

# Technical Data Sheet

## 3M™ VHB™ Tape 5952

### Product Description

**Finite Element Analysis (FEA)** data is available for this product at: [3m.com/FEA](https://www.3m.com/FEA)

3M™ VHB™ Tape 5952 is a 0.045 inch (1.1 mm) thick black double coated acrylic foam tape with PE film liner. The modified acrylic adhesive on both sides bonds to a broad range of high, medium and medium/low surface energy substrates including metals, glass and a wide variety of plastics and paints, including many powder coated paints. The very conformable foam provides good contact between substrates even when they are slightly mismatched. 3M™ VHB™ Tape 5952 is part of the 5952 tape family. Each product in this family has modified acrylic adhesive and very conformable foam but varies in thickness, color and liner type.

### Product Features

- 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
- Black, 0.045 in (1.1 mm), modified acrylic adhesive and very conformable acrylic foam core bonds to a wide variety of substrates including powder coated paints and irregular surfaces
- Eliminate drilling, grinding, refinishing, screwing, welding and clean-up
- Creates a permanent seal against water, moisture and more by offering better gap filling capabilities
- Pressure sensitive adhesive bonds on contact to provide immediate handling strength
- Allows the use of thinner, lighter weight and dissimilar materials

### 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

Property	Values	Additional Information
Adhesive Type	Modified Acrylic	
Foam Type	Very Conformable Acrylic Foam	
Liner	PE Film	
Liner Thickness		

0.13 mm

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Color

Black

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Liner Color

Red (printed)


View 

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Test Name: Primary

Total Tape Thickness (mil)

45 mil

View 

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Test Method: ASTM D3652

Total Tape Thickness (mm)

1.1 mm


View 

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Test Method: ASTM D3652

Total Tape Thickness

0.045 in

View 

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Test Method: ASTM D3652


Thickness Tolerance

±10 %

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Density

590 kg/m<sup>3</sup>

View 

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Test Method: ASTM D3574

Notes: Foam with adhesive

Density

37 lb/ft<sup>3</sup>

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Liner Thickness

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5 mil

Liner Thickness

0.005 in

## Typical Performance Characteristics

Property  
Values  
Additional Information

90° Peel Adhesion

22 lb/in

[View](#) 

Test Method: ASTM D3330

Dwell/Cure Time: 24.0

Dwell Time Units: hr

Temp C: 23C

Temp F: 72F

Environmental Condition: 50%RH

Backing: 5 mil Aluminum Foil

Notes: 12 in/min (300 mm/min)

90° Peel Adhesion

39 N/cm

[View](#) 

Test Method: ASTM D3330

Dwell/Cure Time: 72.0

Dwell Time Units: hr

Temp C: 70C

Temp F: 158F

Environmental Condition: 50%RH


Substrate: Stainless Steel

Backing: 2 mil Aluminum Foil

Notes: 12 in/min (300 mm/min)

Normal Tensile

480 kPa

[View](#) 

Test Method: ASTM D897

Dwell/Cure Time: 72.0

Dwell Time Units: hr

Temp C: 23C

Temp F: 73F

Substrate: Aluminum

Notes: 1 in.<sup>2</sup> (6.45 cm<sup>2</sup>), Jaw Speed 2 in./min. (50 mm/min.)

Normal Tensile

70 lb/in<sup>2</sup>

[View](#) 

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Test Method: ASTM D897

Dwell/Cure Time: 72.0

Dwell Time Units: hr

Temp C: 23C

Temp F: 73F

Substrate: Aluminum

Notes: 1 in.<sup>2</sup> (6.45 cm<sup>2</sup>), Jaw Speed 2 in./min. (50 mm/min.)

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Overlap Shear Strength

550 kPa

[View](#) 

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Test Method: ASTM D1002

Notes: 1 in<sup>2</sup> (6.45 cm<sup>2</sup>), Jaw Speed 0.5 in/min (12.7 mm/min)

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Overlap Shear Strength

80 lb/in<sup>2</sup>

[View](#) 

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Test Method: ASTM D1002

Notes: 1 in<sup>2</sup> (6.45 cm<sup>2</sup>), Jaw Speed 0.5 in/min (12.7 mm/min)

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Short Term Temperature Resistance

149 °C

[View](#) 

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Notes: No change in room temperature dynamic shear properties following 4 hour conditioning at indicated temperature with 100 g/static load. (Represents minutes, hour in a process type temperature exposure).

