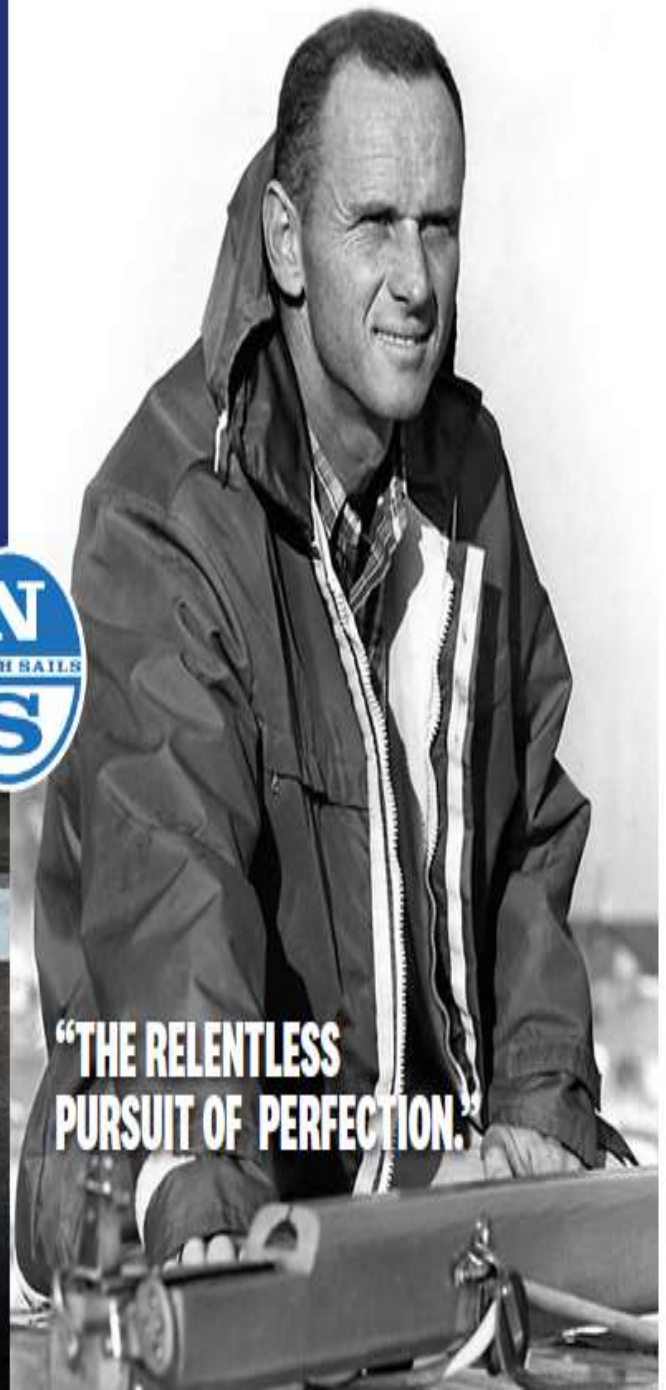
2021 PREVIEW

PERFORMANCE

NORTH SAILS, THE LEGACY, THE FUTURE



"THE RELENTLESS PURSUIT OF PERFECTION."

Go back sixty years and even Lowell North – the pioneering aerospace engineer who founded North Sails in 1957 – could not have foreseen the incredible progress, the sophistication of the North sails that now dominate the world's racing fleets.

Lowell knew what he wanted back then. He was driven by the same goals that drive us today – lighter, stronger, more durable, faster shapes. He was the first to bring a scientific approach to material and product testing, as well as analytics-based sail design and performance development.

He didn't know where this approach would take us or will take us. It was enough to gather brilliant people and set them on a journey of innovation and improvement. We get there one day at a time. Every day, everyone at North Sails tries to find a way to make our sails a little bit better.

The search for better materials led us to laminated polyester and mylar, the aramids, Spectra and carbon fibre. The search for better construction gave us radial panel layouts, moulded sails and eventually the extraordinary composite membranes of 3DL. The search for better design tools took us into computers and built our unique proprietary design software, Flow and Membrain.

This endless pursuit of better engineering, of better technology is the reason we make the best sails, leading the way across disciplines and across classes from the America's Cup through ocean and offshore to the Olympics and dinghies – winners of more one design National, World, and Olympic class titles than all other sailmakers combined.

We will still make the best sails on the planet in sixty years' time. We just can't tell you what those sails will look like yet.

And now we are bringing this same innovative, analytic, design and development-orientated approach to technical sailing clothes. After all, no one's performance is optimal when they are wet when they shouldn't be; or too hot, too cold, or just plain uncomfortable. It was time for foul weather gear for sailors, by sailors. By North Sails.

"LIGHTER, STRONGER, MORE DURABLE."

NORTH SAILS PERFORMANCE

"FOUL WEATHER GEAR FOR SAILORS, BY SAILORS."

"WE PUT A MAN ON THE MOON OVER FIFTY YEARS AGO, SO WHY CAN'T WE MAKE FOUL WEATHER GEAR THAT DOESN'T LEAK?"

Sound familiar? It's probably not the first time that this rather inexplicable situation has been highlighted. It might have been a thought from someone sat in their own private puddle on the windward rail. Or someone who's just caught a wave down the back of their neck.

