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## **Design, fabrication, and test of a dual-coil system for electromagnetic sheet forming**

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In electromagnetic sheet forming(EMF)process, the driving coil structure and strength play a crucial role in the magnetic field distribution and corresponding electromagnetic force acting on the work-piece, which determines the forming performance. In this work, a new EMF system with a dual-coil was proposed to investigate coil strength and the effect of electromagnetic force distribution on the deformation behavior of the work-piece. Different from the traditional EMF coils, the dual-coil system has two coils which are energized by two independent power sources, respectively. Hence, the discharge energy and timing of the two coils can be flexibly controlled for adjusting the temporal and spatial distributions of electromagnetic force. To validate the feasibility of the dual-coil system, numerical simulations and a series of experiments have been presented and results show that the structure strength of the dual-coil has an obvious improvement and the forming performance of an aluminum alloy sheet with a diameter and thickness of 300mm and 2mm can be effectively improved, compared with the conventional single-coil system. Meanwhile, it has been found that, the discharge sequences of the two coils have an obvious influence on the forming performance.

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