

DEFENCE, PEACE, SAFETY AND SECURITY

LANDWARDS SCIENCES COMPETENCY AREA

IBBTC-25-28 Sept 06

Protecting the Lower Extremity against a/p Blast Mines

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Contents

- R&D overview
- Effect of a/p blast mines
- Basic explosive principles
 - Shock effect (brisance)
 - Blast effect
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- Protection concepts
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R&D Overview

Outcome

A better understanding of shock transfer into the lower extremity
New test methods
Simulation models
Results of LEAP study do not correlate with field injuries
Workable protection concept
Result: Chaos and arguments

Benefits:

Test methods and facilities for testing of COTS
Systems
Test data
Prototype protection system for lower extremity
Simulation model

Slide 3

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Goals:

Compare LEAP study results with field injuries
Investigate energy distribution
Develop test methods
Testing of COTS boots
Develop new boot

Future work:

Correlate impulse vs tissue damage
Develop protection concept (s) further

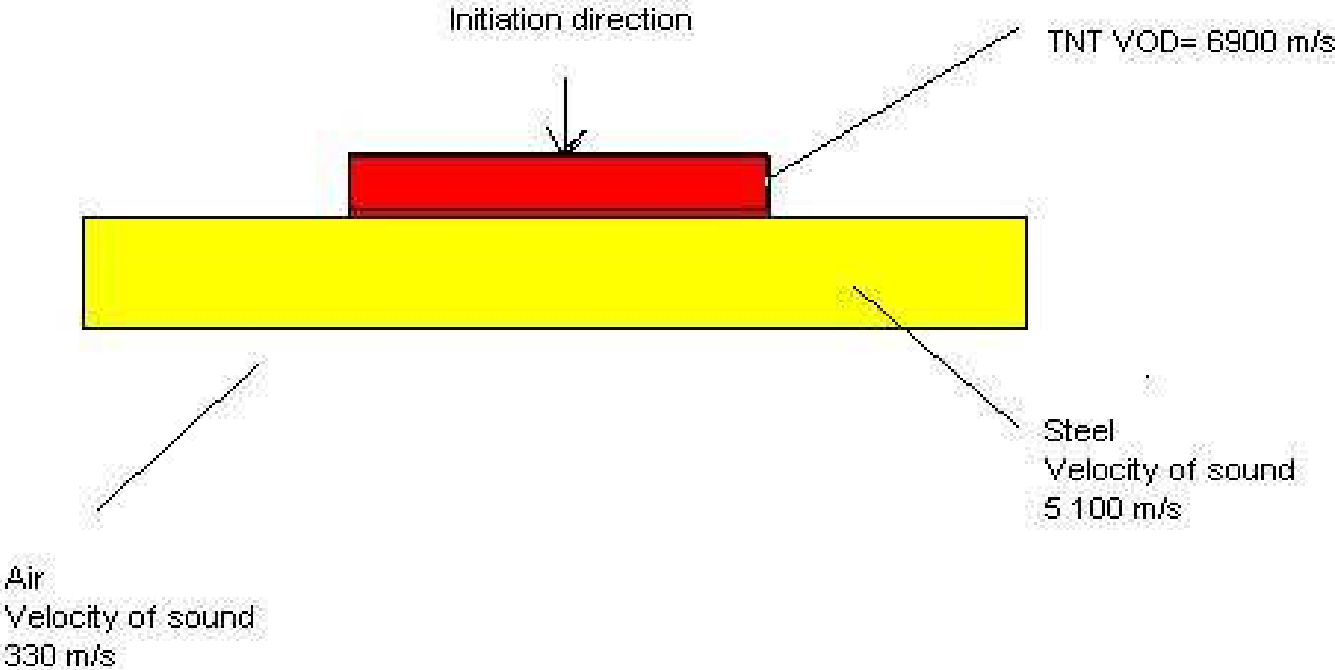
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A/P Blast Mines Effects



