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Fine fragmentation distribution from structural reactive material casings under explosive loading WILLIAM WILSON, DTRA, FAN ZHANG, DRDC, KIBONG KIM, AER Inc. — Structural reactive material (SRM) can be used for explosive casings to provide additional blast energy. SRM fragments can react either promptly or after impact with nearby structure. Better understanding of fine fragment distributions from SRM casings is important for optimization of initiation and reaction of the SRM fragments. Key to this is knowledge of the initial fragmentation character before it has been altered by early reaction or by subsequent impact with surrounding structure. The study must be conducted beyond critical charge diameter to minimize effects of the expansion wave on fragment sizes. The collection and analysis of fragment distribution down to 40 micron size from thick SRM casings are therefore investigated in a 1.18 m diameter, 2.1 m^3 closed cylindrical chamber filled with artificially-made pure snow packed to density 0.35 g/cm^3. The snow quenches early reaction of SRM fragments and soft-catches the fragments before impact with the chamber walls. A 100 g cylindrical C-4 explosive charge is used, packed in a 3.3 cm inner diameter SRM casing, with length-to-diameter ratio of L/d = 2, and casing-to-explosive mass ratio of M/C = 1.75. Three types of SRM are investigated, including a baseline of Aluminum 6061 for comparison. The cased charge is suspended in an argon filled cavity, 20 cm in diameter and 40 cm long, within the snow filed chamber.

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