 | 9.50 | 0.75 | 1-1/2"AMMT | 2" | H2S. | 108-2125-A001 |
| | | | | | Std. | 108-2125-A002 |
| 2.875 | 12.00 | 1.38 | 2-3/8"PAC | 3" | H2S. | 108-2875-A001 |
| | | | | | Std. | 108-2875-A002 |

## OPERATION

The WellEnTech Straight Pull Disconnect is ideal for operations where the use of a pressure-release disconnect or drop ball-actuated components is not possible. The Tool release load is determined at surface prior to running in hole and is easily adjusted by installing the required amount of calibrated shear screws. The Tool is made up as part of the BHA and run in hole. Should disconnection be required, a pull load in excess of the shear load of the screws will retrieve the upper half of the Straight Pull Disconnect, leaving the lower half in the hole. The standard internal fishing neck can then be engaged with a pulling tool in order to retrieve the lower half of the BHA during subsequent fishing/jarring operations.

# XFR PULLING TOOL

## APPLICATIONS

- Standard fishing operations
- Heavy duty fishing operations
- Jetting and pick up operations

## FEATURES

- Flow activated
- Enclosed Spring design
- Multi-function operation
- Fully adjustable activation pressure
- Easily redressed
- Compact and rugged design
- Interchangeable Grapples

## ADDITIONAL INFORMATION

- All tools are supplied with Viton O-rings and music wire Springs. Other options available on request.
- Larger diameter, fluted Grapple housings are available for large bore operations.
- Interchangeable Grapples enable each tool size to catch a range of fishing necks.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit specific diameters and job specific applications

The WellEnTech eXternal Flow-Release (XFR) Pulling Tool is a device for locating, engaging and retrieving tools with standard external fishing necks. The Grapple can be functioned either mechanically or hydraulically in order to engage the fish and a strong spring ensures the Grapple is fully supported when located on the fish. Flow through the tool and a pull load disengages the tool from the fish.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | Activation Pressure (psi) | Nominal External Fishing Neck Size | Tensile Strength (lbs) | Service | Assembly No. | Redress kit No. |
|---|---|---|---|---|---|---|---|---|
| 1.625 | 11.80 | 1"AMMT Box | 250 | 1.000 & 1.188 | 37,600 | Std. | 172-1625-A001 | 172-1625-R001 |
| | | | | | 27,400 | H2S | 172-1625-A002 | 172-1625-R002 |
| 1.813 | 11.80 | 1"AMMT Box | 150 | 1.000, 1.188 & 1.375 | 43,000 | Std. | 172-1813-A001 | 172-1813-R001 |
| | | | | | 31,300 | H2S | 172-1813-A002 | 172-1813-R002 |
| 2.00 | 11.80 | 1-1/2"AMMT Box | 150 | 1.000, 1.188 & 1.375 | 80,900 | Std. | 172-2000-A001 | 172-2000-R001 |
| | | | | | 58,900 | H2S | 172-2000-A002 | 172-2000-R002 |
| 2.125 | 11.80 | 1-1/2"AMMT Box | 150 | 1.000, 1.188 & 1.375 | 80,900 | Std. | 172-2125-A001 | 172-2125-R001 |
| | | | | | 58,900 | H2S | 172-2125-A002 | 172-2125-R002 |
| 2.500 | 15.13 | 1-1/2"AMMT Box | 100 | 1.375 & 1.750 | 108,500 | Std. | 172-2500-A001 | 172-2500-R001 |
| | | | | | 78,900 | H2S | 172-2500-A002 | 172-2500-R002 |
| 3.000 | 15.31 | 2-3/8"PAC Box | 100 | 2.313 | 91,900 | Std. | 172-3000-A001 | 172-3000-R001 |
| | | | | | 66,900 | H2S | 172-3000-A002 | 172-3000-R002 |

## OPERATION

To mechanically function the tool, an axial downward load (in excess of the spring force) enables the Grapple to automatically engage the fish. The Spring then pushes the Grapple back to the supported position and an applied axial load causes the Grapple to become supported by the Main Body. This over pull will verify engagement with the fish.

To release, fluid flow through a Nozzle fitted to the nose of the stem creates an internal pressure which pumps the Grapple back to the de-supported position enabling the Grapple to be pulled free from the fish. The pressure at which activation occurs is adjusted by simply changing out the Nozzle orifice dia.

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# ROTATING TOOLS

# CDC™ HYDRAULIC ANCHOR

## APPLICATIONS

- General Anchoring applications
- As part of a Tubing severance operation
- Abrasive perforating operations

The WellEnTech CDC™ Hydraulic Anchor is used for various downhole operations where there is a requirement for anchoring a tool string centrally within a wellbore. It is a high expansion device and has an uninterrupted through bore. It can be deployed on either Jointed Pipe or on Coiled Tubing. The tool has three blades which provide stability during operation. The large internal piston ensures maximum load is applied to the blades throughout the operation and a powerful spring pulls the blades back into the body when flow is stopped. The unique blade design enables it to grip inside a range of diameters.

## FEATURES

- Short, compact design.
- High expansion, triple blade arrangement.
- Through bore
- Blades and nozzles are easily removed and replaced.
- Reusable blades.
- Assembled/dis-assembled using standard hand tools.
- Field redressable.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connections | To suit tubulars | Service | Part No. |
|---|---|---|---|---|---|
| 1.688 | 13.38 | 1”AMMT | 2-3/8” to 4” | Universal | 210-1688-A001 |
| 2.125 | 18.75 | 1-1/2”AMMT | 3-1/2” to 4-1/2” | Universal | 210-2125-A001 |
| 2.875 | 24.00 | 2-3/8”PAC | 4” to 7” | Universal | 210-2875-A001 |

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.

## OPERATION

The WellEnTech CDC™ Hydraulic Anchor is generally run above a motor during tubing cut operations but can also be run on Jointed Pipe or on Coiled Tubing operations where anchoring and centralisation is required. Flow down through the tool and out through the internal nozzle creates a pressure within the tool which acts against the piston. As the piston moves up within the tool, milled pockets which surround the blades push against them resulting in the blades pivoting about the hinge pins. When fully open, the blades are fully supported against a stop shoulder and wedge. When the operation is completed and flow is stopped, a spring within the tool returns the piston which simultaneously retracts the blades.

# CDC™ UNDEREAMER

## APPLICATION

- Underreaming
- Wellbore cleanup operations
- Anchoring

## FEATURES

- Short, compact design.
- Triple blade arrangement.
- Through bore
- Blades and nozzles are easily removed and replaced.
- Blades can be redressed and reused.
- Assembled/dis-assembled using standard hand tools.
- Field redressable.

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.

The WellEnTech CDC™ Underreamer is suitable for various downhole operations. It is a high expansion device and has an uninterrupted through bore. Depending on which blades the tool is dressed with will determine what OD the reamer will open out to. It can be deployed on either jointed pipe with a top drive or on coiled tubing with a PDM motor. The tool has three cutting blades which provide stability during operation. The large internal piston ensures maximum load is applied to the blades throughout the operation and a powerful spring pulls the blades back into the body when flow is stopped. Interchangeable blades provide a range of reaming diameters.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connections | To suit tubulars | Service | Part No. |
|---|---|---|---|---|---|
| 1.688 | 13.38 | 1”AMMT | 2-3/8” to 4-1/2” | Universal | 220-1688-A001 |
| 2.125 | 18.75 | 1-1/2”AMMT | 3-1/2” to 5-1/2” | Universal | 220-2125-A001 |
| 2.375 | 24.63 | 1-1/2”AMMT | 4” to 7-5/8” | Universal | 220-2875-A001 |
| 2.875 | 24.00 | 2-3/8”PAC | 4” to 7-5/8” | Universal | 220-2875-A001 |
| 3.125 | 27.50 | 2-3/8”PAC | 4-1/2” to 8-3/4” | Universal | 220-3125-A001 |
| 3.500 | 30.00 | 2-3/8”PAC | 4-1/2” to 10-3/4” | Universal | 220-3500-A001 |

## OPERATION

The CDC™ Undereamer is generally run on a BHA below a motor but can also be run on jointed pipe. Flow down through the tool and out through the internal nozzle creates a pressure within the tool which acts against the piston. As the piston moves up within the tool, milled pockets which surround the blade pushes against them resulting in them pivoting about hinge pins. When fully open the blade is fully supported against a stop shoulder and wedge. When the operation is completed and flow is stopped, a spring within the tool returns the piston which simultaneously retracts the blades.

