

7 mm Rem Mag - Sierra SPBT 160gr - RS80

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LOT-TO-LOT VARIATIONS OF POWDERS, PRIMER SUBSTITUTION AND COMPONENT CHANGE OFTEN RAISE PRESSURES TO UNSAFE LEVELS. THE USER MUST ASSUME THE ENTIRE RISK OF USING THIS DATA FOR LOADING PURPOSES.

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User Data:	Date:28-Sep-2016	Time:17:29:40	File: *.dat
Comment	610mm barrel - 83.57mm COL - 74.0gr start load - 829m/s - 2801bar		
Cartridge / Caliber	7 mm Rem. Mag.(CIP)	Bullet	.284, 160, Sierra SPBT 1920
Maximum Average Pressure, allowed	4300 bar	62366 psi. (Piezo CIP)	with boattail
Groove Caliber	7,21 mm	0,284 in.	10,37 gm 160,0 gr.
Case Capacity, overflow	5,324 cm³	82,0 gr. H2O	Bullet Weight
Case Length	63,5 mm	2,500 in.	Bullet Length
Cartridge O.A. Length	83,57 mm	3,290 in.	Bullet Seating Depth
Shot Start / Init Pressure	250,0 bar	3626 psi.	Barrel/Tube Length
		Cross Section Area of Bore	610,0 mm 24,0157 in.
			0,4039 cm² 0,0626 in.²

Propellant type	ReloadSwiss RS 80		
Charge Weight	4,795 gm	74,0 gr.	Load Density
Heat of Explosion, Potential	3840 J/gm	248,8 J/gr.	Energy Density of Charge
Propellant Solid Density	1,6 gm/cm³	404,63 gr./in.³	Used Ratio of Specific Heats cp/cv
Burning Rate Factor Ba	0,262 1/s		Weighting Factor
Burning Function Limit Z1	0,55		Prog.-/ Degressivity Factor a0
Factor b	2,497		Bulk Density
			0,985 gm/cm³ 249,1 gr./in.³
			3782 J/cm³ 61976 J/in.³
			1,2317
			0,5
			3,285
			0,998 gm/cm³ 252,4 gr./in.³

Calculated and Estimated Data:

Bullet Shank Seating Depth	8,2 mm	0,323 in.	Capacity Displaced by Seated Bullet	0,455 cm³	0,0278 in.³
Useable Case Capacity	4,869 cm³	0,2971 in.³	Bullet Travel at Muzzle Exit	558,38 mm	21,98 in.
Loading Ratio("Density") / Filling	98.7 %		Charge Fraction Burnt at Shot Start	1,10 %	

Predicted Data:					
Maximum Chamber Pressure	2801 bar	40619 psi.	Bullet Travel at Pmax	78,3 mm	3,08 in.
at Muzzle Exit:					
Bullet Velocity	829,4 m/s	2721 fps.	Pressure at Muzzle	955 bar	13844 psi.
Bullet Energy	3567 Joule	2631 ft.lbs.	Bullet Barrel Time	1,435 ms	
Propellant Burnt	91,1 %		Ballistic Efficiency	19,4 %	

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 Gramm	Weight Grains	Muzzle Vel. m/s	fps	Muzzle Energy Joule	ft.lbs	Max. Pressure bar	psi	Muzzle Pressure bar	psi	Prop.Burnt %	B_TimeL.R./Filling ms	%
-20,0	3,84	59,2	628	2060	2043	1507	1427	20701	643	9329	72,3	1,887	79
-18,0	3,93	60,7	646	2120	2164	1596	1522	22081	675	9796	74,4	1,840	81
-16,0	4,03	62,2	665	2181	2292	1690	1625	23565	708	10267	76,4	1,795	83
-14,0	4,12	63,6	684	2244	2426	1790	1735	25167	740	10738	78,5	1,749	85
-12,0	4,22	65,1	704	2309	2568	1894	1854	26891	773	11208	80,5	1,705	87
-10,0	4,32	66,6	724	2375	2716	2004	1982	28751	805	11674	82,4	1,661	89
-8,0	4,41	68,1	744	2442	2872	2118	2121	30764	837	12133	84,3	1,617	91
-6,0	4,51	69,6	765	2510	3035	2239	2271	32938	868	12582	86,1	1,574	93
-4,0	4,60	71,0	786	2580	3205	2364	2433	35293	898	13019	87,9	1,531	95
-2,0	4,70	72,5	808	2650	3383	2495	2609	37847	927	13441	89,6	1,485	97
Nominal	4,80	74,0	829	2721	3567	2631	2801	40619	955	13844	91,1	1,435	99
+2,0	4,89	75,5	851	2793	3759	2772	3008	43634	981	14227	92,6	1,385	101
+4,0	4,99	77,0	874	2866	3957	2919	3235	46919	1006	14585	94,0	1,337	103
+6,0	5,08	78,4	896	2940	4163	3070	3482	50503	1028	14916	95,2	1,291	105
+8,0	5,18	79,9	919	3014	4375	3227	3752	54424	1049	15216	96,3	1,246	107
+10,0	5,27	81,4	941	3088	4595	3389	4049	58719	1068	15484	97,3	1,202	109

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	4,80	74,0	898	2947	4184	3086	3538	51313	998	14469	98,3	1,293	99
Data for burning rate decreased by 10% relative to nominal value :													
Nominal	4,80	74,0	746	2447	2885	2128	2213	32094	839	12174	78,5	1,595	99