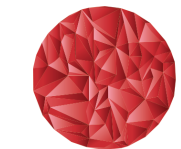


# Durability test data for Brother laminated TZe labels

[www.brother.ae](http://www.brother.ae)



*P-touch* LABELS  
**TESTED**  
TO THE EXTREME ✓



**Japanese  
Excellence**  
For Over 100 Years



LI81/100L  
60.2  
LI81/100L

PMW  
100 50%  
81/100L CV

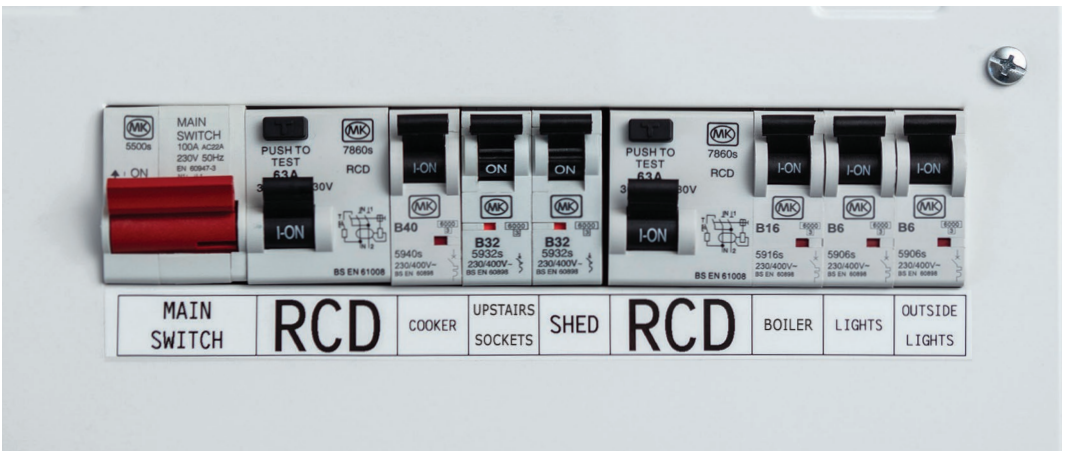
81/100L CV

# Brother laminated TZe labels have been designed to last, wherever you use them

Whether you need a professional labelling solution for the office, industry or home, Brother laminated TZe 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 tests which demonstrate how our laminated labels withstand heavy abrasion, heat, cold, sunshine, water and chemicals.



# Brother laminated TZe labels

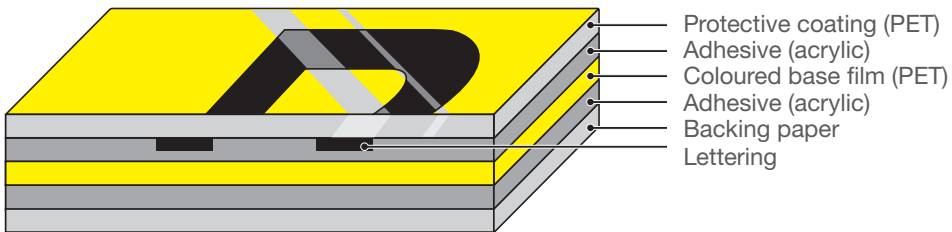


## Why Brother laminated TZe labels withstand the test of time



Lamination provides an extra protective overcoat

Unlike non-laminated labels, our laminated TZe tape technology applies a layer of super-clear polyethylene laminate to protect your text.



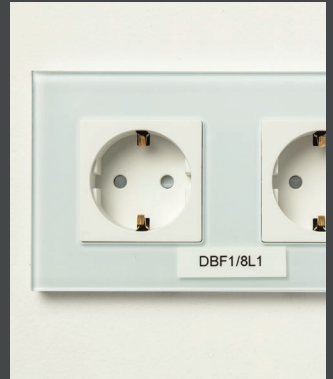
Brother laminated TZe labels consist of six layers of materials, resulting in a thin, extremely strong label. Characters are formed with a thermal transfer ink and sandwiched between two protective layers of PET (polyethylene film). The result is a virtually indestructible label that can withstand harsh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

In fact, we are sure about the durability of our laminated labels because we've had them tested to the extreme. The results prove that Brother laminated TZe labels stay 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 were tested to the extreme.



