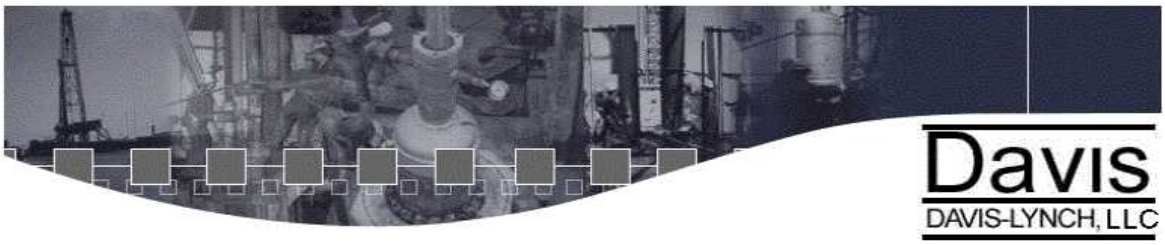


Davis Inner-String Cementing Equipment

Excellent cement jobs at reduced costs have boosted inner-string cementing equipment to the fore-front of operator popularity. Davis was among the first to offer the inner-string systems, and continues today to have the most complete line of systems available in the industry. Davis equipment is designed with a taper in the top of the concrete to guide the adapter on the bottom of the inner-string into the receiver incorporated in the float shoe or collar. All three styles of adapter-to-receiver adjoinments engage dual-seal mechanisms to prevent fluid leakage. The primary seal consists of elastomer seals compressed in a smooth bore. The 45° bearing face affected when the adapter and receiver adjoin creates the secondary seal.

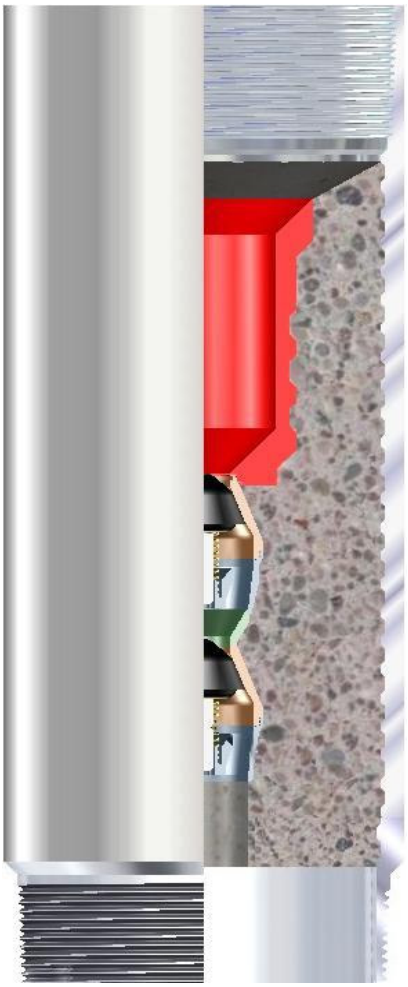
Davis offers three proven systems for inner-string cementing: the Tag-In system, the Screw-In system, and the Latch-In system. The equipment used in these systems can be manufactured in virtually any size and thread, and as single or double-valve float shoes (with or without ports), float collars, and baffle collars.

An option available when ordering Davis inner-string equipment is a latch-down wiper plug. This plug follows the cement and wipes the drill pipe. Once properly latched down, the plug and latch mechanism act to check back pressure, giving additional assurance that cement will be retained in the desired position and the inner-string (drill pipe) can be immediately pulled out of the hole.

Davis is the only company that stocks in local inventories all the accessory items required to perform inner- string cement jobs in a timely and efficient manner. These items include a set of drill pipe bowl and slips, a false rotary plate, and a centralizer to center the drill pipe inside the casing.

