Development of Creative Forging Process and improvement of tool life using CAE Technology

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ABSTRACT

For a long time, the application of cold forging process had been limited due to its difficulty in the process design. But, for the recent paradigm shift to the environmental friendly technologies, the needs to manufacture net-shape part using cold forging process is growing up rapidly, especially for manufacturing high precision forged automotive parts. The importance of applying CAE in this field has increased gradually for supporting designers by predicting possible defects and providing useful information for improvements.

We take advantage of CAE to develop innovative components using servo press and to improve tool life for reduction of production cost.

The servo-press has been known as one of the most attractive tools to dominate the future innovation of precision forging industry due to its outstanding variety and higher accuracy of press motion control. Recently, there has been a growing demand for developing cost-effective and high value added forging processes using the servo-press for the forging industry across the world. Consequently, the development of high performance servo-press has become a usual trend of the major press manufacturing companies.

Also, tool life is one of the most important factors, which should be considered carefully in the forging process design. In general, accurate prediction of tool life is still difficult for process and tool design engineers since it can be affected by many factors complexly related to process and tool manufacturing conditions.

In the present study, we will introduce typical simulation examples from tool making industry and the important points on the effective use of CAE in cold forging design, as well as a developmental example using high performance servo-press machine.