User Data:

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Cartridge / Caliber	**.270 Ackley Mag.**		**Bullet**	**.277, 105 gr, XPERT**	
Maximum Average Pressure, allowed	59988 psi.	4136 bar (Wildcat)		with flatbase	
Groove Caliber	0.277 in.	7.04 mm	Bullet Weight	105.0 gr.	6.8 gm
Case Capacity, overflow	74.0 gr. H2O	4.805 cm³	Bullet Length	1.189 in.	30.2 mm
Case Length	2.460 in.	62.48 mm	Bullet Seating Depth	0.539 in.	13.68 mm
Cartridge O.A. Length	3.110 in.	79.0 mm	Barrel/Tube Length	24.0 in.	609.6 mm
Shot Start / Init Pressure	3625 psi.	249.94 bar	Cross Section Area of Bore	0.05971 in.²	0.3852 cm²
Propellant type	**Somchem S365**				
Charge Weight	58.0 gr.	3.758 gm	Load Density	222.5 gr./in.³	0.880 gm/cm³
Heat of Explosion, Potential	238.8 J/gr.	3685 J/gm	Energy Density of Charge	53127 J/in.³	3242 J/cm³
Propellant Solid Density	404.63 gr./in.³	1.6 gm/cm³	Used Ratio of Specific Heats cp/cv	1.239	
Burning Rate Factor Ba	0.44 1/s		Weighting Factor	0.5	
Burning Function Limit Z1	0.605		Prog.-/ Degressivity Factor a0	1.715	
Factor b	2.271		Bulk Density	231.4 gr./in.³	0.915 gm/cm³

Calculated and Estimated Data:

Bullet Shank Seating Depth	0.539 in.	13.68 mm	Capacity Displaced by Seated Bullet	0.0325 in.³	0.533 cm³
Useable Case Capacity	0.2607 in.³	4.272 cm³	Bullet Travel at Muzzle Exit	22.08 in.	560.8 mm
Loading Ratio("Density") / Filling	96.1 %		Charge Fraction Burnt at Shot Start	1.45 %	
Predicted Data:					
Maximum Chamber Pressure	46253 psi.	3189 bar	Bullet Travel at Pmax	3.08 in.	78.3 mm
at Muzzle Exit:					
Bullet Velocity	3237 fps.	986.8 m/s	Pressure at Muzzle	11078 psi.	764 bar
Bullet Energy	2444 ft.lbs.	3313 Joule	Bullet Barrel Time	1.155 ms	
Propellant Burnt	99.7 %		Ballistic Efficiency	23.9 %	

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.