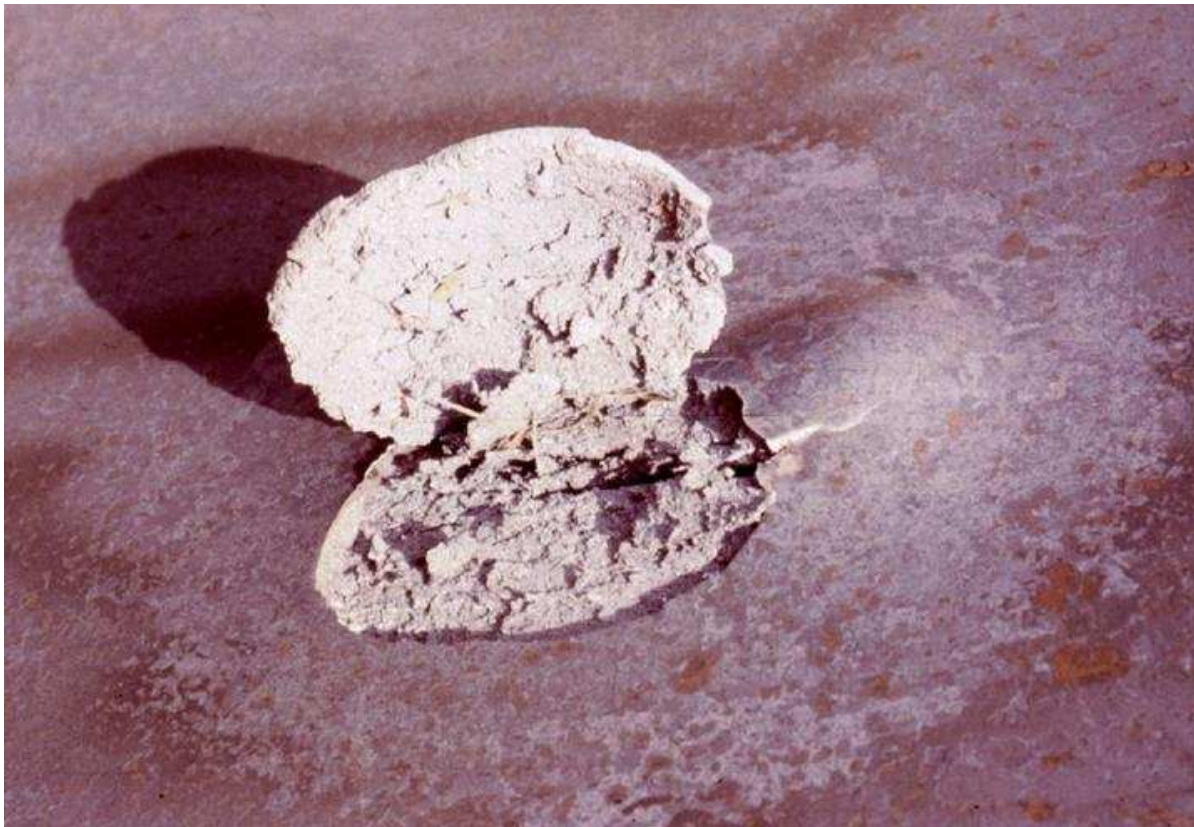
Basic Principles

Shock Effect



Basic Principles

Spalling



Basic Principles

Shock



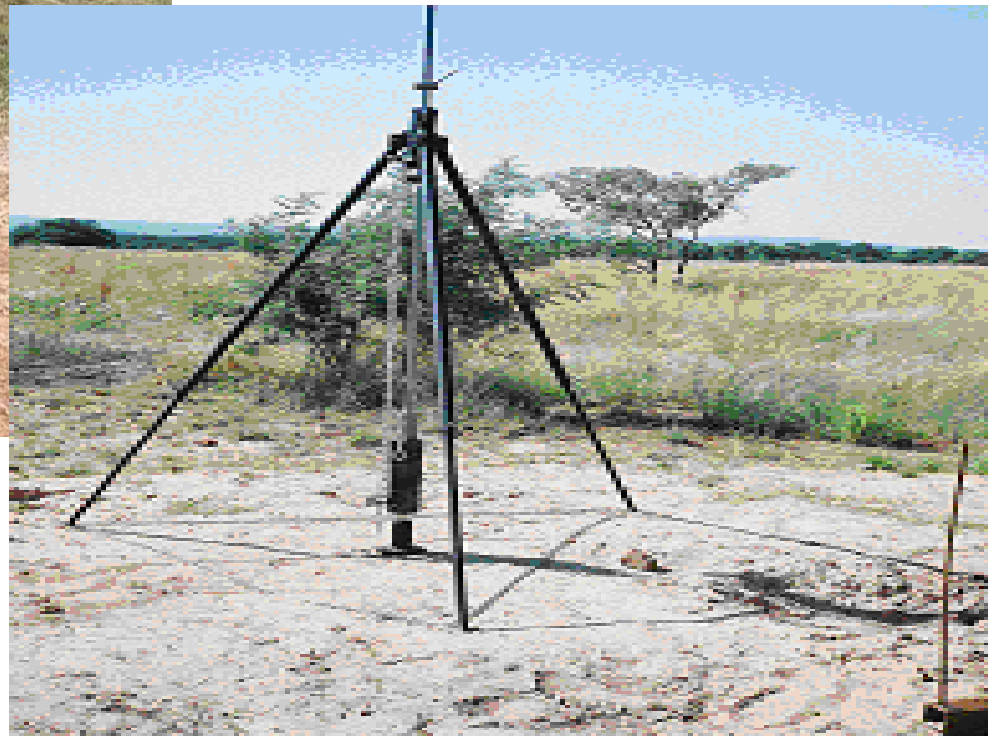
