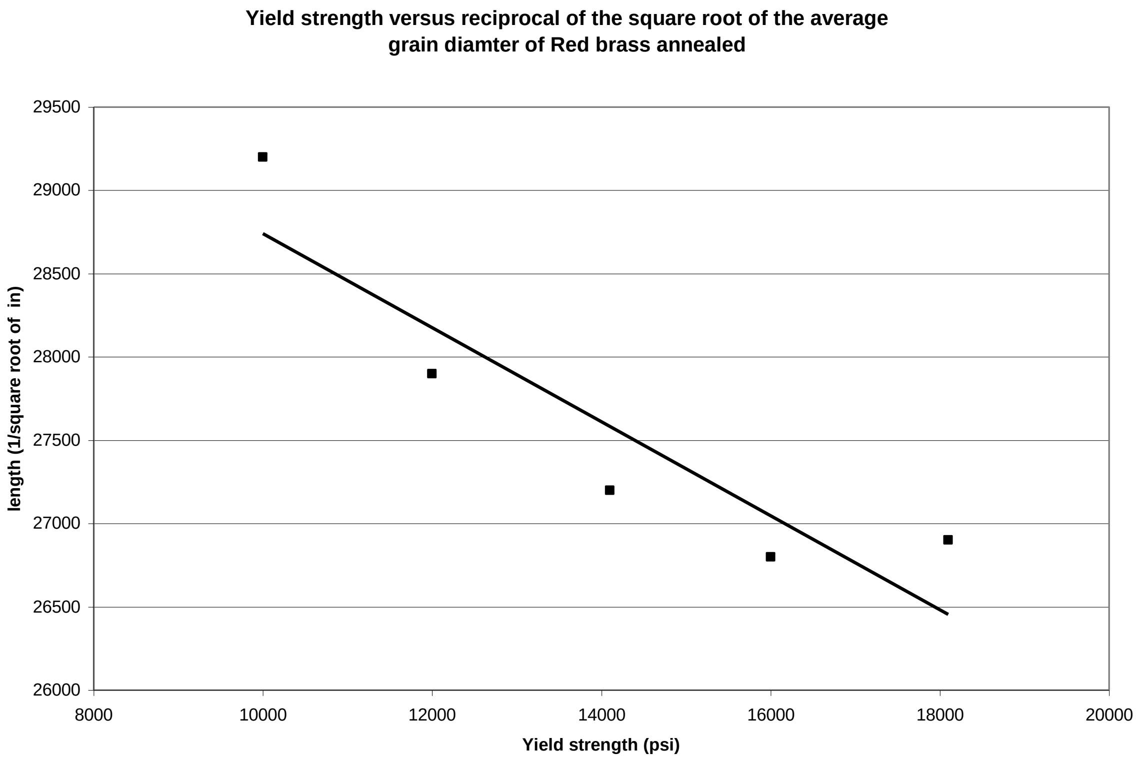
Problem 5

Table 1. Red Brass flat annealed temper data

	sigma yield(psi)	Sigma tensile(psi)	1/(d)^0.5(1/squre root of inches)
Red Brass OS070	10000	39200	29200
Red Brass OS050	12000	39900	27900
Red Brass OS035	14100	41300	27200
Red Brass OS025	16000	42800	26800
Red Brass OS015	18100	45000	26900

Figure 1. Yield strength versus reciprocal of the square root of the average grain diameter of Red Brass flat annealed.



The 1/√d and yield strength has an inverse linear relationship. 1/√d is decreasing with increasing of yield strength. Thus, Hall-Petch relationship is valid for Red Brass flat products in the annealed condition.

