



Your uniform, your health Chemicals in clothes

Information for AFA members at Envoy, Piedmont, and PSA

If you have uniform-related symptoms, see a doctor to document the problem and seek relief. Pay attention to symptoms that develop/worsen while wearing the garments and improve when not wearing the garments. Also be aware that some reactions to chemicals in clothes can have a delayed onset, so the relationship to your clothes may be less obvious. The most effective way to protect your health is to wear an alternative uniform, if the uniform you are wearing is correlated with symptoms.

Based on AFA's research into chemicals in clothes associated with symptom outbreaks, garments can contain a surprisingly complex mixture of chemicals. This complexity is a function of the global nature of the supply chain and a general lack of oversight/regulation in clothing production. Your specific uniform garments were assembled in five countries,¹ and both the fabrics and any agents added in preparation for shipping may be sourced to many more countries, all with different production practices and standards.

In a uniform-related outbreak reported by AFA members at another airline in 2011-4, skin reactions were the most common—rash, redness, irritation, itchiness, hives, etc. If you have skin symptoms, your doctor may recommend skin prick or patch testing as a tool to identify the causal factor(s) in the uniforms. A skin prick test checks for an immediate allergic reaction to specific chemicals. A skin patch test takes longer and determines whether a particular chemical is causing an allergic skin reaction which can have a delayed onset. It is important to know, though, that these kinds of tests usually only assess skin reactions to a small subset of the chemicals that may or may not be present in the fabrics. Some doctors may offer the option for patch testing with fabric samples cut from specific garments, offering a means to test for reactions to specific fabrics in your garments under controlled conditions that better allow your doctor to identify the problem fabric(s) even though the actual chemical(s) may not be defined. Aside from skin symptoms, the most common types of uniform reactions reported by AFA members include (but are not limited to) eye irritation/redness, coughing/breathing problems, hair loss, and abnormal thyroid function.

Skin testing aside, another way that specialists may try to identify the cause of uniform-related symptoms is to test the chemical contents of the fabrics. In some cases, testing may identify the presence of a particularly toxic compound for which a health-based standard exists. But for most chemicals in clothes, there are no allowed/recommended limits, and almost no regulations. It is more likely that fabric testing will identify a partly-defined and complex mixture of compounds rather than a single "smoking gun." Ultimately, even if every chemical compound in a given fabric is identified, and each has a reliable and published health-based limit, the health impact of contact with the complex mixture of chemicals is still unknown. Just as blueberries don't taste the same as a smoothie made with yoghurt and 10 types of fruits and vegetables, you can't compare the health impact of contact with a

¹ Bangladesh, China, Indonesia, Sri Lanka and Vietnam

single chemical to that of a mixture of 20, especially if those chemicals impact the same target organ, which in many cases is the skin.

Just for information, this bulletin does provide a list of chemical compounds that have been associated with other clothing-related outbreaks. This list is based on: (1) AFA's experience with chemical testing of TwinHill uniforms at another US airline (2011-2014); (2) our research into chemicals in clothing-related outbreaks in general; and (3) our review of more recent information about testing of the new TwinHill garments.

1. Formaldehyde;
2. Dimethyl fumarate;
3. Diisodecyl fumarate;
4. 2-ethyl hexyl fumarate;
5. Various heavy metals (including nickel, cadmium, arsenic, lead, cobalt, chromium, antimony);
6. Disperse dyes (recognizing that there is a long list...) and azo dyes;
7. Tributyl phosphate;
8. PFOA/PFOS (poly-fluorinated compounds sometimes used as stain retardants, for example);
9. Perchloroethylene (drycleaning compound);
10. Trimethyl silanol;
11. Heptadecafluorodecyl acrylate;
12. Pentachlorophenol;
13. Tetrachlorophenol;
14. Trichlorophenol;
15. NP, NP(EO), OP(EO)
16. Wool (if for no other reason than to rule it out as a cause);
17. Other common allergens (like dust and pollen; see note in #16); and
18. Other compounds known to contaminate fabrics, including as many of [THE CHEMICALS IN THIS LIST](#). (If you are reading a paper copy of this bulletin, the link takes you to the list of limits for chemicals in fabrics that is published in the Oeko-Tex Standard 100.)

Remember that comprehensive fabric testing has not been conducted on your uniform garments. The chemical list, above, is based on available information and may give some insight into the cause(s) of your symptoms, but it is, undoubtedly, incomplete. The most effective way to protect your health is to wear an alternative uniform, if the uniform you are wearing is correlated with symptoms. Also, don't forget to document your reactions with your airline and submit a report to AFA (in confidence) online by visiting <http://www.afacwa.org/uniforms> and click on one of the reporting links.

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