Basic Principles

Blast effect



Slide 8

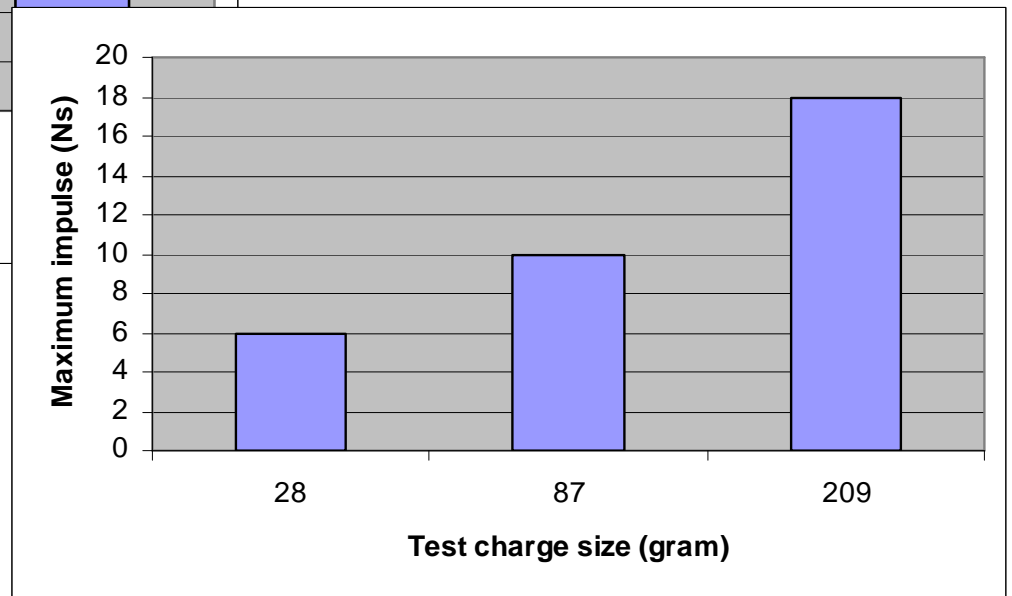
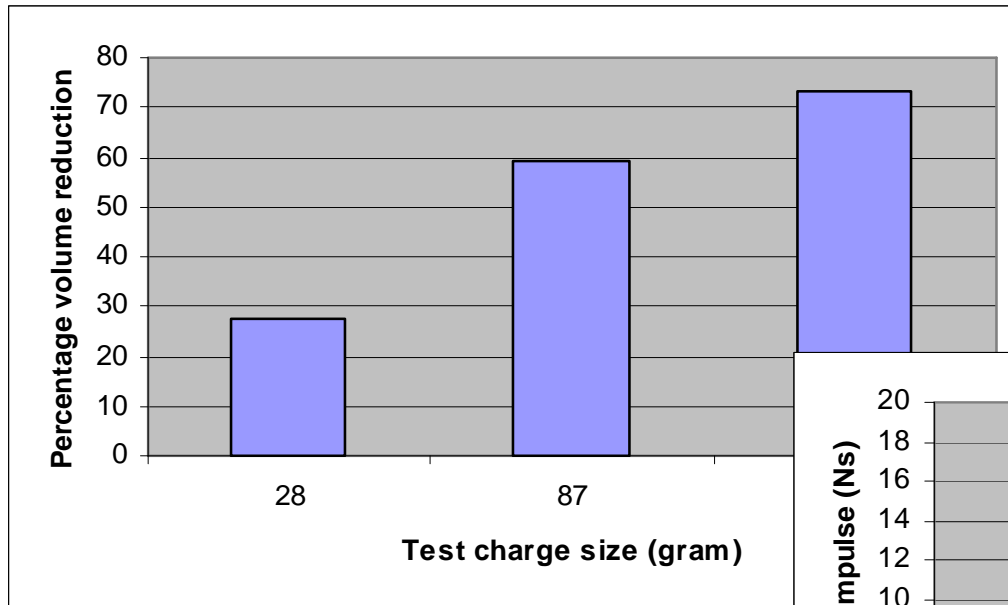
Test Methods