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# DRILLTECH™ PDM

## FEATURES

- Pumped Fluid Lubricated Bearing Pack
- High Strength Forged Alloy Steel Output Shaft
- Through hardened thrust bearing races
- Carbide clad upper and lower radial bearings
- Super Strong jaw clutch drive couplings
- Field Proven power Sections
- Crossover sub (top sub)

## OPTIONAL FEATURES

- Float Bored top subs
- Flex shaft drive coupling for straight motor applications
- Rotor catch
- Flow bypass rotor nozzle

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard.
- Other tool joints also available.

WellEnTech DrillTech™ PDM's (Positive Displacement Motors) are designed with the primary focus on reliability and simplicity in design. This results in an extremely tough and versatile PDM, which offers the performance necessary for a variety of drilling applications. It also makes the DrillTech™ PDM one of the easiest to build, maintain and repair. All motor components are engineered with detail in mind and manufactured to exacting standards with only the highest quality materials. DrillTech™ PDM's are available in sizes ranging from 1 11/16" to 3-1/2" diameters. DrillTech™ PDM's are lubricated with the pumped fluid which means that a portion of the drilling fluid flows through the bearing stack to cool and lubricate the bearings. A "sleeve on sleeve" upper radial bearing provides support and controls the flow of fluid through the bearing stack.

The DrillTech™ PDM bearing pack features multiple tiers of super hardened thrust bearing races. This along with rock bit ball bearings, provide the endurance necessary for long grueling motor runs. A lower mandrel catch is standard in all motor sizes. This catch prevents the bit from being lost in the hole, in the event of a mandrel shaft failure. The DrillTech™ PDM uses a patented transmission coupling, which is the industry standard for flexible torque transmission in downhole motors. It has a long history of downhole use and has proven itself to be reliable and economical.

Our high performance power sections are designed to not only meet, but exceed your requirements. The elastomers are selected for stability and resistance to swell in the most common drilling fluids.

## TECHNICAL SPECIFICATION

| Motor Size | 1-11/16 | 2-1/8 | 2-7/8 | 3-1/8 |
|---|---|---|---|---|
| Rec. Hole Size (In) | 1-13/16" – 3" | 2-5/8" – 3-1/4" | 3-1/2" – 4-3/4" | 4-3/4" – 5-7/8" |
| Std. Bit Box Connection | 1"AMMT | 1-1/2"AMMT | 2-3/8"PAC | 2-7/8"PAC |
| Std. Top Box Connection | 1"AMMT | 1-1/2"AMMT | 2-3/8"PAC | 2-7/8"PAC |
| Max. WOB Operating (lbs) | 5,600 | 9,700 | 10,400 | 14,000 |
| Max. Continuous WOB (lbs) | 2,800 | 4,850 | 5,200 | 7,000 |
| Max. Bit Pull (lbs) | 30,000 | 39,000 | 70,000 | 130,000 |
| Max. Body Pull (lbs) | 45,500 | 90,000 | 165,000 | 190,000 |
| Flow Rate (GPM) | 25-55 | 20-50 | 50-125 | 100-175 |
| Speed (RPM) | 280-610 | 260-640 | 140-340 | 230-390 |
| Lobe configuration | 5/6 | 5/6 | 7/8 | 5/6 |
| No. of Stages | 4.4 | 6 | 3 | 3.5 |
| Operational Torque (ft.lbs) | 280 | 320 | 770 | 1,070 |
| Approx. length | 8ft | 10ft | 13ft | 15ft |
| Part No. | 290-1688-A001 | 290-2125-A001 | 290-2875-A001 | 290-3125-A001 |

# HYDRAULIC PIPE CUTTER

## APPLICATIONS

- Pipe Cutting
- Packer mandrel cutting operations
- Tubular severance

## FEATURES

- Short, robust design.
- Triple Knife arrangement.
- Knives and nozzles are easily removed and replaced.
- Knives can be redressed and reused.
- Assembled/dis-assembled using standard hand tools.
- Field redressable.

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech Hydraulic Pipe Cutter is a device for severing tubulars downhole. It can be deployed on either jointed pipe with a top drive or on coiled tubing below a PDM motor. The tool has three cutting knives which provide stability during operation, each of which is dressed with premium machine tool inserts which are designed to cut material cleanly and efficiently. The dual piston design ensures maximum load is applied to the blades throughout the operation. Interchangeable nozzles generate the required pressure to activate the cutter and are angled in such a way as to direct flow back up-towards the knives.

## TECHNICAL SPECIFICATION

| OD (Inches) | Length (Inches) | Connection | To cut tubulars | Service | Part No. |
|---|---|---|---|---|---|
| 1.688 | 21.50 | 1”AMMT | 2-3/8” to 4” | Universal | 200-1688-A001 |
| 2.125 | 24.75 | 1-1/2”AMMT | 3-1/2” to 4-1/2” | Universal | 200-2125-A001 |
| 2.875 | 33.00 | 2-3/8”PAC | 4” to 5-1/2” | Universal | 200-2875-A001 |

## OPERATION

The Pipe Cutter is generally run on a BHA below a motor but can also be run on jointed pipe. Flow down through the tool and out through the nozzles creates a pressure within the tool which acts against the dual piston arrangement. As these pistons move up within the tool, a cam pushes against the knives which pivot about hinge pins. When the cut is completed and flow is stopped, a spring within the tool returns the pistons to their start position.

# JUNK MILLS

## APPLICATIONS

- General Junk Milling operations
- Ball Valve removal
- Bore enlargement/clean out
- Flapper check valve milling
- Plug removal

## FEATURES

- One piece Body
- Various Diameters available
- Tungsten Carbide Inserts and/or Crushed Carbide
- Other Matrix available on request
- Flow ports at cutting face
- Tool joint or service connections

## ADDITIONAL INFORMATION

- Typical example configurations shown above.
- Mill Bodies are AISI 4140 HT steel as standard.
- Bespoke designs available to suit job specific applications
- Other threaded connections and OD's available on request.

The WellEnTech Junk Mills come in a wide variety of designs and configurations. The Mills are dressed with either Tungsten Carbide Inserts, Crushed Carbide Matrix, a combination of both or Diamond Impregnated matrix. Available as Flat Bottomed (shown below), Concave, Convex. Taper Stage or Bull nose, the Junk Mills can also be supplied as a blank body design or with integral blades (shown below). The Junk Mills are suitable for milling a range of materials and WellEnTech have extensive experience of designing mills and milling operations, providing the most suitable mill for a particular application.

## OPERATION

The Junk Mill can be run on either jointed pipe or below a Downhole Motor. Circulation ports permit pumped fluids to exit the Mill at the cutting face and flutes on the body OD allow cuttings to be circulated up past the mill. Dressing on the Mill gauge diameter ensure the mill remains central preventing the mill damaging casing.

