

Cool solution for PPE lengthens textile life

According to Christeyns, its Cool Chemistry for Workwear solution is set to make hi-vis clothing last longer

A recent study in Europe has shown that the personal protective equipment (PPE) segment is growing fast in the total market for textile rental services, due to increasing public interest in risk prevention.

Fulfilling its role as an innovator, Christeyns had already jumped on the bandwagon in 2016 with the launch of its 'Cool Chemistry for Workwear' concept as a wash reference for high-visibility clothing.

Road construction workers, firefighters, railway workers, and so on, have one thing in common in that their safety at work largely depends on their PPE clothing. Once the clothing is dirty, the workers risk losing their visibility during their activities thereby placing them at risk.

It is therefore essential that high-visibility clothing is cleaned in a professional way to maintain its protective function. Not only should contaminations be removed in a gentle way, the retro-reflective stripes should be preserved for at least 25 cleaning cycles in order to comply with EN ISO 20471:2013.

And this is where Cool Chemistry comes into play. Cool Chemistry for Workwear can

extend the textile lifetime and help retro-reflective stripes keep their reflectivity for more than 25 cleaning cycles.

Cool chemistry – the roots

In 2013, Christeyns successfully introduced Cool Chemistry for hotel and hospital laundry across Europe, enabling low temperature washing with excellent washing quality, bleaching and disinfection results.

Priscilla Maeyens, corporate application manager laundry technology at Christeyns, states: "it was more than logical to introduce Cool Chemistry for Workwear, as our team already did most of the research to meet the high demands for PPE."

Moreover, Cool Chemistry is a wash concept that intervenes in the cost and efficiency of the washing process in order to increase added value and laundry quality while drastically reducing the CO₂ footprint. It not only enables the low temperature washing, a reduction of water and energy consumption, it also enables an improved flow of the linen as operators need to sort less. In this way, linen from the same customer can stay together.



Left: **Figure 2: Before washing**; Right: **Figure 3: After washing with Cool Chemistry for Workwear**

Turning challenges into solutions

What makes cleaning high-visibility clothing so challenging depends on two parameters: the degree of soiling and the fluorescent background material with the retro-reflective paneling.

As high-visibility clothing is prone to persistent stains such as tar and bitumen, the cleaning performance should be highly efficient. However, reflection stripes and fluorescent material are very sensitive to multiple factors such as temperature, alkalinity and pH, which makes standard wash procedures with high temperatures (> 65°C) and large doses not the most effective way to clean the industrial soiling.

By introducing Cool Chemistry for Workwear, Christeyns turned these challenges into solutions. R&D manager industrial laundry, Simon Lambert explains: "What makes Cool Chemistry so effective is the sensational cleaning performance at low temperatures (< 60°C). This is made possible thanks to innovative surfactants. When looking at the cleaned garments the surfactants show a high dirt carrying capacity, especially with polyester fibres. An innovative complexing agent mixture supports the performance of the process over a wide pH range. (Figures 2 and 3, before and after washing)."

Visibility

Other than removing the contaminants in a highly effective way, Cool Chemistry also ensures the preservation of both the fluorescence and retro-reflection of the

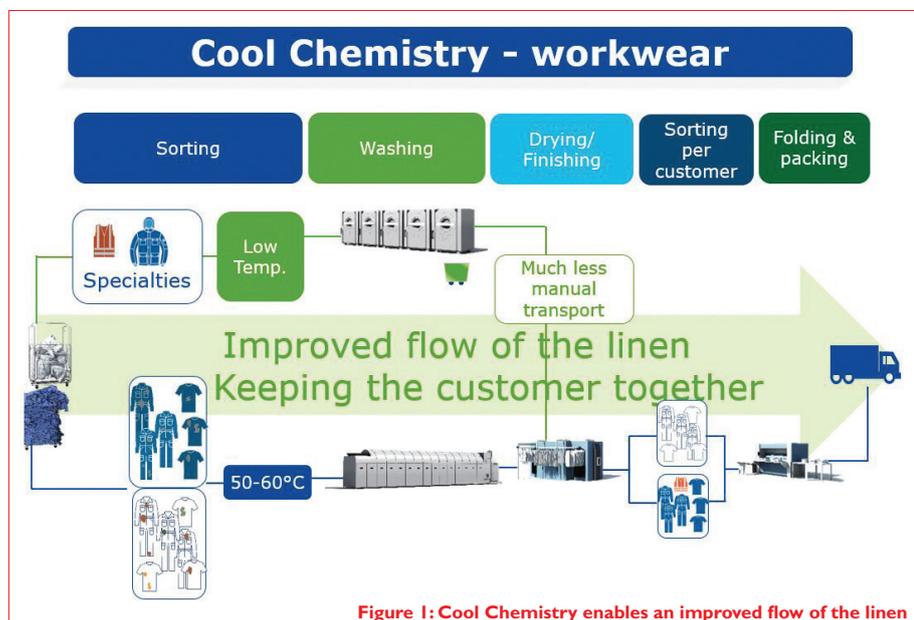


Figure 1: Cool Chemistry enables an improved flow of the linen

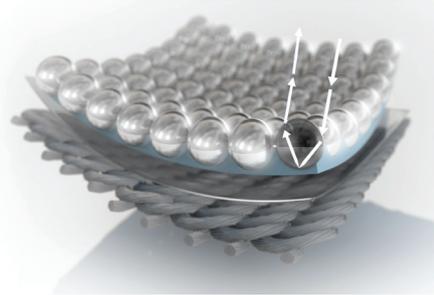


Figure 2: Glass beads 3M

garments. Two main characteristics of PPE that ensure workers to stay safe and visible at daytime and at night.

