

# Garment design

Today most sailors will wear either a jacket or a smock styled top and a chest high trouser or salopette. One-piece garments have lost favour, being too inflexible and are only used in a dry suit form.

We'll start from the premise that all the fabric for foul weather clothing is waterproof. It can however differ with weight, breathability and varying degrees of durability. The amount of protection you get then comes down to the garment design. Water can only access the jacket through the zip, up the sleeves or down the neck opening. Taking the zip area, even the most basic jacket should have a storm flap over the zip secured with Velcro®. The protection can be increased with a flap behind the zip and a further flap above the zip. This can be turned in to create a gully for water to drain away before it can reach the zip. Sophisticated flap arrangements can usually keep water out in most conditions. However the ultimate protection is provided by a smock top without an opening at all. (This we'll look at later.)



- 1 First there is a flap behind the zip
- 2 The inside flap above the zip is turned back on itself to create a gully to drain water away from the zip.
- 3 The outer flap runs the full length of the zip and should be secured by Velcro®

Most jackets today will have an inner cuff made from a soft PU material that has a degree of stretch and can be closed further with Velcro. In addition the sleeve should have an outer cuff that can be tightened to minimise the opening. There tends to be little difference between the top of the range jackets and the inshore jacket in this area. The design has been perfected and is expected as a standard feature. In my experience, if the inner cuffs are done up reasonably tightly and the outer cuff is secured there is little chance of water going up the sleeve.

I will always remember in the early years a particular customer who bullied me into moving our cuff design up a few gears. He returned a jacket saying it was letting water in at the cuff and went into great detail to explain where and how. He was quite right; it was not his particular jacket that was at fault but a limitation on the design. I spent hours tweaking and developing it, which at the time, using a high frequency welding machine, was not easy. I thought we had it sorted but a few weeks later back it came. We spent quite a while discussing it on the 'phone. He was quite forceful that it should be possible and we just had to get it sorted.

# Garment design

Out of this was born our soft PU inner cuff with Velcro® adjustment that is used on just about every manufacturer's cuff today. It made me realise that real progress in garment design could be made and boundaries could be pushed back if we were willing to challenge everything. Whilst at the time, our design and production department were not always complimentary about this particular customer, there is no doubt in my mind that he did the business a lot of good. He pushed us and I am grateful for the experience. When we finally got it sorted he was the first to say so and came on our stand the following London Boat Show and treated us like long lost friends. He came back for many years and I often think about him today in product development meetings when someone tries to tell me something's not possible.

The neck opening is probably the hardest to seal against the elements. This is the area where garments differ most between categories. It tends to be the collar height that determines whether a garment is called an inshore, coastal or offshore/ocean jacket. All garments today will feature a hood that folds into a collar, the collar will be fleece-lined for warmth and comfort. An inshore jacket tends to have a collar that reaches just above the bottom of the ears whereas an offshore collar completely covers them and reaches up to almost the top of the head. Chin flaps and storm guards will leave only the eyes showing; great for tacking into a north-easterly gale but a bit over the top for cruising in the Solent.

The finest test bed we have for understanding how our clothing can best protect you from the elements has always been the Southern Ocean and the Whitbread and Volvo Open 60's. In the '97 Whitbread we were working with Chessie Racing. We had developed a collar and hood arrangement that we believed was second to none. However, the bowman, Ricky Deppe, was still complaining that he was getting wet. "The water hasn't even started breaking when it hits me. Don't forget I get it 55ft before anyone else on the boat. What I really want," Ricky told us, "is the top half of a drysuit with a high collar and hood. That way I will have the flexibility of a two piece and the protection of a drysuit".

# Garment design

This e-mailed feedback was coming to us from deep within the Southern Ocean between Cape Town and Fremantle.

Our designers got on the case, drew up a spec, scanned it into the computer and e-mailed back to Chessie for comments.

We had a one word reply "Perfect" ...followed by a deadline.

"I need it for the Auckland to Rio leg," commanded Ricky.

Thus the Bowman's Smock was born. It consisted of a smock styled garment with latex rubber neck and wrist seals with a high collar and hood.

This has to be the ultimate protection and was also used by the crew of LG Flatron on their way to victory in the BT Global Challenge in 2001. The Challenge race is made up of enthusiastic amateurs crewing with a professional skipper. They have probably had a lifelong ambition to do something adventurous and many cash in their life savings to make it happen.



During training, the LG Flatron skipper, Conrad Humphreys, noticed that there was often resistance from crew members to going forward to change sails. It wasn't the danger, he discovered, but the knowledge that they would inevitably end up with water down their necks and the next four hours would be spent miserably wet and uncomfortable. The tops supplied by the official supplier to the race used a conventional neck closure system. However, Conrad believed that if he had a latex seal on the garment they would be totally dry and that moment's hesitation about going forward would be lost. Conrad had been trying out our Bowman's Smock and decided to let members of his crew try it out in training. It was not long before the entire crew complement had them on order. After the race he commented.

***"It was great to dispel the myth that if you are working on the foredeck during the BT Global Challenge you will be soaking wet. The Gill Bowman's smock kept my team warm and dry and there is no doubt in my mind that this was one of the factors of our success."***

# Garment design

In addition the recent Volvo Ocean Race saw the Bowman's Smock development move further back the boat. The crew of illbruck also wanted the total seal around the neck and cuffs but they wanted to keep weight to an absolute minimum and wanted to be able to hear instructions and shouts from team members. High collars, flaps and hoods meant this was not always possible, especially on top of the roar of surfing down forty foot waves at twenty seven knots. illbruck took our dinghy Dry Smock, added a pocket and specified an Ocean quality fabric. Job done. Stripped down to the basics just like the boat itself. Minimum weight, maximum manoeuvrability and crew alertness at all times and they were still dry underneath.



