

Delta Flight Attendant Uniform Test Results: The Good, the Bad, and the Ugly

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- **Grey is better than purple.**

AFA recently sent some of the “untreated” grey LandsEnd uniform garments to labs for testing. The good news is that the grey is better than the purple, and better than we had expected. **For most of the chemicals we looked for, the garments meet the Oeko-Tex 100 Standard.** That’s not the “be all and end all” assurance of quality, but it is a decent starting point.

- **There’s no such thing as “untreated.”**

The testing also showed that there’s no such thing as “untreated.” Modern fabrics have a complex chemistry. They often promise not to wrinkle and not to stain, or maybe they look shiny, dry quickly, or don’t smell even when you sweat into them. But “performance features” come at a cost. The chemicals added to fabrics can make up to 40% of the weight of the fabric – and they’re mostly unregulated. **The grey suiting is “less treated” but it’s not untreated.** Your skin may get irritated by any of the irritant compounds we found. And when the protective surface of the skin is compromised by a rash, for example, then the mixture of compounds in the fabrics have easier access to the more sensitive layer of cells below. And the cycle repeats. This is especially problematic for the allergenic chemicals we found because your immune system can react to allergens, and then you can have a strong reaction even to a small amount.

- **The scarf is a problem.**

One of those exceptions is the **ladies’ scarf**. The fabric contains between two and almost seven times the maximum recommended amount of total **chromium**. (We tested two scarves.) Most of the chromium is “chromium III” which is an irritant and can affect your skin, eyes, and throat. Also, trace amounts of the chromium is **hexavalent**. “Hex chrome” is allergenic which means that if your body is sensitized to it, you can react even to low levels. Hex chrome is also a carcinogen. Although it is only there in trace amounts, it should not be in fabric at all. The significant variation in the total chromium content of just two scarves suggests that there is poor oversight of “quality control” processes at the plant that produced that fabric. The contents of a fabric should be fairly consistent between samples.

- **What else was found?**

The white shirts (men’s and ladies’) contain **formaldehyde** – up to 43 ppm. That’s less than the typical fabric limit of 75 ppm, but it’s also an allergen and a carcinogen. And some of the suiting bottoms (pants, skirt, etc.) contain various solvents – **tetrachloroethylene (TCE), styrene, toluene** – all at levels below or barely above the fabric limits. Styrene is an allergen and all three of those compounds are irritants. Inhaling TCE can also cause neurological symptoms. Finally, the women’s white shirt contained three polyfluorinated stain-retardant compounds (**PFAS**), including trace amounts of PFOA. The purple v-neck dress fabric contained six PFAS compounds (not including PFOA). And the tie contained trace levels of two PFAS compounds. Fabric standards restrict PFAS compounds in clothes because some of them mimic the body’s hormones (“endocrine disruptors”) and one (PFOA) is a carcinogen. The concentration of the PFAS in the fabrics is less than the minimum concentration that the standard requires a lab to

measure. So, the spirit of the standard is not met (because the compounds are there) but the letter of the standard is met (because the levels are so low).

- **Some garments should be recalled immediately.**

Based on this and previous testing, we would expect that Delta would - at a minimum – recall the following garments:

- **charcoal apron** (hexavalent chromium and PFOA);
- **charcoal men’s “untreated” non-wool pants** (tetrachloroethylene [PCE] in suiting and lining, slightly above Oeko-Tex limit)
- **ladies’ scarf** (high total chromium content and some hexavalent chromium);
- **plum-colored polyester IFS “exclusive” dress** (total chromium in fabric almost meets limit, hexavalent chromium in the fabric, nickel in the buttons);
- **plum-colored wool blend ladies’ pants** (chromium above limit in the suiting and hexavalent chromium is in the lining); and
- **red outerwear coat** (very high total chromium, hexavalent chromium that exceeds Oeko-Tex standard, PFOA).

In addition, these garments were borderline and should not be worn by people who are sensitive to irritants:

- **charcoal women’s “untreated” non-wool pencil skirt** (PCE in suiting; below limit); and
- **charcoal women’s “untreated” non-wool pants** (PCE in suiting; below limit)

Finally, all of the **tested shirts** contain formaldehyde at levels below the fabric limit but could still elicit a reaction in sensitized individuals.

- **Irritant, allergen - what’s the difference?**

Some chemicals are irritants which means that at low levels, they shouldn’t be a problem for most people, whereas at higher levels, they can cause irritated skin, eyes, nose, or throat. The irritants listed above are also volatile which means that, when they’re heated especially, they can off-gas and be inhaled, causing headache, for example. The “threshold” for tolerating exposure to irritants will vary between people, just like people have different tolerances for certain foods or even loud noise. Some chemicals are also allergens, though, and if your immune system has responded to those chemicals (if you are “sensitized”) then you can have a serious reaction to very small amounts, even if the person sitting next to you may not be affected at all.

- **Even “compliant clothes” can cause legitimate problems.**

Some people ask if a garment meets a fabric standard, then shouldn’t it be okay? It’s important to remember that we only tested for a subset of the chemicals that can be added to clothes. We tested for what we thought we had had the best chance of finding that is consistent with the types of symptoms that affected Delta flight attendants are reporting. But there are literally thousands of chemicals that can be added to clothes, and nobody gave us a list of what was added to these particular fabrics! So, we can only comment on what we looked for but that still leaves a lot of stones unturned.

Another problem with fabric standards is that they don't explain how the numbers were chosen. Is 75 ppm formaldehyde in fabrics sufficiently protective for most people? Or will a sizable number of people react to that concentration, especially when it's mixed with a variety of other irritants and allergens? The answer is that nobody really knows.

And finally, whether a fabric contains five chemicals, each at levels just below the limits, or 500 chemicals, each at levels just below the limits, compliance-wise, those garments are the same. Meeting a fabric standard suggests that the suppliers have some quality control processes in play, but that stamp of approval still has to be taken with a pretty big grain of salt. The effect of wearing clothes with a mixture of chemical compounds – the ones we found and the ones we don't know to look for – is not really known, but multiple irritants will at least be additive.

- **The documented reactions make sense. And some flight attendants are getting fired anyway.**

Delta introduced new uniforms in 2018. Since then, a subset of their flight attendant workforce has documented reactions to the fabrics, ranging from rash, hives, and breathing problems to abnormal periods and hair loss. The purple suiting generated the most reactions and the grey have offered improvement, but some people still react to the fabrics. **The test data described here support their claims.** The results show that “untreated” means “less treated”, the chromium content in some of the garments is very high, and there are lower levels of some irritant and allergenic compounds, some of which can cause significant reactions.

- **You should not have to choose between your health and your job.**

People who are intolerant to the chemicals in these garments need a workable alternative. A solid interim option successfully negotiated at some AFA carriers has been to **allow affected flight attendants to purchase look-alike alternative suiting and white shirts.** Those carriers also provided reimbursement for purchased garments up to a fixed dollar amount. At those airlines, most AFA members were able to report for duty to do the job they love, while protecting their health and projecting a professional and consistent corporate image, recognizable to all. In parallel with that effort, those carriers scheduled a recall date and actively sought a new garment line. We sincerely hope that Delta forges a similar path.