FORVALTNING, DRIFT OG VEDLIKEHOLD

PROSJEKT:……..

Entreprise:	**Entreprenør/leverandør** **navn, adresse, tlf, e-post, kontaktperson)**
……. ……..	……. …….
Underleverandør:	
Leveranse:	**Underleverandør** **(navn, adresse, tlf, e-post, kontaktperson)**
Leverandør: Garanti/reklamasjon: Installatør:	Synshjelpemidler AS, Sporveisgata 10, 0352 Oslo, universell-support@synshjelpemidler.no , Sentralbord: 23215555 Synshjelpemidlers bestillings nr./lev.:…… Dato:…….……(for gyldig garanti/reklamasjon på produkt) …….

Beskrivelse av leveranse sted adresse ol: Prosjekt: ……...
Beskrivelse av installasjon: **Produkt levert**: **Type nr**.: ……..… **Dimensjoner (l x b x d/t)**: …… **Produkt overflate type og eventuell behandling**: …….... **Krav etter TEK 17/NS referert til i FDV er fulgt:** …….…… **Eventuelle avvik: (begrunn/dokumenter tiltak):** ……. ……. **Installasjons metode**: ……. **Annen relevant informasjon**: …… ……..

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Materialspesifikasjon på produkter:
Lede/oppmerksomhet:

- BP10115, BP1011503 (med pinne, uten pinne/med tapelim Gerband 950, VHB GPH 060, VHB5925F)
- BP1011535, BP1011536 (uten lim, med tapelim Gerband 950, VHB GPH 060, VHB5925F)
- BP1011542, BP1011544 (med tapelim Gerband 950, VHB GPH 060, VHB5925F, Butyl gummi lim, uten tapelim)
- BP1011547, BP1011549, BP1011546 (med tapelim Gerband 950, VHB GPH 060, VHB5925F, Butyl gummi lim, uten tapelim)
- BP1011550, BP1011551 (med tapelim Gerband 950, VHB GPH 060, VHB5925F, Butyl gummi lim, uten tapelim)
- BP1011552, BP1011553 (med tapelim Gerband 950, VHB GPH 060, VHB5925F, Butyl gummi lim, uten tapelim)

Fare:

- BP10114, BP1011404 - Ø35 (med/uten pinne, med tape lim Gerband 950, VHB GPH 060, VHB5925F
- BP1011403, BP1011405- Ø25 (med/uten pinne, med tape lim Gerband 950, VHB GPH 060, VHB5925F
- BP1011570, BP1011573, BP1011575 (med tapelim Gerband 950, VHB GPH 060, VHB5925F, Butyl gummi lim, uten tapelim)

Trinnmerking:

- BP101462 (uten pinne, med tapelim Gerband 950, VHB GPH060, VHB5925F, Butylgummi lim 0,6 – 1 – 1,5 mm. Leveres i svart, lys grå og gul.

Se vedlagt teknisk spesifikasjon:
Vedlegg i FDV: Ilegg Desmopan 3055DU/et TPU basert produkt (Bayer) og resirkulert TPU (BASF) (brann/ avgasser/andre egenskaper)
Vedlegg i FDV: Skli dokumentasjon
Vedlegg i FDV: Gerband statment/ved behov andre tape lim
Vedlegg 1/2: Produktblad Desmopan fliser og/ eller Produktblad Desmopan linjer og knotter
Vedlegg i FDV: Butylengummi lim.

Desmopan elementer med brann og sklihemmende polyuretan. Alle er gjennomfarget og holder sin egenskap i hele produktets levetid inkl. sklihemmende egenskap.
Lysrefleksjonsverdi avhengig av valgt std. farge og overflate struktur:

- Svart: RAL 9004 - LRV: 4 – 6 (sandblåst - 6) (BASF variant 100% resirkulert materiale)
- Mørk rød: RAL3001 - LRV 8 - 12.
- Blå: RAL 5005 – Blå – LRV 9
- Mørk grå: RAL7015 - LRV: 9 - 12
- Grå: RAL 7004 - LRV: 33 - 34
- Lys grå: RAL 7035 - LRV: 55 – 57* (BASF variant 100% resirkulert materiale)
- Gul: RAL1018 - LRV 61 - 63
- Hvit: RAL 9003 - LRV: 80 – 83*Anbefaler ikke brukt utendørs.

(Variasjoner i LRV kommer av erfart variasjoner i verdi p.g.a. variabel overflate struktur)
Andre farger kan bestilles mot et tillegg.
UV- beskyttet materiale. Hvit og lys grå kan gulne litt i direkte sollys over flere år slik som de fleste lyse og gjennomsiktige plastmaterialer.

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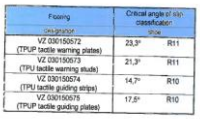
Produktet skal levere en luminanskontrast mot underlaget på over 0,8 foran trapper. Ellers er kravet 0,4 ifølge TEK 10/17 og NS11001:2018. Se ellers egne krav for Veivesenet og Jernbaneverket.

Sklihemmende egenskaper: Farefelt/knotter er testet til R11 og oppmerksomhetsfelt/linjer er testet til R10 klassifisert etter DIN-51130 std og montert etter krav i ISO23599. (Se rapport som vedlegg under.)



Elementene er laget av Desmopan 3055DU som er et egnet materiale for bruk innendørs og utendørs.
Miljø: Alle Desmopan (TPU) elementer er miljøvennlige i forhold til andre tilsvarende materialer. De er 100% resirkulerbare og nedbrytbare i naturen. Fra høsten 2023 vil et begrenset sortiment kunne tilbys i 100% resirkulert TPU.
Elementene tilfredsstiller alle EU-krav med god margin. Ingen ftalater og avgasser langt under krav.

Emisjon av PHA'er er mindre enn 10 ppm og Benzopyrer mindre enn 1 ppm. Mer info om Desmopan (TPU) se vedlegg lenger ned.

Elementene egner seg både til innendørs og utendørs bruk.
Innendørs kan elementene limes med f.eks.: TEC 7 eller Sikabond T2 (som er Breeam sertifisert) eller et av tapelimene nevnt under. Som std. leveres Gerband 950 tapelim.

Tape lim:
Gerban 950: Se egen dokumentasjon under (std)
3M VHB 5925: Serien som er sertifisert etter NFPA Hazard Classification-Health: 0, Flammability: 1, Reactivity: 0, Special Hazards: None. Egen dokumentasjon se under.
VHB GPH 060 og Butyl gummi lim på 0,6 og 1 mm. Direkte på betong, asfalt og stein anbefales 1 mm butylgummi lim. På metallplater kan en bruke både 0,6 og 1 mm.

Spesial innfesting:
BP10115, BP10114 og BP1011403 kan leveres med pinne innfesting.
BP1011503/1011536/1011542/1011547/1011570/1011574/1011575/1011546 kan festes på en del kortbustede tepper. Vi anbefaler bruk av VHB5925F tape lim i denne sammenhengen. Om elementene monteres på kort bustede tepper må underlaget være helt rent, jevnt, tørt og helst nytt for å få best innfesting. Se mer info nedenfor. Normal levetid avhenger av belastning. Alle elementer kan leveres med og uten tapelim/pinner.

Alle Desmopan fliser (BP1011546-75) kan leveres med en påmontert metallplate for montering f.eks. på stål rister, trapper, tregulv etc. Dette påføres med en M etter produktnavn.
Leveres i anbud som std med en 1 mm aluminiumsplate under for påføring på jevne underlag slik som stål rister, tre plattinger ol. Kan leveres med andre plater ved behov mot et tillegg.

Alle Desmopan fliselementer og 5 mm løse elementer med pinne kan brukes utendørs ned mot -30 grader C.

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Elementene er på mellom 2,2 til 5 mm høye og følger intensjonen med ISO23599. For flere mål se detaljer for hvert enkelt produkt i produktblad/listen.

Minimumskrav i forhold til installasjons tetthet og produktegenskaper:

For å få en trygg og forsvarlig installasjonsløsning må en følge TEK 10/17 og retningslinjene gitt i NS11001:2018 vedlegg P750:2014 og ISO23599. Her spesifiseres bl.a. minimumskrav og utforming av elementene for bruk i Norge og internasjonalt. Alle elementer/maler Adaptor Hjelpemidler AS leverer i Norge følger anbefalinger gitt i Norge og eventuelt internasjonalt der dette ikke er nevnt i norske forskrifter eller std.. Der det ikke er spesifisert i norske dokumenter følger vi internasjonale minimumskrav.

Generelle krav:

Innendørs taktil høyde på 3 mm +/- 1 mm, utendørs 5 mm +/-1 mm (norsk), reisvinkel på element ikke over 45 grader (International - ISO 23599).

Ved trapper skal elementene være sklisikre i både våt og tørr tilstand (norsk). Tilsvarer minimum R10 etter DIN51130 std ol..

Luminanskontrast: (Bakgrunnsfarge LRV – element farge LRV)/ Bakgrunnsfarge LRV

Farefelt:

Dybde: min 60 cm (TEK veil/NS), diagonale felt anbefales, avstand mellom sentrum av knotter maks 70 mm senter avstand på Ø25 mm elementer (målt på toppen) /tilsvarer Ø35mm i bunn avhengig av elementhøyde). Dette gir ca 126 knotter pr 0,6 m2)

Maks 68 mm senteravstand på Ø20 mm elementer (målt på toppen)/tilsvarer Ø25mm målt i bunn. (ca 143 knotter pr 0,6 m2) knotter (målt på toppen/tilsvarer 25mm i bunn avhengig av elementhøyde) (International - ISO23599). Disse minimums kravene er gitt for at felte skal være stabilt og trygt å gå på. Sklisikkerhetstester er også gjennomført etter disse min kravene for mønster. Krav til luminanskontrast inne:0,8. Ute: 0,4.

Oppmerksomhetsfelt:

Dybde min 60 cm (TEK veil/NS). ISO 23599 definerer ikke utformingen av et oppmerksomhetsfelt. Definisjonen i Norge er at oppmerksomhetsfeltet ikke skal være farlig å gå på. I ISO er taktil høyde 4 – 5 mm. I Norge 3 mm +/-1 mm inne og 5 mm +/- 1 mm ute. Tetthet er derfor en vurderingssak og relevant i forhold til luminanskontrast krav. Lavere elementer under 4 mm og elementer med farge i hele elementets bredde (større kontrast felt) bør derfor trygt kunne legges ned mot 6 elementer i dybden. Andre elementer som er 4 mm eller høyere og med begrenset kontrast område slik som metal elementer med ilegg bør følge kravet i ISO relatert til brede lederlinjer. Det betyr 7 – 8 elementer i dybden.

