

Guardian™ HPHT Composite Frac Plug

unmatched 15,000 psi isolation at 350°F

Technical Specifications

Benefits

- Less than 8 inch length results in 75% less material than traditional plugs drastically increasing milling performance.
- Expandable tubular aluminum metal-to-metal sealing technology provides unmatched isolation performance up to 15 kpsi at 350°F.
- No cast iron, brass or tungsten parts and 0.25 inch powdered steel or ceramic buttons resulting in increased milling bit life and minimal casing damage.
- Ball-in-place capable with a three piece WLAK.



Performance

- 15,000 psi differential pressure rating at 350°F. As differential pressure increases the seal effectiveness and anchoring capability also increases.
- Can be set in Q125 and all softer grades of casing.
- Two to six minute mill time with low WOB.
- 0.25 inch diameter buttons have 72% less mass than a 0.38 inch diameter button drastically improving coil torque and drag and circulation times.

4.5 inch, 3.45OD, 13.5-17.0 ppf Guardian™ HPHT Frac Plug

Technical Specifications



PN: 45FP1315GXB345-AB			
Plug Specifications			
OD	3.450 inch		
ID	1.100 inch		
Length	7.000 inch		
Type	Frac		
Pressure Rating	Weight	Top	Bottom
	12.6 ppf	13 kpsi	9500 psi
	13.5 ppf	14 kpsi	11 kpsi
	15.1 ppf	15 kpsi	12 kpsi
17.0 ppf	16 kpsi	12 kpsi	
Ball Specifications			
Ball in Place OD	1.375 inch		
Ball Drop OD	2.125 inch		
Material	50% GF Nylon 1.4 SG		
Setting Tool			
Baker 10	WLAK	B10xGX45-AB	
	Sleeve	B10xFPB45-S	
	Adapter	B10xFPB45-A	
	Mandrel	B10xGX45-M	
	Nut	B10xFPB45-N	
Assurity 10	WLAK	S25xGX45-AB	
	Sleeve	S25xFPB45S-S	
	Adapter	S25xFPB45-A	
	Mandrel	S25xGX45-M	
	Nut	S25xFPB45-N	

Annular Velocities During Free Fall (ft/min)			
Line Speed (ft/min)	4.5 inch 13.5 ppf	4.5 inch 15.1 ppf	4.5 inch 17 ppf
100	344	435	571
200	687	870	1142
300	1031	1305	1713
400	1374	1740	2283
500	1718	2175	2854
600	2062	2610	3425
700	2405	3045	3996
800	2749	3481	4567
900	3093	3916	5138
1000	3436	4351	5708
1100	3780	4786	6279
1200	4123	5221	6850
1300	4467	5656	7421
1400	4811	6091	7992
1500	5154	6526	8563

Procedures	
Baker 10	OP-PRO-3P-FP-GXB-ALL-A
Assurity 10	
Screenout and Misrun Recovery	
Plug Milling	

Recommended Run Speeds		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
4.5 inch 13.5 ppf	Fluid Speed (ft/min)	335	402	469	535	602	669	736	803	870	937	1004	1071	1138	1205	1272	1339	1406	1473	1540
	Suggested Line Speed (ft/min)	284	341	398	455	512	569	626	683	740	797	853	910	967	1024	1081	1138	1195	1252	1309
4.5 inch 15.1 ppf	Fluid Speed (ft/min)	351	422	492	562	632	703	773	843	913	984	1054	1124	1195	1265	1335	1405	1476	1546	1616
	Suggested Line Speed (ft/min)	299	358	418	478	538	597	657	717	776	836	896	956	1015	1075	1135	1195	1254	1314	1374
4.5 inch 17.0 ppf	Fluid Speed (ft/min)	368	441	515	588	662	735	809	882	956	1029	1103	1177	1250	1324	1397	1471	1544	1618	1691
	Suggested Line Speed (ft/min)	313	375	438	500	563	625	688	750	813	875	938	1000	1063	1125	1188	1250	1313	1375	1438

4.5 inch, 3.60OD, 10.5-11.6 ppf Guardian™ HPHT Frac Plug

Technical Specifications



PN: 45FP1113GXB360-AB			
Plug Specifications			
OD	3.600 inch		
ID	1.100 inch		
Length	7.000 inch		
Type	Frac		
Pressure Rating	Weight	Top	Bottom
	5 inch	12 kpsi	9000 psi
	24.1 ppf	13 kpsi	9500 psi
	11.6 ppf	14 kpsi	9900 psi
	12.6 ppf	14 kpsi	11 kpsi
13.5 ppf			
Ball Specifications			
Ball in Place OD	1.375 inch		
Ball Drop OD	2.125 inch		
Material	50% GF Nylon 1.4 SG		
Setting Tool			
Baker 10	WLAK	B10xGX45-AB	
	Sleeve	B10xFPB45-S	
	Adapter	B10xFPB45-A	
	Mandrel	B10xGXB45-M	
	Nut	B10xFPB45-N	
Assurity 10	WLAK	S25xGXB45-AB	
	Sleeve	S25xFPB45S-S	
	Adapter	S25xFPB45-A	
	Mandrel	S25xGXB45-M	
	Nut	S25xFPB45-N	

