

Hunting's glass disc Underbalance Sub uses a heat treated frangible disc barrier to isolate the tubing from the annulus allowing for a differential pressure necessary for underbalance perforating or post perforation surging. The glass disc shatters when impacted by a drop bar. The bar continues down the tubing to actuate the firing head and initiate detonation of the gun assembly. As there is no more barrier, fluids are allowed to rush into the essentially dry tubing providing a surge that has the potential to clean out the perforation tunnels improving productivity.

The desired underbalance can be achieved in several ways. The most common method is to top up the tubing while running in hole until the required fluid level is reached. Once the Underbalance Sub is connected, the gun assembly is continually run in the hole keeping the tubing dry. This approach can complicate wireline correlation operations as the tools may not be able to go to a sufficient depth.

An alternate method places the Underbalance Sub at least 30ft above the firing head or packer, depending on setup, and the tubing filled with fluid to the desired level. The advantage of this technique is that wireline correlation tools can be used to determine where the fluid level is in the tubing. A ported sub needs to be run below the underbalance sub to allow fluid flow into the tubing string.

APPLICATIONS

- Underbalanced TCP perforating

FEATURES

- Heat treated glass used to make strong, durable discs
- Can be run above or below a packer

BENEFITS

- Affordable method for achieving underbalance
- Glass discs available in various thicknesses enhancing reliability

UNDERBALANCE SUB HARDWARE SPECIFICATIONS

Tubing Size (in)[mm]	2-3/8 [60] EUE	2-7/8 [68] EUE	3-1/2 [89] EUE
O.D. (in)[mm]	3.13 [79]	3.67 [93]	4.25 [108]
I.D. (in)[mm]	1.90 [46]	2.35 [60]	2.35 [60]
Makeup Length (ft)[m]	0.42 [0.13]	0.39 [0.12]	0.48 [0.15]
Max. 100 Hour Temperature Rating (°F)[°C]†	400 [204]	400 [204]	400 [204]
Max. Operating Pressure (psi)[MPa]	20,000 [138]	20,000 [138]	20,000 [138]
Max. Differential Pressure (psi)[MPa]			
3/8" (10mm) Glass	2,250 [16]	-	-
1/2" (13mm) Glass	3,500 [24]	3,000 [21]	3,000 [21]
3/4" (19mm) Glass	7,500 [52]	4,500 [31]	4,500 [31]
Max. Tension (lbf)[kN]	220,000 [979]	280,000 [1246]	450,000 [2,002]

† Hardware only. Viton O-rings need to be used above 325°F (163°C)

ASSEMBLY PART NUMBERS

Tubing Size (in)[mm]	Glass Thickness (in)[mm]	①	②	③	Redress Kit Part Number
		Underbalance Sub Assembly†	Glass Disc‡	O-Ring§	
2-3/8 [60] EUE	3/8 [10]	0492-232-000	0492-000-027	0111-137-090	0492-232-002
	1/2 [13]	0492-231-000	0492-000-025	0111-137-090	0492-231-002
	3/4 [19]	0492-230-000	0492-000-024	0111-137-090	0492-230-002
2-7/8 [68] EUE	1/2 [13]	0492-281-000	0492-000-015	0111-145-090	0492-281-002
	3/4 [19]	0492-280-000	0492-000-014	0111-145-090	0492-280-002
3-1/2 [89] EUE	1/2 [13]	0492-361-000	0492-000-015	0111-145-090	0492-281-002
	3/4 [19]	0492-360-000	0492-000-014	0111-145-090	0492-280-002

† Includes glass disc and O-ring

‡ Expendable items

§ Viton O-rings need to be used above 325°F (163°C)

