

A Review on Design and Development of Jig and Fixture for Circular Welding

Prof. Nilesh Chanewar¹, Vinayak sonawane², Krushna Rathod³, P.K. Supin Gopi⁴

¹Professor, Department of Mechanical Engineering, Saraswati College Of Engineering, Kharghar, Navi Mumbai, Maharashtra, India.

^{2,3,4}Student, Department of Mechanical Engineering, Saraswati College Of Engineering, Kharghar, Navi Mumbai, Maharashtra, India.

Abstracts:

Welding the various parts in manufacturing is very common and popular form of permanent metal joining process. This is widely used in the manufacturing and reworking industries. There are many types of welding available like Arc welding and gas welding to weld different thickness of metal.

Welding is very delicate joining process which requires very high skill for fine work. In industry there are many

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Introduction:

We found that the methods available for circular welding are very limited and costlier in case of atomization. The explosion welding process is known to be an efficient procedure to join two very different work pieces together. The welding is done by explosives that push the work pieces together. They are then joined rapidly and vigorously. The explosions are contained in typical shapes. Most obvious implications are on steel work

Literature Survey:

1. Prof. Yasunova T.A - Influence of tool shape on friction stir welded joint of aluminum and steel with circular weld line is used to achieve the circular weld line was performed, and effect of welding tool shape was investigated for improving the weldability.

2. Prof. sharma H. - Experimental Analysis of Friction Stir Welding of Dissimilar Alloys AA6061 and Mg AZ31 Using Circular Butt Joint Geometry is used stir welding of

size and shape parts has to be weld very common are CIRCULAR and straight welds.

To eliminate this common problems our circular welding jig and fixture assembly which works on the simple mechanism of gear train which transmit power from manual handle to rotating motion to workpiece and reciprocating motion to our tool in this case the electrode will consume on workpiece and fine circular weld done on workpiece.

pieces where there is rust on the body. Titanium is used in the process which is known to be resistant to corrosion.

Various types of welding went through different stages of change to come to the state as we see them today. Primarily to join two pieces together, we had to beat them until they unite. Nowadays, we have so much efficient and effective welding processes that use fire, electric arc, electromagnetic radiation and so on. No matter which method is used, the procedures are surprisingly useful.

circular butt weld joint between Aluminum alloy AA6061 and Magnesium alloy AZ31.

3. Prof. raut .M -A Review on Design of Fixtures in which The efficiency and reliability of the fixture design has enhanced by the system and the result of the fixture design has made more reasonable.

4. Prof. Yong .G - design and fabrication of mig welding jigs is tends to In designing and fabricating the MIG welding jigs, 5 concepts were designed in order to find for the best concept.

5. Prof. Girish V. -Design of Welding Fixtures and Positioners are use to the process of conducting operations related to welding fixture and positions help in gaining a deeper understanding as well as effective project process.

6. Prof. shinde A. - Design of Welding Fixture for Head End Sub-Assembly of Motor Case are design practice of the welding fixture and at the bottom of clamp plate the arsenic copper provide the support so that there is no effect of clamping force on the part head end sub-assembly.

7. Prof. Simon. - Design and implementation of spot welding trainer for body shop assembly line By using a test plate that is clamped to the new teaching aid, it can help to reduce parts problem. The advantages of this welding jig are it can be located in many different angles.

8. Prof. Okechukwu E.-The Design and Need for Jigs and Fixtures in Manufacturing to adequate strength and rigidity, mild steel with 16 millimeters in diameter was chosen for the design of a sample jig and fixture for the making of jigs of fixtures.

9. Prof. Singh M. -Interpretation and Implementation of Some Aspects of Welding Process and Fixture for Increasing SPR in Manufacturing Industry developed welding fixtures that able to clamp workpiece and reduce the rejection ratio in production. Clamping design and common welding jigs material was studied in order to design and generate concept for the MIG welding jigs

10. Prof. Anbarasan I. -Design and fabrication of jig and fixture for hollow cylindrical component in drilling machine concluded that the project design and fabrication of a jig and fixture holding and indexing of the circular job is made easy.

