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## WHAT IS COVEC™?

Bull-it jeans and Covec™ have affected the modern history of the motorcycle jeans sector

Denim and Kevlar (an Aramid) was once thought a perfect mix, the reality it was born out of presumption. Assumptions that Aramids' strength and denim fashion would provide the perfect solution for the causal motorcycle rider were just that, assumptions.

Used in a 'raw' form Aramids are exposed to UV and (chemical) degradation through normal wear and tear, Alkaline and Acids in sweat and washing chemicals affect the life of an Aramid, further, factoring in flex fatigue and yarn-on-yarn abrasion then the Aramids used inside jeans simply don't last.

In 2004 NASA used the fibre inside Covec™ for the airbag in the Mars Rover space mission because of its resilience to change when in use. Nasa observed, 'appears from literature and testing to date to be an ideal upgrade from Kevlar'.

Covec™ was created specifically for motorcycle rider protection. Covec™ is also doing trials for the FIM for all flat track events and is the only material used in rider clothing that offers the following 4 key elements.

- **Low Thermal Conductivity** -This provides minimal heat transfer in a crash and also offers rider temperature comfort keeping either the sun or the cold out. (HMPE's Such as Dyneema are opposite to this and have a very low melting point, lower than Nylon, so will melt when used in bike jeans in a crash road friction scenario.
- **Almost zero moisture regain** – This prevents chemical ingress through normal daily use. (When compared to Aramids Covec™ offers lifelong performance.)
- **High Cut resistance** – Tested by Kuraray to be 3 times greater cut resistance than Aramids equivalent.
- **Higher Impact Abrasion resistance** – Covec™ material is constructed to maximise impact absorption whilst providing class leading CE abrasion resistance testing results. Covec™ when used in Bull-it jeans was the first denim jeans product in the world to achieve CE Level 2 approval on the VoloCE range.

Bull-it jeans uses Covec™ to offer levels of protection, our clients choose how they want to be protected, from 4.5 seconds up to 8 seconds of impact abrasion resistance.

## WHO WE ARE...

We ride we raced, we love bikes. We work with BSB teams, Speedway riders and the Fire Department – responsible for scooping people up from the road, just anyone who needs a solution to casual riding in protective casual clothing. For those out there that advocate leathers over jeans, well so do we – when the time is right. Guys and girls out there will always ride in denim jeans and occasionally hoodies, so let's make it as safe and wickedly cool as we can.



Working with Covec™ for 3 years straight, we've been designing materials fit for the purpose, fit for Bikers. Aramids are great yarns, but not the ones for Bike jeans, they have several weaknesses, hydrolysis for instance (get weaker over time with any moisture like humidity and washing). High Modulus Polyethylene, probably the last thing you want in your pants, unless you like 3rd degree. It has high thermal conductivity and passes road heat (friction heat) straight through to the skin. Well, that's what we are about, bikers making technical clothing that looks the nuts for bike nuts.

Here is the management team;

**Paul Munn** is Chairman of Covec Limited and brings a wealth of textile industry and consumer goods experience to the role. He is a partner in Par Equity, a boutique investment firm, and investor in Covec™, whose principal activity is providing growth capital to innovative technology led companies.

Paul's background is in corporate management and business development. He has experience in several industry sectors, principally consumer goods, manufacturing and healthcare with companies such as Mars Confectionery, BUPA and Price Waterhouse. From a textile industry perspective Paul joined Dawson International PLC in 1996 and became Group FD before being appointed CEO in 2000. During that time he led the business through a fundamental restructuring which focussed on its heritage as a specialist cashmere group. This included the turnaround of the Group's large scale US cotton based business as well as the repositioning of brands such as Pringle, Ballantyne and Duofold.

In addition to his management experience, Paul has acted as both principal and adviser in a number of corporate finance transactions. He has worked in and has extensive experience of business in the US and Asia as well as Europe. More recently, while working for Hermes Fund Managers, Paul was responsible for the successful commercial development of Hermes' corporate governance and active shareholder engagement services, which it offers to large institutional investors. He has a law degree from the University of Glasgow and is a Chartered Accountant.

**Keith Bloxsome**, Chief Executive Officer, started his career as a professional speedway rider after which he was a consultant, sales manager and director in the automotive and apparel

industries for companies such as Ford, Mitsubishi and Landes Du Marche. In 2009 he founded Global On Line Distribution Ltd. Here he developed the Bull-It brand for protective jeans and other apparel for the motorcycle industry. He invented the textile, Covec™ to overcome deficiencies in Kevlar. He transferred the Bull-It brand and Intellectual Property to Covec™ Ltd when it was formed and will now lead its exploitation under this new company as Managing Director and major shareholder.

