



# **Study to Assess Glass-Encased and Silicone-Covered CFLs as a Recommended Option for Use in Carpeted Areas of Residential Homes**

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# Introduction

- ▶ **Maine DEP Study:** Clean up on carpet is more challenging than on hard surfaces.
- ▶ **EPA:** Would a more durable design be an option for carpeted areas?
- ▶ **Research Question:** Do CFLs that have a covering (glass or silicone casing) help to prevent breakage of the inner glass tubing when dropped on carpet?

# Methodology

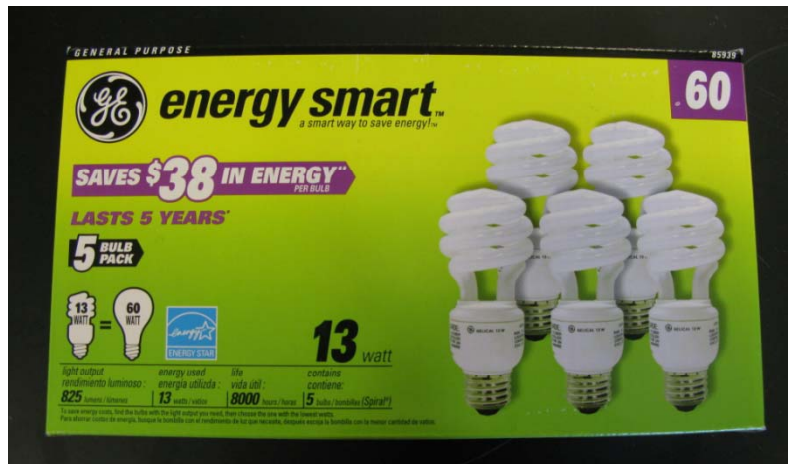
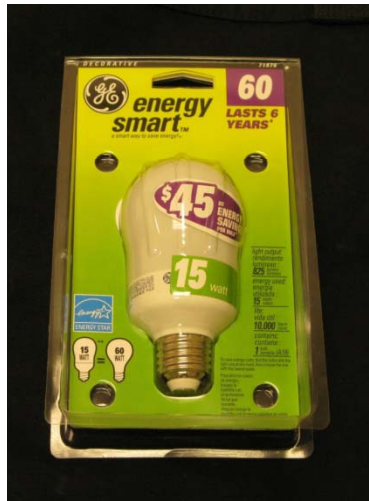
- ▶ Fort Lewis College Chemistry Lab (complete air exchange every 30 seconds)
- ▶ Carpet (berber cut pile) placed in cardboard box
- ▶ Dropped from height of 7 feet



# Methodology cont.

Manufacturer	GE	n: vision #1	n: vision #2	Philips	MaxLite	TCP #1	TCP #2	GE Spiral
<b>Model # / Product Code</b>	FLE15/2/A19 XL/CD PC: 71876	EDG25h-14	11314	Soft white Plus EL/SWP	SKB13EAP	28918SS	28913SS	85939
<b>Wattage</b>	15	14	14	14	13	18	13	13
<b>Lumens</b>	825	800	800	800	800	1200	900	825
<b>Rated Hour Life</b>	10,000	8,000	8,000	8,000	15,000	10,000	12,000	8,000
<b>Covering Type</b>	Glass	Glass	Glass	Glass	Glass	Silicone	Silicone	None
<b>Energy Star Qualified?</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Number of bulbs acquired</b>	25	25	25	20	25	25	25	30

# Methodology cont.



# Results

	GE	n: vision #1	n: vision #2	Philips	MaxLite	TCP #1	TCP #2	GE Spiral (Control)
<b>Model # / Product Code</b>	FLE15/2/A19 XL/CD PC: 71876	EDG25-14	11314	Soft white Plus EL/SWP	SKB13EAP	28918SS	28913SS	85939
<b>Number of lamps tested</b>	25	25	25	20	25	25	25	30
<b>Number of lamps: exterior covering cracked</b>	0	0	0	0	0	N/A*	N/A*	N/A
<b>Number of lamps: exterior covering broke</b>	0	3	0	0	0	N/A*	N/A*	N/A
<b>Number of lamps: interior glass tubing broke</b>	1	2	0	0	0	23	11	24
<b>Number of lamps where both the interior and exterior glass broke</b>	0	2	0	0	0	N/A	N/A	N/A