Test Methods



Test Methods

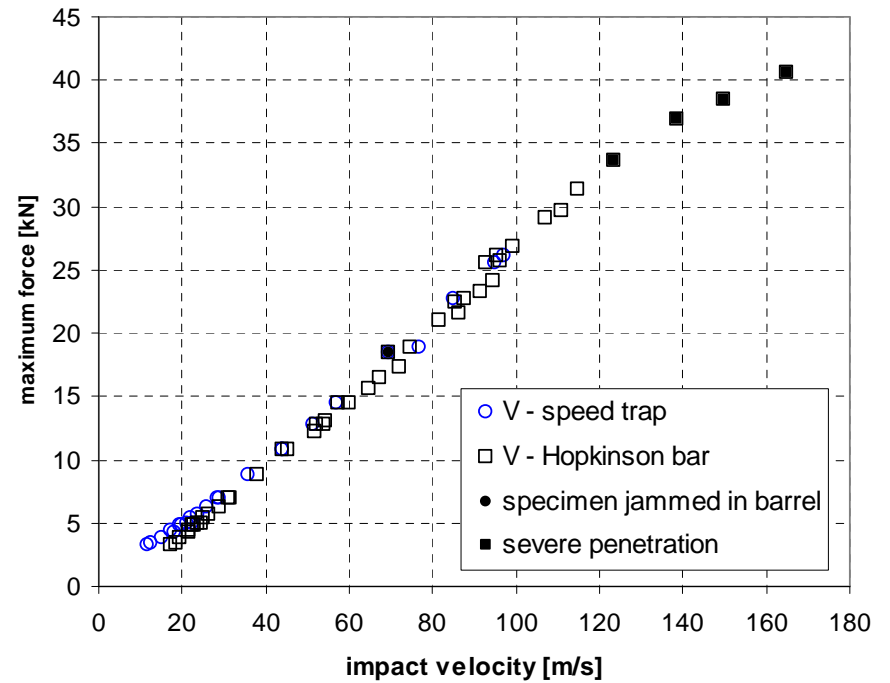
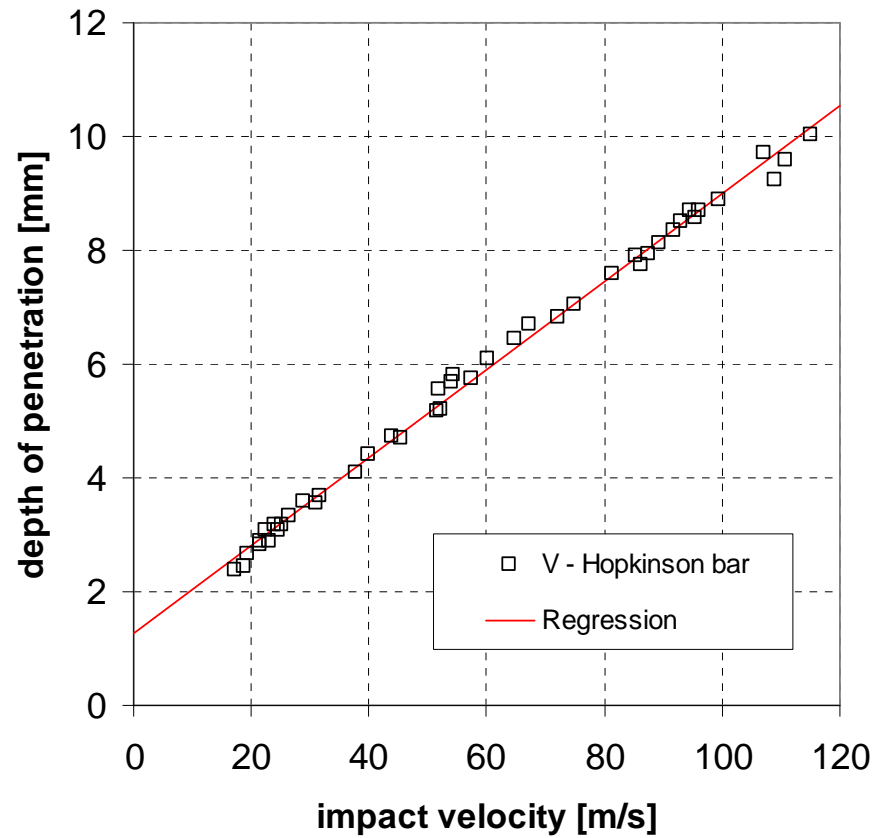