Problem 6

Table 1. Brass flat annealed temper data

	Sigma tensile (psi)	Percent of elongation (%)	Rockwell B hardness(Rb)	Modulus of elasticity(ksi)
Red Brass H01	50000	25	0	16700
Red Brass H02	57300	12	14	16700
Red Brass H04	70300	5	35	16700
Red Brass H06	78300	4	46	16700
Red Brass H08	84100	3	51	16700

Figure 1. Cold work versus tensile strength of Red Brass flat H temper

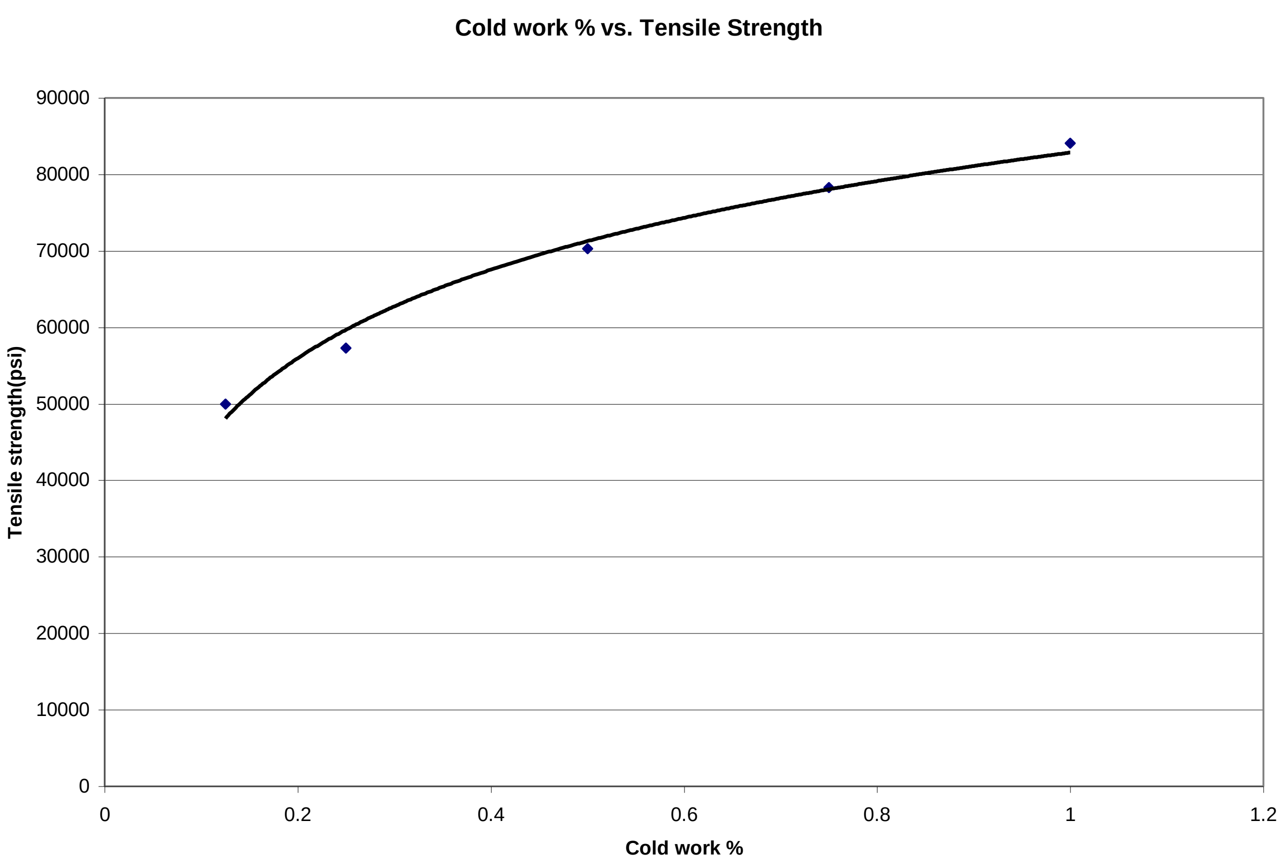


Figure 2. Yield strength versus Cold work of Red Brass flat H temper
There is a polynomial relationship between hardness and yield strength with cold work.

