

Technical Data Sheet

**3M™ VHB™ Tape LVO Series**

LVO060BF · LVO110BF · LVO160BF

**EN** English

**DE** Deutsch

**FR** Français

**IT** Italiano

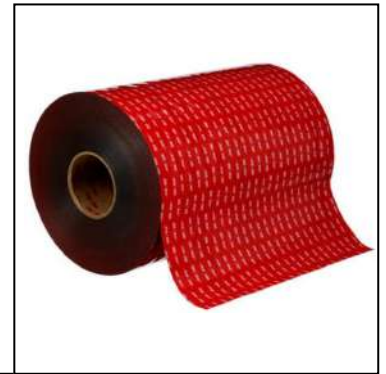
**ES** Español

July 2024  
Supersedes: New



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# 3M™ VHB™ Tape LVO Series



## Product Description

3M™ VHB™ Tape LVO is a low VOC and low odor (LVO) black double-sided acrylic foam tape with PE film liner and available in 0,6 mm, 1,1 mm and 1,6 mm thickness. The low odor adhesive on both sides bonds to a broad range of substrates and plastics, optimized for polypropylene and polystyrene. The conformable foam provides good contact between substrates even when they are slightly mismatched. Each product in this family has low odor adhesive and very conformable foam but varies in thickness.



## Key Features

- 85% reduced VOC's compared to common acrylic foam tapes, tested to VDA278 standard
- Low in Odor – tested to VDA270 standard
- Fast and easy-to-use permanent bonding method provides high strength and long-term durability
- Virtually invisible fastening keeps surfaces smooth
- Can replace mechanical fasteners (rivets, welding, screws) or liquid adhesives
- Closed-cell foam creates a seal against water and moisture
- Pressure sensitive adhesive bonds on contact to provide immediate handling strength
- Allows the use of thinner, lighter weight and dissimilar materials
- This product might be suitable for use in indirect food contact applications. Please see the applicable Regulatory Data - FDA 21 CFR 175.105

**Technical Information Note:** The following technical information and data should be considered representative or typical only and should not be used for specification purposes.



## Typical Physical Properties

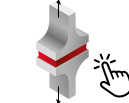
**Adhesive:** Low Odor

**Foam Type:** Very Conformable Acrylic / **Tape Colour:** Black

|                 | LVO-060BF       | LVO-110BF       | LVO-160BF       |
|-----------------|-----------------|-----------------|-----------------|
| Thickness       | 0,6 mm          | 1,1 mm          | 1,6 mm          |
| Density         | 580 kg/m³       | 540 kg/m³       | 540 kg/m³       |
| Liner           | PE Filmic       | PE Filmic       | PE Filmic       |
| Liner Thickness | 0,130 mm        | 0,130mm         | 0,130mm         |
| Liner Colour    | Red, 3M Branded | Red, 3M Branded | Red, 3M Branded |



## Typical Performance Characteristics

|                                                                                                                                                                                                                                                                                                 | LVO-060BF | LVO-110BF | LVO-160BF |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|
|  <b>90° Peel adhesion to Stainless Steel</b><br>acc. to ASTM D3330, 90° peel angle @ RT, after 72h @ RT dwell                                                                                                   | 23 N/cm   | 38 N/cm   | 37 N/cm   |
|  <b>90° Peel adhesion to Polypropylene (PP)</b><br>acc. to ASTM D3330, 90° peel angle @ RT, after 72h @ RT dwell                                                                                                | 25 N/cm   | 36 N/cm   | 44 N/cm   |
|  <b>90° Peel adhesion to Polystyrene</b><br>acc. to ASTM D3330, 90° peel angle @ RT, after 72h @ RT dwell                                                                                                      | 25 N/cm   | 36 N/cm   | 38 N/cm   |
|  <b>Normal Tensile (T-Block)</b><br>acc. to ASTM D897 to Aluminium @ RT, after 72h @ RT dwell, 6.45 cm², test speed 50 mm/min                                                                                 | 970 kPa   | 990 kPa   | 920 kPa   |
|  <b>Dynamic Shear</b><br>acc. to ASTM D1002 on stainless steel, after 72h @ RT dwell                                                                                                                          | 790 kPa   | 790 kPa   | 680 kPa   |
| <b>Short Term Temperature Performance</b><br>No change in room temperature dynamic shear properties following 4 hours conditioning at indicated temperature with 100 g/6.45 cm² static load (Represents minutes, hours in a process type temperature exposure).                                 |           |           |           |
|                                                                                                                                                                                                                                                                                                 |           | 121 °C    |           |
|  <b>Long Term Temperature Performance</b><br>Maximum temperature where tape supports at least 250 g load per 3.23 cm² in static shear for 10,000 minutes. (Represents continuous exposure for days or weeks). |           |           |           |
|                                                                                                                                                                                                                                                                                                 |           | 93 °C     |           |



## Static Shear: ASTM D-3654

72-hour dwell time, Size: 25,4 mm x 12,7 mm.

| Weight | Temperature/ Substrate         | Minutes  |
|--------|--------------------------------|----------|
| 1000 g | 22 °C / Stainless Steel and PP | >10 000* |
| 500 g  | 66 °C / Stainless Steel        | >10 000* |
| 500 g  | 93 °C / Stainless Steel and PP | >10 000* |

\*Test concludes at 10,000 minutes.



