

A Near-Perfect Shaft that Meets IEC61400* Specifications



Masaya Kubo
Corporate Planning Department
Sylphid Inc.

Sylphid Inc. develops, sells, and constructs small wind generators (small wind turbines). At our company, in order to maximize the performance of our small wind turbines, we feel that *balance is the most important factor*. In light of Japan's wind conditions, which are considered an inconsistent, "off-road" environment of changing wind direction and speed, we have developed and employed Japan's first *vortex generators*.

Our present focus is on small autonomous turbines operated by independent power sources, which can be used when generators or power lines go down during a natural disaster. An example of what we have in mind is clean bathrooms at emergency evacuation sites and parks, with odor-eliminating functions powered by independent generators. Our company hopes to contribute to society and be of use to everyone by raising the quality of life through providing power generation even in regions lacking infrastructure.

Ease of rotation is a necessary feature of small wind turbines. However, while a certain degree of strong wind is needed to initialize movement, wind that is too strong can lead to accidents due to over-rotation, so it is necessary to stop the unit to prevent this. In general, Japan is a country with unsuitable wind conditions, but there are some regions with strong winds of speeds of 14 m/s. In such regions, turbines that stop every time there is a strong wind would be unable to function as independent power generators. On the other hand, turbines must be able to rotate even under low wind conditions of 3 m/s, or they become very limited in the uses they can serve. It is difficult to find a balance of ability and versatility for small wind turbines.

When we were developing new products, I attended a wind turbine conference in search of high-safety bearings

with excellent output potential and heard THK's presentation, which gave me a great sense of confidence in their shaft units. The biggest reason that our company started using THK's products in our wind turbines was the appeal of achieving such a high level of performance even with low torque. Furthermore, THK is the only company we are aware of whose products meet IEC61400 specifications. Even within our company, you hear people saying that if we weren't using THK products, we wouldn't have been able to complete our wind turbines. A turbine's vibration when taking on wind force is a critical factor in maintaining a safe system, and when a turbine is made up of numerous individual parts assembled together, it makes it difficult to identify problem areas. However, the THK product used in our wind turbines is designed to be a single unit. The result is that the usual vibration is absent even when running on test machines, and the number of devices we've had to develop has been greatly reduced. When using it in actual wind conditions, you can't help but wonder at how well it spins. An individual from Fukushima Strawberry Farm, where they use our products, insists, "All you need is wind, and they'll run forever." It is extremely important that small wind turbines run without pause if there is a noticeable amount of wind.

Through this project, we were able to build a very good relationship of trust with THK. I feel that those at THK who worked with us are just as important to the project as the developers of our product. To put it a different way, without partnership of this degree, I don't believe we would see good new products coming out of the new market of renewable energy. Our industry can expect much future growth in conserving the earth's environment, so we feel it is vital that we make wind turbines that meet our customers' needs, whether big or small. Rather than simply selling a turbine, we want to ensure that it remains as a regional and social resource. To accomplish this, I believe that THK products must also have the potential to evolve in response to varying circumstances. For the future of our planet, I would like to see the cultivation of THK's shaft unit into a product that could be called the backbone of the business.



Wind turbine installed at a strawberry farm

* IEC61400: International specification for wind turbines