

The following samples were collected from the JFK Library, rooms/areas:

- L03
- L05
- L23
- M14
- M18 (two samples)
- U04
- U08
- U12A
- U18 (three samples, one labeled U19c)

## LABORATORY REPORT

**TO:** Chad Johnson  
EWU, EH+S  
002 Martin Hall  
Cheney, WA 99004

**PHONE:** (509) 359-6455 **FAX:** (509) 359-4690 **E-MAIL:** djohnson@ewu.edu  
**SUBJECT:** Particle Identification  
**SPECIMEN:** Twelve Tapelifts  
**REFERENCE:** JFK

### INTRODUCTION

Twelve tapelifts were received for analysis. They represented surfaces in Suites L, U, and M. The tapelifts are listed in the table below.

TAPELIFTS
JFK030118T01: L03, 03/01/2018, 12:55
JFK030118T02: L23, 03/01/2018, 13:01
JFK030118T03: M14, 03/01/2018, 13:23
JFK030118T04: M18a, 03/01/2018, 13:14
JFK030118T05: U04, 03/01/2018, 13:57
JFK030118T06: U08, 03/01/2018, 14:30
JFK030118T07: U12A, 03/01/2018, 15:17
JFK030118T08: U18a, 03/01/2018, 15:58
JFK030218T09: U18b, 03/02/2018, 14:11
JFK030218T10: U19c, 03/02/2018, 14:12
JFK030218T11: M18b, 03/02/2018, 14:23
JFK030218T12: L05, 03/02/2018, 14:30

The tapelifts were placed on clean microscope slides and immersed in acetone for about two hours and then removed. The slides with the tapelifts were rinsed with clean acetone as they were removed from the immersion tank. The tapelifts were allowed to dry for twenty minutes in a laminar flow Clean Work Station and then mounted using a synthetic resin (Shurmount). The completed mounts were analyzed using analytical light microscopy. The materials identified are listed in decreasing order of frequency, the most common materials first. The significance of a material's location in the list is not necessarily related to its health impact because some materials have a greater health impact at low levels than other materials do at high levels.

## RESULTS

Many of these tapelifts were significantly overloaded with particles: M14, M18a, U04, U08, U12A, and U18a. This indicates a thick layer of particles and large “coincidence” error. Coincidence error is the result of the tape adhesive being occupied by surface particles that prevents the collection of particles deeper in the particle layer. An adhesive covering of 20% is estimated to result in a 10% coincidence error. The tapelifts listed above had a covering exceeding 90%. This would suggest that less than half of the particles on these surfaces were collected by the tape. These tapelifts contained clothing fiber, paper fiber, natural minerals, skin flakes, glass fiber, biomass combustion particles, starch, pollen, feather barbules, whitewash, toner, dry-erase ink, plant parts, insect debris, fungal spores, shoe wear, tire wear, cosmetics, magnetite spheres, and wear metals. There were over 5,000 glass fibers per square inch on tapelifts M14 and M18a. There were 744, 704, 816, and 2,496 glass fibers per square inch on tapelifts U04, U08, U12A, and U18a. These levels are all well above that level associated with health complaints. The toner was most elevated on tapelift U12A. Tapelift U04 had the most dry-erase ink. An elevated level of toner has been associated with elevated ozone levels and health complaints as a result of that exposure. Elevated dry-erase residue has been associated with elevated solvent exposure and related health complaints.

The tapelifts from L03 and L23 had a particle loading over 50%. That would indicate the possibility of a large coincidence error but not as high as the tapelifts mentioned above. They contained paper fiber, clothing fiber, natural minerals, glass fiber, plaster, biomass combustion particles, starch, pollen, feather barbules, dog dander, dry-erase ink, insect debris, plant parts, paint spheres, tire wear, shoe wear, high hydrocarbon content soot, cosmetics, and wear metal. There were 768 and greater than 5,000 glass fibers per square inch on tapelift L03 and L23 respectively.

Tapelifts U18b, U18c, M18b, and L05 all had moderate loading, about 15% coverage. The coincidence error at this loading is less than 4%. That equates to a collection efficiency of over 96%.

Tapelift U18b contained natural minerals, clothing fiber, skin flakes, paper fiber, plaster, shoe wear, paint spheres, starch, dog dander, glass fiber, tire wear, biomass combustion particles, pollen, fungal spores, open-cell plastic foam, magnetite spheres, and diatoms. There were 122 glass fibers per square inch on this tapelift.

Tapelifts U18c and M18b were similar. They contained skin flakes, clothing fiber, paper fiber, natural minerals, starch, pollen, fungal spores, feather barbules, plant parts, shoe wear, tire wear, insect parts, cat dander, ink, biomass combustion particles, cosmetics, and mite frass. The mite frass was found on tapelift M18b. There were 16 and 5 glass fibers per square inch tapelifts U18c and M18b respectively.

The tapelift L05 contained clothing fiber, paper fiber, skin flakes, natural minerals, pollen, starch, fungal spores, feather barbules, plant parts, shoe wear, tire wear, insect parts, charred grass, glass fiber, ink, high hydrocarbon content soot, and cosmetics. There were no glass fibers on this tapelift.

## CONCLUSION

The tapelifts from L03, L23, M14, M18a, U04, U08, U12A, U18a, U18b, and U18c contained glass fiber above the level associated with health complaints. They ranged from well over 5,000 glass fibers per square inch (L23, M14, M18a) to a low of 16 glass fibers per square inch (U18c). Two of the tapelifts contained glass fiber below the level associated with health complaints (M18b and L05).

Thank you for this opportunity to be of service. If I can provide any further assistance please contact me.

Signed: *Russ Crutcher*  
E. R. Crutcher, Consultant