## TECHNICAL SPECIFICATION

| Thread | Shank Dia | OD | Mill Types |
|---|---|---|---|
| 1"AMMT | 1.563" | 2.00 | Flat Bottomed<br>Concave<br>Convex<br>Taper<br>Bull Nose<br>Diamond Matrix<br>Stage Mills |
| | | 2.25 | |
| | | 2.50 | |
| | | 2.75 | |
| | | 3.00 | |
| 1-1/4"AMMT | 1.750" | 2.25 | |
| | | 2.50 | |
| | | 2.75 | |
| | | 3.00 | |
| | | 3.25 | |
| 1-1/2"AMMT | 2.000" | 2.50 | |
| | | 2.75 | |
| | | 3.00 | |
| | | 3.25 | |
| | | 3.50 | |
| 2-3/8"PAC | 2.875" | 3.5 | |
| | | 3.75 | |
| | | 4.00 | |
| | | 4.25 | |
| | | 4.50 | |

# STRING MILLS

## APPLICATIONS

- Wellbore clean out
- Casing/Liner repair
- Extending whipstock windows
- Eliminating key seats and doglegs

## FEATURES

- One Piece Body
- Robust Construction
- Spiral Blades
- Large cutting area

## ADDITIONAL INFORMATION

- Typical example configurations shown above.
- Mill Bodies are AISI 4140 HT steel as standard.
- Bespoke designs available to suit job specific applications
- Other threaded connections and OD's available on request.

WellEnTech String Mills, sometimes referred to as Watermelon mills, are designed to mill through collapsed casing and liners, eliminating key seats and doglegs, and extending whipstock windows. The blades on the mill are tapered top and bottom to allow reaming both up and down. A connection on the bottom allows a stinger to be run below the mill to keep it centred which prevents cutting out of the casing or sidetracking. String mills are often run piggyback with a tapered mill as a pilot.

## TECHNICAL SPECIFICATION

| Thread (API REG) | Fishing Neck | | Dressed OD | Overall Length |
|---|---|---|---|---|
| | Diameter | Length | | |
| 2-3/8" | 3-1/8" | 18" | 3-1/4" – 4-1/2" | 48" |
| 2-7/8" | 3-3/4" | 18" | 4-1/2" – 5-1/2" | 48" |
| 3-1/2" | 4-1/4" | 18" | 5-1/2" – 5-5/8" | 48" |
| 3-1/2" | 4-3/4" | 18" | 5-3/4" – 7-1/2" | 48" |
| 4-1/2" | 5-3/4" | 18" | 7-1/2" – 9.00" | 60" |
| 6-5/8" | 7-3/4" | 24" | 9-1/2" – 12-1/4" | 88" |
| 6-5/8" – 7-5/8" | 7 3/4", 9 1/2" | 24" | 13.00" – 15.00" | 88" |
| 7-5/8" – 7-7/8" | 8 3/4", 9 1/2" | 24" | 17.00" – 17-1/2" | 88" |
| 8-5/8" | 9 3/4", 9 1/2" | 30" | 18-1/2" – 26.00" | 96" |

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# WASHOVER SHOE

## APPLICATION

- General clean out operations
- Ball Valve removal
- Bore enlargement/clean out
- Flapper check valve milling
- Plug removal

## FEATURES

- One or two piece Body
- Various Diameters available
- Tungsten Carbide Inserts and/or Crushed Carbide
- Other Matrix available on request
- Flow ports for circulation
- Box or Pin thread connections

## ADDITIONAL INFORMATION

- Typical example configurations shown above.
- Mill Bodies are AISI 4140 HT steel as standard.
- Bespoke designs available to suit job specific applications
- Other threaded connections and OD's available on request.

The WellEnTech Washover Shoes come in a wide variety of designs and configurations. The Mills are dressed with either Tungsten Carbide Inserts, Crushed Carbide Matrix, a combination of both or Diamond Impregnated matrix. Available as Flat Bottomed or a wave profile the Washover shoe can be supplied as one piece or with a drive sub. The Washover Shoes are suitable for milling a range of materials and WellEnTech have extensive experience of designing shoes and milling operations, providing the most suitable Washover Shoe for a particular application.

## OPERATION

The Washover Shoe can be run on either jointed pipe or below a Downhole Motor. Circulation ports permit pumped fluids to exit the Washover Shoe bore and, wall thickness permitting, external flutes allow cuttings to be circulated up past the tool OD. Dressing on the Washover Shoe gauge diameter ensures it remains central preventing damage to the casing.

## TECHNICAL SPECIFICATION

| Thread | Shank Dia | OD |
|---|---|---|
| 1"AMMT | 1.563" | 2.00 |
| | | 2.25 |
| | | 2.50 |
| | | 2.75 |
| | | 3.00 |
| 1-1/4"AMMT | 1.750" | 2.25 |
| | | 2.50 |
| | | 2.75 |
| | | 3.00 |
| | | 3.25 |
| 1-1/2"AMMT | 2.125" | 2.50 |
| | | 2.75 |
| | | 3.00 |
| | | 3.25 |
| | | 3.50 |
| 2-3/8"PAC | 2.875" | 3.5 |
| | | 3.75 |
| | | 4.00 |
| | | 4.25 |
| | | 4.50 |

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# DRILLING TOOLS

# ARCTECH™ CASING EXIT SYSTEM

## APPLICATION

- Sidetracks
- Multilaterals

## FEATURES

- Single Trip Design
- Fully Retrievable
- Short, robust construction
- System & Mill Head Design eliminates need for knock off plugs & maximises dressed area
- Number of Flow Ports on Mill Head are not restricted
- No internal Burst Disc required
- Retrieval Hook slot in whip face
- Suitable for Hydraulic or Mechanical Setting
- High torsional and tensile yield
- Fully adjustable setting and shear values
- Easy to assemble and redress

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Shear Values are adjustable
- Alternative concave angles available to suit dog leg requirements
- Hook retrieval tools, Die Collars and Deflectors are also available from WellEnTech

The WellEnTech ARCtech™ Casing Exit System is a Single Trip System that can be hydraulically or mechanically set. The unique patented design minimises the length of a conventional system by combining tools that are normally run in conjunction, into a single assembly, without compromising on functionality or strength.

The Wrapped Mill and Multi-Ramp are designed to complement each other for flexibility, ease of shear out, Mill starting and centre point elimination. This design delivers a smooth exit and beyond into the new wellbore. The system enables 360 degree exit capability making it an ideal solution to a variety of casing exit scenarios.

## TECHNICAL SPECIFICATION

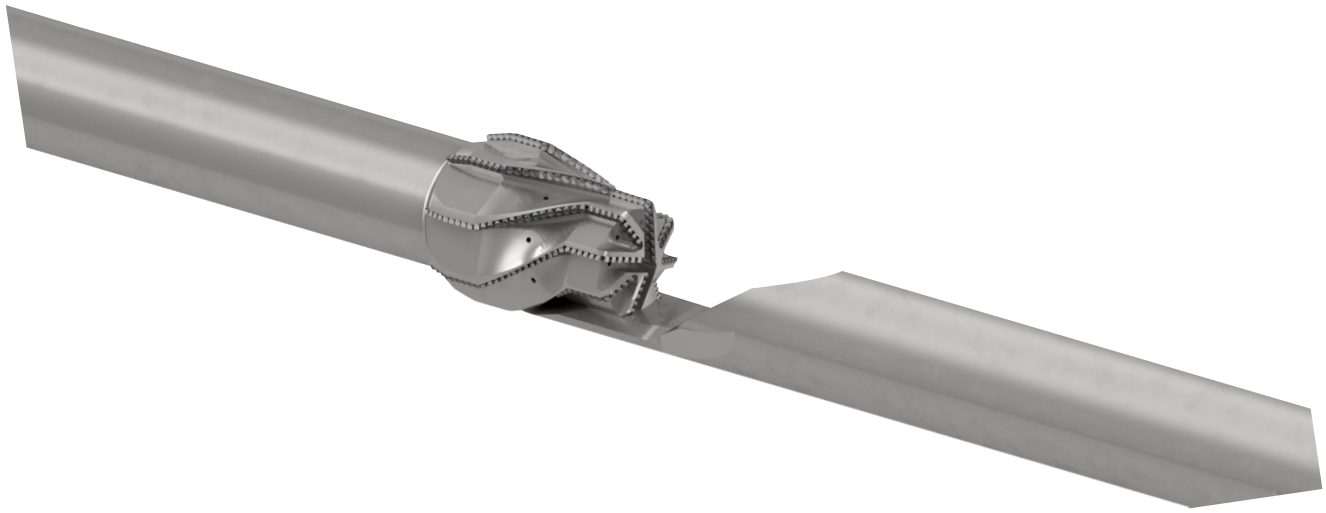
| Casing Size (Inches) | Whipstock OD (Inches) | Concave Angle | Concave Length (ft) | Total Length incl. Hydraulic Anchor (ft) | Weight (lbs) | Shear Bolt Value (lbs) |
|---|---|---|---|---|---|---|
| 4-1/2 | 3.300 | 2.5° | 6.5 | 12.2 | 560 | 15K |
| 5-1/2 | 4-1/2 | 2° | 7 | 15.5 | 680 | 20K |
| 7 | 5-1/2 | 2° | 8.5 | 22 | 870 | 30K |
| 9-5/8 | 8 | 2° | 12 | 18.5 | 1,200 | 40K |
| 13-3/4 | 11-1/2 | 2.5° | 17 | 34.5 | 2,100 | 60K |

## OPERATION

The WellEnTech Casing Exit System is easily assembled with the use of basic tools provided with the system. Packer hook up at hinge point & mill head hook up to ramp are all designed for ease and safety.

