



# Quantifying the Amount of Linear Shape Charge Required to Penetrate Certain Thicknesses of Composite Material



## Objective

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This effort will quantify the amount of explosive in a linear shaped charge (LSC) needed to penetrate certain thicknesses of composite material. LSC is currently used on the Shuttle for frustum separation, nozzle severance and the range safety destruct mechanism. It will also be used on future vehicles for stage separation and destruct mechanisms. The results of this effort will help narrow the area in which pyrotechnic design engineers will need to look when sizing a destruct or separation charge for a composite structure.

## Why Needed

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The results of this effort will help narrow the area in which pyrotechnic design engineers will need to look when sizing a destruct or separation charge for a composite structure. While data for the penetration depth of LSC through aluminum and steel is readily available, the database for composites is relatively small. As more composite materials are utilized in future launch vehicle design, a LSC vs. composite thickness database will reduce future testing and save time during design cycles. This database will be invaluable if a destruct system is required for MSFC's new "X" vehicles that will use composite materials. It will also benefit the design of a "Bantam" type of vehicle for ground separation, stage separation, and destruct system.

## Point of Contact

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## Sponsor

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