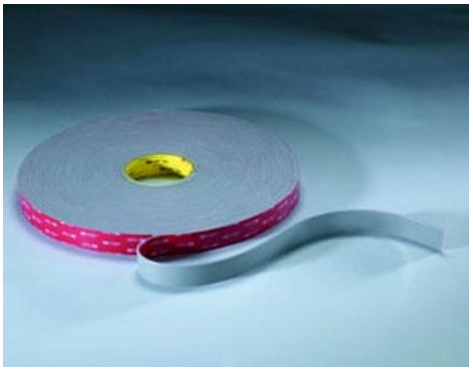
November, 2017

3M™ VHB™ Structural Glazing Tape G23F

Product Description

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



3M™ VHB™ Structural Glazing Tapes are fully-cured, durable, high performance double-sided pressure sensitive acrylic foam tapes. They are used for attaching glass and other infill panels to metal frames in curtain wall systems, commercial windows and doors, skylight and canopy systems replacing commonly used mechanical fasteners, gaskets or structural silicone sealants. Application performance history since 1990 and 3rd party test results demonstrate the outstanding durability, UV resistance and temperature performance of 3M™ VHB™ Tape acrylic foam chemistry.

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		Method	Notes
Color	Gray			
Adhesive	High Performance Acrylic			
Adhesive Carrier	Acrylic Foam (closed cell)			
Adhesive Thickness	2.3 mm	90 mil		
Density	720 kg/m³	45 lb/ft³	ASTM D3574	Foam with adhesive
Liner	Red Polyethylene Film			
Liner Thickness	0.125 mm	5 mil		

Typical Performance Characteristics

Property	Values		Method	Test Name	Substrate	Temp C	Temp F	Notes
90° Peel Adhesion Anodized Aluminum	52.5 N/cm	30 lb/in	ASTM D3330	90° Peel Adhesion	Anodized Aluminum			
Normal Tensile	480 kPa	70 lb/in²	ASTM D897	T-Block	Aluminum T-block			
Overlap Shear Strength Anodized Aluminum	450 kPa	65 lb/in²	ASTM D1002	Overlap Shear Strength	Anodized Aluminum			
Static Shear 23C	1000 g/3.2cm²	2.2 lb/0.5 in²	ASTM D3654			23C	73F	Holds 10,000 min.

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Typical Performance Characteristics (continued)

Property	Values		Method	Test Name	Substrate	Temp C	Temp F	Notes
Static Shear 66C	500 g/3.2cm²	1.1 lb/0.5 in²	ASTM D3654			66C	150F	Holds 10,000 min.
Static Shear 93C	500 g/3.2cm²	1.1 lb/0.5 in²	ASTM D3654			93C	200F	Holds 10,000 min.

Relative High Temperature Operating Ranges		Test Condition
149 °C	300 °F	Short Term (minutes, hour)
93 °C	200 °F	Long Term (day, weeks)

Property: Relative High Temperature Operating Ranges

Available Sizes

Property	Values		Test Name
Standard Roll Length	32.9 m	36 yd	
Standard Width	15, 20, 25, 30 mm	1/2, 5/8, 3/4, 7/8, 1, 1-1/8, 1-1/4 in	
Normal Slitting Tolerance	±0.8 mm	±1/32 in	
Core Size	76.2 mm	3 in	ID

Design Guidelines

Note: For tape area calculations the following guidelines can be used. Each application should be reviewed by a 3M Application Engineer.
Dynamic Loads:
For dynamic tensile or shear loads, such as wind loads, a design strength of 12 lb/in² (85 kPa) is used for 3M™ VHB™ Structural Glazing Tapes. This design strength guideline provides a safety factor of >5 and was established based on material property testing as well as ASTM dynamic load testing for curtain wall applications.
Static Loads:
For static tensile or shear loads, such as dead weight loads with no mechanical support, snow loads and other long-term loads, a design strength of 0.25 lb/in² (1.7 kPa) is used for 3M™ VHB™ Structural Glazing Tapes. This means 4 in² of tape per 1 lb load (60 cm² of tape per 1 kg load) should be used to support constant stress loads. This guideline provides a safety factor of >5. Dead load support is required for glass panel bonding in most structural glazing applications. Note: Static load and dynamic load calculations should be performed on unsupported dead load structural glazing applications. The calculation resulting in the wider tape width should be used as the appropriate tape width for the specific application.
Differential Movement:
3M™ VHB™ Structural Glazing Tapes can tolerate shear movement up to 3 times its original thickness (300% shear strain). This means 0.090 in (2.3 mm) thick tapes can tolerate shear strain up to 0.27 in (6.9 mm).
Force/Stress:
In general, when designing with 3M™ VHB™ Structural Glazing Tapes, forces acting on the tape should consist of either shear or tensile type stress loads. This allows the stress or force to be applied over the entire tape area. Applications placing cleavage or peel type stress on the tape should be avoided as this will place the stress on the leading edge of the peel or cleaving.

Application Guidelines

Application Review:
Project applications with 3M™ VHB™ Structural Glazing Tapes must be reviewed by a 3M Application Engineer. Project drawings must be submitted to 3M to initiate the project-specific application review.
Adhesion Testing:
Adhesion testing must be conducted on project specific substrates to determine the appropriate surface preparation methods leading to high bond strength of the 3M™ VHB™ Structural Glazing Tape. Adhesion testing should be coordinated through a 3M Application Engineer. Adhesion test results will provide guidance on proper surface preparation methods, including cleaning and priming techniques, for project-specific substrates and finishes.
Fabrication Guidelines:
A shop work environment is appropriate for bonding applications with 3M™ VHB™ Structural Glazing Tape. Tape application temperature should be at least 60°F (15°C). Field bonding is only considered for deglaze/reglaze activities but only after consultation with a 3M Application Engineer. It is also important to provide adequate pressure to the tape after it has been applied to the first prepared substrate surface and after the two parts are joined together. A pressure of 15 lb/in² (100 kPa) or greater should be applied over the whole tape area to facilitate good contact of the adhesive to both substrates. Rigid surfaces may require 2 or 3 times more pressure to achieve >15 lb/in² (100 kPa) at the tape bond line. Pressure application methods must achieve acceptable wet-out (contact) of the adhesive to the bonding substrates. 3M Application Engineers or their channel partners are available to provide training of operators for 3M™ VHB™ Structural Glazing Tape bonding applications.

Storage and Shelf Life

The optimum storage conditions are 72°F (22°C) and 50% relative humidity.
3M™ VHB™ Structural Glazing 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.

Trademarks

References

Property	Values	Method
3m.com Product Page	https://www.3m.com/3M/en_US/company-us/all-3m-products/~/3M-VHB-Structural-Glazing-Tape-G23F?N=5002385+3293108011&rt=rud mil	ASTM D3652
Safety Data Sheet (SDS)	https://www.3m.com/3M/en_US/company-us/SDS-search/results/?gsaAction=msdsSRA&msdsLocale=en_US&co=ptn&q=G23F in	ASTM D3652

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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