

1000-100-100

KES

Fuel Tube for Plastic

KES D – A312

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Quoted Standard

Appended Document

1. Scope of Application

This standard shall specify the plastic tube (Hereinafter referred to as tube) for the fuel line in a car. This standard shall specify the minimum conditions that are required to the tube that is using on the feeding, return, or evaporating gas line in a gasoline or diesel fuel system, the operating pressure of the system is less than 7kgf/cm^2 (690Kpa), and the consecutive exposed temperature of the system is $-40^{\circ}\text{C} \sim 115^{\circ}\text{C}$.

2. Purpose

This purpose of this standard shall be to make the specification standardized in order to secure the proper quality.

Remark : This standard shall notify the demand of our company with the specification drawing.

3. Reporting of Evaluation Result

The evaluation result of quality in each level from developing to manufacturing should be submitted to KIA according to the indication in appended document.

4. Summary of terms

(1) Nominal size

Nominal size is defined as the outer diameter of tube, and sizes are in table 1.

Table 1. Tube size according to the nominal size

Nominal size (mm)	Inner diameter (mm)	Thickness(mm)	Minimum diameter of curvature(mm)
6.35	3.89~4.14	0.98~1.14	76.2
7.93	6.20~6.50	0.90~1.15	101.6
9.53	7.90~8.20	0.90~1.15	152.4

5. Specifications Expressed on Drawing

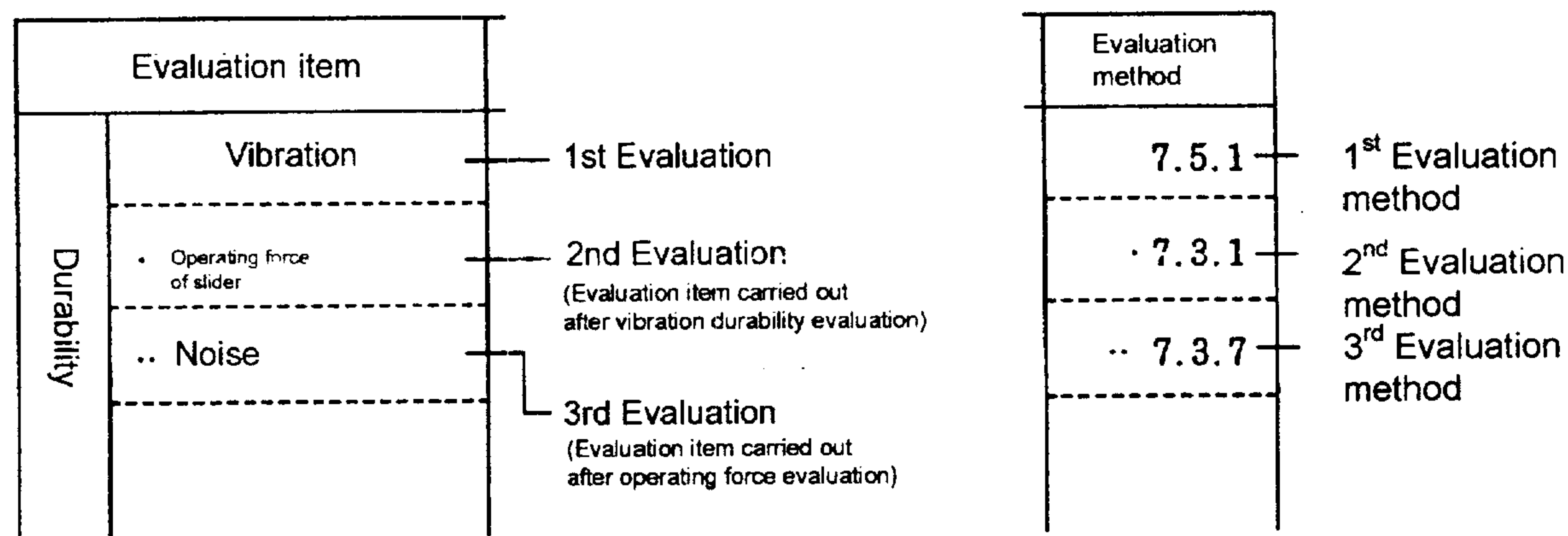
(1) The quality of material of parts

(2) Weight of parts and measuring method

6. Evaluation Standard

The evaluation standard of a tube follows table 2.

