RISE TO THE CHALLENGE: JRC-REFLEX AND MASSEBEUF

Two very different fields of expertise, spinning and coating, were needed to create CRY (Coated Reflective Yarn), believed to be the world's first round – not flat – yarn with retro-reflective properties. It is the newest product to be released by JRC-Reflex and was co-developed and patented with high-tech yarn manufacturer Massebeuf.

A new spin on retro-reflection

Long awaited, the first retro-reflective yarn for knitting and weaving is now leaving the lab to move onto mill floors. It is the result of three years of research and development by two companies based in the south of France. Well-known to sportswear manufacturers, retro-reflective material supplier JRC-Reflex is based in Romans, France's former shoe capital (most of that industry has moved away), while manufacturing is done by its subsidiary, IBR, located in the north of Italy, near Bergamo. Spinning mill Massebeuf, a family-owned company like JRC, is based in Aubenas, Ardèche, a region of textiles and yarns makers. A long-time supplier of covered elastane yarns to the hosiery industry, it is headed by Patrick Massebeuf, grandson of the founder, who has been steering the company towards innovative technical yarns for the past ten years.

Chance meeting

Though distant by only 100 kilometres, the two companies first met at the Performance Days textile show, in Annecy, in November 2011, when a representative of Massebeuf stopped by the JRC-Reflex-IBR booth. Bernard Cugerone, JRC-Reflex founder, had been thinking of making a yarn with reflective properties for years. Up till now, the only way to create a retro-reflective thread-like material was to cut fine ribbons out of a glass-bead coated fabric. The result is a 'yarn' that is flat, not round, and not suitable for use in industrial knitting or weaving machines.

Meanwhile, Massebeuf had developed a series of innovative yarns for technical applications in a move to escape the increasingly price-driven and commoditised hosiery yarn market. "Our know-how is in covered yarns. It is a technique used to add mechanical properties to conventional yarns, be it cut-resistance, or elasticity, achieved by covering an elastane yarn with nylon microfibres," says Patrick Massebeuf. With growing competition coming from China and Turkey in covered yarns, he sees technical markets as more promising and less prone to copying.

New function

The thinking behind the coated yarns Massebeuf has been working on for the past ten years follows the same principle as covering, in that it adds a new function to a core yarn. The first product developed using this technique was Thermoform, a yarn coated with a thermofusible material. "It is a niche product used to create textiles that melt at 60°Celsius and solidify at low temperatures," says Mr Massebeuf. A few years later, in 2008, the company introduced a yarn coated with a layer of silicone, Silicotex. It was the result of a collaborative effort between the yarn manufacturer, silicone manufacturer Bluestar Silicones and warp knitter Texinov, and was one of the first products to emerge from the French textile innovation cluster Techterra. Silicotex was developed for the medical and lingerie markets to introduce a grip or non-slip function to textiles and bandages. The smallest count currently available is 130 dtex; Massebeuf is working on making a 50 dtex reference that would be suitable for hosiery. Both Thermoform and Silicotex were awarded TechTextil prizes, in 2007 and 2009.

JRC -Reflex supply reflective materials to some of the world's largest sports brands.
Nike

Bonding exercise

Perhaps CRY would also be a good candidate for a TechTextil award. In the three years of research and development, the Massebeuf and JRC-Reflex teams faced many challenges, not the least of which was to achieve a homogenous layer of tiny reflective glass beads on the entire circumference of the yarn. The two companies spent much time working on the adhesive used to bond the glass beads to the yarn. As the manufacturer of JRC's coated fabrics and trimming, IBR, was instrumental in developing the resin that made the innovative yarn possible. The evenness of the reflective coating also implies that every centimetre be checked during the quality control process, making it much more time-consuming than conventional yarns. The patent-pending yarn, which will be registered by both JRC-Reflex and Massebeuf, will be marketed by a new company, called CRY, of which JRC owns 60% and Massebeuf 40%.

