PREFACE

In the present dissertation work, the main focus is on weldability studies between similar metal joints and dissimilar metal joints by using MIG welding. The weldability study includes weld joint strength, ductility, hardness and impact toughness.

Chapter - 1

Gives detailed description on concepts of welding, types of welding, elsewhere studies on weldability of stainless steel, background of the problem and it concludes with objectives and methodology of the research work.

Chapter - 2

In this chapter literature survey is made and presented pertinent to the MIG welding with respect to the influencing parameters that show effect on the similar and dissimilar joints and many studies were carried out to evaluate the residual stress on the welded parts. Other studies were concerned on the application of the different types of treatments (mechanical and thermal) on the welded components. Many studies were also made to investigate the effect of post weld heat treatment (PWHT) on the reduction of the residual stress.

Chapter - 3

Involves Experimental procedure followed to produce weldments, testing procedures adopted and heat treatment cycles followed. Weld heat input parameters like current; voltage and welding speed used to produce similar and dissimilar joints are selected. Nondestructive testing methods viz. X-ray and diepenetrant tests are discussed. Tensile, Impact and hardness testing procedure of the weldments is explained. Post weld heat treatment methods followed viz. annealing, normalizing and tempering are discussed. Procedure for carrying out microstructure study is also discussed.

Chapter – 4

In this chapter mechanical and metallurgical properties of weldments are improved by considering different PWHT processes. The weld samples are considered for similar joints with different heat input conditions. Describes in detail, experimental methods and procedures that
were employed to evaluate mechanical and micro structural properties of various versions of similar metal welded joints.

**Chapter - 5**

In this chapter mechanical and metallurgical properties of weldments are improved by considering different PWHT processes. The weld samples are considered for dissimilar joints with different heat input conditions. Describes in detail, experimental methods and procedures that were employed to evaluate mechanical and micro structural properties of various versions of dissimilar welded joints.

**Chapter –6**

Consists of summary of the key findings of the research work and proposes the scope of the future work followed by references, publications and appendix.