

Testing Methods For Adhesives For Automobiles

KES T – L278

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1. Scope of Application

This standard shall specify test for general testing items of non-structural adhesive used at vehicle.

2. Test Items

- (1) Specific Gravity
- (2) Non-volatile
- (3) Viscosity
- (4) Roughness
- (5) Storing Tensility
- (6) Contaminative quality
- (7) Shearing Strength
- (8) Tensile Strength
- (9) Peeling Strength
- (10) Softening Point
- (11) Adhesive Keeping Time
- (12) Cold Peeling Strength
- (13) Hot Peeling Strength
- (14) Heat Aging Peeling Strength
- (15) Sticking paper Peeling Strength

3. General Condition of Test

- (1) Standard condition of test : Let it standard temperature condition 2nd class of KS

A 0006 (Standard condition of testing place), that is temperature of 20 ± 2 °C, humidity of 65 ± 10 %.

- (2) Collecting method of sample : Sample collects amount necessary to test from lot

thought to be same with an adequate tool and put it in sealed vessel, which is not evaporated. Use it at test after making it uniform by stirring sufficiently.

(3) Preparation of sample and specimen material : Sample and specimen material are used after keeping in condition of 3.(1) during sufficient time in advance.

(4) Type of specimen material and surface treatment : Type of specimen material and surface treatment conform to table 1. But, it conforms to agreement between concerned parties in exceptional case.

Table 1

Type of specimen material	Material	Surface treatment
Steel plate	Cold rolling steel plate of 1 st type, thickness of 1.6 mm defined in KS D 3512 [Cold rolling steel plate and steel belt]	Polish No.240 defined in KS L 6003 (Polishing paper) and wash with solvent ⁽¹⁾ .
Steel material	Rolling steel material for general structure defined in KS D 3503 (Rolling steel material for general structure)	
Aluminum plate	Aluminum plate of Al PI – ½H, thickness of 2.0 mm defined in KS D 6701 (Aluminum and aluminum alloy plate and sheet)	
Vulcanized rubber	Thickness of 1.5 mm and 5.0 mm	
Cotton canvas	Conform to parallel cotton canvas defined in KS K 1450 (Cotton canvas)	
Vinyl leather cloth	Vinyl leather cloth of type 2 and thickness of 0.4 mm defined in vinyl leather cloth of KS M 3601 (Chloride vinyl leather)	
Hardened fiber plate	Hardened fiber plate of thickness of 5.0 mm defined in KS 3203 (Hardened fiber plate)	

Note (1) In case of washing with solvent, use what is defined in reagent class

(Tri-chloro-ethylene) KS M 8153 (Toluene reagent), KS M 8010 (Acetone reagent), or KS M 2611 (Gasoline for industry) and etc.

(2) Vulcanized rubber takes thing shown on table 2 as a standard.

Table 2

Mixture	Weight ratio	Remark
SBR # 1500	100.00	What is applied to KS M 6517 (Testing method for synthesis rubber SBR)
Sulfur	2.0	What is defined in KS M 6539 (Sulfur for rubber)
Zinc oxide	5.0	What is defined in KS M 6551 (Zinc for rubber)
Stearic acid	1.5	What is defined in KS M 2710 (Stearic acid)
Diebezo tiazoladesolpid	3.0	What is defined in KS M 1604 (Vulcanized promotion DM)
SRF carbon black	40.0	What is applied to KS M 6558 (Carbon black testing method for rubber)

Remark : Take vulcanizing condition at 150 °C for 45 minutes.

- (5) Method to paint sample and amount to paint : Method and amount to paint sample are same to Table 3. But, it conforms to agreement between concerned parties in case that there is specified thing.

Table 3

Name	Painting method	Painting amount
Spraying	Use spray gun that diameter of nozzle is 1.5 ~ 2.0 mm and keep distance between adhered material and spray gun in range of 300-500mm and make pressure of air 3.5 ~ 4.0 kg / cm ² and take spraying to both adhered surfaces.	130 ~ 180 g / m ²
Brushing	Paint to both adhered surfaces with brush that sample is wetted sufficiently	150 ~ 250 g / m ²
Spooning	It is applied to high viscous sample and paints it to both adhered surfaces so that thickness is approximate 0.5 mm.	400 ~ 500 g / m ²

- (6) Number of specimen and ending method of numerical feature : Make the number of specimen used at the same test more than 5 and end testing result by obtaining the averaging value according to KS A 0021 (Ending method of numerical feature) and show with digit number of table 4.

Table 4

Testing method	Testing record
Specific gravity	2 decimal places
Non-volatile (%)	1 decimal places
Viscosity (cP/20 °C or P/20 °C)	2 places of efficient feature
Roughness (20 °C)	Integral place
Shearing Strength (kg / cm ²)	2 places of efficient feature
Tensile Strength (kg / cm ²)	2 places of efficient feature
Peeling Strength (kg / 25 mm)	1 decimal places
Softening Point (°C)	Integral place
Cold Peeling Strength (kg / 25 mm)	1 decimal places
Hot Peeling Strength (kg / 25 mm)	1 decimal places
Heat Aging Peeling Strength (kg / 25 mm)	1 decimal places
Sticking paper Peeling Strength (kg / 25 mm)	1 decimal places

4. Specific Gravity

4.1 Testing tools

(1) Specific gravity cup : As shown on figure 1, it is made with brass, is plated with chrome. Cup is a cylinder made strongly so as not to deform and cover is excavated with inside tilted and has a small hole at its deepest place.