**Brian Norton**, Commercial Director joined Covec™ Limited as a founding investor and provides commercial expertise and general business management advice. He has been a Partner and Managing Director of a number of Management Consulting firms and has led multi billion pound investment programmes globally. In 1998 he founded his own Management Consulting firm which was acquired in 2006 by a NYSE listed company. From 2006 to 2009 he was Managing Director and head of European Corporate Development for the NYSE company and presided over the acquisition of a number of companies. He currently holds a number of Directorships for companies in the Property, Technology and Services companies as well as serving as a Director for Covec Limited.

**Brian McCarthy**, Technical Director is a Chartered Biologist and Textile Technologist with specialist expertise in textiles, biotechnology, microbiology and natural fibres. He is a highly regarded UK expert in the field of Technical Textiles and is a Director at TechniTex Faraday Limited which is the Premier Research and Knowledge Transfer Organisation for the UK's Technical Textiles and Advanced Materials Sector. He is also the sector leader for the Material Knowledge Transfer Network for Technical Textiles in the UK. Brian joined the Board of Covec™ as a Director in 2011 and provides technical expertise to ensure that our textiles are designed and tested to the most exacting standards.

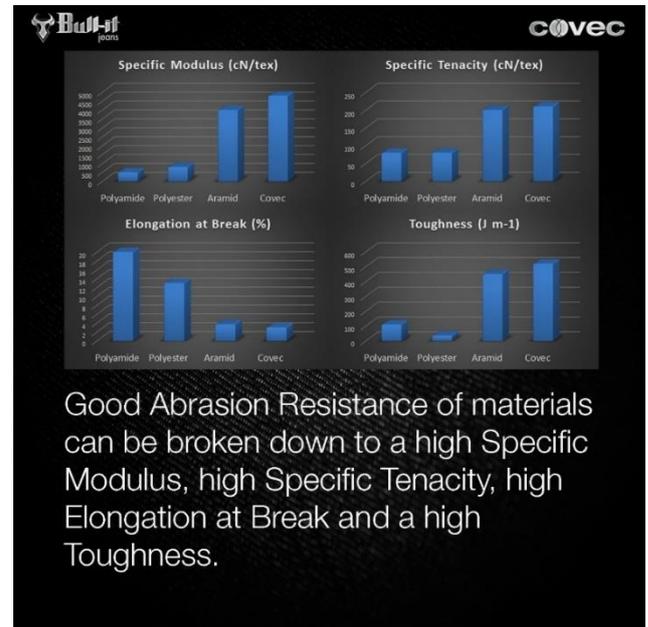
**Jeremy Hakim**, Finance Director. Qualified as a Chartered Accountant and has acted as partner in his various practices including Rhobson Rhodes since. Has significant experience in assisting SME's and has advised Crew Clothing Ltd among others in the clothing industry. Jeremy will act as interim Finance Director.

**Colin Bell** is Development Adviser at Covec™ with responsibility for advising on R&D, Product Development and Production for our range of world-class technical textiles. Prior to working with Covec™ he spent over 15 years with Gore Livingston Fabrics Plant and held senior production and development roles spanning a full range of GORE-TEX garment segments for the Military, Emergency Services, Workwear, Outdoor and Sportswear. His career at Gore culminated as Global Category Leader and Product Specialist for the Snowsport and Motorsport sectors. Following his time with Gore he worked in Barcelona for several years at the MAT Group which specialises in global solutions for passive safety products and technical sports garment markets. Colin has a 1st Class Honours degree in Engineering with Management from Napier University in Edinburgh.

