



March 21, 2017

Mr. Mike Hodes
Senior Manager
Occupational Safety & Health/Audits
American Airlines
AMR Corporation
4333 Amon Carter Blvd.
Fort Worth, TX 76155

Sent by email (mike.hodes@aa.com) and copy to follow via UPS

RE: Recall of TwinHill uniforms

Dear Mr. Hodes:

I am writing to you on behalf of the approximately 3,000 Flight Attendants who fly for PSA Airlines, Envoy Air, and Piedmont Airlines, all members of the Association of Flight Attendants-CWA, AFL-CIO (AFA).

In September of 2016, you distributed new uniform garments manufactured by TwinHill to these Flight Attendants, as well as to the Flight Attendants employed by your mainline American Airlines. Since rolling out these new uniforms, significant numbers of the Flight Attendants have documented symptoms that worsen when wearing the uniforms and either improve or resolve after time away from the work environment. Irritant and allergic symptoms (e.g., rash/hives, irritated/burning eyes, sore throat/cough) dominate the reports. A subset of the Flight Attendants who initially reported irritant symptoms later developed non-irritant symptoms as well (e.g., hair loss, headaches, etc.).

Since the uniform rollout, you have seen increases in claims for workers compensation and have had repeated negative attention in both mainstream and social media. The uniforms have been so problematic that TwinHill has had to set up a call center and (appropriately) offered various alternative options for people who cannot tolerate wearing these garments.

Chemical testing on 31 of your Flight Attendant and Pilot TwinHill uniform compounds identified a total of 13 irritants and three sensitizers (Appendix 1, Table A1).¹ Additional chemical testing of 68 of your Flight Attendant and Pilot TwinHill uniforms identified a total of 15 sensitizers (Appendix 1, Table A2).² Together, these reports illustrate the complexity of the chemical mixtures in these fabrics. Further, some of the

¹ Letter from Intertek Scientific & Regulatory Consultancy to American Airlines "Assessment of Skin Irritation/Sensitization Potential of Chemicals Identified in Uniform Fabric Samples- Request 114335 & 114989," Intertek, Mississauga, ON, Canada (15 pages), 5 April 2016.

² Letter from Intertek Scientific & Regulatory Consultancy to American Airlines titled "Assessment of Skin Irritation/Sensitization Potential of Chemicals Identified in Uniform Fabric Samples Analyzed in the Fall of 2016," Intertek, Mississauga, ON, Canada (40 pages), 3 Feb. 2017.



compounds listed in in the Appendix³ are named in a 2013 report regarding the link between allergenic reactions and chemicals in textiles.⁴

Most recently, AFA had 14 of these TwinHill garments (provided by our members at Envoy Air, PSA Airlines, and Piedmont Airlines) tested for a variety of chemicals at a specialty lab. We focused on chemicals that can be measured in fabrics, could cause the reported skin/eye/respiratory symptoms, and for which there is at least one published fabric standard that would provide some insight into the results. The general findings are listed in Table A3. The bold font indicates an amount of the given chemical that exceeded the limits in the Oeko-Tex 100 Standard.⁵

As summarized in Table A4, all of these 11 compounds are irritants, three of them are sensitizers, as many as two are confirmed human carcinogens, four are probable human carcinogens, and eight are endocrine disruptors. In all, about 28,000 flight attendants are wearing these garments which have been (and, presumably, are being) assembled in batches at factories located in at least five countries (Bangladesh, China, Indonesia, Sri Lanka, and Vietnam) with fabrics sourced to unknown locations and where production line practices may vary over time, between factories, and between batches of the same garments.

Chemical limits for fabric are a “best guess” intended to protect the majority of non-sensitized individuals against irritant effects associated with contact to intact skin for a single chemical. They may not be sufficiently protective for contact with either one or more chemicals to broken or irritated skin, and they are unlikely to be sufficiently protective for individuals who are sensitized to a particular compound. The degree to which they offer protection will also be influenced by the duration and frequency of the exposure, chemical interactions between elements of the mixture of chemicals in the fabric, temperature of the work environment, and how sensitive a person is to the ill effects. Continued exposure to chemical allergens is known to result in worsening of symptoms and a poorer prognosis.

AFA requests the following:

1. The wrap skirt and polyester alternative skirt failed the Oeko-Tex 100 standard. This justifies a decision to recall those two garments system-wide promptly and to provide suitable reimbursement for Flight Attendants who are wearing those garments to purchase like-uniform items until a longer term solution is in place.
2. The serving apron, women’s all-weather coat, and dress each contain measurable amounts of nickel and/or chromium. The amounts do not exceed the fabric limits in the Oeko-Tex 100 standard, but nickel and chromium are sensitizers, and limits do not offer sufficient protection for sensitized individuals.
3. The vest contains chlordane which is an irritant chlorinated insecticide that is classified as a probable human carcinogen and recalled by US industry in 1988. On this basis, the vest should also be recalled.

³ Examples include antimony, benzyl benzoate, disperse orange 30, formaldehyde, and chromium.

⁴ RPS (2013) “FINAL REPORT: Study on the link between allergic reactions and chemicals in textile products,” Report no. VRM11.8088, Prepared by RPS for European Commission, DG Enterprise and Industry, Delft, Netherlands, Jan. 7, 2013.

⁵ OEKO-TEX (2012) “Oeko-Tex 100 Standard, Version 04/2012,” International Association for Research and Testing in the Field of Textile Ecology, Zurich, Switzerland.