## Directions for Use and Application Temperature

- Ideal application temperature range is 21 °C to 38 °C and minimum application temperature is 10 °C. Pressure sensitive adhesives use viscous flow to achieve substrate contact area.
  - To obtain good performance with all 3M™ VHB™ Tapes, it is important to ensure that the surfaces are clean, dry and free of condensed moisture. For maximum bond strength the surfaces should be thoroughly cleaned with a 50:50 to 70:30 mixture of isopropyl alcohol and water.
  - For in depth surface preparation and application instructions, please click or scan QR code to see 3M Technical Bulletin on Surface Preparation for 3M™ VHB™ Tape Applications.
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## Storage and Shelf Life

All 3M™ VHB™ Tapes have a shelf life of 24 months from date of manufacture when stored at 4°C to 38°C and 0-95% relative humidity. The optimum storage conditions are 22°C and 50% relative humidity. Performance of tapes is not projected to change even after shelf life expires; however, 3M does suggest that 3M™ VHB™ Tapes are used prior to the shelf-life date whenever possible.

The manufacturing date is available on all 3M™ VHB™ Tapes as the lot number, typically marked on the core or on a label on the outer roll lap. The lot number, typically a 4 digit code, is a Julian date (Y D D D). The first digit refers to the year of manufacture, the last 3 digits refer to the days after January 1. Example: A lot number of 4266 (or 24266) would translate to a date of manufacture of Sept. 23 (266th day of year) in 2024.

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## Design Considerations

Adhesion to the substrate is important in achieving bonding success. Adhesives must flow onto the substrate surfaces in order to achieve intimate contact area and allow the molecular force of attraction to develop. The degree of flow of the adhesive on the substrate is largely determined by the surface energy of the substrate. Achieving good contact is also important. The necessary thickness of tape depends on the rigidity of substrates and their flatness irregularity. While the 3M™ VHB™ Tapes will conform to a certain amount of irregularity, they will not flow to fill gaps between the materials. For bonding rigid materials with normal flatness, consider use of tapes with thickness of 1.1 mm or greater. As the substrate flexibility increases thinner tapes can be considered. Using the right amount of tape is important to handle the expected stresses. Because 3M™ VHB™ Tapes are viscoelastic by nature their strength and stiffness is a function of the rate at which they are stressed. They behave stronger with relatively faster rate of stress load (dynamic stresses) and will tend to show creep behavior with stress load acting over a long period of time (static stresses). As a general rule, for static loads, approximately 60 sq cm of tape should be used for each Kg of weight to be supported in order to prevent excessive creep. For dynamic loads a useful design factor is 85 kPa for most dynamic stresses in general applications.

Allow for thermal expansion/contraction. 3M™ VHB™ Tapes can perform well in applications where two bonded surfaces may expand and contract differentially. Assuming good adhesion to the substrates, the tapes can typically tolerate differential movement in the shear plane up to 3 times their thickness. Bond Flexibility: While an advantage for many applications where allowing differential movement is a benefit, the tape bonds are typically more flexible than alternative bonding methods. Suitable design modifications or periodic use of rigid fasteners or adhesives may be needed if additional stiffness is required. Performance in Severe Cold Temperature can be challenging. Applications which require performance at severe cold temperatures must be thoroughly evaluated by the user if the intended use will subject the tape product to high impact stresses. Please click or scan QR code to see 3M Technical Bulletins on 3M™ VHB™ Tape Cold Temperature Performance and 3M™ VHB™ Tape Durability for additional information.

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## Further Test Reports and Certifications

3M can offer extended data for different test conditions and substrates, as well as certifications. Please get in touch with your 3M Sales Rep or Application Engineer. Please contact your local 3M Office, you can click or scan QR code to see contact detail or visit [www.3M.com](http://www.3M.com).



## 3M™ Material Data Card (MDC) for Finite Element Analysis (FEA)

FEA modelling is a tool that helps design engineers determine the right adhesive system for the application requirements. 3M can offer elastic-plastic modeling data at different strain rates for most of our adhesives. We also recognize and support other modeling conditions and methods. Please click or scan QR code to request 3M Material Data Card for your modelling.



## 3M™ Bonding Process Center

3M™ Bonding Process Centers around the world can address application challenges. Please click or scan QR code to schedule in person or virtual visit to try new innovations in dispensing and automation to find customized solutions for production challenges.

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**Select Automotive Applications:** This product is an industrial product and has not been designed or tested for use in certain automotive applications, such as automotive electric powertrain battery or high voltage applications, which may require the product to be manufactured in a IATF certified facility, meet a Ppk of 1.33 for all properties, undergo an automotive production part approval process (PPAP), or fully adhere to automotive design or quality system requirements (e.g., IATF 16949 or VDA 6.3). Customer assumes all responsibility and risk if customer chooses to use this product in these applications.

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- Product and Application Trainings & Videos
- Request 3M™ Material Data Card (MDC) for Modelling / Finite Element Analysis (FEA)
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