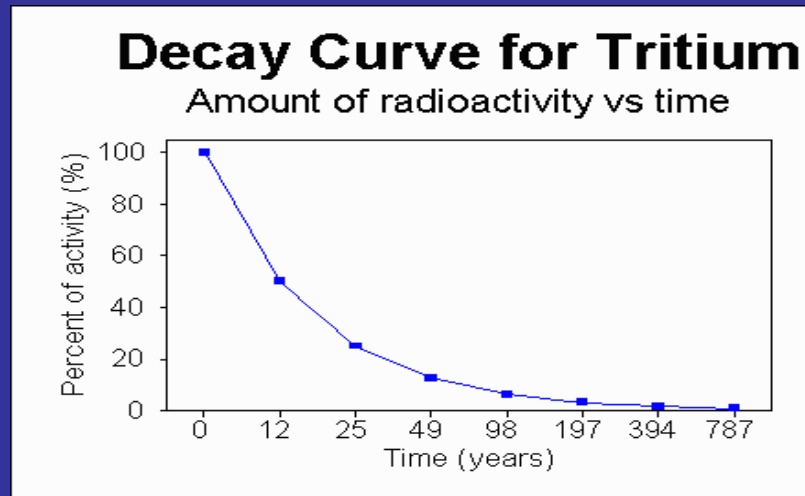


Decontamination of a Fume Hood Contaminated with Tritiated Thymidine



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Colorado
State
University

Contaminated Fume Hood



Background

- Contaminated in 2003 with Tritiated-Thymidine
 - Inadvertently volatilized
- From 2003 to 2007, have been attempting decon
 - Still contaminated after almost monthly attempts
 - Tried both soap/water and Radiacwash
- RSO will not release until counts are at background

Proposed Solution

- Polymer-hydrogel strippable-coating from Cellular Bioengineering Inc. (CBI)



Process

- Spot tests demonstrated to RSO that gel was capable of removing tritiated-thymidine contamination
- Gained approval to continue decon efforts
- Removed expendable materials and put in radioactive waste
- Painted hood with 2 formulations of gel for comparison
 - ½ Decon 1001
 - ½ Decon 1001EXP
- Gel applied and allowed to set for 3 days

Materials

- Tried two formulations in development
 - Decon Gel 1001
 - Polymer B + Thixotrope A
 - Decon 1001EXP
 - Polymer B + Thixotrope B
- Multiple surfaces of hood
 - Glass
 - Painted metal
 - Cement board countertop
 - Copper pipe