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Short Term Temperature Resistance

300 °F

[View](#) 

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Notes: No change in room temperature dynamic shear properties following 4 hour conditioning at indicated temperature with 100 g/static load. (Represents minutes, hour in a process type temperature exposure).

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Long Term Temp C

93 °C

[View](#) 

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Notes: Maximum temperature where tape supports at least 250 g load per 0.5 in<sup>2</sup> in static shear for 10,000 minutes. (Represents continuous exposure for day or weeks).

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Long Term Temp F

200 °F

[View](#) 

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Notes: Maximum temperature where tape supports at least 250 g load per 0.5 in<sup>2</sup> in static shear for 10,000 minutes. (Represents continuous exposure for day or

weeks).

Minimum Application Temperature


10 °C

Minimum Application Temperature

50 °F

Static Shear

1000 g

View 

Test Method: ASTM D3654

Temp C: 23C

Temp F: 73F

Substrate: Stainless Steel

Notes: Tested at various temperatures and gram loadings. 0.5 in<sup>2</sup> (3.23 cm<sup>2</sup>). Will hold listed weight for 10,000 minutes (approximately 7 day).

Static Shear

500 g

View 

Test Method: ASTM D3654

Temp C: 66C

Temp F: 150F

Substrate: Stainless Steel

Notes: Tested at various temperatures and gram loadings. 0.5 in<sup>2</sup> (3.23 cm<sup>2</sup>). Will hold listed weight for 10,000 minutes (approximately 7 day).

Static Shear

250 g

View 

Test Method: ASTM D3654

Temp C: 93C

Temp F: 200F

Substrate: Stainless Steel

Notes: Tested at various temperatures and gram loadings. 0.5 in<sup>2</sup> (3.23 cm<sup>2</sup>). Will hold listed weight for 10,000 minutes (approximately 7 day).

## Available Sizes

Property

Values

Additional Information

Standard Roll Length

32.9 m

Standard Roll Length

36 yd

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Minimum Available Width

6.4 mm

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Minimum Available Width

0.25 in

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Maximum Available Width

1219 mm

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Maximum Available Width

48 in

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Normal Slitting Tolerance

±0.79 mm

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Normal Slitting Tolerance

±1/32 in

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Core Size (ID)

76.2 mm

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Core Size (ID)

3 in

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Available Sizes

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UL 746C Listings

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Solvent and Fuel Resistance

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Additional Performance Characteristics

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Property  
Values  
Additional Information

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Water Vapor Transmission

37.1 g/m<sup>2</sup>/24 hr

View 

Test Method: ASTM F1249

Temp C: 38C

Environmental Condition: 100%RH

Shear Modulus

3 x 10<sup>5</sup> Pa

Coefficient of Thermal Expansion

180 x 10<sup>-6</sup> m/m/°C

Coefficient of Thermal Expansion

100 x 10<sup>-6</sup> in/in/°F

## Electrical and Thermal Properties

Property

Values

Additional Information

Dielectric Constant 1KHz

2.14

View 

Test Method: ASTM D150

Temp C: 23C

Temp F: 72F

Dielectric Constant 1MHz

1.95

View 

Test Method: ASTM D150

Temp C: 23C

Temp F: 72F

Dissipation Factor 1KHz

0.0065

View 

Test Method: ASTM D150

Temp C: 23C

Temp F: 72F

Dissipation Factor 1MHz

0.0506

View 

Test Method: ASTM D150

Temp C: 23C

Temp F: 72F

Dielectric Strength

18 V/μm

View 

Test Method: ASTM D140

Dielectric Strength

455 V/mil

View 

Test Method: ASTM D140

Thermal Conductivity


0.05 W/m/K

Thermal Conductivity

0.4 (btu-in)/(h-ft<sup>2</sup>-°F)

Volume Resistivity

2.5 x 10<sup>14</sup> Ω-cm

View 

Test Method: ASTM D257

Temp C: 23C

Temp F: 73F

Surface Resistivity

>10<sup>16</sup> Ω

View 

Test Method: ASTM D257

## 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. 3M™ VHB™ 5952 family tapes bond well to high (HSE), medium (MSE), and medium/low (M/LSE) surface energy materials. The image below shows typical materials in these categories.