Annular Velocities During Free Fall (ft/min)			
Line Speed (ft/min)	4.5 inch 11.6 ppf	4.5 inch 13.5 ppf	4.5 inch 15.1 ppf
100	290	344	435
200	581	687	870
300	871	1031	1305
400	1162	1374	1740
500	1452	1718	2175
600	1743	2062	2610
700	2033	2405	3045
800	2324	2749	3481
900	2614	3093	3916
1000	2905	3436	4351
1100	3195	3780	4786
1200	3486	4123	5221
1300	3776	4467	5656
1400	4067	4811	6091
1500	4357	5154	6526

Procedures	
Baker 10	OP-PRO-3P-FP-GXB-ALL-A
Assurity 10	
Screenout and Misrun Recovery	
Plug Milling	

Recommended Run Speeds		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
4.5 inch 11.6 ppf	Fluid Speed (ft/min)	321	386	450	514	579	643	707	771	836	900	964	1029	1093	1157	1221	1286	1350	1414	1479
	Suggested Line Speed (ft/min)	273	328	383	437	492	546	601	656	710	765	820	874	929	984	1038	1093	1148	1202	1257
4.5 inch 13.5 ppf	Fluid Speed (ft/min)	335	402	469	535	602	669	736	803	870	937	1004	1071	1138	1205	1272	1339	1406	1473	1540
	Suggested Line Speed (ft/min)	284	341	398	455	512	569	626	683	740	797	853	910	967	1024	1081	1138	1195	1252	1309
4.5 inch 15.1 ppf	Fluid Speed (ft/min)	351	422	492	562	632	703	773	843	913	984	1054	1124	1195	1265	1335	1405	1476	1546	1616
	Suggested Line Speed (ft/min)	299	358	418	478	538	597	657	717	776	836	896	956	1015	1075	1135	1195	1254	1314	1374

5.5 inch, 4.25OD, 20-26 ppf Guardian™HPHT Frac Plug

Technical Specifications



PN: 55FP2026GXB425-AB			
Plug Specifications			
OD	4.250 inch		
ID	1.400 inch		
Length	7.950 inch		
Type	Frac		
Pressure Rating	Weight	Top	Bottom
	20 ppf	13 kpsi	8500 psi
	23 ppf	15 kpsi	9100 psi
	26 ppf	15 kpsi	9900 psi
Ball Specifications			
Ball in Place OD	1.625 inch		
Ball Drop OD	2.125 inch		
Material	50% GF Nylon 1.45G		
Setting Tool			
Baker 20	WLAK	B20xGXB55-AB	
	Sleeve	B20xFPB55-S	
	Adapter	B20xFPB55-A	
	Mandrel	BK20xGXB55-M	
	Nut	B20xFPB55-N	
Assurity 20	WLAK	S35xGXB55-AB	
	Sleeve	S35xFPB55-S	
	Adapter	S35xFPB55-A	
	Mandrel	S35xGXB55-M	
	Nut	S35xFPB55-N	

Annular Velocities During Free Fall (ft/min)			
Line Speed (ft/min)	5.5 inch 17 ppf	5.5 inch 20 ppf	5.5 inch 23 ppf
100	378	484	656
200	756	969	1311
300	1133	1453	1967
400	1511	1937	2622
500	1889	2422	3278
600	2267	2906	3933
700	2644	3390	4589
800	3022	3875	5245
900	3400	4359	5900
1000	3778	4843	6556
1100	4155	5328	7211
1200	4533	5812	7867
1300	4911	6297	8522
1400	5289	6781	9178
1500	5666	7265	9834

Procedures	
Baker 20	OP-PRO-3P-FP-GXB-ALL-A
Assurity 20	
Screenout and Misrun Recovery	
Plug Milling	

Recommended Run Speeds																				
Pump Rate (bpm)		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	21	
5.5 inch 17 ppf	Fluid Speed (ft/min)	215	258	301	344	387	430	473	516	559	602	645	688	731	774	817	860	903	946	989
	Suggested Line Speed (ft/min)	107	129	150	172	193	215	236	258	279	301	322	344	365	387	408	430	451	473	494
5.5 inch 20 ppf	Fluid Speed (ft/min)	225	270	315	360	405	451	496	541	586	631	676	721	766	811	856	901	946	991	1036
	Suggested Line Speed (ft/min)	191	230	268	306	345	383	421	460	498	536	574	613	651	689	728	766	804	843	881
5.5 inch 23 ppf	Fluid Speed (ft/min)	236	283	330	377	424	472	519	566	613	660	707	755	802	849	896	943	990	1038	1085
	Suggested Line Speed (ft/min)	200	241	281	321	361	401	441	481	521	561	601	641	682	722	762	802	842	882	922

