User Data:

Date:8-Apr-2015 **Time:21:30:16** **File: xpert .50bmg 650gr tm.dat**

Cartridge / Caliber	**.50 Browning MG (12.7x99)**		**Bullet**	**.510, 650gr XPERT TARGET**	
Maximum Average Pressure, allowed	53664 psi.	3700 bar (Piezo CIP)		with flatbase	
Groove Caliber	0.510 in.	12.95 mm	Bullet Weight	650.0 gr.	42.12 gm
Case Capacity, overflow	294.0 gr. H2O	19.089 cm³	Bullet Length	2.252 in.	57.2 mm
Case Length	3.900 in.	99.06 mm	Bullet Seating Depth	0.916 in.	23.27 mm
Cartridge O.A. Length	5.236 in.	132.99 mm	Barrel/Tube Length	30.0 in.	762.0 mm
Shot Start / Init Pressure	3625 psi.	249.94 bar	Cross Section Area of Bore	0.20093 in.²	1.2963 cm²
Propellant type	**Accurate MAGPRO**				
Charge Weight	200.0 gr.	12.96 gm	Load Density	204.6 gr./in.³	0.809 gm/cm³
Heat of Explosion, Potential	251.4 J/gr.	3880 J/gm	Energy Density of Charge	51439 J/in.³	3139 J/cm³
Propellant Solid Density	409.68 gr./in.³	1.62 gm/cm³	Used Ratio of Specific Heats cp/cv	1.245	
Burning Rate Factor Ba	0.334 1/s		Weighting Factor	0.5	
Burning Function Limit Z1	0.47		Prog.-/ Degressivity Factor a0	2.018	
Factor b	1.917		Bulk Density	247.3 gr./in.³	0.978 gm/cm³

Calculated and Estimated Data:

Bullet Shank Seating Depth	0.916 in.	23.27 mm	Capacity Displaced by Seated Bullet	0.1874 in.³	3.071 cm³
Useable Case Capacity	0.9775 in.³	16.018 cm³	Bullet Travel at Muzzle Exit	27.02 in.	686.21 mm
Loading Ratio("Density") / Filling	82.7 %		Charge Fraction Burnt at Shot Start	1.63 %	
Predicted Data:					
Maximum Chamber Pressure	45952 psi.	3168 bar	Bullet Travel at Pmax	3.21 in.	81.5 mm
at Muzzle Exit:					
Bullet Velocity	2647 fps.	806.8 m/s	Pressure at Muzzle	10785 psi.	744 bar
Bullet Energy	10113 ft.lbs.	13712 Joule	Bullet Barrel Time	1.686 ms	
Propellant Burnt	98.9 %		Ballistic Efficiency	27.3 %	

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.