Strong  
Adhesion

# Strong Adhesion Tests



# Strong Adhesion Tests



Strong adhesion tests were conducted in two stages:

**Stage 1:** Adhesion to smooth and textured surfaces test

**Stage 2:** Adhesion to various diameter curved surfaces test

## STAGE 1

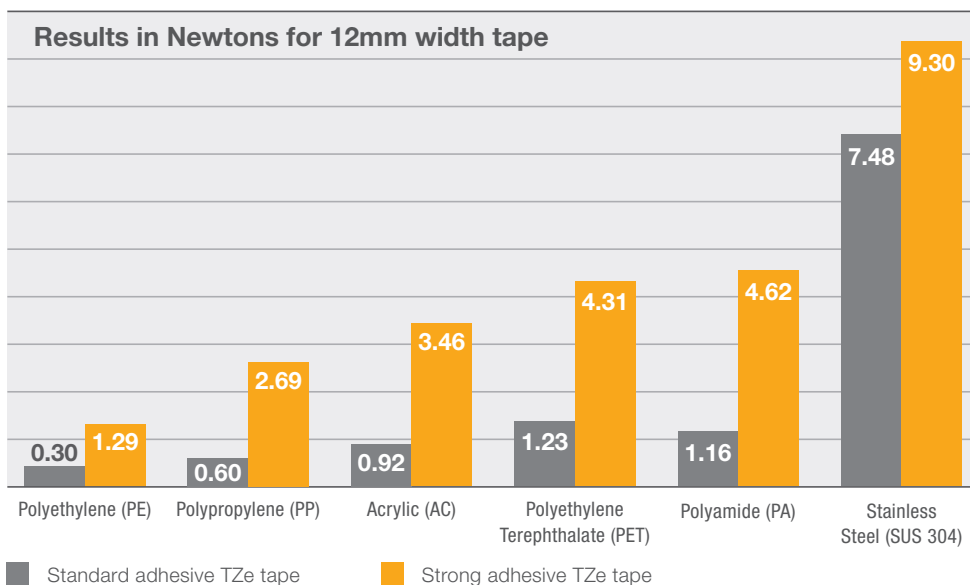
### Adhesion to smooth and textured surfaces test procedure

To test the adhesive strength of Brother laminated TZe labels, Brother standard adhesive and strong adhesive laminated TZe labels were affixed to a variety of materials at room temperature and left for 30 days. After this period, adhesive strength was tested by measuring the force needed to remove the labels at an angle of 180 degrees.

The testing method complies with Japanese Standard JIS Z 0237 (2009) testing.

### Test Results

The chart below details the amount of force needed (measured in Newtons) to remove Brother standard adhesive labels and Brother strong adhesive labels from the various materials. The higher the value, the stronger the tape was affixed to the material. As this test shows, when used on textured surfaces Brother strong adhesive labels maintained three times the adhesive strength of Brother standard adhesive labels on average. Brother strong adhesive labels have been specially developed to adhere to both smooth and textured surfaces, and on more demanding materials.





# Strong Adhesion Tests

## STAGE 2

### Adhesion to various diameter curved surfaces test procedure

To test the adhesive strength of Brother laminated TZe labels, Brother standard adhesive, strong adhesive and flexible ID laminated TZe labels were affixed to a variety of materials at room temperature and left for 14 days. After this period, the labels were visually inspected to note any peeling from the materials they were attached to.

### Test Results

The table below explains that Brother standard adhesive, strong adhesive and flexible ID laminated TZe labels showed no signs of peeling from the materials of 6mm or higher diameter. However, when the labels were wrapped or applied as a flag to the 3mm diameter material, the standard adhesive and strong adhesive laminated labels either showed signs of peeling or fell off completely. Only the Brother flexible ID labels showed no peeling.

Brother flexible ID labels have been developed for flagging and wrapping around wires, cables, pipes and tubes with a minimum diameter of 3mm, and should be used to ensure your labels stay affixed.

Brother self-laminating labels have the exact same properties as Brother flexible ID labels and can therefore also be safely used for wrapping around cables.

Brother strong adhesive labels should be used for applying to the surfaces of larger diameter curved surfaces.