Typically reflective and fluorescent components of a PPE have a specific performance life cycle, which is determined by several influencing parameters. For the retro-reflective part the loss of the glass beads in the wash and dry cycle is degrading the performance cycle after cycle.

The longer the glass beads are left at their spot in the construction, the longer the material will do the job.

The wash chemistry, the wash and dry temperature and the type of drying have the strongest influence of the bond of the glass beads in the carrier. Reducing the wash temperature has a huge positive impact on the performance life cycle.

Thanks to the neutral washing conditions of Cool Chemistry, not only the brightness of the fluorescent colours is kept preserved, the technology of the glass beaded material is being protected as well.

Reflective stripes comparison

As a reliable specialist and partner in textile care solutions, Christeyns wanted the claims to be based on concrete figures. In collaboration with a third party, Christeyns outsourced the research to the textile research institute Aitex, which carried out the lifespan tests of reflective stripes according to CIE 54.2 EN 2041.

These tests compared the service life of reflective stripes washed with Cool Chemistry for Workwear with a standard wash procedure. Additionally, bands from different manufacturers were inspected. The only criteria for the bands to be included in this study was the minimum requirement of >100 ($\text{cd}/\text{m}^2 \text{ lx}$).

The tests showed that hi-vis stripes washed with Cool Chemistry had a better retro-reflectivity score after 25 washes than hi-vis stripes washed with a standard wash process. The new and unwashed control



From left to right: Test band manufacturer A; Test band manufacturer B; Test band 3M; Test band manufacturer D

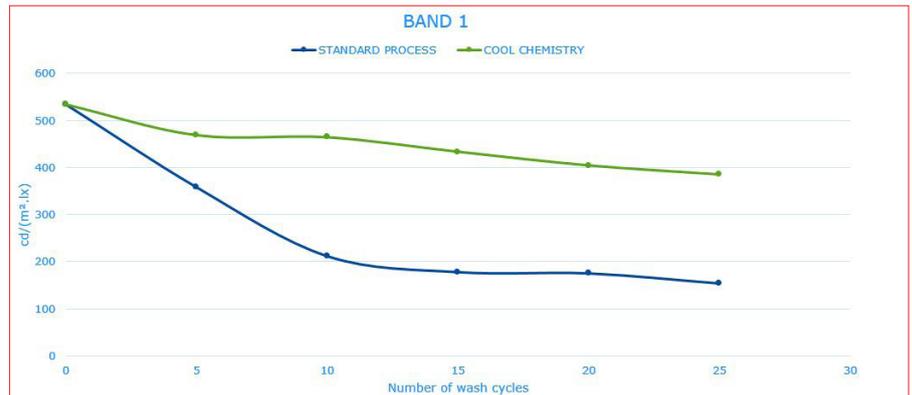


Figure 7: The retro-reflectivity score with Cool Chemistry is higher than with a standard wash process after 25 wash cycles

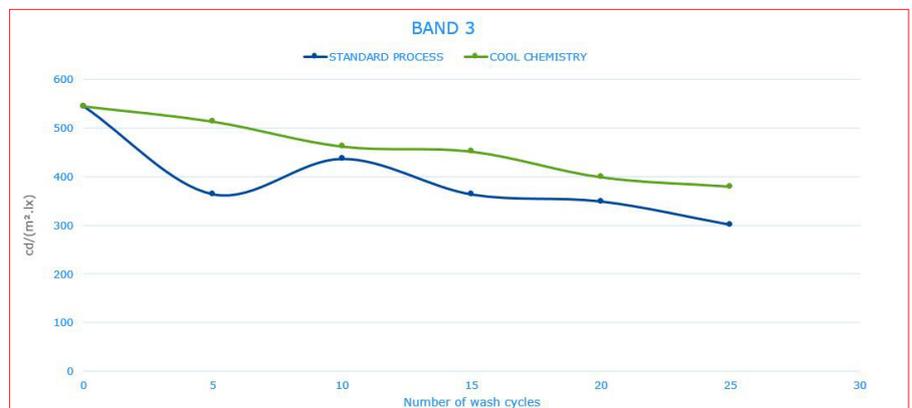


Figure 8: Retro-reflectivity score on 3M bands after 25 wash cycles

sample had a reflectivity score of around 530. The sample washed with the standard procedure had a score of 180 whereas the sample washed with Cool Chemistry had a score of almost 400 after 25 washes. The manufacturer 3M even claims that some of their bands have high scores even after 75 washes. Priscilla Maeyens explains why Cool Chemistry for Workwear prolongs the lifespan of the reflective stripes: retro-reflective bands are sensitive to alkalinity. Cool Chemistry for Workwear on the other hand is a neutral washing process that eliminates the dirt at temperatures even below 50°C , without losing the brightness of the fluorescent colours.

Today, more than 50 satisfied customers across Europe are currently processing their

workwear with Cool Chemistry in order to minimise the deterioration of the garments and to ensure the item continues to meet safety regulations.

Taking washing to a higher level

Priscilla Maeyens concludes: "We believe that with Cool Chemistry we have developed a wash reference for high-visibility clothing, helping our customers to care for the materials and preserve the protective function in order to prolong the service life of these garments. This has the result of keeping workers safe at work while saving costs in buying new clothing and at the same time contributing to a reduction in waste: Low impact on the environment, high impact on safety." ■