

KES

Testing Method of Brightness
Temperature of Plastics
and Elastomers by Impact

KES T – L208

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1. Scope of Application

This standard shall regulate a measuring method of a brightness temperature, which plastics and elastomers break by a regulated impact. It also regulates two usual inspection method and a range of allowance.

Note ⁽¹⁾ : For a measuring method of a brightness temperature of rubber by impact, refer to regulations in KS M 6676 (Measuring method of a brightness temperature of vulcanized rubber and plastics by low temperature impact).

2. Purpose

2.1 This standard regulates a temperature, at which the testing plate is broken 50 %, when the test is performed under conditions regulated here. It is possible to evaluate long-term influence such as crystallization or perform a test for non-miscibility of sample and plastic material at low temperature. The plastics and elastomers are used for applications in fields that require low temperature bending with or without impact. Data obtained by this standard, which can be applied to deformation conditions similar to the one described in this standard, is used to predict movements of the plastics and elastomers at low temperature. Although this standard is appropriate for a standard purpose, it does not necessarily measure the useful lowest temperature of the sample exactly.

3. Definition

3.1 Brightness temperature

As the temperature that 50 % of the sample is broken in a regulated test, it is presumed statistically.

4. Equipment

4.1 Clamp for testing plate and impact rod

A clamp for testing plate must be an equipment that can hold one or few testing plates firmly like a cantilever beam. Each testing plate is held firmly and securely by a different clamp.

A linear speed of an impact rod on the testing plate should be kept at 1.8 ~2.1 m per second to move at least 6.4mm during and after the impact.

In order to keep this speed, it is necessary to limit numbers of the testing plate for each

test. At impact, keep a distance between a centerline of the impact rod and the clamp as 7.87 ± 0.25 mm, and a radius of end of the impact rod should be 1.57 ± 0.13 mm. An interval between the impact rod and the clamp before and after the impact should be 6.35 ± 0.13 mm. These sizes are shown in Figure 1, and Figure 2 shows a typical clamp.