	CURVED SURFACE		WRAPPED		FLAGGED
	Ø50mm glass beaker	Ø25mm glass beaker	Ø6mm PVC cable	Ø3mm Polypropylene tube	Ø3mm Polypropylene tube
Standard TZe tape	●	●	●	●	◐
Strong adhesive TZe tape	●	●	●	●	◐
Flexible ID TZe tape	●	●	●	●	●

- No peeling of label observed
- ◐ Some peeling of label observed
- Label peeled off completely



# Strong Adhesion Tests



Strong  
Adhesion





Water  
Resistant



Chemical  
Resistant

# Water and Chemical Resistance Tests



# Water and Chemical Resistance Tests



Water  
Resistant



Chemical  
Resistant

Water and chemical resistance tests were conducted in three stages:

**Stage 1:** Water and chemical submersion test

**Stage 2:** Water and chemical abrasion test

**Stage 3:** Pure water and 5% sodium chloride (salt) solution immersion test

## STAGE 1

### Water and chemical submersion test procedure

To test Brother laminated labels against the effects of water and chemicals, Brother standard adhesive, strong adhesive and flexible ID laminated TZe labels were firstly attached to glass slides and immersed in a variety of liquids for 2 hours at room temperature.

### Test Results

Although some labels soaked in certain chemicals showed slight separation of the laminate, the table below explains no change in the print quality occurred and the labels remained affixed to the slides. So even if any of the chemicals tested are spilled on your Brother TZe laminated labels, a quick wipe should be enough to prevent any damage.

	Toluene	Hexane	Ethanol	Ethyl Acetate	Acetone	Mineral Spirit	Pure Water	0.1N Hydrochloric Acid	0.1N Sodium Hydroxide
Standard TZe tape	●	●	●	●	●	●	●	●	●
Strong adhesive TZe tape	●	●	●	●	●	●	●	●	●
Flexible ID TZe tape	●	●	●	●	●	●	●	●	●

● No print discolouration



### Label after testing:

Label: Brother strong adhesive laminated TZe label

Chemical: Acetone



Water  
Resistant



Chemical  
Resistant

# Water and Chemical Resistance Tests

## STAGE 2

### Water and chemical abrasion test procedure

Next, Brother standard adhesive, strong adhesive and flexible ID laminated TZe labels were subjected to a 200gf weight with a chemical and solvent infused cloth, which was passed over each label for 100 round trips. The labels were then visually inspected to note if any print quality problems were observed.

### Test Results

As the table below demonstrates, the print quality of Brother TZe laminated labels was unaffected by being rubbed with various chemicals.

	Toluene	Hexane	Ethanol	Ethyl Acetate	Acetone	Mineral Spirit	Pure Water	0.1N Hydrochloric Acid	0.1N Sodium Hydroxide
Standard TZe tape	●	●	●	●	●	●	●	●	●
Strong adhesive TZe tape	●	●	●	●	●	●	●	●	●
Flexible ID TZe tape	●	●	●	●	●	●	●	●	●

● No print discolouration



### Label before testing:

Label: Brother strong adhesive laminated TZe label



### Label after testing:

Label: Brother strong adhesive laminated TZe label  
Chemical: 0.1N Hydrochloric Acid

# Water and Chemical Resistance Tests



Water  
Resistant



Chemical  
Resistant

## STAGE 3

### Pure water and 5% sodium chloride (salt) solution immersion test procedure

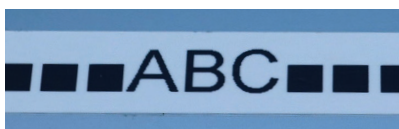
The final test involved Brother standard adhesive, strong adhesive and flexible ID laminated TZe labels being affixed to stainless steel plates which were then immersed in the two solutions. They were placed in a thermostatic chamber set at 40°C and removed after the predetermined periods shown in the table below. After that, the appearance of the labels was visually checked.

### Test Results

As the table shows, even after 30 days immersed in pure water or 5% sodium chloride (salt) solution, Brother standard adhesive, strong adhesive and flexible ID laminated TZe labels stayed perfectly attached and the print quality was unaffected.

	4 DAYS		10 DAYS		30 DAYS	
	Peeling	Fading	Peeling	Fading	Peeling	Fading
Standard TZe tape	●	●	●	●	●	●
Strong adhesive TZe tape	●	●	●	●	●	●
Flexible ID TZe tape	●	●	●	●	●	●

● No peeling of tape or fading of text observed



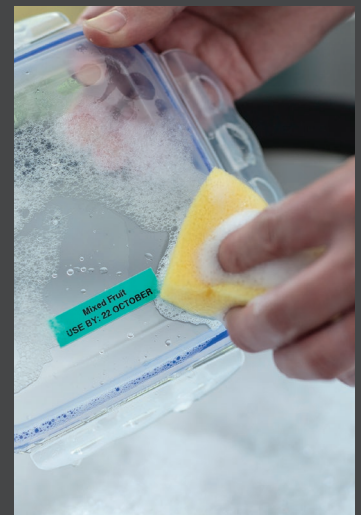
### Label after testing:

Label: Brother strong adhesive laminated TZe label  
Liquid: 5% sodium chloride solution



Abrasion  
Resistant

# Abrasion Resistance Test



# Abrasion Resistance Test



Brother's tape lamination technology ensures that Brother TZe laminated labels can withstand heavy abrasion.

