User Data:

Date:8-Apr-2015 **Time:21:38:46** **File: xpert 220 swift 42gr.dat**

Cartridge / Caliber	**.220 Swift**		**Bullet**	**.224 42GR XPERT**	
Maximum Average Pressure, allowed	62366 psi.	4300 bar (Piezo CIP)		with flatbase	
Groove Caliber	0.224 in.	5.69 mm	Bullet Weight	42.0 gr.	2.72 gm
Case Capacity, overflow	47.0 gr. H2O	3.052 cm³	Bullet Length	0.772 in.	19.6 mm
Case Length	2.205 in.	56.01 mm	Bullet Seating Depth	0.300 in.	7.62 mm
Cartridge O.A. Length	2.677 in.	68.0 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 S355**				
Charge Weight	40.0 gr.	2.592 gm	Load Density	229.4 gr./in.³	0.907 gm/cm³
Heat of Explosion, Potential	253.4 J/gr.	3910 J/gm	Energy Density of Charge	58109 J/in.³	3546 J/cm³
Propellant Solid Density	404.63 gr./in.³	1.6 gm/cm³	Used Ratio of Specific Heats cp/cv	1.2291	
Burning Rate Factor Ba	0.5 1/s		Weighting Factor	0.4	
Burning Function Limit Z1	0.39		Prog.-/ Degressivity Factor a0	2.36	
Factor b	1.774		Bulk Density	227.6 gr./in.³	0.900 gm/cm³

Calculated and Estimated Data:

Bullet Shank Seating Depth	0.3 in.	7.62 mm	Capacity Displaced by Seated Bullet	0.0118 in.³	0.194 cm³
Useable Case Capacity	0.1744 in.³	2.858 cm³	Bullet Travel at Muzzle Exit	22.1 in.	561.21 mm
Loading Ratio("Density") / Filling	100.8 % = compressed		Charge Fraction Burnt at Shot Start	1.33 %	
Predicted Data:					
Maximum Chamber Pressure	49179 psi.	3391 bar	Bullet Travel at Pmax	2.59 in.	65.9 mm
at Muzzle Exit:					
Bullet Velocity	3980 fps.	1213.0 m/s	Pressure at Muzzle	10717 psi.	739 bar
Bullet Energy	1477 ft.lbs.	2003 Joule	Bullet Barrel Time	0.928 ms	
Propellant Burnt	94.4 %		Ballistic Efficiency	19.8 %	

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.