Casing Exit system is run in hole to setting depth where the Whipstock is oriented using MWD or Gyroscope.

With the mill head ports internally isolated the Anchor is set hydraulically via the setting port. Once anchor is set the internal mechanism will shear out the mill head isolating feature to establish full flow through the mill.



# WELLENTECH ST™ CASING EXIT SYSTEM

## APPLICATION

- Sidetracks
- Multilaterals

## FEATURES

- Single Trip Design
- Fully Retrievable
- Tried and tested Knock off plug design
- No internal Burst Disc required
- Retrieval Hook slot in whip face
- Suitable for Hydraulic or Mechanical Setting
- High torsional and tensile yield
- Easy to assemble and redress

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Shear Values are adjustable
- Alternative concave angles available to suit dog leg requirements
- High Flow By-Pass Valves, Running Tools, Hook Retrieval Tools, Die Collars and Deflectors are also available from WellEnTech.

The WellEnTech ST™ Casing Exit System is a Single Trip System that can be hydraulically or mechanically set. The design utilises tried and tested technology while incorporating some new design features for easy whip to mill hook up and reduce the amount of additional components to be milled without compromising on functionality or strength.

The Mill Head and Ramp are designed to complement each other for flexibility, ease of shear out, mill starting and centre point elimination. This design delivers a smooth exit and beyond into the new wellbore. The system enables 360 degree exit capability making it an ideal solution to a variety of casing exit scenarios.

## TECHNICAL SPECIFICATION

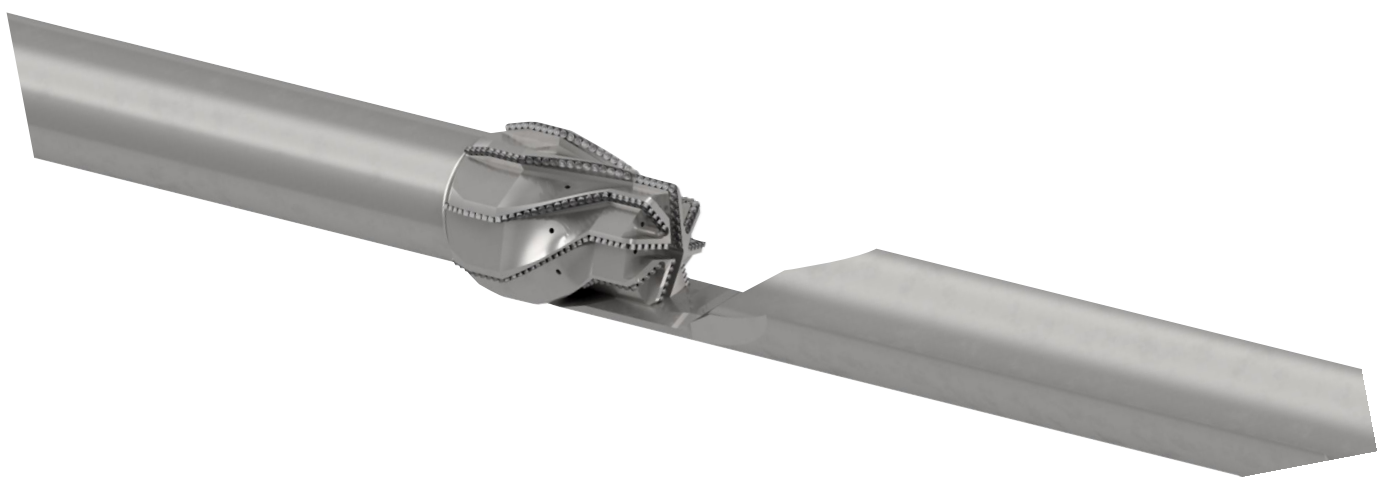
| Casing Size (Inches) | Whipstock OD (Inches) | Concave Angle | Concave Length (ft) | Total Length incl. Hydraulic Anchor (ft) | Weight (lbs) | Shear Bolt Value (lbs) |
|---|---|---|---|---|---|---|
| 5-1/2 | 4-1/2 | 2° | 7 | 15.5 | 680 | 20K |
| 7 | 5-1/2 | 2° | 8.5 | 22 | 870 | 30K |
| 9-5/8 | 8 | 2° | 12 | 18.5 | 1,200 | 40K |
| 13-3/4 | 11-1/2 | 2.5° | 17 | 34.5 | 2,100 | 60K |

## OPERATION

The WellEnTech Casing Exit System is easily assembled with the use of basic tools. Packer hook up at hinge point & mill head hook up to ramp are all designed for ease and safety.

Casing Exit system is run in hole to setting depth where the Whipstock is oriented using MWD or gyroscope. With the mill head ports isolated, the Anchor is set hydraulically via the setting port. Once anchor is set and the mill sheared out, rotation of the mill will establish full flow through the mill when it contacts the whip tip. It is advisable to run a WellEn Tech Running Tool with the system to ensure clean hydraulic fluid is used to set the Packer or Anchor.

Mill is shear released from the ramp (shear can be up only or bi directional as required) to enable milling of the casing exit and 10-15ft of rat hole. The result is a full gauge easily accessible window with minimal milling time.



# BOOT BASKET ( JUNK SUB )

## APPLICATION

- Packer/Plug Milling
- Underreaming
- Scale Milling

## FEATURES

- Robust Design
- Welded construction
- High Quality Alloy Steel
- Large Debris Catch Capacity
- No elastomers or moving parts

## ADDITIONAL INFORMATION

- Listed above are common sizes. Extended length versions are also available.
- Bespoke versions available to suit specific requirements
- Manufactured from high grade Alloy Steel, other materials available on request.

The WellEnTech Boot Basket is designed to remove debris too heavy to be circulated out of the well bore. The robust welded construction ensures the tool strength is optimised. They are manufactured from high-strength heat treated alloy steel, Heavy-duty ribs are attached to the cup to prevent it from being crushed and to guide the tool through tight spots while tripping in and out of the hole. These ribs are integral to the main body of the tool, further enhancing its strength.

## TECHNICAL SPECIFICATION

| Body Dia. | Overall Length | Bore Dia. | Catcher Length | Connections |
|---|---|---|---|---|
| 13-38" | 60" | 3.00” | 22.5” | 7-5/8"Reg Pin x Box |
| 9-5/8" | 56" | 2.88” | 22.5” | 6-5/8” Reg Pin x Box |
| 7" | 48" | 2.25” | 20” | 4-1/2” Reg Pin x Box |
| 5-1/2" | 48" | 1.50” | 20” | 3-1/2” Reg Pin x Box |
| 3-1/4" | 36" | 1.00” | 12” | 2-3/8”PAC Pin x Box |

## OPERATION

The WellEnTech Boot Basket is generally run immediately above a drill bit or mill, but can be positioned anywhere as part of a drill string in order to catch debris. The Boot Basket traps junk by suddenly decreasing annular velocity. This decrease occurs after flow passes the larger OD of the boot to reach the smaller OD of the body and top connection, at which point the heavier milled debris drops down into the catcher. The Boot basket can be run in either open hole or inside casing. To capture larger quantities of debris, additional Boot baskets can be deployed as part of the drilling string or Boot Baskets with extended length catchers are also available.

