User Data:

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Cartridge / Caliber	**7 x 64 Brenneke**		**Bullet**	**.284, 139, Hornady BTSP 2825**	
Maximum Average Pressure, allowed	60191 psi.	4150 bar (Piezo CIP)		with boattail	
Groove Caliber	0.285 in.	7.24 mm	Bullet Weight	139.0 gr.	9.01 gm
Case Capacity, overflow	69.0 gr. H2O	4.48 cm³	Bullet Length	1.130 in.	28.7 mm
Case Length	2.519 in.	63.98 mm	Bullet Seating Depth	0.342 in.	8.68 mm
Cartridge O.A. Length	3.307 in.	84.0 mm	Barrel/Tube Length	22.0 in.	558.8 mm
Shot Start / Init Pressure	3626 psi.	250.0 bar	Cross Section Area of Bore	0.06245 in.²	0.4029 cm²
Propellant type	**Alliant Reloder-17**				
Charge Weight	60.0 gr.	3.888 gm	Load Density	237.5 gr./in.³	0.939 gm/cm³
Heat of Explosion, Potential	258.5 J/gr.	3990 J/gm	Energy Density of Charge	61402 J/in.³	3747 J/cm³
Propellant Solid Density	407.15 gr./in.³	1.61 gm/cm³	Used Ratio of Specific Heats cp/cv	1.2291	
Burning Rate Factor Ba	0.47 1/s		Weighting Factor	0.5	
Burning Function Limit Z1	0.625		Prog.-/ Degressivity Factor a0	0.805	
Factor b	2.002		Bulk Density	244.0 gr./in.³	0.965 gm/cm³

Calculated and Estimated Data:

Bullet Shank Seating Depth	0.217 in.	5.51 mm	Capacity Displaced by Seated Bullet	0.0208 in.³	0.34 cm³
Useable Case Capacity	0.2526 in.³	4.14 cm³	Bullet Travel at Muzzle Exit	19.82 in.	503.5 mm
Loading Ratio("Density") / Filling	97.3 %		Charge Fraction Burnt at Shot Start	1.21 %	
Predicted Data:					
Maximum Chamber Pressure	67796 psi.	4674 bar	Bullet Travel at Pmax	2.49 in.	63.3 mm
at Muzzle Exit:					
Bullet Velocity	3171 fps.	966.4 m/s	Pressure at Muzzle	12912 psi.	890 bar
Bullet Energy	3103 ft.lbs.	4207 Joule	Bullet Barrel Time	0.998 ms	
Propellant Burnt	100.0 %		Ballistic Efficiency	27.1 %	

Additional Data:

Powder Lot	Primer Type and Lot
Bullet Lot	Case Manufacturer
Measured Muzzle Vel., StdDev.	Measured Pressure, StdDev.

D A N G E R : PRESSURE EXCEEDS ALLOWED MAXIMUM LEVEL !
Real maximum (peak) of pressure is reached while bullet moves within barrel.
End of combustion reached before bullet's base passes muzzle.

Table with predicted charges of different powders for a nominal pressure of about 363 MPa or 52666 psi or a maximum loading ratio or filling of 105 %

CAUTION! - D A N G E R ! : Table may exceed limits of recommended loads ! Pressures exceeding SAAMI or CIP specs are underlined!
Be aware that the powders listed may be totally unsuitable for the given cartridge !
In reality the order of loads may vary due to lot-to-lot variations of propellants and other components.

