

Programming Concepts for Mechanical Engineers

THIS IS A SAMPLE – NOT TO BE SUBMITTED

Brinell Hardness Calculator

Title: I am hard-headed! Now how hard is my head?

Background: Hardness of materials is one of the most used material selection factors. Hardness is equated with wear resistance and durability. One of the hardness tests is called the Brinell hardness test. In this case, a ball is pushed into the surface of the material, and an optical measuring device is used to measure the diameter of the resulting indentation. The diameter of the ball and indentation, and the applied force is then used calculate the Brinell hardness number (HB).

$$HB = \frac{L}{\left\{\frac{\pi D}{2}\right\} \left\{D - \sqrt{D^2 - d^2}\right\}}$$

where

L = load, kg

D = diameter of indenter, mm

d = diameter of indentation, mm

Specifications: Write a MATLAB worksheet where the values of L, D, and d, are placed in the beginning of the MATLAB worksheet and then it computes and displays the Brinell Hardness. Use L=3000 kgf, D=10 mm, d=7.2 mm.