

KES

Method of Brinell Hardness Testing by UTM

KES T – K023

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1. Scope of Application

This standard determines Method of Brinell Hardness (HB) Testing for metal material by 10 T U.T.M.

2. Testing Instrument

10 T U. T. M.

3. Test Method and Order

- (1) For HB hardness, test the products as they are or with their samples.
- (2) When picking up a sample by predicting the expected permanent mark, cut the sample as 10 times thicker than the pressed mark, 5 times wider than the diameter of the pressed mark.
- (3) The product and sample shell be flat and grind the sample with # 800 sandpaper so that the concave part can be read by 0.05 mm. Polishing shell be better if possible.
- (4) Wash the polished sample with alcohol and prevent rust.
- (5) Set a CT type load unit to 10 T U.T.M cross head.
- (6) Set a pusher to CT type load unit.
- (7) Zero the recording chart of dataletty 401.
- (8) Select the load selector. [Example, set it at 2(5 T) for steel.]
- (9) Put F/S load in.
- (10) Set the test mode at cycle.
- (11) Put min. load in. (0 kg)
- (12) Put max. load in. (500, 750, 1000, 1500, 3000 kg)
- (13) Put the sample No. in. (Generally, a random number)
- (14) Using an auto control system and program control timer, set the time to maintain

constant load for specific duration. (Generally, 30 seconds for iron or steel, longer than 30 seconds for other soft material)

(15) Put a sample on the test and press it. (Test Down)

(Here, C.H works automatically according to the program put in)

(16) When 1 cycle is finished, stop the U.T.M and take the sample out.

(17) Read the diameter of permanent mark of the sample using a microscope by 0.05 mm.

(Refer to figure 2)

(18) Read the sample's hardness value, the numbers observed by a microscope, according to the converting table.

(19) Repeat the test more than 3 times and have their average.

(20) Indicate the hardness value as HB (Ball diameter) / (Test load) / (Duration).

Example : HB10 / 3000 / 30 000 (Hardness value)

4. Other Reference Data

(1) Testing velocity shall be 1 mm / min.

(2) Chart velocity shall be minimal.

(3) Tolerance : KS. ASTM : $\pm 1\%$

B . S : $\pm 0.5\%$

(4) Pressed mark tolerance : $\pm 0.01 \sim 0.025$ mm

(5) Diameter of pressed mark and choice of relation with load

Table 1

Diameter of pressed mark (mm)	Load (kg)
5	750
10	500
10	1,000
10	3,000

Table 2

Sample's material	Testing load for each steel ball	
	D = 10 mm	D = 5 mm
Steel and same level of hardness(Iron)	3000	750
Steel alloy	1000	250
Steel and aluminum alloy	500	125
Zinc, tin alloy	100	25

Table 3 Distance between pressed marks

	KS	ASTM	BS	ISD
Distance between the center of pressed mark	4.5 d	1.5 ~ 2 d	4 d	4 d
Distance between the edge and the center of pressed mark	2.5 d	1.5 ~ 2 d	3 d	2.5 d

d : Diameter of pressed mark