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 45 mils (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 four square inches of tape should be used for each pound (57 cm<sup>2</sup> of tape per kg) of weight to be supported in order to prevent excessive creep. For dynamic loads a useful design factor is 12 lb/in<sup>2</sup> (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. A technical bulletin “3M™ VHB™ Tape Cold Temperature Performance” (70-0707-3991-0) is available for additional information.

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## Converting

In addition to standard and custom roll sizes available from 3M through the distribution network, 3M™ VHB™ Tapes are also available in limitless shapes and sizes through the 3M Converter network. For additional information, contact 3M Converter Markets at 1-800-223-7427 or on the web at [www.3M.com/converter](http://www.3M.com/converter).

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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 40°F to 100°F (4°C to 38°C) and 0-95% relative humidity. The optimum storage conditions are 72°F (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 7266 (or 17266) would translate to a date of manufacture of Sept. 23 (266th day of year) in 2017.

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## Industry Specifications

UL 746C (File MH 17478)

UL 879 (File E65361)

[EN 45545 test report for details \(ISO 5660-1, ISO 5658-2\)](#)

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## Bottom Matter

3M

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3M and VHB are trademarks of 3M Company.

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CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE.

## Handling/Application Information

### Application Techniques

Clean: Most substrates are best prepared by cleaning with a 50:50 mixture of isopropyl alcohol (IPA\*) and water prior to applying 3M™ VHB™ Tapes.

Exceptions to the general procedure that may require additional surface preparation include:

- Heavy Oils: A degreaser or solvent-based cleaner may be required to remove heavy oil or grease from a surface and should be followed by cleaning with IPA/water.
- Abrasion: Abrading a surface, followed by cleaning with IPA/water, can remove heavy dirt or oxidation and can increase surface area to improve adhesion.
- Adhesion Promoters: Priming a surface can significantly improve initial and ultimate adhesion to many materials such as plastics and paints.
- Porous surfaces: Most porous and fibered materials such as wood, particleboard, concrete, etc. need to be sealed to provide a unified surface.
- Unique Materials: Special surface preparation may be needed for glass and glass-like materials, copper and copper containing metals, and plastics or rubber that contain components that migrate (e.g. plasticizers).

Refer to 3M Technical Bulletin “Surface Preparation for 3M™ VHB™ Tape Applications” for additional details and suggestions. (70-0704-8701-5)

\*Note: These cleaner solutions contain greater than 250 g/l of volatile organic compounds (VOC). Please consult your local Air Quality Regulations to be sure the cleaner is compliant. When using solvents, be sure to follow the manufacturer’s precautions and directions for use when handling such materials.

Pressure: Bond strength is dependent upon the amount of adhesive-to-surface contact developed. Firm application pressure develops better adhesive contact and helps improve bond strength. Typically, good surface contact can be attained by applying enough pressure to insure that the tape experiences approximately 15 psi (100 kPa) pressure. Either roller or platen pressure can be used. Note that rigid surfaces may require 2 or 3 times that much pressure to make the tape experience 15 psi.

Temperature: Ideal application temperature range is 70°F to 100°F (21°C to 38°C). Pressure sensitive adhesives use viscous flow to achieve substrate contact area. Minimum suggested application temperature for the 3M™ VHB™ Tape 5952 family is 50°F (10°C). Minimum application temperature does vary by 3M™ VHB™ tape family and ranges from 32°F to 60°F (0°C to 15°C)

Note: Initial tape application to surfaces at temperatures below these suggested minimums is not recommended because the adhesive becomes too firm to adhere readily. However, once properly applied, low temperature holding is generally satisfactory. To obtain good performance with all 3M™ VHB™ Tapes, it is important to ensure that the surfaces are dry and free of condensed moisture.

