Name(s)	Project Number
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Project Title

Protection with Geometry

Abstract

Objectives/Goals
My objective was to determine what the optimal angle of metal is for tank armor. Out of five selected angles ranging from ninety degrees vertically to thirty degrees. I believed that thirty degrees would work the best since it is closest to parallel with the ground.

Methods/Materials
Five different angles ranging from 90 degrees to 30 degrees were tested three times each, on thin metal "flashing" shingles measured in sheets; one sheet each in this test. An air cannon was constructed using Schedule 40 PVC pipe parts and air compressor adapters, with an electronically activated sprinkler valve. The cannon fired a 1/2" bolt-like projectile at the flashing while being enclosed in a wooden box for safety; the cannon fired at 100 psi.

Results
All but the flashing at 30 degrees were fully penetrated consistently, the 30 degrees having an anomaly, which was one deflected shot. Using an equation found in research, I calculated the relative thickness of each piece of flashing at each degree I plugged in. The normal thickness was considered one, or one sheet of flashing. From the equation I found that 30 degrees relatively doubles the thickness of the piece of flashing.

Conclusions/Discussion
Further research and testing are still being done, but the results from the first experiment show that 30 degrees would seem to be the best angle, in theory. In practice, 30 degrees was the same as all the other angles aside from the single incident of deflection.

Summary Statement

This project hopes to expand the research on angled tank armor and perhaps prove its continued worth.

Help Received

Friend and Father helped with manual labor(direct construction of project i.e. use of power tools).