



Different Types of Adhesive Tapes & Its Application in Apparel Industry

Sayantana Raha

Assistant Professor, Amity School of Fashion Technology, Kolkata
sraha@kol.amity.in

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ABSTRACT

Adhesive, also recognized as glue, cement, mucilage, or paste, is any non-metallic substance applied to one or both surfaces of two separate items that binds them together and resists their separation. Adhesives are active connecting substances with vast application and market value. The application areas of adhesive are increasingly expanding in Garment & textile industries. This paper discusses the types, composition, bonding mechanisms and application characteristics of apparel-related adhesives, based on their source of manufacturing. This paper will expedite the types, manufacturers & core application in apparel industries.

Introduction

Adhesive Tapes

Sticky tape is a tape with adhesive on one side that is used for either a temporary or a permanent connection. One-sided tapes are designed for sticking two materials together that are either overlapping or next to each other, whereas two-sided tape (with adhesive on both sides) is made for sticking two objects together side by side. (BlueRose Packaging, 2023)

Adhesive tapes consist of a blend of a substance and a sticky coating applied to stick or connect items together rather than employing fasteners, screws, or welding. Adhesive tape was invented in 1925 by Richard Drew of 3M. (Can-Do-tape, 2023).

Type of Adhesives used for Tapes

- I. Acrylic adhesives offer superior durability against environmental factors and achieve a faster curing period compared to alternative adhesives.
- II. Epoxy resins exhibit high strength and minimal shrinkage during the curing process; they are renowned for their resilience to environmental and chemical harm.
- III. Rubber-based adhesives offer extremely flexible bonds and are typically derived from nitrile, butadiene-styrene, butyl, or polyisobutylene compounds.
- IV. Silicone adhesives and sealants are resistant to extremely high temperatures and have a high degree of flexibility.
- V. Polyurethane and Isocyanate adhesives are resistant to extremely high temperatures and have a high degree of flexibility. (Can-Do-tape, 2023)



Different Types of Adhesive Tapes

Seam Sealing Tape

- In addition to being formulated to achieve the strongest possible bond on a variety of materials to be welded, this tape is designed to seal at sewn seams for waterproofing and to provide a long-lasting waterproof sewn seam. Seam Sealing tapes are activated by heat.

- Seam Sealing Tapes is composed of Two or Three layers- One is a thermoplastic, hotmelt and Adhesive layer; Other are the barrier layer made by PVC, PU, Taffeta, Tricot, etc.
- Manufactures: Pros Korea Corporation, Framis Italia, HiMel (korea), Bemis(USA), Ardmel(UK). (ProsKorea, 2023)

Application of Seam Sealing Tape

Rainwear, Skiwear, Tent, Sportswear, Outdoor gear (like Skiing, Climbing, Hiking, Fishing gear, etc.), Boots & Footwear, Backpacks, Military gear, Protective gear, etc. (Himel, 2023)



Fig-1. To prevent water from leaking through the seams

Physical & Chemical Composition of Seam Sealing Tape

Composition	100% PU
Appearance	Soft
Colour	Transparent, Matte
Tape Width	15-25 mm
Weight	100-150g/m ²
Thickness	90-130µm
Adhesion Softening Point	125-135°C

Indicative Application Conditions			
	Temperature	Time	Pressure
Heat Press	140-160°C	20-30 Sec	6 bar
Heat Welding Machine	290-330°C	1.5-2 m/min	3-5 bar

Seam Reinforcing Tape

With Seam Reinforcement Tape (SRT), seams are strengthened without affecting the weight, feel, or flexibility of the clothing. It can maintain clothing lighter than sewing when combined with bonded seams. These tapes are available for knit and woven fabrics.

Manufacturers - Bemis (USA), LOXY (Norway), HiMEL (Korea), etc.

Material used for knit SRT - Nylon/Spandex/Polyurethane Adhesive; & for woven SRT - Polyester/Spandex/ Polyurethane Adhesive.

Application of SRT

(1) Ultrasonic bonded seams; (2) Decorative; (3) Applied in conventional hot-air seam sealing machine.



