

EDS

Engineering,
GM DAEWOO Auto & Technology
Standards

METHOD OF BRINELL HARDNESS TEST

EDS-T-7118

ISSUED DATE: 1990. 12. 29

REVISED DATE: 2006. 06. 19

VERSION: 2

1. PURPOSE

This standard aims at establishing an appropriate test method for **GMDAT** by describing the method of brinell hardness test for metallic materials.

2. SCOPE

This standard specifies the method of measuring brinell hardness for metallic materials used in **GMDAT**.

In case of brinell hardness measured with a steel ball indenter, apply this standard to HB450 max. and in case of brinell hardness measured with a tungsten carbide alloy ball indenter, to the hardness range of HB650 max.

3. DEFINITIONS

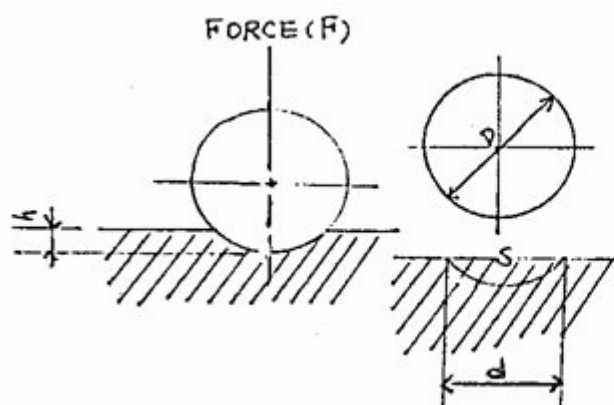
Brinell hardness means the value obtained in case the testing force F when residual impression is made on the test surface with a steel ball indenter or a tungsten carbide alloy ball indenter, is divided by the surface area S , calculated from the diameter of permanently strained residual impression. It is calculated from the following formula and unit shall not be added to the hardness value.

3.1. F : in case of kgf

$$HB = F/S = \frac{2F}{\pi D(D - \sqrt{D^2 - d^2})} \quad \text{----- (1)}$$

3.2. F : in case of N

$$HB = 0.102 \times F/S = \frac{0.102 \times 2F}{\pi D(D - \sqrt{D^2 - d^2})} \quad \text{----- (2)}$$



F : Testing force

D : Diameter of steel ball indenter(mm)

S : Surface area of residual impression(mm²)

d : Diameter of residual impression(mm)

Fig. 1. Relation among residual impression, steel ball indenter and force

4. INDICATION METHOD

Brinell hardness shall be indicated as HB and when necessary to indicate the diameter of steel ball(mm), testing force(kg · f or N) and force maintaining time according to test conditions, indicate as follows.

