



Subsurface-Release Large-Bore Plug System For Casing and Liner Sizes 9-5/8 in. to 24 in.

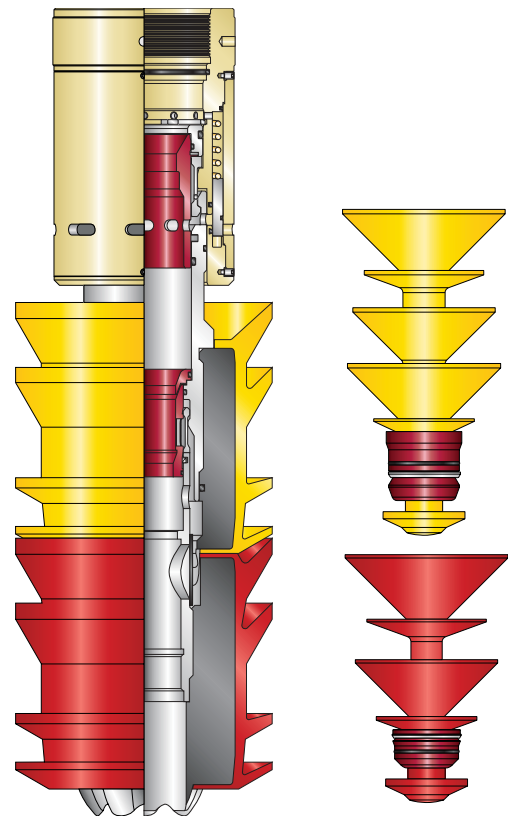
The Weatherford industry-standard subsurface-release, large-bore plug system is particularly advantageous in close-tolerance casing programs. It is run in conjunction with 9 5/8- to 24-in. subsea casing hanger or liner hanger systems in which the minimum drift of the running string is 2.88 in. The plugs have a 2.41-in. internal bore to enable the passage of 2 1/4-in. trip balls, improve fluid-flow capacity, and reduce surge pressures on weak formations when the plug system is used with Weatherford autofill float equipment. The patented, integral pressure-equalizer prevents pressure buildup above the plugs to prevent premature release.

The large-bore bottom dart is pumped from the surface in front of cement slurry and latches into the bottom plug. The bottom plug is released and lands on compatible float equipment below. Then applied pressure ruptures the rupture disk in the plug to re-establish circulation.

The large-bore top dart is pumped behind the cement slurry. When the dart lands in the top plug, that plug is released and wipes the casing ID clean of cement before it bumps on the top of the bottom plug, which indicates cement displacement.

In the unlikely event that the top and bottom plugs are released simultaneously, the integral emergency bypass feature enables fluid to bypass the plug set and flow into the shoe track. This feature ensures continuation of cement displacement.

Weatherford subsurface-release, large-bore plugs are constructed primarily of polyurethane and are available with either standard or combination fin designs. A patented interlocking mechanism secures the plugs against compatible float equipment and prevents the plugs from rotating during drill-out, which significantly reduces the time required for drill-out and running in the hole.



Subsurface-release large-bore system uses a red color-code to ensure correct use of a dart with its corresponding plug.



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Applications

- Any liner requiring a dual-plug system configuration to provide fluid separation during cementing operations
- Tight-tolerance liners that require the largest possible bore through the running string
- Especially beneficial when radial clearance between casing strings is less than or equal to 0.125 in.
- Compatible and recommended for use with the Weatherford Sure-Seal™ 3 and 402/P/NP autofill equipment
- Liners run in pressure-sensitive formations

Features, Advantages, and Benefits

- The large-bore plug system reduces surge pressures while running a liner with autofill equipment in close-tolerance annuli. This protects sensitive formations from surge pressures that can cause mud losses and ultimately saves time and rig costs.
- The patented, integrated pressure-equalizer prevents pressure buildup above the plugs to avert premature release. It also enables rotation of the running string without rotation of the plugs to prevent damage to the plug fins.
- The 2.41-in. large-bore enables 2 1/4-in. trip balls to pass through and activate float equipment below the plug. For float equipment requiring a smaller (2-in.) trip ball activation, see the Weatherford subsurface release mid-bore plug system.
- Two large 1.97-in. (50-mm) rupture disks in the bottom plug minimize the risk of plugging with solids or debris to ensure system reliability.
- In the event the dual plugs are released simultaneously by the bottom dart, the integral emergency bypass feature enables fluid to bypass the plug set and flow into the shoe track. This ensures continued cement displacement.
- Plugs are released by darts that maintain fluid separation through the drillpipe to prevent cement contamination.
- The system is polycrystalline diamond composite (PDC)-drillable and has a Wiperlok® nonrotation profile that prevents rotation of the plugs during drillout of the float equipment. This design simplifies drillout to save rig time.
- Polyurethane plug fins offer superior abrasion resistance and excellent wiping action. This results in a clean casing ID after passage.



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Specifications

Plug sizes (in., mm)		9-5/8 244.5	10-3/4 to 11-3/4 273.1 to 298.5	13-3/8 to 14 339.7 to 355.6	16 to 24 406.4 to 609.6
Maximum plug-bump pressure (psi, MPa)		6,000 41.37	5,500 37.92	5,000 34.47	3,000 20.68
Bottom-plug launch pressure (psi, MPa)		800 to 1,200 5.52 to 8.27			
Top-plug launch pressure (psi, MPa)	High pressure	2,000 to 2,500 13.79 to 17.24			
	Low pressure	800 to 1,200 5.52 to 8.27			
Minimum plug ID (in., mm)		2.41 61.21			
Minimum flow area (in ² ., mm ²)		4.56 2,941			
Maximum rigid-dart diameter (in., mm)		2.84 72.14			
Minimum pump-through drift diameter for dart (in., mm)		2.88 73.2			
Flow endurance (bbl/min)		27 for 4 hours / 18 for 16 hours			
Maximum circulating temperature rating (°F, °C)		257 125			
Maximum temperature for bump pressure (°F, °C)		257 125			
Pressure required to open equalizer (psi, MPa)		30 to 60 0.21 to 0.41			

Options

- Plug sets are available in standard or combination plug fin designs.
- A top plug is available for high- or low-pressure applications.
- An optional ball catcher enables a 1 1/2- to 2-in. setting ball to be caught and retained in the bottom plug.