Sklisikkerhetstester er gjennomført etter disse min kravene for mønster. Krav til luminanskontrast inne:0,8 (trapp) 0,4 (heis mm). Ute: 0,4.

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Ledelinje:

Mindre områder: Minimums krav på elementers bredde er 20 mm på linjen (norsk - krav til luminans kontrast og bredde på denne). Med ilegg i metall elementer gir det en minimumsbredde på 30 – 35 mm i bunn avhengig av høyde siden ilegg må være minst 20 mm bred. Store områder inne og utendørs skal ledelinje være 15 - 30 cm i bredde (norsk anbefaling). Bredden på feltet skal stå i stil til rommets/områdets størrelse.

Alle produkter blir montert etter disse minimumskravene eller bedre. Alle produkter følger norske og internasjonale krav. Krav til luminanskontrast inne og ute: 0,4.

Trinnmerking:
Skal være på mellom 30 – 40 mm bredde. De skal fases på kantene så en ikke får kanter en kan snuble i på trinnene. U-fasede kanter må være på under 2 mm høyde. Merkingen skal ligge nær trinnkanten dog ikke helt på kanten Vi anbefaler 5 mm fra kanten.
Elementene skal være sklihemmende i våt og tørr tilstand. Inne minst R10 etter DIN 51130. Ute anbefales minst R11 etter DIN 51130. I tillegg anbefaler vi mønster som gir en vanndrivende effekt. Krav til luminanskontrast på minst 0,8 mot underlaget.

Driftsinstruks: Det må aldri plasseres løse gjenstander nærmere en 50 cm fra de taktile elementene. Dette for at ikke svaksynte og blinde skal støte borti det mens de går ved eller på elementene. Elementene tåler stor gang trafikk inkludert rullestoler med gummihjul. En skal unngå å dra tunge og skarpe gjenstander uten gummihjul over elementene slik som jekketraller med harde hjul mf. Trafikk med slikt på egent ansvar.

Vedlikeholds instruksjon:
Hvis elementene er riktig installert, trenger elementene ikke noen spesielle vedlikehold eller renholdsrutiner.
Om elementene monteres på kort bustede tepper: Underlaget kan i korte perioder bli våt.
Slitasje kan oppstå der gangtrafikken er høy. Det er normalt. Elementene er gjennomfarget.
Om tykkelsen på elementene synker under 2 mm må de byttes.
Skal en bytte elementer må underlaget rengjøres nøye før nytt påmonteres.
Sjekk elementene minst en gang per år. Skift ut de som måtte være utslitt.

Det vil over tid være behov for utbytting av enkelte elementer utfra belastningsgrad. Ved bytte må underlaget rengjøres før nytt lim/element legges. En kan bruke TEC 7 Cleaner, 3M Scotch-Weld Cleaner Spray 50098 for å fjerne gamle lim rester. Eventuelt aceton om underlaget tåler dette, men aldri direkte på eksisterende elementer.

Montering av BP101462 utendørs: Bruk butylengummi lim. Vurder overflatens struktur og velg tykkelse på limet etter dette. Grovere underlag krevet tykkere lim. Se egen installasjonsveiledning.

Renhold:
Kan børstes/feies rent for støv og skitt. I tillegg kan elementene vasket med fuktig klut, kost eller mopp. Ph nøytralt vaskemiddel kan brukes. Ikke bruk rengjøringsmidler direkte på elementene som inneholder akryliske lim fjernings forbindelser. Alle elementene kan vaskes med maskiner (med forbehold). Noen maskiner øker slitasjen på elementene. Det kan øke utskiftningsbehovet. Ikke rygg en maskinvask med roterende hoder over taktile

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elementer. Bruk av mye vann kan også øke slitasjen. Det kan medføre at de over tid løsner. Der en skal bruke maskinvask anbefaler vi bruk av VHB5925F tape. (Flatene en skal montere på må være helt jevne.)
Viktig: Ikke bruk maskinvask på elementene kort tid etter de er montert.
Vent minst en uke til lim er herdet og full heft til gulvet er oppnådd.

Avfall: TPU plast er et miljøvennlig plastmateriale som brytes ned i naturen og kan resirkuleres 100%. Innleveres som TPU - 7 avfall.

FDV vedlegg:

Mest brukte tape lim:

Gerdband 950
Statement on the Non-Use of Substances
in Gerband 950 adhesive tapes
The following chemical substances are often questioned regarding their presence in chemical products. Many of them are regulated by national and international legislation.
1. Cadmium (Cd) and its compounds
2. Lead (Pb) and its compounds
3. Mercury (Hg) and its compounds
4. Hexavalent chromium (Cr VI) compounds
5. Polybrominated biphenyls (PBB)
6. Polybrominated diphenyl ethers (PBDE)
7. Polychlorinated biphenyls (PCB)
8. Polychlorinated terphenyls (PCT)
9. Polychlorinated naphthalenes (PCN)
10. Chlorinated paraffines (CP)
11. Pentachlorophenol (PCP)
12. Polyvinylchloride (PVC)
13. Arsenic and its compounds
14. Beryllium and its compounds (e.g. BeO)
15. Selenium and its compounds
16. Tributyltin / triphenyltin compounds
17. Tributyltin oxide (TBTO)
18. Asbestos
19. Azo compounds, releasing certain carcinogenic aromatic amines
20. Dioxins
21. Formaldehyde
22. Radioactive substances
23. Hexabromocyclo-dodecane (HBCDD)
24. Hexachlorocyclo-hexane and its isomers
25. Phosphor in elemental form (e.g. red, white)
26. Synthetic mineral fibres classified as carcinogenic according to European Regulations
27. Natural Rubber Latex

Non-of the above have been intentionally added for the production of Gerband 950 adhesive tapes and therefore, these substances are not expected to be present.

The presence of analytically detectable traces of the above-mentioned substances, which have possibly been introduced into our product via the raw materials, auxiliaries and additives, cannot be excluded. Statement on the Non-Use of Substances
in Gerband Gerband 950 adhesive tapes
Note: This product safety and regulatory related information – whether verbal, in writing or by ways of trial – is given in good faith but without warranty, express or implied. The information is provided by Gerlinger GmbH & Co. KG without assumption of any liability. If any of the above-mentioned regulations change after the date of declaration, this declaration is no longer valid.
2017, and Gerlinger GmbH & Co. KG reserves the right to withdraw or modify the statement at any time without notice.

Gerlinger GmbH & Co. KG
Klebeband- und Dichtstoffwerke
Dietrich-Gerlinger-Straße 1
86720 Nördlingen
USt.-ID-Nr. DE 130 886 221
Registergericht Augsburg HRA 2045
Geschäftsführer: Ulrich Gerlinger

Gerlinger AdhesiveTape

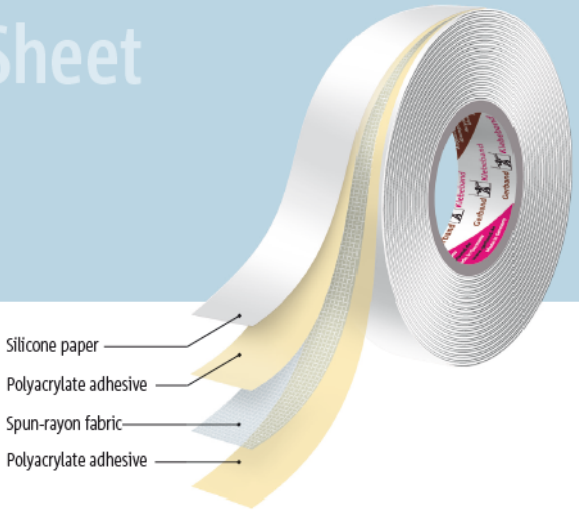
Technical Data Sheet

Gerband 950

Cloth adhesive tape, double sided adhesive

Gerband 950

Double sided adhesive tapes



Gerband 950 is a splitting resistant and highly tear resistant spun-rayon fabric, which is double sided coated with a shearing resistant and very good adherent polyacrylate adhesive.
It is used for permanent bondings of floorings during heavy-duty.

Product description

Carrier
- Spun-rayon fabric; thickness 0.18 mm
- Splitting resistant
- Highly tear resistant, length and crosswise

Adhesive
- Polyacrylate adhesive
- Very good adhesive strength
- High initial and permanent adhesion
- High tack
- Very good shear strength and heat resistance
- Very good plasticizer resistance

Release liner
- Silicone paper

Special features
- Double-sided adhesive
- Outstanding ageing resistance

Colours
- Spun-rayon fabric white-transparent
- Silicone paper white

Applications

- Permanent bonding during heavy-duty
- Bonding of plasticizer-containing surfaces (PVC, CV)
- Bonding of carpets; suitable materials are:
  - Floor backings
    - PVC and CV floorings

Technical data

Total thickness (DIN EN 1942)*	0.34 mm
Tensile strength (DIN EN 14410)*	≥70 N / 25 mm
Elongation at break (DIN EN 14410)*	7 % to 10 %
Adhesion (DIN EN 1939)*	≥10 N / 25 mm
Temperature range	-40 °C to +80 °C
Heat resistance (short-term)	+150 °C
Core diameter	76.5 mm

*According to the respective DIN

Application notes

- Apply at temperatures from +5 °C to +40 °C
- Store in dry rooms from +5 °C to +25 °C, protected from UV-radiation

Packaging unit

Roll length 10 m		
Roll width mm	50	
Rolls per carton	72	
Roll length 25 m		
Roll width mm	38	50
Rolls per carton	32	24

Different packaging units available upon request

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3M VHB5925:

3M VHB™ Tapes

Technical Data October 2018

Product Description:

3M™ VHB™ Tapes provide the convenience and simplicity of a tape fastener and are ideal for use in many interior and exterior bonding applications. In many situations, they can replace rivets, spot welds, liquid adhesives and other permanent fasteners.

These 3M™ VHB™ Tapes are made with acrylic foam which is viscoelastic in nature. This gives the foam energy absorbing and stress relaxing properties which provides these tapes with their unique characteristics. The acrylic chemistry provides outstanding durability performance.

These tapes utilize a variety of specific foam, adhesive, color and release liner types to provide each product/family with specific features. These features can include adhesion to specific or a broad range of materials, conformability, high tensile strength, high shear and peel adhesion, resistance to plasticizer migration, and UL746C recognition. All 3M™ VHB™ Tapes have excellent durability and excellent solvent and moisture resistance.