The crew weren't in that much of a hurry to take the gear off despite the neck seals

People have often said to me, surely wearing a rubber latex seal for long periods is desperately uncomfortable. However if you looked at the television pictures from the Volvo Ocean Race, the skipper John Kostecki and his crew would still be in their Dry Smocks long after they had come ashore. Standing on the podium, hugging their family and chatting to the media can't have been that uncomfortable otherwise the smocks would have been pulled off the minute the guys hit dry land. The answer is that a Dry Smock is not an immersion garment that is worn in or under the water and therefore the neck seal can be less tight than it would be on a drysuit or survival suit. The seals come with ring marks and the answer is to keep cutting them away, one at a time, so it seals round the neck with only the slightest pressure. That way you can wear it day and night and the crew of illbruck often did.

Hung on my office wall is a picture of Chessie Racing blasting through New Zealand's Hauraki Gulf in a mass of white horses and spray. All the crew were dressed in their yellow Ocean gear except Gavin Brady who was in his red and dinghy spray top.



Neither the fabric nor the garment were designed for this sort of use but it tells me that the lighter and more freedom of movement the garment offers, the better, and the proof is there on my wall as a constant reminder. Our job is never done.

# Garment design

So Chessie started what illbruck would finish. Ocean gear used to be about bells and whistles, pockets and flaps, harness channels and EPIRB pockets. illbruck wanted performance, and performance to them meant minimum weight and maximum speed. If it wasn't essential leave it off. Stripped down and sleek like the racing machine it was. We were effectively producing dinghy clothing in ocean level fabrics because short of swimming, I defy you to get any wetter in a dinghy than you can on a Volvo Open 60!

Dinghy clothing has been reasonably lightweight now for several years but it could still be restrictive. Working with the Olympic sailors and in particular Ian Walker, (twice Olympic silver medallist), I learned that what they wanted was better freedom of movement and reduced windage. They wanted to be able to lift their arms without the garment riding up. If we could achieve this, then we could slim the garment down and reduce windage. This was achieved by putting in an underarm panel from the waist to the tips of the arms. It worked perfectly and reduced the flapping fabric by about 20%. We then looked at the legs and arms. When you are sitting on a boat your legs are bent, putting strain on the fabric across the knees. Strain equals resistance and resistance slows you down. So, our designer came up with the idea of pre-articulating the legs. In other words, pre-bending, by putting more fabric in the front than in the back, thereby taking away any resistance. We did the same with the arms. The overall result was that we produced garments that were slimmer, better fitting, more comfortable to wear and with less wind resistance than previously.



John Oakeley,  
skipper of *Lionheart*.

I first worked on reducing windage in 1980 and it has taken a long time put into commercial use. Back in 1980 John Oakley, Olympic Medallist, was appointed skipper of *Lionheart*, the first British America's Cup challenge for many years. He came to us for their clothing requirements because we were a young innovative company, hungry for a challenge and willing to listen. His ideas were not only radical for the time; they would still raise eyebrows today. He wanted lightweight, low windage and flexibility, giving exceptional freedom of movement and

"THERE are three good reasons why I chose the Giltex range for the crew of *Lionheart*. They are light and supple; they are very easy to move around in and really you don't know you are wearing them; the material does not sweat so waterproofs can fit snugly thereby reducing windage. As the suits are so light and friction-free, even at very low temperatures, I maintain you save 10-12% of crew energy." John Oakeley.

# Garment design

comfort. We chose a light transfer coated fabric with a degree of stretch. We then put in long zips with gussets behind so once the garment was on it could be zipped up and slimmed down. A trip to the motorcycle shop to look at cycling leathers taught us a lot. John recognised that speed on the grinders was essential so he wanted detachable arms. Again coil zips were inserted just below the shoulder blades. When detached it was like wearing a gilet and when attached you had the full protection of a jacket. He chose white as the colour, not just because it went well against the shiny black hull but because it did not absorb heat. Up until then wet weather gear had always been yellow or orange for visibility. For nearly a decade after that we had white gear in our range, only disappearing when fully breathable fabrics helped reduce the temperature. John Oakley's ideas were well ahead of their time; it took another twenty years when we started working with the illbruck crew that quite so much detailed attention was again given to clothing design.

Gill		illbruck Challenge	
<b>Product Notes</b> Douglas Gill International Ltd. Manor House Road, Long Eaton, Nottingham, NG10 1LR - UK Tel +44 (0)115 9460844 Fax +44 (0)115 9465150 www.douglasgill.com			
<b>PRODUCT # :</b>	<b>DESCRIPTION :</b>		
156	CROSSWINDS SALOPETTE		
<b>SAN MENNO FEEDBACK :</b>			
<ul style="list-style-type: none"><li>• Upgrade zip to 522 weight, 2 way</li><li>• Slim down fleece in legs by stopping at bottom of knee patch, where taffeta add drainage V</li><li>• Stronger hanging loop</li><li>• Increase body length slightly</li><li>• Remove front zip flap</li></ul>			
<b>SOUTHERN OCEAN FEEDBACK :</b>			
<ul style="list-style-type: none"><li>• Lining still pushes out at ankles</li><li>• Longer shoulder straps</li><li>• Need to size bigger than specification</li></ul>			
<b>REFINEMENTS REQUIRED :</b>		<b>CREW OPTIONS :</b>	
<ul style="list-style-type: none"><li>• More room in armboles</li><li>• Lengthen leg</li><li>• Lengthen body again</li></ul>		<ul style="list-style-type: none"><li>• Length</li></ul>	
<i>6cm zip Standard all sizes</i>			
<i>Size 2 Green Lyon - black Indiana - black Kring - black</i>			
<i>Trademark white - patches</i>			