Time: After application, the bond strength will increase as the adhesive flows onto the surface (also referred to as “wet out”). At room temperature approximately 50% of ultimate bond strength will be achieved after 20 minutes, 90% after 24 hours and 100% after 72 hours. This flow is faster at higher temperatures and slower at lower temperatures. Ultimate bond strength can be achieved more quickly (and in some cases bond strength can be increased) by exposure of the bond to elevated temperatures (e.g. 150°F [66°C] for 1 hour). This can provide better adhesive wetout onto the substrates. Abrasion of the surfaces or the use of primers/ adhesion promoters can also have the effect of increasing bond strength and achieving ultimate bond strength more quickly.

## References

Property  
Values

3m.com Product Page

[https://www.3m.com/3M/en\\_US/p/d/b40065688/](https://www.3m.com/3M/en_US/p/d/b40065688/)

Safety Data Sheet SDS

[https://www.3m.com/3M/en\\_US/company-us/SDS-search/results/?gsaAction=msdsSRA&msdsLocale=en\\_US&co=ptn&q=5952](https://www.3m.com/3M/en_US/company-us/SDS-search/results/?gsaAction=msdsSRA&msdsLocale=en_US&co=ptn&q=5952)

## Family Group

Link Tags:

- 5906
- 5907
- 5908
- 5909
- 5915
- 5915P
- 5915WF
- 5925
- 5925P
- 5925WF
- 5930
- 5930P
- 5930WF
- 5952
- 5952P
- 5952WF
- 5958FR
- 5962
- 5962P
- 5962WF
- 5913

Products	Liner	Color	Liner Color	Total Tape Thickness (mm)	Liner Thickness	Adhesive Type	Foam Type
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5908	PET	Black	Clear	0.25 mm	N/A	N/A	N/A
5952	PE Film	Black	N/A	N/A	0.13 mm	Modified Acrylic	Very Conformable Acrylic Foam
5906	PET	Black	Clear	0.15 mm	N/A	N/A	N/A
5909	PET	Black	Clear	0.3 mm	N/A	N/A	N/A
5958FR	PE Film	Black	Red (printed)	1 mm	N/A	N/A	N/A
5907	PET	N/A	Clear	N/A	0.08 mm	Modified Acrylic	Very Conformable Acrylic Foam
5915	PE Film	Black	Red (printed)	0.4 mm	0.13 mm	N/A	Very Conformable Acrylic Foam
5925	PE Film	Black	Red (printed)	N/A	N/A	Modified Acrylic	N/A
5930	N/A	N/A	Red (printed)	N/A	0.13 mm	Modified Acrylic	Very Conformable Acrylic Foam
5962	PE Film	Black	Red (printed)	N/A	N/A	Modified Acrylic	N/A
5913	N/A	Black	Clear	N/A	0.05 mm	Modified Acrylic	N/A
5952P	PCK Paper	Black	White (printed)	N/A	N/A	N/A	N/A
5952WF	PE Film	White	Red (printed)	N/A	0.13 mm	Modified Acrylic	Very Conformable Acrylic Foam
5915P	PCK Paper	N/A	White (printed)	N/A	N/A	Modified Acrylic	Very Conformable Acrylic Foam
5915WF	PE Film	White	Red (printed)	N/A	N/A	N/A	N/A
5925P	PCK Paper	N/A	White (printed)	N/A	N/A	Modified Acrylic	Very Conformable Acrylic Foam
5925WF	N/A	White	Red (printed)	0.6 mm	N/A	Modified Acrylic	Very Conformable Acrylic Foam
5962P	PCK Paper	N/A	White (printed)	N/A	N/A	Modified Acrylic	Very Conformable Acrylic Foam
5962WF	PE Film	White	Red (printed)	N/A	N/A	N/A	N/A
5930P	PCK Paper	Black	White (printed)	N/A	N/A	N/A	N/A
5930WF	PE Film	N/A	Red (printed)	N/A	N/A	Modified Acrylic	Very Conformable Acrylic Foam

## ISO Statement

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001 standards.

## Information

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