

Design and Development of Drill Jig Using Additive Manufacturing Technology

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Abstract: *This paper concern with design, analysis and development of drill jig. The fundamental objectives of manufacturing - improve quality, reduce costs, speed up throughout and increase production capacity are the primary reasons that jigs and fixtures are so abundant. the mass production is help to increase the productivity and increase the accuracy. Thereby, mass production can be achieved by the use of jigs. The conventional processes for jig could be lengthy, more tool wear hence drill jig life is less, Skill labor is required, the heavy weight of the final jig. These caused the final production cost of jig is high. To overcome these issues, additive manufacturing is one of the process between the manufacturing rate and high precision product. The goal of this project is to determine the efficiency of 3D printed jigs. The design of these jigs and how they function compared to conventional jig systems is analyzed. While machining custom jigs can be costly, 3D printing these jigs provides precision as well as reduces costs and setup time since they are designed for their specific application.*

Keywords: Jig, Reduce cost, Reduce weight, Conventional process, Additive manufacturing

REFERENCES

- [1]. Jayagantha , K. Jayakumarb, A. Deepaka , K. Pazhanivelc, “Experimental studies on Drilling of 410 Stainless Steel”, Elsevier, vol.5, issue-2, April 2018.
- [2]. A. Z. Sultana, SafianSharifb, DenniKurniawanb, “Effect of Machining Parameters on Tool Wear and Hole Quality of AISI 316L Stainless Steel in Conventional Drilling”, Elsevier, Vol.2, February 2015.
- [3]. Abdulhamid, A., Sumaila, M., Yawas, D. S., Kaisan, M. U., Shaaba, “Design and Construction of Drilling Jig for Drilling Operations”, Faculty of Technology Education, Abubakar Tafawa Balewa University Bauchi, ISSN: 2277-0011, March 2020.
- [4]. Dr. Rajendra K. Patil, Shivam C. Shinde, “Design and Development of Drilling Jig for Spinning Rings used in Textile Industry”, International Conference on Industrial Engineering and Operations Management, March 2016.
- [5]. NorasikinHussin, Dzullijah Ibrahim, N. H. Mohd Yahya, Nor IzlanZulkhiflee, “Design of Jig for Coordinate Measuring Machine”, Faculty of Mechanical Engineering, UniversitiTeknologi MARA CawanganPulau Pinang, Campus PermatangPauh, Pulau Pinang, Malaysia, Vol SI 5(5), 97-107, April 2018.
- [6]. Vemuri Venkata PhaniBabua, MD Asaduddin Siddiqib, “Analysis of Drill Jig for a Missile Component”, AIP Publishing, vol.2317, issue- 1, February 2021.
- [7]. NBV Lakshmi Kumari ,G.Prsasna Kumar, “Design and Analysis of Indexing Type of Drill Jig”, International Organization Of Scientific Research , ISSN-2349-5162, April 2015.
- [8]. K.RamaSubba Reddy, S.Ramesh Kumar Babu, A.V. Hari Babu, “Design and Analysis of Drill Jig at Variable Materials”, International Research Journal of Engineering and Technology, Volume: 03 Issue: 06, June 2016.
- [9]. Joe Hiemenz, Stratasys, “3D printing jigs, fixtures and other manufacturing tools”, Stratasys, 2018.
- [10]. A. Ramya, Sai leelaVanapalli, “3D Printing Technologies In Various Applications”, IAEME Publication, Volume 7, Issue 3, June 2016