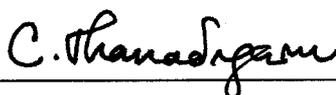


Name : Mr. Kittiphat Rattanachan
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Major Field : Production Engineering
Thesis Advisors : Assoc.Prof. Charn Thanadngarn,
Assoc.Prof.Dr. Sirisak Harnchoowong
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Abstract

A deep drawing is a metal forming process which involves the process of pressing a metal sheet into a die opening. Generally, a deep drawing process is used to manufacture shells that have complicate structures. The common failures that usually occur on the sheets during a deep drawing process include tears on the shell wall and wrinkles on the flange. Such failures are caused by the use of an inappropriate flow rate of the metal sheet during the forming process. A number of techniques can generally be used to regulate the flow rate of the metal sheet: regulating the blankholding force and reducing the friction between the die and metal sheet surfaces. However, these techniques can only be used to regulate the overall flow rate of the whole metal sheet. In order to minimize tears and wrinkles, it is necessary to regulate the flow rate at certain parts of the sheet. This leads to the idea of using a drawbead to obstruct the flow path in order to achieve control over the flow rate at the necessary locations. In this thesis, the effect of using drawbeads in a deep drawing process is investigated. The drawbeads used in this case have half-round shapes. The controllability of metal flow when drawbeads are in used depend upon the following parameters : the shape and heights of the drawbeads, the drawing speed, and the lubrication condition. The experiment results indicate that the heights of the drawbeads and the lubrication condition have the major effects on the metal flow while the drawing speed using in this experiment has negligible effects on the quality of forming product. The results reveal that by increasing the heights of the drawbeads, the blankholding force is increased, but the wrinkles is decreased. In addition, the results also indicate that without the use of any lubrication agents, tears will always occur on the metal sheet during the forming process.



Committee Chairperson