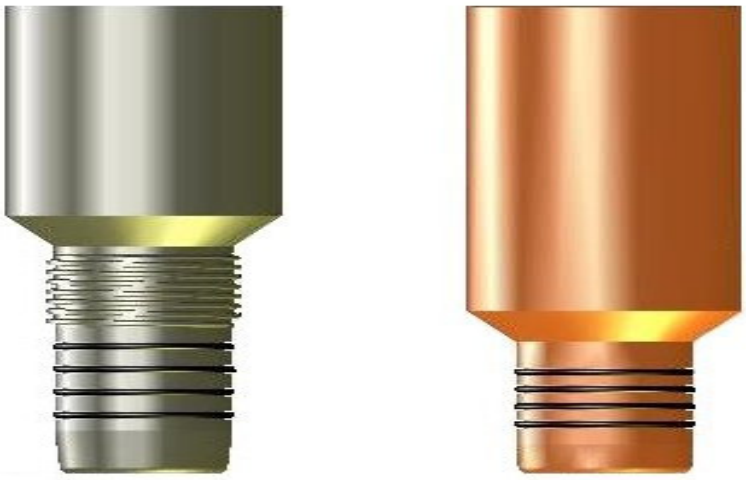
Davis Tag-In Equipment
Tag-In float equipment incorporates a receiver built into the float equipment (shoe or collar) that receives an adapter made up to the bottom of the inner string (usually drill pipe). The tapered concrete finish around the receiver guides the adapter into it. The Type B-122-C Tag-In Adapter is engaged to the receiver by straight-in movement, No rotation is required. Once engaged, a primary and secondary seal are affected. Disengagement of the seal is achieved by picking the adapter up and out of the receiver. Once again, no rotation is required.

A popular choice of equipment for inner-string cementing larger diameter casings, from both onshore and offshore rigs, is the Davis Type 501- PVTS Float Shoe and the Type 700 T-PVTS Tag-In Float Collar. This equipment provides all the benefits that come with inner-string cementing through a float collar, including the option to run one or more shoe joints and the option to displace cement below the float collar without creating a “wet shoe.”



Type 700 DVT-PVTS

For those preferring to inner-string cement through a shoe, Davis offers the Type 501 DVT-PVTS Double- Valve, Down-Jet, Tag-In Float Shoe. This float shoe incorporates all the features and benefits built into the 501-PVTS Float Shoe and the Type 700 T Tag-In Float Collar.



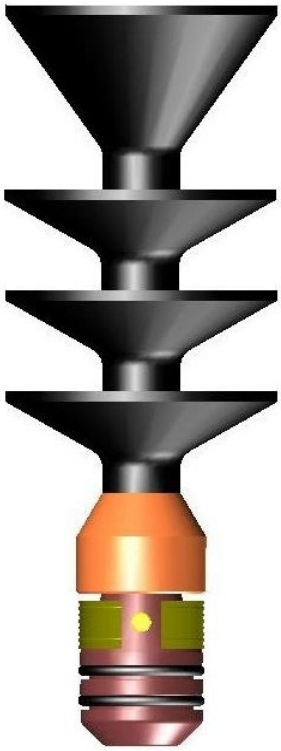
Screw-In Adapter Type B-120-B	Tag-In Adapter Type B-122-C

Pack-Off Head Assemblies
Davis also has available the largest and most complete inventory of casing to drill pipe pack-off heads in the industry, if well hydraulics dictate the use of one when inner-string cementing. These heads are designed to seal the drill pipe/casing annulus and allow pressure to be applied to it. This pressure serves to offset pump pressure that creates collapse loading whenever inner-string cementing operations are conducted.

Pack-Off Head Assembly

Davis Latch-Down Wiper Plug

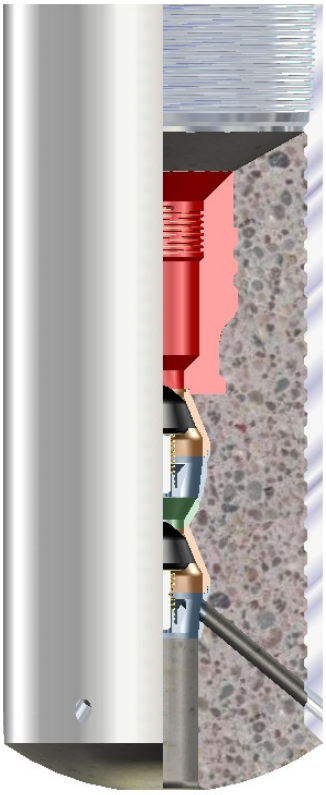
This plug is optional with Davis Tag-in and Screw-in systems whether cementing through a shoe or collar. It is available for all drill pipe sizes and can be manufactured from non-metallic components if drilling out with a PDC bit is intended.



