Obliged to improve and differentiate

Looking at sleeping bags, one might be forgiven for thinking that they have been unchanged for the last ten or even twenty years. Same old mummy shape for real outdoor use, same old square shape for caravanning. No news at all? Not quite.

Down as a natural filling material is a real evergreen. No matter what scientists and textile researchers have come up with so far, the warmth to weight ratio of down is still superior to synthetics. So, it is no surprise that all manufacturers confirm their high-end sleeping bags selling well. This may be surprising, because of high prices due to a general shortage of down with a fillpower of 700 cuin and above, because Asian flu led to the mass slaughter not only of chickens but also geese.

Quality control

However, one of the problems for manufacturers is to make sure the fillpower of the down they use is the same when filling the bag as when consumers buy the bag. Bernd Ackermann, product manager at Ajungilak, says: "This is one of the major problems that the entire industry faces. Ajungilak tries to cope with it by checking the fillpower three times: we ask our suppliers for a test protocol of every single batch; we check every single batch during filling; we take a lot of random samples from our sleeping bag stock in our warehouse." Kurt Gerber from Exped adds that they are shipping their raw down 50 per cent less compressed than usual thus doubling their freight costs. Exped and Mountain Equipment store their sleeping bags in loose plastic bags and not in the stuff bag. "However, we do not have any influence on what dealers do. Many of them lack storage room. So they must stuff the bags," says Gerber. Furthermore, many well-regarded brands have the shells of their top models made in the Far East, but fill them in Europe on order, trying to minimise storage time.

In spite of the efforts of all the serious brands, recent tests in consumer magazines showed an evident gap between labelled and measured fillpower. When 'Oppad' in the Netherlands, 'Alpin' magazine in Germany, and 'Retki' in Finland tested sleeping bags, they had the down examined by independent institutes. Almost every sleeping bag had a fillpower lower than labelled. Andi Schimeck, CEO of Marmot in Europe, explains: "Of course, this should not happen. But down is a natural product and it may actually change its properties over time. There are various reasons that this happens." North American manufacturers nominate different test procedures for the fillpower in North America and Europe. While Europe measures the fillpower of 30 grammes of down, North America uses one ounce – the equivalent of 27.344 grammes. No surprise that North American results are about 10% higher than those in Europe. Another reason might be the time that the down has been packed before it was allowed to acclimatise. The standard fillpower test prescribes a period of 24 hours for the down to acclimatise. "This might be enough for the relative humidity. But I am convinced it may take more than 24 hours for the down to develop the full loft," says Gerold Ringsdorf, director of hardware at Jack Wolfskin. "The longer it has been stuffed, the longer it needs to achieve again its full loft."

One of the most reputed down testing institutes, International Down and Feather Laboratories in Salt Lake City, after many thousands of tests of down sleeping bags also concluded that, of the three fillpower measuring treating methods – dry, after washing or after steaming, it was the washing method which best simulates the actual fillpower the consumer will have after some usage. Japanese tests concluded that steaming comes closest.

Not just varying standards but inconsistent results too

The problem of measuring fillpower also mirrors the experiences that manufacturers have had with the EN European Norm for sleeping bags. One of the product managers we talked to who asked not to be named said: "We have sent identical sleeping bags to the test institutes in France, Norway and Germany, and we received three different temperature ratings. This should not happen as these institutes tried to standardise their test procedures by testing the same 24 sleeping bags. I would say that this was not good enough."

Manufacturers also agree that the EN norm needs adjustment for expedition sleeping bags. Bernd Ackermann states: "We had one expedition bag rated –58°C as the extreme temperature by the EN-test. However, no one in our athletes team would ever dare to use it in such freezing cold." Assuming that people who go on expeditions have reasonable knowledge and experience anyway, this should not be a serious problem.

However, another fact will definitely remain an unsolved problem: sensing temperature is a highly individual thing. Max Hofbauer, TNF, claims: "If you check the internet chat rooms, you will find extremely controversial statements concerning the same bag. One person feels fine while the other one is close to freezing to death. The norm is nothing else than an aid for basic orientation. But nobody, not us, not the trade and no consumer must blindly believe what they read on the sleeping bag!"