4. The garments listed above also contain measurable amount of known and probable carcinogens (Table A3). This is another strong argument to recall these garments. Flight Attendants who are not experiencing irritant/sensitization effects may still be incurring health impacts that are currently invisible.
5. When we invited AFA members who documented uniform reactions to identify which garments they associated with symptoms, the top five answers were the pants (67% of respondents), one of the shirts (63%), buttoned cardigan (56%), blazers (52%), and dress (46%). These symptom reports justify removing these garments from circulation.

AFA recognizes that you have made alternative options available to Flight Attendants who document symptoms associated with wearing these garments. And, as of today, you are offering one more option that is more comprehensive. However, the chemical mixtures in these garments argue strongly for a complete recall. Please choose to protect your Flight Attendants' health by assuming a forward-thinking strategy on uniforms. AFA has extensively researched uniform features and vendors that are recognized to protect health and cabin security, while conveying a professional and polished corporate image to the world. We would welcome the opportunity to meet with you to discuss this further.

Sincerely,



Christopher J. Witkowski

Director

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APPENDIX 1

CHEMICALS MEASURED IN TWINHILL UNIFORM GARMENTS

Table A1. Sensitizer and irritant compounds identified in one or more of 31 TwinHill uniform garments in April 2016

Compound	Irritant?	Sensitizer?
9,10-Anthracenedione CAS 120-51-4	Yes	Yes
1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl ester, CAS 117-81-7	Yes	No
Benzyl benzoate CAS 120-51-4	Yes	Yes
1, 1 '-Biphenyl, CAS 92-52-4	Yes	No
2-Bromo-4,6-dinitro-benzeneamine, CAS 1817-73-8	Yes	No
Butylated hydroxytoluene, CAS 128-37-0	Yes	No
Caprolactam, CAS 105-60-2	Yes	No
Diethyl phthalate, CAS 84-66-2	Yes	No
9, 10-Dimethylantracene, CAS 781-43-1	No	Yes
Docosane, CAS 629-97-0	Yes	No
1-methylethyl ester hexadecanoic acid, CAS 142-91-6	Yes	No
Methyl palmitate (methyl ester hexadecanoic acid), CAS 112-39-0	Yes	No
Octadecane, CAS 593-45-3	Yes	No
Oleic acid, CAS 112-80-1	Yes	No

Table A2: Sensitizer compounds identified in one or more of 68 TwinHill uniform garments in Sept. 2016

Compound	Sensitizer?
Antimony	Yes
Arsenic salts	Yes
Benzophenone (CAS number 119-61-9)	Yes
Benzyl benzoate (CAS number 120-51-4)	Yes
4-Biphenyl ester benzoic acid (CAS number 2170-13-0)	Yes
Chromium (soluble)	Yes
C.I. Disperse Red 60 (CAS number 17418-58-5) – also potentially irritating;	Yes
C.I. Disperse Orange 30 (CAS number 12223-23-3/5261-314)	Yes
Cobalt and cobalt compounds	Yes
9,10-Dimethylantracene (CAS number 781-43-1)	Yes
4,4'-Diphenylmethane diisocyanate (CAS number 101-68-8) - also potentially irritating	Yes
Ethylbenzaldehyde (CAS number 4748-78-1)	Yes
Formaldehyde (CAS number 50-00-0) – also potentially irritating	Yes
Mercaptobenzothiazole (CAS number 149-30-4)	Yes
2-(Methylthio)-benzothiazole (CAS number 615-22-5) – also potentially irritating	Yes

Table A3: Summary of chemical testing of 14 TwinHill uniform garments in March 2017

Garment	Chemicals found
All-weather coat	<u>Outer fabric:</u> nickel; <u>Padding material:</u> NP(EO), OP(EO)
Apron	formaldehyde, nickel
Suiting, dress	<u>Woven fabric:</u> chromium, nickel
Suiting, pants	<u>Lining:</u> NP
Suiting, skirt (polyester-alt.)	<u>Pocket lining:</u> dichlorophenol, nickel, pentachlorophenol tetrachlorophenol , trichlorophenol,
Suiting, skirt (wrap)	<u>Pocket lining:</u> nickel, tetrachlorophenol , dichlorophenol, trichlorophenol, pentachlorophenol; <u>Woven fabric:</u> NP; <u>Lining:</u> NP
Suiting, vest	<u>Woven fabric:</u> chlordane, NP, NP(EO)

NP = nonylphenol (NP); listed if ≥ 5 mg/kg (below Oeko-Tex 100 standard limit)

NP(EO) = nonylphenoethoxylates; listed if ≥ 15 mg/kg (below Oeko-Tex 100 standard limit)

OP(EO) = octylphenoethoxylates; listed if ≥ 15 mg/kg (below Oeko-Tex 100 standard limit)

**Table A4: Chemicals measured in 1+ fabrics in March 2017 testing
with description of key health impacts**

Chemical	Sensitizer?	Irritant?	Known/suspected Endocrine disruptor?	Carcinogen?
Chlordane	No	Yes	Yes	Probable human carcinogen
Chromium	Yes	Yes	Insufficient data	Depends; hexavalent chromium is a human carcinogen; trivalent chromium is not
Dichlorophenol	No	Yes	Yes	No
Formaldehyde	Yes	Yes	Yes	Known human carcinogen
Nickel	Yes	Yes	Yes	Probable human carcinogen
NP	No	Yes	Yes	No data
NP(EO)	Yes	Yes	No data	No data
OP(EO)	No	Yes	No data	No data
Pentachlorophenol	No	Yes	Yes	Probable human carcinogen
Tetrachlorophenol	No	Yes	Yes	Possible animal carcinogen
Trichlorophenol	No	Yes	Yes	Probable human carcinogen