

The Practical Application and Analysis for the Assembly of Machine tool with Linear Motors

朱享仁、紀華偉

E-mail: 9607729@mail.dyu.edu.tw

ABSTRACT

Recently, the research and development of machine tools tend to improve the production efficiency, and for the sake of satisfying such a requirement, high speed machining technology has played an important role in this trend. Accordingly, the conventional feed drive by means of ball-screw servo system can't reach the requirement, and it is gradually replaced by the linear motor drive system due to such possesses the advantages of high speed, high accuracy, long travel distance, and so on. In other words, by applying the linear motor technology to the feed drive system of machine tools can effectively improve the driving dynamic characteristics and reduce the machining time to make greater profits for manufacturers. The linear motor technology indeed brings on a revolution in these years. By taking the gear hobbing machine as an example, this study concentrates on the practical issue in developing the high speed, high accuracy, and high stable machine tools with linear motor drive systems. The methods for carrying out the essential tasks, e.g., specifications of feed drives, finite element analysis for the bed and the column of structures, the selection and assembly for the primary and secondary sections of the linear motor, accuracy inspection, cutting test, etc., are presented in this work. Due to the great potential for gear manufacturing market, the gear hobbing machine integrated with linear motors can effectively reduce the processing time to make greater profits for producers.

Keywords : High speed cutting ; High speed traverse ; Linear motor

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