



# INVESTIGATION OF MECHANICAL BEHAVIOR OF DIFFERENT STEELS IN MIG AND TIG WELDING JOINTS IN HAZ

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## INTRODUCTION

In the past, present and future, welding is used as a useful and indispensable method of joining. Welding parameters are determinant in manufacturing, construction, maintenance and repair operations due to the quality and safety of production. Type of welding, type of electrode and the manufacturing data in the machines are the determinants of the material properties as a result of the welding. During the cooling phase of the material, this process is carried out at high temperature, both chemical and physical interaction occurs in the microstructure of the material due to the media and consumables used. It changes the whole characteristics of the material in internal structures that occur due to different cooling rates <sup>(1)</sup>.

Welding is used as an alternative to cast, forged, bolted and riveted joints as an alternative<sup>(2)</sup>. Welding of steels is of tremendous importance in the manufacturing industry. Arc welding is a process that uses the condensed heat of an electric arc to fuse metal with the fusion of the base metal and the addition of the metal usually provided by a consumable electrode. Depending on the material to be welded and the electrode used, direct or alternating current can be used for the arc <sup>(3)</sup>. The arc is continuously between the welding of the metal and the electrode wire, the consumable. In general, the quality of a welding connection is directly influenced by the input parameters during welding. Welding process; therefore, it can be considered as a multi-input and multi-output heat treatment. Welding includes a wide range of variables that influence the final properties of the weld metal such as welding metal, welding current, welding voltage, temperature, electrode, pulse frequency, power input, gas flow rate, and gas composition (4). There

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- v) As a result of all the investigations, all the joints made with MIG welding method gave better mechanical results than TIG welding method. Therefore MIG (Metal Inert)

Gas) is generally preferred because it is more functional and suitable for series method as it responds to the desired mechanical properties in under ground steel pipelines by automatic welding method. TIG (Tungsten Inert Gas) welding method also requires NDT root-filler used pipe diameter up to 4' resources are also used.

**Keywords:** MIG/TIG, Welding, HAZ, 304 Stainless Stell

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