

NITTO PRODUCT INFORMATION

NITTO DOUBLE – COATED ADHESIVE TAPES

NO.500, NO.500A

1. Outline

NITTO Double – coated Adhesive Tapes for industrial use, No.500 and No.500A consist of a flexible nonwoven fabric impregnated with NITTO's own high – adhesion pressure – sensitive adhesive. No.500 is suitable for metal nameplates to be punched out and No.500A is for plastic nameplates to be preliminarily processed.

2. Construction

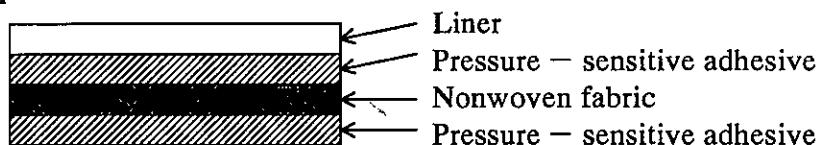


Fig. 1

3. Features

- 1) Excellent adhesion
- 2) Very high repulsion resistance
- 3) Bonds firmly 2 different materials showing high thermal dimensional change such as a metal plate and a plastic plate.

4. Uses

- 1) For metal plates to be punched out
- 2) For decoration of automotive meter panels and air conditioners
- 3) For laminating ABS decorative panels
- 4) For mounting plastic display panels

5. Standard Sizes

Table 1

Thickness (mm)	Width (mm)	Length (m)
0.15	10, 15, 20, 25, 30, 50, 400	50

For other sizes, please contact us.

6. Properties

6.1 Adhesion

Table 2

(unit: g/20mm width)

Sample \ Substrate	Aluminum	Styrol	Stainless Steel	Woodgrained ABS	Test Method
No.500, No.500A	770	850	1,240	780	JIS Z 1528
Competitive Item A	650	650	1,000	550	
Competitive Item B	500 Min.*	500 Min.*	1,100	500 Min.*	

Competitive Item B: transfer type

* Min. indicates occurrence of adhesive layer failure.

