

## Commercial Pressure & Velocity Data

We've undertaken the pain and expense of curating pressure-testing capability to develop our own Dagny Dagger loads, such capability is very rare outside of disinterested corporations, and Atlas Arms exists as an R&D non-profit firm for public benefit. In light of these, we would like to inform the public on this generally-unknown but critically-important aspect of ammunition specification by testing and publishing pressure data for commercially-available loads in conjunction with velocity. At this point, we are only able to test 9mm cartridges cased in NAS3 which fit a SAAMI-spec. chamber. That said, we are open to public testing requests and perhaps even custom load development.

Note: NAS3 cases produce very similar but slightly different ballistics than brass cases. SAAMI-spec. 9mmX19 (obsolete) chamber pressure is 35ksi, SAAMI-spec. 9mmX19 +P chamber pressure is 38.5ksi, and 9mmX19 "proof pressure" is 50-55ksi.

Oak Island Ammunition 9MM 124 Grain FMJ				
Manufacturer	Data Source	Date	Barrel Length (in)	Barrel Twist (in/r)
Oak Island Ammunition	Atlas Arms	10/15/2019	4	10
Caliber	Bullet Weight (gr)	Bullet Type	Load	Case
9mm Luger	124	FMJ Ball	Std. P	NAS3
Sample	Pressure (psi)	Velocity (fps)	Notes	
1	33118	1026	--	
2	33038	1006	--	
3	31873	1000	Min Pressure, Min Velocity	
4	32168	1015	--	
5	33399	1016	--	
6	33316	1024	--	
7	32869	1022	--	
8	34135	1028	Max Pressure, Max Velocity	
9	33693	1025	--	
10	32348	1008	--	
Average	<b>32996</b>	<b>1017</b>	<< SAAMI P <<Advertised V	
Advertised/SAMMI Spec.	<b>35000</b>	<b>1130</b>		
Standard Deviation	703	10		
Spread	2263	28		

Pressure significantly less than SAAMI spec. accompanied by a much lower velocity than advertised. Underpowered on the whole, but just fine for close-range target shooting. Reasonable consistency.

<b>ARM 9mm Luger 124 Grain CuMJ-RN</b>				
<b>Manufacturer</b>	<b>Data Source</b>	<b>Date</b>	<b>Barrel Length (in)</b>	<b>Barrel Twist (in/r)</b>
American Reserve Munitions	Atlas Arms	10/3/2019	4	10
<b>Caliber</b>	<b>Bullet Weight (gr)</b>	<b>Bullet Type</b>	<b>Load</b>	<b>Case</b>
9mm Luger	124	FMJ Ball	Std. P	NAS3
<b>Sample</b>	<b>Pressure (psi)</b>	<b>Velocity (fps)</b>	<b>Notes</b>	
1	33690	1065	Min Pressure, Min Velocity	
2	34977	1079	--	
3	34076	1074	--	
4	35088	1084	Max Pressure	
5	34205	1074	--	
6	30606	1074	--	
7	35051	1100	Max Velocity	
8	35066	1085	--	
9	34457	1096	--	
10	33774	1077	--	
<b>Average</b>	<b>34099</b>	<b>1081</b>	< SAAMI P == Advertised V	
<b>Advertized/SAMMI Spec.</b>	<b>35000</b>	<b>1086</b>		
<b>Standard Deviation</b>	1342	11		
<b>Spread</b>	4482	35		

Advertised velocity is accurate, though pressure is a bit low. Slightly underpowered but fine for close-range target shooting. Velocity is reasonably consistent while pressure is quite inconsistent, an apparent trend with ARM loads.

<b>ARM 9MM +P - G9</b>				
<b>Manufacturer</b>	<b>Data Source</b>	<b>Date</b>	<b>Barrel Length (in)</b>	<b>Barrel Twist (in/r)</b>
American Reserve Munitions	Atlas Arms	10/10/2019	4	10
<b>Caliber</b>	<b>Bullet Weight (gr)</b>	<b>Bullet Type</b>	<b>Load</b>	<b>Case</b>
9mm Luger	80	Fluted Sol. Cu	+P	NAS3
<b>Sample</b>	<b>Pressure (psi)</b>	<b>Velocity (fps)</b>	<b>Notes</b>	
1	28915	1343	Min Pressure, Min Velocity	
2	37872	1479	--	
3	37314	1490	--	
4	37717	1488	--	
5	37210	1478	--	
6	38291	1482	--	
7	39410	1505	--	
8	44808	1580	Max Pressure, Max Velocity	
9	39811	1533	--	
10	39405	1503	--	
<b>Average</b>	<b>38075</b>	<b>1488</b>	< SAAMI P <Advertised V	
<b>Advertized/SAMMI Spec.</b>	<b>38500</b>	<b>1525</b>		
<b>Standard Deviation</b>	3906	60	Very Poor Consistency	
<b>Spread</b>	15893	237	Extreme Variation	