The Exped Iris
Exped

Reaching the limits

The lightweight trend is also mirrored in fabrics. Steve Laycock, product manager at Pertex, says: "It took us a lot of researching to find the appropriate engineering compromise of weight, tear and wear resistance, breathablity,



Quick drying synthetic sleeping bags are ideally suited to the humid conditions faced on the Southern Patagonian Icecap.
Till Gottbrath

windproofness and textile touch on Pertex Quantum. Today, we are excited by the acceptance of Quantum, particularly as it is definitely not a cheap product." Quantum weighs a mere 30 g/m2 and is being used in the top range sleeping bags of most brands. Claudia Wagner, sales and marketing at Toray, agrees: "With Toray being a very big company, we are able offer a wide range of sleeping bag fabrics. With Chinese and Korean suppliers actually owning the $1 million market, we face a high demand for technical lightweight fabrics, for example our 33 g/m2 quality made from hollow core polyamide yarns." However, both Wagner and Laycock believe that they have reached the limit. Getting considerably lighter would result in sacrificing durability.

No major changes can be expected from synthetic fill fibres. The entire industry agrees that synthetic fillings have become really good. Max Hofbauer, North Face Germany CEO, says: "Modern synthetic fill fibres outperform low quality down in almost every respect: The warmth to weight ratio is as good or even better. They don't suffer as much from moisture. Care is easier. And they even cost less. Down's more comfortable climate inside is not enough to use them."

So far, branded fill fibres such as PrimaLoft, Polarguard, or Thermolite have mainly been used for more expensive sleeping bags. However, some of them aim for more volume. The solution for many is licensing manufacturers in China. There, they can offer a great benefit to sleeping bag makers: "Good quality + branded fibre + good price". But there is downside, too. In addition to branded fibres, some of the Chinese also offer "good quality + no-name fibre + very, very good price". One product manager who wanted to remain anonymous told WSA: "I don't dare to say that we buy exactly the same fibres without a brand name. But I can assure you that we are extremely pleased with the quality we get for our money."

All this is basically marketing. So, no news on the engineering side? If it comes to the filling, Thermore offers T37 Dynamic, calling it a smart insulation or a 'self-adjusting thermal product'. This concept means that the thermal resistance (CLO value, TOG rating, etc.) actually changes according to varying weather conditions. According to the Italians, they work with 'thermal gates', or chemical microspaces that make up the structure of the T37 Dynamic. During colder conditions, these thermal gates are 'closed' and maximum thermal efficiency is achieved. As the temperature becomes warmer, the microspaces start to "open" and allow excess heat to escape.



Three sleeping bags - Jack Wolfskin, North Face Fission and Haglofs Zest.

Wolfskin/NorthFace/Haglof

UK-based Mountain Equipment has been working on a real blend of down and synthetics. Marketing manager Mark Clifford says: "Our R&D has been busy with this project for two years already. The target is to combine more of the advantages of both with trying to eliminate the typical disadvantages. So far, we have not yet arrived at this point, but it looks promising enough to us to continue the development work."

The idea of blending materials has also been adapted by PrimaLoft. Mid-January, they showed a combination of PrimaLoft and Ingeo at the HeimTex show in Frankfurt. Originally intended for use in beddings, Central European Sales Representative Mark Kaminski sees future sleeping bag opportunities: "The new product has excellent thermal properties, extreme softness, good loft, great compressibility and due to the absorption properties of Ingeo an excellent moisture management. This improve the sleeping comfort."

Waterproof technologies

Three years ago, Swiss manufacturer Exped pioneered a really waterproof down sleeping bag. Of course, Exped-mastermind Andi Brun patented his WB-construction. The technical difficulty he had to overcome was a seam taping that withstands the use and abuse of a sleeping bag: "It is quite amazing how a sleeping bag gets stressed when packing and unpacking and especially when being washed." Until now, Exped has licensed Mountain Hardware to use its technology. But there are others who offer waterproof bags, for example, Berghaus in the UK and Macpac of New Zealand. Obviously, not everything has been cleared concerning possible patent infringements.