There's no doubt that modern materials, design and manufacturing have all vastly improved life for sailors since the day when Apollo 11 landed on the moon - but, when people at North were out sailing with folks we were hearing that it all seemed to have hit a plateau, that there hadn't been much progress in marine foul weather gear in recent years.

The foulies are good but not great...
It's all kind of samey...
Same old problems...
Leaky knees and butts and latex seals that don't last two minutes...

It felt like it was time to fix it. After all, that's what North Sails do - the relentless pursuit of perfection. When we do something, we do it right. It's the reason we are sailing's most trusted brand.

So when we decided to create our own foul weather gear, we didn't take it on lightly. We want it to work as advertised - foul weather gear is gear for foul weather, gear that keeps the foul weather out.

We started by getting Nigel Musto to lead the project - you probably recognise the name. Nigel understands the blend of technology, art and craft - along with the intricate design detail - that makes for great foulies, and he was as frustrated as the sailors at the recent lack of progress. He knew that in other extreme sports there had been more innovation in design and technology. There were lessons to be explored from these sports in fabrics, design and detailing.

The first step though was getting GORE-TEX onboard. It was mission critical, as it's been proven as the only waterproof, breathable material tough enough for a sailboat. The next was to go out to the sailing community, both those within North Sails and those at the very top of the sport; the ranks of America's Cup, Ocean Race, Vendee Globe and Olympic sailors.

There was no shortage of feedback, ideas or information... the hard part was to distil it down to the fundamentals that needed to change, and how best to change them. It wasn't easy, but the results are all here in these pages. This is foul weather gear for sailors, by sailors - the best you'll find. Period. It wouldn't have our name on it if it wasn't.

"THE NORTH SAILS TEAM HAVE SAILED A LOT OF MILES WEARING ALL SORTS OF FOULIES OVER THE YEARS. THE NEW LINE INCORPORATES OUR COMBINED EXPERIENCE WITH THAT OF ONE OF THE MOST SUCCESSFUL FOUL WEATHER GEAR DESIGNERS IN THE WORLD - NIGEL MUSTO. WE ARE REALLY EXCITED ABOUT THE RANGE WE HAVE PUT TOGETHER."

Ken Read - President | North Sails

THE SCIENTIFIC METHOD

The scientific method was Lowell North's method. So it should be no surprise that our design work doesn't end when the first prototypes ship out of the factory.

"AFTER SAILING OVER 10,000NM IN THE OCEAN GEAR I CAN SAY IT IS THE MOST COMFORTABLE AND WATERPROOF FOUL WEATHER GEAR I HAVE WORN - THE NEW 4DL REINFORCEMENT IS A GAME CHANGER."

Kévin Escoffier - skipper PRB

The scientific method was Lowell North's method. So it should be no surprise that our design work doesn't end when the first prototypes ship out of the factory. This is just the beginning. Every North Sails product is the result of the same extensive process; research, innovate, design, build, test... rinse and repeat. Over, and over, and over again.

The North Sails Apparel range of foul weather gear has already been tested to destruction, and it should not be a surprise that the lead role in this process has been taken by an engineer; Kévin Escoffier.

One of the most experienced and successful ocean racing sailors of his generation, Escoffier has emerged from a backroom role running Team Banque Populaire's design office to win a Jules Verne Trophy and a Volvo Ocean Race.

Now he's been crowned as the new skipper of PRB, following in the footsteps of legends like Isabelle Autissier and Vendee Globe winners Michel Desjoyeaux and Vincent Riou. It was Riou who handed the batten over - as is the tradition for PRB - along with the 2010-designed boat in which Kévin will contest the 2020 Vendee Globe.

Kévin Escoffier has been doing a lot of sea miles to prepare for this new challenge, and he's been doing them while testing North Sails foul weather gear. He has already achieved a second-place finish in the IMOCA class of the Rolex Fastnet Race and the Transat Jacques Vabre. It's been the perfect testing environment for the Ocean range and Kevin's thoughtful, analytical feedback was essential to the refinement of the final designs.

The Offshore and Inshore gear was despatched to the racetracks of the world in the hands of North's experts and sail designers. The Offshore prototypes went south to Sydney for the start of one of the world's classic races, and then on to Hobart aboard overall winner Ichi Ban.

It was worn by sail designer and trimmer Dick Parker, just one of the talented group that had input into the prototypes. He came back from his first Hobart win with plenty of praise and lots more ideas - as did everyone else. Research, innovate, design, build, test... rinse and repeat.

"FOR THE FIRST TIME EVER I WAS DRY THE WHOLE WAY TO HOBART."

Dick Parker, sail trimmer Ichi Ban,
Overall Winner, Rolex Sydney Hobart 2019

GORE-TEX PRO, THE ONLY FABRIC FOR THE JOB

GORE-TEX® PRO

When the goal is to make the toughest foul weather gear on the planet there is only one fabric to choose from – GORE-TEX Pro. GORE-TEX has led the way towards drier, warmer sailing since the company invented breathable fabrics in 1969 – and they continue to do so with a brand new fabric for the first North Sails Apparel foul weather gear.

