P-touch

brother
at your side

Technical data for TZe and HGe tapes

P-touch

brother
at your side

Brother P-touch laminated labels have been designed to last, wherever you use them

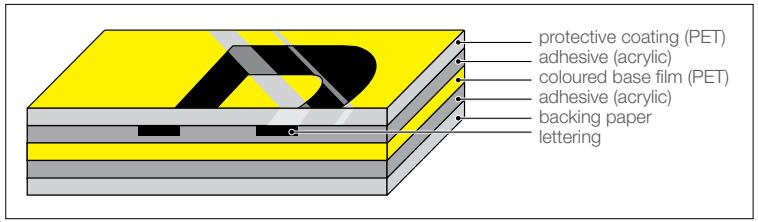
Whether you need a professional labelling solution for the office, industry or home, Brother P-touch laminated labels have been designed with you in mind. We've thought about exactly when, where and how you might need to use our labels and put them through a series of rigorous tests, which means that even when they're exposed to heavy abrasion, heat, cold, sunshine, water and chemicals, our labels have been designed to last.

P-touch LABELS TESTED TO THE EXTREME

Brother P-touch laminated labels

Why do Brother P-touch laminated labels last longer?

Unlike ordinary labels, our laminated tape technology ensures that a layer of super-clear polyethylene laminate protects your text.



Brother P-touch laminated TZe tapes consist of six layers of materials, resulting in a thin, extremely strong label. Characters are formed with a thermal transfer ink and sandwiched between two protective layers of PET (polyethylene film). The result is a virtually indestructible label that can withstand even the harshest conditions.

In fact, we are sure about the durability of our labels because we've tested them to the extreme, against the effects of abrasion, temperature, chemicals and sunlight. Our results prove that Brother P-touch laminated labels out-perform competitor labels, staying legible and attached, so you can be confident of a professional quality label that has been designed to last.

The following pages will show you exactly how our labels are tested to the extreme.

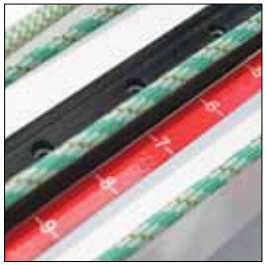
Laminated

Lamination provides an extra protective overcoat

P-touch LABELS TESTED TO THE EXTREME

Laminated

Abrasion Test



Abrasion Resistant Labels

Brother's tape lamination technology ensures that Brother P-touch laminated labels can even withstand heavy abrasion.

The Abrasion Test Procedure

A 1kg sanding device was passed over Brother P-touch laminated labels, and non-laminated competitor labels. After 50 return passes the characters underneath the Brother P-touch laminated label were completely unaffected and the lamination was only slightly scratched.