# BRUSHTECH™

## APPLICATION

- Wellbore clean-up and displacements
- Drilling Cement inside the casing
- Workover/ Intervention

## FEATURES

- Beveled blocks and centralizers prevent hang-ups while running
- Stainless steel wire brushes prevent CRA casing damage.
- Large internal bore and external flow path allow high rate circulation for maximum wellbore cleaning.

## ADDITIONAL INFORMATION

- Available in sizes for API and non-API casing from 4-1/2" upwards.
- Tools are manufactured from mild steel as standard. Other materials are available on request.

The WellEnTech BrushTech™ is a non-rotating compact tool that features rows of vigorous brush pads which scours cement, scale and rust from the casing wall including corrosion pits and coupling recesses. It is designed with large bypass channels that allows unhindered circulation rates during displacements to remove debris, and with the pads' strategically overlap position provides 360-degree reach ensuring 100% coverage of the casing wall.

The BrushTech™ compliments the aggressive ScrapeTech™ scraper and can be run in tandem or individually, with its robust construction allowing high-speed rotation and reciprocation in vertical, deviated, or horizontal wells without wearing the casing or damaging the tool.

## TECHNICAL SPECIFICATION

| Tubing/ Casing Size (Inches) | Weight (ppf) | Connection | Centralizer OD (Inches) | Brush OD (Inches) | ID (Inches) | Length (Inches) | Tensile Yield (lbs) | Torsional Yield (ft-lbs) | Max Stock-off (lbs) | Burst/ Collapse (PSI) | Max Rotation (rpm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-1/2 | 17.1-16.6 | 2-7/8" HT PAC / 2-3/8 REG | 3.610 | 4.20 | 1.00 | 93 | 341,200 | 12,400 | 5,000 | 10,000 | 60 |
| 7 | 20-29<br>29-38 | NC38 | 6.050<br>5.790 | 7.48 | 1.50 | 105.4 | 523,200 | 28,600 | 10,000 | | 120 |
| 9-5/8 | 47-53.5<br>36-43.5 | NC50 | 8.374<br>8.594 | 9.84 | 2.25 | 105.8 | 927,000 | 59,800 | 20,000 | | 120 |

## OPERATION

The WellEnTech BrushTech™ consists of a 2-piece mandrel with no external bolts, rings, etc. that can be left in the hole. The internal connection is designed to exceed the strength of the rig end connection and comes pre-torqued. The tool is made up to the drill string and cleans the casing while running in the hole. Once at the critical depths, the tool is rotated and reciprocated to vigorously scrub the casing wall. Cement can be drilled inside the casing. The well can be displaced if necessary, before pulling out of hole.

# DIE COLLAR

## APPLICATION

- Retrieval of whipstock
- Retrieval of a slick OD fish

## FEATURES

- One piece design
- Hardened internal wicker profile
- Robust construction

## ADDITIONAL INFORMATION

- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

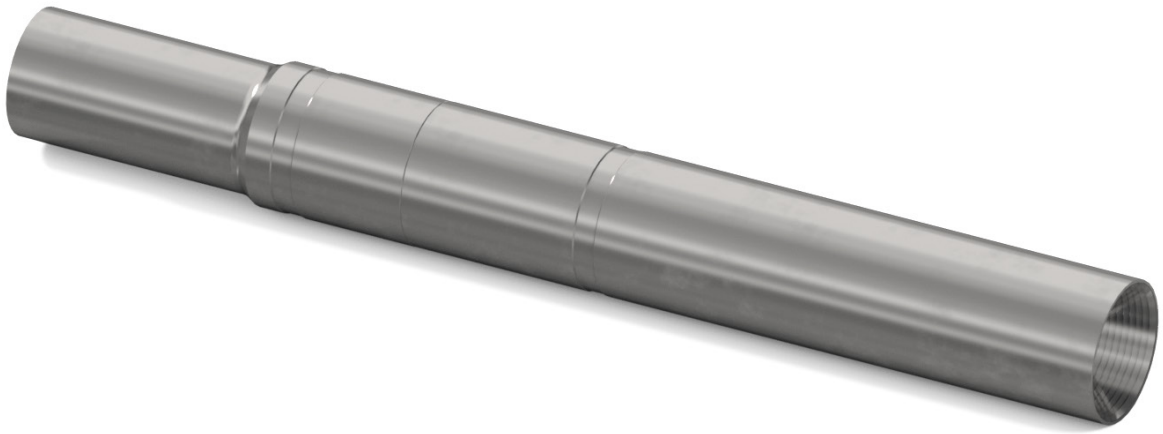
The WellEnTech die collar is a retrieval tool primarily for the retrieval of a whipstock, but can also be employed to retrieve slick OD tubulars or fish from a well bore. It is designed with a cut lip guide, designed to lift the whipface or fish off of the casing or tubing wall.

## TECHNICAL SPECIFICATION

| Nominal Size (Inches) | OD (Inches) | Length (Inches) | Connection | Tensile Strength (lbs) | Catch Range (Inches) | Part No. |
|---|---|---|---|---|---|---|
| 7 | 6-1/8 | 24 | NC 38 | 100,300 | 5 to 5-3/4 | 264-0700-A001 |
| 9-5/8 | 8-3/4 | 32 | NC 50 | 168,200 | 7-1/2 to 8 | 264-0963-A001 |
| 13-3/8 | 12 | 56 | NC50 | 180,600 | 6-5/8 to 10-1/4 | 264-1338-A001 |

## OPERATION

A typical bottom hole assembly for retrieval may consist of the Die Collar, full gauge stabilizer, bumper sub, fishing jar, full gauge stabilizer, crossover, heavyweight drill pipe, and drill pipe. A safety joint and accelerator can also be used in some assemblies. The die collar is run to depth and slowly rotated and run in hole until a significant amount of torque is witnessed. The BHA is then picked up and an over pull confirms engagement, the pull is increased until the applied load is greater than the whip hinge pin shear load enabling the retrieval of the whipstock or fish to surface to surface.



# DOWNHOLE FILTER SUB

## APPLICATION

- Any fluid pumping operations

## FEATURES

- Compact, robust design.
- Easy to install/remove
- Designs to suit all Drill String sizes
- Stainless Steel filter construction
- API tool joint connections as standard

## ADDITIONAL INFORMATION

- WellEnTech Drill Stem Filters are available to suit a wide range of filtration requirements. Listed above are some common sizes to suit most applications, however bespoke sizes can be produced for specific operations.

The WellEnTech Downhole Filter Sub is designed to filter debris from pumped fluids. One or more can be installed in various locations within a drill string or completion. In order to maximise the flow area, the filter is installed within a specially designed housing with an increased bore and a bored back box connection looking up. The filters can be removed, cleaned or replaced after each operation. They are manufactured from Stainless Steel to prevent corrosion and to prolong the service life of the filter. Large ports are included as standard at the top of the filter so that should it become full of debris, circulation past the filter can still take place without the need to stop operations. Various filter size options are available to suit all operational requirements.

## TECHNICAL SPECIFICATION

| Housing OD | Connection Size | Length (Shoulder to shoulder) | Filter Volume | Assembly No. |
|---|---|---|---|---|
| 4-3/4 | NC38 | 48’ | 160 in³ | 755-0475-A001 |
| 5 | NC38 | 48” | 160 in³ | 755-0500-A001 |
| 5-1/8 | NC38 | 48” | 160 in³ | 755-0512-A001 |
| 6-1/4 | NC46 | 48” | 240 in³ | 755-0568-A001 |
| 6-3/4 | NC50 | 48” | 240 in³ | 755-0675-A001 |
| 8 | 6-5/8”REG | 60” | 240 in³ | 755-0800-A001 |
| 9-1/2 | 7-5/8”REG | 60” | 240 in³ | 755-0950-A001 |

## OPERATION

The Filter is inserted into the Downhole Filter Housing without the need for any specialised installation tools and is secured in place when the upper connection is made up. The elongated filter design maximises the amount of debris which can be collected. To swap out the filter or remove it, the connection is simply broken out and the filter pulled out of the Filter Housing.

