

6mm-ARC_108ELD_AllPowders_2-28in_20inch_6-6-20

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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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User Data:	Date:6-Jun-2020	Time:18:34:48	File: *.dat
Comment	6mm-ARC_108ELD_AllPowders_2-28in_20inch_6-6-20		
Cartridge / Caliber	6 mm ARC	Bullet	.243, 108, Hornady ELD-M 24561
Maximum Average Pressure, allowed	58740 psi.	4050 bar (Piezo)	with boattail
Groove Caliber	0.242 in.	6.15 mm	108.0 gr. 7.0 gm
Case Capacity, overflow	34.81 gr. H2O	2.26 cm³	1.252 in. 31.8 mm
Case Length	1.490 in.	37.85 mm	Bullet Length
Cartridge O.A. Length	2.280 in.	57.91 mm	Bullet Seating Depth
Shot Start / Init Pressure	3626 psi.	250.0 bar	Barrel/Tube Length
			20.0 in. 508.0 mm
			Cross Section Area of Bore
			0.04535 in.² 0.2926 cm²
Propellant type	Hodgdon CFE223		
Charge Weight	29.8 gr.	1.931 gm	Load Density
Heat of Explosion, Potential	254.0 J/gr.	3920 J/gm	Energy Density of Charge
Propellant Solid Density	414.74 gr./in.³	1.64 gm/cm³	Used Ratio of Specific Heats cp/cv
Burning Rate Factor Ba	0.533 1/s		Weighting Factor
Burning Function Limit Z1	0.522		Prog.-/ Degressivity Factor a0
Factor b	1.675		Bulk Density
			251.1 gr./in.³ 0.993 gm/cm³
			63778 J/in.³ 3892 J/cm³
			1.2305
			0.67
			0.7
			259.2 gr./in.³ 1.025 gm/cm³
Calculated and Estimated Data:			
Bullet Shank Seating Depth	0.282 in.	7.16 mm	Capacity Displaced by Seated Bullet
Useable Case Capacity	0.1187 in.³	1.945 cm³	Bullet Travel at Muzzle Exit
Loading Ratio("Density") / Filling	96.9 %		Charge Fraction Burnt at Shot Start
			0.0192 in.³ 0.315 cm³
			18.97 in. 481.88 mm
			1.10 %
Predicted Data:			
Maximum Chamber Pressure	65403 psi.	4509 bar	Bullet Travel at Pmax
at Muzzle Exit:			1.42 in. 36.0 mm
Bullet Velocity	2679 fps.	816.7 m/s	Pressure at Muzzle
Bullet Energy	1722 ft.lbs.	2334 Joule	Bullet Barrel Time
Propellant Burnt	99.8 %		Ballistic Efficiency
			9103 psi. 628 bar
			1.028 ms
			30.8 %

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 occurs after the bullet's base passes muzzle.

Table with predicted charges of different powders for a nominal pressure of about 379 MPa or 55000 psi

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			
Alliant Reloder-26	115	2.20	34.0	808	2650	3792	55000	97.3	1.088
ReloadSwiss RS 60	104	1.96	30.2	801	2629	3792	55000	99.8	1.087
Elcho 17	103	1.94	29.9	797	2614	3792	55000	99.4	1.091
Alliant Reloder-17	103	1.94	29.9	797	2614	3792	55000	99.4	1.091
Somchem S365	112	1.99	30.6	795	2609	3792	55000	99.9	1.095
Alliant Reloder-23	120	2.11	32.5	793	2602	3792	55000	98.8	1.094
Alliant Reloder-16	111	1.94	29.9	792	2600	3792	55000	98.8	1.097
Alliant Reloder-25	123	2.19	33.8	790	2593	3792	55000	96.2	1.094
ReloadSwiss RS 62	108	2.02	31.2	790	2592	3792	55000	97.7	1.103
Norma 217	135	2.38	36.7	790	2591	3792	55000	92.4	1.096
Norma MRP 2	126	2.26	34.9	787	2584	3792	55000	90.6	1.096
Bofors RP30	126	2.26	34.9	787	2583	3792	55000	90.6	1.097
Raufoss RA15	117	2.11	32.6	786	2579	3792	55000	92.5	1.097
Alliant Reloder-22	117	2.11	32.6	786	2579	3792	55000	92.5	1.097
Bofors RP5/NP ~approximation	117	2.11	32.6	786	2579	3792	55000	92.5	1.097
Winchester WXR	120	2.12	32.8	786	2578	3792	55000	92.3	1.098
Bofors RP15	120	2.12	32.8	786	2578	3792	55000	92.3	1.098
Vihtavuori N560	116	2.13	32.8	785	2577	3792	55000	89.4	1.097
ReloadSwiss RS 70	110	2.10	32.4	785	2576	3792	55000	94.4	1.095
Accurate 4350	108	1.93	29.8	783	2568	3792	55000	97.9	1.117
PB Clermont PCL 511	105	2.00	30.8	782	2567	3792	55000	96.0	1.101
Norma URP	108	1.91	29.5	782	2567	3792	55000	97.8	1.105
Bofors RP19 ~approximation	108	1.91	29.5	782	2566	3792	55000	97.8	1.105
Ramshot Hunter	108	2.00	30.9	782	2566	3792	55000	96.0	1.101
PB Clermont PCL 518	109	2.01	31.1	782	2565	3792	55000	95.5	1.101
ReloadSwiss RS 52	98	1.82	28.1	781	2564	3792	55000	99.8	1.110
Vihtavuori N550	105	1.92	29.6	781	2563	3792	55000	97.7	1.112
Winchester 760	102	1.94	29.9	780	2561	3792	55000	95.0	1.104
Hodgdon H414	102	1.94	29.9	780	2561	3792	55000	95.0	1.104
Accurate MAGPRO	117	2.22	34.3	780	2560	3792	55000	87.2	1.101
SNPE Vectan SP 11	101	1.86	28.7	778	2554	3792	55000	98.9	1.107

