

## CHAPTER-3

### OBJECTIVES AND SCOPE

The present work has to be investigated with the following objectives and scope:

- 1) To study the various welding parameters on the welding quality of PC GTAW of 90/10 & 70/30 Cu-Ni alloy welds.
- 2) To study LBW on mechanical properties of 90/10 & 70/30 Cu-Ni alloy welds.
- 3) To study the mechanical properties of 90/10 & 70/30 Cu-Ni alloy welds by using CC GTAW and PC GTAW with same filler wire ERCu-Ni (70/30).
- 4) To Identify the PC GTAW process parameters such as Peak Current (PC), Base Current (BC), Pulse frequency (PF) & Welding speed (WS) and considering four levels from each welding parameter.
- 5) To optimise the selected PC GTAW process parameters & levels for predicting the ultimate tensile strength (UTS) at 95% confidence level by Taguchi's method.
- 6) To confirm the predicted ultimate tensile strength values obtained from Taguchi method with that of the experimental values of PC GTAW joints by Analysis of variance (ANOVA).
- 7) To observe the influence of PC GTAW process parameters on mechanical properties and microstructures of 90/10 and 70/30 Cu-Ni alloy welds.
- 8) In addition to the above, To study the LASER Beam Welding (LBW) at various welding speeds on 90/10 and 70/30 Cu-Ni alloy welds for further improvement in mechanical properties (tensile strength and hardness) of the weld joints.
- 9) Finally, to study the pitting and corrosion resistance for CC GTAW, PC GTAW, & LBW of 90/10 & 70/30 Cu-Ni welds.

In order to accomplish the above objectives, a detailed experimental program was developed, as shown in Fig. 3.1. The overall aim of the work is to comprehensively assess the improvement in mechanical properties, microstructures & pitting corrosion of 90/10 & 70/30 Cupronickel (Cu-Ni) alloy welds by PC GTAW and LBW.

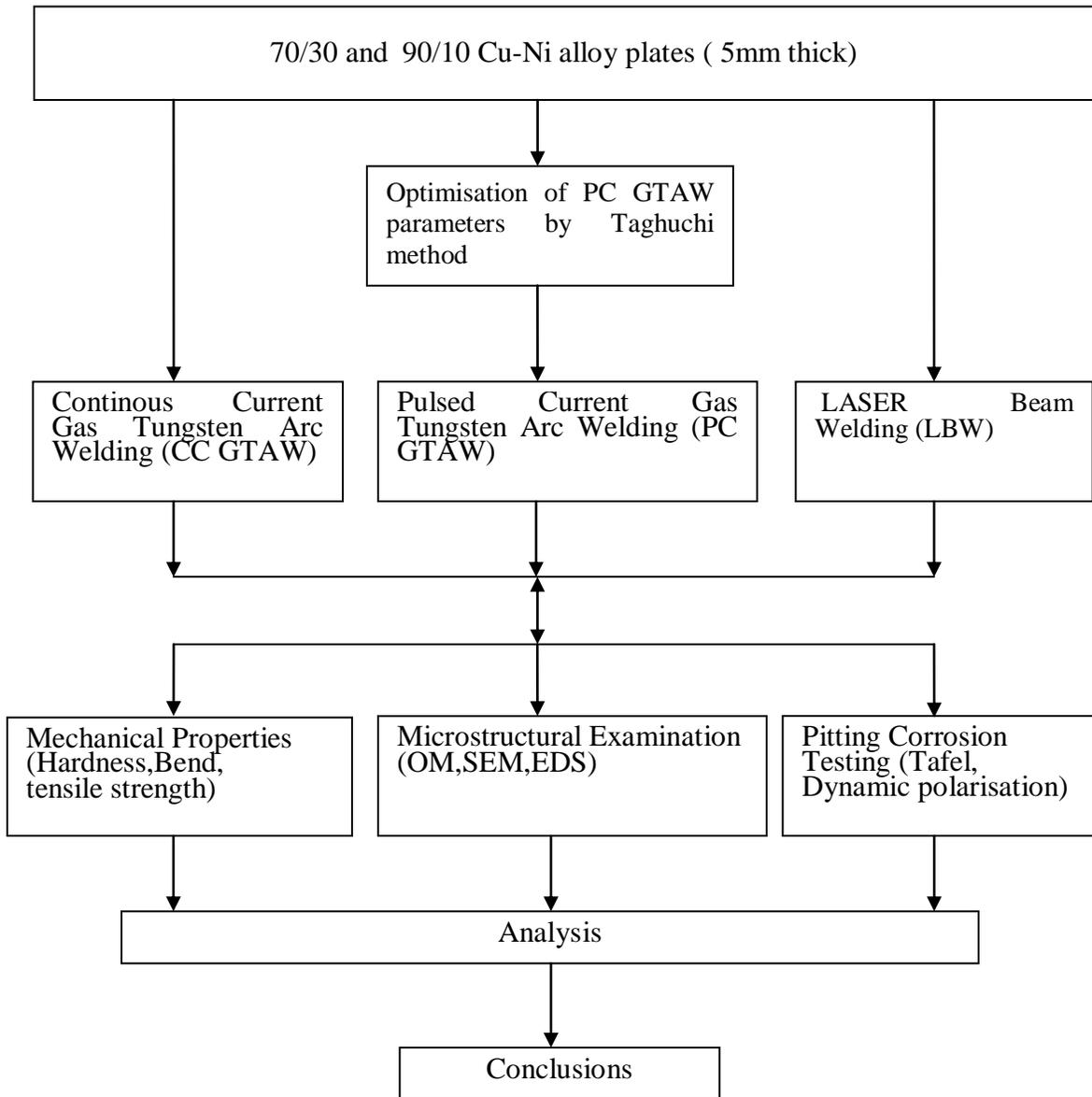


Fig: 3.1 Experimental flow chart