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Comparisionof Electrode Manipulation between Different Welding Processeslike Straight,Circular & Zigzag

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Abstract: *Over the years welding emerged as main metal joining technique. Out of this Arc welding is most commonly used welding technique due to small equipment,cheapprocess and portable machining equipment.Quality of weld depend uponvariousparameters like, value of current,type of basematerial, type of electrode, human skills andelectrode manipulation. Present work demonstratesthe effect of electrodemanipulation over quality of weld. Three typeofelectrodemanipulation were consider straight, circular and zigzag. To evaluate the quality of weld hardness and micro structure of the weld was considered. It was observed that circular manipulation produced bestquality weld out of these three types of electrode manipulation.*
Key Words: *Arc Welding, Electrode formulation, Hardness, Microstructure, Substrate.*

I. INTRODUCTION

Welding is a fabrication or sculptural process that joins materials, usually metals or thermoplastics, by causing coalescence. This is often done by melting the work pieces and adding a filler material to form a pool of molten material (the weld pool) that cools to become a strong joint, with pressure sometimes used in conjunction with heat, or by itself, to produce the weld. This is in contrast with soldering and brazing, which involve melting a lower-melting-point material between the work pieces to form a bond between them, without melting the workpieces.

ShieldGas

1. Electrode Rod
1. Fusion
2. Gas Shield
3. Weldpool
4. Base Metal
5. solidified Slag

II. PROCEDURE OFEXPERIMENTAL

The experiment is divided into twoparts:
Part A: Preparing TestSpecimen Part B: Testing TestSpecimen

Part A: Preparing TestSpecimen

To perform arc welding process three specimens were prepared. Specimens were prepared for welding process. All there specimen were joined with three manipulation of weldingelectrode.

a) StraightManipulation
b) CircularManipulation

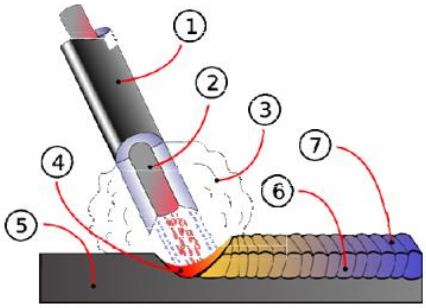

Figure 1: Arc WeldingProcess

c) ZigzagManipulation

Part B: Testing TestSpecimen
The entire welding specimens were tested for welding quality. To know the welding quality two types of tests wereperformed.

a) Hardness
b) Microstructure

III. RESULTS

Table 1 below shows the values of hardness at various electrode manipulations. It is observed that circular manipulation achieved maximumhardness.

Table1: Hardnessatdifferentmanipulationofelectrode

S.No.	Type of Manipulation	MaximumHardness
1	Straight	42
2	Circular	48
3	Zigzag	34

Figure 1 shows the microstructure of welded zone with straight manipulation of electrode. Figure 2 shows the microstructure of welded zone with circular manipulation of electrode. Figure 3 shows the microstructure of welded zone with Zigzag manipulation ofelectrode.

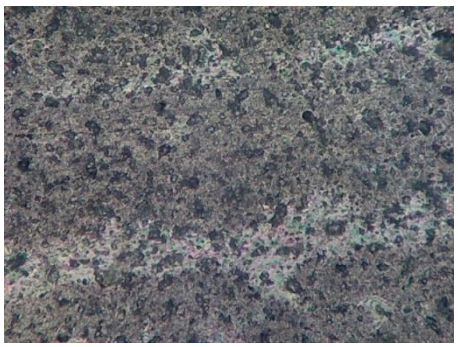

Figure 2: StraightManipulation

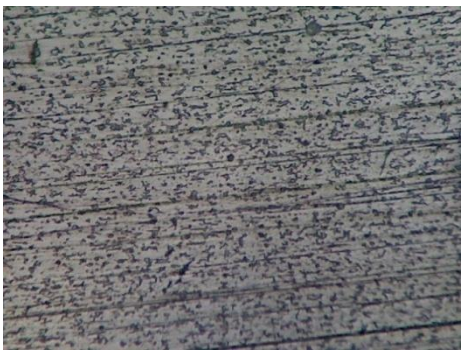

Figure 3: CircularManipulation

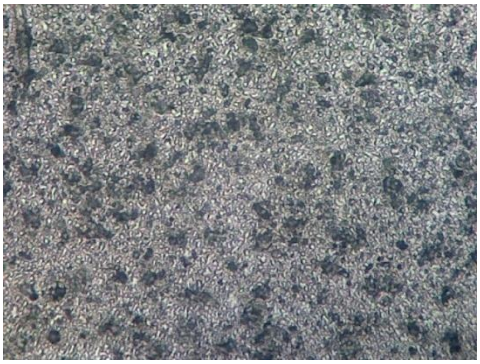

Figure 4: ZigzagManipulation

IV. CONCLUSION

Present work showed microstructure and maximum harness value at different manipulation of electrode. From the result of hardness it is concluded that maximum hardness can be achieved bydoingcircularmanipulation.Themicrostructure of circular manipulation is smoother and evens that other two manipulation.

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