Remark 1. The reading method of test item and test method in table 2 is as following example.



Remark 2. The grades of quality are represented as A, AR, B, or C.

The method follows KMS Q 410001(Regulation of quality rank determination).

Table 2.

Test item		Evaluation standard	Quality garde	Test method
Initial Perfo- mance	Breakage	Should be more than 74.9kfg/cm2(7.35Mpa)	A	7.2.1
	Pressure resistibility	The changing rate of outer diameter should be within 2%.	A	7.2.2
	Airtight	Oil leakage and tube taking-off should not be found.	A	7.2.3
	Elongation intensity	. Should be more than 40.8kgf(400N). . Quick connect and tube taking-off should not be found.	A	7.2.4
Endu- rance Perfo- mance	Cold resistibility	The crack, deformation, and etc. of parts should not be found.	A	7.3.1
	. breakage	Should satisfy the initial performance.	A	7.2.1
	.. airtight	Should satisfy the initial performance.	A	7.2.3
	Heat resistibility	The crack, deformation, and etc. of parts should not be found.	A	7.3.2
	. breakage	Should satisfy the initial performance.	A	7.2.1
	.. airtight	Should satisfy the initial performance.	A	7.2.3
	Cold flexibility	The crack, deformation, and etc. of parts should not be found.	A	7.3.3
	Twist resistibility	Steel ball should pass inside the tube.	A	7.3.4
	Bending resistibility	The crack, deformation, and etc. of parts should not be found.	A	7.3.5
	Breakage	Should satisfy the initial performance.	A	7.2.1

Table 2.(Continue)

Test item		Evaluation standard	Quality garde	Test method
Endu- rance Perfo- mance	Cold impact resistibility	The crack, deformation, and etc. of parts should not be found.	A	7.3.6
	.breakage	Should satisfy the initial performance.	A	.7.2.4
	Life cycle resistibility	The deformation, discoloration, and crack should not be found.	A	7.3.7
	.breakage	Should satisfy the initial performance.	A	7.2.1
	..airtight	Should satisfy the initial performance.	A	7.2.3
	Fuel suitability	The deformation, discoloration, and crack should not be found.v	A	7.3.8
	.breakage	Should satisfy the initial performance.	A	.7.2.1
	..elongation intensity	Should be more than 75% of initial performance.	A	..7.2.4
	Chemistry resistibility	The deformation, discoloration, and crack should not be found.	A	7.3.9
	.breakage	Should satisfy the initial performance.	A	.7.2.1
	..elongation intensity	Should be more than 75% of initial performance.	A	..7.2.4
	Calcium chloride resistibility	The deformation, discoloration, and crack should not be found.	A	7.3.10
	.breakage	Should satisfy the initial performance.	A	.7.2.1
	Fuel permeability resistibility	Should be less than 0.03g/m2.24Hrs.	AR	7.3.11
	Self fire fighting	Should be within 5 seconds.	A	7.3.12
Appea- rance	Appearance	Burr, crack, breakage, deformation, and etc. should not be found.	A	Naked eye inspection
	Size	Should be suitable to the indication value of the specification drawing.	B	Calipers
	Purity	Dust, metal, plastic, rubber particles that are bad on performance should not be found.	A	Naked eye inspection

7. Test method

7.1 Common test condition

7.1.1 Standard condition in testing place

If no special indication, it follows KS A 0006 (Standard condition in testing place). The standard state of temperature is 20 °C , fifteenth grade (20 ± 15 °C), the standard state of humidity is 65 %, twentieth grade (65 ± 20 %) 1atm.

