TYPE 500-PVTS

TYPE 501-PVTS

TYPE 501DV-PVTS

TYPE 600

TYPE "S"
LUG NOSE

RIBBED DOWN-JET
SHOE

NEEDLE-NOSE
SHOE

TYPE 610
MULE SHOE

TYPE 800
SHOE

TYPE 800ST
SAW-TOOTH

Davis Manual-Fill Float Shoes

Davis manual-fill float shoes and float collars are simple in design and operation. They have been engineered and manufactured to withstand the high temperatures encountered and the high pressures created by differences in fluid columns when floating, landing, and cementing strings of casing.

Davis' standard design manual-fill float shoes and float collars are manufactured with the Davis PVTS valve. This valve is a spring-actuated, plunger-type, one-way check valve. It is designed to withstand high temperatures and large volumes of fluids pumped at high flow rates. It also provides an effective seal under both high- and low-pressure conditions when casing is run and cemented in either the vertical or horizontal position.

The valve housing and closure element are made with a phenolic material. High strength concrete is the compound that molds the valve in the machined housing to form a strong singular unit. Despite the high compressive strength of the concrete, and the shear strength of the valve, Davis float shoes and collars are easily drilled with conventional or PDC bits.

Because of its proven performance qualities, the PVTS valve is used in all manual-fill Davis float equipment including double-valve shoes and collars, and all inner-string cementing equipment including the tag-in, screw-in, and latch-in designs.

Since Davis float shoes and float collars are usually manufactured from steel that has a greater wall thickness than the pipe body of the casing string they are run in, they normally have burst and collapse resistance greater than the casing string.

Float Shoe Type 500-PVTS

This shoe features a strong, rounded concrete nose that aids in guiding the casing string to bottom and incorporates the PVTS back-pressure valve assembly. These features make this Davis shoe highly preferred for conventional cementing jobs.

Down-Jet Float Shoe Type 501-PVTS

Along with all the features incorporated into the Type 500-PVTS float shoe, the popular Type 501-PVTS model features properly drilled and angled down-jet ports. The even distribution of fluid through these raised ports delivers to the user several advantages, including the added assurance that circulation can be established when casing becomes plugged during running or is landed on bottom. The angle of the ports assists if casing has to be washed to bottom, and the spacing of the ports assists in breaking up or preventing cement channeling.

Double-Valve Down-Jet Float Shoe Type 501DV-PVTS

For additional protection, choose this shoe which combines the maximum security of a unitized double check valve along with all the benefits inherent in the Type 501-PVTS.

Guide Shoes Types 600 and 601

The rounded design of the concrete noses of these Davis shoes assists in guiding the casing string into the hole and safely to the bottom. Both have flat-finished concrete tops to provide strong surfaces for landing cement plugs. The Type 600 (shown) has a single fluid outlet through the nose while the Type 601 (not shown) has down-jets which deliver the efficient washing action, cement slurry distribution and other benefits of the Type 501-PVTS.

Down-Jet Set Shoe with Lug Nose Type "S"

This Davis shoe comes with a special drillable lug nose for use when casing is run as a liner, lowered on drill pipe and set on bottom. When bottom is contacted, the nose piece will prevent the casing from rotating when the drill pipe is released from the liner. This lug nose design can also be incorporated into self-filling shoes.

Ribbed Down-Jet Float Shoe

The externally raised ribs of this shoe aid in centering the casing at bottom and promote more even distribution of cement to reduce the risk of channeling. Ribbed float collars are also available.

Needle Nose Float Shoe

Field-proved for over 20 years, the Davis Needle Nose Float Shoe has provided operators with an aid to run casing in adverse conditions. With its tapered aluminum nose, it has been extremely effective for running casing through tight spots, different geometric sections in the wellbore, and previous casing strings that have been damaged. It incorporates down-jet ports that create turbulent flow at the shoe for washing, conditioning, or cementing. The Needle Nose Shoe can be equipped with the Davis Type PVTS valve, which has been proven to meet or exceed API RP 10 F category III C., or with a self-filling type valve.

Mule Shoe Type 610

The Davis Mule Shoe is used when the running of casing is hindered by hole conditions. When the shoe encounters a ledge in the wellbore, for example, it is rotated so that the fluid under pump pressure washes the ledge off. The shoe can also be used to facilitate getting over or by obstacles in the hole.

Texas Pattern Casing Shoes Types 800 and 800ST

These types of casing shoes are popular for use in reinforcing the end of the casing on shallow strings. They help the casing to run past bridges, and they provide maximum circulation through the casing. They are available with smooth-surface or sawtooth bottoms.

