2017 NZ ROD & RIFLE SUPPRESSOR TEST

This is a test we've wanted to run for a while now. New Zealand shooters and hunters started embracing suppressors on centre fire rifles around 20 years ago, and we haven't looked back since then. There are many different options available on the New Zealand market, some produced locally and some imported. BY JOHN HERBERT

There are virtually no US-made suppressors commonly available as the Americans see them as dangerous devices that need to be controlled; yet here in NZ they are viewed quite differently. In New Zealand we see a number of benefits. Firstly, the reduction of muzzle blast can help the hunter disguise their position; it's the muzzle blast that is directional while the supersonic crack of the projectile is not, so an animal in hearing the crack is often unable to determine the direction it has come from. I have seen this phenomenon on many occasions when hunting.

The next advantage is the reduction of recoil. To be clear, a suppressor won't reduce recoil like a well-designed muzzle brake, which can reduce felt recoil by up to 60%, but a suppressor can certainly reduce felt recoil by up to 25%. A suppressor can also, in some instances, help with accuracy. The suppressor affects barrel harmonics and while this is an article in itself, the net result is often tighter groups. The final positive for the suppressor is the protection of our hearing, the hearing of our fellow hunters and shooters and even the dogs we hunt with..

NZ Rod&Rifle sent invitations to suppliers and manufacturers to submit suppressors for testing. The specs of the rifle, the calibre (.308) were supplied along with the thread (M14 x 1), and the invitees were able to supply multiple suppressors to test. The response was overwhelmingly positive, although a few suppliers chose not to be involved. They chose either not to respond, or couldn't meet the deadline, or they set testing conditions that **NZ Rod&Rifle** would not accept. It's worth noting that the only people involved with the testing were **NZ Rod&Rifle** staff, and for the record there was no bias, favouritism or advantage shown to any suppressor. While the sound pressure meter used is a pretty smart piece of equipment it's not smart enough to skew results or generate random figures!

I would note that this test was focussed on *supersonic* performance. Subsonic suppressor performance is a separate subject and is outside the scope of this article, but for those who shoot both supersonic and subsonic rounds through the same suppressor it is accepted that baffle design and the number of baffles in front of the muzzle have a big influence on subsonic performance.

The testing device was a Larson Davis Soundtrack LxT Sound Level Meter. This device is internationally recognised and unlike many devices used by backyard enthusiasts it is fully capable of recording the high peak decibel readings of gunshots; in fact that is what is was specifically designed for. The Larson Davis is expensive, costing thousands of dollars and is used by many international organisations to measure sound pressure.

I cannot emphasise strongly enough how important this Sound Meter is. The devices that clip to your phone, or the ones you used to be able to buy from Dick Smith, just don't have the ability to deal with the peak pressures generated, with many clipping the noise at around 110dB. The other point with cheap sound meters is that they're designed to record industrial noise as opposed to gunshots; gunshots peak very quickly and you need a meter that can respond in 20 microseconds (a microsecond is one-millionth of a second) or less. A cheap meter just responds too slowly; it will respond in maybe 20 milliseconds (a millisecond is *one-thousandth* of a second) so the peak pressure from the gunshot has already occurred before the meter is able to register it. Gunshot data gathered with these cheaper instruments is next to useless and in no way can it be compared to the data presented here.

The shots were recorded with the Sound meter

positioned one metre to the left of the muzzle, and at the same height as the muzzle. This puts the test in line with that of other international tests, and as the shots were recorded in an anechoic (read on) chamber, the data presented here is accurate and relevant.

During the testing we looked at various models of suppressor, and to make sure the testing was able to stand up to scrutiny the following conditions were set.

The testing was all done in an anechoic chamber, to keep outside influences at bay. An anechoic chamber is a room designed to completely absorb sound reflections; this means that a person or detector exclusively hears direct sounds (no reverberant sounds), in effect simulating being inside an infinitely large room. Testing was carried out over two days, but the atmospheric conditions on both days were almost identical. In any case, the main benefit of an anechoic chamber is the elimination of wind noise and sound reflection. The ammunition used was Winchester 147gr .308 FMJ, and it was all from the same batch, so as to provide consistency. The rifle was a Remington 700 SPS Stainless in .308 Winchester, with a barrel 24 inches in length. The rifle was cooled in between serials by putting the barrel into a tube of water then patching it out until dry.

Several of the suppressors came fitted with a neoprene sock, however these were removed so that there would be no possible bias in results. We did however test one

THE TESTING PROCEDURE WAS AS FOLLOWS.

1. **Fire 5 shots with no suppressor attached, to achieve a baseline sound pressure level.**
2. **Inspect each suppressor and confirm it fitted the rifle.**
3. **Check the distance between the shooting point and the end of the suppressor, and adjust as necessary.**
4. **Fire two shots to put some carbon into the suppressor, then remove the suppressor, blow out the residual gas and let it cool to room temperature.**
5. **When the suppressor is cool, fit it to the barrel and fire five shots with a gap of 5-10 seconds between shots.**
6. **Remove the suppressor and cool the barrel in a tube of water. Swab the barrel dry and fit the next suppressor.**
7. **The recording was done by *NZ Rod&Rifle* Editor Simon Gibson. Each shot fired was also video recorded.**

NAME & RRP	WEIGHT(g)	DIA (mm)	OAL(mm)	LPM (mm)	OVERALL DB REDUCTION
A-TEC 150 Hertz - $599	391	49.5	232	152	32.02
A-TEC 87 Hertz - $459	304	49.5	168	89	19.06
A-TEC Carbon 2 - $779	317	48	234	156	31.34
A-TEC MilliHertz - $559	298	39.5	232	151	24.04
Aimsport Triton 42s - $599	446	42	266	160	25.88
ASE Utra SL5i - $495	349	44.5	118	106	25.24
ASE Utra SL7i - $695	462	44.5	165	148	29.26
DPT Modular 4 Baffle -$350	259	44.1	207	101	21.56
DPT Modular 5 baffle - $295	199	44.1	154	137	20.32
DPT Modular 9 Baffle - $575	392	44	292	171	30.42
DPT Modular Mag 4 Baffle - $405	285	44.1	240	103	22.26
Gunworks 35mm - $300	350	34.8	344	123	19.66
Gunworks 41mm - $340	450	41.3	343	126	23.38
Hardy Rifle Eng Gen 5 Stealth - $599	425	44.5	301	151	32.98
Hardy Rifle Eng Gen 6 - $555	300	44.5	200	90	24.82
Hushpower Shorty - $349	280	44	170	123	15.12
Hushpower Magnum With Sleve - $399	420	44	325	111	20.18
Hushpower 220 AR -$299	215	37.5	186	111	13.8
Hushpower 300 - $349	370	37	312	160	23.9
Hushpower 370 - $299	305	37.5	310	157	22.92
Hushpower Magnum - $399	410	44	325	112	20.24
Maniatis Alloy - $400	323	38.5	274	99	14.58
Maniatis Carbon Fibre - $425	317	39.5	254	98	11.54
Nielsen Sonic 45 Max 8 - $399	480	44.5	269	125	23.72
Oceania Defence Alpine Hunter -$995	155	37.3	167	152	24.38
Oceania Defence Ratchet Lock - $1,194	250	38	187	176	29.4
Silenz Long rifle - $472	404	43.8	263	100	12.84
Silenz XLR - $510	505	43.8	311	150	20.82
Waitakai Engineering L/W Over Barrel - $525	665	38.3	306	126	24.24
Waitakai Engineering Muzzle can - $275	345	38.3	139	126	17.84
Waitakai Engineering Std Over Barrel - $400	484	38.3	285	126	23.54