The tapes included in this data page represent products most commonly used by customers. Please refer to "3M™ VHB™ Tape Specialty Tapes" technical data sheet for additional 3M™ VHB™ Tapes that may be required in special circumstances.

3M™ VHB™ Tape Products

4941 Family

This family utilizes multi-purpose acrylic adhesive on both sides of a conformable adhesive foam core. The adhesive provides excellent adhesion to a broad range of high and medium surface energy substrates including metals, glass, and a wide variety of plastics, as well as plasticized vinyl. The conformable adhesive foam core provides good contact, even with mismatched substrates. The combination of foam strength, conformability, and adhesion makes this family one of the most capable all-around 3M™ VHB™ tapes.

Tape Number	Color	Thickness in (mm)
4919F	Black	0.025 (0.6)
4926	Gray	0.015 (0.4)
4936(F)	Gray	0.025 (0.6)
4941(F)	Gray	0.045 (1.1)
4947F	Black	0.045 (1.1)
4956(F)	Gray	0.062 (1.6)
4979F	Black	0.062 (1.6)
4991	Gray	0.090 (2.3)
4991B	Black	0.090 (2.3)

5952 Family

This family utilizes modified acrylic adhesive on both sides of a very conformable adhesive foam core, providing adhesion the broadest range of substrates, including most powder coated paints.

Tape Number	Color	Thickness in (mm)
5906	Black	0.006 (0.15)
5907	Black	0.008 (0.20)
5908	Black	0.010 (0.25)
5909	Black	0.012 (0.30)
5915(P)	Black	0.016 (0.4)
5915WF	White	0.016 (0.4)
5925(P)	Black	0.025 (0.6)
5925WF	White	0.025 (0.6)
5930(P)	Black	0.032 (0.8)
5930WF	White	0.032 (0.8)
5952(P)	Black	0.045 (1.1)
5952WF	White	0.045 (1.1)
5958FR	Black	0.040 (1.0)
5962(P)	Black	0.062 (1.6)
5962WF	White	0.062 (1.6)

RP Family

This family utilizes multi-purpose acrylic adhesive on both sides of a conformable adhesive foam core. The adhesive provides good adhesion to a broad range of high and medium surface energy substrates including metals, glass, and a wide variety of plastics. The conformable adhesive foam core provides good contact, even with mismatched substrates

Tape Number	Color	Thickness in (mm)
RP16(F)	Gray	0.016 (0.4)
RP25(F)	Gray	0.025 (0.6)
RP32(F)	Gray	0.032 (0.8)
RP45(F)	Gray	0.045 (1.1)
RP62(F)	Gray	0.062 (1.6)

(P) or (F) after the product number designates that both a paper and film liner product version are available. [e.g. 4941 (paper liner) and 4941F (film liner), 5915 (film liner) and 5915P (paper liner). See page 2 for specific details.

3M™ VHB™ Tapes

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

3M™ VHB™ Tapes				Adhesive and Foam			Release Liner		
Family	Number	Color	Tape Thickness Inches (mm) Tolerance	Adhesive Type	Foam Type	Density lb/ft³ (kg/m³)	Type	Thickness Inches (mm)	Color
4941	4919F	Black	0.025 (0.6) ±15%	Multi-Purp	Conform	45 (720)	PE Film	0.005 (0.13)	Red (printed)
	4926	Gray	0.015 (0.4) ±15%	Multi-Purp	Conform	45 (720)	Dk Paper	0.003 (0.08)	White (printed)
	4936	Gray	0.025 (0.6) ±15%	Multi-Purp	Conform	45 (720)	Dk Paper	0.003 (0.08)	White (printed)
	4936F	Gray	0.025 (0.6) ±15%	Multi-Purp	Conform	45 (720)	PE Film	0.005 (0.13)	Red (printed)
	4941	Gray	0.045 (1.1) ±10%	Multi-Purp	Conform	45 (720)	Dk Paper	0.003 (0.08)	White (printed)
	4941F	Gray	0.045 (1.1) ±10%	Multi-Purp	Conform	45 (720)	PE Film	0.005 (0.13)	Red
	4947F	Black	0.045 (1.1) ±10%	Multi-Purp	Conform	45 (720)	PE Film	0.005 (0.13)	Red (printed)
	4956	Gray	0.062 (1.6) ±10%	Multi-Purp	Conform	45 (720)	Dk Paper	0.003 (0.08)	White (printed)
	4956F	Gray	0.062 (1.6) ±10%	Multi-Purp	Conform	45 (720)	PE Film	0.005 (0.13)	Red (printed)
	4979F	Black	0.062 (1.6) ±10%	Multi-Purp	Conform	45 (720)	PE Film	0.005 (0.13)	Red (printed)
	4991	Gray	0.090 (2.3) ±10%	Multi-Purp	Conform	45 (720)	PE Film	0.005 (0.13)	Red (printed)
	4991B	Black	0.090 (2.3) ±10%	Multi-Purp	Conform	45 (720)	PE Film	0.005 (0.13)	Red (printed)
5952	5906	Black	0.006 (0.15) ±15%	Modified	Very Conf	45 (720)	PET	0.003 (0.08)	Clear
	5907	Black	0.008 (0.20) ±15%	Modified	Very Conf	45 (720)	PET	0.003 (0.08)	Clear
	5908	Black	0.010 (0.25) ±15%	Modified	Very Conf	45 (720)	PET	0.003 (0.08)	Clear
	5909	Black	0.012 (0.30) ±15%	Modified	Very Conf	45 (720)	PET	0.003 (0.08)	Clear
	5915	Black	0.016 (0.4) ±15%	Modified	Very Conf	43 (690)	PE Film	0.005 (0.13)	Red (printed)
	5915P	Black	0.016 (0.4) ±15%	Modified	Very Conf	43 (690)	PCK Paper	0.004 (0.10)	White (printed)
	5915WF	White	0.016 (0.4) ±15%	Modified	Very Conf	43 (690)	PE Film	0.005 (0.13)	Red (printed)
	5925	Black	0.025 (0.6) ±15%	Modified	Very Conf	37 (590)	PE Film	0.005 (0.13)	Red (printed)
	5925P	Black	0.025 (0.6) ±15%	Modified	Very Conf	37 (590)	PCK Paper	0.004 (0.10)	White (printed)
	5925WF	White	0.025 (0.6) ±15%	Modified	Very Conf	37 (590)	PE Film	0.005 (0.13)	Red (printed)
	5930	Black	0.032 (0.8) ±15%	Modified	Very Conf	37 (590)	PE Film	0.005 (0.13)	Red (printed)
	5930P	Black	0.032 (0.8) ±15%	Modified	Very Conf	37 (590)	PCK Paper	0.004 (0.10)	White (printed)
	5930WF	White	0.032 (0.8) ±15%	Modified	Very Conf	37 (590)	PE Film	0.005 (0.13)	Red (printed)
	5952	Black	0.045 (1.1) ±10%	Modified	Very Conf	37 (590)	PE Film	0.005 (0.13)	Red (printed)
	5952P	Black	0.045 (1.1) ±10%	Modified	Very Conf	37 (590)	PCK Paper	0.004 (0.10)	White (printed)
	5952WF	White	0.045 (1.1) ±10%	Modified	Very Conf	37 (590)	PE Film	0.005 (0.13)	Red (printed)
	5958FR	Black	0.040 (1.0) ±10%	Modified	Very Conf	50 (800)	PE Film	0.005 (0.13)	Red (printed)
	5962	Black	0.062 (1.6) ±10%	Modified	Very Conf	37 (590)	PE Film	0.005 (0.13)	Red (printed)
	5962P	Black	0.062 (1.6) ±10%	Modified	Very Conf	37 (590)	PCK Paper	0.004 (0.10)	White (printed)
	5962WF	White	0.062 (1.6) ±10%	Modified	Very Conf	37 (590)	PE Film	0.005 (0.13)	Red (printed)
RP	RP16	Gray	0.016 (0.4) ±15%	Multi-Purp	Conform	45 (720)	Dk Paper	0.003 (0.08)	White (printed)
	RP16F	Gray	0.016 (0.4) ±15%	Multi-Purp	Conform	45 (720)	PE Film	0.005 (0.13)	Red (printed)
	RP25	Gray	0.025 (0.6) ±15%	Multi-Purp	Conform	45 (720)	Dk Paper	0.003 (0.08)	White (printed)
	RP25F	Gray	0.025 (0.6) ±15%	Multi-Purp	Conform	45 (720)	PE Film	0.005 (0.13)	Red (printed)
	RP32	Gray	0.032 (0.8) ±15%	Multi-Purp	Conform	45 (720)	Dk Paper	0.003 (0.08)	White (printed)
	RP32F	Gray	0.032 (0.8) ±15%	Multi-Purp	Conform	45 (720)	PE Film	0.005 (0.13)	Red (printed)
	RP45	Gray	0.045 (1.1) ±10%	Multi-Purp	Conform	45 (720)	Dk Paper	0.003 (0.08)	White (printed)
	RP45F	Gray	0.045 (1.1) ±10%	Multi-Purp	Conform	45 (720)	PE Film	0.005 (0.13)	Red (printed)
	RP62	Gray	0.062 (1.6) ±10%	Multi-Purp	Conform	45 (720)	Dk Paper	0.003 (0.08)	White (printed)
	RP62F	Gray	0.062 (1.6) ±10%	Multi-Purp	Conform	45 (720)	PE Film	0.005 (0.13)	Red (printed)

3M™ VHB™ Tapes

Available Sizes

Tape Thickness Inches (mm)	Standard Length yards (meters)	Minimum Width Inches (mm)	Maximum Width Inches (mm)	Maximum Roll Length: Width 1/4"up to 3/8" (6.4mm up to 9.5mm) yards (meters)	Maximum Roll Length: Width >3/8" up to 1/2" (>9.5mm up to 12.7mm) yards (meters)	Maximum Roll Length: Width 1/2" and wider (12.7mm and wider) yards (meters)
< 0.015 (0.4)	72 (65.8)	0.5 (13)	46 (1168)	N/A N/A	N/A N/A	See Note Below
0.015/0.016 (0.4)	72 (65.8)	0.25 (6)	48* (1219)	144 (131.7)	175 (160.0)	360 (329.2)
0.025 (0.6)	72 (65.8)	0.25 (6)	48* (1219)	72 (65.8)	108 (98.8)	175 (160.0)
0.032 (0.8)	72 (65.8)	0.25 (6)	48 (1219)	72 (65.8)	108 (98.8)	175 (160.0)
0.040 (1.0)	36 (32.9)	0.25 (6)	48 (1219)	72 (65.8)	108 (98.8)	144 (131.7)
0.045 (1.1)	36 (32.9)	0.25 (6)	48 (1219)	72 (65.8)	108 (98.8)	144 (131.7)
0.062 (1.6)	36 (32.9)	0.25 (6)	46 (1168)	72 (65.8)	72 (65.8)	108 (98.8)
0.090 (2.3)	36 (32.9)	0.25 (6)	46 (1168)	36 (32.9)	36 (32.9)	72 (65.8)

*Exception – 5915 (P) max. width 46 inches (1168 mm); 5925 (P) max. width 47 inches (1194 mm).