Back in 1969 the critical innovation was a membrane layer of expanded or stretched polytetrafluoroethylene (PTFE). The membrane had pores that were just the right size to let tiny sweat particles out, while blocking much bigger rain droplets from getting in.

In the 1980s an oleophobic, or oil-repelling chemical was added to stop sunscreen and sweat blocking the pores of the membrane and reducing the breathability. In the 1990s GORE-TEX OCEAN TECHNOLOGY was introduced with a membrane layer three and a half times thicker than standard GORE-TEX, increasing the durability ten-fold. And now, North Sails Apparel will use the next generation of GORE-TEX materials. GORE-TEX Pro has always been a laminate, with an inner and outer layer of fabric to protect the inside from the abrasion of movement and to protect the outside of the membrane from the world.

The outer layer has a Durable Water Repellent (DWR) coating. DWR does what it says on the tin, it makes the water 'bead' and roll off the fabric, rather than being absorbed – a process called wetting out. Wetting out is bad; the clothing is heavier, less comfortable and because the layer of water absorbed into the fabric reduces breathability it's much more likely to get sweaty and wet inside.

The most effective DWR coating has for many years been a perfluorocarbon (PFC) called perfluorooctanoic acid, or PFOA. Unfortunately, these coatings eventually wear or wash off – it's one of the reasons why older or well-worn foul weather gear is less good at keeping you warm and dry.

Worse, the PFOA coating is also toxic and once it's in the environment it doesn't degrade for a very, very long time. This leads to a toxic build-up in animals, fish and humans. So the EU has banned PFOA from July 2020; a ban that's soon likely to extend to other countries and other PFCs that are still used as DWR coatings.

Our new fabrics take a different approach, with a construction that uses much thinner threads and much tighter weaves. We call it TightWeave (TW) and it makes fabrics more naturally water repellent, giving them a quality that's part of the fabric, that won't wash off. It makes the fabric more durable, so the foul weather gear will perform better for longer. And it isn't leaching toxic chemicals into the environment. So that's a win for humans, fish, animals and the oceans.

FABRIC TECHNOLOGY

North Sails Performance foul weather gear is called that for a reason. We've refined every detail with performance in mind and that starts with the fabric. The new TightWeave (TW) range has been designed for the optimum mix of capabilities in the different race environments.

There's a focus on weight - with the dry weight of every garment listed on each product page - because we believe that weight is an important part of the performance matrix.

A light-weight garment improves human performance whether running marathons, playing football or trimming sails. Sailing clothes should weigh just enough to keep you warm and dry in the conditions - any further weight is a performance penalty that saps the sailor's speed, endurance, and flexibility. And when it's not being worn the weight of the foul weather gear is a performance penalty that saps the speed of the boat. No one voluntarily adds weight to the hull, sails or gear of a modern sailboat, so why add it in the foul weather gear stowed down below?

While dry weight is an important performance number, the impact multiplies when it's wet. The minimal water absorption of our TightWeave fabrics and our non-absorbent 4DL Laminated Reinforcements means that the wet weights are as much as half of that of our competitors.

No one willingly adds aerodynamic drag to a racing sailboat these days either. Not everyone is going at Mach 2 with their hair on fire on foils, but every category of boat is quicker than it was a generation ago. The faster you go the more the aero drag hurts you - just ask the America's Cup sailors. North Sails Performance clothes stretch to fit closer than any others - try them.

TWTECH

All our fabrics are based on TightWeave or TW technology that makes the material more naturally water repellent and more durable, minimising water absorption and maximising abrasion resistance. The number we give each fabric is the total weight of the laminate per square meter in grams.

TW240

TW240 is our toughest laminate with GORE-TEX Pro fabric at 240g/m². It's used on our Ocean range of products. When sailing in the most brutal conditions - we're talking Southern Ocean here - it's critical to use a fabric that is heavy enough to maintain a barrier of insulating air inside the garment, and durable enough to resist tears and abrasion from outside. Nothing less than TW240 will cope.

TW160

TW160 is our Offshore race laminate using GORE-TEX Pro at 160g/m². When racing inshore or on short offshores (spanning one or a few days), minimising the weight of foul weather gear benefits both human and boat performance. TW160 strikes the perfect balance between performance and the required durability for this environment.

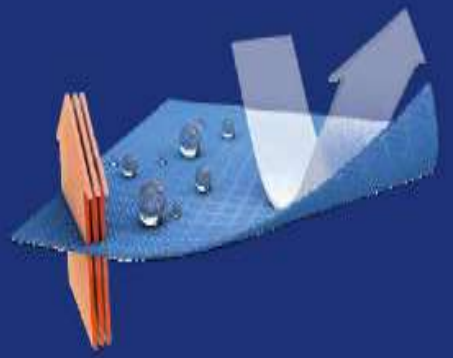
TW140S

STRETCH

TW140S is our Inshore race laminate using Pertex Shield Air at 140g/m². The 'S' is for stretch; 30% stretch designed into the laminate for low aero drag. This is the ultimate lightweight, high performance, extremely breathable fabric for those racing inshore at elite level.

PERTEX® SHIELDAIR

Pertex is an extremely breathable technology, first developed in 1979 it relies on moisture moving through the fibre filaments of the fabric via capillary action. Pertex Shield Air is the latest iteration and uses an air permeable nanofibre that's laminated to a lightweight, woven protective layer. The combination creates a very supple material with remarkable stretch properties.



