



2023-2024 FALL TERM
MLZ 447 Materials Processing Laboratory II
Experiment 2: Jominy End- Quench Test, Hardness Techniques



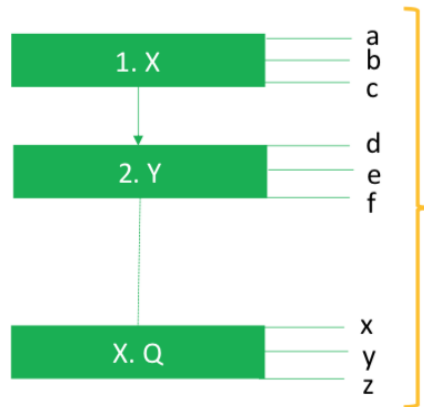
As mentioned in your meeting, reports will be a digital copy (MS word or PDF document) and it will be sent to Turnitin class. Informations about turnitin class were shared in your laboratory document.

Please pay attention the file name!

Files should be uploaded by the name format of **GroupName_Student Number_Name&Surname** (For exp.; **GroupA_12345678910_AhmetYilmaz**).

You only need to answer the following 4 questions in your reports. There is no need for a formal report format. You only need to show the sources you have used at the end of the report under the title of references.

1. Please draw a flow chart what we did during the experiment, with all steps and parameters. (In this flow chart, indicate the important parameters as keywords. Any sentence or paragraph answers will not be accepted. As an example, you can take the chart below.) (15P)



These should be important informations like,
test name, sample name, test parameters,
etc

2. Please plot the hardenability curve of 4140 steel obtained values from the Jominy test experiment (15P) and interpret the hardenability curve regarding the microstructure, cooling rate, and chemical composition of steel. (10P)
3. a) How hardenability curve would change, if your material was 4120 steel instead of 4140 steel? (15P)
b) Please write the chemical composition of 4140 steel. (5P)
c) Please write the chemical composition of 4120 steel. (5P)

(In this part, you must search literature and give the searched documents as references) (25P)

4. From the hardness test, please
a) Give the measured hardness values (6P) and calculate the average hardness values (4P) for both Al and Cu samples.
b) Why Hardness of Al and Cu differs? Please explain it in terms of structure-property relationship (15P) **(In this question, you must search literature and give the searched documents as references)**

Give the references in questions 3 and 4 in the form of a bibliography list, numbered in the text (10P)