



Flammability Characteristics of 3M™ VHB™ Extrudable Tape

Technical Bulletin

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Background:

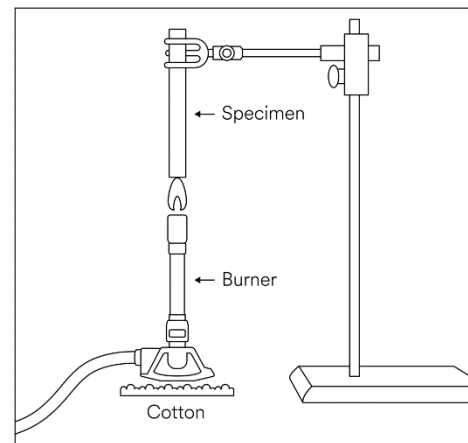
3M™ VHB™ Extrudable Tape has been developed for use worldwide in a variety of industrial applications. As national, regional and local regulations and standards change, many manufacturers are looking to use materials that satisfy flammability standards. Several different flammability standards exist (UL 94, NFPA 130, EN45545, etc.) for a variety of industries, and each have their own sample preparation and test methods to demonstrate compliance.

Many of the flammability tests require standardized “open-face” test specimens (see Figure 1 for basic UL 94 schematic). A burner of specified configuration and thermal output is held in proximity to the material for a specific amount of time. Most commonly burn time and length, time for self-extinguishment, and flaming “drips” are evaluated. This configuration is not representative of a pressure sensitive adhesive (PSA) used to bond two noncombustible materials.

Analysis:

An open-face format burn makes sense for many polymeric materials, but not for a PSA like 3M™ VHB™ Extrudable Tape that is intended for use between two substrates, which are often non-combustible substrates. When 3M™ VHB™ Tape is subjected to open-face format burn testing, the rubber adhesive will likely result in non-compliance.

Instead, manufacturers should look at a test of their assembled system – where the adhesive is “sandwiched” between two materials in the intended end-use product configuration, more representative of actual use.



In speaking with UL’s engineering team members, they have consistently confirmed:

“Any evaluation of an adhesive needs to be conducted as part of the specific end-use-product configuration when there’s a concern about the contribution of the adhesive to the flammability of the polymeric system”

When bonded between two non-combustible substrates, it has been observed in testing performed by 3M’s Product Stewardship Laboratory, that 3M™ VHB™ Extrudable Tape does not contribute to flame propagation. While the bulk of the adhesive burns in open-face formats, a closed-face format only exposes the very thin edge of the rubber adhesive to the

flame. This edge may char or melt, but the entire bonded system generally passes most flammability tests.

Conclusion:

In practice, 3M™ VHB™ Extrudable Tape is commonly used to bond two non-combustible substrates. When standard 3M™ VHB™ Extrudable Tape is used to bond two non-combustible components to create a “system”, this adhesive performs well and the flame does not propagate as the bond line is so thin and/or the 3M™ VHB™ Extrudable Tape is recessed from the edge and not exposed to direct flame. If practical performance is the metric, independent testing of the assembled part(s) or system with 3M™ VHB™ Extrudable Tape is suggested for consideration.

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