# HYDRO-SET PERMANENT PACKER

## FEATURES

- Hydraulically set via tubing pressure
- No additional running or setting tools required.
- Capable of tolerating High Axial Loads
- Rotationally locked design
- Slips are positioned at the top of the tool to aid with removal by milling or washing over
- Slip design ensures even stress distribution exerted on the casing or tubing
- Integral Hydraulic setting mechanism
- A range of connections can be cut into top sub

## OPTIONAL FEATURES

- Top sub can be replaced with Whipstock Hinge connector, eliminating a connection.
- High temperature and hostile service elements available
- Alternative slip designs available for specific operations

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard.
- Other tool joints also available.

The WellEnTech Hydro-set Permanent Packer is an anchoring and sealing device designed to suit a range of tubing and casing sizes. The packer design includes an integral setting mechanism which negates the need for any additional running and setting tools. The packer is set with the application of tubing pressure..

The WellEnTech Hydro-set Permanent Packer is ideally suited to whipstock operations where the ability to withstand high axial and torsional loads is required. The slips are designed to spread the setting load evenly across the casing or tubing ID and are hardened to ensure the teeth bite and hold the packer firmly within the casing when subjected to axial and rotational loads. It is also designed to withstand vibrations induced as a result of milling, such as that experienced during window milling operations.

The Element includes anti extrusion rings designed to keep the set element contained ensuring maximum elastomer contact with the casing. All components within the tool are rotationally locked to aid milling the packer should it need to be removed from the casing bore. The setting load can be adjusted to suit specific operational requirements.

## TECHNICAL SPECIFICATION

| Tubing Casing Size | Weight Range | OD | Length | Assembly No. |
|---|---|---|---|---|
| 7” | 29# - 32# | 5.750” | 67.00” | 760-7029-A001 |
| 9-5/8” | 53.5# - 70.3# | 7.560” | 67.75” | 760-9653-A001 |
| 13-3/8” | 68# - 86# | 11.750” | 82.00” | 760-1368-A001 |

# HYDRO-SET RETRIEVABLE PACKER

## FEATURES

- Hydraulically set via tubing pressure
- Straight pull release
- No additional running, setting or pulling tools required.
- Capable of tolerating High Axial Loads
- Rotationally locked design
- Slips are positioned below the packing element to protect them from casing debris
- Slip design ensures even stress distribution exerted on the casing or tubing
- Integral Hydraulic setting mechanism
- A range of connections can be cut into top sub

## OPTIONAL FEATURES

- Top sub can be replaced with Whipstock Hinge connector, eliminating a connection.
- High temperature and hostile service elements available
- Alternative slip designs available for specific operations

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard.
- Other tool joints also available.

The WellEnTech Hydro-set Retrievable Packer is an anchoring and sealing device designed to suit a range of tubing and casing sizes. The packer design includes an integral setting mechanism which negates the need for any additional running and setting tools. The packer is set with the application of tubing pressure and released with a straight pull load.

The WellEnTech Hydro-set Retrievable Packer is ideally suited to whipstock operations where the ability to withstand high axial and torsional loads is required. The slips are designed to spread the setting load evenly across the casing or tubing ID and are hardened to ensure the teeth bite and hold the packer firmly within the casing when subjected to axial and rotational loads. It is also designed to withstand vibrations induced as a result of milling, such as that experienced during window milling operations.

The release mechanism is isolated from well fluids preventing debris ingress which facilitates reliable and dependable de-activation of the packer. The setting and release loads can be adjusted to suit specific operational requirements.

## TECHNICAL SPECIFICATION

| Tubing Casing Size | Weight Range | OD | Length | Assembly No. |
|---|---|---|---|---|
| 4-1/2” | 11.6# - 15.1# | 3.625” | 72.50” | 780-4511-A001 |
| 5-1/2” | 17# - 20# | 4.530” | 77.00” | 780-5517-A001 |
| 7” | 29# - 32# | 5.750” | 82.25” | 780-7029-A001 |
| 9-5/8” | 53.5# - 70.3# | 7.560” | 87.00” | 780-9653-A001 |
| 13-3/8” | 68# - 86# | 11.750” | 96.50” | 780-1368-A001 |

# JETTECH™

## APPLICATION

- Wellbore clean-up and displacements
- Jetting BOP stacks and wellheads
- Workover/ Intervention

## FEATURES

- Multiple jetting nozzles
- Configurable in two operational modes

## ADDITIONAL INFORMATION

- Tools are manufactured from mild steel as standard. Other materials are available on request.

The WellEnTech JetTech™ is a simple circulation and jetting device which can be opened by dart action to allow jetting of BOP Stacks and Wellheads or other critical areas of the wellbore. The tools flexible design allows series of configuration depending on the operational requirements by use of the Inner sleeve and Activation Dart.

The JetTech™ can be run in two operational modes: First mode, with the ports open, it is possible to install the Activation Dart to ensure 100% of the fluid exits through the port. Second mode, with the ports closed, the Activation Dart can be pumped down to shear the Inner Sleeve and open the ports. The external diameter of the JetTech™ can be configured to customer specification with flush outer diameter, or enlarged to 8", 10" or 16". Each port has a Jetting Nozzle to concentrate the jetting action and prevent wash-out of the ports. These are simple to replace when so desired.

## TECHNICAL SPECIFICATION

| Nominal OD (Inches) | Connection | Ball Seat ID (Inches) | ID (Inches) | Length (Inches) | Plug OD (Inches) | Parts/ Flow Area | Tensile Yield (lbs) | Torsional Yield (ft-lbs) | Burst/ Rotation (PSI) |
|---|---|---|---|---|---|---|---|---|---|
| 16 | NC50 | 2.125 | 2.50 | 36.0 | 2.75 | 6 x 12mm 1.0 in² | 2,514,000 | 267,958 | 10,000 |
| 10 | NC50 | 2.125 | 2.50 | 36.0 | 2.75 | 6 x 12mm 1.0 in² | 2,514,000 | 267,958 | 10,000 |
| 7 | NC50 | 2.125 | 2.50 | 36.0 | 2.75 | 6 x 12mm 1.0 in² | 2,514,000 | 267,958 | 10,000 |

## OPERATION

The WellEnTech JetTech™ is typically run to the BOP stack and can be activated by Activation Dart or run in the open position. To open using the Activation Dart, drop the dart into the string and pump down in a controlled manner. Once the dart lands on the Inner Sleeve, slowly increase pressure until the shear is seen.

Commence jetting at 10 BPM across the stack and wellhead. Reduce to 5 BPM across the annular rams. Function the pipe rams and variable rams to help dislodge debris. Rotate slowly which reciprocating slowly across 1 stand 3 passes.

# MAGTECH™

## APPLICATION

- Wellbore clean-up and displacements
- Drilling Cement inside the casing

## FEATURES

- Excellent temperature resistance Neodymium rare-earth magnets
- Beveled blocks and centralizers prevent hang-ups while running
- Magnets are securely retained in mill packets

## ADDITIONAL INFORMATION

- Available in sizes for API and non-API casing from 4-1/2" upwards.
- Tools are manufactured from mild steel as standard. Other materials are available on request.

The WellEnTech MagTech™ is a non- rotating compact tool that features rows of multiple magnets which capture and retain ferrous debris during wellbore cleaning arranged along the ribs to maximize the exposure area available to trap debris while pulling out of hole. The tool is designed with large internal bore and external flow path allowing high rate circulation for maximum wellbore cleaning.

