CONNECTICUT STATE DEPARTMENT OF EDUCATION

Division of Instruction

Hartford

SHOP THEORY FOR THE MACHINE TRADES

SESSION 9.

OBJECT: Theory of Heat Treatment of Steel

METHOD: Run the following films, followed by questions and discussion:
U.S. Film #170, Hardening of Steel, 16 m.m.,sound, 30 minutes
U.S. Film #171, Tempering, Normalizing, and Annealing, 30 min.,
sound.
(These films are almost indispensable if the average
 student is to be expected to understand the more technical
 material that will appear in the next three lessons)

Name of Student_____Date_____

Instructor_____Grade_____

Questions – Metallurgy of Iron and Steel
        Session 9, Theory of Heat Treatment of Steel

Answer briefly the following questions:

1. What Rc number is assigned to S.A.E. 1043 steel, after it has been
    fully annealed?

2. What is the proportion of carbon, if any, in ferrite?

3. If S.A.E. 1043 steel is heated to 1000° F., and quenched, what will
    be the resulting hardening effect?

4. What heat treatment is given to steel to promote toughness?

5. Describe the Charpy test.

6. Which has the higher upper critical temperature, S.A.E. 1013 or S.A.E.
    1043 steel?

7. What is the range of drawing temperature for S.A.E. 1043 steel?

8. Where, in the temperature scale, is found an exception to the usual
    hardness toughness relation?

9. What is the effect of normalizing on grain structure?

10. What are the two basic functions of the annealing process?