"NORTH SAILS PERFORMANCE FOUL WEATHER GEAR IS CALLED THAT FOR A REASON. WE'VE REFINED EVERY DETAIL WITH PERFORMANCE IN MIND AND THAT STARTS WITH THE FABRIC."

FABRIC TECHNOLOGY

FIVE STAR SYSTEM

It is never easy to choose one product over another, particularly when there is little agreement on the standards used for comparison. If you want to know a car's fuel economy, there is an agreed measure - miles per gallon - but any test result will depend significantly on the driving conditions. So it is with fabric breathability - only more so...

There are a couple of different units and three different tests used to measure breathability. There is 'moisture vapour perspiration' (MVP) which measures the amount of water that will pass through the fabric. It is measured in grams of water per square meter of fabric in 24 hours ($g/m^2/24hrs$).

A couple of different tests for breathability use this standard. There is the 'upright cup' test where the fabric seals a cup of water and the amount that passes through the cup is measured over a fixed period. The 'inverted cup' test is similar, but the cup is upside down. Obviously, the results are very dependent on the conditions. The time, the amount of water, the temperature and humidity all need to be carefully controlled - and checked as part of any comparison.

The sweating hot plate test is more complex and is intended to mimic moisture transmission driven by body heat. It uses a hot plate to warm water that must evaporate through the fabric being tested. The rate of evaporation will determine how quickly the water can cool, and so the amount of energy being used to keep the hot plate 'hot' becomes a measure of breathability. It is called 'resistance of evaporation of a textile' (RET) and scales from 0 (completely breathable) to a figure of 30 or more which shows little or no breathability.

Complicated, isn't it? And that's just the breathability, never mind measures of waterproofness or durability of the foul weather gear. Since no one can agree on the tests or the test conditions, comparing the data published by manufacturers is difficult and maybe even pointless.

We didn't want to add to the white noise, and since we can't control what's put out there by other manufacturers we thought that the best approach was to give you an effective way to compare our own products.

We use a simple 5-star system to rate our products for the three main qualities of breathability, waterproofness and durability. The rating is for the whole product, and not just the fabric. For instance, for the durability we have looked at the fabric tear strength, abrasion resistance and the reinforcement patches as well as the design.

No surprise that 5-stars means it is as good as it gets, while 1-star is the lowest rating. We have tried to be as honest and accurate as we can in these ratings so you can effectively match the product to the sailing that you are going to do.

The system only compares the North Sails foulies against each other - it says nothing about their performance against anyone else's gear. The only way to do that is to find an independent review - remembering what we said about the different tests - or to try them all out!

SoftShell+

This is not just a fleece with a finished face fabric - which is what passes for a soft shell for most people. This is North's SoftShell+, made from a bespoke, three-layer laminate. It starts with a flat, knitted face with a DWR finish. The next layer is a membrane that makes the garment breathable and waterproof, while the inner face is a patterned microfleece designed to reduce weight, reduce water absorption, increase loft and air entrapment for extra warmth. It is lightweight, soft to the touch and very comfortable to wear.

It's not just a soft shell, it's SoftShell+.

Weight

The one thing that is not captured by our 5-star rating system is the weight of the garment. The weight is related to the other qualities - in particular, it is easy to make a garment more durable and waterproof if you don't mind making it heavy.

We do mind making it heavy. We publish the weight of all our garments with the ratings so you can see how hard we have worked to keep the weight down. These weights should be compared to our competitors. We think you will find significant differences in the weights to comparable products from other manufacturers, and that will translate into performance: neither humans (when you're wearing it) nor boats (when you are not) go faster when they are carrying unnecessary weight.

Polygiene®

Polygiene's technology is the real deal – a fabric treatment that stops the growth of odour-causing bacteria. North Sails Polygiene gear will stay fresh for much longer, and not just when you are wearing it. Polygiene will also stay effective through many more washes than any other anti-bacterial treatment.

The active ingredient is a biocide made of silver chloride, a silver salt that inhibits and guards against the growth of bacteria and fungi. It keeps the material fresh and hygienic – so you can wear it for a couple of days offshore, and not have to worry about the whereabouts of the nearest shower when returning ashore.

Polygiene has a background in the healthcare sector and the treatments have undergone extensive skin sensitivity testing, they don't interfere with the skin's natural bacterial flora. It is applied at the same time as other treatments during the finishing stage of the material and is manufactured in the EU with minimal use of resources and in accordance with strict environmental regulations.

Polygiene Stays Fresh Technology is bluesign® approved, the textile industry's demanding environmental certification with a life-cycle approach. It also has OEKO-TEX Eco Passports approval, it's registered under the EU Biocidal Product Directive (BPD) and approved by the US Environmental Protection Agency (EPA). It also meets the requirements of REACH, the EU's chemicals legislation.

4 LAYER DURABLE LAMINATION

4DL

When North Sails talked to the sailing community about what the planet's best foul weather gear should look like, we quickly got a good idea of the two main problems that we needed to fix.

Leaky knees and butts and latex seals that don't last two minutes...

Identifying these issues was the first and easiest step - everyone has had a wet butt and a torn neck seal. Understanding why they were happening would take us down the path to a solution.