continued

Table with predicted charges of different powders for a nominal pressure of about 379 MPa or 55000 psi
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 Gramm Grains	Muzzle Vel. m/s fps	Max. Pressure bar psi	Prop.Burnt %	B_Time ms
IMR 4831	114	1.95 30.0	778 2552	3792 55000	98.0	1.113
Hodgdon CFE223	92	1.83 28.3	778 2552	3792 55000	99.2	1.107
Ramshot Big Game	97	1.86 28.7	777 2548	3792 55000	98.8	1.107
Hodgdon Retumbo	129	2.33 35.9	776 2547	3792 55000	92.6	1.102
ADI AR 2225	129	2.33 35.9	776 2547	3792 55000	92.6	1.102
IMR 4895	97	1.73 26.7	775 2542	3792 55000	99.0	1.119
Alliant Reloder-19	112	2.01 31.1	775 2541	3792 55000	92.5	1.102
Hodgdon Hybrid 100V	111	1.92 29.6	774 2541	3792 55000	99.2	1.103
Vihavuori N570	126	2.37 36.6	774 2539	3792 55000	81.7	1.103
IMR 7828	120	2.09 32.3	774 2538	3792 55000	89.3	1.099
IMR 7828 SSC	114	2.09 32.3	774 2538	3792 55000	89.3	1.099
Accurate 3100	118	2.11 32.5	773 2535	3792 55000	96.0	1.117
Lovex S071	124	2.11 32.5	773 2535	3792 55000	96.0	1.117
Bofors RP14 ~approximation	113	2.03 31.3	772 2534	3792 55000	92.4	1.103
Hodgdon BL-C2	92	1.80 27.8	772 2534	3792 55000	99.6	1.121
Norma 203 old	100	1.81 27.9	772 2533	3792 55000	99.5	1.129
Bofors RP3	100	1.81 27.9	772 2533	3792 55000	99.5	1.129
Rottweil R905	118	2.09 32.3	772 2533	3792 55000	89.6	1.102
Norma 203B	98	1.75 27.1	771 2531	3792 55000	98.9	1.121
Alliant Reloder-15	98	1.75 26.9	771 2530	3792 55000	98.5	1.120
Bofors RP11 ~approximation	98	1.75 26.9	771 2530	3792 55000	98.5	1.120
Raufoss RA11	98	1.75 26.9	771 2530	3792 55000	98.5	1.120
IMR 3031	97	1.63 25.2	771 2529	3792 55000	100.0	1.117
Somchem S385	113	2.05 31.7	771 2528	3792 55000	94.1	1.115
ADI AR 2209	111	1.98 30.6	770 2526	3792 55000	91.9	1.100
Rottweil R903	102	1.81 27.9	770 2526	3792 55000	99.3	1.130
ADI AR 2213	114	2.07 31.9	769 2524	3792 55000	89.1	1.100
SNPE Vectan SP 12	118	2.25 34.7	768 2518	3792 55000	89.0	1.102
Bofors RP4 ~approximation	110	1.97 30.4	767 2518	3792 55000	92.1	1.104
Norma 204	106	1.97 30.4	767 2518	3792 55000	92.1	1.104
Raufoss RA4	110	1.97 30.4	767 2518	3792 55000	92.1	1.104
Hodgdon H4895	94	1.68 25.9	767 2517	3792 55000	99.3	1.122
PB Clermont PCL 517	118	2.25 34.7	767 2517	3792 55000	88.8	1.102
Bofors RP4 NT ~approximation	108	1.96 30.2	767 2517	3792 55000	94.5	1.113
Alliant Reloder-50	134	2.59 39.9	767 2516	3792 55000	80.7	1.108