suppressor with the neoprene sock on and off but there was no discernible change in decibel readings.
We focussed on a number of outcomes to ensure that the test results were meaningful to the New Zealand hunter and shooter.

THE OUTCOMES WE FOCUSSED ON WERE AS FOLLOWS:

1. **Overall dB reduction.**
2. **dB reduction per mm past the muzzle.**
3. **dB reduction per gram.**
4. **dB reduction per mm in diameter.**
5. **dB reduction per dollar.**

The reason we didn't just focus on total db reduction was that it would be biased towards long, large-volume suppressors that may not represent what the New Zealand hunting and shooting community want. Some suppressors may sacrifice some noise reduction for lighter weight, and the same may be true for overall length. Money is often a factor and the cost of the suppressor influences people's decisions, so we added a 'dB per dollar' ratio as well. We're unable to provide any information regarding strength and durability; however it's widely accepted that wall thickness and the metal that the suppressor is made from will influence durability. So if you were a competition shooter, or you were involved in pest destruction and as a consequence you fired a large volume of shots, then you might need to consider whether your suppressor is designed to handle the heat generated in this activity. And while the material is one consideration, the construction is also worth investigating. During testing we noted that a number of suppressors were far too hot to handle after 5 shots, while others were merely warm.

A WORD FROM THE SUPPLIERS:

MANIATIS GUNSMITHS.

I have been making silencers for a long time. I set out to make the strongest, lightest over-barrel design, starting from scratch. After 25 different prototypes I succeeded in ticking all the boxes. As I'm writing this I've launched two newer models than those featured in this article. The first is an over-barrel model weighing 280g; still in 3 pieces with a monolithic baffle system, but only 3 inches forward of the muzzle, for use up to .300 Win Mag. The second is a bigger

volume carbon version. The 280g silencer will endure normal bolt action shooting; its design is a lot stronger than modular baffle-type silencers that need cleaning and are shot-specific to avoid warranty issues; with mine there is no cleaning and you don't have to count your rounds while you're firing. Prices for the Suppressors include fitting.

HUSHPOWER (GUN CITY).

We have been making Suppressors since 1988. Designed and built in NZ, they are made out of the highest quality materials available to us. We test our suppressors for a large variety of NZ's extreme conditions. We have supplied both the civilian and law enforcement markets with a wide variety of our silencers. With over 10,000 Hushpower silencers produced, not only are we one of the largest suppressor makers but we believe ours will also be the best value on the market. We offer a fitment service on a standard rifle from $75. Our over-barrel multi-change bush system will allow fitment to more than one rifle

SILENZ SUPPRESSORS

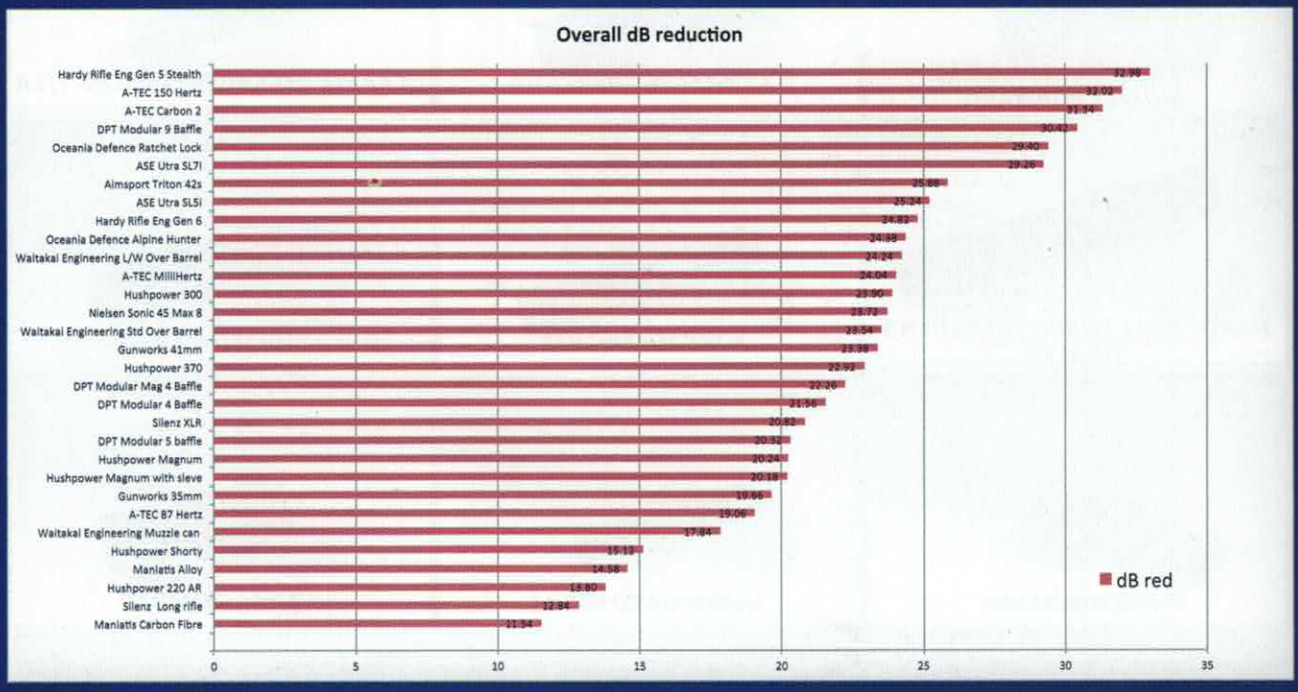
SILENZ centerfire suppressors are designed to provide a lighter-weight but strong, durable and effective suppressor solution for hunting rifles, and are intended for bolt-action rates of fire.