Let's take the knees and butts first; sailing puts these parts of the body into contact with abrasive surfaces a lot more than any other sport. If we want the gear to be durable we need to reinforce these areas effectively, and the traditional method has been to stitch a Cordura patch in place.

"THIS IS WHERE IT REALLY HELPED TO BE THE WORLD'S MOST ADVANCED SAILMAKING FIRM WITH A TRACK RECORD FOR INNOVATION IN LAMINATING TECHNOLOGY."

Our research identified two problems with this method. The first was that Cordura is thick and heavy. It adds weight to the foul weather gear even when it's dry, and as it absorbs water the problem gets worse. The reinforcing patch also creates a pocket between the GORE-TEX Pro and the Cordura that can retain water; so it takes a long while to dry even when it drains efficiently.

The second problem is with the stitched construction; adding the thick Cordura creates a weak point on the seams, because it's difficult to get the waterproofing tape to stick to a lumpy seam. This is often the reason why the seams start leaking.

So we looked at changing both the material and the method of attachment. This is where it really helped to be the world's most advanced sailmaking firm with a track record for innovation in laminating technology.
We found a lighter and much tougher material than Cordura that could be used for the reinforcement. Then we worked out how to laminate it in place as a vital fourth protective layer over the 3-layer GORE-TEX PRO, bringing you 4-Layer Durable Laminated reinforcement (4DL).

The result is much lighter foul weather gear, in the case of the trousers it's a full 30% lighter when dry. When it's wet, there are even greater gains, because 4DL doesn't absorb water, and the lamination makes it impossible for moisture to get trapped.

The seams are much more secure and reliable because the material is laminated straight onto the outer fabric. And finally, the 4DL reinforcement is completely waterproof. So there is no chance of the breathability reversing and sucking water into the gear when sitting on a particularly hot, wet deck.

If you're thinking, 'It's laminated, so when's it going to delaminate?' then we're ahead of you. We've run this gear in a washing machine for 200 hours without any signs of the 4DL coming unstuck. It's a much more brutal test than even Kévin Escoffier could manage on the Transat Jaques Vabre and the delivery trip home - over 10,000 miles of testing.

There's no doubt that 4DL reinforcement is a remarkable solution to an age-old problem. We can't wait for you to see it, and even better, we can't wait for you to sail in it.

DURASEALS

There was a good reason why latex became the material of choice for seals on drysuits and serious foul weather gear. It's exceptionally flexible, so it gets a watertight grip around necks, wrists and ankles.

Unfortunately, there are several reasons why latex wasn't such a great idea – for one, the material degrades in ultraviolet (UV) light. Latex is also fragile; it can tear from even the tiniest nick. This makes the seals vulnerable to damage as well as high maintenance; demanding careful use, washing and regular replacement.

These are worrying qualities if you are going to be out in tough conditions a long way from repair. A blown neck or wrist seal can turn a drysuit into a cold, wet suit very quickly. Never mind the stress of trimming to size the neck seal of your brand-new smock: tip; don't use nail scissors!

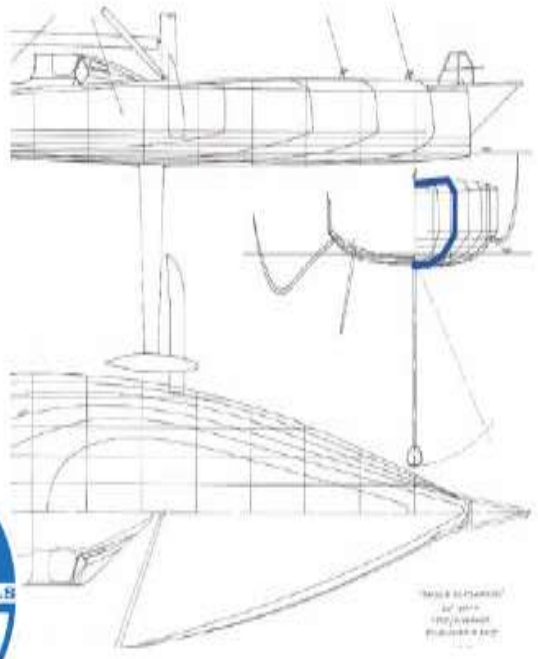
The other problem with latex is that it can produce a skin reaction, and even if you are not allergic, many people are left with the unflattering and uncomfortable 'garrotted' look after a day on the water.

Overall, we had no doubt that there was room for improvement.

Welcome to the DuraSeal; a brand-new innovation from North Sails Apparel, and the answer to the many problems of latex. The DuraSeal is a super thin, 1.2mm neoprene so it's incredibly stretchy. It's even easier than a latex seal to get on and off. The DuraSeal also has a protective external layer of nylon that makes it much tougher, and keeps the sun off it and stops the UV degradation.

The real magic though is in the DuraSeal finish on the inside, a super smooth rubber that just glides into place and seals. And as it has none of the allergic and irritant properties of latex no one has to come off the water looking like they just escaped the hangman's noose in a bad pirate movie. DuraSeal – make sure your foulies have got one.

