

**7.62 x 39 Russ. - Lapua FMJ 123gr - RS30**

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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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<b>User Data:</b>	<b>Date:</b> 16-Apr-2016	<b>Time:</b> 18:30:15	<b>File:</b> *.dat
<b>Comment</b>	<b>16" barrel - 53.34mm COL - 19.5gr start load - 643m/s - 2549bar</b>		
<b>Cartridge / Caliber</b>	<b>7.62 x 39 (.308) Russ.</b>	<b>Bullet</b>	<b>.308, 123, Lapua FMJ S374 7003</b>
Maximum Average Pressure, allowed	3550 bar	51488 psi. (Piezo CIP)	with hollowbase
Groove Caliber	7.82 mm	0.308 in.	Bullet Weight 8.03 gm 123.9 gr.
Case Capacity, overflow	2.311 cm³	35.59 gr. H2O	Bullet Length 22.66 mm 0.892 in.
Case Length	38.68 mm	1.523 in.	Bullet Seating Depth 8.0 mm 0.315 in.
Cartridge O.A. Length	53.34 mm	2.100 in.	Barrel/Tube Length 406.4 mm 16.0 in.
Shot Start / Init Pressure	250.0 bar	3626 psi.	Cross Section Area of Bore 0.4732 cm² 0.07335 in.²

<b>Propellant type</b>	<b>ReloadSwiss RS 30</b>		
Charge Weight	1.264 gm	19.5 gr.	Load Density 0.651 gm/cm³ 164.6 gr./in.³
Heat of Explosion, Potential	4010 J/gm	259.8 J/gr.	Energy Density of Charge 2610 J/cm³ 42770 J/in.³
Propellant Solid Density	1.61 gm/cm³	407.15 gr./in.³	Used Ratio of Specific Heats cp/cv 1.2326
Burning Rate Factor Ba	1.162 1/s		Weighting Factor 0.75
Burning Function Limit Z1	0.409		Prog.-/ Degressivity Factor a0 0.225
Factor b	1.359		Bulk Density 0.810 gm/cm³ 204.8 gr./in.³

**Calculated and Estimated Data:**

Bullet Shank Seating Depth	8.0 mm	0.315 in.	Capacity Displaced by Seated Bullet	0.369 cm³	0.0225 in.³
Useable Case Capacity	1.942 cm³	0.1185 in.³	Bullet Travel at Muzzle Exit	375.72 mm	14.79 in.
Loading Ratio("Density") / Filling	80.4 %		Charge Fraction Burnt at Shot Start	2.46 %	

**Predicted Data:**

Maximum Chamber Pressure	2549 bar	36963 psi.	Bullet Travel at Pmax	22.2 mm	0.88 in.
<b>at Muzzle Exit:</b>					
Bullet Velocity	642.6 m/s	2108 fps.	Pressure at Muzzle	352 bar	5106 psi.
Bullet Energy	1658 Joule	1223 ft.lbs.	Bullet Barrel Time	1.013 ms	
Propellant Burnt	99.8 %		Ballistic Efficiency	32.7 %	

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	1.01	15.6	539	1768	1165	860	1576	22857	289	4193	95.5	1.227	64
-18.0	1.04	16.0	550	1803	1213	894	1656	24018	297	4302	96.2	1.203	66
-16.0	1.06	16.4	560	1838	1260	930	1740	25230	304	4407	96.9	1.179	67
-14.0	1.09	16.8	571	1873	1309	965	1827	26495	311	4509	97.4	1.156	69
-12.0	1.11	17.2	581	1908	1358	1001	1918	27813	318	4607	97.9	1.133	71
-10.0	1.14	17.6	592	1942	1407	1038	2012	29187	324	4702	98.4	1.112	72
-8.0	1.16	17.9	602	1976	1456	1074	2111	30619	330	4792	98.8	1.091	74
-6.0	1.19	18.3	613	2010	1506	1111	2214	32111	336	4877	99.1	1.070	76
-4.0	1.21	18.7	623	2043	1557	1148	2321	33664	342	4958	99.4	1.051	77
-2.0	1.24	19.1	633	2076	1607	1185	2433	35281	347	5035	99.7	1.031	79
<b>Nominal</b>	<b>1.26</b>	<b>19.5</b>	<b>643</b>	<b>2108</b>	<b>1658</b>	<b>1223</b>	<b>2549</b>	<b>36963</b>	<b>352</b>	<b>5106</b>	<b>99.8</b>	<b>1.013</b>	<b>80</b>
+2.0	1.29	19.9	652	2140	1709	1260	2669	38714	357	5173	99.9	0.992	82
+4.0	1.31	20.3	662	2172	1760	1298	2795	40536	361	5235	100.0	0.971	84
+6.0	1.34	20.7	672	2203	1811	1336	2926	42432	365	5292	100.0	0.952	85
+8.0	1.36	21.1	681	2234	1862	1374	3062	44404	369	5347	100.0	0.933	87
+10.0	1.39	21.5	690	2265	1914	1411	3203	46456	372	5402	100.0	0.915	88

**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	1.26	19.5	650	2131	1695	1250	2665	38654	349	5055	100.0	0.993	80
Data for burning rate decreased by 3% relative to nominal value :													
Nominal	1.26	19.5	635	2082	1617	1193	2432	35280	354	5137	99.3	1.030	80