7.1.2 Condition of test and measuring size

7.2 Initial performance

7.2.1 Breakage

- (1) Make the tube stabilized for 0.5~3 hours in the standard state.
- (2) Close up one end of tube in a device as figure 1, and apply a constant pressure with a velocity by which the pressure is reached to 35.7kgf/cm^2 (3.5Mpa) within 10 seconds.
- (3) Apply the pressure until the tube is broken.

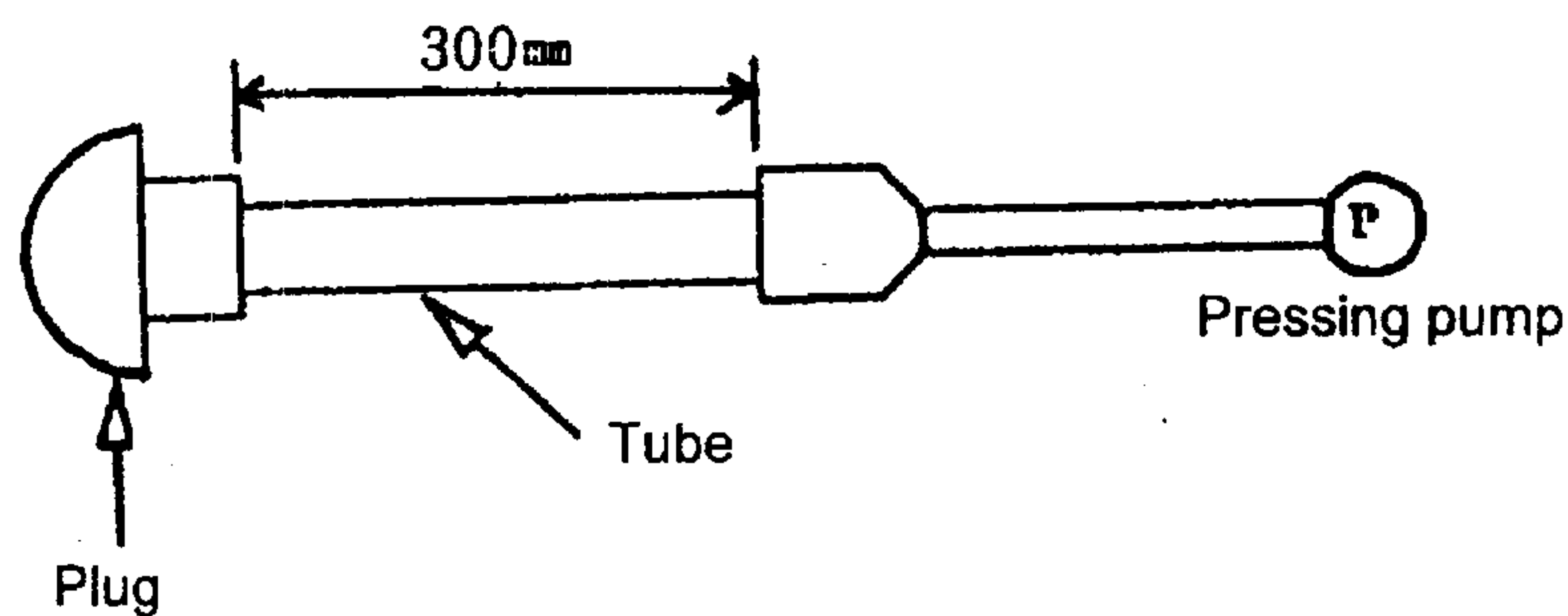


Figure 1. Breakage test device

7.2.2 Pressure resistibility

- (1) Fill the tube, the length of which is 550mm, with water, and maintain the internal pressure of 10kgf/cm^2 (980Kpa) for 5 minutes.
- (2) Measure the outer diameter at the positions in figure 2.