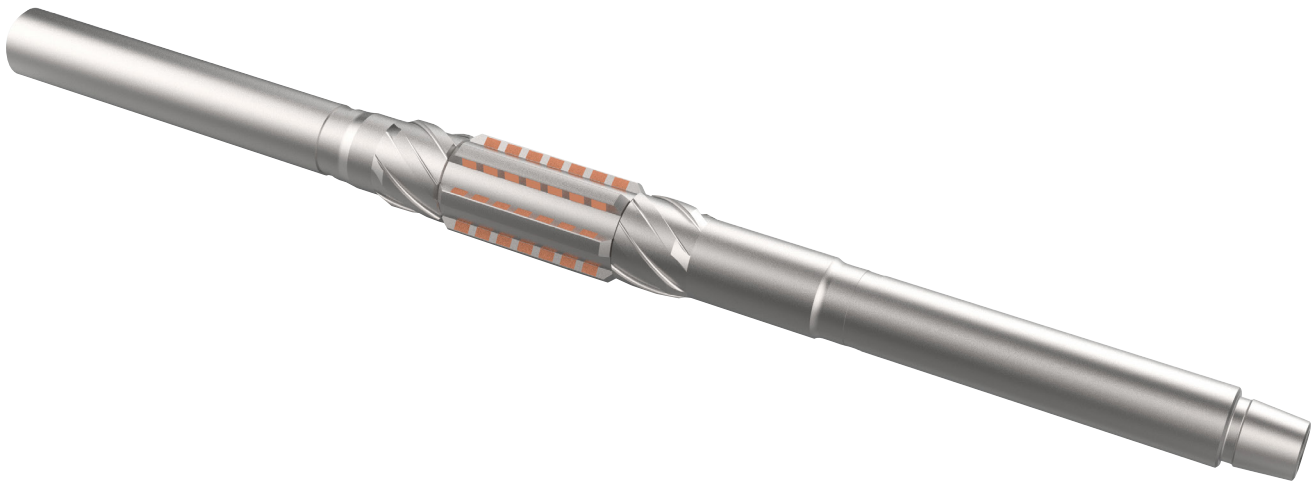
Robust construction allows high-speed rotation and reciprocation in vertical, deviated, or horizontal wells without wearing the casing or damaging the tool.

## TECHNICAL SPECIFICATION

| Tubing/ Casing Size (Inches) | Weight (ppf) | Connection | Centralizer OD (Inches) | Magnet Capacity (lbs) | ID (Inches) | Length (Inches) | Tensile Yield (lbs) | Torsional Yield (ft-lbs) | Max Stock-off (lbs) | Burst/ Collapse (PSI) | Max Rotation (rpm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-1/2 | 17.1-16.6 | 2-7/8" HT PAC / 2-3/8 REG | 3.610 | 18.2 | 1.00 | 93 | 341,200 | 12,400 | 5,000 | 10,000 | 60 |
| 7 | 20-29 29-38 | NC38 | 6.050 5.790 | 43 | 1.50 | 105.4 | 523,200 | 28,600 | 10,000 | | 120 |
| 9-5/8 | 47-53.5 36-43.5 | NC50 | 8.374 8.594 | 105 | 2.25 | 105.8 | 927,000 | 59,800 | 20,000 | | 120 |

## OPERATION

The WellEnTech MagTech™ consists of a 2-piece mandrel with no external bolts, rings, etc. that can be left in the hole. The internal connection is designed to exceed the strength of the rig end connection and comes pre-torqued. The tool is made up to the drill string and attracts ferrous debris while running in the hole and pulling out of the hole, that can be run in tandem with other wellbore cleaning tools.



# PACKER PICKER – LATCH TYPE

## APPLICATION

- Retrieval of Drillable Production Packers

## FEATURES

- Non-rotating Latch
- Fully retained Shear Ring
- Wide range of interchangeable Latch catch diameters
- Adjustable Shear Release
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech Packer Picker is designed to be used in conjunction with a washover shoe or bladed style of packing milling device. This Packer Picker is designed to catch a profile or bottom end of a Packer and prevent the bottom end of the packer falling when the element and slips have been milled. The Latch is free to rotate on the mandrel, which allows the Latch to remain stationary during the milling operation.

There is an emergency shear release mechanism enabling the packer picker to be released from the Packer fail to release after milling.

## TECHNICAL SPECIFICATION

| Tool Size | Catch Range (ID) | Connections | Assembly No. | Shear Value (lbs) | Part No. |
|---|---|---|---|---|---|
| 2.125 | 2.25 to 2.75 | 1.625" 6 SA Box | 350-2125-A001 | 30,000 | 351-2125-ST10 |
| | | | | 40,000 | 351-2125-ST11 |
| 2.25 | 2.50 to 3.25 | 1.81" 6 SA Box | 350-2250-A001 | 30,000 | 351-2250-ST10 |
| | | | | 40,000 | 351-2250-ST11 |
| | | | | 50,000 | 351-2250-ST12 |
| 3.125 | 3.25 to 4.00 | 2-3/8"API REG Box | 350-3125-A001 | 40,000 | 351-3125-ST10 |
| | | | | 50,000 | 351-3125-ST11 |
| | | | | 60,000 | 351-3125-ST12 |
| | | | | 70,000 | 351-3125-ST13 |
| 3.750 | 4.00-4.88 | 2-7/8"API REG Box | 350-3750-A001 | 60,000 | 351-3750-ST10 |
| | | | | 80,000 | 351-3750-ST11 |
| | | | | 100,000 | 351-3750-ST12 |
| | | | | 120,000 | 351-3750-ST13 |

## OPERATION

The WellEnTech Packer Picker is run down through the Packer bore and is spaced out so that the latch is fully out of the bottom of the Packer when the Bladed Mill or Overshot tags the top of the Packer. The Packer Picker is supplied with a dressed Mill Sub to clear any bore obstructions when running into the Packer bore. Once in position, milling of the Packer can commence. Once the desired amount has been milled, the drill string can be picked up, resulting in the latch contacting the bottom of the Packer and enabling the Packer to be retrieved. If however the Packer fails to release, the Packer Picker can be released by applying a predetermined over pull, shearing the Shear Ring and allowing the latch to collapse and pullup through the Packer bore.

# PACKER PICKER – SLICK BORE

## APPLICATION

- Retrieval of Drillable Production Packers

## FEATURES

- Non-rotating Grapple
- Fully retained Shear Ring
- Wide range of interchangeable grapples
- Adjustable Shear Release
- Easily redressed

## ADDITIONAL INFORMATION

- Common sizes are shown, other sizes available on request.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

The WellEnTech Packer Picker is designed to be used in conjunction with a washover shoe or bladed style of packing milling device. This Packer Picker is designed for use in a slick bore with a grapple which is free to rotate on the mandrel. This allows the grapple to remain stationary within the packer bore during the milling operation. There is an emergency shear release mechanism enabling the packer picker to be released from the packer bore should the Packer fail to release after milling.

## TECHNICAL SPECIFICATION

| Tool Size | Catch Range (ID) | Connections | Assy No. | Shear Value (lbs) | Part No. |
|---|---|---|---|---|---|
| 2.125 | 2.25 to 2.75 | 1.625" 6 SA Box | 350-2125-A001 | 30,000 | 350-2125-ST10 |
| | | | | 40,000 | 350-2125-ST11 |
| 2.25 | 2.50 to 3.25 | 1.81" 6 SA Box | 350-2250-A001 | 30,000 | 350-2250-ST10 |
| | | | | 40,000 | 350-2250-ST11 |
| | | | | 50,000 | 350-2250-ST12 |
| 3.125 | 3.25 to 4.00 | 2-3/8"API REG Box | 350-3125-A001 | 40,000 | 350-3125-ST10 |
| | | | | 50,000 | 350-3125-ST11 |
| | | | | 60,000 | 350-3125-ST12 |
| | | | | 70,000 | 350-3125-ST13 |
| 3.750 | 4.00-4.88 | 2-7/8"API REG Box | 350-3750-A001 | 60,000 | 350-3750-ST10 |
| | | | | 80,000 | 350-3750-ST11 |
| | | | | 100,000 | 350-3750-ST12 |
| | | | | 120,000 | 350-3750-ST13 |

## OPERATION

The WellEnTech Packer Picker is run down into the Packer bore until the Bladed Mill or Overshot tags the top of the Packer. The Packer Picker is supplied with a dressed Mill Sub to clear any bore obstructions when running into the Packer bore. Once in position, milling of the Packer can commence. During milling the Grapple moves down within the Packer bore but does not rotate. Once the desired amount has been milled, the drill string can be picked up, enabling the Packer to be retrieved. If however the Packer fails to release, the Packer Picker can be released by applying a predetermined over pull, shearing the Shear Ring and allowing the latch to collapse and pullup through the Packer bore.