Put water in cup at 20±2 °C and close the cover and then adjust the volume of cup by cutting upper edge of cup so that weight of water is 100±1 g when wipe water poured from the small hole and weigh it.

Make weight of cup less than 200 g.

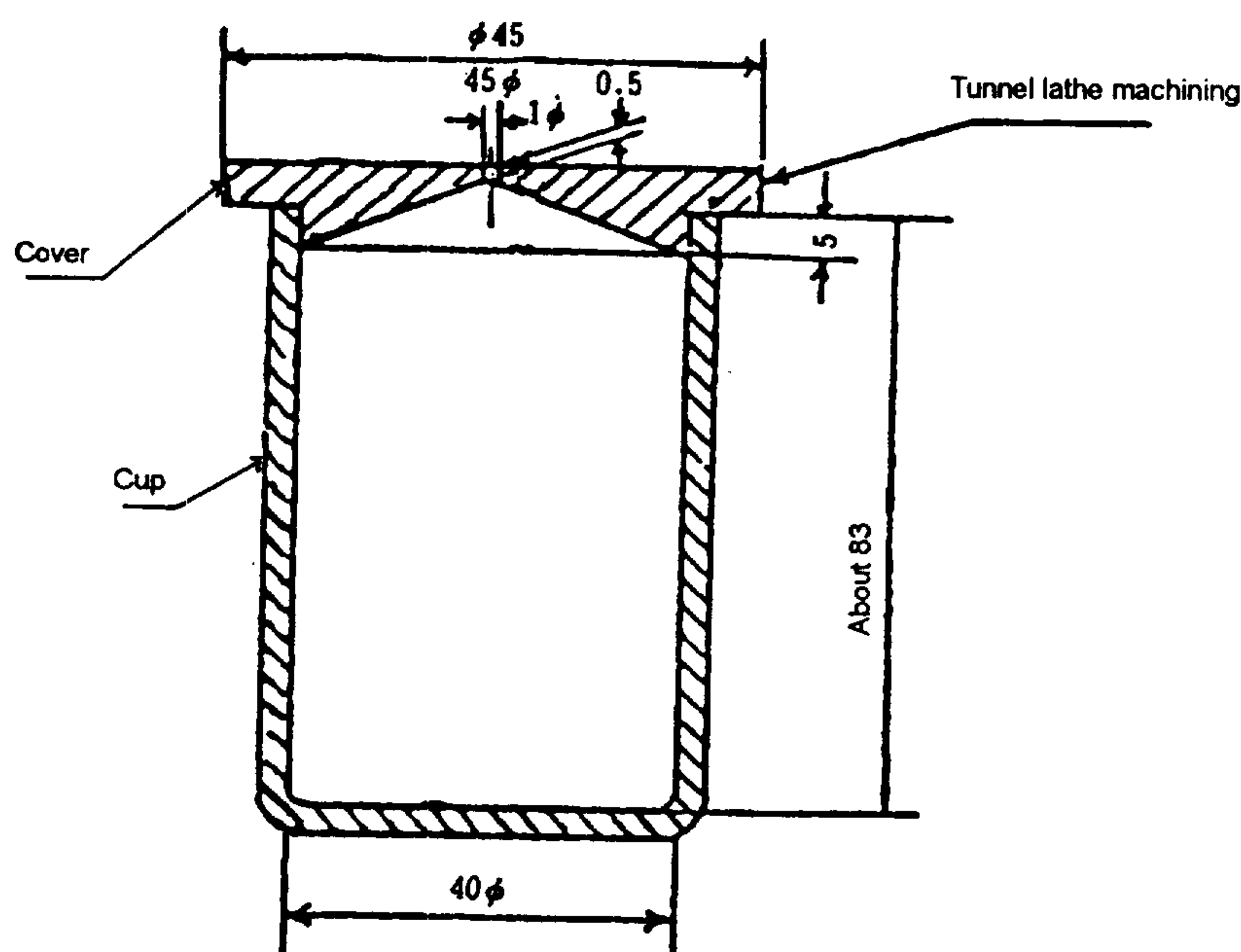


Figure 1 : Specific gravity cup

- (2) Testing method : After keeping sample at 20 ± 2 °C for approximate 3 hours, put it in fully as taking care so that bubbles don't get in and wipe remaining sample leaked from hole of cover well when close the cover. After weighing these sample, take number obtained by multiplexing 0.01 to g number of weight as specific weight.
- (3) Report : Testing record obtains average value by measuring 3 times and show as same as 3.(6)

5. Non-volatile

5.1 Testing tools

- (1) Dryer : Use hot blow cycling type able to keep at 105 ± 2 °C.
- (2) Weighing bottle : Use thing of which inner diameter is 50 mm and depth is 30 mm approximately defined in KS L 2303 (Glass tools for physics and chemistry)
- (3) Chemical balance : Use one of which weight able to weigh is 100 ~ 200 g and sensitivity is 1mg.