

匠 TAKUMI is ...

The name for master craftsmen with superior talent and commitment, who have learned a traditional Japanese craft and elevated it to an art form. Baroness applies the forging techniques of traditional Japanese sword making to its manufacturing process. Many Baroness employees are Takumi, who have trained themselves to the level of master craftman and are responsible throughout the blade manufacturing process. This is why Baroness' blades are far superior, durable, and long-lasting. Takumi are at the heart of Japan's craftsmaking that earns worldwide admiration. In the 21st century, they are still the foundation of products "Made in Japan."



It's all about creating a beautiful finish.

The history of man's connection with turf goes back to ancient times, at least 2000 years. It is said that during Roman times turf was widely used in gardens and athletic arenas. Even back then turf helped create a beautiful landscape for sporting events. The turf used in those places required regular maintenance; that is, "turf management" was already in existence back then. Around the same time, tools, such as the sickle, were invented and became a necessity for turf maintenance. In 1830 an English engineer, Edwin Beard Budding, invented the world's first lawnmower. This was the prototype of what we call walk-behind greensmowers. Around 1947, the greens mower started being mass-produced as an industrial product and became a tool indispensable for turf maintenance all over the world. It has continued to improve to this day.

In 1959, Kyoisha started manufacturing mowers in Japan. This coincided with Japan's post-war expansion of the leisure industry, which in turn spurred the need for building and maintaining golf courses,

Most of the Japanese golf courses use Zoysia Japonica. It is well suited to Japan's climate because of its high tolerance for humidity and heat. Another characteristic of this grass is its strong fiber component. To cut this grass cleanly, a cutting tool with a sharp edge is necessary. How to cut Korean Zoysia cleanly has been Kyoisha's primary goal in developing its products. Greens are the face of golf courses. Mowing greens beautifully is crucial regardless of the type of grass used. One of the principles Kyoisha has come to believe in is that a mower is a tool for cutting grass. In other words, the blade is the heart of the mower. Over the last 50 years, Kyoisha has experimented with blades in order to create the ideal turf condition that superintendents seek. To achieve this goal, Kyoisha has continually improved the strength of the blades and finally achieved a cutting unit that creates beautiful turf, specially for greens.

This is how the Baroness reel cutter was born. Through blending steel and other special materials, and by developing innovative manufacturing processes, the

quality of the Baroness reel cutter is second to none. For the last 56 years, the basic design of the Baroness reel cutter has not changed and has earned the highest reputation. There are multiple elements affecting the growth of grass, including soil, watering, fertilization, weather conditions, and the conditions of the mower used.

Kyoisha believes that a beautiful, healthy green where a ball rolls fast and smooth, requires a condition where the number of grass shoots is just right and they grow evenly and straight up. For that to happen, the health of the grass is key. Grass is a delicate living organism. When grass is subjected to extreme heat, lack of water, or being physically stepped on, it becomes weak, develops lethargic growth and is less disease resistant.

Kyoisha's mowers produce the best results when grass needs the most help. The best result does not happen in just a few days of mowing. When mowed over several weeks, the grass becomes enlivened, promoting growth and increasing the grass shoot number. Kyoisha sees its products not just as mowing tools but as machinery for improving greens conditions and has always strived to refine its products. As a result, both domestic and international turf maintenance professionals who hold high standards have given Baroness mowers high marks. Day and night, these professionals study and strive to achieve ideal turf condition. What is considered ideal the condition?

For golf course greens, it involves the following:

- production of a stimp value (greens speed) targeted by superintendents.
- a ball rolling smoothly.
- all the greens having uniform condition.
- a beautiful look.

These are our criteria.

To realize these criteria, superintendents must maintain the turf's health by growing grass with the proper amount of shoots and uniform leaf size while

standing the grass up. We believe that the Baroness reel mower is the best tool superintendents can rely on for improving greens conditions. The amount of grass clipping removed by the Baroness reel mower is No. 1 in the industry. When it comes to mowing capacity, the Baroness reel mower is second to none. Its smartly-designed construction creates a beautiful cutting finish by standing the grass up. The Baroness reel mower is the culmination of Kyoisha's experience obtained over several decades. Baroness products exist solely to allow the superintendent to create the ideal greens. This reel book explains Kyoisha's commitment to creating an ideal greens condition and its maintenance, and our special passion for the reel.

