.308 Win - Hornady A-MAX 168gr - RS52

User Data:

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Comment **450mm barrel - 71.12mm COL - 42.0gr start load - 715m/s - 2846bar**

Cartridge / Caliber	**.308 Win. (CIP)**		**Bullet**	**.308, 168, Hornady A-MAX 30502**	
Maximum Average Pressure, allowed	4150 bar	60191 psi. (Piezo CIP)		with boattail	
Groove Caliber	7.82 mm	0.308 in.	Bullet Weight	10.89 gm	168.0 gr.
Case Capacity, overflow	3.636 cm³	56.0 gr. H2O	Bullet Length	32.13 mm	1.265 in.
Case Length	51.16 mm	2.014 in.	Bullet Seating Depth	12.16 mm	0.479 in.
Cartridge O.A. Length	71.12 mm	2.800 in.	Barrel/Tube Length	450.0 mm	17.7165 in.
Shot Start / Init Pressure	250.0 bar	3626 psi.	Cross Section Area of Bore	0.4751 cm²	0.07364 in.²
Propellant type	**ReloadSwiss RS 52**				
Charge Weight	2.722 gm	42.0 gr.	Load Density	0.886 gm/cm³	224.1 gr./in.³
Heat of Explosion, Potential	3920 J/gm	254.0 J/gr.	Energy Density of Charge	3472 J/cm³	56896 J/in.³
Propellant Solid Density	1.6 gm/cm³	404.63 gr./in.³	Used Ratio of Specific Heats cp/cv	1.2309	
Burning Rate Factor Ba	0.505 1/s		Weighting Factor	0.5	
Burning Function Limit Z1	0.52		Prog.-/ Degressivity Factor a0	1.375	
Factor b	1.89		Bulk Density	0.950 gm/cm³	240.2 gr./in.³

Calculated and Estimated Data:

Bullet Shank Seating Depth	8.1 mm	0.319 in.	Capacity Displaced by Seated Bullet	0.563 cm³	0.0343 in.³
Useable Case Capacity	3.073 cm³	0.1875 in.³	Bullet Travel at Muzzle Exit	411.0 mm	16.18 in.
Loading Ratio("Density") / Filling	93.2 %		Charge Fraction Burnt at Shot Start	1.39 %	
Predicted Data:					
Maximum Chamber Pressure	2846 bar	41272 psi.	Bullet Travel at Pmax	41.0 mm	1.62 in.
at Muzzle Exit:					
Bullet Velocity	714.6 m/s	2344 fps.	Pressure at Muzzle	695 bar	10074 psi.
Bullet Energy	2780 Joule	2050 ft.lbs.	Bullet Barrel Time	1.112 ms	
Propellant Burnt	95.6 %		Ballistic Efficiency	26.1 %	

Check Loading Manuals for Safe Minimum Charge Weight to Avoid Hazardous Ignition Conditions like Secondary Explosion Effects !
Real maximum (peak) of pressure is reached while bullet moves within barrel.
End of combustion occurs after the bullet's base passes muzzle.

Table of incremented charges ranging from +10.0% to -20.0% of above specified charge

D A N G E R ! : Table data may exceed maximum average pressures ! Pressures exceeding SAAMI or CIP specs are printed underlined!

Diff.	Charge Weight		Muzzle Vel.		Muzzle Energy		Max. Pressure		Muzzle Pressure		Prop.Burnt	B_Time	L.R./Filling
%	Gramm	Grains	m/s	fps	Joule	ft.lbs	bar	psi	bar	psi	%	ms	%
-20.0	2.18	33.6	566	1857	1744	1287	1558	22594	516	7484	83.7	1.446	75
-18.0	2.23	34.4	581	1905	1835	1353	1653	23981	536	7769	85.1	1.410	76
-16.0	2.29	35.3	595	1952	1928	1422	1755	25454	555	8050	86.5	1.374	78
-14.0	2.34	36.1	610	2001	2024	1493	1863	27021	574	8328	87.9	1.340	80
-12.0	2.39	37.0	625	2049	2124	1566	1978	28690	593	8600	89.2	1.306	82
-10.0	2.45	37.8	639	2098	2226	1642	2101	30466	611	8866	90.4	1.273	84
-8.0	2.50	38.6	654	2147	2331	1719	2231	32355	629	9126	91.6	1.241	86
-6.0	2.56	39.5	669	2196	2439	1799	2370	34375	647	9377	92.7	1.209	88
-4.0	2.61	40.3	684	2245	2550	1881	2518	36525	663	9620	93.7	1.178	89
-2.0	2.67	41.2	699	2295	2663	1965	2677	38820	679	9852	94.7	1.145	91
Nominal	**2.72**	**42.0**	**715**	**2344**	**2780**	**2050**	**2846**	**41272**	**695**	**10074**	**95.6**	**1.112**	**93**
+2.0	2.78	42.8	730	2394	2899	2138	3026	43891	709	10284	96.4	1.081	95
+4.0	2.83	43.7	745	2444	3020	2228	3219	46693	723	10481	97.2	1.050	97
+6.0	2.88	44.5	760	2494	3145	2319	3426	49694	735	10664	97.8	1.020	99
+8.0	2.94	45.4	775	2543	3271	2413	3648	52909	747	10833	98.4	0.991	101
+10.0	2.99	46.2	790	2593	3400	2508	3886	56357	757	10986	98.9	0.963	103

Results caused by ±10% powder lot-to-lot burning rate variation using nominal charge

Data for burning rate increased by 10% relative to nominal value :

Nominal	2.72	42.0	757	2484	3120	2301	3486	50557	699	10139	99.6	1.021	93

Data for burning rate decreased by 10% relative to nominal value :

Nominal	2.72	42.0	660	2166	2373	1751	2300	33363	649	9418	87.0	1.219	93