7.62 x 54 R - PrviPartizan SP 180gr - RS60

User Data:

Date:12-Okt-2018 **Time:09:39:08** **File: *.dat**

Comment	**730mm barrel - 76.20mm COL - 50.5gr start load - 818m/s - 2719bar**				
Cartridge / Caliber	**7.62 x 54 R Russ.Nagant**		**Bullet**	**.311, 180, PrviPartizan SP BT**	
Maximum Average Pressure, allowed	3900 bar	56565 psi. (Piezo CIP)		with flatbase	
Groove Caliber	7.92 mm	0.312 in.	Bullet Weight	11.66 gm	180.0 gr.
Case Capacity, overflow	4.155 cm³	64.0 gr. H2O	Bullet Length	29.49 mm	1.161 in.
Case Length	53.7 mm	2.114 in.	Bullet Seating Depth	6.99 mm	0.275 in.
Cartridge O.A. Length	76.2 mm	3.000 in.	Barrel/Tube Length	730.0 mm	28.7402 in.
Shot Start / Init Pressure	250.0 bar	3626 psi.	Cross Section Area of Bore	0.4799 cm²	0.07439 in.²
Propellant type	**ReloadSwiss RS 60 *T**				
Charge Weight	3.272 gm	50.5 gr.	Load Density	0.859 gm/cm³	217.2 gr./in.³
Heat of Explosion, Potential	3990 J/gm	258.5 J/gr.	Energy Density of Charge	3427 J/cm³	56158 J/in.³
Propellant Solid Density	1.61 gm/cm³	407.15 gr./in.³	Used Ratio of Specific Heats cp/cv	1.2291	
Burning Rate Factor Ba	0.468 1/s		Weighting Factor	0.5	
Burning Function Limit Z1	0.695		Prog.-/ Degressivity Factor a0	0.669	
Factor b	2.192		Bulk Density	0.965 gm/cm³	244.0 gr./in.³

Calculated and Estimated Data:

Bullet Shank Seating Depth	6.99 mm	0.275 in.	Capacity Displaced by Seated Bullet	0.345 cm³	0.0211 in.³
Useable Case Capacity	3.81 cm³	0.2325 in.³	Bullet Travel at Muzzle Exit	683.29 mm	26.9 in.
Loading Ratio("Density") / Filling	89.0 %		Charge Fraction Burnt at Shot Start	1.49 %	
Predicted Data:					
Maximum Chamber Pressure	2719 bar	39432 psi.	Bullet Travel at Pmax	46.1 mm	1.81 in.
at Muzzle Exit:					
Bullet Velocity	817.7 m/s	2683 fps.	Pressure at Muzzle	499 bar	7240 psi.
Bullet Energy	3900 Joule	2877 ft.lbs.	Bullet Barrel Time	1.518 ms	
Propellant Burnt	99.8 %		Ballistic Efficiency	29.9 %	

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		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	2.62	40.4	658	2160	2529	1865	1526	22130	399	5792	91.8	1.941	71
-18.0	2.68	41.4	674	2213	2653	1957	1616	23440	413	5984	93.1	1.894	73
-16.0	2.75	42.4	690	2265	2781	2051	1712	24828	425	6168	94.4	1.849	75
-14.0	2.81	43.4	706	2318	2911	2147	1813	26300	437	6343	95.5	1.805	77
-12.0	2.88	44.4	723	2371	3045	2246	1921	27857	449	6508	96.4	1.761	78
-10.0	2.95	45.5	739	2423	3182	2347	2035	29511	459	6662	97.3	1.719	80
-8.0	3.01	46.5	755	2476	3322	2450	2156	31267	469	6804	98.1	1.678	82
-6.0	3.08	47.5	771	2528	3463	2554	2284	33127	478	6934	98.7	1.637	84
-4.0	3.14	48.5	786	2580	3607	2661	2420	35104	486	7050	99.2	1.598	85
-2.0	3.21	49.5	802	2632	3753	2768	2565	37202	493	7152	99.6	1.560	87
Nominal	**3.27**	**50.5**	**818**	**2683**	**3900**	**2877**	**2719**	**39432**	**499**	**7240**	**99.8**	**1.518**	**89**
+2.0	3.34	51.5	833	2734	4049	2987	2882	41804	504	7313	100.0	1.479	91
+4.0	3.40	52.5	849	2784	4199	3097	3056	44326	508	7372	100.0	1.440	93
+6.0	3.47	53.5	864	2833	4351	3209	3241	47013	512	7426	100.0	1.403	94
+8.0	3.53	54.5	879	2883	4503	3321	3439	49876	516	7479	100.0	1.366	96
+10.0	3.60	55.6	893	2931	4656	3434	3649	52930	519	7530	100.0	1.331	98

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	3.27	50.5	831	2727	4031	2973	2877	41734	492	7133	100.0	1.480	89
Data for burning rate decreased by 3% relative to nominal value :													
Nominal	3.27	50.5	802	2633	3756	2770	2566	37218	503	7293	99.1	1.559	89