

WARNING: Since we have no control over equipment or data which may be used with this program, no responsibility is implied or assumed for results obtained through its use. Input data and results may be incorrect or wrong. Therefore the use of this data for loading ammunition can cause serious injury to personell and material. The computer-results had to be checked against data available in current loading manuals.

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:18-Jul-2020	Time:07:00:09	File: *.dat
Cartridge / Caliber	.44-40 Win. CF	Bullet	.430, 200, Hornady HP/XTP 4410
Maximum Average Pressure, allowed	15954 psi. 1100 bar (Piezo CIP)		with flatbase
Groove Caliber	0.428 in. 10.87 mm	Bullet Weight	200.0 gr. 12.96 gm
Case Capacity, overflow	40.04 gr. H2O 2.6 cm ³	Bullet Length	0.675 in. 17.15 mm
Case Length	1.305 in. 33.15 mm	Bullet Seating Depth	0.390 in. 9.9 mm
Cartridge O.A. Length	1.591 in. 40.4 mm	Barrel/Tube Length	20.0 in. 508.0 mm
Shot Start / Init Pressure	2176 psi. 150.03 bar	Cross Section Area of Bore	0.14255 in. ² 0.9197 cm ²
Propellant type	ADI AR 2205		
Charge Weight	23.5 gr. 1.523 gm	Load Density	229.4 gr./in. ³ 0.907 gm/cm ³
Heat of Explosion, Potential	261.8 J/gr. 4040 J/gm	Energy Density of Charge	60059 J/in. ³ 3665 J/cm ³
Propellant Solid Density	384.39 gr./in. ³ 1.52 gm/cm ³	Used Ratio of Specific Heats cp/cv	1.202
Burning Rate Factor Ba	1.2 1/s	Weighting Factor	0.75
Burning Function Limit Z1	0.234	Prog.-/ Degressivity Factor a0	0.545
Factor b	1.213	Bulk Density	221.3 gr./in. ³ 0.875 gm/cm ³

Calculated and Estimated Data:

Bullet Shank Seating Depth	0.39 in. 9.9 mm	Capacity Displaced by Seated Bullet	0.0562 in. ³ 0.921 cm ³
Useable Case Capacity	0.1025 in. ³ 1.679 cm ³	Bullet Travel at Muzzle Exit	19.08 in. 484.75 mm
Loading Ratio("Density") / Filling	103.7 % = compressed	Charge Fraction Burnt at Shot Start	0.82 %

Predicted Data:

Maximum Chamber Pressure	31543 psi. 2175 bar	Bullet Travel at Pmax	0.33 in. 8.4 mm
at Muzzle Exit:			
Bullet Velocity	1783 fps. 543.5 m/s	Pressure at Muzzle	1866 psi. 129 bar
Bullet Energy	1412 ft.lbs. 1914 Joule	Bullet Barrel Time	1.273 ms
Propellant Burnt	84.8 %	Ballistic Efficiency	31.1 %

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 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	Charge Weight Grains	Muzzle Vel. m/s	Muzzle Vel. fps	Muzzle Energy Joule	Muzzle Energy ft.lbs	Max. Pressure bar	Max. Pressure psi	Muzzle Pressure bar	Muzzle Pressure psi	Prop.Burnt %	B_Time ms	L.R./Filling %
-20.0	1.22	18.8	437	1432	1235	911	<u>1167</u>	<u>16928</u>	95	1378	73.4	1.647	83
-18.0	1.25	19.3	447	1467	1296	956	<u>1242</u>	<u>18009</u>	98	1428	74.6	1.604	85
-16.0	1.28	19.7	458	1502	1358	1002	<u>1320</u>	<u>19150</u>	102	1479	75.9	1.563	87
-14.0	1.31	20.2	468	1537	1422	1049	<u>1404</u>	<u>20363</u>	105	1529	77.1	1.524	89
-12.0	1.34	20.7	479	1571	1487	1097	<u>1493</u>	<u>21659</u>	109	1578	78.3	1.486	91
-10.0	1.37	21.2	490	1606	1554	1146	<u>1589</u>	<u>23042</u>	112	1628	79.4	1.448	93
-8.0	1.40	21.6	500	1642	1623	1197	<u>1691</u>	<u>24520</u>	116	1677	80.5	1.411	95
-6.0	1.43	22.1	511	1677	1693	1249	<u>1800</u>	<u>26100</u>	119	1725	81.7	1.374	97
-4.0	1.46	22.6	522	1712	1765	1302	<u>1916</u>	<u>27791</u>	122	1773	82.7	1.339	100
-2.0	1.49	23.0	533	1747	1839	1356	<u>2041</u>	<u>29602</u>	125	1820	83.8	1.305	102
Nominal	1.52	23.5	543	1783	1914	1412	<u>2175</u>	<u>31543</u>	129	1866	84.8	1.273	104
+2.0	1.55	24.0	554	1819	1991	1469	<u>2319</u>	<u>33627</u>	132	1911	85.8	1.241	106
+4.0	1.58	24.4	565	1854	2071	1527	<u>2473</u>	<u>35866</u>	135	1956	86.8	1.211	108
+6.0	1.61	24.9	576	1890	2151	1587	<u>2639</u>	<u>38276</u>	138	1999	87.8	1.181	110
+8.0	1.64	25.4	587	1926	2234	1648	<u>2818</u>	<u>40873</u>	141	2041	88.7	1.152	112
+10.0	1.68	25.9	598	1962	2319	1710	<u>3011</u>	<u>43678</u>	144	2081	89.6	1.124	114

Results caused by ±10% powder lot-to-lot burning rate variation using nominal charge

Nominal	1.52	23.5	575	1887	2144	1582	<u>2570</u>	<u>37268</u>	136	1969	91.7	1.187	104
Data for burning rate increased by 10% relative to nominal value :													
Nominal	1.52	23.5	506	1661	1662	1226	<u>1806</u>	<u>26189</u>	118	1708	76.1	1.381	104
Data for burning rate decreased by 10% relative to nominal value :													