11. Prof. SmitaBhise - Design & Development of Hydraulic Fixture for VMC Implemented that this project eliminates the need of human operator for clamping of manifolds. It reduces the cycle time. It gives an economically feasible design.

12. Prof. P. Vakharia -Design & Development of Fixture for CNC – Reviews, Practices & Future Directions concluded that Fixture design needs to be tested and evaluated in real manufacturing.

13. Prof. Martin P - Welding Fixture with Active Position Adapting Functions concluded based on the information that they have collected about each aspect of their project.

14. Prof. SukumarBhate- Research on Rotary Friction Welding concluded that the process of friction welding of dissimilar welding is much different than conventional fusion welding process. Result of variation in parameters of friction welding process on the weld strength and weld geometry is needs to be studied.

15. Prof. Rajashree S. Pawar- Modeling and Analysis of Vertical Rotary Automated Drilling Fixture concluded that the machine tool for indexing is feasible with bracket mounting fixtures with vertical drive fitted.

16. Prof. HeidarHashemi-Fixture Designers Guidance: A Review of Recent Advanced Approaches concluded that by combining CBR with other intelligent methods, effective and more comprehensive fixture design systems can be achieved.

17. Prof. Anatoly P. Pashkevicha -Kinematic aspects of a robot-positioner system in an arc welding applications concluded that the developed technique allows to co-ordinate movements of two manipulators of knowledge By using this technique together with the work piece CAD-data, it is also possible to achieve an essential time reduction of the design.

18. Prof. AnkushBatta - Optimization of Submerged Arc Welding Process: A Review concluded that very less work has been reported on metal transfer in SAW, which influences the chemical composition and metallurgy of weld metal, arc stability, weld bead geometry as well as strength of the weld influence by current.

19. Prof. Dr. S.V. Patil - Design and Analysis of Welding Fixture for Automotive Component using FEA conclude that the complete fixture for welding of cab leg assembly has been designed analytically as well as critical components of the fixture assembly are analysed using FEA for safety.

20. Prof. GauravBhavsar -Design of special purpose machine for welding concluded that the Methodology which was used prior to the automated system included Welding which was done by means of hand held Welding guns. This method had less accuracy and precision as compared to the automated system of welding.

21. Prof. M. Ganesan -Experimental investigation of tensile strength of friction welding concluded that the experiments were conducted on Austenitic stainless steel grade using the continuous drive friction welding machine. The experiments were accomplished for various combinations of heating pressure, upset pressure and heating time

22. Prof. N. Sahoo -Study of aluminum plate welding concluded that with an increase in amplitude the failure load is decreasing or we can say that the weld strength or tensile strength is decreasing. At moderate weld pressure, failure load or tensile stress is minimum.

23. Prof. D. Lundin - Dissimilar Metal Welds concluded that the Carbon migration across the weld interface is considered a significant factor in the "life" of a transition joint, since time dependent property changes occur in the regions where carbon movement occurs. The carbon

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6. A. Markus, Z. Markusz, J. Farkas and J. Filemen, "Fixture design using Prolog: an expert system", Robotics and Computer-Integrated Manufacturing,1(2), pp. 167–172, jun2014
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migration causes loss of strength in the ferritic material adjacent to the weld interface.

24. Prof. D.D.Balsaraf- Analysis of Sensitization and Corrosion of Ferrite Stainless Steel (FSS) by Different Welding Processes concluded that when thermally treated in the range greater than 900°C, and as such it becomes readily prone to corrosive attack. So this is done in region of ferrite temperature to avoid corrosion.

25. Prof. J. C. Trappey- A literature survey of fixture design automation. The major topics of the review are the fixturing principles (supporting, locating and clamping), automated.

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