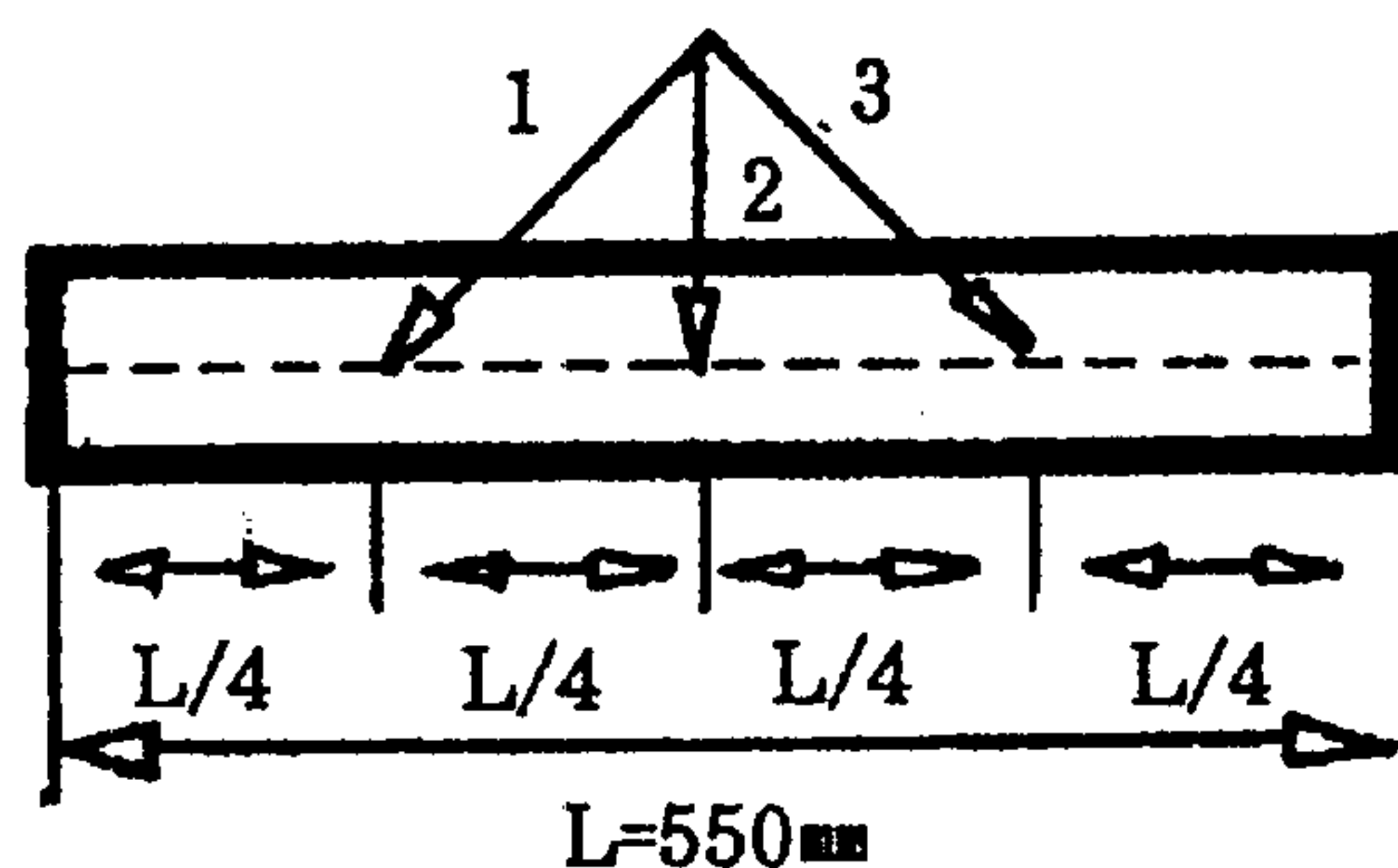


Figure2. Pressure resistibility test

7.2.3 Airtight

- (1) Install the tube, at both ends of which quick connectors are attached, as figure 3.
- (2) Fill the inside of tube with fuel oil (ISO-Octane 50 vol % + Toluen 50 vol %), and leave it alone for 24 hours in the standard state.