## Abrasion test procedure

Brother standard adhesive, strong adhesive and flexible ID laminated TZe labels were firstly attached to stainless steel plates with a BA (bright annealed surface). A 1kgf sanding device was then passed over the labels with 50 return passes at a speed of 60 round trips per minute.

## Test results

As the table below demonstrates, even after 50 return passes of the heavy sanding device although the laminated surface showed some sandpaper wear, the characters underneath the Brother laminated TZe labels were unaffected and the text was completely legible.

	PRINT QUALITY
Standard adhesive TZe tape	●
Strong adhesive TZe tape	●
Flexible ID TZe tape	●

● Print quality unaffected



### Label after testing:

Label: Brother flexible ID laminated TZe label

Test: Abrasion with sanding device



Temperature  
Resistant

# Temperature Resistance Test





# Temperature Resistance Test



Temperature  
Resistant

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 laminated TZe labels can withstand temperatures from -80°C to +150°C.

## Temperature resistance test procedure

Brother standard adhesive, strong adhesive and flexible ID laminated TZe labels were firstly attached to stainless steel and placed in a thermo-hygrostat chamber set under the test conditions, taken out after a predetermined time and returned to room temperature where the appearance of the label was visually checked.

## Test Results

As the table below shows, after 3 days at -80°C no noticeable change in label adhesive or colour had occurred. After 2 days at +150°C, despite slight discolouration of the label, the text on the label remained completely intact\*. We recommend Brother TZe-M931/951/961 black on matt silver laminated TZe labels as most resistant to discolouration under high temperatures, and Brother flexible ID laminated TZe labels as most suitable when used in an autoclave/sterilising unit.

TEMPERATURE	TIME	RESULT
-80°C	3 days	●
-30°C	30 days	●
+50°C at 90% RH	30 days	●
+100°C*	18 days	●
+150°C*	2 days	●

\* 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 peeling of tape or fading of text observed
- No peeling of tape observed. Text is legible but some tape discolouration observed



### Label after testing:

Label: Brother flexible ID laminated TZe label

Temperature: +100C

Time: 18 days



Fade  
Resistant

# Fade Resistance 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

\*478 hours approximates to 1 year in outdoor sunny conditions

# Fade Resistance Test



Fade  
Resistant

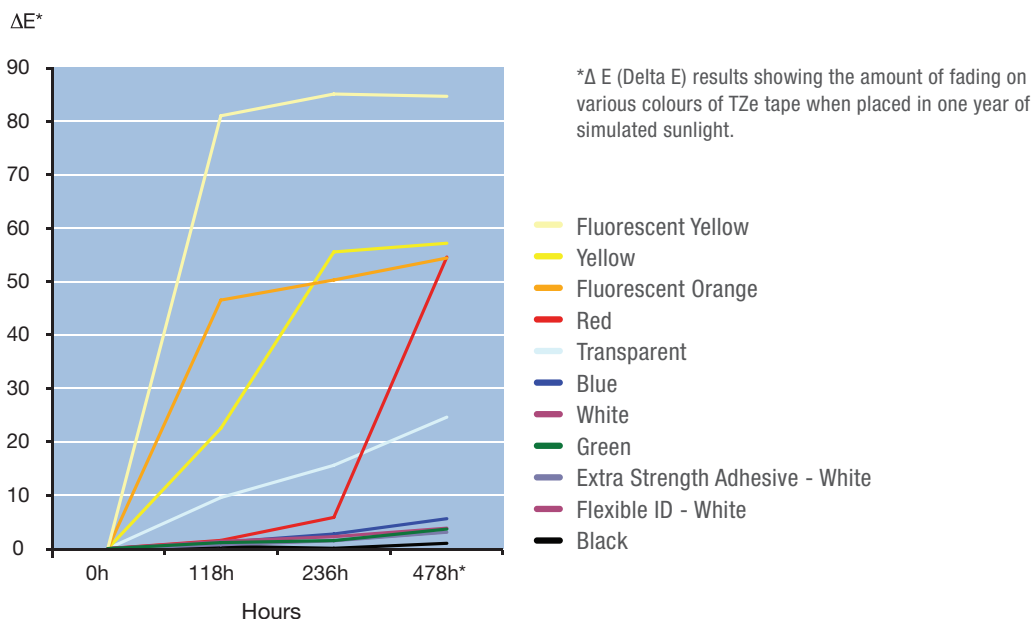
Wherever you use Brother laminated TZe labels, they have been designed to keep your text clear and legible for many years.