Note: 5952 family tapes thinner than 0.015 in (0.4 mm) have max. length 360 yd (329.2 m) for widths 1 in (25 mm) to 8 in (203 mm) and 180 yd (164.6 m) for all other widths.

Slitting Tolerance

Standard slitting tolerance ± 1/32 inch (± 0.031 inch, ± 0.79 mm).

Precision slitting with slitting tolerance of ± 1/64 inch (± 0.016 in., ± 0.41 mm) is available on select products with minimum order of full web increments.

Core Size

All products are provided on a 3 inch ID Core (76.2 mm)

Converted Parts

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.

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™ Tape cores as the lot number. 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 9266 would translate to a date of manufacture of Sept. 22 (266th day of year) in 2009. On most products this is found as the 4 digits after the "9" following the product number. For tapes printed continuously around the core (e.g. 3M™ VHB™ Tape 5952 family) the lot number typically will be the string of 4 digits preceding the product number.

Special Cases:

Plasticized Vinyl – Plasticizers compounded in soft vinyl can migrate into adhesives and significantly change their performance characteristics. 3M™ VHB™ Tapes 4941 family has very good plasticizer resistance and adhesion to many vinyl formulations. Because of the wide variation in vinyl formulations, however, evaluation by the user must be conducted with the specific vinyl used to ensure that performance will be satisfactory over time. Problems related to plasticizer migration can often be predicted by accelerated aging of assembled parts at 150°F (66°C) for one week).

3M™ VHB™ Tapes

Typical Performance Characteristics

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

3M™ VHB™ Tapes				Dynamic Adhesion Performance		
Family	Product Number	Color	Thickness Inches	90° Peel Adhesion lb/in N/cm	Normal Tensile lb/in² kPa	Dynamic Overlap Shear lb/in² kPa
4941	4919F	Black	0.025	17 (30)	90 (620)	80 (550)
	4926	Gray	0.015	14 (25)	95 (660)	90 (620)
	4936(F)	Gray	0.025	17 (30)	90 (620)	80 (550)
	4941(F)	Gray	0.045	22 (39)	85 (590)	70 (480)
	4947F	Black	0.045	22 (39)	85 (590)	70 (480)
	4956(F)	Gray	0.062	22 (39)	80 (550)	70 (480)
	4979F	Black	0.062	22 (39)	80 (550)	70 (480)
	4991	Gray	0.090	22 (39)	70 (480)	65 (450)
	4991B	Black	0.090	22 (39)	70 (480)	65 (450)
5952	5906	Black	0.006	9 (16)	100 (690)	100 (690)
	5907	Black	0.008	10 (18)	100 (690)	100 (690)
	5908	Black	0.010	12 (21)	100 (690)	100 (690)
	5909	Black	0.012	12 (21)	100 (690)	100 (690)
	5915(P)	Black	0.016	14 (25)	90 (620)	90 (620)
	5915WF	White	0.016	14 (25)	90 (620)	90 (620)
	5925(P)	Black	0.025	17 (30)	90 (620)	90 (620)
	5925WF	White	0.025	17 (30)	90 (620)	90 (620)
	5930(P)	White	0.032	19 (33)	90 (620)	85 (590)
	5930WF	Black	0.032	19 (33)	90 (620)	85 (590)
	5952(P)	Black	0.045	22 (39)	90 (620)	80 (550)
	5952WF	White	0.045	22 (39)	90 (620)	80 (550)
	5958FR	Black	0.040	20 (35)	100 (690)	100 (690)
	5962(P)	Black	0.062	22 (39)	90 (620)	80 (550)
	5962WF	White	0.062	22 (39)	90 (620)	80 (550)
RP	RP16(F)	Gray	0.016	12 (21)	95 (660)	90 (620)
	RP25(F)	Gray	0.025	17 (30)	90 (620)	80 (550)
	RP32(F)	Gray	0.032	18 (32)	85 (590)	75 (520)
	RP45(F)	Gray	0.045	20 (35)	85 (590)	70 (480)
	RP62(F)	Gray	0.062	20 (35)	80 (550)	70 (480)

90° Peel Adhesion - Based on ASTM D3330 -To stainless steel, room temperature, jaw speed 12 in/min (304.8 mm/min). Average force to remove is measured. 72 hour dwell.

Normal Tensile (T-Block Tensile) - ASTM D-897 - To aluminum, room temperature, 1 in² (6.45 cm²), jaw speed 2 in/min (50.8 mm/min) Peak force to separate is measured. 72 hour dwell.

Dynamic Overlap Shear - ASTM D-1002 - To stainless steel, room temperature, 1 in² (6.45 cm²), jaw speed 0.5 in/min (12.7 mm/min) Peak force to separate is measured. 72 hour dwell.

Synshjelpemidler AS Sporveisgata 10, 0354 Oslo, tlf: 23215555
Mail: universell-support@synshjelpemidler.no

Synshjelpemidler AS
Norges Blindeforbund

3M™ VHB™ Tapes

Typical Performance Characteristics

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

3M™ VHB™ Tapes				Static Shear				Temperature Tolerance	
Family	Product Number	Color	Thickness Inches	72°F (22°C)	150°F (66°C)	200°F (93°C)	250°F (121°C)	Short Term (Minutes, Hours) °F (°C)	Long Term (Days, Weeks) °F (°C)
4941	4919F	Black	0.025	1000	500	500		300 (149)	200 (93)
	4926	Gray	0.015	1000	500	500		300 (149)	200 (93)
	4936(F)	Gray	0.025	1000	500	500		300 (149)	200 (93)
	4941(F)	Gray	0.045	1000	500	500		300 (149)	200 (93)
	4947F	Black	0.045	1000	500	500		300 (149)	200 (93
	4956(F)	Gray	0.062	1000	500	500		300 (149)	200 (93)
	4979F	Black	0.062	1000	500	500		300 (149)	200 (93)
	4991	Gray	0.090	1000	500	500		250 (121)	200 (93)
	4991B	Black	0.090	1000	500	500		250 (121)	200 (93)
5952	5906	Black	0.006	1000	500	500	250	300 (149)	250 (121)
	5907	Black	0.008	1000	500	500	250	300 (149)	250 (121)
	5908	Black	0.010	1000	500	500	250	300 (149)	250 (121)
	5909	Black	0.012	1000	500	500	250	300 (149)	250 (121)
	5915(P)	Black	0.016	1000	500	500	250	300 (149)	250 (121)
	5915WF	White	0.016	1000	500	500	250	300 (149)	250 (121)
	5925(P)	Black	0.025	1000	500	500	250	300 (149)	250 (121)
	5925WF	Black	0.032	1000	500	500	250	300 (149)	250 (121)
	5930(P)	Black	0.032	1000	500	500	250	300 (149)	250 (121)
	5930WF	White	0.032	1000	500	500	250	300 (149)	250 (121)
	5952(P)	Black	0.045	1000	500	500	250	300 (149)	250 (121)
	5952WF	White	0.045	1000	500	500	250	300 (149)	250 (121)
	5958FR	Black	0.040	1000	350	250		300 (149)	200 (93)
	5962(P)	Black	0.062	1000	500	500	250	300 (149)	250 (121)
	5962WF	White	0.062	1000	500	500	250	300 (149)	250 (121)
RP	RP16(F)	Gray	0.016	1000	500	500		250 (121)	200 (93)
	RP25(F)	Gray	0.025	1000	500	500		250 (121)	200 (93)
	RP32(F)	Gray	0.032	1000	500	500		250 (121)	200 (93)
	RP45(F)	Gray	0.045	1000	500	500		250 (121)	200 (93)
	RP62(F)	Gray	0.062	1000	500	500		250 (121)	200 (93)

Static Shear - ASTM D3654 - To stainless steel, tested at various temperatures and gram loadings. 0.5 in² (3.23 cm²). Will hold listed weight for 10,000 minutes (approximately 7 days). Conversion: 1500 g/0.5 in² equals 6.6 lb/in²; 500 g/0.5 in² = 2.2 lb/in².

Short Term Temperature Tolerance - No change in room temperature dynamic shear properties following 4 hours conditioning at indicated temperature with 100 g/static load. (Represents minutes, hours in a process type temperature exposure).

Long Term Temperature Tolerance - Maximum temperature where tape supports at least 250 g load per 0.5 in² in static shear for 10,000 minutes. (Represents continuous exposure for days or weeks).

3M™ VHB™ Tapes

Additional Typical Performance Characteristics

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

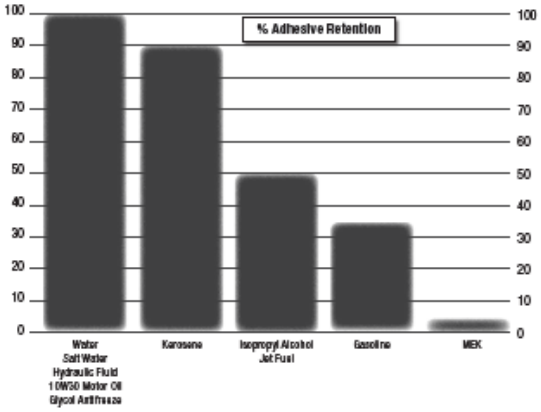
	3M™ VHB™ Tape 4941	3M™ VHB™ Tape 5952	Units	Test Standard
Dielectric Constant	2.29 1.99	2.14 1.95	at 1 kHz at 1MHz	ASTM D150 ASTM D150
Dissipation Factor	0.0245 0.0374	0.0065 0.0506	at 1 kHz at 1MHz	ASTM D150 ASTM D150
Dielectric Breakdown Strength	14 (360)	18 (455)	V/µm (V/mil)	ASTM D140
Thermal Conductivity (k value)	0.08 (0.5)	0.05 (0.4)	W/mK (BTU•in/hr•ft²•°F)	
Volume Resisitivity	2.1×10^{14}	2.5×10^{14}	Ω-cm	ASTM D257
Surface Resisitivity	2.7×10^{14}	$>10^{16}$	Ω/sq	ASTM D257
Water Vapor Transmission Rate	25.6	37.1	g/m²•day	ASTM F1249 at 38°C/100% RH
Thermal Properties of Modeling				
Thermal Coefficient of Expansion	180 (100)		10^{-6} m/m/°C (10^{-6} in/in/°F)	
Shear Modulus (at 25°C, 1 Hz)	3×10^{5}		Pa	

