



GEAR INSIGHT

ORIKAMI BACK PROTECTION

Niviuk have designed a new type of slimline back protection – Orikami. Designer Guillem Batlle explains more

▲ **SLIMLINE PROTECTION**

The trend for performance harnesses is to use thin back protection, which still passes certification. Niviuk's new Orikami is used at 5.5cm deep
Images: Niviuk

Niviuk used the Stubai Cup to launch their new type of slimline back protection. Called Orikami it's been developed by Niviuk's team of in-house designers and is already in use in Niviuk's new Drifter 2 paragliding harness.

Niviuk say they developed Orikami as an alternative to "existing protector materials" – which is code for Koroyd, the low-profile (slim), plastic, honeycomb back protection used in harnesses for everything from speed-riding to competition flying.

"Specifically designed" for high-performance harnesses, Niviuk say the benefits of Orikami are that it is thin – just 5.5cm thick in the Drifter 2 – and designed to take multiple impacts. The material recovers its shape and characteristics after each impact and is good for at least six impacts, according to Niviuk's Guillem Batlle, a trained aerospace engineer who worked on the team that developed the new back protection.

Introducing the new material on the Niviuk stand at Stubai, Guillem explained that the team of eight had been working on the project for 18 months. "We developed Orikami in-house, and it's a new concept in back protection. We wanted to create a thin material that has good protection and is comparable to foams," he said.

The result is Orikami relies on elastic deformation rather than plastic deformation – the difference is the former goes back to its original shape when its shape is changed, while in plastic deformation it doesn't, it stays changed. "We did laboratory tests that show it can protect the pilot for at least six high-energy impacts," Guillem said. "But of course, we advise pilots to check their back protection, whatever type it is, after any crash."

Honeycomb design

Orikami is loosely termed a honeycomb design. "Honeycomb absorbers are widely



ONLINE

Niviuk's Guillem Batlle takes us on a deep dive into the design and development of Orikami
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used in the aerospace industry, for example as absorbers in helicopters,” Guillem said.

“It’s a well-known technology, but there is a problem with honeycomb absorbers in that they exhibit this jerk, a high point of stress, at the beginning of the deformation. So, we took that technology and decided to find another shape in order to avoid this jerk.”

The name Orikami is inspired by origami, and that is how they came up with the shape of the cells in the material, albeit using a design program and not folding bits of paper by hand. “Because of the shape it now has, it’s like the structure folds on itself when compressing,” Guillem said.

The search for thinner materials to use as back protection in high performance harnesses is driven by the desire to create low-profile – and therefore low drag – harnesses. It’s all about performance while staying within the parameters demanded by the certification tests. As a result, the Orikami in the Drifter 2 is used at 5.5cm – the slimmest possible while still passing the certification test.

“We know the drawbacks of going to thinner protectors. With safety as our main concern we decided to investigate new shapes and technologies for two reasons,” explained Guillem. “First, so we could install it in high performance harnesses, so that the cross-section area could be reduced. And

secondly, to give pilots tools that protect them effectively, not only for a crash but also for different angles on the impact and for different situations when crashing.”

Niviuk say that Orikami does not deform if squashed from the side, for example. “If you crash with a lateral impact, for example, the Orikami stays in place and is there to protect you.”

Certification

The Drifter 2 harness is certified according to both EN and LTF standards using 5.5cm of Orikami back protection. It offers 45g of protection: 50g is the limit to pass certification; g is the g-force, and is a measurement of deceleration. Guillem added: “If we look at other thicknesses, then for 7cm thickness the value is 35g, so it’s a good result.”

Niviuk have applied to patent Orikami and expect to use it in other harnesses in their range in the future, most likely for pods. “It’s not a lightweight solution – for the lightest possible you want an airbag – but for conventional cross-country harnesses then it will have a role.” **✎ Ed Ewing**

We will be taking a wider, in-depth look at harnesses and back protection in articles in the next couple of issues

▼ BOUNCE BACK

Niviuk set out to develop a honeycomb protection that relies on elastic deformation – so it can bounce back and regain its original shape. It is used in the new Drifter 2 harness
Images: Niviuk