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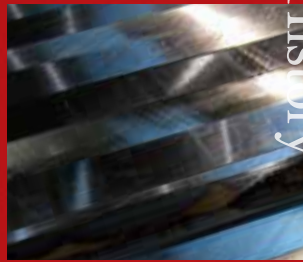
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BARONESS UNIQUE SELLING POINT 匠

The Baroness reel cutter has continually received high marks from all over the world. We will tell you why here.

USP.1 Quality that has consistently improved for 56 years.

Kyoeisha started developing mowers in 1959. The material used in Kyoeisha's reel cutter has changed gradually over the years since its beginning. A high level of cutting quality, created from the very beginning, has remained the same to this day. Factors such as the manufacturing process, know-how, and craftsman's skill have been handed down from generation to generation and this has enabled Kyoeisha to continually produce high-quality reel cutters.



History

USP.2 Similarity to the Japanese Sword Making Process

In the Japanese sword making process there is step called "yakiire". It is a process to harden the steel by putting the sword into a furnace and raising its temperature up to 1472 degree fahrenheit, then cooling it by plunging the sword into a water tank. The manufacturing process of the Baroness reel cutter also incorporates this "yakiire" step. "Yakiire" creates a reel cutter that is hard and resilient.



Manufacturing Process

USP.3 The Craftsman's Expert Skills

A shaft and disks (collars) are welded together to form a frame. Then blades are built into the frame. The blades, which are formed by machine into a precise shape, are normally welded to a frame by a machine (robot), but in the case of the Baroness reel cutter, a craftsman inspects each blade's fit by sight and adjusts it if necessary before the final assembly. This craftsman's work removes any stresses that could form in the reel cutter and ensures that each finished reel cutter is of the highest quality. This is only possible through the hands of master craftsmen.



The Craftsman

USP.4 High Processing Accuracy

The Baroness reel cutter is manufactured with a high processing accuracy, thus holding a near perfect circular shape from end to end. The processing accuracy of the outer diameter of the reel cutter is under 1/100 (0.01) mm deflection. A thickness of newspaper used for checking the cut of the reel is between 3/100 and 5/100mm (0.03 and 0.05mm). That is, the amount of deflection caused by the Baroness reel cutter is less than one third of a newspaper's thickness. This is why the cutting quality of all new Baroness reel cutters is consistently high.



Processing

USP.5 Ideal Dynamic Balance

When an unbalanced object spins it vibrates and cannot spin in a perfect circle. An unbalanced reel cutter could have an extremely negative effect on the performance of a mower. Kyoeisha has paid careful attention to the importance of dynamic balancing and keeps a standard value of under 2 grams when the reel cutter is spinning. That is extremely small.



Balance

USP.6 High Assembly Accuracy

High accuracy is required not only during the manufacturing of the reel cutter, but, also when installing the reel cutter into the mower. Workers check each mower during assembly for how much distortion exists between the right and the left sides of the frame and make sure the amount falls below Kyoeisha's standard value (below 0.3mm). Strict adherence to this standard value ensures that Baroness mowers produce superb cutting quality right out of the box.



Assembly

USP.7 The Relationship Between the Reel Cutter and Bedknife

Obviously a reel cutter alone cannot mow grass. When teamed up with a bedknife a reel cutter cuts grass. The contact point between the reel cutter and bedknife is only 0.5mm to 0.8mm. This minimal contact results in healthy cut grass and a beautiful finish.



Cutting

USP.8 Multiple Cutting Points Create a High Quality Finish

In the case of a 22 inch mower with 11 blades, for example, the reel cutter and bedknife always maintain cutting points at 3 or 4 locations when the mower is mowing. Because of these multiple points the pressure on each blade is even, which reduces wear on the blades and prolongs the cutting quality.