Using advanced engineering and hybrid construction techniques, incorporating high-grade aluminium alloys with stainless steel internal components, SILENZ suppressors are not only maintenance-free but provide the best compromise of the features for the hunter in terms of overall size, weight, length past the muzzle, sound suppression, recoil reduction, self-tightening and accuracy-enhancing features, durability, and cost.

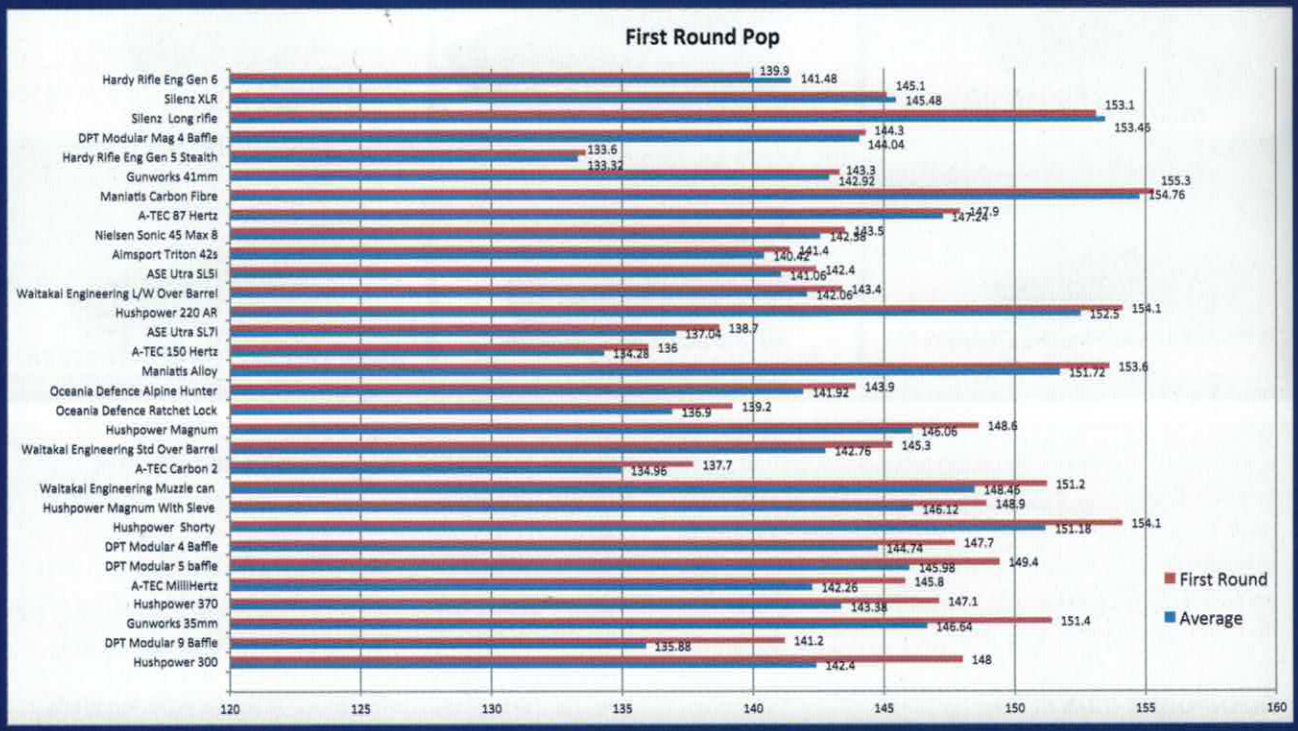
All components are precision CNC-machined and assembled in NZ.

- Only NZ suppressor maker to feature Tennalum® ultra-strength aluminium alloys.
- First to perfect the use of high-temp co-polymer inserts in the mid-baffle system to provide pre-tensioning, vibration-deadening, and self-compensating function as the unit heats up and cools down again.
- We can honestly claim a 100% reliability record with no warranty issues or failures at all to date. All units are serial numbered and fully QC-checked.

THE FOLLOWING CHARTS SHOW YOU THE FACTS *on the red line and a derived calculation on the blue line. The blue line is essentially an efficiency measure; you can use this to find the balance you want or just use the raw data to get the numbers that matter for you*



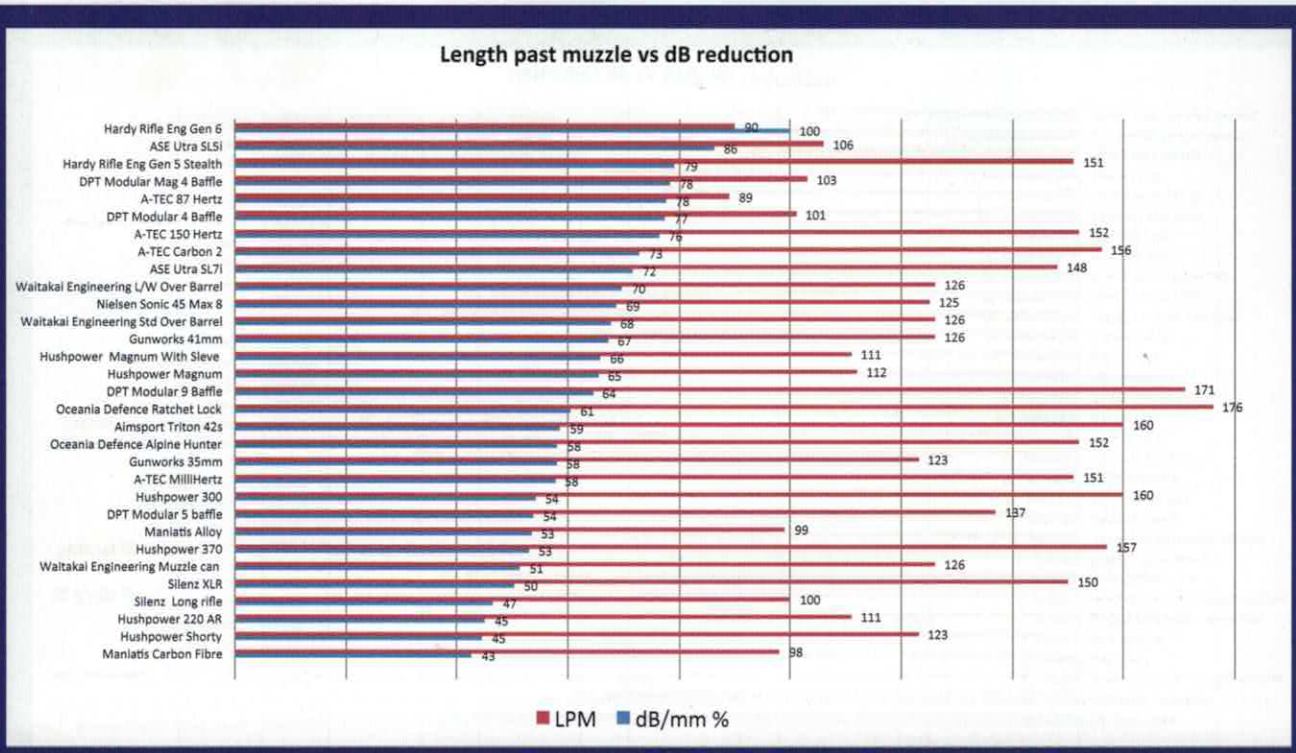
ABOVE: ***DECIBEL REDUCTION*** *from highest to lowest including First Round Pop*