DESIGN INSPIRATION

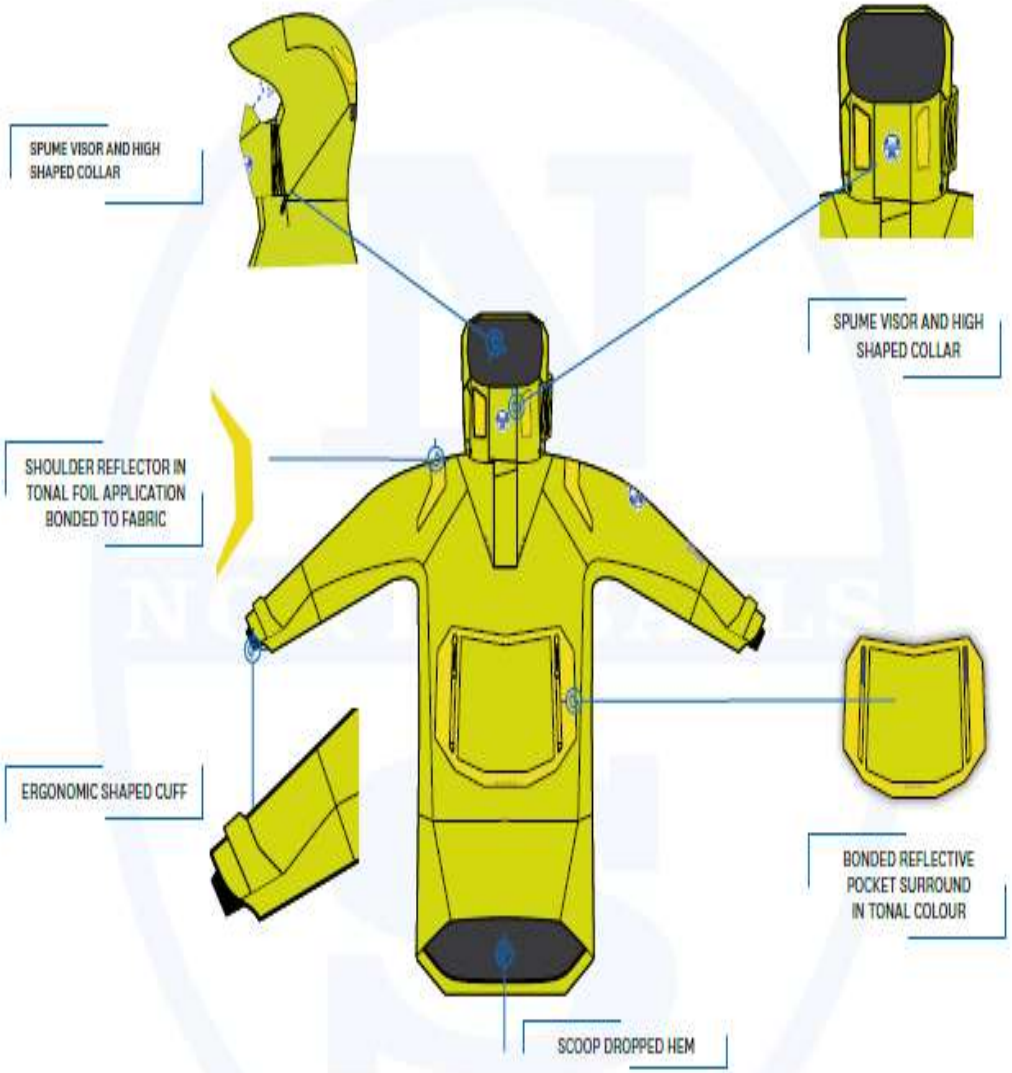


The world has changed; boats are no longer round and curved. Just check out the latest designs from the race circuits where speed is everything, like the Open 60s and the foiling mono-hulls of the America's Cup. There are a lot of hard chines and square corners. Sharp angles maximise righting moment and minimise wetted surface. Sharp angles are fast.

We took these boats as the inspiration for our new designs, specifically (very specifically) the shape of Station 3 of Arkea Paprec (IMOCA 60); built at CDK to a Juan Kouyoumdjian design, and assembled by Sébastien Simon and Vincent Riou.

This shape is reflected everywhere on our gear, the pockets, collar and hem profiles, tabs and reflectors. The design is clean, with no unnecessary seams. We have kept the external stitching to a minimum by using modern bonding technology. The result is less clutter, and less potential for failure and leakage.

It's also a strikingly contemporary and very fresh look that we know you are going to love.



OCEAN

Ocean is the choice of those who want the very best, because they are going to face the very worst the ocean can throw at them. If you're headed to wild, deep blue water - perhaps on a trans-oceanic voyage, or a winter crossing of the Bay of Biscay - then you will need what the sailors in the Ocean Race or Vendee Globe need; the North Sails Ocean range.

This is the most breathable, the most waterproof and the most durable gear that we make. We'd tell you that this is the gear for extreme conditions, but everybody says that... so instead, let's just say that this is the gear that will never let you down, no matter how bad it gets.

