



## PFAS-use in School Uniforms

### Do we know what we're buying?

#### What are they?

Per- or poly-fluorinated alkyl substances (PFAS) represent a diverse group of man-made synthetic chemicals. They came into common use in the 1950s and '60s and are now used in a wide range of products from carpets, fire-fighting foams and food packaging, to the fabrics used to make school uniforms. The main characteristics of interest are their high water- and oil- resistance. These properties allow manufacturers to treat or coat clothing to achieve an impressive range of desirable sounding qualities such as 'waterproof and breathable', 'easy-care' and 'stain-resistant'.



#### What's the problem?

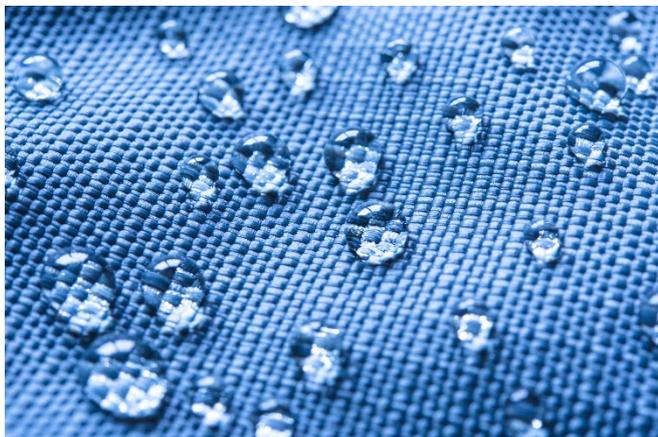
These chemicals do not breakdown easily, once they enter the environment they persist and bioaccumulate. This means that when they enter the food chain they remain inside the organism and over time the concentrations build up to levels higher than in the surrounding environment; the higher up the food-chain an organism is, the more concentrated the chemicals in the food they eat and the greater their risk of harm.

Current regulations prevent these chemicals being used at a concentration that is likely to cause direct harm, i.e. the child wearing the school uniform is very unlikely to be affected by the chemical coating on their school uniform. However, through the manufacturing processes, washing cycles and eventual breakdown of the product these harmful chemicals can be released into the environment where wildlife and humans become at risk of exposure to much higher concentrations.

Although they are not produced naturally, these chemicals are now found all over the world in water, snow, air, soil and dust, even in remote polar regions. They are present in both land animals and sea-life and are thought to be ubiquitous across the global human population. Polar bears in relatively untouched' areas of the arctic have been found with levels in their blood significantly greater than the recommended safe levels for humans.



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Laboratory experiments show that chemicals within the PFAS group can be harmful to animals upon exposure. PFOS and PFOA are the most commonly studied of the PFAS chemicals; the results show cause for concern. These chemicals have been shown to disrupt the hormone system in some animals and are therefore classed as endocrine disruptors. In laboratory animals, they are shown to reduce immunity to disease, damage the liver and pancreas and affect the growth and development of young even at low levels.

The effects on human health are less well known and are in fact very poorly understood. Some studies have suggested that PFAS may affect fetal development and young children, leading to possible growth, learning, or behavioural problems. Other studies have pointed towards possible links to cancer, immune system disorders and fertility problems. However, the findings are inconsistent as it can be difficult to confidently attribute effects to PFAS exposure alone given the wide range of chemicals and influences we are exposed to in everyday life.

### Do we need them?

This is the question that Fidra is asking. There is little doubt that the job they are assigned to do, be that stain-resisting, water-proofing or fire-fighting (to name a few), they do well. The question is whether or not the potential

consequences of their over-use are worth the benefits they bring us.

Whilst there are undoubtedly circumstances where technical performance is vitally important, we question whether school uniforms fall into this category. Are parents genuinely making an informed decision when buying 'easy-care' options or are they making their decision based on having only half the information? How often are the negative effects of the textile treatments presented alongside the benefits? Do parents genuinely have the choice or are they limited by external factors such as cost, availability and school-specific suppliers?

### Who are Fidra and what are we doing to address the overuse of PFAS?

Fidra is a charity based in East Lothian, Scotland. We aim to use scientific evidence and research best practice to establish how best to influence positive environmental change.

To tackle PFAS-use in textiles we are working in collaboration with an international research group based in Sweden to understand why PFAS is being used, if they are adequately performing a useful function, what the harmful side-effects are and whether alternatives exist. We aim to have an open dialogue with retailers and clothing manufacturers offering advice and helping them achieve positive change. Through both local and national surveys our aim is to understand consumer needs and consumer behaviour, so solutions can be found that offer environmentally sustainable alternatives without compromising the needs of the public.

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