User Data:

Date:8-Apr-2015 **Time:21:58:43** **File: xpert 223 rem 42gr.dat**

Cartridge / Caliber	**.223 Rem. (SAAMI)**		**Bullet**	**.224 42GR XPERT**	
Maximum Average Pressure, allowed	55000 psi.	3792 bar (Piezo SAAMI)		with flatbase	
Groove Caliber	0.224 in.	5.69 mm	Bullet Weight	42.0 gr.	2.72 gm
Case Capacity, overflow	28.8 gr. H2O	1.87 cm³	Bullet Length	0.772 in.	19.6 mm
Case Length	1.759 in.	44.68 mm	Bullet Seating Depth	0.287 in.	7.28 mm
Cartridge O.A. Length	2.244 in.	57.0 mm	Barrel/Tube Length	24.0 in.	609.6 mm
Shot Start / Init Pressure	3625 psi.	249.94 bar	Cross Section Area of Bore	0.0388 in.²	0.2503 cm²
Propellant type	**Somchem S335**				
Charge Weight	24.5 gr.	1.588 gm	Load Density	238.2 gr./in.³	0.942 gm/cm³
Heat of Explosion, Potential	240.4 J/gr.	3710 J/gm	Energy Density of Charge	57289 J/in.³	3496 J/cm³
Propellant Solid Density	407.15 gr./in.³	1.61 gm/cm³	Used Ratio of Specific Heats cp/cv	1.224	
Burning Rate Factor Ba	0.624 1/s		Weighting Factor	0.6	
Burning Function Limit Z1	0.35		Prog.-/ Degressivity Factor a0	2.299	
Factor b	1.666		Bulk Density	227.6 gr./in.³	0.900 gm/cm³

Calculated and Estimated Data:

Bullet Shank Seating Depth	0.287 in.	7.28 mm	Capacity Displaced by Seated Bullet	0.0113 in.³	0.185 cm³
Useable Case Capacity	0.1028 in.³	1.685 cm³	Bullet Travel at Muzzle Exit	22.53 in.	572.2 mm
Loading Ratio("Density") / Filling	104.7 % = compressed		Charge Fraction Burnt at Shot Start	1.32 %	
Predicted Data:					
Maximum Chamber Pressure	42086 psi.	2902 bar	Bullet Travel at Pmax	1.46 in.	37.0 mm
at Muzzle Exit:					
Bullet Velocity	3278 fps.	999.3 m/s	Pressure at Muzzle	5824 psi.	402 bar
Bullet Energy	1002 ft.lbs.	1359 Joule	Bullet Barrel Time	1.013 ms	
Propellant Burnt	92.8 %		Ballistic Efficiency	23.1 %	

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.