.308 Win - Hornady SST 180gr - RS50

User Data:

Date:13-Mai-2019 **Time:17:53:44** **File: *.dat**

Comment **20" barrel - 71.12mm COL - 40.5gr start load - 684m/s - 2866bar**

Cartridge / Caliber	**.308 Win. (CIP)**		**Bullet**	**.308, 180, Hornady SST InterLock 3**	
Maximum Average Pressure, allowed	4150 bar	60191 psi. (Piezo CIP)		with boattail	
Groove Caliber	7.82 mm	0.308 in.	Bullet Weight	11.66 gm	180.0 gr.
Case Capacity, overflow	3.636 cm³	56.0 gr. H2O	Bullet Length	33.99 mm	1.338 in.
Case Length	51.16 mm	2.014 in.	Bullet Seating Depth	14.02 mm	0.552 in.
Cartridge O.A. Length	71.12 mm	2.800 in.	Barrel/Tube Length	508.0 mm	20.0 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 50**				
Charge Weight	2.624 gm	40.5 gr.	Load Density	0.879 gm/cm³	222.3 gr./in.³
Heat of Explosion, Potential	3815 J/gm	247.2 J/gr.	Energy Density of Charge	3352 J/cm³	54929 J/in.³
Propellant Solid Density	1.61 gm/cm³	407.15 gr./in.³	Used Ratio of Specific Heats cp/cv	1.239	
Burning Rate Factor Ba	0.512 1/s		Weighting Factor	0.5	
Burning Function Limit Z1	0.35		Prog.-/ Degressivity Factor a0	1.231	
Factor b	1.484		Bulk Density	0.957 gm/cm³	242.0 gr./in.³

Calculated and Estimated Data:

Bullet Shank Seating Depth	9.96 mm	0.392 in.	Capacity Displaced by Seated Bullet	0.65 cm³	0.0397 in.³
Useable Case Capacity	2.986 cm³	0.1822 in.³	Bullet Travel at Muzzle Exit	470.86 mm	18.54 in.
Loading Ratio("Density") / Filling	91.8 %		Charge Fraction Burnt at Shot Start	1.42 %	
Predicted Data:					
Maximum Chamber Pressure	2866 bar	41570 psi.	Bullet Travel at Pmax	33.4 mm	1.32 in.
at Muzzle Exit:					
Bullet Velocity	683.7 m/s	2243 fps.	Pressure at Muzzle	545 bar	7910 psi.
Bullet Energy	2726 Joule	2011 ft.lbs.	Bullet Barrel Time	1.251 ms	
Propellant Burnt	90.4 %		Ballistic Efficiency	27.2 %	

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	2.10	32.4	546	1792	1740	1284	1599	23197	402	5838	78.8	1.601	73
-18.0	2.15	33.2	560	1836	1827	1348	1697	24611	417	6054	80.1	1.563	75
-16.0	2.20	34.0	573	1881	1917	1414	1800	26112	432	6269	81.4	1.526	77
-14.0	2.26	34.8	587	1925	2009	1482	1909	27690	447	6483	82.7	1.490	79
-12.0	2.31	35.6	601	1970	2103	1551	2024	29349	462	6696	83.9	1.454	81
-10.0	2.36	36.5	614	2015	2201	1623	2144	31094	476	6906	85.1	1.420	83
-8.0	2.41	37.3	628	2060	2301	1697	2271	32945	491	7114	86.2	1.387	84
-6.0	2.47	38.1	642	2106	2403	1772	2407	34910	505	7319	87.3	1.354	86
-4.0	2.52	38.9	656	2151	2508	1850	2551	36997	518	7520	88.4	1.322	88
-2.0	2.57	39.7	670	2197	2616	1929	2704	39214	532	7717	89.5	1.286	90
Nominal	**2.62**	**40.5**	**684**	**2243**	**2726**	**2011**	**2866**	**41570**	**545**	**7910**	**90.4**	**1.251**	**92**
+2.0	2.68	41.3	698	2289	2839	2094	3039	44076	558	8097	91.4	1.217	94
+4.0	2.73	42.1	712	2335	2955	2179	3223	46741	571	8279	92.3	1.185	96
+6.0	2.78	42.9	726	2381	3073	2267	3418	49578	583	8455	93.2	1.153	97
+8.0	2.83	43.7	740	2428	3194	2356	3627	52601	595	8623	94.0	1.123	99
+10.0	2.89	44.6	754	2474	3317	2447	3849	55824	606	8785	94.8	1.093	101

Results caused by ±3% powder lot-to-lot burning rate variation using nominal charge

Data for burning rate increased by 3% relative to nominal value :

Nominal	2.62	40.5	696	2285	2829	2087	3025	43874	554	8032	92.5	1.221	92

Data for burning rate decreased by 3% relative to nominal value :

Nominal	2.62	40.5	670	2199	2620	1932	2710	39305	535	7760	88.1	1.283	92