3M™ VHB™ Tapes
UL746C Listings - File MH 17478
Category QOQW2 Component - Polymeric Adhesive Systems, Electrical Equipment

3M™ VHB™ Tapes/ Product Families	Substrates	Temperature Rating Minimum	Maximum
4919F, 4926, 4936, 4936F, 4941, 4941F, 4947F, 4956, 4956F, 4979F	Ceramic	-35°C	110°C
	Aluminum, Galvanized Steel, Stainless Steel, Enameled Steel, Nickel Coated ABS, Glass (with or without Silane Coating) PVC, Glass/Epoxy, PBT, Polycarbonate, Acrylic/Polyurethane Paint, Polyester Paint	-35°C	90°C
	ABS	-35°C	75°C
4991	Polycarbonate, Aluminum, Acrylic/ Polyurethane Paint, Polyester Paint	-35°	90°C
5915, 5915P, 5915WF, 5925, 5925P, 5925WF, 5930, 5930P, 5930WF, 5952, 5952P, 5952WF, 5962, 5962P, 5962WF	Polycarbonate, Primer 94 Coated Polycarbonate, Aluminum, Acrylic/ Polyurethane Paint, Galvanized Steel, Polyester Paint, Epoxy Paint, Silane Coated Glass, Uncoated Glass, Stainless Steel, Enameled Steel, Glass Epoxy, Polybutylene Terephthalate, Nylon, Polyphenelene Ether (PPE), Acrylic	-35°C	90°C
	Rigid PVC, ABS	-35°C	75°C
5952, 5952P, 5952WF	Cellulose Acetate Butyrate	-35°C	90°C
RP16	Aluminum, Silane Coated Glass	-35°C	90°C
	PVC, ABS	-35°C	75°C
RP16, RP25, RP32, RP45, RP62	Galvanized Steel, Enameled Steel, Nylon, Polycarbonate, Glass Epoxy, Phenolic, PPE/PS Blend, PBT, Epoxy Paint, Polyester Paint, Adhesion Promoter 111 Coated Epoxy Paint, Promoter 111 Coated Polyester Paint, Acrylic Urethane Paint, Epoxy/ Polyester Paint	-35°C	90°C
RP62	Stainless Steel, Glass, Acrylic	-35°C	90°C
	PVC, ABS	-35°C	75°C

A current list can be found at www.ul.com (select certifications, search file MH17478)

Solvent and Fuel Resistance



Test Method

- Tape between stainless steel and aluminum foil
- 72 hours dwell at room temperature
- Solvent immersion for 72 hours
- Test within 45 minutes after removing from solvent
- 90° peel angle
- 12 in/min rate of peel
- Peel adhesion compared to control

Note: Continuous submersion in chemical solutions is not recommended. The above information is presented to show that occasional chemical contact should not be detrimental to tape performance in most applications in ordinary use.

Burn Characteristics 3M™ VHB™ Tape 5958FR
Meets FAR 25.853 (a) 12 second vertical burn, Appendix F, Part I (a)(ii)
Meets NBS Smoking Density (ASTM F814/E662)
Meets Toxicity (Draeger Tube ABD0031, AITM 3.0005)

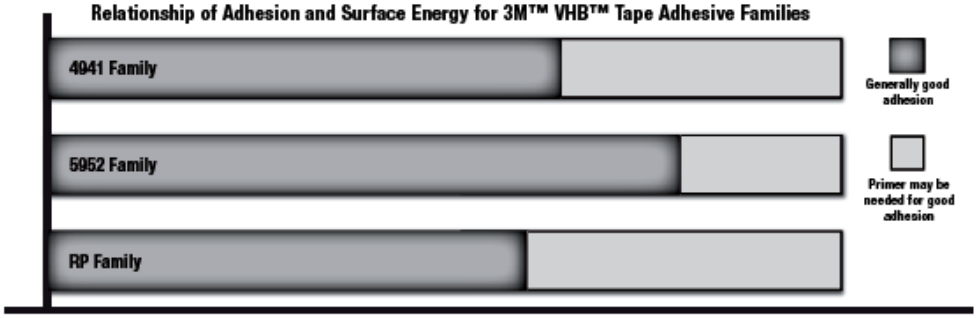
3M™ VHB™ Tapes

Design and Tape Selection Considerations

► **Choose the right tape for the substrate:** 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.

This illustration demonstrates the effect of surface energy on adhesive interfacial contact. High surface energy materials draw the adhesive closer for high bond strength.

Relationship of Adhesion and Surface Energy for 3M™ VHB™ Tape Adhesive Families



Aluminum	Polyimide	ABS	PVA	EVA
Stainless Steel	Phenolic	Polycarbonate	Polystyrene	Polyethylene
Copper	Nylon	PVC	Acetal	Polypropylene
Zinc	Alkyd Enamel	PPE	PVDF Paint	PVF
Tin	Polyester	Acrylic	Powder Paint	Silicone
Lead	Epoxy Paint	PU Enamel		PTFE
Anodized Aluminum	Polyurethane	Powder Paint		
Glass				

NOTES: There are a wide variety of formulations, surfaces finishes and surface treatments available on substrate materials which can affect adhesion. This chart is intended to provide only a rough estimate of the adhesion levels which can be expected on some common materials relative to a reference surface such as aluminum.

Foam type can affect and/or limit maximum adhesive strength.

► **Use the right tape thickness:** 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.

► **Use the right amount of tape:** 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^2 of tape per kg) of weight to be supported in order to prevent excessive creep. For **dynamic loads,** the dynamic performance characteristics provided on page 4 should be useful, factoring in the appropriate safety factors.

► **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.

► **Severe Cold Temperature:** 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.

3M™ VHB™ Tapes

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 temperatures:

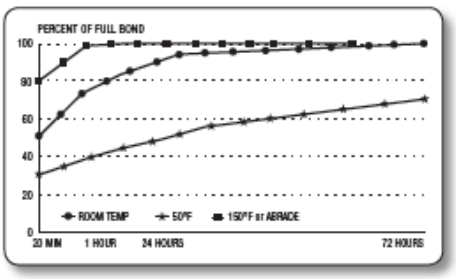
- 50°F (10°C): 3M™ VHB™ Tapes 5952 and RP families.
- 60°F (15°C): 3M™ VHB™ Tape 4941 family.

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.

Bond Typical Build vs. Time



3M™ VHB™ Tapes

Technical Information

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Product Selection and Use

Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. As a result, customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer's application, including conducting a workplace hazard assessment and reviewing all applicable regulations and standards (e.g., OSHA, ANSI, etc.). Failure to properly evaluate, select, and use a 3M product and appropriate safety products, or to meet all applicable safety regulations, may result in injury, sickness, death, and/or harm to property.

Warranty, Limited Remedy, and Disclaimer

3M warrants for 24 months from the date of manufacture that 3M™ VHB™ Tape will be free of defects in material and manufacture. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE. This warranty does not cover damage resulting from the use or inability to use 3M™ VHB™ Tape due to misuse, workmanship in application, or application or storage not in accordance with 3M recommended procedures (except to the extent 3M approves and issues a specific application warranty, for which the customer must apply, receive 3M approval, and meet all applicable warranty and process requirements, the additional details, terms, and conditions of which are available from 3M). If a 3M product does not conform to this warranty, then the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price.

Limitation of Liability

Except for the limited remedy stated above, and except to the extent prohibited by law, 3M will not be liable for any loss or damage arising from or related to the 3M product, whether direct, indirect, special, incidental, or consequential (including, but not limited to, lost profits or business opportunity), regardless of the legal or equitable theory asserted, including, but not limited to, warranty, contract, negligence, or strict liability.

ISO 9001

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

3M

Industrial Adhesives and Tapes Division
3M Center, Building 225-3S-06
St. Paul, MN 55144-1000
800-362-3550 • 877-369-2923 (Fax)
www.3M.com/vhb

3M

VHB™ GPH Series

Product Data Sheet

February 2017
Supersedes: August 2016

Product Description

3M™ VHB™ GPH Series, a general purpose, high temperature, grey conformable double coated acrylic foam tape with a high initial tack and a soft foam. Available in three different thicknesses with a 3M branded red siliconised polyethylene film liner.

Key Features

- Double coated acrylic foam tape
- 100 % closed cell acrylic foam
- High temperature performance (short term 230 °C)
- Good balance of high temperature and peel & shear performance
- High initial tack
- Soft foam enables stress relaxation & an easy application
- Good sealing properties
- For indoor and outdoor applications

Applications & Benefits

- Its temperature performance enables bonding of materials in applications with high operating temperatures such as prior to processing in a powder coating line
- Capability to bond to a variety of substrates makes it a good fit for multi material bonding - those substrates have a high or medium surface energy including many metals (e.g. stainless steel) and plastics (e.g. Polyamide, PMMA, ABS)
- For applications in metal working, signage, appliances and specialty vehicle

Physical Properties

	GPH-060GF	GPH-110GF	GPH-160GF
Adhesive Type	Acrylic foam adhesive		
Thickness acc. to ASTM D-3652	0.60 mm	1.10 mm	1.60 mm
Foam Density	710 kg/m³		
Release Liner	3M branded red siliconised polyethylene film		
Tape Colour	Grey		

Performance Characteristics

Type	GPH-060GF	GPH-110GF	GPH-160GF
90 ° Peel adhesion to Stainless Steel acc. to ASTM D3330, 90° peel angle @ RT, after 72h @ RT dwell	25 N/cm	37 N/cm	34 N/cm
90 ° Peel adhesion to PA6 acc. to ASTM D3330, 90° peel angle @ RT, after 72h @ RT dwell	33 N/cm	48 N/cm	55 N/cm
90 ° Peel adhesion to ABS acc. to ASTM D3330, 90° peel angle @ RT, after 72h @ RT dwell	21 N/cm	33 N/cm	32 N/cm
90 ° Peel adhesion to PMMA acc. to ASTM D3330, 90° peel angle @ RT, after 72h @ RT dwell	21 N/cm	34 N/cm	37 N/cm
Dynamic Shear acc. to ASTM D1002 on stainless steel, after 72h @ RT dwell	547 N/6.54 cm²	476 N/6.54 cm²	375 N/6.54 cm²
Static Shear Strength acc. to ASTM D3654, after 72h @ RT dwell (Weight held for 10.000 minutes to stainless steel, 3.32cm² (0.5in²)	23 °C - 1000 g 150 °C - 500 g		
Normal Tensile (T-Block) acc. to ASTM D897 to Aluminium @ RT, after 72h @ RT dwell, 6.45 cm², test speed 50 mm/min	410 N/6.54 cm²	439 N/6.54 cm²	470 N/6.54 cm²
Temperature Performance	Short term (minutes, hours): 230 °C Long term (days, weeks): 150 °C		

Application Temperature

Ideal application temperature range is 21 °C to 38 °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.

