



WWT Performance Guide Shoes



Specifications



Performance Casing Guide Shoes

WWT's guide shoes are operator focused solutions to address any casing running challenge.

WWT FlexShoe™

Flexible, strong guide shoe. Ideal for speeding up casing runs in directional, horizontal, and deepwater wells. Reduces casing end loads by up to 90%, resulting in less buckling and reduced drag.



WWT JetGuide™

Powerful jetting shoe with up to 30x more force than normal jetting and guide shoes. Speeds up casing runs by quickly washing through cuttings, debris, and salt or tar zones. Fail-safe design with large centerline nozzle that opens for cementing or if jets are plugged. Standard and eccentric models available.



WWT JetReam™ / WWT ReamGuide™

A new approach to reamer shoes. Effective reamer design with fast drill-out with no metal in drill out path. Cost effective. JetReam also includes jetting features to help work through tight spots.



WWT International

See how it works at

www.wwtinternational.com

WWT FlexShoe™

Strong, Flexible Guide Shoe



Specifications

| FLX Model | 450 | 550 | 700 | 758 | 958 | 1075 | 1175 | 1338 | 1400 | 1600 | 1800 |
|----------------------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|
| Casing Size (inches) | 4-1/2 | 5-1/2 | 7 | 7-5/8 | 9-5/8 | 10-3/4 | 11-3/4 | 13-3/8 | 14 | 16 | 18 |
| OD (inches) | 5-5/8 | 6-3/4 | 8-1/4 | 8-3/4 | 11-1/4 | 11-7/8 | 12-3/4 | 14-1/4 | 14-1/4 | 16-1/4 | 18-1/8 |
| ID (inches) | 3-7/8 | 4-7/8 | 6-1/8 | 6-3/4 | 8-3/4 | 9-7/8 | 10-7/8 | 12-1/4 | 12-1/4 | 14-5/8 | 16-5/8 |
| Length | 8 | 8 | 10 | 10 | 12 | 12 | 12 | 12 | 26 | 32 | 32 |

* Other sizes available upon request. Length is approximate and varies depending on connection, etc.

Features and Benefits

- Downhole-proven composite section is strong and durable, but also 10 times more flexible than steel.
- Guides casing past doglegs, ledges and soft formations.
- Reduces end loading by up to 90%, resulting in less drag and buckling when running casing.
- Casing can be rotated with WWT FlexShoe installed.
- Casing is cemented through the tool and easily drilled out.
- Patented design provides a low-stress transition from rigid casing to flexible shoe.
- Compatible with floats and other casing running equipment, including premium connections.
- Ideal for deepwater operations, extended reach drilling and horizontal wells
- Modular design. Chose from standard, jetting, and reamer shoe configurations.



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WWT JetGuide™

High Velocity Failsafe Jetting Shoe



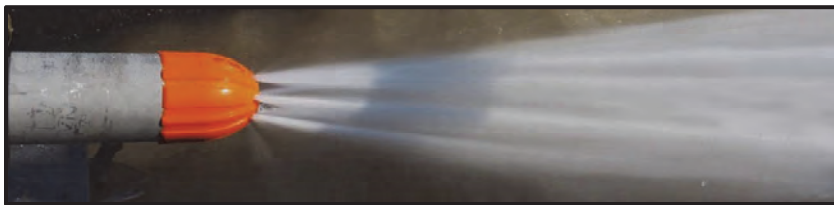
Specifications

| JetGuide Model | 450 | 550 | 700 | 758 | 958 | 1075 | 1175 | 1338 | 1400 | 1600 | 1800 |
|---------------------------------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|
| Casing Size (inches) | 4-1/2 | 5-1/2 | 7 | 7-5/8 | 9-5/8 | 10-3/4 | 11-3/4 | 13-3/8 | 14 | 16 | 18 |
| Max OD (inches) | 5-3/8 | 6-1/4 | 8-1/4 | 8-3/4 | 11-1/4 | 11-3/4 | 12-3/4 | 14-1/4 | 14-1/4 | 16-1/4 | 18-1/8 |
| Minimum TFA* (in ²) | 2.1 | 2.1 | 5.1 | 5.1 | 7.1 | 7.1 | 7.1 | 7.1 | 7.1 | 7.1 | 7.1 |

*TFA in. With jetting feature TFA out is reduced until opening centerline at predetermined flow rate.