NEW

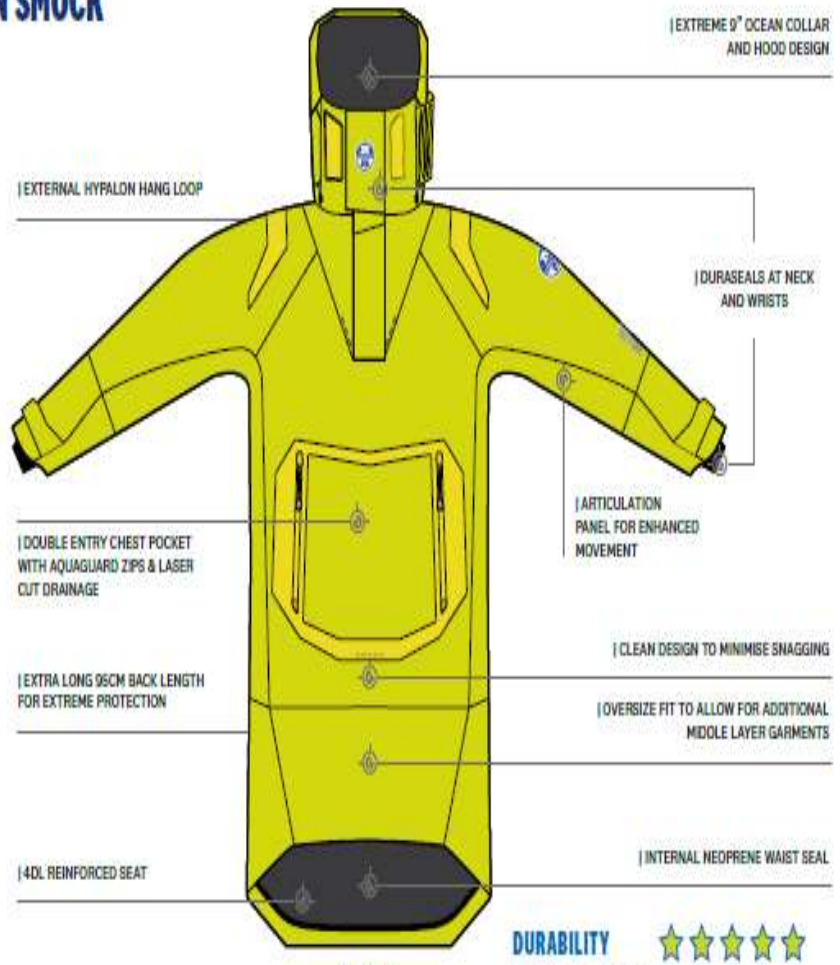
SOUTHERN OCEAN SMOCK

27M020

SIZE: S | M | L | XL | XXL

HOOD REVERSE AND SIDE VIEW

RED



SULPHUR

- | EXTREME 9" OCEAN COLLAR AND HOOD DESIGN
- | EXTERNAL HYPALON HANG LOOP
- | DURASEALS AT NECK AND WRISTS
- | ARTICULATION PANEL FOR ENHANCED MOVEMENT
- | DOUBLE ENTRY CHEST POCKET WITH AQUAGUARD ZIPS & LASER CUT DRAINAGE
- | CLEAN DESIGN TO MINIMISE SNAGGING
- | EXTRA LONG 96CM BACK LENGTH FOR EXTREME PROTECTION
- | OVERSIZE FIT TO ALLOW FOR ADDITIONAL MIDDLE LAYER GARMENTS
- | 4DL REINFORCED SEAT
- | INTERNAL NEOPRENE WAIST SEAL

GORE-TEX® PRO | TW240 | 4DL | DuraSeal

DURABILITY	★★★★★
WATERPROOFING	★★★★★
BREATHABILITY	★★★★★
WEIGHT (Large)	1230g

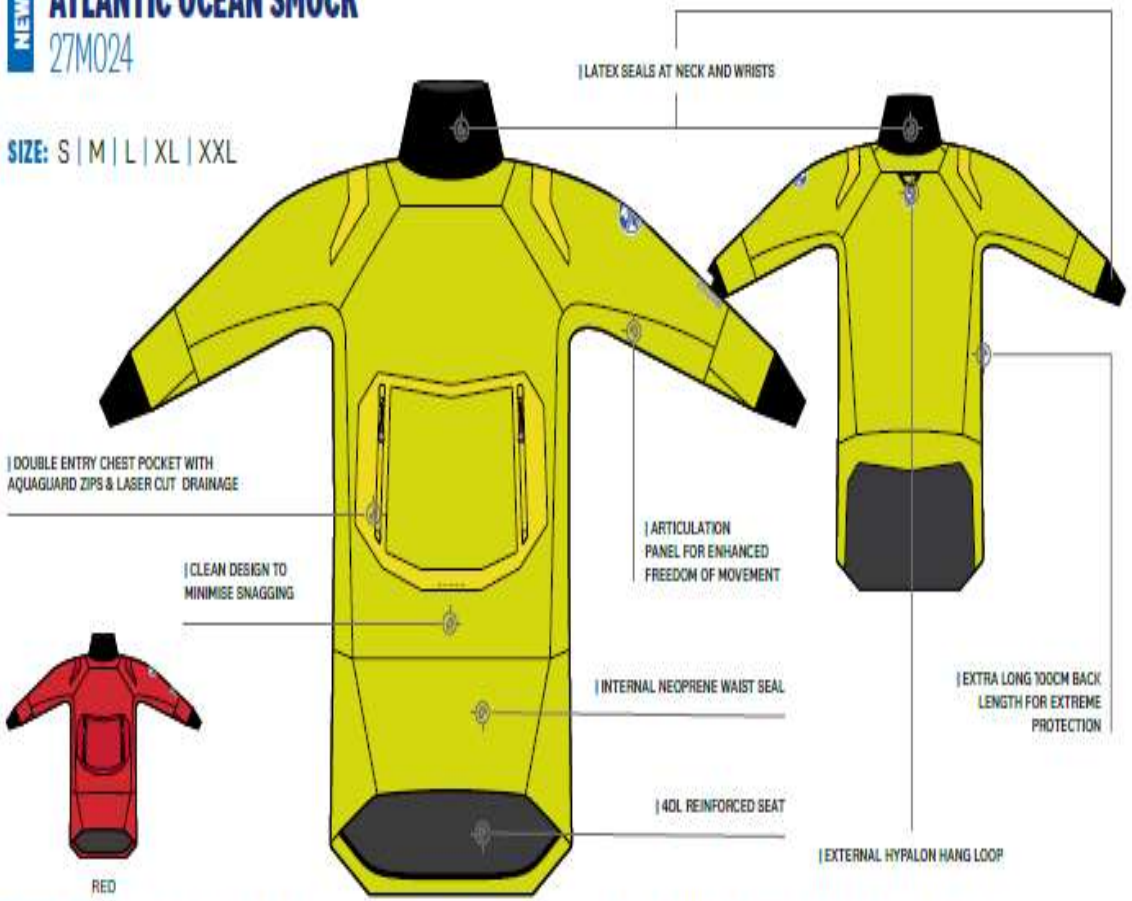
More details on fabric technology on page 14