Davis Latch-Down Wiper Plug

Davis Screw-In Equipment

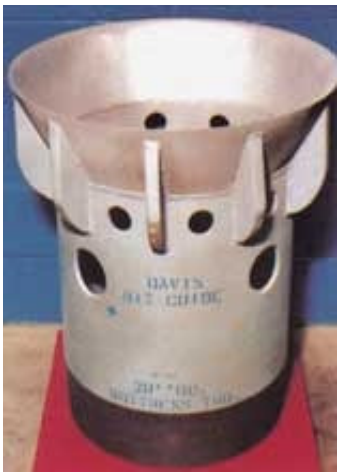
Screw-In float equipment allows the adjoining of the inner-string to the casing at the float equipment. This adjoinment supports the load of the casing, allowing it to be lowered to bottom and inner-string cemented while being reciprocated. The equipment incorporates a strong receiver built into the float equipment (shoe or collar) that is capable of handling loads up to 300,000 pounds. Adjoinment between the Type B-120-B Adapter and the receiver is accomplished by applying left-hand rotation to the inner-string. No torque is required.



Type 501 DVS-PVTS **Type 700 S-PVTS**

Once the receiver and adapter are engaged, primary and secondary seals are affected between the two. Disengagement is attained by applying right-hand rotation to the inner-string while gradually picking it up. Davis Screw-In equipment has created a whole new realm of economical uses with regard to its multiple applications.Among them:

1. Offshore, running and landing of the conductor casing string at either the mudline or the production deck. The string can be landed in tension by utilizing a Davis Drive Pipe Landing Ring and Davis Conductor Casing Hanger. (See graphic opposite page). This allows the operator to effectively seal off the conductor/drive pipe annulus. A second option is to allow the casing string to be landed on bottom or free standing in compression. Either application can save the operator rig time and related costs by eliminating the need for nippling-up well control equipment on the conductor casing string. When conductor casing is suspended on a landing ring, at either the mudline or the production deck, the tapered top of the Davis casing hanger serves as an aid in protecting and guiding the bits to be used for the next hole section into the top of the liner. In addition to this, Davis can customize the top of the casing hanger to receive most brands of conventional mudline suspension or well-head housing equipment. When conductor casing is set on bottom in compression, Davis offers the Type B-125 bit guide (see photo below) that screws into the top of the liner. In addition, Davis manufactures a fluted casing hanger that is designed to land on this bit guide and suspend surface casing. Most brands of conventional, modular mudline suspension equipment can then be placed in the surface casing string for the purpose of landing and suspending ensuing casing strings.



Type B-125 Bit Guide

2. Reciprocating full strings of casing while inner-string cementing. This application has proven extremely effective on geothermal wells where the absence of cement voids in the annulus is exceptionally critical if eventual casing collapse is to be avoided.

3. Setting a large-diameter liner to eliminate the cost of an expensive, conventional liner hanger, and realizing all the benefits inherent in inner-string cementing. As with all Davis inner-string equipment, the Screw-In style is available in several models including the Type 700 S-PVTS for those who prefer cementing through a float collar, and the Type 501 DVS-PVTS for those who prefer cementing through a float shoe.

Davis Special Inner-String Cement Equipment
Davis has available, in either a shoe or collar, open-ended equipment that can be used to conduct inner-string cementing operations. The design of this equipment makes its use advantageous particularly when large-diameter/ thin-walled casings of the type commonly run in storage wells are being cemented. The equipment incorporates two receivers, one to receive the standard Tag-In adapter and one to receive a special latch-down wiper plug that follows cement. A popular choice for this application is the Davis Type 601 TLP Down-Jet, Tag-In Guide Shoe with Latch-Down Plug receptacle. Its open-ended feature allows casing to self-fill as it is run in the well. This eliminates the time that would normally be required to manually fill the casing. Once casing is on bottom, the inner-string is run and seal engagement occurs by use of the standard Tag-In adapter. A Davis Pack-Off Head Assembly is often rigged up at this point. At the conclusion of cement displacement, the special latch-down wiper plug is landed and locked into the shoe. Once latched, this plug provides the back-pressure check that is necessary to retain cement in the desired position.