Abrasion Tests Results

Brother P-touch laminated TZe label	✓
Competitor non-laminated label	✗

✓ = No effect on print quality

✗ = Print quality affected

Brother P-touch Laminated Label

Non-Laminated Competitor Label

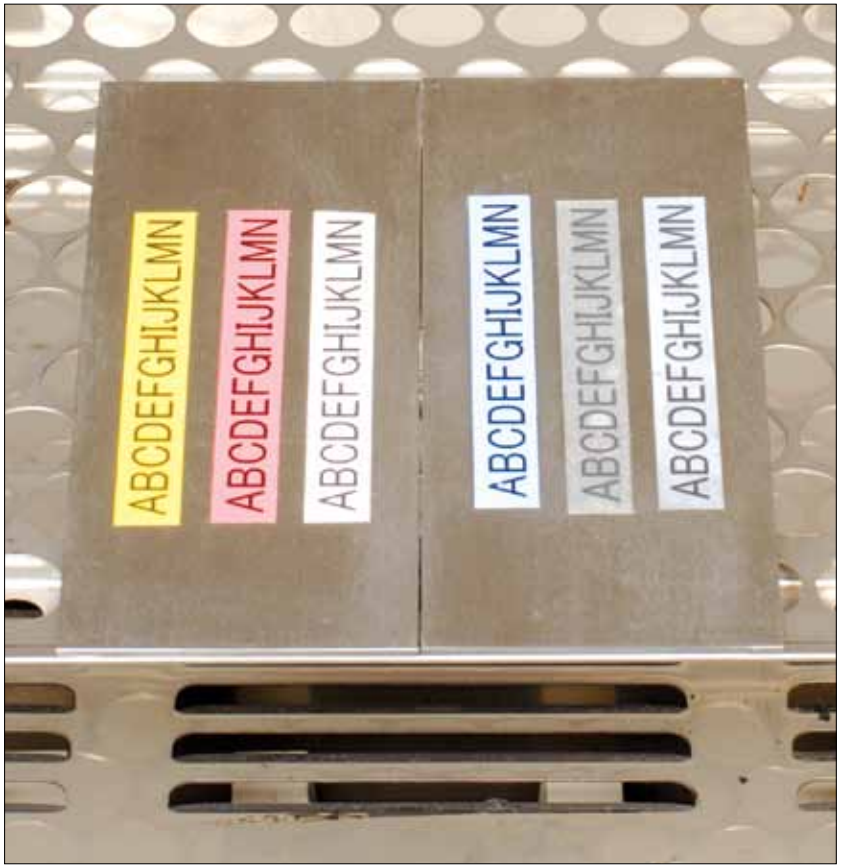
Abrasion Resistant

Can withstand heavy abrasion

P-touch LABELS TESTED TO THE EXTREME

Abrasion Resistant

Temperature Test



Temperature Resistant Labels

Whether you want to use our labels in freezing conditions or extremely warm environments, our labels have been designed to last. In fact, results show that Brother P-touch laminated labels can withstand temperatures from -80°C to +150°C.

The Temperature Test Procedure

Brother P-touch laminated labels were attached to stainless steel plates at room temperature, then heated and cooled for a specified time. After 72 hours at -80°C no noticeable change in tape adhesive or colour had occurred. After 2 hours at +150°C, despite slight discolouration of the tape, the text on the label remained completely intact*. We recommend TZe-M931/951/961 (black on matt silver) as most resistant to discolouration under high temperatures, and Flexible-ID tapes as most suitable when used in an Autoclave/Sterilising unit.

Test Results

Label performance after exposure to heat and cold

Temperature	Hours	Brother Laminated Labels
-80°C	72	●
-30°C	72	●
-0°C	240	●
+50°C	240	●
+100°C	240	▲*
+150°C	2	▲*

*When used under extremely high temperatures or for long periods of time the laminate film may be separated, discoloured or shrink. If in doubt, request a free tape sample from Brother to perform your own testing.

● = No noticeable change

▲ = Text is legible but there was some tape discolouration. Matt silver tapes are most resistant to discolouration due to heat, and Flexible-ID tapes as most suitable when used in an Autoclave/Sterilising unit

Test: Temperature
Temperature: +100°c
Duration: 240 hours
Labels: Brother P-touch Laminated Label

Temperature Resistant

Resistant to temperatures of -80° to +150°

P-touch LABELS TESTED TO THE EXTREME

Temperature Resistant

Fade Test

Fade Meter (Time - Δ E)

Tape Colour	118h	236h	478h*
Transparent	9.66	15.69	24.69
White	0.83	1.58	3.18
Red	1.65	5.95	54.61
Blue	1.27	2.85	5.71
Yellow	22.59	55.57	57.2
Green	1.24	1.62	3.77
Fluorescent Orange	46.57	50.33	54.43
Fluorescent Yellow	81.02	85.09	84.66
Black	0.55	0.18	1.11
Extra Strength Adhesive - White	0.83	1.58	3.18
Flexible ID - White	1.49	2.35	3.94

