# MAD MAX

*Power does matters !!*


*Max Power 178m / sec*
*Over 24 rounds / sec*

SYSTEMA

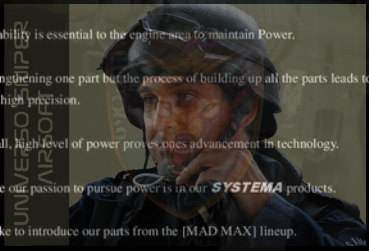
Power does Matters: Going beyond 170m/sec.

We have always insisted that our P.T.W. is as much of a toy as it is a firearm.

Clear evidence shows our production product is capable of establishing records for the highest round discharge capabilities.

Furthermore, at this time we are releasing into the market a product that was believed to be the domain of the physically impossible; our [MAD MAX].

Because precision shooting requires a gentle parabolic orbit trajectory, a longer flight distance is achieved when the HOP structure is the focus of Power.




General durability is essential to the engine area to maintain Power.

Not just strengthening one part but the process of building up all the parts leads to maintaining high precision.

And above all, high level of power proves ones advancement in technology.

This is where our passion to pursue power is in our **SYSTEMA** products.

We would like to introduce our parts from the [MAD MAX] lineup.


MAD MAX Exclusive Stainless Homing Cylinder

O-Ring

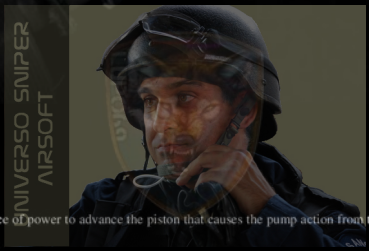
MAD MAX Exclusive Cylinder Grease

MAD MAX Exclusive Gear Box
- Planetary Gear
- Sun Gear

MAD MAX Exclusive 7512 Type Motor
(as well as the 7512 Type Motor exclusive Grip)

Mad Max Exclusive Lithium Polymer 14.8V / 1400mAh 25C Battery

# MAD MAX Exclusive M170 Spring




M170 Spring

Needless to say, the source of power to advance the piston that causes the pump action from the discharge mechanism, originate from the spring.

The factors that determine the performance of the spring are listed below.

- Mainly either Stainless Steel SUS304 or Silicone Chrome wire are used.
- If the spring is thicker in gauge the stronger the tension it will have.
- The higher the count in coils the stronger the tension it will have.
- The bigger the pitch the stronger the tension strength, however the higher likelihood of premature wear.
- The longer the length (assuming there were no boundaries), the stronger the tension strength it will have.
- If the shaft diameter is big, then the tension strength will also be big, however it will also be prone to premature wear.

This concludes the typical factors that influence tension strength.

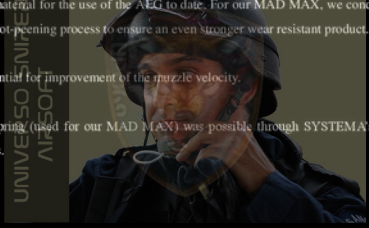
Like in our current situation we are limited in the space allowed, therefore one cannot expect a great deal of flexibility in the design when we propose to incorporate a powerful spring. In addition, if the choice of materials or the winding coils were not done properly, the initial use may be as expected, however shortly after premature wear or in the worst case it may lead to breakage.

In the case of our P.T.W. because our shaft diameter is small (along with our coil) as compared to TM (which we used as our base); we were able to ensure a much more durable foundation. Among some of our customers, when they look at the P.T.W. Spring Guide they may comment on how it looks so "thin"; and although it incorporates a bearing based lock mechanism into the Spring Guide for the spring unit, when we designed the outer diameter of the guide as small as possible it became a necessity to design it to the size that it was. Because we use Stainless Steel, there is absolutely no worry about any loss to durability. For an AEG spring, a high level of strength against wear as well as durability is needed due to the repetitive load that it bears, we referred to an automobile's valve spring used in the engine.

The material for the spring used in our P.T.W. which is the SAE9254 was specifically developed for the valve spring, and is the most reliable material for the use of the AEG to date. For our MAD MAX, we conditioned the surface of the spring with our double shot-peening process to ensure an even stronger wear resistant product.

Spring tuning is also essential for improvement of the muzzle velocity.