Shelf Life

24 months from date of production when stored at 16 °C – 25 °C and 40-65 % 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.

Important Notice	All statements, technical information and recommendations contained in this document are based upon tests or experience that 3M believes are reliable. However, many factors beyond 3M's control can affect the use and performance of a 3M product in a particular application, including the conditions under which the product is used and the time and environmental conditions in which the product is expected to perform. Since these factors are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method or application. All questions of liability relating to this product are governed by the terms of the sale subject, where applicable, to the prevailing law.

Values presented have been determined by standard test methods and are average values not to be used for specification purposes. Our recommendations on the use of our products are based on tests believed to be reliable but we would ask that you conduct your own tests to determine their suitability for your applications. This is because 3M cannot accept any responsibility or liability direct or consequential for loss or damage caused as a result of our recommendations.

3M Svenska AB
Industri
Bollstanäsvägen 3
191 89 Sollentuna
Tel: 08-92 21 00
Fax: 08-92 22 88
E-post:
kundservice@mmm.com
www.3M.se/tejp

3M a/s
Industri
Hannemanns Allé 53
2300 København S
Tlf.: 43 48 01 00
Fax.: 43 20 15 65
E-mail:
dkindustri@mmm.com
www.3Mindustri.dk

3M Norge AS
Avd. Industri
Hvamveien 6
2013 Skjetten
Tel: 0 63 84
Fax: 63 84 17 88
E-post:
Kundeservice@mmm.com
www.3M.no/tape

Suomen 3M Oy
Teollisuustuotteet
PL 600
Keilaranta 6
02151 Espoo
Puh: 09-525 21
Fax: 09-525 2279
www.3M.fi/teollisuus

DESMOPAN/TPU egenskaper:
Bayer variant!

Desmopan 3055DU PAH's/avgasser:

Statement on Polycyclic Aromatic Hydrocarbons (PAHs)

page 1 of 1

Polycyclic aromatic hydrocarbons (PAHs) have not been intentionally added for the production of the Covestro's thermoplastics

APEC, Bayblend, Desmopan, Makrolon and **Makroblend**

and are not expected to be contained.

The presence of analytically detectable traces of the above mentioned substances, which occur widely and have possibly been introduced into our product via the raw materials, auxiliaries and additives, can not be excluded.

An analysis of typical grades gave the following result:
Sum of PAHs: < 10 ppm
Benzo (a) pyrene: < 1 ppm

Covestro Deutschland AG
D-51365 Leverkusen, Germany
IO-S&A-PSRA
Product Safety & Regulatory Affairs

Date: 2015-10-23

Board of management: Patrick Thomas (chairman), Frank H. Lutz, Klaus Schäfer, Markus Steilemann
Chairman of the supervisory board: Richard Pott
Registered office: 51365 Leverkusen, Local court of Cologne, HRB 49892

Gerlinger AdhesiveTape

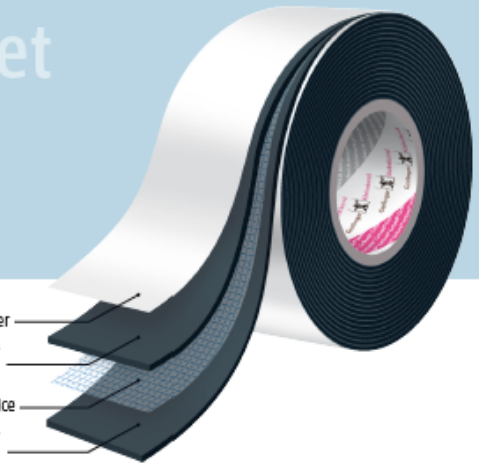
Technical Data Sheet

Gerband 625

Butyl rubber tape with cloth lattice, double sided adhesive

Gerband 625

Butyl Rubber Tapes



Gerband 625 is used for durable sealing of joints and gaps, for prevention of cold bridges and humidity migration as well as in construction sector in compliance with DIN 4108-7.

Product description

Carrier
- PP-cloth lattice; thickness approx. 0.1 mm
- Allows easy handling with strong reduction of the flowability and extensibility of the butyl rubber

Adhesive
- Butyl rubber adhesive
- Strongly adherent
- Very high tack

Release liner
- Silicone paper

Special features
- Fire performance class E, according to DIN EN 13 501-1
- Lasting water-resistance
- Very high ageing resistance

Colour
- Butyl rubber adhesive black

Applications

- Durable sealing of joints and gaps in appliance and vehicle construction
- Prevention of cold bridges and humidity migration
- For wind- and vapor-tight bonding of films and other airtight membranes in compliance with DIN 4108-7 in construction

With the same construction but different in butyl thickness are:
- Gerband 620 (Total thickness 0.6 mm)
- Gerband 622 (Total thickness 1.0 mm)
- Gerband 626 (Total thickness 2.0 mm)
- Gerband 627 (Total thickness 3.0 mm)

Technical data

Total thickness (DIN EN 1942)*	1.5 mm
Tensile strength (DIN EN 14410)*	≥70 N / 25 mm
Elongation at break (DIN EN 14410)*	≥15 %
Peel strength (IPM 5009)**	≥25 N / 25 mm
Temperature range	-30 °C to +80 °C
	at increasing temperature the adhesive mass becomes softer and stickier
Core diameter	76.5 mm

*according to the respective DIN **at 100 mm/min, 90° peel

Application notes

- Apply at temperatures from +5 °C to +40 °C
- Surfaces must be dry and free of release agents, grease, oil, tensides, dirt, and dust
- Preconditioning of porous or sandy subsurfaces recommended (with Gerband Butyl-Primer 6000 or Gerband Primer 6300)
- To be bonded as tension-free as possible and rubbed adequately onto surfaces
- The adhesion may be improved by applying higher pressure
- Not to be used for bondings under mechanical load
- Due to eventual plasticizer migration, the product's suitability on plastics and rubber is to be tested
- Not resistant against oil, many organic solvents, e.g. mineral spirits
- Store in dry rooms from +5 °C to +25 °C, protected from UV-radiation

Packaging unit

Roll length 10 m

Roll width mm	6	9	12	15	19	25	30	38	50	75	100	150	600
Rolls per carton	96	64	48	40	32	24	20	16	12	8	6	4	1

Different packaging units available upon request

Further technical data about Gerband 625 available upon request.

Subject to change without notice in line with product advancements.

As of July 2019 · replaces edition of February 2014

Gerlinger GmbH & Co. KG
Adhesive Tape Factories
Dietrich-Gerlinger-Straße 1-9
D-86720 Nördlingen, Germany
Telephone +49 (0) 90 81 213-0
Telefax +49 (0) 90 81 213-100
e-Mail info@gerband.de
Internet www.gerband.de

Certified according to DIN ISO 9001 and 14001 Reg.-Nr. 56398-QM

Gerband® adhesive tapes are used by a very diverse customer base for a wide range of technical and industrial applications. The demands made on Gerband® products vary considerably from application to application. We strongly advise users to test the product's suitability for their own particular requirement. All data and recommendations contained in this Technical Data Sheet are based on our own test results and practical experience and are aimed at helping customers select the appropriate tape for a given application. This information is provided without liability. We reserve the right to change the technical specification without prior notice. Samples are available free of charge. Our sales team is also available to assist customers with their tape.

FORVALTNING, DRIFT OG VEDLIKEHOLD

Brannegenskaper – Desmopan/Bayer varianten

All organic substances – including plastics – are combustible. A material's fire performance is essentially described by the following parameters:

- ignitability
- flame spread
- heat release
- smoke development (smoke density and toxicity of the fire gases)
- surface-to-mass ratio of the combustible materials

In addition to being influenced by the material-inherent components, fire performance is additionally determined by associated factors, such as

- distribution
- type of storage
- quantity of material
- thermal pre-treatment
- ventilation
- exposure time and intensity of the ignition source, etc.

In view of the complexity of the influencing variables, it is not possible to provide a universally valid description of the fire performance of Desmopan® grades. A large number of standards and regulations describe what are frequently highly specific applications and test procedures, but these do not have any absolute information value. In case of doubt, please contact our technical product support team, who will be pleased to provide advice and assistance at all times. A number of particularly important and widely-used fire tests are listed below. This list does not claim to be exhaustive.

UL 94 (Underwriters Laboratories)

Desmopan® grades without additives essentially attain an HB classification; a number of grades without flame retardants also achieve a V2 classification. We can send you Yellow Cards for a number of grades on request.

ISO 4589 (ASTM D 2863; Lowest Oxygen Index; LOI value)

The Lowest Oxygen Index (LOI) indicates the minimum oxygen concentration that must be present in an oxygen/nitrogen mixture for a material to burn. To measure the LOI, a mixture of O2/N2 with a decreasing O2 content is fed to a burning specimen until the flame extinguishes. Desmopan® grades attain values of between 18 and 24 %.

ISO 871 (ASTM D 1929; external ignition; self-ignition)

These tests involve exposing a sample to a pilot flame in a hot-air oven or determining the self-ignition temperature of the sample in the hot-air oven. This method can be used to compare different plastics under identical conditions, but it does not provide a generally-valid statement on combustibility or burning rate. Desmopan® grades have an external ignition temperature of between 350 and 400 °C, and a self-ignition temperature of between 450 and 600 °C.

Burning behavior to FMVSS 302

Various Desmopan® grades have been tested to test standard FMVSS 302. The requirements of the standard have always been satisfied. According to FMVSS 302, burning rates of up to 101.6 mm/min are permitted. The burning rates measured were between 15 and 65 mm/min, depending on the Desmopan® grade, the Shore hardness and the wall thickness. We thus assume that all Desmopan® grades satisfy the requirements of test standard FMVSS 302. Please contact us if you have any further questions in this respect.

DIN EN 50267-2-2 (corrosiveness of combustion gases)

All non-modified Desmopan® grades meet the requirements of this standard, which relates to the corrosiveness of the combustion gases.