Decon 1001EXP vs. Decon 1001



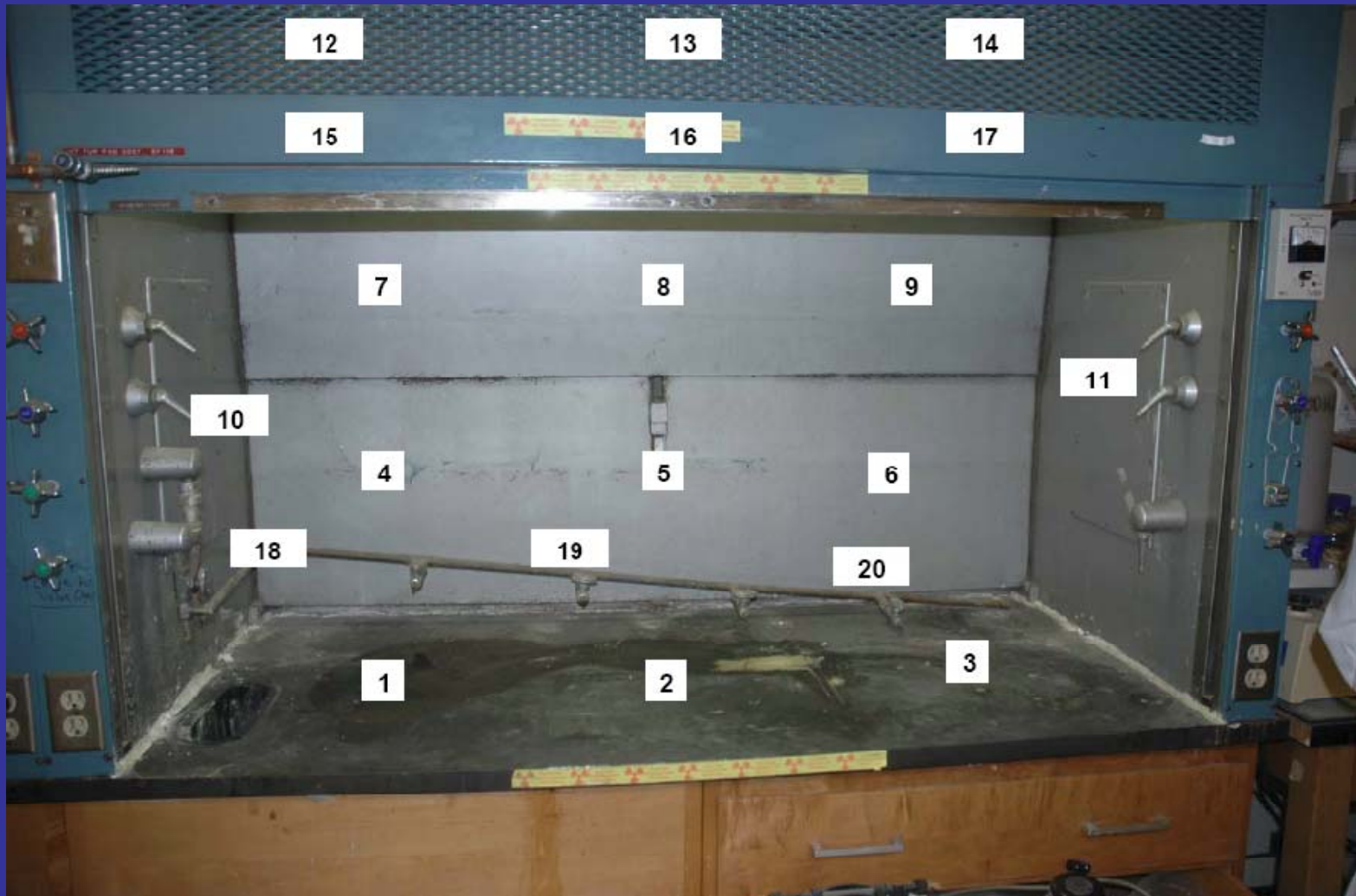
Application & Removal

Decon 1001

vs. Decon 1001EXP

- Easier to paint
 - Horizontal surfaces:
Thick or thin, even application
 - Vertical & inverted surfaces:
Thinner application
Dripped more
- Removed in large pliable sheet
 - Thicker films
 - Easier to peel
 - Longer dry time
 - Thinner films
 - Peeled satisfactorily
- More difficult to paint even thickness
 - Horizontal surfaces
Thick, uneven application
 - Vertical & inverted surfaces :
Thick, uneven application
Dripped less
- Removed in smaller brittle pieces
 - Thicker films
 - Easier to peel
 - Longer dry time
 - Thinner films
 - Difficult to peel - tended to tear

Scintillation Wipe Map



12-14 = Inside ceiling; 15-17 = Inside hood window center; 18-20 = water pipe; 21 = floor

Area #	<u>Before decon</u>	<u>3 days after</u>	<u>One month later</u>	<u>% removed</u>	<u>11 Weeks later</u>	<u>% removed</u>
1	30	0	0	100	0	100
2	261	0	0	100	0	100
3	89	0	0	100	0	100
4	21	0	0	100	0	100
5	1180	0	0	100	0	100
6	1920	11	47	98	0	100
7	202	0	0	100	0	100
8	754	0	0	100	0	100
9	1184	0	0	100	0	100
10	33	0	0	100	0	100
11	209	0	0	100	0	100
12	154	0	0	100	0	100
13	341	0	0	100	0	100
14	758	21	19	98	0	100
15	0	0	0	100	0	100
16	0	0	0	100	0	100
17	0	0	0	100	0	100
18	10	0	0	100	0	100
19	509	0	0	100	0	100
20	163	0	0	100	0	100
21	0	0	0	100	0	100

Paper wipes counted for 5 min using dark-adapted Beckmann Liquid Scintillation Counter

Reported in cpm / 100cm² above background

Conclusions

- Decon Gel 1001 was preferred for application and removal ease
- Decon of tritiated-thymidine accomplished
- Leaching controlled after one month
- Hood checked again 11 weeks later
 - Additional coat was applied to area still contaminated
 - Leaching still controlled



Questions?

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