TYPE 700-PVTS

TYPE 700-LAP

TYPE 700-LAPN

PVTS AUTOFILL

Davis Manual-Fill Float Collars

Float Collar Type 700-PVTS

This Davis collar comes equipped with a flat concrete surface and load distributor plate for landing and sealing cement plugs. It normally is offered with pin and box thread connections, but it is also available with double-box connections. Both of these designs embody the positiveseal, PDC drillable Davis PVTS springoperated plunger-type valve molded in place with high strength concrete.

When a back-pressure valve is not desired or required in a float collar, Davis has available the Type 701 Baffle Collar (not shown). This collar allows fluid flow in either direction and provides a strong concrete surface to land and seal cement plugs. It is often run in tandem with the Davis Type 501DV-PVTS double-valve, down-jet float shoe.

Lock-Down Anti-Rotation Plug System Type LAP

(Surface launch and sub sea launch)*

Available for both surface launch and sub sea launch applications, Davis offers the Type LAP plug system. The Type LAP system incorporates our first generation of mechanism to prevent plug rotation while drilling out. This system is still used on some surface launch applications involving specialty float equipment (such as autofill types), and is available through Baker Hughes for sub-sea applications. Baker Hughes has incorporated the Davis Type LAP mechanism into their respective sub sea launch plugs, so the Baker plugs can be run with Davis Type LAP float collars (Fig. 2, above), and provide an effective means to prevent rotation while drilling out.

The system features a float collar that incorporates a threaded type receiver to receive a collet type insert. A bottom plug with collet insert on bottom, and threaded type receiver on top of plug. The top plug features a collet type insert on the bottom end. The collet feature allows for the bottom plug to latch into the float collar, as well as for the top plug to latch-in to the bottom plug. Once latched in, right hand rotation during drill out tightens up the engagement of the plugs and collar, with the threaded profiles on the collet and receiver. Some notable features/benefits are:

- Once engaged the latch-in design prevents plugs from becoming disengaged by pressure acting on the plugs from below, or being mechanically disengaged during the drill-out process. A significant improvement over other designs that only mesh against rotation, this lock-down feature is unique to Davis.
- Five-wiper premium quality plugs provide for most efficient casing wiping.
- Type LAP collars and plugs are field proven for easy drill out with PDC bits.
- System allows for use of multiple bottom plugs or no bottom plugs if desired.
- Davis float shoes are also available with the Type LAP insert upon request.

Lock-Down Anti-Rotation Plug System Type LAPN (Surface launch)*

Available for surface launch applications, Davis offers the Type LAPN plug system. This system incorporates our latest generation of mechanism to prevent plug rotation while drilling out. The system features a float collar (Fig. 3, opposite page) with a heavy duty "tooth like" insert incorporated, a bottom cementing plug with heavy duty inserts incorporated on top and bottom, as well as a top plug with a heavy duty insert incorporated on bottom. The unique angled tooth design of the system allows for easy engagement between plug and collar, as well as between plugs. Notable features/benefits are:

- Once engaged the angled tooth design prevents plugs from becoming disengaged by pressure acting on the plugs from below, or being disengaged during the drillout process. A significant improvement over other designs that only mesh against rotation, this lock-down feature is unique to Davis.
- Five-wiper premium quality plugs provide for most efficient casing wiping.
- Type LAPN collars and plugs are field proven for easy drill out with PDC bits.
- System allows for use of multiple bottom plugs or no bottom plugs if desired.
- Davis float shoes are also available with the Type LAPN insert upon request.

Davis Self-Filling Float Shoes and Float Collars

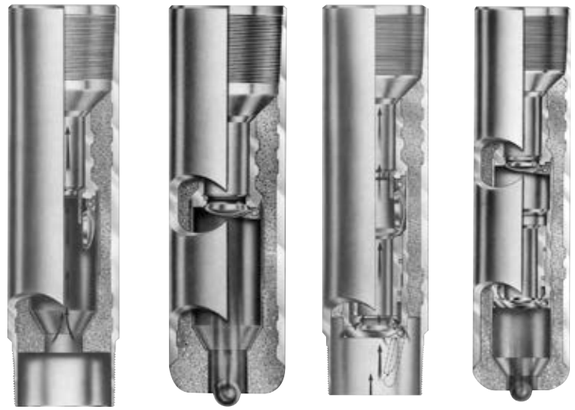
Davis offers three types of self-filling equipment: the pump converted, PVTS valve equipped automatic-fill, the drop ball converted automatic-fill, and the drop ball converted differential-fill. All three types are simple in design to give top-quality performance.