Accurate 4064	100	1.75 27.0	767 2516	3792 55000	100.0	1.151
Somchem S355	102	1.78 27.5	767 2516	3792 55000	99.2	1.127
IMR 4320	99	1.75 27.0	767 2516	3792 55000	98.8	1.105
Ramshot Wild Boar	92	1.77 27.3	767 2516	3792 55000	98.9	1.117
Hodgdon H380	99	1.81 27.9	767 2515	3792 55000	97.4	1.125
Hodgdon H870	133	2.45 37.8	766 2513	3792 55000	83.9	1.107
Accurate 2520	93	1.75 27.0	766 2513	3792 55000	100.0	1.133
Lovex D073.6	95	1.75 27.0	766 2513	3792 55000	100.0	1.133
ADI AR 2206H	94	1.68 26.0	766 2512	3792 55000	98.9	1.123
Ramshot Magnum	115	2.24 34.6	765 2509	3792 55000	91.8	1.103
SNPE Vectan SP 9	95	1.75 27.1	764 2507	3792 55000	98.9	1.118
PB Clermont PCL 516	95	1.81 28.0	764 2505	3792 55000	97.3	1.118
Lovex S070	107	1.89 29.1	763 2504	3792 55000	95.2	1.127
PB Clermont PCL 507	91	1.71 26.3	763 2503	3792 55000	99.6	1.120
Alliant Reloder-33	127	2.46 37.9	762 2502	3792 55000	81.3	1.109
Accurate 2495	94	1.65 25.4	762 2501	3792 55000	100.0	1.157
Elcho TR140 - preliminary data	98	1.82 28.0	762 2500	3792 55000	97.5	1.122
Lovex S062	98	1.71 26.5	761 2497	3792 55000	99.6	1.131
Vihavuori N165	119	2.10 32.4	761 2497	3792 55000	93.1	1.109
IMR 4350	107	1.91 29.4	760 2495	3792 55000	94.1	1.112
Hodgdon H4350	109	1.91 29.5	760 2495	3792 55000	94.0	1.112
Vihavuori N530	90	1.63 25.1	760 2494	3792 55000	99.6	1.121
Somchem S341	93	1.80 27.7	760 2493	3792 55000	98.8	1.119
Vihavuori N540	97	1.76 27.1	760 2492	3792 55000	100.0	1.125
Norma 202	95	1.67 25.7	759 2491	3792 55000	100.0	1.127
Hodgdon VARGET	100	1.73 26.6	759 2491	3792 55000	98.3	1.115
ADI AR 2208	99	1.73 26.6	759 2491	3792 55000	98.3	1.115
Alliant AR-Comp	93	1.60 24.7	759 2489	3792 55000	100.0	1.122
Bofors RP11 TZ ~approximation	92	1.60 24.7	759 2489	3792 55000	100.0	1.122
Hodgdon H4831 SC	113	2.04 31.5	758 2488	3792 55000	88.9	1.107
Hodgdon H4831	117	2.04 31.5	758 2488	3792 55000	88.9	1.107
Lovex S065	105	1.84 28.4	758 2488	3792 55000	96.5	1.129
Winchester Supreme 780	110	2.08 32.1	758 2488	3792 55000	91.8	1.108
SNPE Vectan SP 7	93	1.79 27.6	758 2487	3792 55000	97.2	1.130
ReloadSwiss RS 50	98	1.83 28.3	758 2487	3792 55000	95.7	1.124
Bofors RP7 NT ~approximation	100	1.81 27.9	758 2486	3792 55000	95.2	1.105
IMR 4064	100	1.70 26.2	758 2486	3792 55000	98.5	1.119
Vihavuori N150	107	1.81 27.9	758 2486	3792 55000	99.8	1.124
IMR 8208 XBR	92	1.65 25.5	758 2486	3792 55000	99.6	1.121
Norma 201	95	1.67 25.7	758 2485	3792 55000	99.6	1.136