5.5 inch, 4.35OD, 17-23 ppf Guardian™ HPHT Frac Plug

Technical Specifications



PN: 55FP1723GXB435-AB			
Plug Specifications			
OD	4.350 inch		
ID	1.400 inch		
Length	7.950 inch		
Type	Frac		
Pressure Rating	Weight	Top	Bottom
	17 ppf	12 kpsi	8000 psi
	20 ppf	13 kpsi	8500 psi
	23 ppf	15 kpsi	9100 psi
Ball Specifications			
Ball in Place OD	1.625 inch		
Ball Drop OD	2.125 inch		
Material	50% GF Nylon 1.4SG		
Setting Tool			
Baker 20	WLAK	B20xGXB55-AB	
	Sleeve	B20xFPB55-S	
	Adapter	B20xFPB55-A	
	Mandrel	BK20xGXB55-M	
	Nut	B20xFPB55-N	
Assurity 20	WLAK	S35xGXB55-AB	
	Sleeve	S35xFPB55-S	
	Adapter	S35xFPB55-A	
	Mandrel	S35xGXB55-M	
	Nut	S35xFPB55-N	

Annular Velocities During Free Fall (ft/min)			
Line Speed (ft/min)	5.5 inch 17 ppf	5.5 inch 20 ppf	5.5 inch 23 ppf
100	378	484	656
200	756	969	1311
300	1133	1453	1967
400	1511	1937	2622
500	1889	2422	3278
600	2267	2906	3933
700	2644	3390	4589
800	3022	3875	5245
900	3400	4359	5900
1000	3778	4843	6556
1100	4155	5328	7211
1200	4533	5812	7867
1300	4911	6297	8522
1400	5289	6781	9178
1500	5666	7265	9834

Procedures	
Baker 20	OP-PRO-3P-FP-GXB-ALL-A
Assurity 20	
Screenout and Misrun Recovery	
Plug Milling	

Recommended Run Speeds																				
Pump Rate (bpm)		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	21
5.5 inch 17 ppf	Fluid Speed (ft/min)	215	258	301	344	387	430	473	516	559	602	645	688	731	774	817	860	903	946	989
	Suggested Line Speed (ft/min)	107	129	150	172	193	215	236	258	279	301	322	344	365	387	408	430	451	473	494
5.5 inch 20 ppf	Fluid Speed (ft/min)	225	270	315	360	405	451	496	541	586	631	676	721	766	811	856	901	946	991	1036
	Suggested Line Speed (ft/min)	191	230	268	306	345	383	421	460	498	536	574	613	651	689	728	766	804	843	881
5.5 inch 23 ppf	Fluid Speed (ft/min)	236	283	330	377	424	472	519	566	613	660	707	755	802	849	896	943	990	1038	1085
	Suggested Line Speed (ft/min)	200	241	281	321	361	401	441	481	521	561	601	641	682	722	762	802	842	882	922

7.0 inch, 5.72OD, 32-38 Guardian™HPHT Frac Plug

Technical Specifications



PN: 70FP3238VDB572-AB			
Plug Specifications			
OD	5.720 inch		
ID	1.400 inch		
Length	8.950 inch		
Type	Frac		
Pressure Rating	Weight	Top	Bottom
	32 ppf	13 kpsi	6000 psi
	35 ppf	13 kpsi	7000 psi
	38 ppf	14 kpsi	7500 psi
Ball Specifications			
Ball in Place OD	1.625 inch		
Ball Drop OD	2.125 inch		
Material	50% GF Nylon 1.4SG		
Setting Tool			
Assurity 20	WLAK	S35xGXB70-AB	
	Sleeve	S35xFPB70-S	
	Adapter	S35xFPB70-A	
	Mandrel	S35xGXB70-M	
	Nut	S35xFPB70-N	

Annular Velocities During Free Fall (ft/min)			
Line Speed (ft/min)	7.0 inch 32 ppf	7.0 inch 35 ppf	7.0 inch 38 ppf
100	378	484	656
200	756	969	1311
300	1133	1453	1967
400	1511	1937	2622
500	1889	2422	3278
600	2267	2906	3933
700	2644	3390	4589
800	3022	3875	5245
900	3400	4359	5900
1000	3778	4843	6556
1100	4155	5328	7211
1200	4533	5812	7867
1300	4911	6297	8522
1400	5289	6781	9178
1500	5666	7265	9834

Procedures	
Baker 20	OP-PRO-3P-FP-GXB-ALL-A
Assurity 20	
Screenout and Misrun Recovery	
Plug Milling	

Recommended Run Speeds		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	21
7.0 inch 32 ppf	Fluid Speed (ft/min)	215	258	301	344	387	430	473	516	559	602	645	688	731	774	817	860	903	946	989
	Suggested Line Speed (ft/min)	107	129	150	172	193	215	236	258	279	301	322	344	365	387	408	430	451	473	494
7.0 inch 35 ppf	Fluid Speed (ft/min)	225	270	315	360	405	451	496	541	586	631	676	721	766	811	856	901	946	991	1036
	Suggested Line Speed (ft/min)	191	230	268	306	345	383	421	460	498	536	574	613	651	689	728	766	804	843	881
7.0 inch 38 ppf	Fluid Speed (ft/min)	236	283	330	377	424	472	519	566	613	660	707	755	802	849	896	943	990	1038	1085
	Suggested Line Speed (ft/min)	200	241	281	321	361	401	441	481	521	561	601	641	682	722	762	802	842	882	922