

MAXIMUM ANTICIPATED SURFACE PRESSURE

WD=	3,490
RKB-ML=	3,562

**Example:** TD at 31,150' TVD RKB, Rig floor at 0' TVD RKB. Distance = 31,150' TVD  
 1/2 of distance is mud on bottom = 15,575' and 1/2 gas on top = 15,575'  
 Interface depth between gas and mud is therefore 31,150' / 2 = 15,575' TVD from surface  
 MASP = 25,917 psi - (16.2 ppg mud \* 0.052 \* 15,575 TVD) - (0.1475 psi/ft \* 15,575')  
 MASP = 10,499 psi

Net Burst at WH based on MAWP in line 26 reduced by SW backup

22" CASING TEST CALCULATIONS					
Size	Wt/ft	Grade	Conn	Burst	Collapse
22	170.21	X-60	S-60MT	3580	1816
70% Internal Yield of Weakest Casing =				2506	
<b><u>Considering Internal Yield Test @ Mudline</u></b>					
Top of casing TVD=				3602	
Test mud weight=				8.6	
Pore pressure=				8.6	
Differential pressure= $(8.6 - 8.6) * 0.052 * 3602 =$				0	
Test pressure top casing= $2506 - 0 =$				2506	
<b><u>Considering Internal Yield Test @ Shoe</u></b>					
Btm of casing TVD=				6,300	
Test mud weight=				8.6	
Pore pressure=				11.2	
Differential pressure= $(8.6 - 11.2) * 0.052 * 6300 =$				-852	
Test pressure top casing= $2506 - -852 =$				3358	
<b><u>However, Considering the MAWP:</u></b>					
MAWP + 500 psi= 3445 + 500 psi=				3945	
Shoe Test pressure= $(11.9 - 8.6) * 0.052 * 6300 + 200$ psi=				1279	
<b><u>Therefore:</u></b>					
Plan test pressure is lesser of the above, greater than shoe test				2506	
Test casing to	2600	psi for 30 min. with		8.60	ppg mud
<b><u>Notes:</u></b> 1. Casing test pressures are based on the lower of MAWP + 500 psi (reduced by choke line hydrostatic) or 70% internal yield less differential of test mud weight and pore pressure behind casing.					
2. Actual test pressure will be calculated based on actual mud weight					
Test pressure will be greater than shoe test in all cases.					
<b>22" CONDUCTOR</b>					

17-7/8" CASING TEST CALCULATIONS				
Size	Wt/ft	Grade	Conn	Burst
22	170.21	X-60	S-60MT	3580
17 7/8	93.50	P-110HC	Hydril 521	5380
70% Internal Yield of 22" Casing =				2506
70% Internal Yield of 17.875" Casing =				3766
<u>Considering Internal Yield Test @ Mudline</u>				
Top of casing TVD=				5800
Test mud weight=				11.6
Pore pressure=				11.60
Differential pressure= $(11.6 - 11.6) * 0.052 * 5800 =$				0
Test pressure= $2506 - 0 =$				2506
<u>Considering Internal Yield Test @ Shoe</u>				
Btm of casing TVD=				7800
Test mud weight=				11.6
Pore pressure =				11.5
Differential pressure= $(11.6 - 11.5) * 0.052 * 7800 =$				41
Test pressure= $3766 - 41 =$				3725
<u>However, Considering the MAWP:</u>				
MAWP + 500 psi= $3445 + 500 =$				3945
<u>Current Liner Top Test</u>				
17 7/8 Liner top test= $(11.9 - 11.6) * 0.052 * 6300 + 500 =$				598
<u>Current Shoe Test</u>				
Shoe Test pressure= $(14.5 - 11.6) * 0.052 * 7800 + 200 \text{ psi} =$				1376
<u>Therefore:</u>				
Test casing to be greater than shoe test or minimum of test pressure or liner top testing				2506
Test casing:	2600	for 30 min. with		11.6 ppg mud
Note: Actual test pressure will be calculated based on actual mud weight				
18" Surface CASING				

**18" Surface CASING**

<b>16" CASING TEST CALCULATIONS</b>				
Size	Wt/ft	Grade	Conn	Burst
16.040	109.61	HCQ-125HP	SLSF	10385
16	97.00	HCQ-125	SLSF	8733
70% Internal Yield of 16.04" Casing =				7270
70% Internal Yield of 16" Casing =				6113
<b><u>Considering Internal Yield Test @ Mudline</u></b>				
Top of casing TVD=				3602
Test mud weight=				14.2
Pore pressure=				8.55
Differential pressure= (14.2 - 8.55) * 0.052 * 3602=				1056
Test pressure= 7269.5 - 1056=				6214
<b><u>Considering Internal Yield Test @ Shoe</u></b>				
Btm of casing TVD=				15500
Test mud weight=				14.2
Pore pressure =				14.0
Differential pressure= (14.2 - 14) * 0.052 * 15500=				161
Test pressure= 6113.1 - 161=				5952
<b><u>However, Considering the MAWP:</u></b>				
MAWP+ 500 psi= 9464 + 500 =				9964
<b><u>Therefore:</u></b>				
Plan test pressure is lesser of the above=				5952
Shoe Test pressure=( 16.3 - 14.2)*.052*15500+200 psi =				1893
<b><u>Future Liner pressure tests</u></b>				
<i>However, for future liner testing:</i>				
Test 13.625 liner to	2300	psi for 30 min. with	15.5	ppg mud
Equates to casing test to	3348	psi for 30 min. with	14.2	ppg mud
Test 11.875 liner to	2100	psi for 30 min. with	15.60	ppg mud
Equates to casing test to	3228	psi for 30 min. with	14.2	ppg mud
<b><u>Therefore:</u></b>				
Plan test pressure is maximum of the above =				5952
Test casing:	6000	psi for 30 min. with	14.2	ppg mud
<b>Note: Actual test pressure will be calculated based on actual mud weight</b>				
Casing				
<b>16" CASING</b>				