*472 hours approximates to 1 year in outdoor sunny conditions

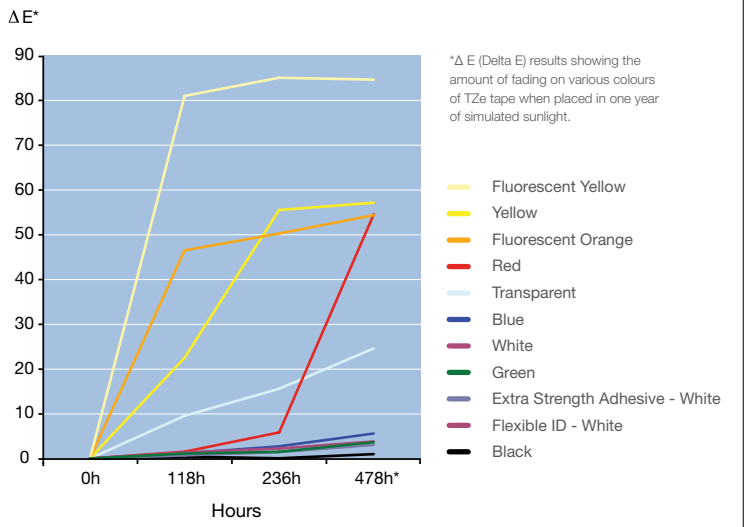
Fade Resistant Labels

Wherever you use P-touch laminated labels, they have been designed to stay as clear and legible as the day they were applied.

Several Brother P-touch laminated labels in various colours were attached to stainless steel plates, and exposed to simulated outdoor UV radiation of approximately 12 months, and changes in the base colour of the tape could be observed (test compliant with JIS K7350-2/ISO 4892-2).

The printed text on all tapes remained unchanged and was perfectly legible. The red, yellow and fluorescent tapes, however, showed some fading to the tape background colour. Other tape colours showed little or no change.

Fade Test results



*Δ E (Delta E) results showing the amount of fading on various colours of TZe tape when placed in one year of simulated sunlight.

Fade Resistant

Resistant to ultraviolet exposure

P-touch LABELS TESTED TO THE EXTREME

Water and Chemical Submersion Test

Water and Chemical Resistance

Water and chemical resistance tests were conducted in two stages:

Stage 1 - The water and chemical submersion test
Stage 2 - The water and chemical abrasion test

Stage 1
Water and Chemical Submersion Test Procedure

To test Brother P-touch laminated labels against the effects of water and chemicals, the tapes were firstly attached to glass slides and immersed in a variety of liquids for 2 hours. No change in the print quality occurred, and the labels remained affixed to the slides.

Although some labels soaked in certain chemicals showed slight separation of the laminate film, rubbing the labels with the same chemicals had no effect at all. So even if chemicals are spilled on your Brother P-touch laminated labels, a quick wipe should be enough to prevent any damage.

Test Results for Brother P-touch Laminated Labels

Toluene	Hexane	Ethanol	Ethyl Acetate	Acetone	Mineral Spirit	Water	0.1N Hydrochloric	0.1 Sodium Hydroxide
•	•	•	•	•	•	•	•	•

• = no print discolouration

ABCDE

Test: Water and Chemical
Chemical: Ethanol Submersion
Duration: 2 hours
Labels: Brother P-touch Laminated Label

Water Resistant — Water resistant

Chemical Resistant — Resistant to a wide range of industrial chemicals

P-touch LABELS TESTED TO THE EXTREME

Water Resistant

Chemical Resistant

Water and Chemical Abrasion Test

Water and Chemical Resistance

Stage 2
Water and Chemical Abrasion Test Procedure

Brother P-touch laminated tape was affixed to several glass plates. A 500g weight with a chemical and solvent infused cloth was passed over each label 20 times. As the results below show, the print quality of Brother P-touch laminated labels was unaffected, unlike our competitor's non-laminated labels.

Test Results

	Toluene	Hexane	Ethanol	Acetone	Ethyl acetate	Water	0.1N Hydrochloric	Mineral spirit	0.1 Sodium Hydroxide
P-touch Laminated Label	●	●	●	●	●	●	●	●	●
Non-Laminated Competitor Label	X	●	●	X	X	●	●	●	●

● = Print quality unaffected X = Print quality affected

Labels After Testing

Test: Chemical Abrasion **Chemical:** Acetone

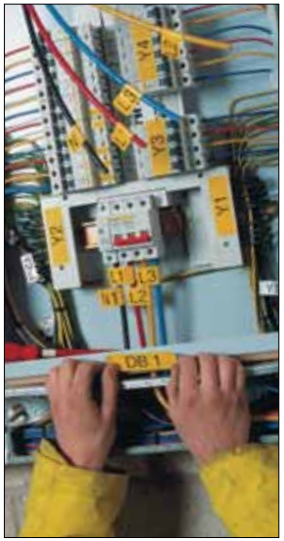
Brother P-touch Laminated Label

Non-Laminated Competitor Label

Water resistant

Resistant to a wide range of industrial chemicals

Strong Adhesion Test



Strong Adhesion

The Adhesion Test Procedure

To test the adhesive strength of Brother P-touch laminated tapes, 12mm standard, extra strength adhesive, flexible ID and security tape were affixed to a variety of materials at room temperature and left for 30 minutes. Adhesive strength was tested by removing the tape at an angle of 180 degrees. This testing method complies with Japanese Standard JIS Z0237 testing.