The gem of our M170 spring (used for our MAD MAX) was possible through SYSTEMA's extensive experience in producing custom springs.



# MAD MAX Exclusive Stainless Honing Cylinder

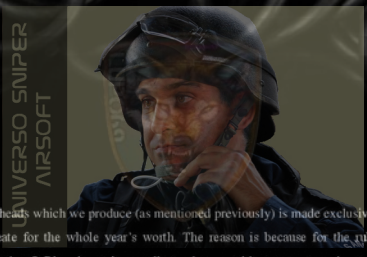
Horning Cylinder

Inside the automobile engine, oil is used for lubrication.
In contrast, for AEG's, due to the short stroke, as well as the relatively light load along with reducing any adverse effects to the HOP structure, the use of a grease seal is the appropriate choice. The ideal grease for lubrication in the inner Cylinder should be both low viscosity while having a strong adhesion to the Cylinder walls; these two opposing factors are what's essential although we have confidence in our **SYSTEMA** Cylinder grease as the most effective lubrication product available; when it comes to the smooth surface of the Cylinder walls, it is unavoidable to find unbalanced lubrication within the inner wall surface a while after applying the lubrication after the piston head moves back and forth. When that happens, the air seal may become compromised, even though right after applying the lubrication it may show strong muzzle velocity, in a short period of time stability may become a problem. So this is where we decided to adapt the PSG-1 Cylinder production technology, and applied the horning process to our inner Cylinder. Horning is a Cylinder abrasion technology used on the inside of the pipe shaped metal surface. In the AEG industry when parts are cut; the value of measurement shows the high level of precision, however in the realm of grind processing, the unit of precision of columns is measured in μ or microns. The Stainless Steel pipe that is cut to form the Cylinder is spun and grinded down through a whetstone. We tested various coarseness, and decided on a specific degree of surface texture.

The O-Ring used for the Piston Head is carefully selected from a batch that was produced specifically in winter (where the O-Ring is expected to be the smallest in size) which we call this process "Sizing". The precision of the inner diameter dimension of the Cylinder and the level of coherence of the O-Ring to the Cylinder is the most important overall dimension in disburse the best muzzle velocity.

To realize the performance of over 170m/secs is a world where small processes are built up in order to achieve.

# O-Ring

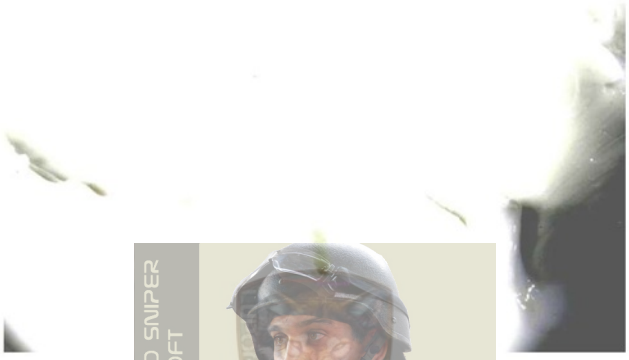



O-Ring

The O ring for the piston heads which we produce (as mentioned previously) is made exclusively in February using our special die which we create for the whole year's worth. The reason is because for the rubber compound used the completed dimension of the O-Ring is at its smallest when outside temperature is at its lowest. Because the manufacturing tolerance of rubber compounds is generally very big, not just O-Rings but any products with similar materials it becomes a challenge because we lose the freedom to anticipate the results as we would with metal processing.

O-Rings made using Nitrile rubber, when they are small minor adjustments to sizing may be possible, however once they are enlarged, it will never return to its original dimensions. Therefore, special consideration is necessary. In addition, Fluorine is added to the O-Ring material to aid in lubrication. Of course that is nothing more then a supporting role to the primary form of lubrication, which is the grease. In addition, lately we have been receiving many inquiries from cold weather regions, we are now able to assemble our Cylinders with Silicone Rubber materials as well; we recommend placing the request at the time of ordering.

# MAD MAX Exclusive Cylinder Grease




Grease

Lubrication in the Cylinder is an important problem in order to maximize muzzle velocity. Generally, Fluorine based grease is used, however there are various things that are unknown regarding this product. Because we sell the Cylinder grease to the general public, we formulated our grease with a little higher viscosity to be used in various types of cylinders. However, for the MAD MAX series we created special low viscosity grease exclusively for this product. There may be customers who think that "all grease is the same", however that is not the case.

