

KES

Brinell Hardness

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1. Scope of application

This standard should be applied to testing method and Brinell hardness that is used in our company.

2. Definition of terms

2.1 Brinell hardness

It is a value that is obtained by area that originates from load on testing surface with press-pin is divided by load.

$$HB = \frac{P}{A} = \frac{2P}{\pi D(D - \sqrt{D^2 - d^2})} = \frac{P}{\pi D h}$$

Where, P : Applying load (kgf)

A : Surface area of concave (mm²)

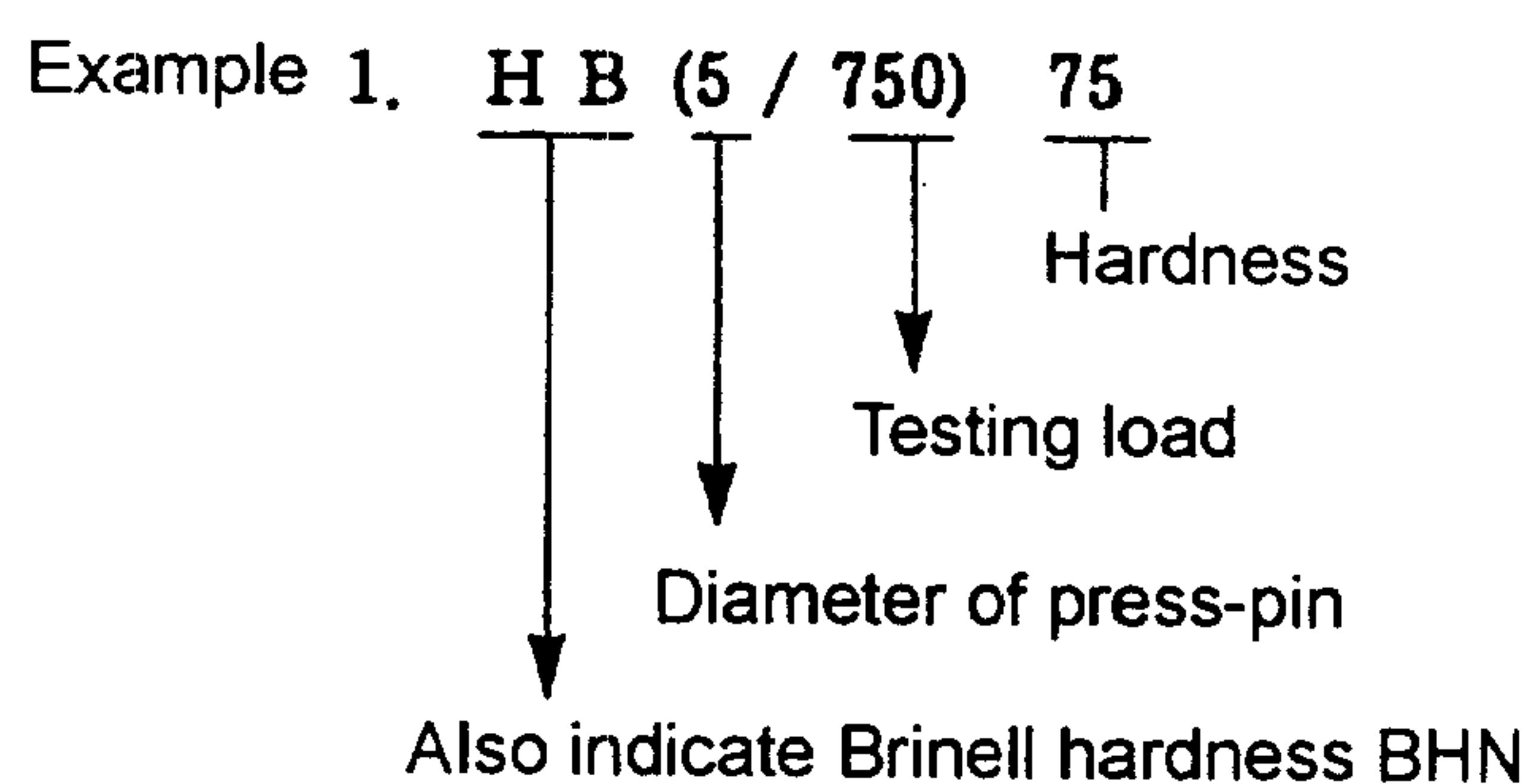
D : Diameter of press-pin (mm)

d : Diameter of concave (mm)

h : Maximum height of concave (mm)

2.2 Indication of hardness

(1) Indicate diameter of press-pin and testing load with hardness.



(2) Write HB only when diameter of press-pin is 10mm and testing load is 3000kg.

Example 2. HB(10/3000) 110 $\Rightarrow$ HB 110

(3) Numerical value of hardness express to one digit in case of HB > 50, and express to down to one decimal place in case of HB $\leq$ 50.

(4) Hardness is expressed by diameter of concave part down to two decimal places.

Example 3. BHD(10/500) > 90

3. Types of hardness tester (1)

(1) Hydraulic Type

It is generally used for standard type. This is used in our company mostly.

(4) Lever Type

This type does not use oil. Therefore, it protects precision unbalance by difference in viscosity due to temperature change. And it protects falling-off of precision due to dust.

Note (1) Refer to appending figure.

4. Testing condition

(1) Diameter of press-pin and testing load are selected in following table 1.

Table 1 Combination of press-pin diameter and testing load

Diameter of press-pin D mm	Testing load F Kgf (KN)	Hardness symbol	Applied material
10	3000(29.42)	HB (10/3000)	Steel Cast iron(More than HB 140) Copper and copper alloy (Morr than HB 200)
5	750(7.355)	HB (5/750)	
10	1500(14.71)	HB (10/1500)	
10	1000(9.807)	HB (10/1000)	Cast iron (Below HB140), light metals and light metal alloy Copper and copper alloy(HB35 ~ 200)
10	500(4.903)	HB (10/500)	Light metals and light metal alloy Copper and copper alloy(Below HB35)

(2) Diameter of concave part, d should be within 0.20 ~ 0.5.

(3) It can use together calculation table of HB(10/3000) because two times of diameter of