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Technical Data for DK Rolls
For Internal Use Only

P-touch

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Extensive DK Label Tests

To ensure that we offer our customers consistently high quality and the most accurate directions for usage, we have performed extensive testing on our DK labels. These tests show that we are one of the highest quality producers of labels in the labelling industry.

Different competitor labels have also been tested and the results compared. The competitors' label pictured and presented in each test section is not necessarily produced by the same label supplier.

Abrasion Resistant Test

Brother's durable plastic film technology ensures that Brother P-touch DK film labels can withstand moderate* abrasion without leaving a single mark.

Brother P-touch DK paper labels even protect against accidental marks and scratches, due to its special coating technology applied to the paper labels.

The Abrasion Test Procedure

A 1 kg sanding device was passed over Brother P-touch DK film, DK paper, and competitor paper labels. After 50 return passes the DK film labels were completely unaffected.

The DK paper labels' print quality stayed completely unaffected, even though slight scratches appeared on the paper itself.



The Abrasion Test Results

Brother P-touch DK film label



Brother P-touch DK paper label



Competitor paper label



● = Not affected

✗ = Illegible

ABCDEFGHIJKL

DK Film

ABCDEFGHIJKL

DK Paper

ABCDEFGHIJKL

Competitor Paper

* For exposure to more heavy abrasion we recommend using our scratchproof TZ laminated labels.

Extensive DK Label Tests

Temperature Resistant Test

Whether you want to use your labels in freezing conditions or in very hot environments, Brother P-touch DK labels have been designed to last.

The Temperature Test Procedure

Brother P-touch DK film, DK paper and competitor paper labels, were slightly roughened with abrasive paper, attached to stainless steel, heated and cooled.

The Temperature Test Results

The results showed that DK film labels were unaffected throughout the temperature test, whether placed in -80°C or in +80°C*. The DK paper labels were unaffected at temperatures ranging from -80°C to +60°C, but showed slight discoloration at +80°C.

* For exposure to more extreme temperatures we recommend using our TZ laminated labels.



Temperature	Hours	DK Film	DK Paper	Competitor Paper
-80°C	240hrs	●	●	●
-30°C	240hrs	●	●	●
0°C	240hrs	●	●	●
25°C	240hrs	●	●	●
60°C	240hrs	●	●	▲
80°C	240hrs	●	▲	✗

● = No noticeable change ✗ = Illegible

▲ = Slight discoloration, but legible

ABCDEFGHIJKL

DK Film in -80°C/+80°C

ABCDEFGHIJKL

DK Paper in -80°C

ABCDEFGHIJKL

Competitor Paper in -80°C

ABCDEFGHIJKL

DK Paper in 60°C

ABCDEFGHIJKL

Competitor Paper in 60°C

ABCDEFGHIJKL

DK Paper in 80°C

ABCDEFGHIJKL

Competitor Paper in 80°C



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Extensive DK Label Tests

Indoor Fade Resistant Test

Brother P-touch DK film and paper labels are ideal for indoor usage.

The Indoor Fade Test Procedure

Brother P-touch DK film and paper labels were attached to coated metal plates and placed inside a fade-inducing chamber at 24°C±2°C with 60±5% humidity. They were left for a period of 52 hours.

In addition, DK labels were placed in a natural office environment for 1 year and inspected for any obvious changes*.

The Indoor Fade Test Results

Both the Brother P-touch DK film and paper labels remained completely legible, as shown below.



The Natural Indoor Environment Fade Test Results



* The labels' condition depends upon the environment in which they are placed. Each unique environment will affect the labels in a different way. We cannot, therefore, guarantee that labels placed in another environment than those tested will not deviate from the test results presented here.

Extensive DK Label Tests

Outdoor Fade Resistant Test

Even though Brother P-touch DK labels are not specifically designed for outdoor environments, we have nevertheless put the DK film labels through rigorous outdoor fade tests. And the results show that for temporary outdoor labelling, our yellow film labels are the most reliable choice.

The Outdoor Fade Resistant Test Procedure

Brother P-touch DK film and paper labels were attached to coated metal plates and placed inside a fade-inducing chamber and left for a maximum period of 100 hours. In addition, labels were placed in a natural outdoor environment and inspected for any obvious changes*.



The Natural Outdoor Environment Fade Test Results



Test results show that DK labels will not withstand being placed for long periods of time outdoors. We would recommend TZ laminated tapes for outdoor use of periods longer than 2 months.

* The labels' condition depends upon how heavily exposed they are to sun, rain, and other environmental circumstances, and different environments may affect the labels in a different way. We cannot guarantee, therefore, that the labels you place in a particular environment will not deviate from the test results presented here.



Extensive DK Label Tests

Water and Chemical Resistant Test

We have tested Brother P-touch DK film and paper labels extensively for their interaction with chemicals and water, and the tests show that they outperform competitor labels.