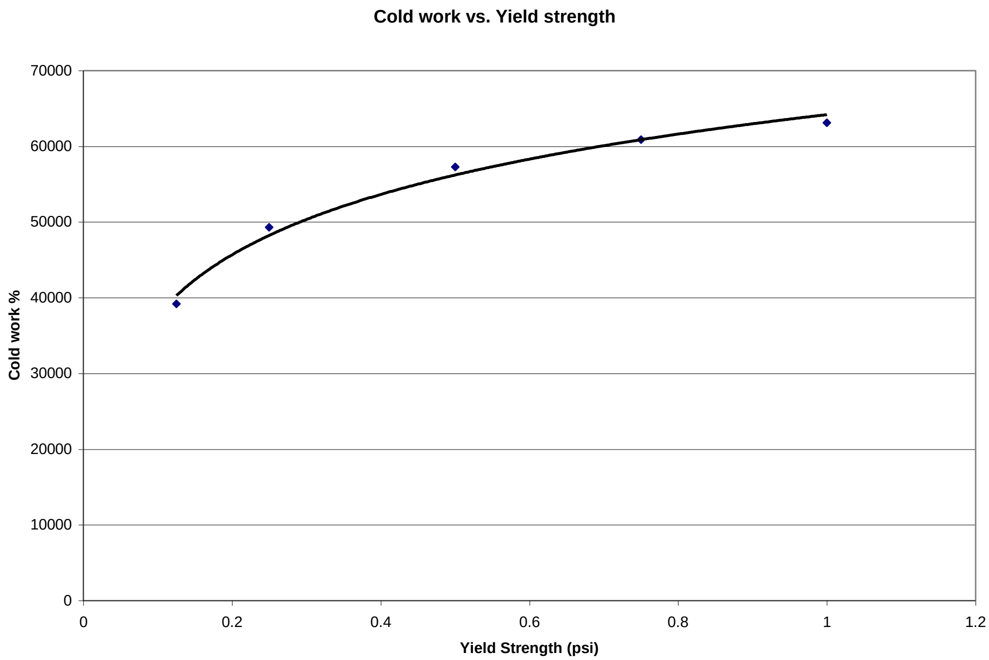


Figure 3. Modulus of elasticity versus Cold work of Red Brass flat H temper

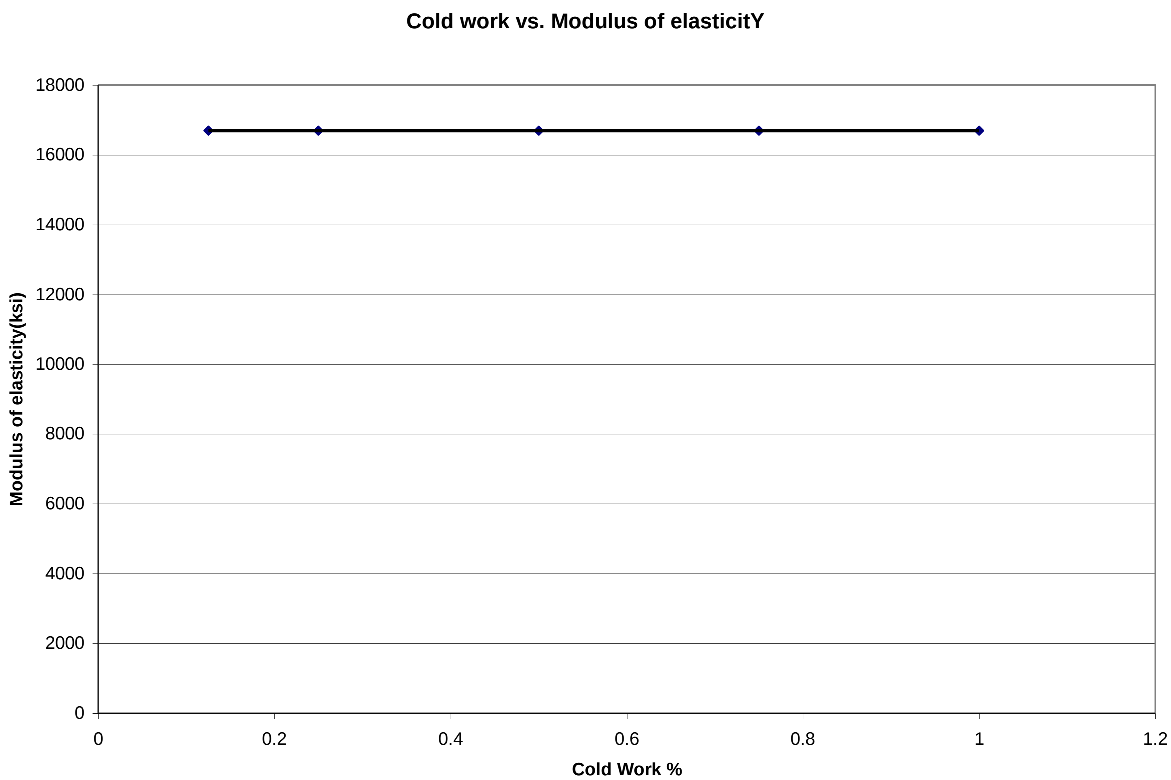