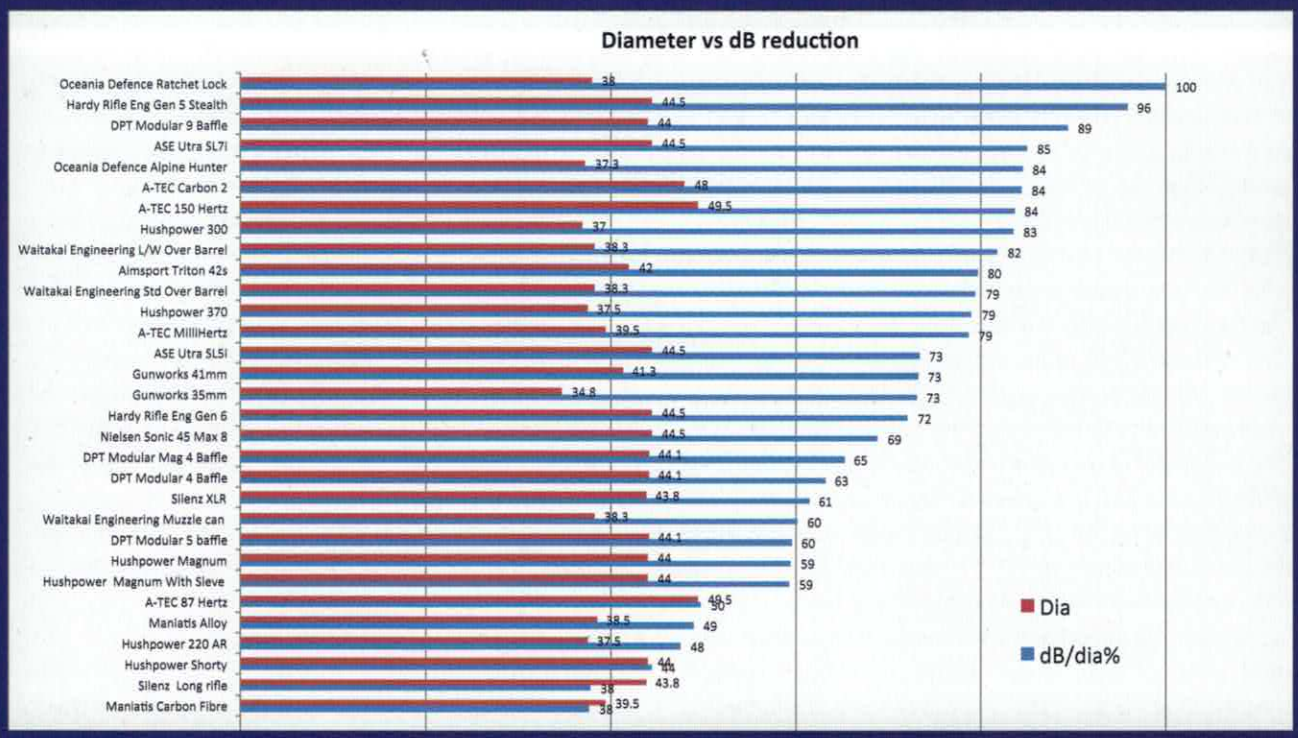
ABOVE: ***SOME SUPPRESSORS HAVE A NOTICEABLE FIRST ROUND POP*** *while others have none; pop is influenced by baffle design, interior volume and time since the last shot*

- No maintenance is required, other than a bit of grease on barrel threads. No need to continuously purchase and replace any sacrificial/disposable parts. Life-span of unit for non-magnum calibres depends on barrel length and cartridge size, but in real-world field tests our earliest prototype suppressors are still in active service with professional hunters, and have already lasted 5 times longer than some of their previous aluminium type suppressors with the exact same type of use on 16" barrels. Three years later they are still going strong.
- The addition of a small amount of stainless steel in the critical wear/high-temp areas does add to the weight slightly, but provides a massive increase in durability, lifespan, and gas/flame blast resistance – especially on shorter barrels.

The units supplied for this test are both standard current production issue, not a special product made or tweaked just for this test. We compliment **NZ Rod&Rifle** for having the courage to take on this review. We hope that readers would



ABOVE: ***THE RED LINE IS THE LENGTH*** *of the suppressor past the muzzle while the blue line is a percentage calculated by dividing the overall dB reduction by the length past muzzle figure. The best suppressor is given a score of 100 and the others are divided by that figure to get their percentage. The aim of this test is to establish the efficiency of shorter LPM suppressors.*



ABOVE: ***THE RED LINE IS THE DIAMETER*** *of the suppressor while the blue line is the percentage calculated by dividing the dB reduction by the diameter. The best suppressor is given a score of 100 and the others are divided by that figure to get their percentage. The aim here is to establish the efficiency of smaller diameter suppressors."*