## IN DETAIL:

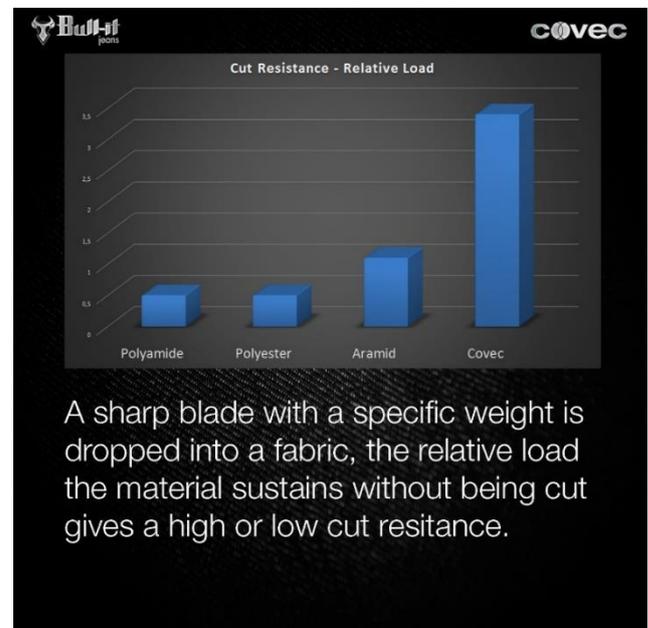
### HIGH ABRASION RESISTANCE

VoloCE is CE EN 13595-1 Level 2 approved for 7.97 seconds, making them the FIRST jeans in the world to perform to Level 2 safety. SR4 is tested to 4.5 seconds and SR6 to 6.3 seconds. The polymer in our yarn was tested by NASA as a replacement for Aramids in 2004; it was used for the MARS space mission providing impact and abrasion protection for the space craft. The increased density offers unrivalled high speed abrasion resistance, tested to outperform the highest reported figures in motorcycle jeans using the most aggressive abrasion test currently available, EN 13595-1 clause 5.4. If you score the different fibres used in motorcycle clothing against toughness, specific tenacity, elongation at break and specific modulus, you get the following results.



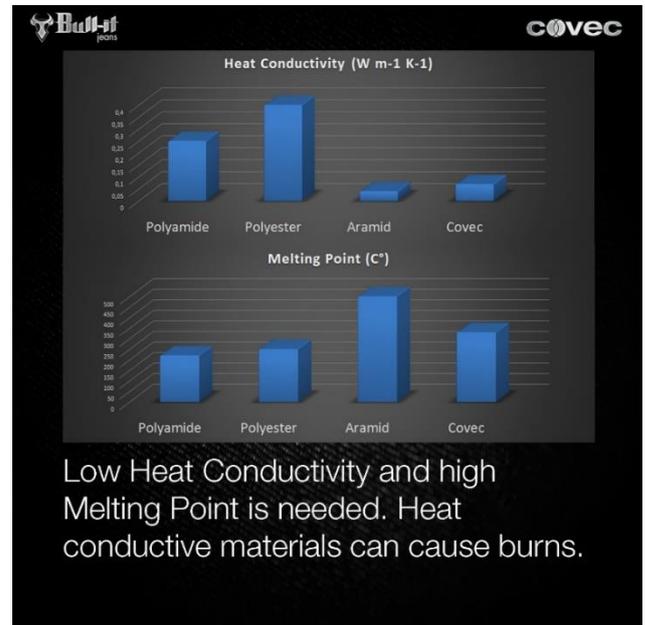
### HIGH CUT RESISTANCE

Another key requirement in conjunction with abrasion resistance, these two elements are very important to prevent abrasion injury. VoloCE passing EN 13595-1 Level 2 cut resistance makes its performance in this area unique compared to other products available. Polyester performs because of its elasticity and you can confuse the test for CE with density, but you can't change the characteristics of Polyester, it has the lowest of all the groups when it comes to cut resistance. A blade is dropped into the fabric with a specific force, resulting in a relative load:



## LOW FRICTION HEAT TRANSFER

Covec™ provides low thermal conductivity and a high melting point, preventing additional consequential burns in a crash scenario. Some jeans use high thermal materials such as HMPE's, Nylon, Polyester and Hi Abrasion Resistant Textiles (Hi-Art) with low melting points or high thermal conductivity, either way it can burn you or melt to your skin. Clearly materials with high heat conductivity and low melting point are unsuitable in situations where heat is produced due to friction against abrasive road surfaces. Any product may incorporate high performance fibres and yarns but its performance will be defined in certain circumstances by the lowest common denominator in any given situation.



