

Abstract Submitted  
for the SHOCK07 Meeting of  
The American Physical Society

**The dynamic behavior of mortar under impact-loading** NOBUAKI KAWAI, KENJI INOUE, SATOSHI MISAWA, KYOJI TANAKA, SHIZUO HAYASHI, KEN-ICHI KONDO, Materials and Structures Laboratory, Tokyo Institute of Technology, WERNER RIEDEL, Fraunhofer, Ernst-Mach-Institut — Concrete and mortar are the most fundamental structural material. Therefore, considerable interest in characterizing the dynamic behavior of them under impact-loading exists. In this study, plate impact experiments have been performed to determine the dynamic behavior of mortar. Longitudinal and lateral stresses have been directly measured by means of embedded polyvinylidene fluoride (PVDF) gauges up to 1 GPa. A 200 mm-cal. powder gun enable us to measure longitudinal and lateral stresses at several point from the impact surface, simultaneously. The shear strength under impact-loading has been obtained from measured longitudinal and lateral stresses. The longitudinal stress profile shows a two-wave structure. It is indicated that this structure is associated with the onset of pore compaction and failure of mortar by comparing with hydrocode simulations using an elastic-plastic damage model for concrete.

Nobuaki Kawai  
Materials and Structures Laboratory, Tokyo Institute of Technology

Date submitted: 23 Feb 2007

Electronic form version 1.4