6.2 Creep Properties

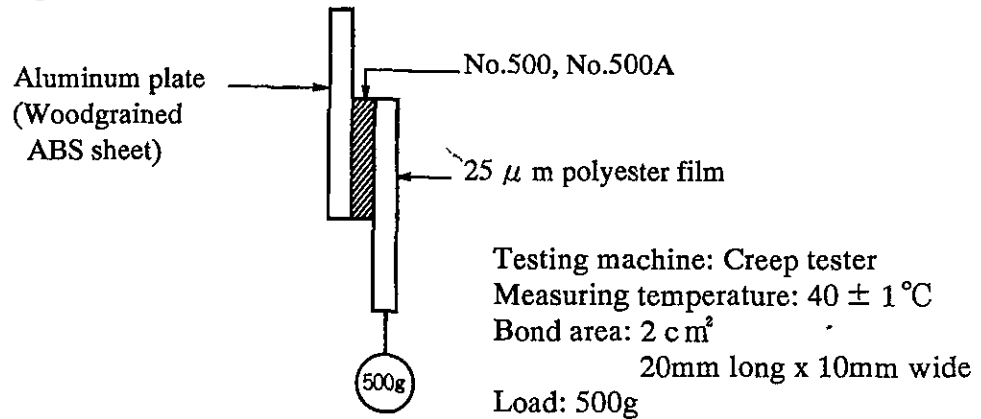


Fig. 2

6.2.1 Against Aluminum Plate

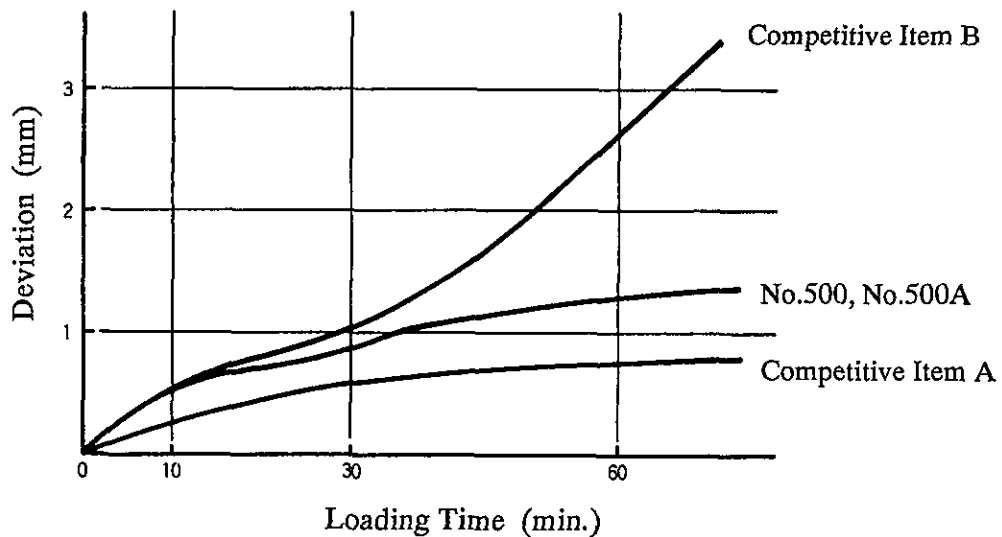


Fig. 3

6.2.2 Against Woodgrained ABS Sheet

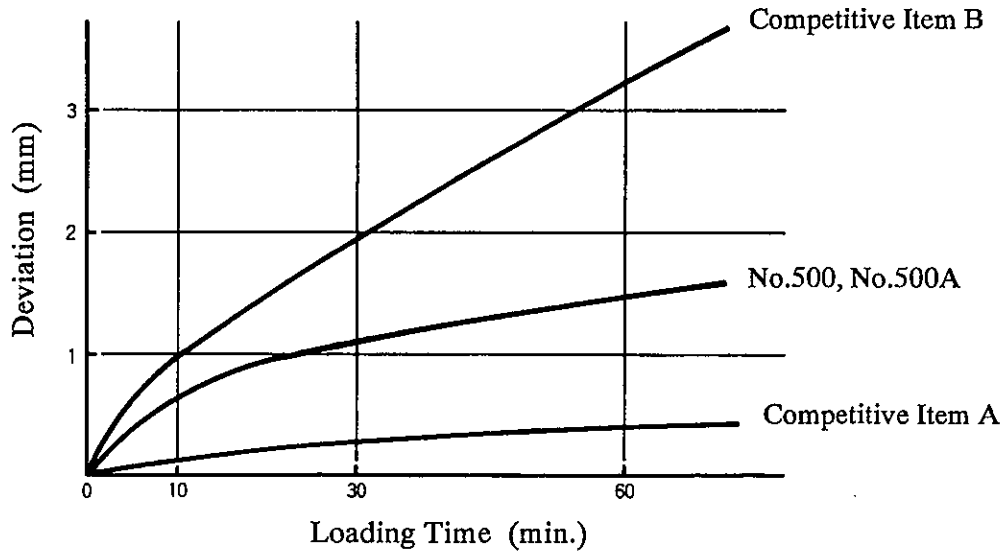


Fig. 4

6.3 Peeling Test under a Constant Load

Table 3

Sample		Holding Time (hrs.)	Peeling (mm)
No.500, No.500A	20°C	258 Min.	10
	80°C	258 Min.	20
Competitive Item A	20°C	168	—
	80°C	0.6	—
Competitive Item B	20°C	258 Min.	25
	80°C	2.3	—

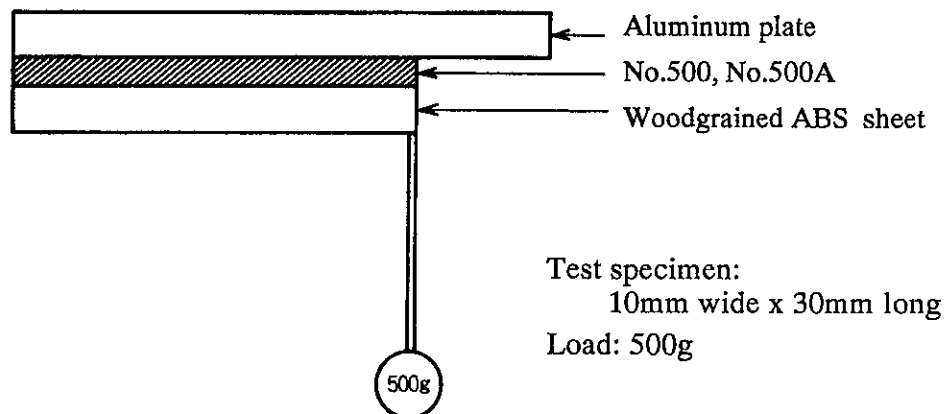


Fig. 5

6.4 Vertical Holding Strength

Measured at $40 \pm 1^\circ\text{C}$

Bond area : 2c m^2 (20mm long x 10mm wide)

Table 4 (unit: min.)