Test Results

The table explains that an adhesive strength of approximately 6 Newtons* was maintained with most materials. Our strong adhesive tape maintained an average of 50% more adhesive strength compared to our standard tape and is suitable for more demanding surfaces such as polypropylene.

	Stainless Steel	Glass	PVC	Acrylic	Polypropylene	Polyester Coated Wood
Standard TZe Tape	7.6	7.2	8.6	6.9	3.3	6.4
Extra Strong Adhesive TZe tape	10	10.1	11.5	11.5	7.4	11.5
Flexible ID tape	7.6	6.4	7.8	7	6.2	6.6
Security tape	2.8	4.3				

* Results in Newtons for 12mm width tape

Strong Adhesion

Strong adhesion to a wide range of surfaces

P-touch LABELS TESTED TO THE EXTREME

Choose the right tape for the job

Tape Options

3.5 mm	6 mm ※5.8mm	9 mm ※8.8mm	12 mm ※11.7mm	18 mm ※17.7mm	24 mm ※23.6mm	36 mm
Standard Laminated - 8m						
	TZe-111	TZe-121	TZe-131	TZe-141	TZe-151	TZe-161
			TZe-132			
			TZe-133			
			TZe-135	TZe-145		
	TZe-211	TZe-221	TZe-231	TZe-241	TZe-251	TZe-261
			TZe-231S*			
		TZe-222	TZe-232	TZe-242	TZe-252	TZe-262
		TZe-223	TZe-233	TZe-243	TZe-253	TZe-263
			TZe-334	TZe-344	TZe-354	
	TZe-315	TZe-325	TZe-335	TZe-345	TZe-355	TZe-365
		TZe-421	TZe-431	TZe-441	TZe-451	TZe-461
			TZe-431S*			
			TZe-435			
		TZe-521	TZe-531	TZe-541	TZe-551	TZe-561
			TZe-535		TZe-555	
	TZe-611	TZe-621	TZe-631	TZe-641	TZe-651	TZe-661
		TZe-721	TZe-731	TZe-741	TZe-751	
Fluorescent Laminated - 5m						
			TZe-B31		TZe-B51	
			TZe-C31		TZe-C51	
Matt Laminated - 8m						
			TZe-M31			
			TZe-MQL35**			
			TZe-MQP35**			
			TZe-MQG35**			
Metallic Laminated - 8m						
			TZe-M931		TZe-M951	TZe-M961
Non-Laminated - 8m						
TZe-N201		TZe-N221	TZe-N231	TZe-N241	TZe-N251	
Flexible ID Laminated - 8m						
	TZe-FX211	TZe-FX221	TZe-FX231	TZe-FX241	TZe-FX251	TZe-FX261
	TZe-FX611	TZe-FX621	TZe-FX631	TZe-FX641	TZe-FX651	TZe-FX661
Strong Adhesive Laminated - 8m						
		TZe-S121	TZe-S131	TZe-S141	TZe-S151	
	TZe-S211	TZe-S221	TZe-S231	TZe-S241	TZe-S251	TZe-S261
		TZe-S621	TZe-S631	TZe-S641	TZe-S651	
Fabric - 3m						
			TZe-FA3	TZe-FA4B		
Security Laminated - 8m						
				TZe-SE4		
High Grade Laminated *** - 8m						
			HGe-131V5		HGe-151V5	
			HGe-231V5		HGe-251V5	HGe -261V5
			HGe-631V5		HGe-651V5	
			HGe-M931V5		HGe-M951V5	
Heat Shrink Tube - 1.5m ****						
	HSe-211※	HSe-221※	HSe-231※	HSe-241※	HSe-251※	

Actual tape colours may differ slightly from the printed colours.
The availability of TZe tapes may also vary in different countries.

