Armor Combo Rupture Disc Tool®

Protecting Your "Assets"

The Armor Combo Rupture Disc Tool® was invented as a safe, efficient and economical way to combine both a Rupture Disc® and a specific profile together as one tool. This revolutionary design is accepted and utilized by the Oil and Gas Industry in the Canadian Western Basin for years and is promoted by the snubbing industry.

This Armor Combo also works in conjunction with the Armor Single Barrier Rupture Disc Tool® to become a dual barrier system, creating the process safety environment we all strive for in our industry.

Once the tubing string is at your required depth, the Armor Rupture Disc® can be removed by simply overcoming differential pressure within the tubing string.
(See data sheet for Rupturing differential)

Features & Benefits

- ✓ Designed specifically for the live well control industry (Snubbing)
- ✓ Available in 5k, 10k & 15K pressure ratings
- ✓ Available (stocked items) in (1.87 AOXN / AORN), (1.87 AOX / AOR) & (2.31 AOX & 2.31 AOXN)(A) = Armor (O) = Otis®
- ✓ All Rupture Disc Tools® are manufactures using L-80 MTRL (Sour Service Rated)
- ✓ Anti-Rotation set screws prevent threads from disengaging during downhole tool retrieval (packers/bridge plugs)
- ✓ New Body Torque through capability (See spec sheet for maximum allowed torque)
- ✓ Patented Rupture Disc® with Bore ID separation groove & shatter pattern
- ✓ New and improved Lo-Hi pressure seal engaging design (Patent Pending)
- ✓ Special Clearance design available while maintaining Engineered ratings
- ✓ All Combo Rupture Discs Tools® are pressure tested, charted and serialized for full traceability
- ✓ With Snubbing's new fully guided systems the Combo Rupture Disc Tool® system reduces BHA length, thus simplifying snubbing operations.
- ✓ Eliminates wireline operations while running in highly deviated wells
- ✓ Eliminates accidental plug release, increasing safety during well control operations
- ✓ Eliminates excess wireline operations due to miss runs, debris (sand) etc.
- ✓ Approved for single and dual barrier applications (Snubbing IRP 15 Plug Matrix)
- ✓ Customers can special order any size, profile, material, threads, coatings or special hardenings
- ✓ Drifted and Lockset tested with calibrated Genuine Otis® tools
- ✓ Comparable Otis® Profiles Otis® is a registered trademark of Halliburton Energy Services
- ✓ ISO Compliant

Recommended Handling &Running Procedures:

1. Insure the Rupture Disc Tool is transported from the Manufacture to the End User location in "Safe Trip Package"
2. Equalize the outer side of the BHA in a slow consistent manner.
3. Apply fluid equivalent to ½ joint above the Rupture Disc®. Fluid cushion can protect the Rupture Disc® from objects that may accidently drop down the inner bore.

Patent No.

CA 2,762,730 - US 9,540,904

NOT FOLLOWING THE OUT LINED RECOMMENDATIONS COULD RESULT IN PRODUCT FAILURE

ARMOR TOOLS INTL

Armor Combo Rupture Disc Tool®

TOOL DESCRIPTION inch (mm)	TOOL O.D. Standard Clearance inch (mm)	TOOL O.D. Special Clearance inch (mm)	TOOL I.D. inch (mm)	CONCAVE SIDE psi (mpa) Rupturing differential	CONVEX SIDE psi (mpa) Disc Rating
2-3/8 (60.3)*	3.063 (77.8)	2.90 (73.66)	1.905 (48.4)	500 (3447)	5,000 (34.5)*
2-3/8 (60.3)*	3.063 (77.8)	2.90 (73.66)	1.905 (48.4)	750 (5171)	10,000 (68.9)*
2-3/8 (60.3)**	3.063 (77.8)	2.90 (73.66)	1.905 (48.4)	1,000 (6894)	15,000 (103.4)**
2-7/8 (73.0)*	3.66 (92.96)	3.46 (87.88)	2.45 (62.2)	500 (3447)	5,000 (34.5)*
2-7/8 (73.0)*	3.66 (92.96)	3.46 (87.88)	2.45 (62.2)	750 (5171)	10,000 (68.9)*
2-7/8 (73.0)**	3.66 (92.96)	3.46 (87.88)	2.45 (62.2)	1,000 (6894)	15,000 (103.4)**