The North Face and Marmot are both working on their own waterproof constructions, but they are not yet ready to be launched. Max Hofbauer explains: "As one of the market leaders, TNF has to be on the cutting edge of technology. However, even we find it hard to market such new developments. The trade is basically pretty reluctant to real innovations. And the big question is: who is willing to pay the money for such a bag?" Bernd Ackermann goes a step further: "Who actually needs a fully waterproof sleeping bag in winter? When it is below –5°C the water outside your bag freezes and cannot enter the bag anyway. That's why I do not see the need for fully taped winter bags. I agree that climbers in bivouacs, as well as super-lightweight travellers with neither a tent or a bivvy bag, might want it above freezing. But I doubt that it will ever be a mass product." For all these reasons, Jack Wolfskin has also decided not to produce waterproof down sleeping bags and is probably not the only one to come to this decision.

However, water resistant coated or laminated shell fabrics are particularly important on high quality down sleeping bags, as the down needs to be well protected from humidity. In the past, many users reported condensation problems in cold conditions with such fabrics. However, US-magazine Backpacker gave its 'Editor`s Choice Award' 2004 to Pertex Endurance for its great performance. Bernd Ackermann says: "Cheap fabrics, especially non-porous, don't perform and create a lot of condensation. The good and expensive ones are worth the money. Our experiences with Pertex Quantum are excellent."

Invisible improvements

Other than down, synthetics allow easier application of technologies such as lamination, bonding, gluing and welding. While they have become routine on apparel, they are not so easy to apply to sleeping bags. Lightweight fabrics are much more difficult to work with, especially to ensure the entire construction lasts. Besides, too much glue might ruin the breathabilty. On the other hand, there are obvious benefits: well-made, this technology will lead to less weight, because the glue weighs less than the thread; there is no abrasion on seams; and the filling is not compressed where it is glued, while quilting goes all the way through. The North Face has already launched its 'Propel' series, where they glue the synthetic fill onto the outer fabric instead of quilting. Also, Chinese Tsungsang International is the first OEM manufacturer focusing on sleeping bag lamination, and we dare say that every serious sleeping bag maker currently has this on his 'to do' list. Gerold Ringsdorf dreams of a fully laminated sleeping bag on a four-way super-stretchy outer fabric: "Waterproof, lightweight, warm, comfortable, packable…"

But existing technologies also offer room for improvement. Ajungilak's Ackermann says: "We actually learnt a lot from the EN-tests concerning temperature sensation. Correlating with what our testers tell us, we found that we needed to optimise the construction on the footbox." On its top models, Ajungilak now has three overlapping layers of down-filled boxes, making sure that even the longest toes stay warm.

Feeling good, with warm feet, led Mountain Equipment to create a heated sleeping bag, incorporating electrical devices for the first time. Of course, it is impossible to heat the entire bag with a small pack of rechargeable batteries but: "We found that heat at the feet which is switched on for the first 20 minutes after getting into your sleeping bag generates a very comfy feeling," said Mark Clifford. This 'Hot Foot' technology basically works like an electric blanket and will be launched at ispo winter 2005.

Another major construction site is integrated sleeping systems. The first trials by Marmot, Yeti and Exped have been launched on the market – none of them could be called an overwhelming success. Still, turning the insulating mattress and the sleeping bag into a well-working and highly adaptable system can be a major step.

At the end of the day, the biggest challenge that brand sleeping bag makers face is price pressure. Obviously, Germany and Austria suffer most from Aldi and other discounters selling cheap bags. "When Aldi sells ten containers of €19.90 sleeping bags within one week, it actually kills the lower end of the market for quite a while," states Gerold Ringsdorf. "Especially as many of these customers buy a sleeping bag only once in a lifetime." However, this challenge results in an opportunity. Andi Schimeck from Marmot: "The market situation implies an obligation for us to continuously improve our product. By offering a better product at a higher price, we offer the specialist trade an opportunity to show why they call themselves specialists."

