

.222 Rem - Sierra HPBT 1410 52gr - RS40

WARNING: Since we have no control over equipment or data which may be used with this program, no responsibility is implied or assumed for results obtained through its use. Input data and results may be incorrect or wrong. Therefore the use of this data for loading ammunition can cause serious injury to personnell and material. The computer-results had to be checked against data available in current loading manuals.

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:20-Mrz-2016		Time:21:04:33		File: *.dat	
Comment	600mm barrel - 52.81mm COL - 21.0gr start load - 878m/s - 2484bar					
Cartridge / Caliber	.222 Rem.		Bullet		.224, 52, Sierra HPBT MatchK 1410	
Maximum Average Pressure, allowed	3700 bar	53664 psi. (Piezo CIP)			with boattail	
Groove Caliber	5.69 mm	0.224 in.	Bullet Weight		3.37 gm	52.0 gr.
Case Capacity, overflow	1.812 cm³	27.9 gr. H2O	Bullet Length		18.21 mm	0.717 in.
Case Length	43.18 mm	1.700 in.	Bullet Seating Depth		8.62 mm	0.339 in.
Cartridge O.A. Length	52.78 mm	2.078 in.	Barrel/Tube Length		600.0 mm	23.622 in.
Shot Start / Init Pressure	250.0 bar	3626 psi.	Cross Section Area of Bore		0.2509 cm²	0.03889 in.²
Propellant type	ReloadSwiss RS 40					
Charge Weight	1.361 gm	21.0 gr.	Load Density		0.851 gm/cm³	215.2 gr./in.³
Heat of Explosion, Potential	3990 J/gm	258.5 J/gr.	Energy Density of Charge		3396 J/cm³	55650 J/in.³
Propellant Solid Density	1.6 gm/cm³	404.63 gr./in.³	Used Ratio of Specific Heats cp/cv		1.2293	
Burning Rate Factor Ba	0.643 1/s		Weighting Factor		0.6	
Burning Function Limit Z1	0.419		Prog.-/ Degressivity Factor a0		0.782	
Factor b	1.494		Bulk Density		0.938 gm/cm³	237.2 gr./in.³
Calculated and Estimated Data:						
Bullet Shank Seating Depth	6.02 mm	0.237 in.	Capacity Displaced by Seated Bullet		0.213 cm³	0.013 in.³
Useable Case Capacity	1.599 cm³	0.0976 in.³	Bullet Travel at Muzzle Exit		565.44 mm	22.26 in.
Loading Ratio("Density") / Filling	90.7 %		Charge Fraction Burnt at Shot Start		1.50 %	
Predicted Data:						
Maximum Chamber Pressure	2484 bar	36034 psi.	Bullet Travel at Pmax		36.9 mm	1.45 in.
at Muzzle Exit:						
Bullet Velocity	878.4 m/s	2882 fps.	Pressure at Muzzle		401 bar	5816 psi.
Bullet Energy	1300 Joule	959 ft.lbs.	Bullet Barrel Time		1.145 ms	
Propellant Burnt	89.5 %		Ballistic Efficiency		23.9 %	

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 Gramm	Grains	Muzzle Vel. m/s	fps	Muzzle Energy Joule	ft.lbs	Max. Pressure bar	psi	Muzzle Pressure bar	psi	Prop.Burnt %	B_Time ms	L.R./Filling %
-20.0	1.09	16.8	707	2318	841	621	1389	20149	297	4305	76.9	1.436	73
-18.0	1.12	17.2	723	2373	882	650	1472	21343	308	4464	78.3	1.403	74
-16.0	1.14	17.6	740	2429	924	681	1559	22611	319	4622	79.6	1.372	76
-14.0	1.17	18.1	757	2485	967	713	1652	23956	330	4779	81.0	1.341	78
-12.0	1.20	18.5	774	2541	1011	746	1750	25384	340	4935	82.3	1.311	80
-10.0	1.22	18.9	792	2597	1056	779	1855	26900	351	5088	83.6	1.281	82
-8.0	1.25	19.3	809	2654	1103	813	1966	28510	361	5240	84.9	1.253	83
-6.0	1.28	19.7	826	2711	1150	849	2084	30221	372	5389	86.1	1.225	85
-4.0	1.31	20.2	844	2768	1199	885	2209	32040	382	5535	87.3	1.197	87
-2.0	1.33	20.6	861	2825	1249	921	2343	33975	391	5677	88.4	1.172	89
Nominal	1.36	21.0	878	2882	1300	959	2484	36034	401	5816	89.5	1.145	91
+2.0	1.39	21.4	896	2939	1352	997	2636	38226	410	5950	90.6	1.116	93
+4.0	1.42	21.8	913	2996	1406	1037	2797	40562	419	6080	91.6	1.088	94
+6.0	1.44	22.3	931	3054	1460	1077	2968	43052	428	6204	92.5	1.060	96
+8.0	1.47	22.7	948	3111	1515	1118	3151	45707	436	6323	93.4	1.033	98
+10.0	1.50	23.1	966	3168	1572	1159	3347	48548	444	6436	94.3	1.007	100

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	1.36	21.0	895	2937	1351	996	2629	38127	408	5916	91.7	1.119	91
Data for burning rate decreased by 3% relative to nominal value :													
Nominal	1.36	21.0	860	2823	1248	920	2346	34024	393	5695	87.1	1.171	91