



## Method for Investigating Early Liner Collapse in a Shaped Charge

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- Materials and Manufacturing
- NSWC Crane

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The U.S. Navy seeks a partner for licensing and collaboration on a method of analyzing early-stage deformation of a liner of a shaped explosives charge wherein the method uses material from the line to collect data on the explosive event and its impact on the material.

Current testing methods for analyzing early shaped-charge liner collapse and liner material involve a full explosion of the shaped charge. Testing can be performed during the event to analyze jet formation or performed after an event to determine the effectiveness of the shaped charge. However, testing liner material and/or the collapse of the liner can be difficult because the explosive event happens very quickly at intense pressures and high temperatures. There are complex and expensive experiments for analyzing shaped charges, such as jet capture testing, flight flash X-ray imaging, and computer simulation, but the need exists for a practical, less expensive method of investigating the effects of subtle alterations in shaped charge liner metallurgy.

NSWC Crane has developed and patented a testing method for analyzing liner collapse in a shaped explosives charge and a method of analyzing early-stage liner collapse in a shaped explosive charge which produces an actual sample on which metallurgical testing can be performed. The test methodology includes a shaped charge with a small amount of explosive material which is sufficient to partially form a jet which deforms but does not destroy the liner of the shaped charge. With the ability to recover a physical sample of the liner after the explosive event, it is possible to determine early-stage deformation of the liner and perform metallurgical and other tests thereon.

**People:**

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