.308 Win - H&N RN HS 165gr - RS20

User Data:

Date:1-Apr-2016 **Time:15:49:24** **File: *.dat**

Comment	**600mm barrel - 68.05mm COL - 12.0gr start load - 476m/s - 1570bar**				
Cartridge / Caliber	**.308 Win. (CIP)**		**Bullet**	**.308, 165, H&N RN HS max.1600fps**	
Maximum Average Pressure, allowed	4150 bar	60191 psi. (Piezo CIP)		with hollowbase	
Groove Caliber	7.82 mm	0.308 in.	Bullet Weight	10.69 gm	165.0 gr.
Case Capacity, overflow	3.636 cm³	56.0 gr. H2O	Bullet Length	24.89 mm	0.980 in.
Case Length	51.16 mm	2.014 in.	Bullet Seating Depth	8.0 mm	0.315 in.
Cartridge O.A. Length	68.05 mm	2.679 in.	Barrel/Tube Length	600.0 mm	23.622 in.
Shot Start / Init Pressure	110.0 bar	1595 psi.	Cross Section Area of Bore	0.4751 cm²	0.07364 in.²
Propellant type	**ReloadSwiss RS 20**				
Charge Weight	0.778 gm	12.0 gr.	Load Density	0.239 gm/cm³	60.4 gr./in.³
Heat of Explosion, Potential	4100 J/gm	265.7 J/gr.	Energy Density of Charge	0978 J/cm³	16027 J/in.³
Propellant Solid Density	1.52 gm/cm³	384.39 gr./in.³	Used Ratio of Specific Heats cp/cv	1.229	
Burning Rate Factor Ba	2.58 1/s		Weighting Factor	0.5	
Burning Function Limit Z1	0.57		Prog.-/ Degressivity Factor a0	-0.042	
Factor b	1.507		Bulk Density	0.617 gm/cm³	156.0 gr./in.³

Calculated and Estimated Data:

Bullet Shank Seating Depth	8.0 mm	0.315 in.	Capacity Displaced by Seated Bullet	0.375 cm³	0.0229 in.³
Useable Case Capacity	3.261 cm³	0.199 in.³	Bullet Travel at Muzzle Exit	556.84 mm	21.92 in.
Loading Ratio("Density") / Filling	38.7 %		Charge Fraction Burnt at Shot Start	4.14 %	
Predicted Data:					
Maximum Chamber Pressure	1570 bar	22771 psi.	Bullet Travel at Pmax	25.4 mm	1.00 in.
at Muzzle Exit:					
Bullet Velocity	475.8 m/s	1561 fps.	Pressure at Muzzle	146 bar	2122 psi.
Bullet Energy	1210 Joule	893 ft.lbs.	Bullet Barrel Time	1.864 ms	
Propellant Burnt	100.0 %		Ballistic Efficiency	38.0 %	

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 reached before bullet's base passes muzzle.

Table of incremented charges ranging from +15.0% to -30.0% 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	%
-30.0	0.54	8.4	392	1285	821	605	905	13128	106	1534	100.0	2.361	27
-27.0	0.57	8.8	401	1315	859	634	965	13996	110	1593	100.0	2.303	28
-24.0	0.59	9.1	410	1345	898	662	1026	14885	114	1653	100.0	2.248	29
-21.0	0.61	9.5	419	1373	937	691	1089	15797	118	1713	100.0	2.197	31
-18.0	0.64	9.8	427	1402	976	720	1154	16731	122	1772	100.0	2.142	32
-15.0	0.66	10.2	436	1429	1015	748	1219	17686	126	1831	100.0	2.088	33
-12.0	0.68	10.6	444	1456	1054	777	1287	18662	130	1890	100.0	2.038	34
-9.0	0.71	10.9	452	1483	1093	806	1355	19658	134	1948	100.0	1.991	35
-6.0	0.73	11.3	460	1510	1132	835	1426	20675	138	2006	100.0	1.946	36
-3.0	0.75	11.6	468	1535	1171	864	1497	21713	142	2064	100.0	1.904	37
Nominal	**0.78**	**12.0**	**476**	**1561**	**1210**	**893**	**1570**	**22771**	**146**	**2122**	**100.0**	**1.864**	**39**
+3.0	0.80	12.4	483	1586	1250	922	1644	23849	150	2180	100.0	1.826	40
+6.0	0.82	12.7	491	1611	1289	951	1720	24948	154	2237	100.0	1.790	41
+9.0	0.85	13.1	498	1635	1328	980	1797	26066	158	2295	100.0	1.756	42
+12.0	0.87	13.4	506	1659	1368	1009	1876	27205	162	2352	100.0	1.723	43
+15.0	0.89	13.8	513	1683	1407	1038	1956	28363	166	2408	100.0	1.692	44

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	0.78	12.0	477	1564	1215	896	1609	23338	146	2117	100.0	1.848	39
				Data for burning rate decreased by 3% relative to nominal value :									
Nominal	0.78	12.0	475	1558	1205	889	1529	22180	147	2128	100.0	1.881	39