Fig-2. SRT – in Woven use & active wear

Physical & Chemical Composition

	2 Layer	3 Layer
Composition	ne Adhesive/NylonFabric	e/PU barrier/ Nylonfabric

Service Temp.	-40 to 60°C	-40 to 60°C
Colour	Black, White, Grey	Black, White, Grey
Gauge/Adhesive	0.42mm/0.1mm	0.45/0.12mm
Standard Width	10mm	13mm
Weight	2.8 g/m	3.2 g/m
Flat Pressure	40-60 psi	40-60 psi
Time	15-20 sec	15-20 sec
Adhesion Softening Point	95°C (203F)	95°C (203F)
Wash	Excellent up to 40°C	Excellent up to 40°C

Reflecting Tape

Reflective tape is a strong, long-lasting adhesive that is used to mark areas clearly by reflecting light off of it. Pressure-sensitive, engineering-grade reflective safety tape is resistant to extreme weather, including heat and moisture. Also Known as “High Visibility Tapes or Retro-Reflective Tapes”. (TapeCase, 2023)

Manufacturers: Pros Korea Corporation, Framis Italia (Dream & Noso), Bemis, etc.

Application of Reflecting Tape

Uniforms for garbage man, policeman, on the highway or street, at night-time work locations, Safety Vests for fireman as functional material but now it is used in Club-wear like shoes, bag and accessory in young casual as fashion material. (BemisWorldWide, 2023)



Fig-3. Construction Wear

Physical & Chemical Composition Reflecting Tape

Composition	100% PU
Appearance	Soft & High Reflective
Color	16 Color card
Tape Width	10-20mm
Weight	260-270g/m ²
Thickness	150-170µm
Adhesion Softening Point	90-130°C

Inductive Application Conditions			
	Temperature	Time	Pressure
Heat Press	120-140°C	20-30 Sec	4-6 bar
Heat Welding Machine	360-400°C	1.5-2m/min	3-4 bar

Decorative Tape

Decorative overlay films are cost effective fashion elements that can incorporate into any design. This tapes can also be applied over bonded seams to eliminate edge fraying.

Decorative Tapes are strong, lightweight, excellent UV stability and very good resistance to abrasion. Decorative Tape is a Single-sided Adhesive Tape. Also known as “Overlay Tapes”.

Manufacturers: Framis Italia (Portofino & Thicker Dream), HiMel (Korea), Ardmel (UK), etc. (Ardmel, 2023)

Application of Decorative Tape

Zippers, Pocket flaps, Elbow & Knee patches, Laser-cut logos & designs, Seam coverage, Decorative purposes, Cut edge, etc.



Fig-4. Zipper & Pocket Edge



Seam Coverage



Laser-cut Logos

Physical & Chemical Composition of Decorative Tapes

Composition	PU, Polyester, Reflective Beads
Appearance	Smooth & Matte
Color	Color card

Tape Width	10-1000 mm		
Weight	300g/m ²		
Thickness	0.08-0.15 mm		
Adhesion Softening Point	130-150°C		
Inductive Application Conditions			
	Temperature	Time	Pressure
Heat Press	120-150°C	20 Sec	4-6 bar
Heat Welding Machine	360-410°C	1.5-2 m/min	3-4 bar

Waterproof Tape

Waterproof Tape composed by Polyurethane glue coupled with a 100% Polyamide fabric. The glue fluidity and high adhesion power allow the deep penetration in fabric fibers, covering the needle holes and restoring good impermeability to water, liquids and air. The polyamide backing used in the production of this tape offers excellent resistance to stress and abrasion. (Framis, 2023)

Manufacturers - Bemis (USA), Framis Italia, Sekisui (Japan), HiMEL (Korea). Area of Use - Functional & Waterproofing. (Outdoorsmagic, 2023)

Application of Waterproof Tape

(1) Seam-sealing taping (2) Inside and outside taping (3) Waterproof protection.

Features of 3-layer waterproof tape (1) Low melting point (2) Excellent resistance to stress and abrasion (3) Dry cleaning resistance.