Sample	Load	500g	1000g
No.500, No.500A		400	54
Competitive Item A		840	70
Competitive item B		220	65

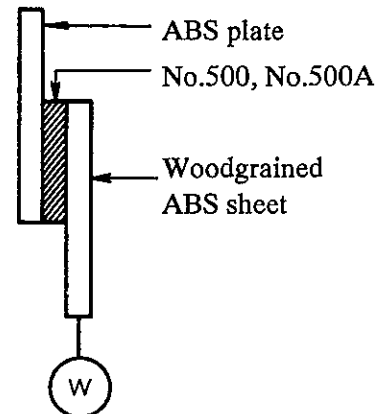


Fig. 6

6.5 Shear Strength

6.5.1 Testing Method

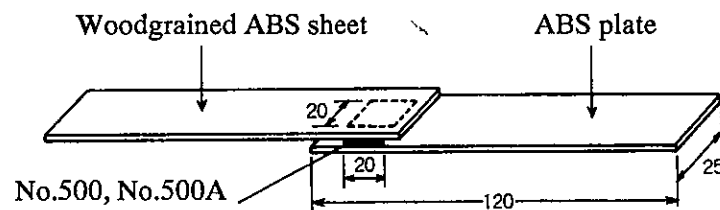


Fig. 7

Substrate: ABS plate, 2mm thick x 25mm wide x 120mm long

Woodgrained ABS sheet, 0.25mm thick x 25mm wide x 120mm long

Specimen: 20mm long x 20mm wide

Bonding condition: 5kg loading for 10 sec.

Measuring condition: $20 \pm 2^\circ\text{C}$, $65 \pm 15\% \text{RH}$

Pulling rate: 200 mm/min.

6.5.2 Shear Strength in Normal Condition

Initial shear strength: measured after the duration of 10min. at 20°C since bonding

Shear strength after conditioned: measured after conditioned at 20°C for 48hrs. since bonding

Table 5 (unit: kg/20mmx20mm)

Sample	Initial	After 48hrs. since bonding
No.500, No.500A	22.1	22.1 Min.*
Competitive Item A	22.8	22.2 Min.*
Competitive item B	22.8	22.2 Min.*

* Woodgrained ABS sheet was broken.

6.5.3 Shear Strength at High Temperature

Conditioned at 20°C for 48hrs. after bonding

Measured at 70 ± 2°C,

Preheated for 10min.

Table 6 (unit: kg/20mmx20mm)

Sample	Values
No.500, No.500A	12.8
Competitive Item A	13.5
Competitive item B	12.1

6.5.4 Shear Strength at Low Temperature

Conditioned at 20°C for 48hrs. after bonding

Measured at - 10 ± 2°C,

Precooled for 10min.

Table 7 (unit: kg/20mmx20mm)

Sample	Values
No.500, No.500A	28.8 Min.*
Competitive Item A	28.5 Min.*
Competitive item B	29.0 Min.*

* Woodgrained ABS sheet was broken.

6.5.5 Shear Strength after Heat Aging

Conditioned at 20°C for 48hrs. after bonding, Heat - aged at 70 ± 2°C for 96hrs

Conditioned at 20°C for 24hrs.

Measured at 20°C

Table 8 (unit: kg/20mmx20mm)

Sample	Values
No.500, No.500A	28.8 Min.*
Competitive Item A	28.5 Min.*
Competitive item B	29.0 Min.*

* Woodgrained ABS sheet was broken.

6.5.6 Shear Strength after Moistened

Conditioned at 20°C for 48hrs., Stored at 40 ± 2°C and 95 ± 2%RH for 168hrs.

After the duration of 168hrs., the assembled sample was taken out and immediately the test was carried out at 20°C.

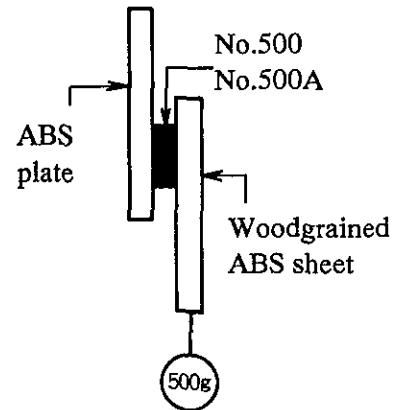
Table 9 (unit: kg/20mmx20mm)

Sample	Values
No.500, No.500A	28.8 Min.*
Competitive Item A	28.5 Min.*
Competitive item B	29.0 Min.*

* Woodgrained ABS sheet was broken.

6.6 Softening Point

An ABS plate and a woodgrained ABS sheet were lap-jointed with a test specimen. After the lapse of 48hrs., the assembled sample was hung down vertically in the oven and a weight of 500g was attached to the lower end. The temperature in the oven was kept at 38°C for the first 15min., then, it was increased at a rate of 3°C/5min. When the sample fell down the temperature was measured.