*4m, **5m, ***PT-9700PC / PT-9800PCN

****PT-E300VP / PT-E550WVP

TZe TAPE HGe TAPE HSe TUBE

Choose the right tape for the job

Brother P-touch laminated tapes are available in a wide range of tape colours, widths and styles. Your application and your choice of P-touch model should guide your ultimate tape selection. The table below will also help you to determine the correct tape for your applications.

			TZe Laminated	Strong Adhesive	Flexible ID	Security	Heat Shrink
Flat Surface		Smooth	●	●	●	●	✕
		Textured	▲	●	▲	✕	✕
Curved Surface		Smooth	▲	●	●	▲	✕
		Textured	▲	●	▲	✕	✕
Cable Flag		Smooth	▲	▲	●	✕	✕
		Textured	▲	▲	●	✕	✕
Cable Wrap		Smooth	▲	▲	●	✕	●†
		Textured	▲	▲	●	✕	●†

● Recommended ▲ Acceptable ✕ Not Recommended

† Model name	Width	Recommended cable diameter
HSe-211	5.8mm	Ø1.7mm to 3.2mm
HSe-221	8.8mm	Ø2.6mm to 5.1mm
HSe-231	11.7mm	Ø3.6mm to 7.0mm
HSe-241	17.7mm	Ø5.4mm to 10.6mm
HSe-251	23.6mm	Ø7.3mm to 14.3mm

Choosing The Right Tape

Choose the right tape for the job

P-touch LABELS TESTED TO THE EXTREME

Choosing The Right Tape

Further Tests

The Autoclave Adhesion Test Procedure

Brother P-touch flexible ID tape was affixed to flat and smooth stainless steel at room temperature. The condition of the tape was observed after it was processed in an autoclave under the following test conditions.

Autoclave test machine: Steam sterilizer GETINGE HS22

Test program: B cycle P11 *EN (European Standard) prEN13060 standard compliant

Pre-vacuum: 4 times

Sterilizing temperature: 134 °C

Sterilizing duration: 5 minutes

Drying duration: 20 minutes

Test Results

			1 cycle	5 cycles	10 cycles	20 cycles	30 cycles
TZe	Flexible ID	Text blurring	•	•	•	•	•
		Tape discolouration	•	•	•	•	Δ *1
		Laminate film separation	•	•	•	•	Δ *2
		Tape peeling	•	•	•	•	•

*1 some tape discolouration may be observed
*2 some separation off the laminate film may be observed

The table shows high durability of our flexible ID tape during the test. After several process cycles, some slight discolouration was observed. Nevertheless, the printed text stayed legible.

Further Tests

The Oil Submersion and Adhesion Test Procedure

Brother P-touch laminated tapes were firstly attached to stainless steel plates and immersed in various oils for 2 hours at room temperature.
The tapes were then wiped with a cloth soaked in each of the various oils.

Test Results

		Oil type	Insoluble coolant				Soluble coolant			
			A	B	C	D	E	F	G	H
TZe	Standard laminated/ Extra Strength Adhesive/Flexible ID	Immersed (2 hours)	•	•	•	•	•	•	•	•
		Wiped	•	•	•	•	•	•	•	•

During both tests, no change to the print quality occurred, and the labels remained affixed to the slides.

Oil type: CASTROL synthetic coolants

A=Honilo 981
B=Variocut B30
C=CareCut ES1
D=Iloform BWN205
E=Hysol X
F=Alusol B
G=Syntilo 81 E
H=Syntilo 9954

Frequently Asked Questions

How accurate are the tests in simulating real-world examples?

Every effort was made to ensure the tests accurately simulate real-world examples. However when tapes are used in the real-world, many factors could change the results of these tests, such as surface material, heat, moisture, pressure, chemicals etc. If in doubt, always test Brother P-touch laminated tapes in your own environment to ensure they meet your requirements.

How thick are TZe tapes?

TZe tapes are around 160 micro metres in thickness, but this varies slightly by tape type.

Which colour tape is recommended for high temperatures?

We recommend TZe-M931/951/961 (Black on matt silver) as most resistant to high temperatures in terms of discolouration.