***Denotes L80 (NACE Sour Service)Material and **Denotes P110 (Non-Sour Service)**

Material required to meet Engineered Tool Burst Ratings

Comparable Otis® Profiles Otis® is a registered trademark of Halliburton Energy Services

	COMBO RUPTURE DISC® SPECIFICATIONS				COMBO RUPTURE DISC®SPECIAL CLEARANCE (SC)			
DESCRIPTION	**2-3/8 (60.3mm)**		**2-7/8 (73mm)**		**SC 2-3/8 (60.3mm)**		**SC 2-7/8 (73mm)**	
Maximum OD	3.063 in	77.8 mm	3.69 in	93.6 mm	2.90 in	73.66 mm	3.46 in	87.88 mm
Overall Length	18.373 in	466.67 mm	18.242 in	463.35 mm	18.373 in	466.67 mm	18.242 in	463.35 mm
Pressure Options	5,000 psi (34.45 Mpa)*		10,000 psi (68.9 Mpa)*		15,000psi (103.35 Mpa)**			
Min & Max Temp.	-40c (-40F) 160c (320F) with HSN (Sour Service) seals. Temperature rated seals above 160c (320F) can be supplied upon request							
Tensile Strength*	141 200 lbs	62.808 daN	170 000 lbs	75.650 daN	81 200 lbs	36.120 daN	122 000 lbs	54.290 daN
Tensile Strength**	194 100 lbs	86.340 daN	234 000 lbs	104.130 daN	111 700 lbs	49.687 daN	168 000 lbs	74.760 daN
Internal Yield Pressure*	13 900 psi	95.84 Mpa	14500 psi	99.97 Mpa	10 300 psi	71.02 Mpa	10 700 psi	73.77 Mpa
Internal Yield Pressure**	19 200 psi	132.38 Mpa	19900 psi	137.20 Mpa	14 200 psi	97.91 Mpa	14 700 psi	101.35 Mpa
Collapse Pressure*	12 700 psi	87.56 Mpa	13200 psi	91.01 Mpa	8 600 psi	59.29 Mpa	9 200 psi	63.43 Mpa
Collapse Pressure**	17 500 psi	120.66 Mpa	18100 psi	124.79 Mpa	10 700 psi	73.77 Mpa	11 600 psi	79.97 Mpa
Torque Through Body Specs-L80	Must not exceed 2593 ft-lbs		Must not exceed 4606 ft-lbs		Must not exceed 1367 ft-lbs		Must not exceed 2759 ft-lbs	
Connection	2-3/8 in (60.3mm) EUE		2-7/8 in (73mm) EUE		SC 2-3/8 in (60.3mm) EUE		SC 2-7/8 in (73 mm) EUE	
AOX Profile	1.875 in	47.63 mm	2.318"	58.88 mm	1.875 in	47.63 mm	2.318 in	58.88 mm
AOXN Profile	1.875 in	47.63 mm	2.318"	58.88 mm	1.875 in	47.63 mm	2.318 in	58.88 mm
No Go (AXN)	1.79 in	45.47 mm	2.208"	56.08 mm	1.79 in	45.47 mm	2.208 in	56.08 mm
AOR Profile	1.875 in	47.63 mm			1.875 in	47.63 mm		
AORN Profile	1.875 in	47.63 mm			1.875 in	47.63 mm		
No Go (ARN)	1.716 in	43.59 mm			1.716 in	43.59 mm		
Material/Metal*	L80 NACE*	L80 NACE*	L80 NACE*	L80 NACE*	L80 NACE*	L80 NACE*	L80 NACE*	L80 NACE*
Material/Metal**	P110**	P110**	P110**	P110**	P110**	P110**	P110**	P110**