Propellant type	L.R./Filling	Charge Weight		Muzzle Vel.		Max. Pressure		Prop.Burnt	B_Time
	%	Gramm	Grains	m/s	fps	bar	psi	%	ms
Norma MRP	101	4.01	61.9	909	2982	3631	52667	97.4	1.118
Vihtavuori N560	102	3.99	61.5	902	2959	3631	52667	93.6	1.116
Elcho 17	90	3.60	55.5	899	2951	3631	52667	100.0	1.117
Alliant Reloder-17	90	3.60	55.5	899	2951	3631	52667	100.0	1.117
Raufoss RA15	103	3.96	61.0	898	2947	3631	52667	95.9	1.120
Bofors RP5/NP ~approximation	103	3.96	61.0	898	2947	3631	52667	95.9	1.120
Alliant Reloder-22	103	3.96	61.0	898	2947	3631	52667	95.9	1.120
Accurate MAGPRO	103	4.17	64.3	898	2946	3631	52667	91.8	1.122
IMR 7828 SSC	101	3.95	60.9	896	2941	3631	52667	94.0	1.108
SNPE Vectan SP 12	105	4.27	65.9	894	2935	3575	51845	94.3	1.118
Winchester WXR	105	3.96	61.0	893	2930	3577	51875	95.5	1.129
Bofors RP15	105	3.96	61.0	893	2930	3577	51875	95.5	1.129
PB Clermont PCL 517	105	4.27	65.9	893	2929	3554	51547	94.1	1.121
ADI AR 2213	102	3.92	60.4	892	2925	3631	52667	93.8	1.107
Ramshot Magnum	103	4.27	65.8	891	2925	3631	52667	96.5	1.113
Somchem S365	97	3.66	56.5	891	2924	3631	52667	100.0	1.132
Rottweil R905	104	3.92	60.6	886	2907	3631	52667	93.6	1.121
PB Clermont PCL 511	91	3.71	57.3	886	2907	3631	52667	98.2	1.126
Ramshot Hunter	95	3.72	57.4	886	2906	3631	52667	98.2	1.126
ADI AR 2209	98	3.73	57.5	885	2902	3631	52667	95.6	1.112
Alliant Reloder-19	99	3.77	58.1	884	2901	3631	52667	95.8	1.120
Bofors RP14 ~approximation	100	3.80	58.6	882	2895	3631	52667	95.7	1.120
Norma URP	94	3.54	54.6	882	2893	3631	52667	99.3	1.133
Bofors RP19 ~approximation	94	3.54	54.7	882	2893	3631	52667	99.3	1.133
Accurate 4350	94	3.56	55.0	881	2891	3631	52667	99.4	1.152
Vihtavuori N550	91	3.55	54.8	881	2889	3631	52667	99.2	1.138

continued

Table with predicted charges of different powders for a nominal pressure of about 363 MPa or 52666 psi
or a maximum loading ratio or filling of 105 %

CAUTION! - D A N G E R ! : Table may exceed limits of recommended loads ! Pressures exceeding SAAMI or CIP specs are underlined!
Be aware that the powders listed may be totally unsuitable for the given cartridge !
In reality the order of loads may vary due to lot-to-lot variations of propellants and other components.