Figure 4. Percent of elongation %EL versus cold work
of Red Brass flat H temper

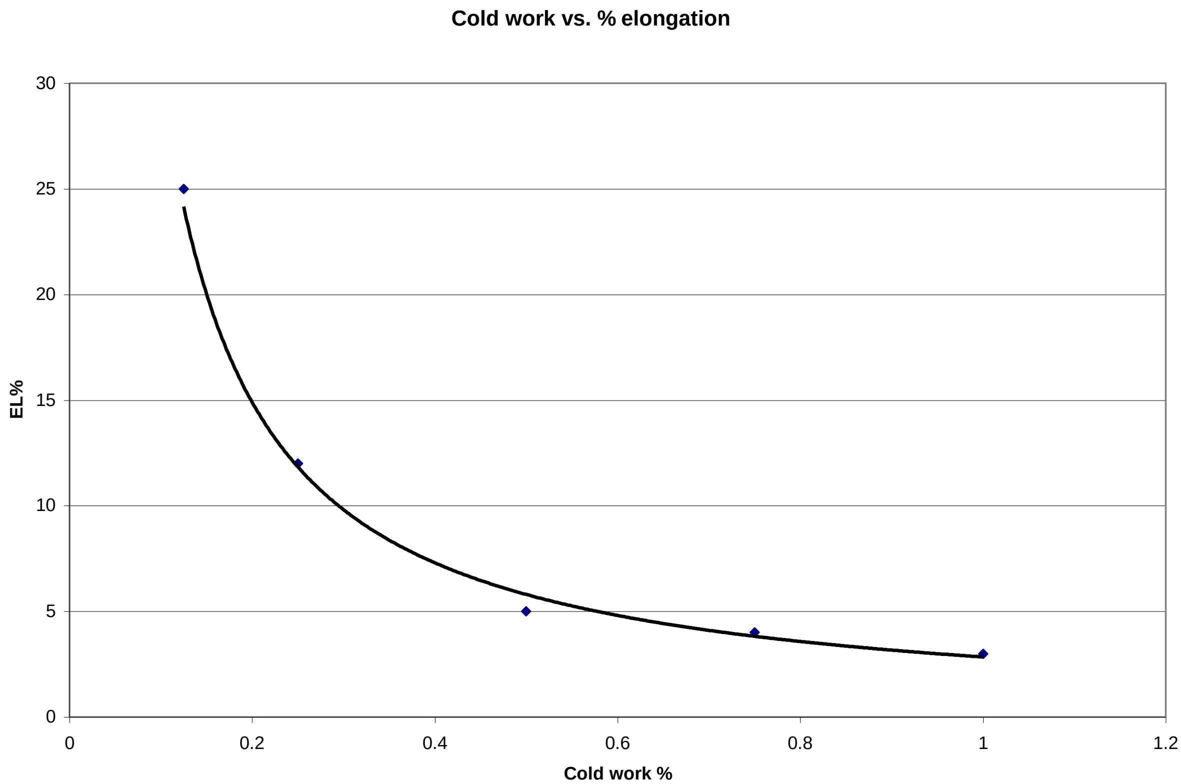


Figure 5. Rockwell-B hardness versus cold work
of Red Brass flat H temper