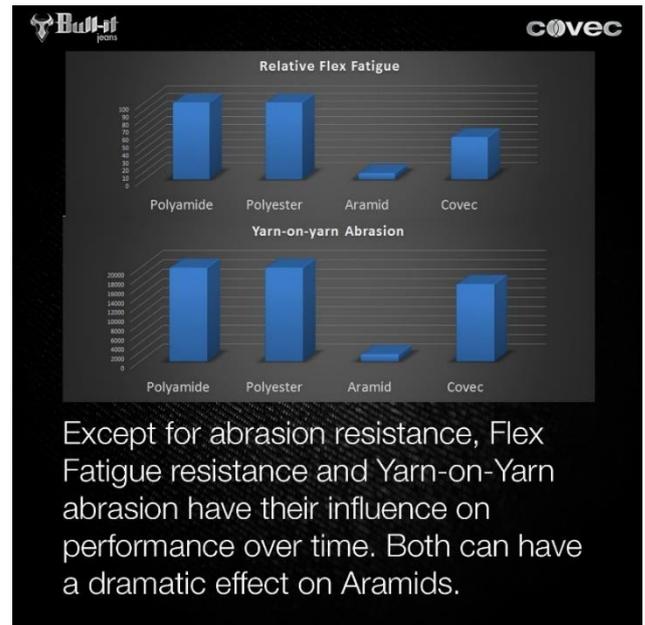
## PROLONGED PERFORMANCE

When a material retains moisture it will become weaker over time, with chemicals often functioning as catalyst. Aramids for instance can retain up to 7% of moisture, while Covec™ can only retain 0.01% of moisture. Sweat is an acid between 3.3 and 5 pH, detergents are alkali between 9 and 11 pH, people use bleach for washing, grease and oils are on bikes, etc. There are many chemicals that can come into contact with riders gear in daily life. Many of these chemicals can have a degenerating effect on polymers and some have a devastating effect. For instance, bleach destroys Aramids rapidly (1 to 2 washes), while Aramids have an overall good resistance to halogens, they are more severely attacked by acids. The graph here below shows the relative scores on chemical resistance per material and chemical type. 1=poor, 2=fair, 3= good:



Flex fatigue is the loss of strength after repeated bending or folding (in a washing machine, for instance) in the graph below you see the relative scores.

Yarn-on-yarn abrasion is the effect of the yarns in a fabric rubbing against each other. The scores in the graph below are the cycles to break on a standard (dry) yarn-to-yarn abrasion test setup, both Polyamide and Polyester outscore the super fibres.

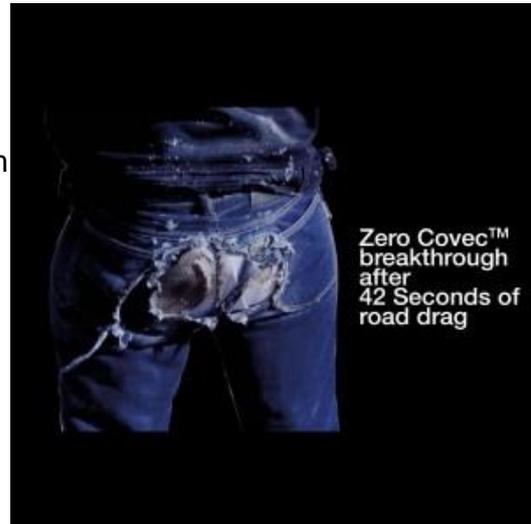


## CE – TESTING

### BULL-IT TESTING PROGRAM & THE MYTH BEHIND THE TESTS

For three years, Bull-it has been working with Covec™ materials, the Satra Technology Centre testing facility, the University of Manchester, Hampshire Fire & Rescue Road safety division and Materials KTN, a UK government body specializing in technical material innovation.

CE 'Approval' or marking is frequently promoted in the motorcycle clothing industry's marketing of its products; however, it often applies only to the impact protectors fitted to garments, with the garments themselves not being CE approved. Its use is therefore intended to be, and is misleading.



Many clothing brands use the CE logo when the garment merely offers armour as included or optional. There is a European Standard for armour – CE EN 1621 – but this only covers protectors in specific zone areas; the elbow joint for example. *The garment may not have been tested at all*, the fact is that clothing is normally made to ensure the lowest production cost can be achieved.

So, to be clear: if your clothing had a CE marking, make sure it **applied to the garment** and not the protectors

The tests for individual garment performance relating to the CE EN standard 13595-1 are:

**Abrasion resistance** – EN 13595-1 Clause 5.4

**Cut resistance** – EN 13595-1 Clause 5.5

**Burst strength** – EN 13595-1 Clause 5.6

**Combined report for full CE approval** – EN 13595-1

To be approved to CE EN 13595-1 and the accessory level of protection (see below), clothing has to pass all the requirements of all four parts of the standard. In isolation, use of test data for the abrasion, cut or burst tests can only be referred to as 'Tested to' that part of the standard and not CE approved. So, we refer to our jeans as:

- **SR4 range** – Tested to and exceeded CE EN 13595-1 Level 1 Clause 5.4 for Abrasion resistance in all relevant zones, with over 4 seconds of abrasion resistance.
- **SR6 range** – Tested to and exceeded CE EN 13595-1 Level 1 Clause 5.4 for Abrasion resistance in all relevant zones, with over 6 seconds of abrasion resistance.
- **VoloCE range** – CE EN 13595-1 Level 2 – This garment is CE APPROVED TO LEVEL 2.

