Abstract Submitted for the SHOCK05 Meeting of The American Physical Society

Underwater explosive welding, Discussion based on weldable window AKIHISA MORI, Graduate student, Kumamoto University, 2-39-1 Kurokami, Kumamoto, 860-8555, Japan, KEISUKE TAMARU, Graduate student, Kumamoto University, KAZUYUKI HOKAMOTO, Shock Wave and Condensed Matter Research Center, Kumamoto University, MASAHIRO FUJITA, Dept. of Mech. Eng., Sojo University, Kumamoto, 860-0082, Japan — A new method of underwater explosive welding is introduced and its possibilities are suggested. In the underwater explosive welding, a high explosive with detonation velocity of 7km/s is placed at an initial inclined angle to decrease the horizontal collision point velocity, which is one of the important parameters to achieve welding. This method is effective to accelerate a thin metal plate rapidly. However, this arrangement makes a difference in the welding conditions with horizontal position when a constant thickness explosive is used, as the propagation distance of the underwater shock wave increases at the ends. Hence, a method of linearly increasing the thickness of explosive in proportion to the propagation distance is proposed. This investigation intends to clarify the welding conditions in using a constant thickness explosive and linearly increasing thickness explosive based on numerical analysis. Further, a method of designing the assembly is confirmed through numerical analysis and its validity with the experimental results is demonstrated based on the welding window.

> Akihisa Mori Graduate student, Kumamoto University, 2-39-1 Kurokami Kumamoto, 860-8555, Japan

Date submitted: 07 Apr 2005

Electronic form version 1.4