continued

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Propellant type	L.R./Filling %	Charge Gramm	Weight Grains	Muzzle Vel. m/s	Muzzle Vel. fps	Max. Pressure bar	Pressure psi	Prop.Burnt %	B_Time ms
Hodgdon H322	90	1.57	24.2	757	2485	3792	55000	100.0	1.118
Bofors 12,7mmRA NC1214 Lot20115087	134	2.54	39.1	757	2484	3792	55000	73.5	1.117
Rottweil R904	110	1.95	30.1	757	2484	3792	55000	90.7	1.111
Ramshot TAC	92	1.77	27.4	756	2482	3792	55000	96.7	1.123
Bofors RP5 NT ~approximation	118	2.15	33.1	756	2480	3792	55000	86.0	1.109
Bofors RP3 NT ~approximation	102	1.82	28.0	756	2479	3792	55000	96.4	1.113
Rottweil R902	97	1.68	25.9	755	2478	3792	55000	99.6	1.138
ReloadSwiss RS 80	127	2.47	38.2	755	2476	3792	55000	81.1	1.113
IMR 4451 Enduron	102	1.80	27.8	755	2476	3792	55000	94.7	1.117
ADI AP 2214	118	2.19	33.8	754	2474	3792	55000	87.9	1.108
Vihtavuori N135	104	1.68	25.9	754	2473	3792	55000	100.0	1.131
Rottweil R907	103	1.82	28.0	754	2473	3792	55000	94.1	1.128
Bofors RP7	103	1.82	28.0	754	2473	3792	55000	94.1	1.128
IMR 4007 SSC	100	1.82	28.0	754	2472	3792	55000	94.1	1.128
Hodgdon H1000	124	2.19	33.8	753	2471	3792	55000	87.8	1.109
ADI AR 2217	124	2.19	33.8	753	2471	3792	55000	87.8	1.109
IMR 4955 Enduron	114	1.98	30.6	753	2470	3792	55000	89.8	1.113
Vihtavuori N140	97	1.70	26.2	753	2469	3792	55000	100.0	1.125
Rottweil R901	93	1.58	24.4	752	2467	3792	55000	100.0	1.148
Vihtavuori N160	118	2.02	31.2	752	2466	3792	55000	90.4	1.113
Bofors RP2 NT ~approximation	94	1.66	25.6	750	2460	3792	55000	99.2	1.121
Vihtavuori N170	129	2.28	35.2	749	2459	3792	55000	82.2	1.118
Alliant Reloder-12	90	1.65	25.4	749	2457	3792	55000	100.0	1.124
IMR 4166 Enduron	101	1.72	26.6	747	2452	3792	55000	94.9	1.123
Somchem S361	109	2.08	32.1	747	2450	3792	55000	89.4	1.123
Lovex S060	94	1.64	25.3	747	2450	3792	55000	98.9	1.123
Hodgdon Benchmark	91	1.61	24.8	746	2449	3792	55000	99.8	1.126
ADI AR 2206	93	1.65	25.5	744	2441	3792	55000	99.2	1.124
Accurate 2015	90	1.55	23.9	743	2437	3792	55000	100.0	1.144
Somchem S335	94	1.65	25.5	741	2430	3792	55000	100.0	1.140
SNPE Vectan SP 13	136	2.48	38.3	740	2428	3792	55000	80.0	1.119
Accurate 2700	100	1.87	28.8	739	2425	3792	55000	93.7	1.134
PB Clermont PCL 513/520/9520	137	2.51	38.7	732	2402	3792	55000	77.6	1.124
ADI AR 2218	126	2.41	37.1	731	2398	3792	55000	75.0	1.126
Hodgdon 50BMG	132	2.40	37.0	725	2380	3792	55000	69.0	1.127
Vihtavuori 24N41	125	2.38	36.7	724	2375	3792	55000	72.7	1.128
Hodgdon US 869	131	2.51	38.7	724	2374	3792	55000	72.8	1.130
Lovex D100	123	2.36	36.5	721	2366	3792	55000	75.6	1.129
Vihtavuori 20N29	135	2.59	40.0	721	2365	3792	55000	74.4	1.133
IMR 7977 Enduron	117	2.08	32.1	719	2360	3792	55000	79.3	1.130
Accurate 8700	134	2.50	38.5	716	2351	3792	55000	76.7	1.1