Average pressure is a little lower than SAMMI +P, though this is of little relevance as the max pressure is nearly 45ksi! Extreme inconsistency. Average velocity a bit lower than advertised. *Note: inconsistency may be due in part to apparent loose crimp onto the exotic bullet which may allow the bullet to be jammed deeper into the case, increasing pressure with no velocity gain.*



<b>Liberty Civil Defense Ultra-Light "+P"</b>				
<b>Manufacturer</b>	<b>Data Source</b>	<b>Date</b>	<b>Barrel Length (in)</b>	<b>Barrel Twist (in/r)</b>
Liberty Ammunition	Atlas Arms	2/16/2020	4	10
<b>Caliber</b>	<b>Bullet Weight (gr)</b>	<b>Bullet Type</b>	<b>Load</b>	<b>Case</b>
9mm Luger	50	Copper XHP	+P	NAS3
<b>Sample</b>	<b>Pressure (psi)</b>	<b>Velocity (fps)</b>	<b>Notes</b>	
1	45977	2137	Min Velocity	
2	44700	2154	--	
3	44447	2169	Min Pressure	
4	46388	2179	--	
5	47506	2180	Max Pressure, Max Velocity	
6	45444	2166	--	
7	46910	2162	--	
8	46916	2159	--	
9	46733	2149	--	
10	45118	2156	--	
<b>Average</b>	<b>46014</b>	<b>2161</b>	<b>Dangerously High Pressure (&gt;&gt;+P)!, &gt;Advertised V</b>	
<b>Advertised/SAMMI Spec.</b>	<b>38500</b>	<b>2000</b>		
<b>Standard Deviation</b>	1044	13		
<b>Spread</b>	3060	43	Wide Pressure Spread	

Advertised as "+P", this load is far into the +P+ domain! Perhaps dangerously so. Very consistent percent-wise. Significantly higher-than-advertised velocity accompanied by absurd overpressure. Powder load reverse-engineered to 9.0gr.-9.1gr. Winchester Autocomp, CFE Pistol, or very similar-burning powder. This is a "textbook" extrapolation for a 50gr. +P 9mm powder load, so it is likely no one cared to test the pressure or optimize the cartridge before commercializing. This lack of due care also manifests in notably low velocity for such extreme overpressure. Still, before release of the Dagny Dagger, one might argue it to be the best defensive 9mm load on the market. Fast, light, and fragile.

<b>NovX 9MM Luger +P ARX</b>				
<b>Manufacturer</b>	<b>Data Source</b>	<b>Date</b>	<b>Barrel Length (in)</b>	<b>Barrel Twist (in/r)</b>
NovX	Atlas Arms	10/18/2019	4	10
<b>Caliber</b>	<b>Bullet Weight (gr)</b>	<b>Bullet Type</b>	<b>Load</b>	<b>Case</b>
9mm Luger	65	Fluted Cu Comp.	+P	NAS3
<b>Sample</b>	<b>Pressure (psi)</b>	<b>Velocity (fps)</b>	<b>Notes</b>	
1	39835	1830	Max Velocity	
2	39843	1787	--	
3	38136	1818	Min Pressure	
4	41577	1801	--	
5	38999	1792	--	
6	38704	1794	--	
7	40567	1795	--	
8	39612	1784	Min Velocity	
9	39401	1789	--	
10	41803	1793	Max Pressure	
<b>Average</b>	<b>39848</b>	<b>1798</b>	> SAAMI Pressure ==Advertised Velocity	
<b>Advertized/SAMMI Spec.</b>	<b>38500</b>	<b>1800</b>		
<b>Standard Deviation</b>	1181	15		
<b>Spread</b>	3667	46		

Slightly high on pressure but spot-on true to advertised velocity. Velocity is slightly inconsistent and pressure more so. This is a high-performer and it seems NovX is a good standard and example of good load development in forward-thinking configurations, separate from the debate to be had on the frangible injection-molded Cu/PA composite bullets.

*Note: Slight overpressure here may be due in part or in whole to the bullets jamming deeper into cases to headspace in our SAAMI-spec. Universal Receiver (UR) barrel, which may increase pressure without significant velocity increase. Extremely rarely if at all are 9mm barrels chambered to SAAMI-spec., but rather cut to various deeper throat depths. Clearly NovX cartridges are spec'd for real pistol barrels, so this is the only NovX load which chambered well enough in our UR barrel for testing.*