Stable muzzle velocity and a display of Max power.
We feel that, in order to realize these two goals the recognition of the grease as a legitimate functioning component is necessary.

# MAD MAX Exclusive Gear Box


MAD MAX Exclusive Gear Box

Contrary to the compact appearance, the extremely durable and high performance of the P.T.W. Planetary Gear Box has been re tuned for the MAD MAX. The spring used in the MAD MAX is an unprecedented in terms of load. Therefore, we were concerned that there would not be enough lubrication particularly between the sun gear and the sun gear shaft as well as the planetary gear and the planetary gear shaft when conventional lubrication methods were applied. As a result, we created (during our trial manufacture) a reservoir where the grease could go to and tested it. The results were very good; we noticed a smoother cycling gear box with less worry of burn out due to a lack of grease. Although the concepts for the new planetary gear and the sun gear are very simple ideas, the actual processing was very back breaking work. Firstly, Chrome Molybdenum Steel requires an extremely high degree of processing difficulty which is our primary material for our gears. In addition, if you would imagine the degree of difficulty when the sun gear reaches 3mm in diameter as well as the planetary gear reaching 2.5mm in diameter inside of that hole. With these two small gears, the sector gear will inevitably have to bear a greater load when a stronger spring is used. Regardless how difficult it may be in processing, to protect the gears from burn out, it is an unavoidable path that must be taken.

With the continuous pursuit of power come various new problems. The process of solving these problems one by one carefully, improves ***SYSTEMA***'s technology.

# New 7512 Type Motor

## Exclusive use for MAD MAX

1. 7512 Type Motor

It goes without saying,
for the 2012 production model,
the most time and cost investment was placed into
the development of our 7511 type motor.
This task was extremely difficult to achieve as the outer appearance, dimensionally remained the same, while achieving an improvement to both power output as well as durability. An unexpected by-product of this process during our trial manufacturing was the creation of 14 types of rotors with differing torque properties. We took the individual differences into account, and selected two pieces based on one specification, and carefully repeated measurements; after inspecting its specific characteristic we repeated the durability tests. Of which, we found the initial torque from the rotor of our new 7512 type motor was particularly superior. Unfortunately for the 2012 model, because we found that the number of revolutions as well as the power output was slightly different from our goal, we decided to not adopt it. However, for the theme of the MAD MAX, because the highest power output from the motor was required, we felt that this was the ideal for our specifications. This time, we added an improvement to the magnet case part to further improve the magnetic field from the direction of the pivot point. As the size of the motor became slightly bigger the grip was also adjusted to fit. The slight gap that was created between the grip and the magnet case serves a vital purpose of allowing for the convection of air within the grip.

We do not simply force power output by changing out the spring and swap out with a large-capacity battery. The reason is because we believe that it is ***SYSTEMA***'s style to produce the best parts to deal with any problem that occurs.

# MAD MAX Exclusive Lithium Polymer Battery
# 14.8V/1400mAh 25C


Mad Max Exclusive Lithium Polymer 14.8V / 1400mAh 25C Battery

The Mad Max exclusive 7512 type motor is superior in startup torque, however is slightly lacking in the number of revolutions in comparison to the 7511 type motor.

Therefore, we developed a new battery that dramatically increases the voltage thus supplementing the number of revolutions.

From a conventional safety aspect, we refrained from using LiPo batteries, however this time we not only adopted the use of that battery we created it to our exclusive shape.

Extended Full Auto firing will tremendously degrade the battery's life; however this battery will be able to comfortably go through one full magazine with Full Auto firing without any worries.

There are many users already familiar with the benefits of using LiPo batteries; such as it light weight, non-self discharging properties, no memory effects, usability in recommended chargers, and so on.

The feeling of shooting using this battery will leave you shocked and speechless.

The trigger response to the P.T.W. in Semi-Auto mode already has a very crisp reaction speed; however in regards to the MAD MAX, we highly recommend experiencing the sensation of firing in burst patterns in Full Auto mode.

During our testing we found that; with a fully charged battery 400 rounds of intermittent firing will produce no lag.

With the MAD MAX surpassing the SUPER MAX's (24 rounds per second) overall speed using the M170 spring, it truly deserves the name MAD.