Glow wire test to IEC 60695-2-12 (DIN EN 60695-2-12)

The material fulfils the requirements if none of the three specimens has a flaming combustion time of more than 30 sec. and if the underlying tissue paper is not ignited by flaming droplets. Values for this test are available for a number of Desmopan® grades.

Glow wire test to IEC 60695-2-13 (DIN EN 60695-2-13)

This specifies a temperature that is 25 °C higher than the highest temperature prevailing at the tip of the glowing wire which does not lead to ignition in three successive tests. (ignition is defined as a flame that is visible for more than 5 sec.) Values for this test are available for a number of Desmopan® grades. Additives can influence the fire performance of Desmopan® grades. Further details may be found in our Safety Data Sheets.

The Thermoplastics Testing Center (TTC) will carry out the following fire tests for you:

Fire Test Method	Standards
Flammability UL 94 HB	UL 94
Flammability UL 94 V	UL 94
Flammability UL 94-5V	UL 94
Electrical ignition source	IEC 60695-2-13
Glow wire	IEC 60695-2-12
HWI	ASTM D3874
Ash content	ISO 3451-1 in-house standard (rapid ash)

VDA CAMPUS® Datasheet

Desmopan® DP 3055D - TPU
Covestro Deutschland AG

Physical properties	I	M	E[1]	Value	Unit	Test Standard
Melt volume-flow rate, MVR	X	X	X	-	cm³/10min	ISO 1133
Temperature	X	X	X	-	°C	ISO 1133
Load	X	X	X	-	kg	ISO 1133
Viscosity number	X	X	X	*	cm³/g	ISO 307, 1157, 1628
Molding shrinkage, parallel	X	X	X	-	%	ISO 294-4, 2577
Molding shrinkage, normal	X	X	X	-	%	ISO 294-4, 2577
Humidity absorption	X	X	X	-	%	Sim. to ISO 62
Water absorption	X	X	X	-	%	Sim. to ISO 62
Density	X	X	X	1220	kg/m³	ISO 1183
Type and amount of reinforcement				-	-	ISO 3451-1
Mechanical properties	**I**	**M**	**E[1]**	**Value**	**Unit**	**Test Standard**
Tensile Modulus	X	X	X	-	MPa	ISO 527-1/-2
Yield stress	X	X	X	-	MPa	ISO 527-1/-2
Stress at break	X	X	X	-	MPa	ISO 527-1/-2
Yield strain	X	X	X	-	%	ISO 527-1/-2
Strain at break	X	X	X	-	%	ISO 527-1/-2
Charpy impact strength, +23°C	X	X	X	-	kJ/m²	ISO 179/1eU
Charpy notched impact strength, +23°C	X	X	X	-	kJ/m²	ISO 179/1eA
Charpy impact strength, -30°C	X	X	X	-	kJ/m²	ISO 179/1eU
Charpy notched impact strength, -30°C	X	X	X	-	kJ/m²	ISO 179/1eA
Puncture test - ductile/brittle transition temperature	X		X	-	°C	ISO 6603-2
Thermal properties	**I**	**M**	**E[1]**	**Value**	**Unit**	**Test Standard**
Melting temperature, 10°C/min	X	X	X	*	°C	ISO 11357-1/-3
Temp. of deflection under load, 1.80 MPa	X	X	X	-	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	X	X	X	-	°C	ISO 75-1/-2
Temp. of deflection under load, 8.00 MPa	X	X	X	-	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h 50N	X	X	X	-	°C	ISO 306
Coeff. of linear therm. expansion -40°C to +100°C, parallel	X	X	X	-	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion -40°C to +100°C, normal	X	X	X	-	E-6/K	ISO 11359-1/-2
FMVSS				-	-	ISO 3795 (FMVSS 302)
Burning rate, Thickness 1 mm	X			-	mm/min	ISO 3795 (FMVSS 302)
Burning Behav. at 1.5 mm nom. thickn.		X	X	-	class	IEC 60695-11-10
Emission / Odor	**I**	**M**	**E[1]**	**Value**	**Unit**	**Test Standard**
Emission of organic compounds	X			-	µgC/g	VDA 277
Thermal desorption analysis of organic emissions	X			-	µg/g	VDA 278
Odor test	X	X[2]		-	class	VDA 270
Weather stability, ISO 4892-2, Method A	**I**	**M**	**E[1]**	**Value**	**Unit**	**Test Standard**
Weather stability delta l			X	-	-	DIN 53236
Weather stability delta a			X	-	-	DIN 53236
Weather stability delta b			X	-	-	DIN 53236
Weather stability delta E			X	-	-	DIN 53236
Weather stability grey scale			X	-	-	ISO 105-A02
Light stability, ISO 4892-2, Method B	**I**	**M**	**E[1]**	**Value**	**Unit**	**Test Standard**
Light stability delta l	X		X	-	-	DIN 53236

[1] I=Interior parts, M=Parts in motor compartment, E=Exterior parts
[2] air-ducting parts with contact to interior

Datasheet according to an agreement between VDA (Association of the Automotive Industry) and CAMPUS®
All data is subject to the producer's disclaimer.
http://www.campusplastics.com - Covestro - 2015-10-29

Desmopan® DP 3055D - TPU
Covestro Deutschland AG

Light stability delta a	X	X	-	-	DIN 53236
Light stability delta b	X	X	-	-	DIN 53236
Light stability delta E	X	X	-	-	DIN 53236
Light stability grey scale	X	X	-	-	ISO 105-A02

Dynamic mechanical analysis (I,M,E)

Dynamic Shear modulus-temperature
No data available

Dynamic Tensile modulus-temperature
No data available

Miljø: Alle Desmopan (TPU) elementer er miljøvennlige i forhold til andre tilsvarende materialer. De er 100% resirkulerbare og nedbrytbare. Svart og lys grå Desmopan (TPU) leveres som std. med 100% resirkulerbart materiale.

See other related properties:
Link: https://www.tpu.covestro.com/Technologies/Properties/Chemical-Physical-Structure.aspx

TPU BASF varianten (svart og lys grå):

OLEJAR safety

Technical properties

GENERAL OVERVIEW

Ether TPU based on 100% recycled industrial waste, suitable for injection moulding and extrusion

Resin type	Version	Performance	Colour	Processing
TPU Industrial Regrind	Ether based	Abrasion resistance Hydrolysis resistance	Black	Extrusion / Injection M.

PROPERTIES

Property	Method	Unit	Value
Density	ISO 1183-1	g/cm³	1,14
Hardness	ISO 868	Shore A	75
Abrasion resistance	EN 12770	mm³	40
Tensile Strength	EN 12803	MPa	38
Elongation at Break	EN 12803	MPa	> 650
Tear Strength	ISO 34	KN/m	50
Stress at 50% elongation	EN 12803	Mpa	3,5
Stress at 100% elongation	EN 12803	MPa	5
Stress at 300% elongation	EN 12803	MPa	8
Compression set at room temperature	ISO 815-1	%	20
Compression set at 70 °C	ISO 815-1	%	42
Glass transition temperature (Tg)	DMA	°C	-40
Flammability	UL – 94		
Charpy notched impact strength (+23°C)	ISO 179-1	kJ/m²	no break
Charpy notched impact strength (-30°C)	ISO 179-1	kJ/m²	no break

PROCESSING DATA

Maximum shear rate	m/s		0,2
Melt temperature	°C		190-215
Mould temperature (depend on application)	°C		20-80
Extrusion die temperature optimum	MPa		200-210
Drying: temperature/time (circulating air)	°C / hours		100/ 2-3
Drying: temperature/time (dehumidified dryer)	°C / hours		90/ 2-3
Moisture content	%	ISO 3344	max 0,05
Manufacturing shrinkage for 1mm wall thickness	%	ISO 294-4	1
Manufacturing shrinkage for 6mm wall thickness	%	ISO 294-4	2

The information contained herein are supplied in good faith and given purely as an indication. Properties should be carefully evaluated for all projects requirements. Unless otherwise posted this product is not suitable for food and/or medical application and use. They shall not be considered in any way as a formal commitment or warranty on our part especially in case of improper use of our products from third parties. SCT REV. 2

5

100% resirkulert materiale. Kan enkelt resirkuleres 100% som TPU resirkulerings kode 7 TPU

Sklihemmende dokumentasjon (testrapport):

(krav i TEK 10/17 om produktene skal legges ved/i trappeløp)

TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
Technical and Test Institute for Constructions Prague
Akreditovaná zkušební laboratoř, Autorizovaná osoba, Certifikační orgán, Inspekční orgán
Accredited Test Laboratory, Authorised Body, Certification Body, Inspection Body

Branch 0300 – Plzeň

REPORT

No. 030 – 051633

on determination of slipperiness

Customer: **OLEJÁR, spol. s r.o.**
Nižná Polianka 65
086 36 Nižná Polianka, Slovakia

Order no.: – – from 20. 5. 2015

Order No.: Z030150209

Enclosures: –

This Report has been made in duplicate. The first original copy is for the customer, the other will be filed along with other documentation in TZÚS Plzeň.

Person responsible for the wording of this Report:

Kotorová

Ing.Hana Kotorová
Report Author

Person responsible for the correctness of this Report:

Plzeň 4th June 2015

TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
Pobočka Plzeň
326 00 Plzeň-Slovany, Zahradní 15
IČ 00015679 (1)

Stamp TZÚS - Plzeň Branch

Ing. Alexander Trinner
Branch Manager

Statement:
1) *The test results relate to the items under test (samples) only.*
2) *This report may not be reproduced otherwise than complete without the written consent of TZÚS.*

Technický a zkušební ústav stavební Praha, s. p., Pobočka 0300 - Plzeň, Zahradní 15, 326 00 Plzeň, Česká republika
☎: 377 243 331, ☎: 377 430 345, Fax:+420 377 430 347, Internat.:+420 377 244 158, e-mail: kotorova@tzus.cz, www.tzus.cz
Bankovní spojení (Bank): KB Praha 1 Czech Republic, ú.č.: 1501-931/0100 IČ: 000 15679 DIČ/VAT: CZ00015679