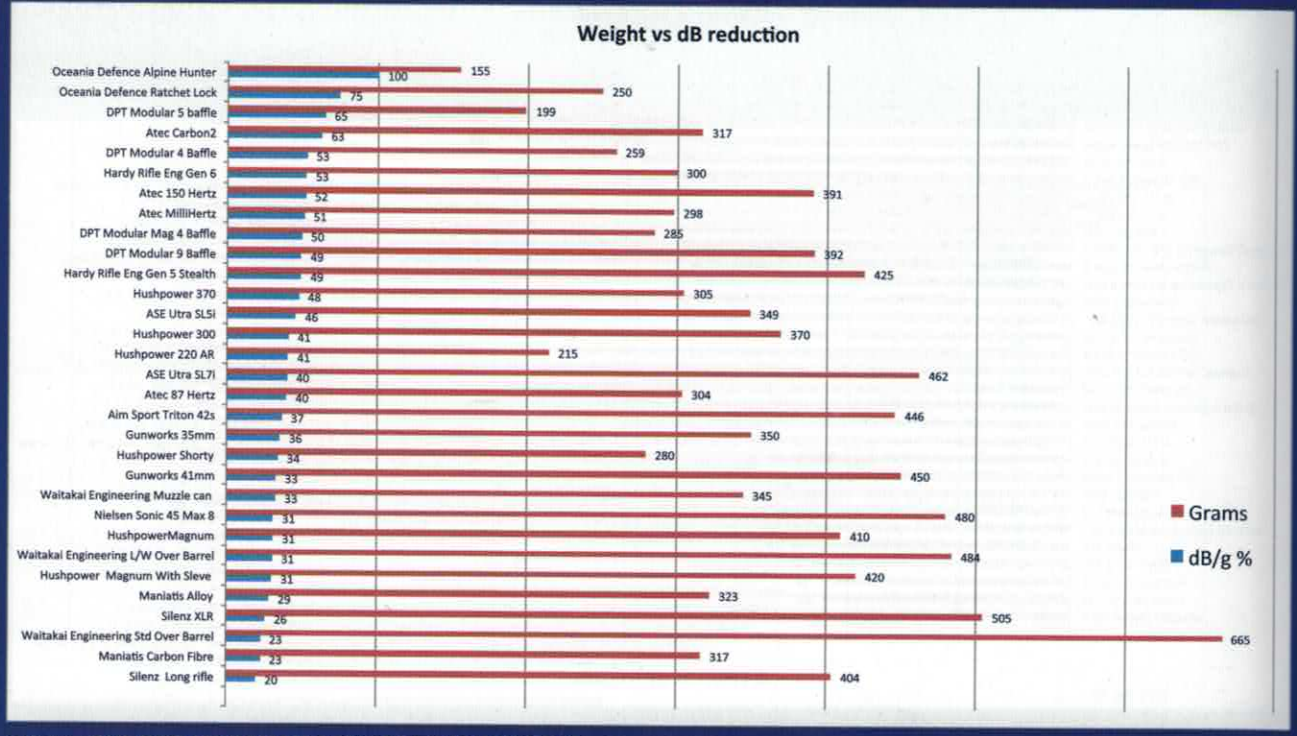
also consider suppressor build quality, durability, accuracy effects, thread quality/selection/concentricity, life-span, and operator safety when they are looking for the best choice suppressor for their particular application.

Footnote: Since submitting the two suppressors for the test, there have been some slight design changes/improvements – namely a smaller diameter isolator tube option which has provided a weight decrease of about 18 grams, and a slight performance gain due to an increase in internal volume. These suppressors have also been recently re-branded, as Kaimai® Rifle Suppressors.

HARDY RIFLE ENGINEERING

The Hardy Gen 6 compact suppressor is designed to be as user-friendly as possible. The intention was to develop a suppressor that is extremely light, and adding as little as possible to the length while still dropping the decibels to a desirable level.

To get there has taken considerable testing and evaluation



*'ABOVE: **THE RED LINE SHOWS THE OVERALL WEIGHT** of the suppressor in grams, while the blue line is a percentage calculated by dividing the overall dB reduction by the weight. The best suppressor is given a score of 100 and the others are divided by that figure to get their percentage. The aim of this test is to look at the performance of the lightweight suppressors'.*

over a great many years. We have tested hundreds of different styles of cores and invested thousands of dollars in testing equipment. To design a suppressor that is small, light and quiet is very challenging but after thousands of rounds of expended ammunition, and days and days in our testing chamber, it was achieved.

As the name suggests this is our sixth iteration of our compact suppressor and our most effective to date.

All of our suppressors are designed using computer-aided design software before going to our CNC machining department for manufacture. They are manufactured from several different grades of aircraft aluminium which we import from Germany, and the final product is hard-face anodised. One of the unique features of Hardy suppressors is the fact that they are mono core construction; this means that they do not have a stack of baffles inside the suppressor tube. The part of the suppressor that threads onto the muzzle of your rifle and the muzzle end of the suppressor are the same piece of material, machined from a solid billet. This makes them extremely reliable as there are very few parts; this means fewer parts to cause problems.

The Hardy Gen 5 Stealth suppressor is another design born from our dedicated full time research and development department. It was designed around one goal - maximum sound reduction. This being said, we restricted ourselves to 150mm past the muzzle and less than 450 grams in weight to ensure the suppressor did not become too cumbersome to use.

The design is based around gas recirculation and gas manipulation. As the gas is circulated around inside the suppressor it uses up its energy, and as the gas uses its energy it cools and slows down. When it gets to the point where it is to leave the muzzle of the suppressor it is travelling considerably slower than when it entered the suppressor. The gas speed is actually below the speed of sound; that's why it's so quiet, and that's what makes the Stealth such an impressive suppressor. The manufacture of the Gen 5 Stealth is very similar to the Gen 6 Compact. It has the same mono core construction method and it is manufactured from the same aircraft grades of aluminium.

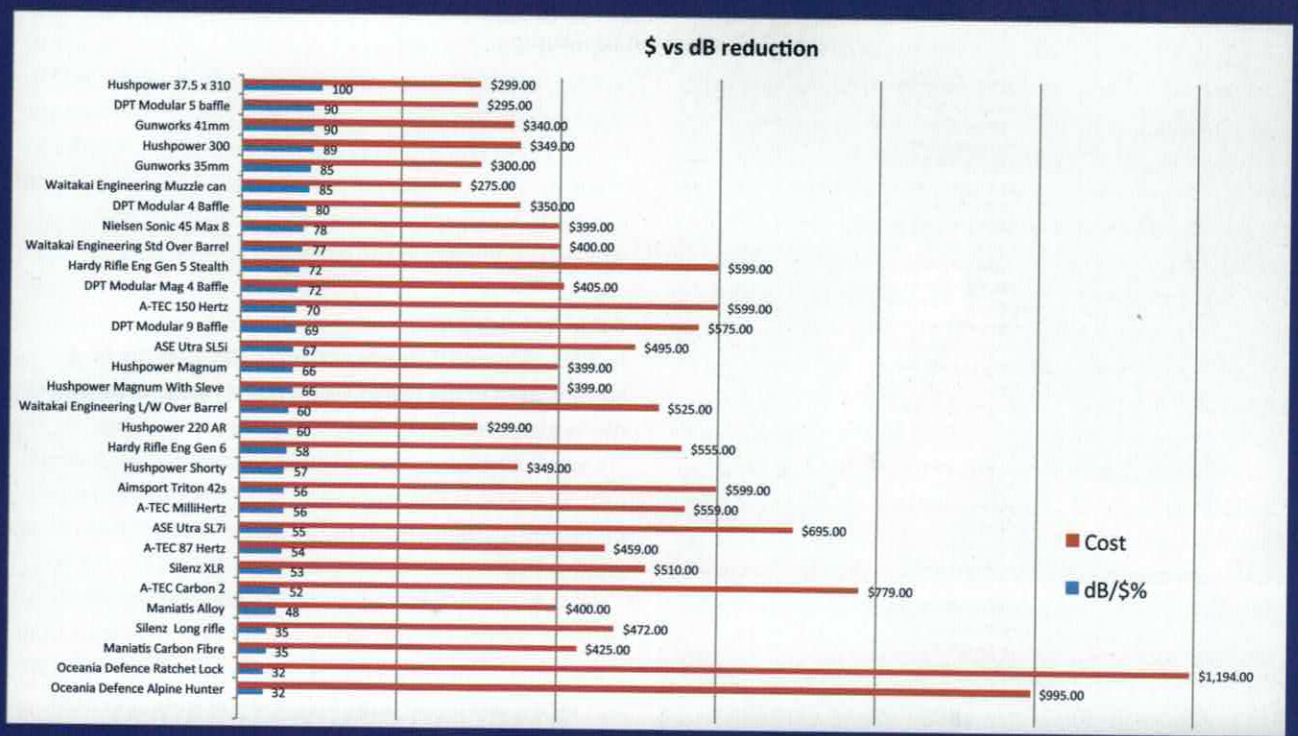
The Gen 5 Stealth is a very popular suppressor in our range and can be used on calibres from small-based centerfire cartridges to standard magnum calibres. A variant of this suppressor is even manufactured in the USA under licence by the Idaho Suppressor Company, who supply both civilian and law enforcement with this product.