The figure that drives consumer understanding and consequently sales is the abrasion test, CE EN 13595-1, clause 5.4 (test method specified in CE EN 13595-2). This correlates with four areas of the garment, or “zones” which describe the areas at\*

- high risk of impact and abrasion (shoulders, elbows, forearms, hips, buttocks, sides of legs, knees and shins – Zones 1 and 2)
- low risk of impact and abrasion (the front of the chest, under the arms, the insides of the elbows, the front of the abdomen and groin, the inside of the thighs, the back of the knees and the lower legs which are ordinarily covered by boots – Zone 4)
- moderate risk of impact and abrasion (everywhere else; e.g back of torso, side front chest, back and front of thighs, etc – Zone 3)

\*Note: Zone 1 sits within Zone 2 and is the area of coverage provided by impact protectors (shoulders, elbows, hips and knees) tested and approved to European Standard EN 1621-1.

A manufacturer might quote a CE EN 13595-1 level 1 pass with an abrasion resistance of only one second, but this would be misleading as it only applies to Zone 4 and would ensure the garment fails a FULL CE test. A pass for Zone 4 is pretty meaningless for the risks faced across the remaining majority of the garment as Zone 4 areas are those least likely to be in contact with the road when you crash. See Table 1:

Once you have decided your garment should be made fit for purpose then check its time rating against the requirements in the abrasion chart, above. You need to achieve a minimum average of 1.0, 1.8 and 4.0 seconds, in zones 4, 3 and 1+2 respectively, for a Level 1 pass and 1.5, 2.5 and 7.0 seconds, respectively, for Level 2 (see table above). This will ensure your most likely contact areas in a crash have a pre tested level of protection.

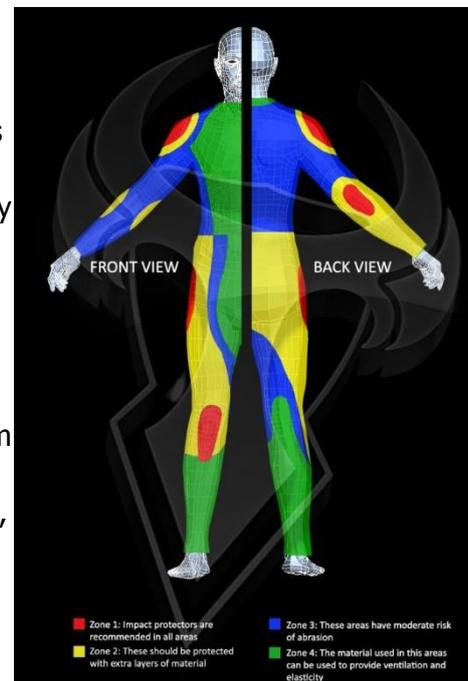


Table 1 Zones	Abrasion Resistance Requirements	
	Level 1	Level 2
1 and 2	4,0	7,0
3	1,8	2,5
4	1,0	1,5

4 and 8 seconds are long times for any one part of the body to remain in contact with the road surface during a crash. Our work with Hampshire Fire and Rescue road safety confirms the view most accidents are a collision with something, kerb, car or other inanimate objects, producing varied and chaotic movements.

Bull-it products use Covec materials and are tested to achieve a specific level of performance in areas we believe are important to the rider, that’s pretty much all the usual impact areas and not just the zones required for certification.

## Protective Liner Coverage



This is already over and above the amount a lot of bike jeans have, that's why the competition have stitch panels all over the thighs, seat and knees, to use as little protective material as they can get away with, some use even less just to say it's in there at all.

Bull-it jeans VoloCE range are the first approved CE EN 13595-1 LEVEL 2 jeans in the world. To achieve CE Approval the garment construction as well as the materials have to achieve performance levels, just 3 of many are mentioned above; abrasion, cut and burst. This will give you peace of mind the whole garment has been tested and all of the garment is lined with a safety protection liner, it makes the garment around 0.5kg heavier but offers protection of the highest level.