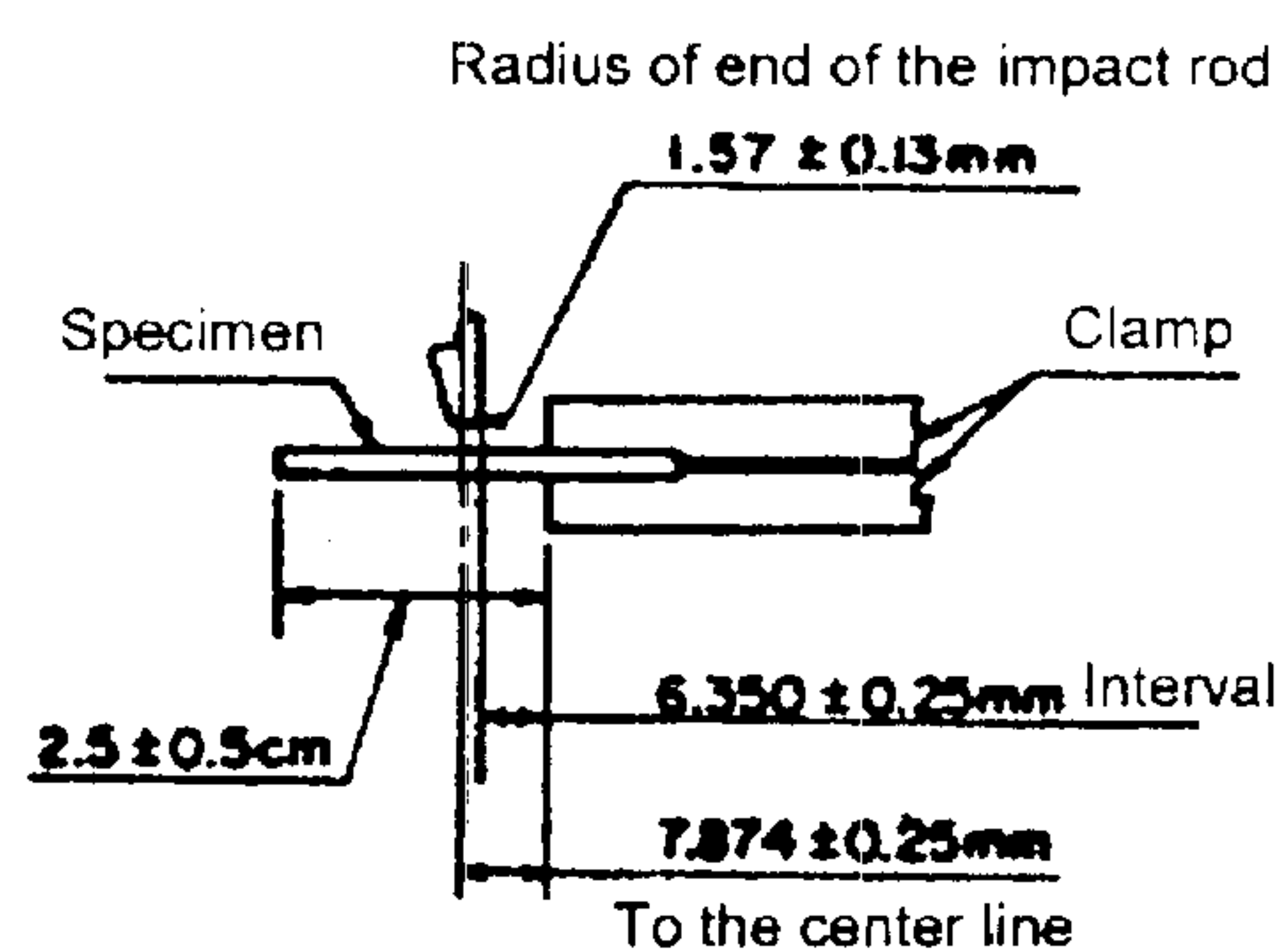


Figure 1. Sizes between testing plate clamp and end of impact rod

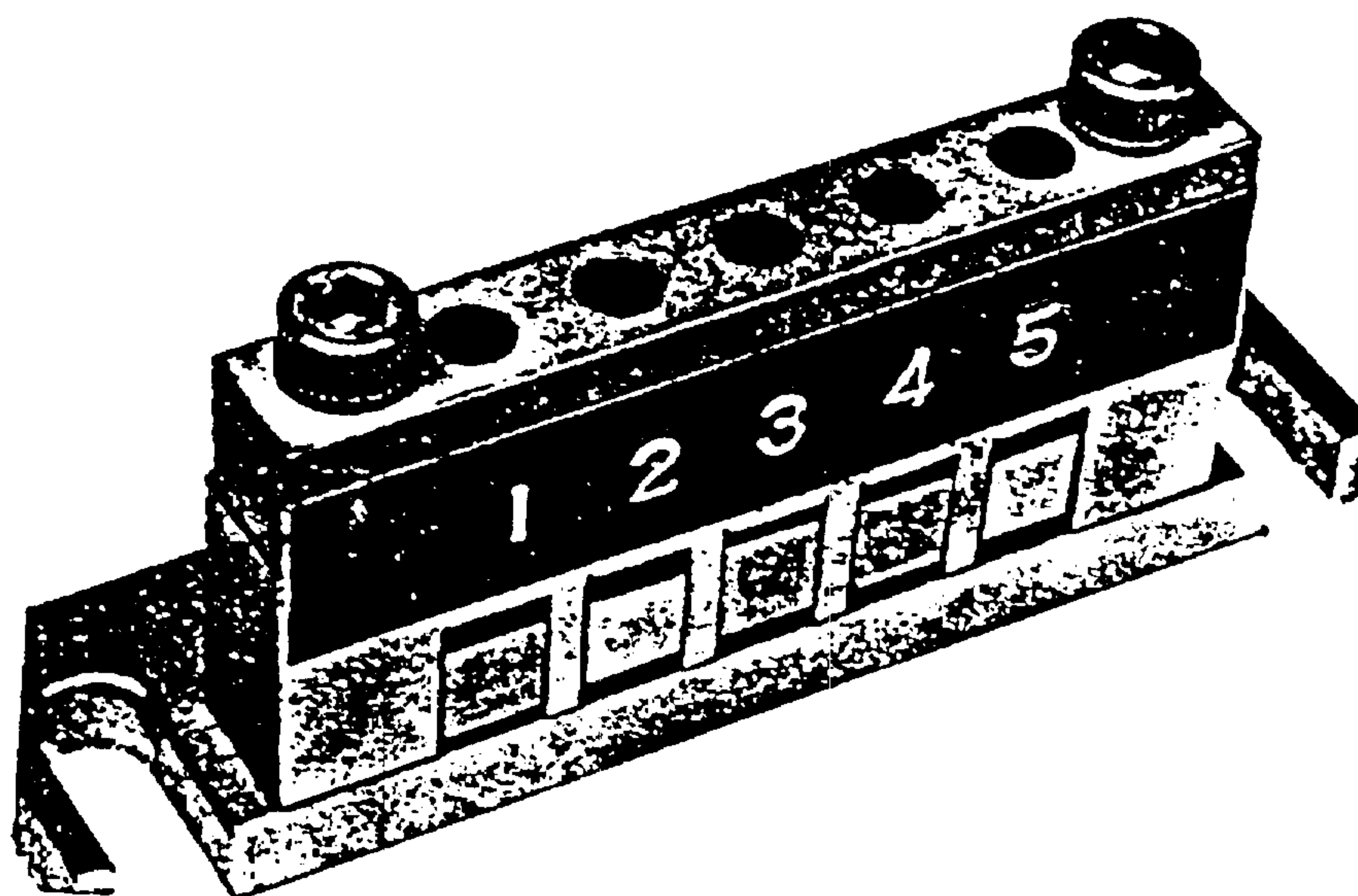


Figure 2. Typical clamp equipment

Note ⁽²⁾ : It is possible to purchase appropriate test equipments commercially from several companies. For impact part, it is possible to use a motor, a solenoid, application of gravity or a spring loading method. There should be a safety apparatus to stop motions of the impact rod when opening a lid of the equipment, which utilizes the motor.

4.2 Couple force wrench
Range from 0 to 8.5 N·m.

4.3 Thermocouple
It should be the one, which has scales in every 1 °C and has an appropriate temperature indicator for a measuring range of temperature. The thermocouple should be a copper-Constantine wire, which wire number is from No. 24 to 32, and be placed as close to the testing plate as possible.

Note ⁽³⁾ : It is allowed to use a thermometer, which range of temperature corresponds to the regulated thermocouple.

4.4 Heat delivering medium
Heat delivering medium should be kept in liquid at the testing temperature, and should not influence the testing plate. When using a refrigerant as a solvent with flammability or virulence, be careful handling with an ordinary method.
An appropriate heat-delivering medium for rubber is methanol.

Note ⁽⁴⁾ : The following mediums can be used up to indicated temperatures. When using dichlorofluoromethanol, it is required to cool down to a boiling temperature of −29.8 °C before moving from a cylinder to a tank of the testing equipment.

Refrigerant and temperature for use

Refrigerant	Lowest temperature for use (°C)
Dow Coning 200 fluid 5 cSt (Viscosity)	-60