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MIG welding of SS304

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Abstract
Steel is an alloy mainly of iron and carbon. Highly malleable, ductile, sonorous. Due to high tensile strength and low price, it is mainly used in tools, building materials, various parts of home appliances etc. steel is one of the most recycled material in world (about 60%). The basic material of steel alloy is Iron. MIG welding is an exact and quickest welding system for the welding of steel. It is exceedingly controllable, fumeless and splash less spotless process. The present work manages THE welding of SS304 grade of steel. The case study is of welding machine used in longway industries for welding of 2 steel vessels for the formation of electric geyser tank. There are various parameters which influence the welding quality.

Keywords: MIG welding, SS304, welding current, welding current, tensile strength

Introduction
Welding is process of joining of two or more diverse Ferrous and Non-Ferrous materials. it uses high heat to melt and join the parts together and allow them to cool causing fusion. Pressure may also be used in addition with heat or by itself to produce weld. Welding uses different sources of energy Like: - gas flame, electric arc, a leaser, electron beam, friction, ETC.

MIG Welding
Metal Inert Gas (MIG) Welding or Gas Metal Arc welding (GMAW). The principle of gas metal arc welding began to be understood in 19th century. In this process an electric arc forms between a consumable MIG electrode and work piece. which heats the workpiece metal to melt and join. A constant voltage, DC power source is used. For most of its applications Gmaw is a fairly simple welding process. Today GMAW is most common industrial welding process, preferred for it's versatility, speed etc. The three modes of GMAW are: - Globular: - It produces high heat, poor weld surface and spatter i.e.it is considered the least desirable.
Short – circuiting: - In this method current produced is less than Globular which reduces the heat.
spray: - It was the first metal transfer method used in GMAW and suited well for the welding of aluminium and stainless steel while employing an inert shielding gas.

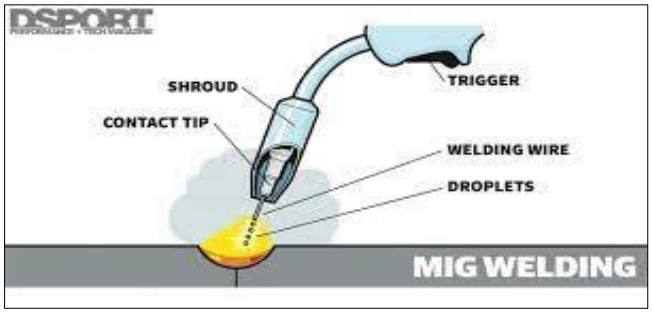


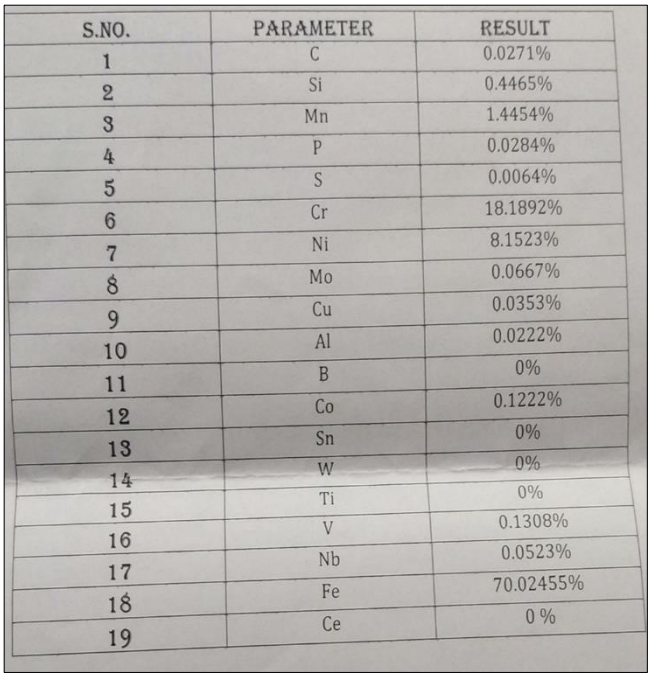
Fig 1

Welding of Steel
Steel is joined by MIG Welding by heating the base metals and melting them and then joining them. Manual MIG welding is often referred as a semi-automatic process, as the wire feed rate and arc length are controlled by the power source, but the travel speed and wire position are under manual control. Shielding gases for steel are: - carbon dioxide, argon +2 to 5% oxygen, argon +5 to 25% carbon dioxide.

Table 1: Mechanical Properties of SS304 AT ROOM temperature

Properties	Value
Poission's Ratio	0.265-0.275
Elastic Modulus (GPa)	200
Tensile Strength (MPa)	510-620
Yield Stength (MPa)	205- 310
Elongation % strain	45-60

Chemical composition of SS304



S.NO.	PARAMETER	RESULT
1	C	0.0271%
2	Si	0.4465%
3	Mn	1.4454%
4	P	0.0284%
5	S	0.0064%
6	Cr	18.1892%
7	Ni	8.1523%
8	Mo	0.0667%
9	Cu	0.0353%
10	Al	0.0222%
11	B	0%
12	Co	0.1222%
13	Sn	0%
14	W	0%
15	Ti	0%
16	V	0.1308%
17	Nb	0.0523%
18	Fe	70.02455%
19	Ce	0 %

Fig 2

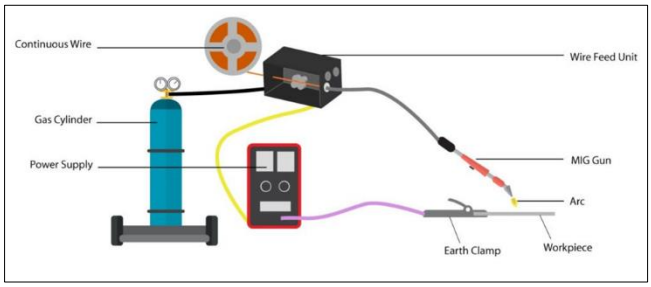


Fig 3

Literature Review

MIG welding is profoundly exact and clean welding procedure yet the control and execution of various welding parameters is very important for fruitful result. The research on parameters optimization of different types of welding obtaining different types of responses in output have been done by the number of researchers using wide range of materials. They make use of various types of methods, techniques, and mathematical models for evaluating and obtaining results.

References

1. Wikipedia