NEW

ATLANTIC OCEAN SMOCK

27M024

SIZE: S | M | L | XL | XXL



DURABILITY ★★★★★

WATERPROOFING ★★★★★

BREATHABILITY ★★★★★

WEIGHT (Large) 860g

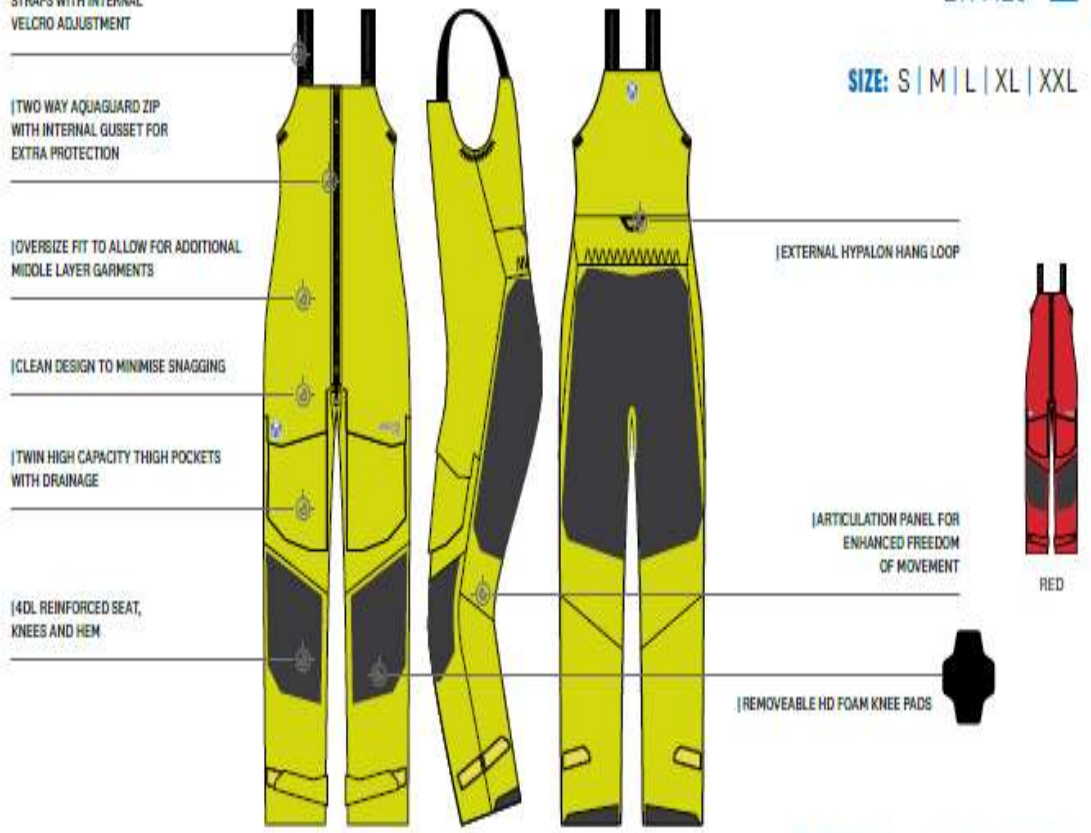
GORE-TEX® PRO | TW240 | 4DL

OCEAN TROUSER

NEW

27M420

SIZE: S | M | L | XL | XXL



DURABILITY ★★★★★

WATERPROOFING ★★★★★

BREATHABILITY ★★★★★

WEIGHT (Large) 1060g

GORE-TEX® PRO | TW240 | 4DL