casing

13-5/8" LINER TEST CALCULATIONS				
Size	Wt/ft	Grade	Conn	Burst
13.625	88.2	Q-125HC	SLSF	10030
16	97.0	Q-125	SLSF	8733
70% Internal Yield of 13.625" Casing =				7021
70% Internal Yield of 16" Casing =				6113.1
<u>Considering Internal Yield Test @ Mudline</u>				
Top of casing TVD=				3,602 (TOP)
Test mud weight=				15.5
Pore pressure=				8.60
Differential pressure= (15.5 - 8.6) * 0.052 * 3602=				1292
Test pressure= 6113.1 - 1292=				4821
<u>Considering Internal Yield Test @ 13 5/8" Shoe</u>				
Btm of casing TVD=				22,000 (BOTTOM)
Test mud weight=				15.5
Pore pressure=				15.40
Differential pressure= (15.5 - 15.4) * 0.052 * 22000=				114
Test pressure= 7021 - 114=				6907
<u>However, Considering the MAWP:</u>				
MAWP + 500 psi= 9464 + 500 psi =				9964
<u>Current Liner Top Test</u>				
13.625 Liner top test=( 16.3 - 15.5)*.052*15200+500=				1132
<u>Therefore:</u>				
Plan test pressure is lesser of the above=				1132
<u>Shoe Test</u>				
Shoe Test pressure=( 16.7 - 15.5)*.052*22000+200 psi =				1573
<u>Future Liner pressure tests</u>				
Test 11.875 liner to	2100	psi for 30 min. with	15.60	ppg mud
Equates to 13.625 liner test to	2214	psi for 30 min. with	15.5	ppg mud
<u>Therefore:</u>				
Test casing to be greater than minimum test pressure or shoe or future liner top testing				2214
Test casing to	2300	psi for 30 min. with	15.5	ppg mud
<u>Notes:</u> 1. Casing test pressures are based on the lower of MAWP + 500 psi, 70% internal casing yield less differential of test mud weight and pore pressure behind casing, or liner top plus 500 psi. Test pressure will be <b>200 psi greater than shoe test</b>				
2. Actual test pressure will be calculated based on actual mud weight				
<b>13-5/8" LINER</b>				

11.875" LINER TEST CALCULATIONS					
Size	Wt/ft	Grade	Conn	Burst	
11.875	71.8	HCQ-125	Hydril 513	10720	
16	97.0	Q-125	SLSF	8733	
70% Internal Yield of 11.875" Casing =				7504	
70% Internal Yield of 16" Casing =				6113.1	
<u>Considering Internal Yield Test @ Mudline</u>					
Top of casing TVD=				3,602	
Test mud weight=				15.60	
Pore pressure=				8.60	
Differential pressure= (15.6 - 8.6) * 0.052 * 3602=				1311	
Test pressure= 6113.1 - 1311=				4802	
<u>Considering Internal Yield Test @ Shoe</u>					
Btm of casing TVD=				26,000	
Test mud weight=				15.60	
Pore pressure=				15.50	
Differential pressure= (15.6 - 15.5) * 0.052 * 26000=				135	
Test pressure= 7504 - 135=				7369	
<u>However, Considering the MAWP surface:</u>					
MAWPsurf + 500 psi=		9464 + 500 =		9964	psi
11 7/8 Liner top test=( 16.7 - 15.6)*.052*21700+500=				1741	psi
<u>Therefore:</u>					
Plan test pressure is lesser of the above=				1741	
11 7/8 Shoe Test pressure=( 17 - 15.6)*.052*26000+200=				2093	
<u>Future Liner pressure tests</u>					
Test 9.375 liner to	#REF!	psi for 30 min. with		16.2	ppg mud
Equates to 11.875 liner test to	#REF!	psi for 30 min. with		15.6	ppg mud
<u>Therefore:</u>					
Test casing to be greater than minimum test pressure or shoe or future liner top testing					
Plan test pressure =				2093	psi
Test casing to	2100	psi for 30 min. with		15.6	ppg mud
<u>Notes:</u> 1. Casing test pressures are based on the lower of MAWP + 500 psi, 70% internal casing yield less differential of test mud weight and pore pressure behind casing, or liner top plus 500 psi. Test pressure will be 200 psi greater than shoe test					
2. Actual test pressure will be calculated based on actual mud weight					
11.875" Liner					