## Fade resistance test procedure

Brother black on white strong adhesive and flexible ID laminated TZe labels, and various coloured Brother standard adhesive laminated TZe labels were attached to stainless steel plates and exposed to simulated outdoor UV radiation of approximately 12 months. After that, the appearance of the labels was checked, compliant with standard JIS K7350-2/ISO 4892-2.

## Test Results

The printed text on all Brother laminated TZe tapes remained unchanged and was perfectly legible. The red, yellow and fluorescent tapes showed a larger change to the tape background colour compared with other tape colours, which showed little or no change. The higher the  $\Delta E$  (Delta E) value, the larger the change in visual perception from the original colour.





Chemical  
Resistant

# Oil Resistance Tests

The protective laminate top-coat on Brother laminated TZe labels ensures your text is protected even when submerged or rubbed with oil. Oil resistance tests were conducted in two stages:

**Stage 1:** Oil immersion test

**Stage 2:** Oil rubbing test

## STAGE 1

### Oil immersion test procedure

Brother standard adhesive, strong adhesive and flexible ID laminated TZe labels were attached to glass slides and immersed in various oils at room temperature for 2 hours, and the change in appearance was checked visually after this time.

## STAGE 2

### Oil rubbing test procedure

Brother standard adhesive, strong adhesive and flexible ID laminated TZe labels were attached to glass slides and rubbed with oil-soaked cloths for 100 round trips, using a measuring element of 4.6mm (16.6mm<sup>2</sup>) and a load of 200gf. After this test was completed, the change in appearance of the labels was checked visually. This test is in accordance with JIS-L-0849. (ISO 105-X12:2001 – Textiles-Tests for colour fastness-Part X12)

### Test Results

As the table below shows, at the end of both tests no change to the print quality occurred, and the labels remained affixed to the slides.

		Honilo 981	Variocut B30	CareCut ES1	Hysol X	Alusol B	Syntio 81E	Syntio 9954
Standard TZe tape	2 hour immersion	●	●	●	●	●	●	●
	100 round trips rubbing	●	●	●	●	●	●	●
Strong Adhesive TZe tape	2 hours immersion	●	●	●	●	●	●	●
	100 round trips rubbing	●	●	●	●	●	●	●
Flexible ID TZe tape	2 hours immersion	●	●	●	●	●	●	●
	100 round trips rubbing	●	●	●	●	●	●	●

● No change to print quality and label remained affixed to the slides

# Autoclave Resistance Test



Temperature  
Resistant

Brother flexible ID laminated TZe labels demonstrate excellent adhesion and text legibility, even after several passes through the harsh environment of an autoclave sterilisation chamber.

## Autoclave resistance test procedure

A Brother flexible ID laminated TZe label was affixed to flat and smooth stainless steel at room temperature. The condition of the label was observed after it was processed in an autoclave under the following test conditions:

### Autoclave test machine:

Steam steriliser GETINGE HS22

### Test program:

B cycle P11 \*EN (European Standard) prEN13060 standard compliant

### Pre-vacuum:

4 times

### Sterilising temperature:

134°C

### Sterilising duration:

5 minutes

### Drying duration:

20 minutes

## Test Results

The table below shows the high durability of our Brother flexible ID laminated TZe labels during the test. After several process cycles, some slight label discolouration and separation of lamination film was observed. Nevertheless, the printed text stayed legible.