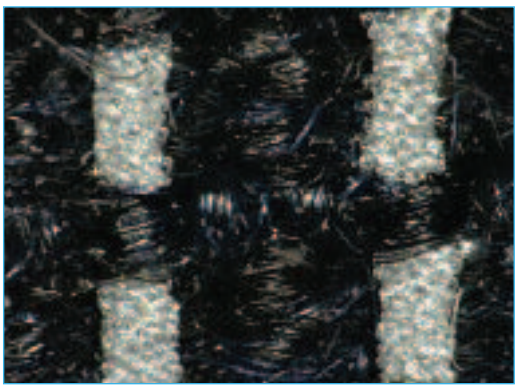
Because of its unusual nature, CRY will not be sold by the kilo, as is customary in spinning, but by length, like fabrics. The first industrial-grade version of the yarn currently measures 280-300 microns in thickness (corresponding to an approximate weight of 1,300 dtex). The two partners hope that the next generation will measure 250 microns, but they believe it will be difficult, if not impossible, to achieve a finer circumference. "At that thickness, it is not an easy yarn to work with," agree both Mr Massebeuf and Céline Cugerone, head of JRC-Reflex and IBR. On the upside, CRY is not fragile as the core is a high-tenacity polyester, and the global resistance of the coated yarn is 26 kilos (or 2,600 cN). As for handle, its beaded surface will not be very comfortable next to the skin, something that clients will need to take into account. That said, reflectivity is a feature that is best placed on the outer surface of a garment.

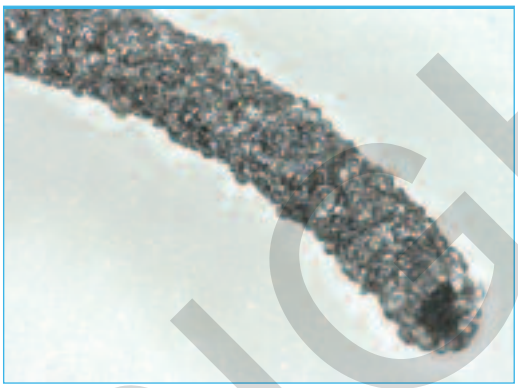
Longed for

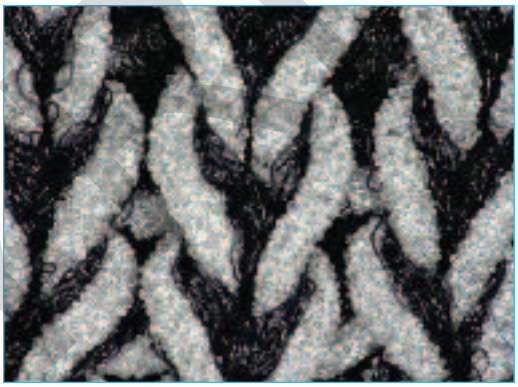
The yarn's complexity and uniqueness inspired the two partners to call it CRY. "We believe it will literally make our clients cry," says Ms Cugerone, "because it is so difficult to manufacture and use, and so expensive. But also because it is such a unique, innovative and wonderful yarn that our clients have been expecting us to develop for such a long time." The unconventional name is not intended to become a brand as much as a mnemonic or something of a gimmick. "All the companies that have seen the yarn have expressed similar 'wow' reactions, and despite its cost and possible manufacturing glitches, they all see the result as being 'wow' too," adds Ms Cugerone.

The first finalised version of the yarn was ready for testing in late 2013. Several sock manufacturers and weavers were given the opportunity to trial the product. In the US, sports sock manufacturer Defeet is one of the very first companies to have a go at knitting products with CRY. The manufacturing expertise of the company founded by Shane Cooper is seen as a positive prospect by Céline Cugerone: "This yarn requires a high level of technical know-how in adjusting the machines and Defeet's input will be useful for users further down the line."

The A-list roster of brands that rely on JRC-Reflex for their reflective materials are said to be eagerly awaiting industrial-grade quantities to be made available. The world's largest sports company is said to have shown interest to knit retro-reflective features in shoe uppers. Due to the size and nature of the yarn, it is not suitable for use as a fabric's only component, but is rather designed to create details and spell out logos that will radiate in the presence of a source of light. Socks manufacturers are obvious big potential end-users, while other developments, once the yarn is fully available and possible finer counts achieved, will certainly see the light soon.







1. CRY has no equivalent on the market, claims Céline Cugerone, head of JRC-Reflex. "Flat yarns with retro-reflective properties exist, and it is possible to cut our fabrics into very fine ribbons, but no round-section yarn of this type has ever been developed that is suitable for weaving and knitting," she says.

2. Not least among the many difficulties in developing CRY was to achieve a homogenous layer of tiny reflective glass beads on the entire surface of the yarn.

3. Close-up of a knit fabric. US performance sock manufacturer Defeet may be the first company to market products made with CRY.

Massebeuf

COPYRIGHT