Propellant type	L.R./Filling	Charge Weight		Muzzle Vel.		Max. Pressure		Prop.Burnt	B_Time
	%	Gramm	Grains	m/s	fps	bar	psi	%	ms
IMR 7828	105	3.89	60.0	880	2886	3439	49872	93.1	1.137
ADI AP 2214	105	4.15	64.1	878	2881	3531	51206	93.3	1.122
Bofors RP5 NT ~approximation	105	4.08	62.9	878	2880	3623	52545	91.1	1.114
IMR 4831	99	3.60	55.6	877	2877	3631	52667	99.4	1.142
Bofors RP4 ~approximation	97	3.69	56.9	877	2877	3631	52667	95.5	1.121
Raufoss RA4	97	3.69	56.9	877	2877	3631	52667	95.5	1.121
Norma 204	94	3.69	56.9	877	2877	3631	52667	95.5	1.121
Hodgdon H4831	104	3.86	59.6	875	2870	3631	52667	93.2	1.117
Hodgdon H4831 SC	100	3.86	59.6	875	2870	3631	52667	93.2	1.117
Somchem S385	99	3.82	59.0	875	2870	3631	52667	96.8	1.141
Accurate 3100	103	3.92	60.5	874	2867	3631	52667	98.2	1.154
Hodgdon Hybrid 100V	97	3.56	54.9	874	2867	3631	52667	100.0	1.129
Alliant Reloder-25	105	3.98	61.4	873	2864	3216	46642	97.8	1.177
Bofors RP4 NT ~approximation	94	3.65	56.4	872	2860	3631	52667	97.2	1.134
Winchester Supreme 780	98	3.93	60.7	871	2859	3631	52667	95.6	1.123
Vihtavuori N165	105	3.94	60.8	871	2857	3631	52667	96.4	1.128
Lovex S070	93	3.52	54.3	867	2845	3631	52667	97.6	1.144
Rottweil R904	97	3.66	56.5	867	2844	3631	52667	94.3	1.123
Hodgdon H4350	96	3.57	55.2	867	2843	3631	52667	96.8	1.126
IMR 4350	94	3.57	55.0	866	2843	3631	52667	96.9	1.126
Vihtavuori N160	104	3.80	58.7	862	2829	3631	52667	94.2	1.126
Lovex S065	92	3.43	53.0	861	2826	3631	52667	98.5	1.143
Bofors RP7	91	3.41	52.5	860	2823	3631	52667	96.9	1.137
Rottweil R907	91	3.41	52.5	860	2823	3631	52667	96.9	1.137
Somchem S361	97	3.92	60.4	857	2811	3631	52667	93.3	1.135
Vihtavuori N150	94	3.37	52.0	855	2804	3631	52667	100.0	1.143
Norma MRP 2	105	4.00	61.7	840	2756	2906	42150	91.0	1.244
Bofors RP30	105	4.00	61.7	840	2756	2906	42150	91.0	1.244
Lovex S071	105	3.78	58.4	840	2755	3208	46529	97.0	1.224
Vihtavuori N570	105	4.22	65.1	828	2718	2816	40840	82.5	1.259
Hodgdon H1000	105	3.96	61.0	823	2700	2948	42753	89.7	1.224
ADI AR 2217	105	3.96	61.0	823	2700	2948	42753	89.7	1.224
Alliant Reloder-33	105	4.39	67.8	816	2676	2751	39902	82.1	1.275
ADI AR 2225	105	4.02	62.0	801	2628	2568	37244	91.0	1.314
Hodgdon Retumbo	105	4.02	62.0	801	2628	2568	37244	91.0	1.314
Lovex D100	105	4.30	66.4	791	2596	2922	42378	77.9	1.247
Vihtavuori 24N41	105	4.26	65.7	778	2552	2715	39372	73.8	1.284
Vihtavuori N170	105	3.96	61.0	777	2550	2672	38756	81.0	1.317
ADI AR 2218	105	4.26	65.7	774	2539	2553	37031	75.1	1.318
Hodgdon H870	105	4.13	63.7	756	2480	2256	32718	79.1	1.394
Alliant Reloder-50	105	4.32	66.7	733	2405	2053	29781	73.9	1.457
Bofors 12,7mmRA NC1214 Lot20115087	105	4.23	65.3	729	2390	2181	31636	67.8	1.454
Hodgdon 50BMG	105	4.06	62.7	721	2364	2218	32169	65.2	1.406
Hodgdon US 869	105	4.26	65.7	719	2358	2198	31878	68.8	1.415
SNPE Vectan SP 13	105	4.09	63.1	703	2307	1996	28954	73.0	1.473
Accurate 8700	105	4.17	64.4	690	2264	1976	28666	70.2	1.475
PB Clermont PCL 513/520/9520	105	4.09	63.1	683	2241	1886	27349	69.4	1.507
Vihtavuori 20N29	105	4.30	66.4	680	2231	1879	27254	66.8	1.510
NC A3502 ,test only	105	3.91	60.4	636	2088	1838	26652	47.3	1.526
TLP A 502(RH) ,test only	105	3.91	60.4	629	2063	1711	24813	51.2	1.569
IMR TrailBoss	105	1.35	20.8	558	1831	2621	38018	100.0	1.406
ADI AS 25 BP	105	1.35	20.8	558	1831	2621	38018	100.0	1.406
V1734 7-multiperf ,test only	105	3.91	60.4	455	1492	979	14202	23.4	2.048