# SCRAPETECH™

## APPLICATION

- Well Bore clean out
- Debris circulation
- Packer/ Plug setting operations

## FEATURES

- One piece body design
- Spring loaded, hardened scraper blades
- 360° blade coverage
- Flow channels for debris circulation
- Easy to redress and replace blades

## ADDITIONAL INFORMATION

- Available in sizes for API and non-API casing from 4-1/2" upwards.
- Tools are manufactured from mild steel as standard. Other materials are available on request.
- Bespoke designs available to suit job specific applications.

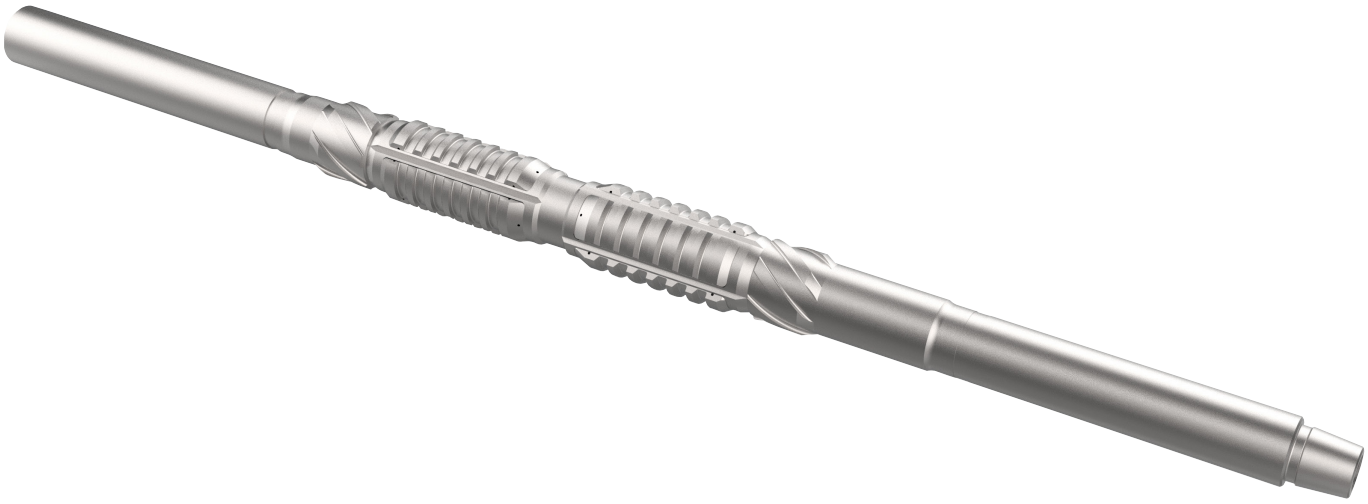
The WellEnTech ScrapeTech™ is a sub which is used for cleaning a casing or tubing bore, it is designed for dislodging and removal of debris which has accumulated on the casing or tubing wall. The robust design provides 360° coverage, with flow channels to facilitate the circulation of debris. The spring loaded blades ensure that they remain in contact with the casing wall at all times and the blade edges are hardened to prolong tool life.

## TECHNICAL SPECIFICATION

| Tubing/ Casing Size (Inches) | Weight (ppf) | Connection | Centralizer OD (Inches) | Scraper Pad OD (Inches) | ID (Inches) | Length (Inches) | Tensile Yield (lbs) | Torsional Yield (ft-lbs) | Max Stock-off (lbs) | Burst/ Collapse (PSI) | Max Rotation (rpm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-1/2 | 17.1-16.6 | 2-7/8" HT PAC / 2-3/8 REG | 3.610 | 4.005 | 1.00 | 93 | 341,200 | 12,400 | 5,000 | 10,000 | 60 |
| 7 | 20-29<br>29-38 | NC38 | 6.050<br>5.790 | 6.700<br>6.440 | 1.50 | 105.4 | 523,200 | 28,600 | 10,000 | | 120 |
| 9-5/8 | 47-53.5<br>36-43.5 | NC50 | 8.374<br>8.594 | 9.140<br>9.340 | 2.25 | 105.8 | 927,000 | 59,800 | 20,000 | | 120 |

## OPERATION

The WellEnTech ScrapeTech™ is run in hole as part of a BHA to assist with the removal of debris. The scraper blades cover a range and weight of casing/ tubing and are easily interchanged to suit a specific well bore. The sub can be made up anywhere within the BHA and requires no flow or mechanical manipulation to operate the tool. When the BHA is at the target area to be cleaned, it is recommended to work the tubing string up and down to dislodge any debris. Circulation of fluid through a jetting or ported sub will lift debris to surface.



# SECTION MILL

## APPLICATION

- Casing milling
- Perforation zones
- Scale/Cement removal
- Pipe Cutting

## FEATURES

- Robust construction
- Tungsten Carbide Insert dressed blades
- Interchangeable stabilizer sleeve
- Flotel device
- Easily redressed

## ADDITIONAL INFORMATION

- Listed above are common sizes
- Bespoke versions available to suit specific requirements
- Manufactured from high grade Alloy Steel, other materials available on request.

The WellEnTech Section Mill is designed to mill sections of casing for ; Sidetracking, gravel packing, and/or perforation zones. The Section Mills are available in a variety of OD sizes. The tungsten carbide blades are designed so that all blades will mill simultaneously. The interchangeable Stabiliser Sleeve can be swapped out to suit specific casing weights.

## TECHNICAL SPECIFICATION

| Tool Series | Casing Size | Body Dia. | Fishing neck | | Overall Length | Top Pin Conn | Weight Lbs. |
|---|---|---|---|---|---|---|---|
| | | | Length | Diameter | | | |
| 3600 | 4-1/2" | 3-5/8" | 18” | 3-1/8 | 56" | 2-3/8" | 135 |
| 4100 | 5" | 4-1/8" | 18” | 3-1/4 | 66" | 2-3/8" | 175 |
| 4500 | 5-1/2" | 4-1/2" | 18” | 4-1/8 | 68" | 2-3/8" | 190 |
| 5500 | 6-5/8 – 7" | 5-1/2" | 18” | 4-3/4 | 74" | 3-1/2" | 350 |
| 6100 | 7-5/8" | 6-1/8" | 18” | 4-3/4 | 74" | 3-1/2" | 368 |
| 7200 | 8-5/8 – 9-5/8" | 7-1/4" | 18” | 5-3/4 | 89" | 4-1/2" | 554 |
| 8200 | 9-5/8" | 8-1/4" | 18” | 5-3/4 - 8 | 87" | 4-1/2" | 900 |
| 9200 | 10-3/4" - 11-3/4" | 9-1/4" | 18” | 5-3/4 - 8 | 87" | 4-1/2" | 980 |
| 11700 | 13-3/8" | 11-1/2" | 18” | 8 - 9 | 90" | 6-5/8" | 1725 |

## OPERATION

The WellEnTech Section Mill is operated by flow through the tool. At a predetermined flow rate, a piston moves down within the tool which pushes all of the section milling blades out of the body. The Section Mill is rotated via a top drive or a down hole motor and the tungsten carbide dressed blades can then mill the target casing. The tool can be supplied with a flotel device which signals the driller than the arms are all fully open. On completion of the milling operation, flow is stopped and the piston will retract by means of a powerful spring allowing the blades to return within the main body of the tool.