Research Paper on Design and Manufacturing

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Abstract*: Angle grinder use in grinding a product and for high performances application, like deburring in foundries and construction. Consequently, this study investigates about the sustainability design of angle grinder with integration of Design for Manufacturing and Assembly (DFMA) analysis. Design for Manufacturing and Assembly (DFMA) is a process that produce a good product which is minimize complexity and number of part that lead to time and cost reduction in development. Sustainability design means a design solution that are advantageous to both human and nature in a complete and combined way. Sustainability design in this research include the production and assembly part which is analysis using DFMA method. The design solutions are minimizing the part number and assembly time problem regardless the costs, materials issues and selection of manufacturing process. Using the DFE method combined with Boothroyd and Geoffrey DFMA principle, the analysis on angle grinder by using the 3D scanning method in drawing some part using the Catia software and the sustainability analysis using Solidwork software is done. The result for current product efficiency is 21.3% with 15.34 KgCO2, 2.10×10-2 KgPO4, 15.5 KgSO2, 1.95 MJ produce in producing one angle grinder. Through this study, expecting 25% of reduction in all criteria study.*

Keywords: Design for manufacture, concurrent engineering, life cycle considerations, assembly