Hardy suppressors are extensively exported worldwide and Hardy products are represented in more than 25 countries globally.

GUNWORKS

Gunworks Ltd, based in Christchurch, introduced the aluminium-bodied suppressor to the NZ market over 20 years ago and have been innovating ever since. Reliability of the unit is a key thing for Gunworks Ltd, and the reason that stainless is used in critical parts of the suppressor, as gas erosion and corrosion are issues with aluminium. Stainless baffles allow us to have very sharp gas cutting edges that withstand firing blast over thousands of rounds and still look and measure as new. Our interchangeable hex bush in the rear of the suppressor allows the suppressor to be fitted to other rifles easily; this is made from a high-grade machining Delrin for ease of fitting. The spanner flats ensure that it stays in the suppressor and doesn't unwind accidently.

Gunworks Ltd muzzle threading is second to none, our



ABOVE: ***THE RED LINE IS THE RRP PRICE*** *of the suppressor while the blue line is a percentage calculated by dividing the overall dB reduction by the price. The best suppressor is given a score of 100 and the others are divided by that figure to get their percentage. The aim of this test is to establish whether the lower priced suppressors give bang for your buck.*

extensive Gunsmithing experience and equipment means a perfect job every time. Custom fitted, sized to the barrel thread protectors are provided on every job. Gunworks Ltd offers duralium suppressors in 35mm, 41mm and 50mm diameter; as we know, suppressing different calibre/barrel combinations requires different solutions and allows custom options. New innovations for 2017/18 will be 3D printed titanium bodied magnum suppressors.

DPT SUPPRESSORS.

DPT suppressors are covered by a limited lifetime warranty. With worldwide sales of 5000 suppressors yearly and one of the best weight/durability/warranty/price ratios, they are proven to be on the leading edge of the hunting market. We also offer a high quality fitting service (quite often in under a week).

ASE UTRA

ASE Utra suppressor's excellent features and high quality are based on innovative suppressor design, advanced manufacturing methods and quality materials manufactured in Finland. These suppressors are made from precision cast components made of 300 series stainless steel by welding suppressor elements that are machined for assembly using CNC technology making them extremely durable with a long service life. The surface of the suppressors is coated with durable CeraKote making it ideal for New Zealand conditions.

All ASE Utra products are subjected to rigorous testing during the product development phase in order to ensure that the suppressors function in all applications. Quality control and product inspections ensure that your suppressor is safe and reliable in all conditions, and has a 2 year warranty.

ASE Utra suppressors are not only effective but also very compact. The SL5i is well suited for hunting and shooting on the range. For those who are looking for more performance, ASE Utra offers the S series SL7i suppressor that offers more suppression in only a slightly larger size. A large selection of threads is available, which ensures that the suppressor will suit barrels of various sizes. Steel suppressors are quieter than an aluminium suppressor when pushing through scrub and do not require a neoprene cover to dampen sound from foliage rubbing on the suppressor. Steel suppressors are also stronger and more durable than an aluminium suppressor, plus muzzle forward suppressors do not have the problems that over-barrel suppressors have with heat transfer from the barrel. Rifles tested with the SL series suppressors comply with the latest personal exposure limit set by the European Directive 2003/10/EC (140 Pa or 137 dB (C)).

A-TEC

A-TEC have acknowledged the importance of putting quality time and resources into research and development in order to stay ahead of competitors, so in the last two years A-TEC invested 1.2 million Euro in R&D into silencer geometry. The know-how gained from this investment is being used to extend the boundaries of silencer technology. This has positioned A-TEC as the leading brand in Europe. A-TEC does not make unsubstantiated claims about decibel ratings and recoil reduction. All A-TEC silencer designs are tested to international ISO standards and do not get released to market until they are thoroughly tested and developed to the highest performance and longevity.

All Carbon models feature an extremely effective internal muzzle brake in the first suppression stage to vastly reduce

recoil. A-TEC Carbon 01 and 02 are suitable for any calibre up to full-bore standard cartridges such as .308 or 6.5x284. A-TEC Carbon 03 is suitable for any calibre including magnums up to .338 Lapua Magnum. A-TEC carbon models are available in any calibre and muzzle thread combination on request. The A-TEC Hertz 87, 119 and 150 are A-TEC's mainstay suppressors, suitable for all uses. Varying only by length and weight, they provide options for your desired suppression vs volume and weight requirements. As with the carbon models the Hertz models feature an extremely effective internal muzzle brake in the first suppression stage to vastly reduce recoil. All Hertz models feature strong alloy and stainless steel construction. MilliHertz has all the same features but a lower profile tube diameter. MegaHertz and MegaHertz+ are the big boys of the Hertz range designed to effectively suppress large rifle calibres such as .300 Norma Mag, .338 Lapua Mag and .375 CheyTac. You will not find a better suppressor on the market for this application, anywhere. They all include the extremely effective inbuilt muzzle brake.