Fig-5. Bemis Waterproof Taping

Waterproof Taping inner side of jacket

Physical & Chemical Composition of Waterproof Tape:

Composition	100% PA fabric coated with TPU glue		
Appearance/Touch	Bright warp knitted fabric		
Color	Black, White, Grey		
Thickness	320 μm (0.013")		
Tape Width	20 / 22 mm		
Weight	210 g/m ²		
Adhesion Softening Point	104°C (219.2°F)		
Inductive Application Conditions			
	Temperature	Time	Pressure
Heat Press	150°C (302°F)	20 Sec	6 bar (90 psi)
Heat Welding Machine	350-390°C	1.25-1.5 m/min	3-5 bar (43-73 psi)

Anti Slip Tape

Anti Slip Tape is a 3 layer grippy product, fully Polyurethane-based, sometime silicone coated, which is used in many application ares. The films can be laser cut. These tapes are also used in the edge of

blouses, cycling pants, for edge in the back wings of bra, to improve fit of no-show socks and for all details where a slip-proof feature is required. Anti-Slip tapes also shows an improved stability, and good resistance to washing.

Material: Nylon, Polyester, Spandex, PP, Cotton, Acrylic, Metallic yarn, Latex, etc. Manufacturers: T&K (China), Framis Italia, SH-UNEED (China).

Application of Anti Slip Tape

(1) Anti slip taping (2) Anti slip functional shape (3) All application where a slip-proof feature is required.

Features of Anti Slip tapes are (1) easy application (not sticky) (2) washing resistant (3) high adhesion (4) can be laser cut



Fig-6. Rubber grip used for Anti Slip taping



Fig. Silicone print anti slip taping

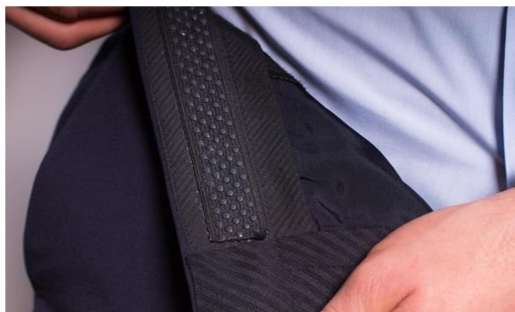


Fig-7. Anti Slip Tape in Trousers



Fig. Anti slip Functional shape

Physical & Chemical Composition of Anti Slip Tape

Composition	100% Polyurethane
Appearance/Touch	Smooth and Bright
Color	Transparent
Thickness	320 μm (0,013")
Tape Width	10-20 mm
Weight	235 g/m ²
Adhesion Softening Point	127°C (260,6°F)

Inductive Application Conditions			
	Temperature	Time	Pressure
Heat Press	140°C (284°F)	15-20 Sec	6 bar (90 psi)
Heat Welding Machine	400-430°C	1.5-2 m/min	0.35 bar (5 psi)

Edge Neatening/Hem Finishing Tape

Hemming tape is a clever and inventive substitute for a needle and thread when hemming garments or other fabric items. Hemming tape's double-sided adhesive forms a solid bond that withstands repeated washings. (Ourpastimes, 2023)

It also provides a smooth, comfortable edge for more textured or irritating fabrics. HemmingTapes are available in Single-sided and Double-sided Adhesive Tapes.

Manufacturers: Framis Italia, Tesa, Somitape, Joysign (China)

Application of Hem Finish Tape

Garments (like Tops, Shirts, Sportswear, Trousers/Pants, etc.), Tents, Curtains, etc.



Fig-8. Trousers Hemming (Double-sided Tape)



Fig. Hemming (One-Sided Tape)

Physical & Chemical Composition Hem Finish Tape:

Composition	100% PU
Appearance	Smooth & Shiny
Color	Transparent, Black, White
Weight	70-80g/m ²
Thickness	60-80µm
Tape Width	10-15mm
Adhesion Softening Point	115-120°C

Inductive Application Condition			
	Temperature	Time	Pressure
Heat Press	120-140°C	10-20 Sec	6 bar
Heat Welding Machine	300-340°C	1.25-1.75m/min	3-4 bar

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