Features and Benefits

- **Effective**
 - Wash through cuttings with 30X the force of other guide shoes.
 - Available in standard and eccentric models.
- **Safe**
 - Converts to full-open center bore for cementing or if jets are plugged.
- **Efficient**
 - Easily drilled out. No metal in drill out path.
 - Much lower cost than reamer shoes, but can be just as effective in many cases.
- **Modular.**
 - Increases the effectiveness of the WWT FlexShoe, or can be used as stand-alone product.
 - Float installed above shoe.



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WWT JetReam™

Drillable Reamer & Jetting Shoe



Specifications

| JetReam Model | 450 | 550 | 700 | 758 | 858 | 958 | 1075 | 1175 |
|--------------------------------|-------|-------|-------|-------|-------|--------|--------|--------|
| Casing Size (inches) | 4-1/2 | 5-1/2 | 7 | 7-5/8 | 8-5/8 | 9-5/8 | 10-3/4 | 11-3/4 |
| Reamer OD (inches) | 5-3/4 | 6-3/4 | 8-3/8 | 8-3/4 | 9-3/4 | 11-1/4 | 11-3/4 | 12-1/4 |
| Minimum TFA (in ²) | 2.1 | 2.1 | 5.1 | 5.1 | 7.1 | 7.1 | 7.1 | 7.1 |

*TFA in. With jetting feature TFA out is reduced until opening centerline at predetermined flow rate.

Features and Benefits

- **Effective**
 - Patented embedded ceramic cutting elements provide effective reaming and movement of cuttings.
 - Ring of powerful jets help wash through cuttings and debris. Large center nozzle opens if needed.
- **Durable**
 - Rotate casing to ream down through trouble zones or past obstructions.
 - Tough polyurethane body with aluminum frame and ceramic cutters.
 - Steel frame and cutters on 4-1/2" and 5-1/2"
- **Efficient**
 - Fast drill-out with PDC or rock bits. Little or no metal in drill-out path.
 - Cost effective.
- **Modular.**
 - Works well with the WWT FlexShoe.
 - Float installed separately above shoe.



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WWT ReamGuide™

Drillable Reamer Shoe



Specifications

| ReamGuide Model | 450 | 550 | 700 | 758 | 858 | 958 | 1075 | 1175 |
|--------------------------------|-------|-------|-------|-------|-------|--------|--------|--------|
| Casing Size (inches) | 4-1/2 | 5-1/2 | 7 | 7-5/8 | 8-5/8 | 9-5/8 | 10-3/4 | 11-3/4 |
| Reamer OD (inches) | 5-3/4 | 6-3/4 | 8-3/8 | 8-3/4 | 9-3/4 | 11-1/8 | 11-3/4 | 12-1/4 |
| Minimum TFA (in ²) | 2.1 | 2.1 | 5.1 | 5.1 | 7.1 | 7.1 | 7.1 | 7.1 |

Features and Benefits

- **Durable**
 - Rotate casing to ream down through trouble zones or past obstructions
 - Tough polyurethane or cement composite body with aluminum frame holding cutters.
- **Effective**
 - Patented embedded ceramic cutting elements provide effective reaming and movement of cuttings
- **Efficient**
 - Made from aluminum and polyurethane or cement composite.
 - No metal in drill-out path in most cases.
 - Cost effective.
- **Modular.**
 - Works well with the WWT FlexShoe.
 - Can be used as a stand-alone product.
 - Float installed separately above shoe



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WWT FlexShoe

Frequently Asked Questions

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Can the WWT FlexShoe be rotated?

