



FABRICATION OF EDDY CURRENT PROBE FOR SS 304 TUBE INSPECTION

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ABSTRACT

The final year student of UiTM Mechanical Engineering under supervision of Prof. Madya Noraini Wahab has carried out this project of "Fabrication of Eddy Current Probe For SS 304 Tube Inspection".

The important part about this project is to study some basic theory that involve in eddy current testing. As we know, eddy current testing is one of the major Non-Destructive methods for tube testing. It used a localized electrical field that is introduced into a conductive test specimen by electromagnetic induction. Virtually all-conductive materials can be examined for flaws, metallurgical conditions, thinning and conductivity. The technique is quick, versatile, and sensitive, can be non-contacting and is easily adaptable to automation and in site examination.

The main purpose of this final year project is to fabricate eddy current probe using parameters obtained from governing equation by choosing the best eddy current signal with the respect to number of coil winding that can be used for testing defects in SS 304 tube.

There are numbers of research methodology used in order to complete the project. The very first step is the literature review studies to understand the basic principals of eddy current Non-Destructive testing. The next step is experimental method used to fabricate and analyzed the best eddy current signal from a set of probe that have been fabricated in the laboratory. Prior to the experiment, 4 eddy current probes are fabricated, each having 40,50,60 and 70 numbers of coil turns. All of these probes are differential type of probe.

The probes are tested using a standard calibration tube to see the signal produced at different sizes of depth of defects in the tube. The best probe is chosen based on its resolution that is the separation angle between 100% thru-wall hole and 20% hole. For a good probe, the separation must be large enough in order to see the defect signal more clearly.

From the test performed, it shows that experimental method can be used to determine a good eddy current testing probe. This method is effective but need more time, effort and cost. In the other hand, the output obtained from the experimental method is more convincing because the signal obtained is from actual testing performed and not using software or computer simulations that only true theoretically.

The best probe that can be used to perform an eddy current Non- destructive testing is one with 60 numbers of layers. This probes gives the best resolution and therefore the output produced by this probe is more clearly define to determine its corresponding defect size.

At the end of this project, the best probe to fulfill the objective of this project is obtained. The best probe is the one with 60 numbers of turns as it gives the best probe resolution compared to others.

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