When I remove the label will messy adhesive remain? How can I remove it?

Tapes can be removed from most materials with relative ease leaving little or no adhesive on the material. Extreme heat, humidity and certain chemicals may result in some residual adhesive being left but this can be removed in most cases with Ethanol.

Which tape is recommended for cable labelling?

TZe Flexible ID tape for wrap or flag labelling or HSe Heat Shrink Tube.

Do TZe tapes create any outgassing?

The following gases may be produced when labels are in a hot environment such as in front of an air conditioner: toluene, n-butanol, 2-ethylhexyl alcohol, butyl carbinol acetate. These levels are however very low.

Frequently Asked Questions

Can TZe tapes be submerged in alcohol?

Submersion of TZe tapes in alcohol is not recommended for extended periods due to the possible deterioration of the tape adhesive.

Do TZe tapes contain silicone?

Since the tape liner itself is silicone coated on both sides, there is a chance that small amounts of silicone may remain on the adhesive layer underneath the label even after the liner is peeled off.

Do TZe tapes contain latex?

TZe tape uses acryl based adhesive materials and do not include latex.

Does TZe tape contain lead?

There is no lead in the cassette case, tape or ink.

Can TZe tapes be used on circuit boards?

We do not recommend that TZe tapes are used on circuit boards due to the sensitivity of circuit boards to dust, static electricity and acid (although these are at very low levels in TZe tapes)

Can TZe tapes be used to label food?

TZe tape can be used safely on food packaging but should not be in contact with the food itself.

Can TZe tapes be used on copper?

As adhesive materials used in our tape are acrylic and weakly acid we do not recommend that TZe tapes are used on copper.

Laminated
Lamination provides an extra protective overcoat
P-touch LABELS TESTED TO THE EXTREME

Frequently Asked Questions

How long should security tape be attached before peeling off?

We recommend that TZe security tape is affixed for at least 24 hours in order to work effectively.

Do TZe tapes contain chloride?

Chloride materials are used in TZe tapes (except clear or silver).

Where is the chloride contained in the TZe tape layers?

It is contained in the coloured base film layer.

Do TZe tapes contain polyvinyl chloride (PVC)?

There is no PVC in the cassette case, tape or ink. The colour layer of the base film includes some chlorine compound which means TZe tapes cannot be categorised as halogen-free.

Do tapes contain REACH SVHC?

Please see www.brother.eu/reach for the latest information.

Do the tapes contain recycled material?

TZe tapes contain at least 5% of recycled material.

Can TZe tapes be used for the marking of electrical and electronic equipment (EEE) that is covered by the RoHS Directive?

TZe tapes are in conformity with the requirements of the RoHS Directive, and do not contain restricted substances (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) above the allowed limit values.

Laminated

Lamination provides an extra protective overcoat

P-touch LABELS TESTED TO THE EXTREME

Frequently Asked Questions

Are TZe tapes RoHS compliant?

TZe tape cassettes themselves do not fall under the definition of EEE, but are considered as consumables and not subject to the directive requirements. However, Brother works closely with our supply chain partners and others in the industry, including material and component suppliers, to ensure the RoHS compliance for TZe tapes.

UL Certification

A number of our TZe tapes have been tested by Underwriters Laboratories, a renowned independent testing laboratory. Our tapes have passed their rigorous safety standards and gained UL certification and we continue to test more tapes. For latest certification details and a list of certified tapes please contact your local Brother office.

Laminated

Lamination provides an extra protective overcoat

P-touch LABELS TESTED TO THE EXTREME

Notes

1. A random sample of tape types were selected and used to perform these tests. Accordingly, results may have differed slightly, depending on the type of tape used.
2. The actual test results were acquired under specific conditions configured by Brother, with the sole aim of providing information contained within this booklet. Brother does not guarantee the strength, safety or accuracy of numerical data.
3. Since tape adherence performance is affected by the material the tape is attached to, the material's surface condition, whether it is greasy, dusty, rough or curved, and the environmental conditions, the customer should confirm adherence performance under actual usage conditions after purchasing the tape required, and use the product under their own responsibility.
4. Brother accepts no responsibility for injuries or lost earnings resulting from application of the information contained in this document.