NEILSON SONIC 45 MAX 8

This suppressor has the volume needed to make a recommended suppression for almost all calibres which makes it a popular choice among our customers. In order to make this suppressor as robust and durable as possible, we have fitted it with a stainless steel core; this core ensures that the damper is not damaged by the high temperatures that arise when multiple shots are fired within a short period of time. When choosing a Sonic 45 you are able to customize it to fit your needs. A standard Sonic 45 is equipped with 5 modules, which is the recommended amount, but if you want a better suppression you are always able to order extra modules.

AIMSPORT TRITON SUPPRESSORS

Aimsport suppressors are the best of both worlds in one suppressor; with an aircraft aluminium exterior tube it creates a reasonably lightweight silencer for the hunter and with the stainless steel interior it gives you the durability that you need as a hunter or sports/target shooter to put through hundreds and thousands of rounds without a worry.

A 5 Year unlimited shooting manufacturer's warranty gives you peace of mind that you are buying a high end product.

The Aimsport Triton has a few features that are quite different to other suppressors; the secret in the *aimZonic™ Triton* is the stainless (patent pending) *LE-valve*. This "Late Escape" valve delays and builds up the pressure in the first expansion chamber until it also releases pressure in the front chamber. The unique design of the LE-valve, with its built-in micro-baffles (that works as a muzzle brake, eliminates the need for traditional baffles and makes the second expansion chamber big, light and efficient!

Another feature/advantage of the Triton suppressors is the ability to use the same silencer on different rifles with the same thread. All you need to do is buy an extra front end in various available calibres. For the shooter who has a variety of rifles but all with the same thread the Aimsport Triton or Triton Sneezer is the best deal out there. You can have one rear end with M14 thread and 4 different front ends in 5.7mm, 6.7mm, 7.7mm and 8.6mm that will cover all your rifles. Your initial unit might be a 7.7mm Triton Sneezer and then you can add the front end for other calibres.

The Triton Sneezer has all the features of the Triton but offers even better noise- recoil and muzzle-flash reduction in the top of its class and is only slightly heavier than the Triton. The extra chamber offers that additional expansion chamber/recoil wall. This is perfect for when you are doing a lot of shooting on the range with a rifle that packs a punch.

OCEANIA DEFENCE

In 2012, Oceania Defence set out to develop the best suppressors in the world, using novel manufacturing methods: suppressors that could soak up high rates of fire without weighing a ton. The only grade 5 titanium and Inconel 718 suppressors made in NZ are being adopted by professional users around the world including hunters, police and military.

This year, ODL released the first hunting can made for extreme conditions. The Alpine Hunter is an ultra light, grade 5 titanium can designed for 7.62 and smaller, non-magnum, bolt action use which provides good sound suppression in a small package. Sold with thread inserts to fit a variety of barrel sizes, the Alpine Hunter is extremely corrosion resistant and will provide the lightest hearing-safe suppressor at the ear. Every gram of suppression performance is built into this can with nothing wasted on over-barrel sections or excessive diameter which can mar your sight picture.

The 762 Ratchet Lock suppressor is built for heavy duty use on 7.62 and smaller rifles. Quickly attaching and detaching to a rifle in about 3 seconds, the 762 RL can rapidly move to a variety of rifle calibres for efficient suppression in 7.62x51, 7.62x39, .300 BLK, 6.5 Creedmoor, 6.5 Grendel,

6.8 SPC and 5.56. Available in both Inconel, for full auto applications or extreme semi-auto firing schedules, and grade 5 titanium for semi-auto and bolt action applications, this suppressor can actually work out to be the most cost-effective solution for a person with a variety of rifles they want to suppress with one good quality suppressor.

The suppressors are coated with a PVD finish which provides a very hard, heat-resistant coating that will not cook off. Maintenance is a quick oil and brush for the outside. Some people choose to ultrasonically clean the insides with hot water and dish soap or Simple Green.

Grade 5 titanium is an alloy made from 90% titanium, 6% aluminium and 4% Vanadium. It provides a yield strength after heat treatment of over 1000 MPa with high temperature and corrosion resistance. Inconel 718 is around 50% nickel, 20% chrome, 18% iron and a mix of other elements. It provides an as-built yield strength of around 650MPa and at 700°C still has a yield strength greater than 304 SS at room temperature.

Oceania Defence also makes a variety of other suppressors for pistols and sub guns. A new Ratchet Lock magnum suppressor will be released this year.

WAITAKI ENGINEERING

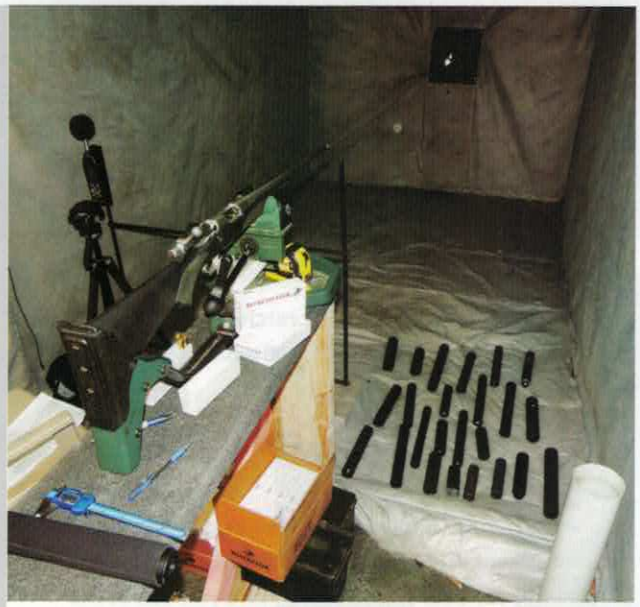
At Waitaki Engineering we take a great deal of pride in the durability of our suppressors. They are made from 100% stainless and are built to last. Unlike many alloy suppressors

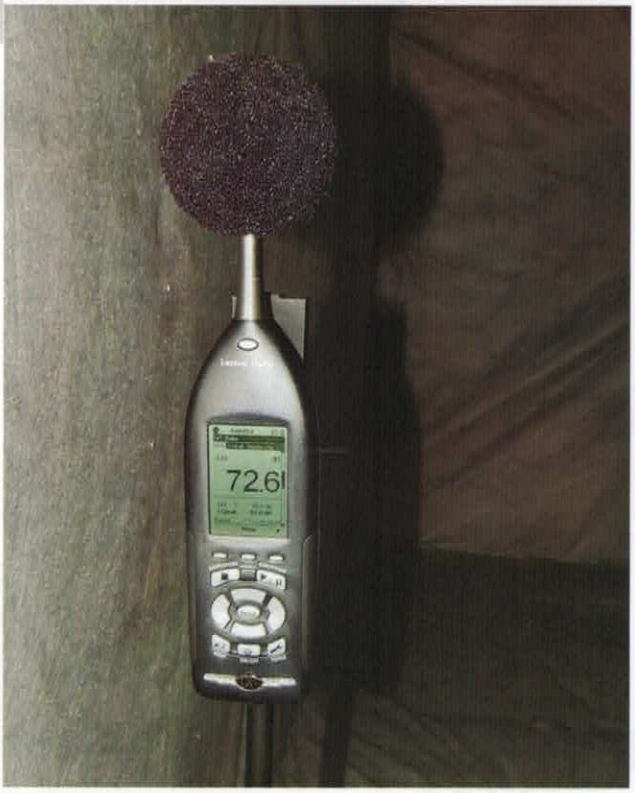
ours can tolerate long shot strings – the 308 Muzzle Can and the Standard Over Barrel suppressor had 90 rounds through them in row and still worked fine. The temperature of the suppressors was just over 440° C but because of the stainless construction they suffered no long term damage.