Yes. The tool is strong and designed to transmit torque. In structural testing, a 7" FlexShoe failed at 16,000ft-lbs, and a 5" tool failed at 8,000ft-lbs.

What about rig handling?

Rig handling has proven to be similar to most casing joints. WWT ships the tool pre-made to a pup joint and normally include certified slings. The pup joint is then set in the slips and made up just like any other joint of casing. See TSI032 for more information.

Can WWT FlexShoe be shipped with a float?

All WWT Guide Shoes are typically shipped without a float, but WWT can make up to a customer supplied float collar above the tool, or WWT can supply Guide Shoes with floats.

Can WWT use someone else's shoe or reamer on the bottom of the WWT FlexShoe?

The WWT FlexShoe and WWT Guide Shoes are designed to work together as a system.

Can WWT ship it with a different shape nose, such as an offset guide-shoe shape?

The answer is yes, WWT has standard, offset, and reamer noses that can work with the WWT FlexShoe to improve performance of the tool.

What about cementing and drill-out?

WWT has features to ensure a quick and efficient drill out, and reports from the field support that drill out of the FlexShoe is often as fast or faster than other types of guide shoe. See TSI032 for our recommendations and best practices for drilling out the FlexShoe.

Can a reamer or other component pull up against the shoe?

Yes. The shoe can take a considerable amount of load, both up and down.

Will the FlexShoe sag against the low side of the well and dig in to ledges?

Compared to steel, the FlexShoe is very flexible, but given the light weight and relatively short length, it will not sag significantly downhole. The tool is neutrally buoyant in moderate weight drilling fluids.

Can WWT make the FlexShoe with built in centralizers?

Given the short length of the FlexShoe, operators have found that they have achieved excellent cement job quality with a centralizer installed immediately above the FlexShoe. A centralizer is not required on the FlexShoe itself.

What effect does the FlexShoe have when performing FIT / leak off test?

The process is the same as any other shoe track. Drill out new formation and perform the test. Operators have not had any issues performing FIT / leak-off tests.

Will I sidetrack out the side of the shoe when drilling out?

The FlexShoe is strong and wear resistant enough to allow the bit and BHA to easily drill out of the shoe, with the path of least resistance down the center of the FlexShoe when drilling cement. The FlexShoe can experience wear if a heavy bit or reamer is rotate inside the FlexShoe for extended periods.

What kind of load and pressure can the FlexShoe take?

The tool is a guide shoe, not a pressure boundary. It is designed to be open to the wellbore and to leak rather than hold pressure. With that said, it is strong, and will withstand a considerable amount of pressure and load without damage. See WWT TSI032 for specific load and pressure limitations.

Can WWT use the FlexShoe with a casing floatation system?

Since casing is normally run without the ability to circulate, the WWT FlexShoe can be very beneficial when floating casing. The FlexShoe works very well with casing floatation systems, and can complement these capabilities. The FlexShoe is installed below any floatation / float equipment.

Does WWT require service personnel on site when running the tool?

WWT recommends a service person be on site for the first couple runs to ensure smooth operations, and to educate rig personnel about the abilities and operations of our tools, but a dedicated service hand is generally not required.

Can the FlexShoe be made with any connection type?

The WWT FlexShoe has been designed to easily adapt to most standard and premium casing connections, but a strong, shouldered BTC (buttress) or stub acme connection is standard. All sizes from 4-1/2" to 10-3/4" are designed to thread into a standard BTC pin connection. Since the FlexShoe connection is at the shoe, a premium connection is not normally required, but premium connections and crossovers are available upon request. Note that premium connections can add considerably to cost and lead time.

What if I'm interested in another size WWT FlexShoe that is not listed on the spec sheet?

WWT can make a WWT FlexShoe in almost any size. Please contact us to discuss the application and WWT can provide a quote.

Can the WWT FlexShoe work in HP / HT wells?

The standard WWT FlexShoe product line can handle temperatures to 275F. Contact WWT if a WWT FlexShoe is needed for higher temperatures.





For additional information and contacts,
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