Bond area : 4 cm^2
20mm long x 20mm wide

Fig. 8

Table 10

(unit: °C)

Sample	Values
No.500, No.500A	87
Competitive Item A	69
Competitive Item B	71

6.7 Lifting after Cycle Test

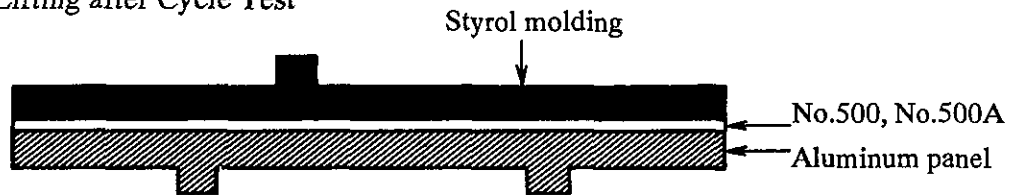


Fig. 9

The first face of the tape (not laminated with the liner) was laminated to an aluminum panel and the second face (laminated with the liner) was done to a styrol molding. The assembled sample was pressed lightly by hand. Then, it was exposed to 2 cycles. 1 cycle consisted of conditioning at room temperature for 1hr., exposure to -20°C for 2hrs., conditioning at room temperature for 1hr. and to 60°C for 2hrs. After that, lifting was inspected.

Number of samples: 5 except for the competitive item A(=3)

Table 6

(unit: kg/20mmx20mm)

Sample	Test Result				
	No.500, No.500A	Good	Good	Good	Good
Competitive Item A	Good	Good	Good	Lifting	Lifting
Competitive Item B	Good	Good	Good	Good	Good

6.8 Repulsion Resistance Test

A styrol molding and an aluminum panel were laminated by the same method as mentioned in 6.7. The assembled sample was curved as shown in Fig. 10 and aged at 40 °C for 7 days. After that, the lifting was inspected.

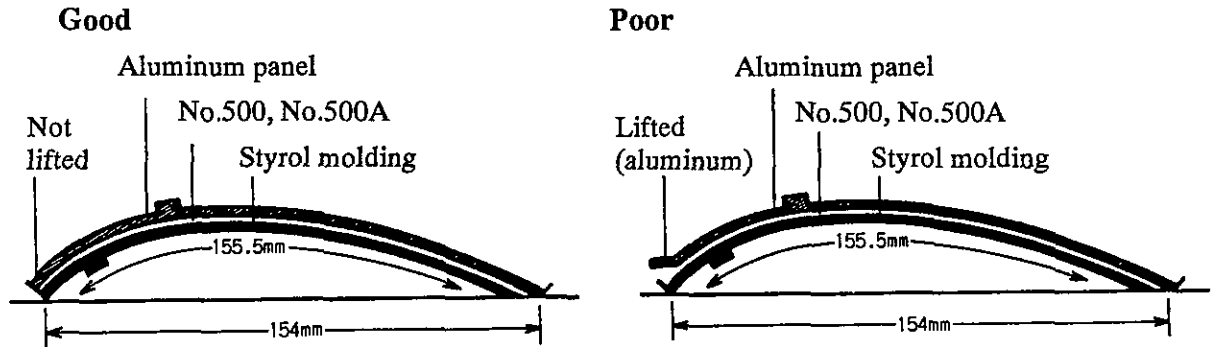


Fig. 10

Table 12

Sample	Test Result
No.500, No.500A	Good
Competitive Item A	Poor
Competitive item B	Good

7. Caution for Use

- 1) No.500 is suitable for nameplates with burrs less than the thickness of No.500 (the standard size: 0.15mm)
- 2) Before use, remove oil and grease, moisture and water, dirt and dust from the surface of the substrate.
- 3) Make the surface of the substrate smooth as much as possible.
- 4) Apply the tape to the substrate giving a sufficient pressure because a pressure – sensitive adhesive is used.
- 5) It takes a time to get enough adhesive strength after application. Accordingly, take care that the tape is not exposed to a strong force for several hours after application.
- 6) The optimum application temperature ranges from 10 °C to 30 °C . Once the tape is applied at normal temperature, the properties will not be deteriorated even if exposed to low or high temperature.

8. Caution for Storage

- 1) The tape should be stored in a box. The tape rolls should be placed in the box so that the cut faces are horizontal. If they are vertical, distortion will occur due to its own weight.
- 2) The tape should be stored in a cool and dark place away from direct sunlight.

9. Others

Technical data figures herein presented are typical and should not be used for any specification purposes.

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