The muzzle can is kept short to stop the AR15 and AK style rifles from over gassing. Fitting longer suppressors has resulted in much greater bolt velocity and the ejected cases were thrown metres further away as a result. The shorter length of the can gives up a bit of noise reduction but is kinder to the rifle. Our 223 muzzle can was tested to 140 rounds in a row without failure.

We have also deliberately stayed with 38mm tubing so the suppressor does not appear in the bottom of the scope as this is can be an issue with the larger 45mm and larger tubes.

Waitaki Engineering suppressors are tough and will last as long as your barrel, maybe longer and they are some of the best priced on the New Zealand market.





UNDERSTANDING DECIBELS

Zero dB is where the human ear can first distinguish noise. If we use some common sounds as references we get whispering at 25dB, talking at around 50dB, the TV or the noise in a shower 70dB, and a motor mower at 90dB. A chainsaw is around 115dB and a jet plane (up close) is around 135dB. A .308 gunshot heard 1 metre to the left or right of the muzzle is about 165dB. A gunshot from the shooting position will drop from the muzzle level by 3-5 dB and as you get further away that obviously continues to reduce. Pain from noise is generally felt at around 140dB. These are noises most people can understand, but if we dig a bit further we find that the dB scale is not linear, its logarithmic - which in layman's terms means that it doesn't get louder on a straight scale; it ramps up. If we take the sound of a TV or what we hear when in the shower as being about 70dB we would expect 80dB to be about 14% louder ... but it's actually *twice* as loud (100% gain in sound pressure) as 70dB. Moving on to 90db, this is 4 times as load as 70; 100dB is 8 times as loud; and by the time we get to 120dB we have sound that is 32 times as loud as our 70dB base!

However this is sound pressure and it's what Sound Level

RIGHT TOP:

THE ANECHOIC CHAMBER ELIMINATES WIND AND REVERBERANT NOISE. *The end of the suppressor is lined up on the point of the spike so every shot fired is exactly 1m to the right of the meter.*

RIGHT MIDDLE:

THE LARSEN DAVIS SOUNDTRACK LXT IS DESIGNED SPECIFICALLY TO MEASURE GUNSHOTS. *Most sound pressure meters just can't react quickly enough to give accurate readings and therefore their data is next to useless.*

RIGHT BOTTOM:

AMMUNITION USED WAS WINCHESTER 147GR FMJ .308, ALL FROM THE SAME LOT NUMBER. *From an unsuppressed rifle the average sound pressure was 166.3dB. This is in line with corresponding tests around the world.*

meters measure. The human ear also defines sound by its intensity and the calculations here are a bit different. With intensity things double every 3 dB. So as you can see, noises like a gunshot at 160dB are both very loud and intense; and although the gunshot peaks and drops very quickly the result is often painful. After repeated exposure the hearing can be permanently damaged.

The above expatiation is just scratching the surface however. For those with the concentration and diligence this * link goes into much more detail:

CONCLUSION

There are a huge variety of makes and models of suppressors available on the New Zealand market, literally something for everyone. Which one you choose is entirely up to you; what we've done in this article is present you with the cold hard facts so that you can decide what works for you. The reason we've done it this way is simple: everyone I've discussed suppressors with over the last decade or so has had different reasons for choosing the model they ended up with. Whether it be ultimate sound suppression, weight, length/diameter or construction material, you have choices. Cost is a big factor for many hunters and shooters and it's clear that even some of the less expensive model can provide adequate sound suppression.

- There is a definite correlation between Length Past the Muzzle and sound suppression. However this is blunt information; the number of baffles and the baffle design obviously have a big influence too. Length alone is not necessarily the overriding factor, but it is certainly a contributing factor.

- Over-barrel suppressors did outperform muzzle-forward suppressors but only by a small amount. Looking at the data the only suppressors to get more than a 30db reduction were over-barrel designs. That said there were a number of muzzle-forward designs that outperformed over-barrel types with similar dimensions forward of the muzzle.

- Suppressor diameter does not seem to have a great effect on noise reduction. Length Past Muzzle would appear to have a bigger influence, and this relates directly to the number of baffles and the design of the baffles.

- First Round Pop is a real thing and shows itself clearly with some of the suppressors having a noticeably louder sound than follow-up shots. This is because the oxygen in the suppressor burns off in the first shot, whereas follow up shots have powder gasses in the suppressor, reducing the amount of oxygen. Why some suppressors have First Round Pop while others don't is the subject of much discussion, but factors like suppressor baffle design, bore size, calibre size and time since the last shot all contribute.

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- Aluminium was by far the most popular material in the construction of suppressors. It's light and strong but it won't tolerate a large number of shots in a short time like a steel or titanium suppressor will. That said, in hunting situations where there are usually only one or two shots fired this is of no consequence, and even 5 shots is fine in most alloy suppressors. Some models here use stainless inserts to take the initial muzzle blast while the modular suppressors allow you to replace a section if it's corroding or showing wear from the muzzle blast. Others again are rebuildable and can be serviced by the manufacturer. It's evident that some suppressors have a finite lifespan and should be replaced at some stage. Corrosion is a major factor here, and aluminium will corrode as well as steel. The simple advice here is always remove your suppressor after shooting and make sure it's stored in a warm dry environment.

This test took a lot of time and effort to put together and we applaud the suppliers and manufacturers who took part. We at **NZ Rod&Rifle** hope the information provided here helps you make your decision more easily.

What has become clear to me over the test is just how much more pleasant a rifle is to shoot with a suppressor. I'm at the point now where I'd suggest that having a suppressor is almost a no-brain decision; the benefits absolutely outweigh the disadvantages.

** www.sengpielaudio.com/calculator-levelchange.htm*