Technology

USP.9 A Large Amount of Clippings

When a mower cuts grass, it is the reel cutter that first makes contact with the grass. As the reel cutter rotates, it brings grass towards the bedknife and together they cut the grass. To maximize the amount of grass a reel cutter can grab, the rake angle is set at 11 degrees*. This angle helps cut a larger amount of grass each time the reel cutter makes contact with the grass. This increases the mowing capacity of a mower and helps create a smoother surface. ※Greens Mower



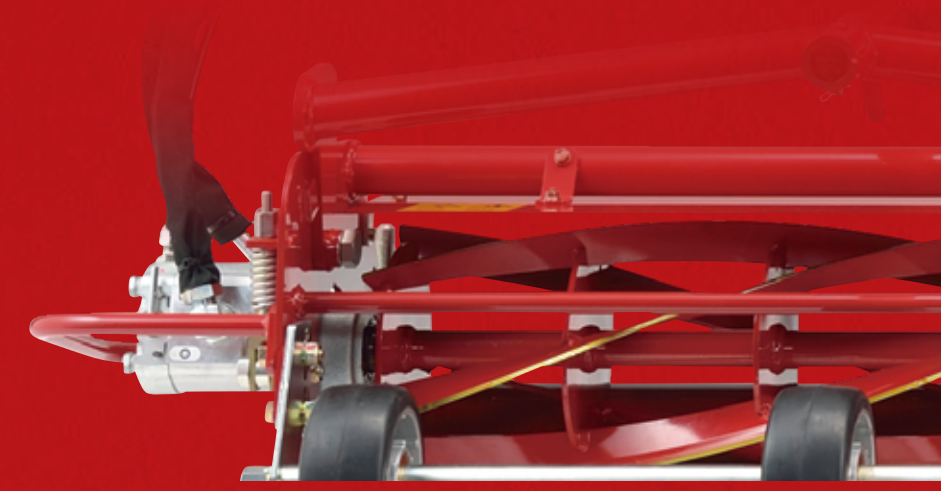
Mowing

USP.10 Quality On Demand

Baroness reel cutters come in about 100 different specifications, including different quantities of blades, width and diameter of the reel cutter. Baroness products range from lawnmowers for home to professional mowers used on golf courses. All Baroness products are created with the same materials, combining accuracy and dedicated craftsmanship. The Baroness reel cutter provides the best cutting quality for everybody, everywhere.

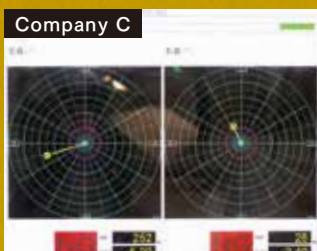
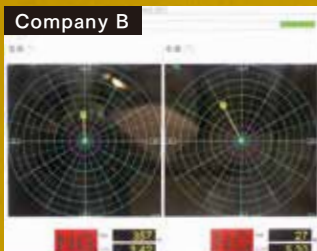
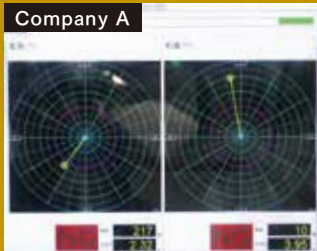


Commitment



WHY BARONESS?

There are other makers who manufacture mowers and reel cutters in the world. In this section, we will attempt to verify the superiority of the Baroness reel cutter.



Verification1 Dynamic Balance

What is dynamic balance?

An example of dynamic balance is the balance of centrifugal force generated when a tire/wheel rotates. It is extremely important for a tire/wheel spinning at a high speed to maintain its gravity point at dead center. Wheel balance adjustment is a process where the appropriate balance weight is installed onto a wheel so that the wheel spins in a more accurate, true circle. The same logic applies to reel cutters. If the gravity point of a reel cutter spinning at a high speed is not at its center, the reel cutter can not spin in a true circle or maintain the same distance to a bedknife, thus causing the cutting unit to vibrate. To prevent this, the dynamic balance of a spinning reel cutter is already factored in at the manufacturing stage.