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 DK film, DK paper and competitor paper labels against the effects of water and chemicals, the labels were attached to glass slides and immersed in a variety of liquids for 2 hours.

Water and Chemical Submersion Test Results

The labels most resistant to submersion in the chemicals tested were the DK film labels. However, in general none of the labels should be submerged in extra strong chemicals, such as acetone and ethyl acetate. When working with such chemicals we recommend using our TZ laminated tapes to prevent any damage to the labels.

Solution	DK Film	DK Paper	Competitor Paper
Water	●	●	▲
Hexane	●	●	■
Mineral Spirit	●	●	▲
0.1N Sodium Hydroxide	●	▲	×
0.1N Hydrochloric Acid	▲	▲	▲
Toluene	▲	▲	×
Ethanol	▲	▲	×
Acetone	×	×	×
Ethyl Acetate	×	×	×

● = Not affected
 ▲ = Affected, but legible
 × = Illegible
 ■ = Adhesive melting

Extensive DK Label Tests



Some test comparison results

Water:



Hexane:



Mineral Spirit:



Toluene:



Extensive DK Label Tests

Stage 2: Water and Chemical Abrasion Test Procedure

Brother P-touch DK film, DK paper and competitor paper labels were affixed to several glass plates, and a 500g weight with a chemical and solvent infused cloth was passed over each label 40 times.

Water and Chemical Abrasion Test Results

Brother P-touch DK film labels remained completely unaffected when rubbed with a variety of chemicals and water. So, should any chemicals be accidentally spilt onto the DK film labels, wiping them dry should be enough to avoid any damage.

The DK paper labels showed some discolouration when tested with several of the chemicals, however, the text itself remained completely legible. If spillages of water, Sodium Hydroxide, or Hydrochloric Acid do occur, do not wipe the label, but simply let it dry.

Some test comparison results:



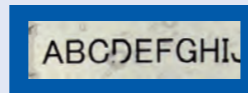
DK Film

DK film labels proved abrasion resistant against all the chemicals tested.

Toluene:



DK Paper

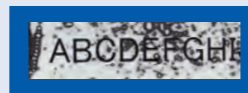


Competitor Paper

Ethanol:

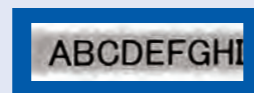


DK Paper

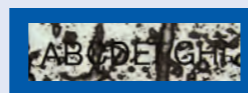


Competitor Paper

Ethyl Acetate:



DK Paper



Competitor Paper

Acetone:



DK Paper



Competitor Paper

Solution	DK Film	DK Paper	Competitor Paper
Water	●	×	×
Hexane	●	●	●
Mineral Spirit	●	●	●
0.1N Sodium Hydroxide	●	×	×
0.1N Hydrochloric Acid	●	×	×
Toluene	●	▲	▲
Ethanol	●	▲	×
Acetone	●	▲	×
Ethyl Acetate	●	▲	×

- = Not affected
- ▲ = Affected, but legible
- × = Illegible



Extensive DK Label Tests

Strong Adhesion Test

Brother P-touch DK paper and film labels are both supplied with a strong adhesive to ensure that they remain stuck to most common surfaces.

Strong Adhesion Test Procedure

To test the adhesive strength of Brother P-touch DK film and paper labels, 25mm wide labels were affixed to a variety of surfaces and left for 30 minutes. The adhesive strength was tested by removing the label at an angle of 180 degrees. This testing method complies with Japanese Standard JIS Z0237 testing for adhesive tape.

Strong Adhesion Test Results

The table shows that an adhesive strength of at least 11 Newtons was maintained with most materials, indicating sufficient adhesive strength against most common materials.



Solution	DK Labels
Stainless Steel	12.1
Glass	11.2
PVC	12.7
Acrylic	11.0
Polypropylene	10.0
Polyester Coated Wood	11.0

Curved Surface Adhesion Test

Brother DK film labels are specifically designed so that the labels will stick to most cylindrical surfaces used within the laboratory and medical sectors*.

Curved Surface Adhesion Test Procedure

Brother P-touch DK film and paper labels were attached to test tubes of various materials and sizes, and left for approximately 30 minutes. The labels were then checked for their ability to stay affixed to each particular surface.

Curved Surface Adhesion Test Results

	Ø 10.6mm Polystyrene	Ø 14.6mm Polystyrene	Ø 17.7mm Polystyrene	Ø 11.8mm Glass	Ø 11.8mm Polypropylene
DK Film	●	●	●	●	●
DK Paper	●	▲	▲	●	×

- = Sticks perfectly to the curved surface
- ▲ = 5mm to 10mm of the label's edge springs back
- × = Does not stick to the curved surface

* For labelling particularly small cylindrical objects, such as cables and wires, we recommend labelling with TZ Flexible ID label tapes.



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