FLEXIBLE ID TAPES	1 cycles	5 cycles	10 cycles	20 cycles	30 cycles
Text blurring	●	●	●	●	●
Tape discolouration	●	●	●	●	●*1
Laminate film separation	●	●	●	●	●*2
Tape peeling	●	●	●	●	●

\*1 Some tape discolouration may be observed

\*2 Some separation off the laminate film may be observed

# Choose the right tape for the job

SURFACE	WIRE AND CABLE IDENTIFICATION			GENERAL IDENTIFICATION			
	Flexible ID	Self-Laminating	Heat Shrink Tube	Flag	Strong Adhesive	Security	Stencil
Smooth surfaces	✓				✓	✓	✓
Textured surfaces	●				✓	●	
Cable wrap	✓	✓	✓				
Cable flag	✓			✓			

✓ Recommended

● Acceptable

## HEAT SHRINK TUBE



Tape	Width	Recommended cable diameters
HSe-211	6.8mm	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

# Brother Genuine Supplies



Consommables originaux Brother

## Brother genuine supplies work in perfect harmony with Brother printers.

Designed, manufactured and tested in controlled environments by the same team of engineers as Brother hardware. Providing you with the best possible results for your business and protection of your print investment.







# 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 printed labels 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 labels in your own environment to ensure they meet your requirements.

## **Which tape is recommended for rough or textured surfaces?**

Brother strong adhesive TZe tape has been specially developed for more demanding surfaces such as rough or textured surfaces.

## **Which tape is recommended for cable labelling?**

Use Brother self-laminating TZe tape or flexible ID TZe tape for cable wrap labelling, For cable flag labelling use Brother flexible ID TZe tape, or non-laminated flag labels.

Brother HSe heat shrink tube is also available for wire and cable identification.

## **Which tape is recommended for high temperatures?**

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

## **How thick are laminated TZe labels?**

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

# Frequently asked questions

## **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 acrylic based adhesive materials and do not include latex.

## **Do TZe tapes contain lead?**

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

## **Do TZe tapes contain chloride?**

Except for clear (transparent) and silver TZe tapes, chloride materials are used in the coloured base film layer of other TZe tapes.

## **Do TZe tapes contain polyvinyl chloride (PVC) or halogen?**

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

## **Do TZe tapes contain REACH SVHC?**

Please see [www.brother.eu/reach](http://www.brother.eu/reach) for the latest information.

## **Do TZe cassettes contain recycled material?**

TZe cassettes contain at least 5% of recycled material.

## **Do TZe labels create any outgassing?**

The following gases may be produced when labels are stored or applied in a hot environment: Toluene, n-butanol, 2-ethylhexyl alcohol, butyl carbinol acetate. These levels are however very low.

## **Do TZe labels leave any adhesive residue when removed?**

Labels 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.

# Frequently asked questions

## **Can TZe labels be used on circuit boards?**

We do not recommend that TZe labels 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).

## **Can TZe labels be used to label food?**

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

## **Can TZe labels be used on copper?**

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

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

TZe labels are in conformity with the requirements of the RoHS Directive, and do not contain restricted substances (Cadmium (Cd), Lead (Pb), Mercury (Hg), Hexavalent Chromium (Cr VI), Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ethers (PBDE), Bis(2-Ethylhexyl) phthalate (DEHP), Benzyl butyl phthalate (BBP), Dibutyl phthalate (DBP), Diisobutyl phthalate (DIBP) ) above the allowed limit values. TZe tape cassettes themselves do not fall under the definition of EEE.

## **Can TZe labels be submerged in alcohol?**

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

## **Are Brother TZe tapes or HSe Tubes UL certified?**

Most of our strong adhesive, flexible ID and security TZe tapes have been recognised by Underwriters Laboratories, and which are listed under the UL file number PGJ12.MH21016.

## **How long should a security TZe label be attached before peeling off?**

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

# Notes

1. A random sample of Brother laminated TZe tapes were selected and used to perform these tests.
2. All test results were acquired under specific conditions configured by Brother and/or Allion (as detailed below), with the sole aim of providing information contained within this booklet.
3. Since TZe tape adherence performance is affected by many variable factors, including the material the tape is attached to, the material's surface condition, whether it is greasy, dusty, rough or curved, and environmental conditions, customers should confirm adherence performance under the actual usage conditions. Products are used at the customers own risk and the findings presented in this document should not be taken as a guarantee of TZe tape performance in each customers' specific circumstances.
4. Brother accepts no responsibility for losses incurred as a result of reliance on information contained in this document.

## Test data sources:

Allion Japan Inc (April 2020):

Strong adhesive | Water and chemical resistance | Abrasion resistance  
Temperature resistance (all temperatures except -80°C) | Oil resistance

Brother Industries Ltd Japan (December 2012):

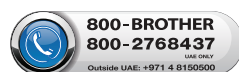
Fade resistance | Temperature resistance (-80°C)  
Autoclave resistance

brother  
at your side

*P-touch*

Contact:

brother  
at your side



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