The rotation speed of the reel cutter on the Baroness LM56GB at a low clip setting is 1,143rpm. This is equivalent to that of a tire on a regular sedan driving at 137km/h (85mile/h). Balance adjustment is critical for consistently achieving a true circular rotation.

Let's look at the level of dynamic balance accuracy from other makers' reel cutters. We tested 3 other makers reel cutters using the device that Baroness employs to measure the dynamic balance of its reel cutters. Below is the result:

	Left	Right
BARONESS	256° 0.48	206° 0.76
Company A	217° 2.32	10° 3.95
Company B	357° 3.42	27° 5.3
Company C	252° 5.20	25° 2.40

* All using a 11- blade reel cutter. Unit (gram)

The resulting figures in the chart indicate the amount of weight added to each reel cutter in order to achieve the truest circle rotation.

The test shows that the reel cutters of 3 other makers required more adjustment weight to achieve true circular rotation. This comparative test verifies that the Baroness reel cutter excels in maintaining the distance between reel cutter and bedknife and that its blades contact grass evenly, thus creating an even surface.

Verification2 Uneven Spinning of Reel Cutter

Measurement of Uneven Spinning

What happens when the reel cutter spins unevenly? When a reel cutter spins unevenly, its rotation orbit in the direction of mowing becomes ellipsoidal. This results in the reel blades not contacting the bedknife evenly. Ellipsoidal spinning causes the reel to vibrate, which in turn affects the performance of the mower itself. In this section, we attempt to verify the degree of spinning accuracy each reel cutter possesses. The test was conducted with reel cutters held by bearing (the same condition inside the mower).

	Left of Blade	Center of Blade	Right of Blade
BARONESS	0.01	0.01	0.01
Company A	0.02	0.02	0.03
Company B	0.02	0.02	0.02
Company C	0.01	0.01	0.01

Unit (mm)

The unevenness of the Baroness reel cutter's rotation is within 0.01 mm at all the testing points on its blades. In comparison, the other reel cutters' rotation showed 0.02 - 0.03 mm of unevenness. When a mower continues to operate for a long time, the wearing down of the reel cutter and bedknife progresses much faster due to the vibration caused by the reel cutter's uneven rotation.

The unevenness, of the Baroness reel cutter's rotation is smaller than that of other manufacturers'; the distace to the bedknife is constant; and the amount of vibration is less. This results in the sharpness of the blades lasting longer. What's more, mechanics do not need to adjust the setting of the Baroness reel cutter as often as the others.This is the advantage of using the Baroness mower.

