Assignment #4

Material and Manufacturing Processes (M2794.001800) Fall 2014, Prof. Ahn, Sung-Hoon
Out: November 6, 2014 / Due: 6PM, November 13, 2014 (Bldg. 301, Room 1405)

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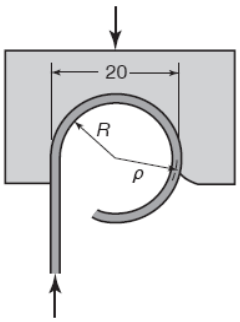
1. A straight bead is being formed on a 1-mm thick aluminum sheet in a 20-mm-diameter die cavity, as shown in the accompanying figure. (See also Fig. 7.25a.) Let Y = 150 MPa and E = 70GPa. Considering springback, calculate the outside diameter of the bead after it is formed and unloaded from the die.



2. What is the force required to punch a square hole, 150 mm on each side, from a 1-mm-thick 5052-O aluminum sheet, using flat dies? What would be your answer if beveled dies were used instead?

3. Estimate the maximum bending force required for a 0.004 m thick and 0.4 m wide Ti-5Al-2.5Sn titanium alloy in a V-die with a width of 0.2 m. (k Value is 1.25.)