## Results cont.

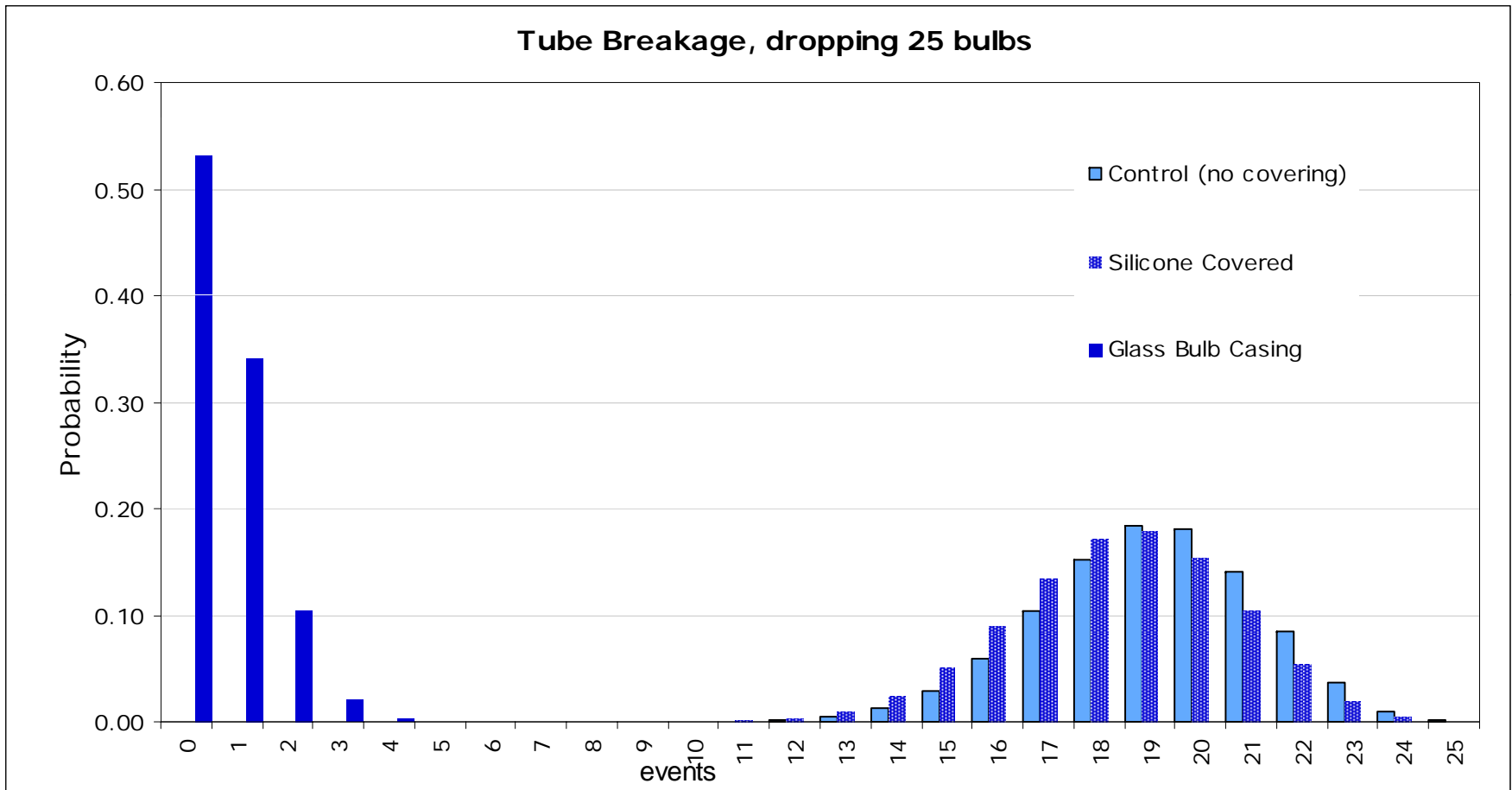


## Results cont.

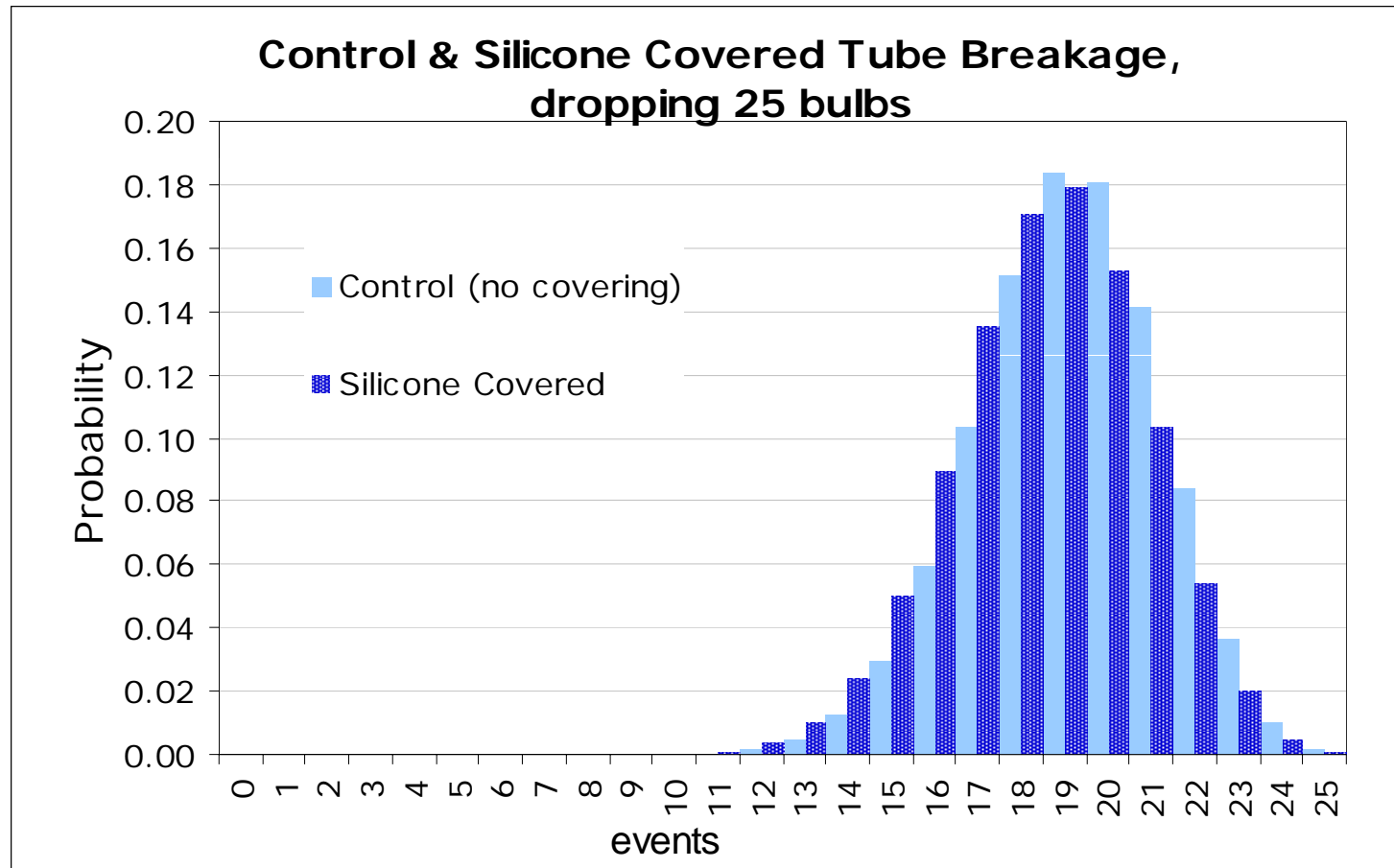




# Analysis



# Analysis cont.



## Other Key Metrics

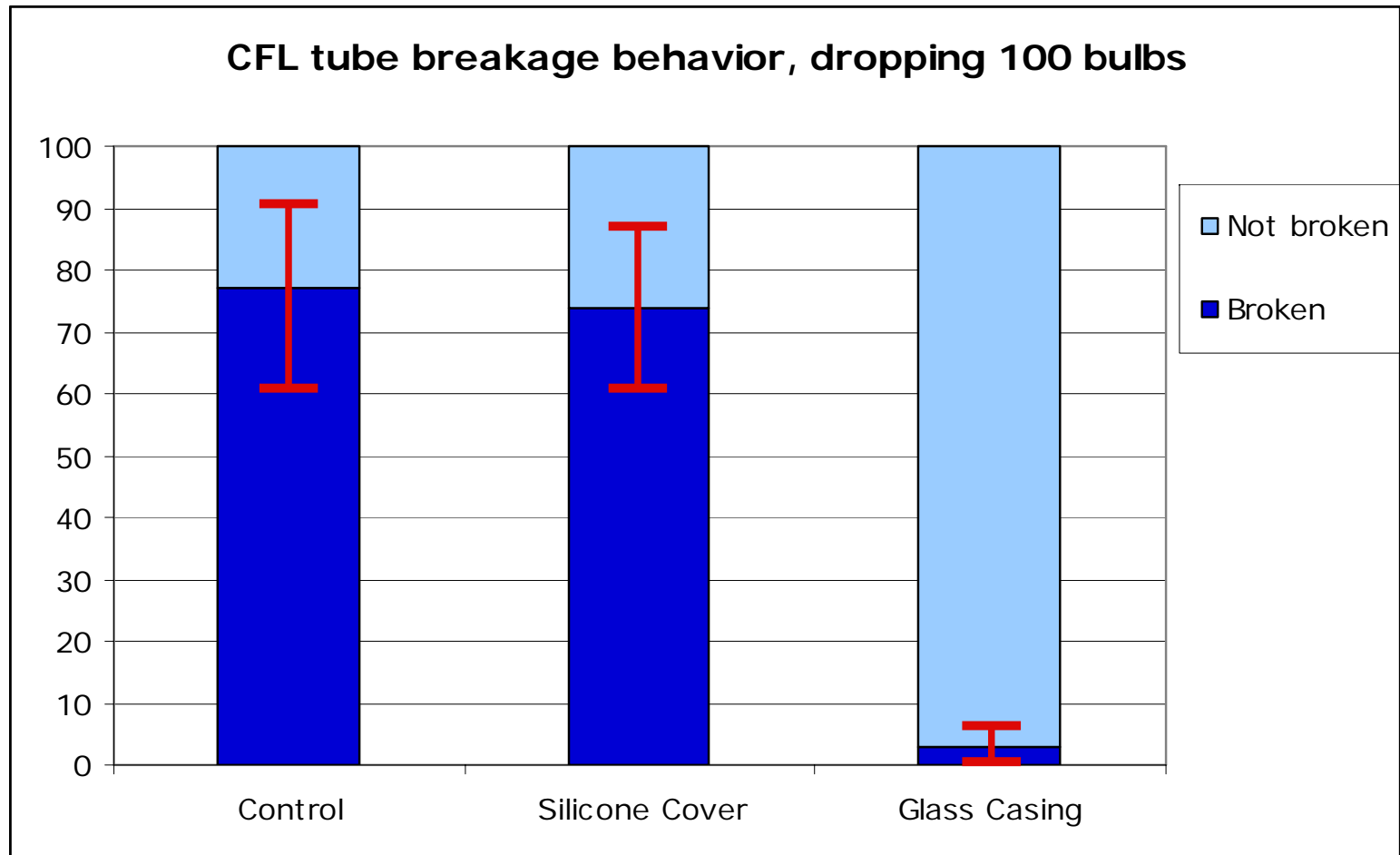
### ► **Glass-encased CFLs**

- Chance that the CFL tubing encased in a glass covering will break when dropped on unpadded carpet from a height of 7 feet: 3%
- Chance that a glass-encased CFL bulb will be damaged when dropped, but the CFL tube does not break (e.g., base becomes loose, exterior casing cracks or breaks): 8%

### ► **Silicone-covered CFLs**

- Chance that the CFL tubing in a silicone-covered lamp will break when dropped on carpet: 75%
- Potential for reduced mercury release, due to “containment” of all lamp components.

## Other Key Metrics cont.



The error bars (in red) represent the minimum and maximum number of CFL tube breaks likely when dropping 100 bulbs (95% certainty).



# Closing thoughts

- ▶ Can conclude that CFLs with glass coverings significantly reduce the opportunity for breakage of the inner tube when dropped on carpet, while silicone coverings do not.
- ▶ Not be taken as an unqualified endorsement of glass-covered CFLs.
  - Slightly lower light output
  - Lower efficacy than uncovered CFLs
  - Significantly higher cost: ~\$5 - \$11
- ▶ **EPA developing communication tools for use by EEPS.**

# Questions?

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