Pump Convert PVTS Automatic Fill-Up Shoes and Collars

The Davis Type 505AD-PVTS automatic fill-up shoe and the Davis Type 705A-PVTS automatic fill-up collar utilize the proven Davis PVTS valve in self-filling equipment. The shoe and collar offer a fixed radial area that allows fluid to enter the casing and seek its own height. This action lowers surge pressures on formations to a minimum, reduces casing running time and, the chances of it sticking are lessened. Casing can be circulated at any time, with low rates, without converting the valve from the fill-up to the back-pressure mode.

Conversion from the fill-up to the back-pressure mode can be accomplished at any time while casing is being run by introducing a pre-determined flow rate to the equipment. Furthermore, if at casing running time it is determined that self-filling equipment is not desirable, the valve can be converted by manually forcing the plunger to its fully open position and removing the three retaining balls. Doing this requires filling the casing from the top as it is run.

Once conversion is carried out, all the benefits of the proven Davis PVTS valve are realized, including PDC bit drillability and high pressure and temperature ratings.



DROP-BALL AUTOFILL

DIFFERENTIAL-FILL

Davis Self-Filling Float Shoes and Float Collars–cont.

Drop Ball Convert Automatic Fill-Up Shoes and Collars

The Davis Type 505AF automatic fill-up shoe and the Davis Type 705AF automatic fill-up collar allow maximum filling of the casing while it is being run in the hole, with the fluid entering the casing free to seek its own level. The filling action reduces casing running time and lowers surge pressures on formations to a minimum. Provided the conversion ball has not been dropped, casing can be circulated at any time without affecting the fill-up operation.

Drop Ball Convert Differential Fill-Up Shoes and Collars

The Davis Type 506 differential fillup shoe and the Davis Type 706 differential fill-up collar allow optimum, metered filling of the casing, while it is being run in the hole. This filling action reduces casing running time, lowers surge pressures on formations, and minimizes the possibility of sticking. Providing the conversion ball has not been dropped, casing can be circulated at any time without affecting the fill-up operation.

Both the differential and the automatic fill-up equipment can be converted from the fill-up to the backpressure mode at anytime during the casing run by dropping the weighted ball furnished with each piece. After allowing sufficient time for the ball to reach the equipment, conversion can be achieved by applying approximately 500 psi of pump pressure. If both a shoe and collar are present in the casing string, the same ball will convert both pieces in two "like-but-separate" actions.

Data for Davis Standard Stock Float Equipment manufactured from K-55 grade material and threaded with API Round-8 or Buttress Connections

Nominal Casing Size (Inches)	Weight Range (Lbs/Ft)	O.D. (Inches)	I.D. (Inches)	Burst (PSI)	Collapse (PSI)
4-1/2	9.5–13.5	5.000	4.031	9,300	9,600
5	11.5–21.0	5.563	4.439	9,720	9,950
5-1/2	14.0–23.0	6.050	4.950	8,750	9,050
7	20.0–38.0	7.656	6.366	8,650	9,000
7-5/8	20.0–39.0	8.500	6.969	8,650	9,000
8-5/8	24.0–44.0	9.625	8.017	8,000	8,400
9-5/8	32.3–53.5	10.625	8.921	7,700	8,100
10-3/4	32.7–55.5	11.750	10.050	6,950	7,350
11-3/4	38.0–65.0	12.750	11.000	6,600	7,000
13-3/8	48.0–72.0	14.375	12.615	5,850	5,850
16	65.0–109.0	17.000	15.250	4,950	4,250
18–5/8	87.5–117.5	20.000	17.755	5,400	5,050
20	94.0–133.0	21.000	19.125	4,250	3,150

Davis-Lock Thread Locking Compound

The Davis-Lock thread locking compound is a strong epoxy-based compound for use on all threaded connections to prevent back-off and loosening of joints. The one-pound kit contains the base, catalyst and applicator.

Davis API Modified Thread Compound

This Davis thread compound conforms to the specifications of API Bulletin 5A2. It is recommended for use on casing, tubing, and in line pipe.

Davis Non-Metallic Thread Compound

This Davis thread compound has been formulated as an environmentally safe replacement for API modified thread compound that will meet or exceed the listed performance objectives in API Bulletin 5A2.

Davis Super-Seal Thread Compound

Davis developed the Super-Seal thread compound to provide long lasting, high pressure sealing on all API threaded joints, especially tubing and casing. The compound contains molydisulfide and TFE resin for a high-pressure seal. Joints coated with Davis Super-Seal hold better and make up easier with less torque and still break clean without damage.