1 Initial Data

1.1 Assignment

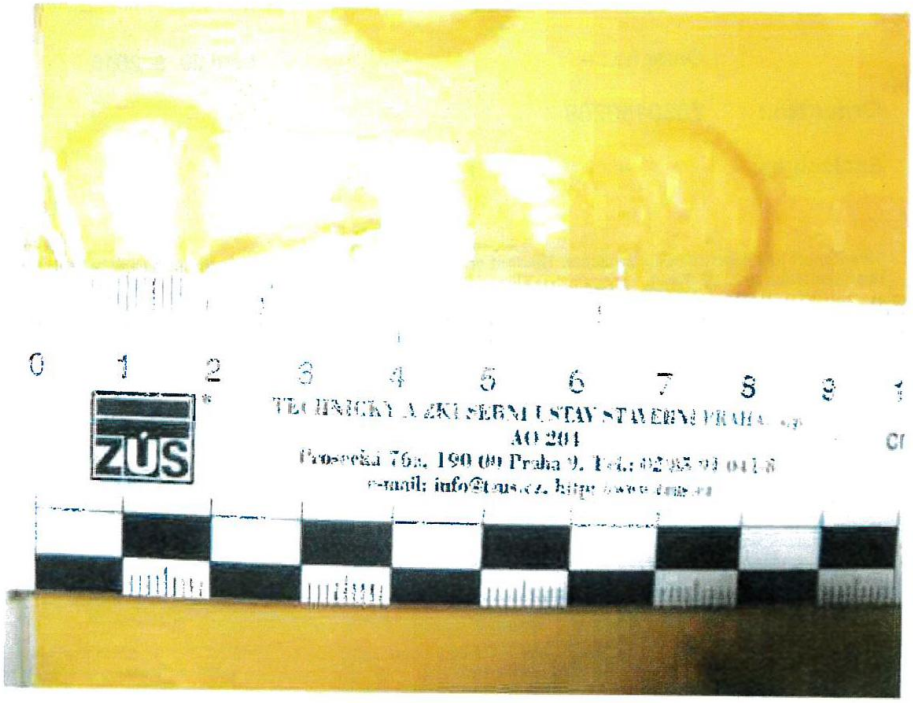
- Execution of tests of slipperiness of flooring according the requirement of the client:
  - **determination of slipperiness – walking methods – ramp test** (shoes) according DIN 51130, P CEN/TS 16165 (annex B)

1.2 Samples

- Sample specification: Polyurethane Floorings
  flooring: TPUP tactile warning plates
  flooring: TPU tactile warning studs
  flooring: TPU tactile guiding strips
  flooring: TPUP tactile guiding plates
- Producer: OLEJÁR, spol. s r.o., Nižná Polianka 65, 086 36 Nižná Polianka, Slovakia
- Samples supplied on 10. 4. 2015.

2 Sampling Method

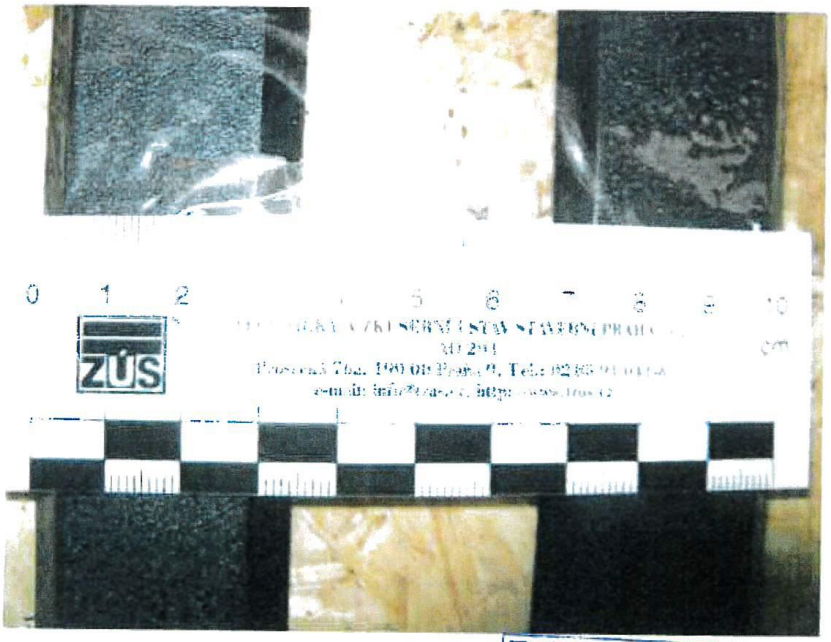
The test specimens of approximate overall dimensions of 60×100 cm were delivered by the customer to Plzeň Branch in four types. After takeover, the specimens were registered as follows: No. VZ 030150572



TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
Pobočka Plzeň
326 00 Plzeň-Slovany, Zahradní 16
IČ 00015679 (1)

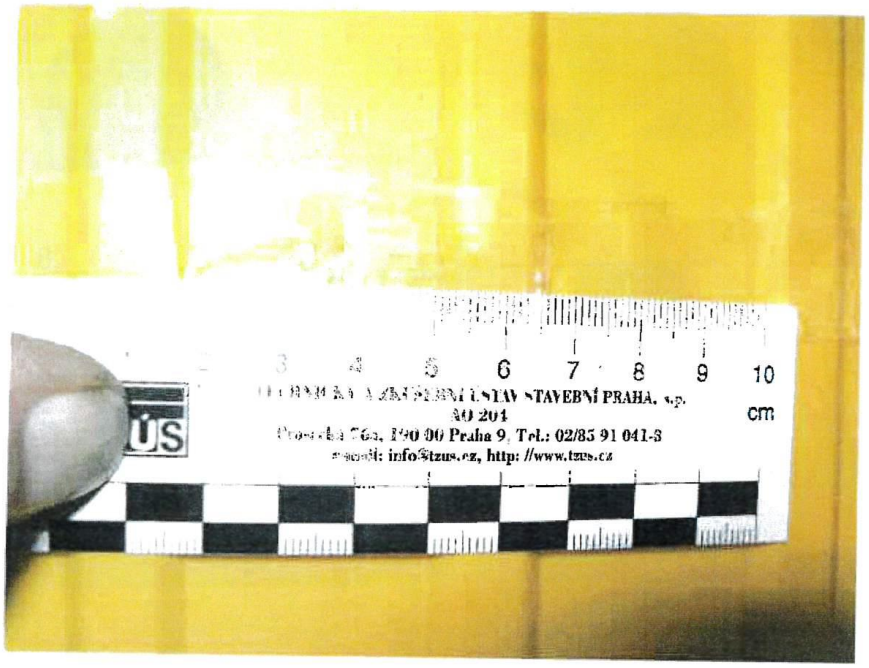
No. VZ 030150573

No. VZ 030150574



TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
Pobočka Plzeň
326 00 Plzeň-Slovany, Zahradní 15
IČ 00015679
(1)

No. VZ 030150575



As required by the customer, slip resistance was determined according to DIN 51130, ČSN P CEN/TS 16165 (Annex B). Other slip resistance testing methods (pendulum swing method, tribometric method, friction coefficient, ...) are not suitable for this flooring relief type as they would distort the results of the slip resistance tests of the face surface.

TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
Pobočka Plzeň
326 00 Plzeň-Slovany, Zahradní 15
IČ 00015679 (1)

3 Testing Procedures

DIN 51130	Testing of floor coverings – Determination of the anti-slip property – Workrooms and fields of activities with slip danger – Walking method – Ramp test
P CEN/TS 16165	Determination of slip resistance of pedestrian surfaces – Methods of evaluation

4 Measurements and Tests

Determination of slipperiness – walking methods – ramp test DIN 51130, P CEN/TS 16165 (method B)

Flooring designation	Critical angle of slip classification shoe	
VZ 030150572 (TPUP tactile warning plates)	23,3°	R11
VZ 030150573 (TPU tactile warning studs)	21,3°	R11
VZ 030150574 (TPU tactile guiding strips)	14,7°	R10
VZ 030150575 (TPUP tactile guiding plates)	17,5°	R10

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FORVALTNING, DRIFT OG VEDLIKEHOLD

5 Conclusion

5.1

The polyurethane flooring under test **TPUP tactile warning plates, TPU tactile warning studs** manufactured by OLEJÁR, spol. s r.o., Nižná Polianka 65, 086 36 Nižná Polianka, Slovakia was classified according DIN51130, P CEN/TS 16165 (method B) into **Group R 11** and can be used to secure the assembly floor eg. for kitchens with a capacity of up to 100 meals a day, school kitchens, stores, factories juices etc.

The polyurethane flooring can also be used as Group R10 can therefore be used to construct safe floors, for instance in storerooms, kitchens where food is defrosted and heated, in sanitary rooms, in rooms where packaged meat is sold, etc.)
and as Group R9 (to construct safe floors, for instance in rooms for medical diagnostic equipment, massage rooms, laboratories, etc.).
The flooring also **meets the requirements** specified in Art. 4.17 of **ČSN 74 4505 Floors – Common Provisions in accordance with** Article 21(2),(3) of **Regulation No. 268/2009 Coll., on technical requirements for products, for floors in all apartment and dwelling rooms** that must conform to **the value of slipping angle of at least 6°, and it also meets the requirements for floors in the parts of structures used by the public including shopping arcades and covered passageways** that must conform to **the value of slipping angle of at least 10°.**

To secure the proper slip-resistant function of the flooring in conformity with the conclusion above, one has to keep the surface clean and free from excessive wear. Other properties were not subject to the tests.

5.2

The polyurethane flooring under test - **TPU tactile guiding strips, TPUP tactile guiding plates** - manufactured by OLEJÁR, spol. s r.o., Nižná Polianka 65, 086 36 Nižná Polianka, Slovakia, was classified according DIN51130, P CEN/TS 16165 (method B) into **Group R 10** during the test carried out according to DIN 51130 and can therefore be used to construct safe floors, for instance in storerooms, kitchens where food is defrosted and heated, in sanitary rooms, in rooms where packaged meat is sold, etc.);
and can also be used as Group R9 (to construct safe floors, for instance in rooms for medical diagnostic equipment, massage rooms, laboratories, etc.).
The flooring also **meets the requirements** specified in Art. 4.17 of **ČSN 74 4505 Floors – Common Provisions in accordance with** Article 21(2),(3) of **Regulation No. 268/2009 Coll., on technical requirements for products, for floors in all apartment and dwelling rooms** that must conform to **the value of slipping angle of at least 6°, and it also meets the requirements for floors in the parts of structures used by the public including shopping arcades and covered passageways** that must conform to **the value of slipping angle of at least 10°.**

To secure the proper slip-resistant function of the flooring in conformity with the conclusion above, one has to keep the surface clean and free from excessive wear. Other properties were not subject to the tests.

END OF REPORT

TZÚS TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p. Pobočka Plzeň 326 00 Plzeň-Slovany, Zahradní 15 IČ 00015679

Moldings made of Desmopan®/TPU must be identified and marked in accordance with DIN/ISO 11469 and ISO 11469:

>TPU<

All Desmopan®/TPU grades can be stably remelted and therefore reprocessed as part of recycling programs (always pre-dry).