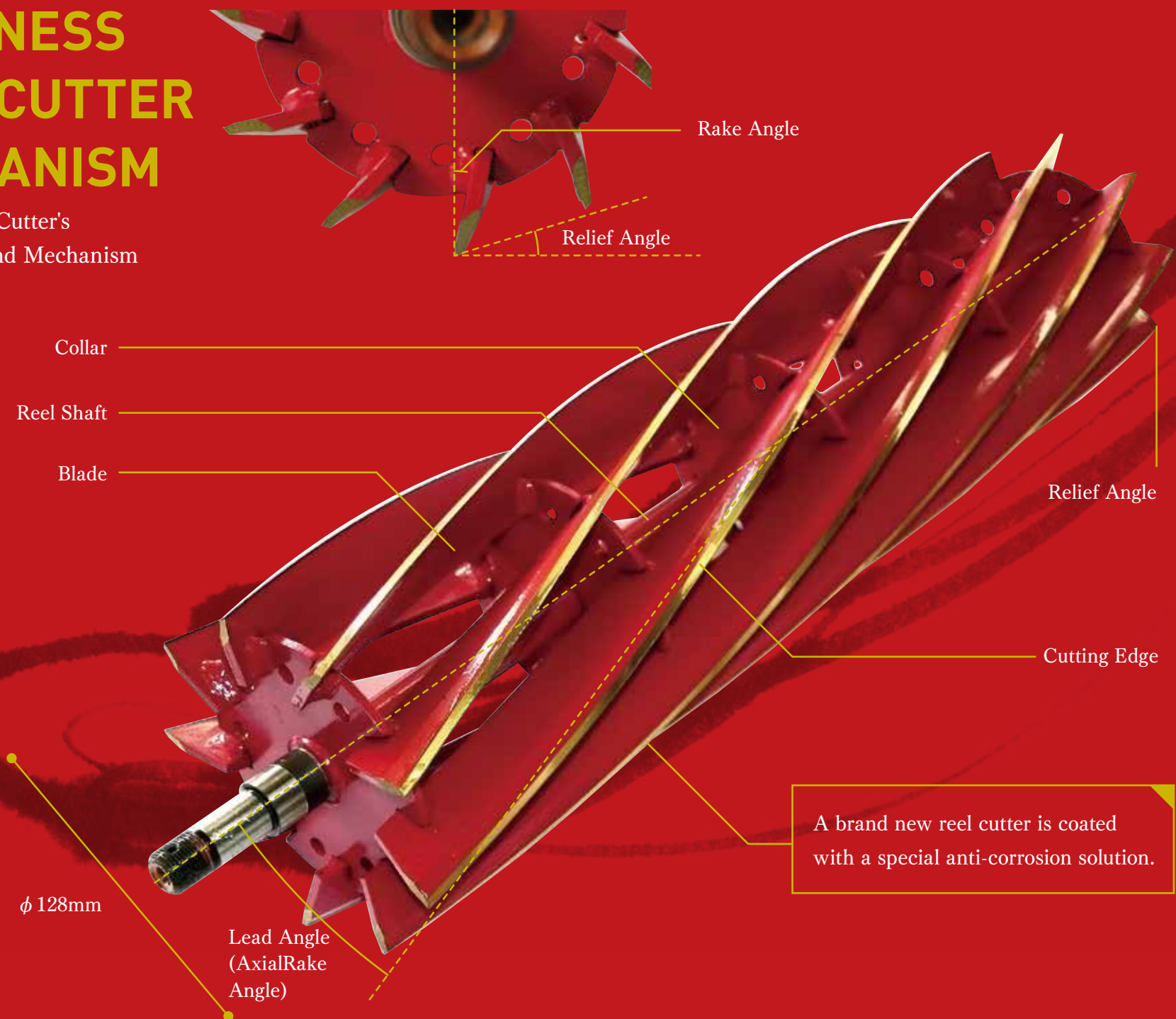
When the reel cutter on a mower provides a high performance, all the holes of the course can achieve a consistent surface condition, green speed, and smooth rolling ball. This is what the course manager wants.





BARONESS REEL CUTTER MECHANISM

Baroness Reel Cutter's
Components and Mechanism



SPECIFICATION



Floating Head Greens Mower
LM101

Reel Diameter:101.6mm
Number of Blades:9•11
Shaft Diameter:25.4mm
Blade Thickness:4.35mm
Collar Diameter:81mm
Collar Thickness:3.2mm
Dynamic Balance:0~2g



Riding Greens Mower
LM315GC

Reel Diameter:128mm
Number of Blades:7•9•11
Shaft Diameter:25.4mm
Blade Thickness:4.35mm
Collar Diameter:107mm
Collar Thickness:3.2mm
Dynamic Balance:0~2g



Fairway Mower
LM551

Reel Diameter:163mm
Number of Blades:7•9
Shaft Diameter:25.4mm
Blade Thickness:5.5mm
Collar Diameter:125mm
Collar Thickness:4.5mm
Dynamic Balance:0~2g



5-Unit Reel Mower
LM3210

Reel Diameter:205mm
Number of Blades:5
Shaft Diameter:30.0mm
Blade Thickness:5.5mm
Collar Diameter:168mm
Collar Thickness:4.5mm
Dynamic Balance:0~2g

*Other options are available



Worldwide Endorsements for Baroness Mowers.

The quality of cut on all Baroness machines is one of its strongest points.
You set the cut up and it can be a long time before you have to reset the blade.
The blades stay sharp for an awfully long while. It's such a good cut.

John Wells , Master Greenkeeper, Course Manager of South Herts GC UK



John Wells