Test Methods

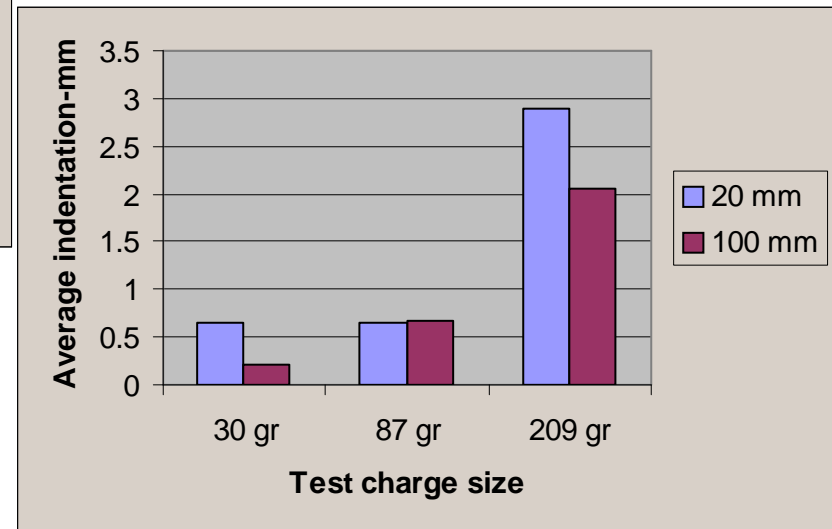
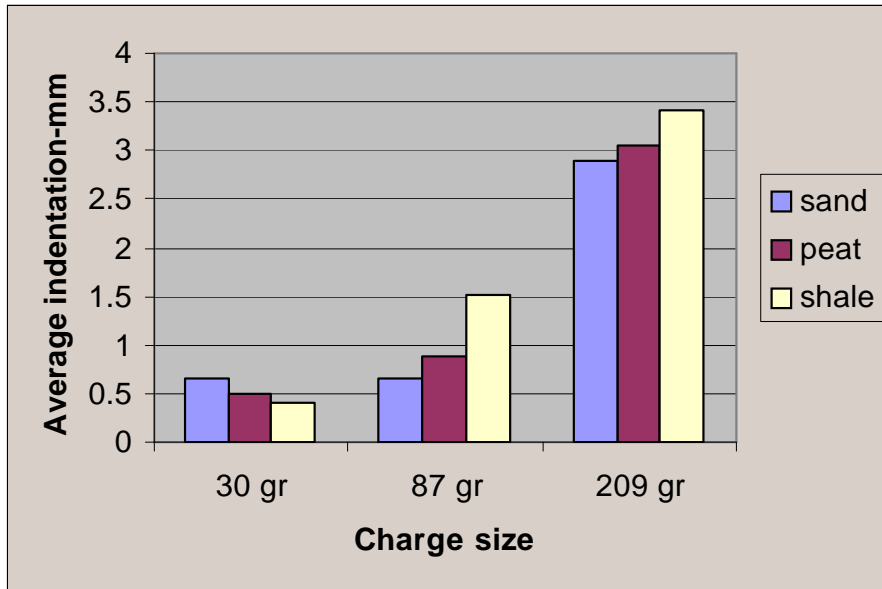
Bridge of “sighs”



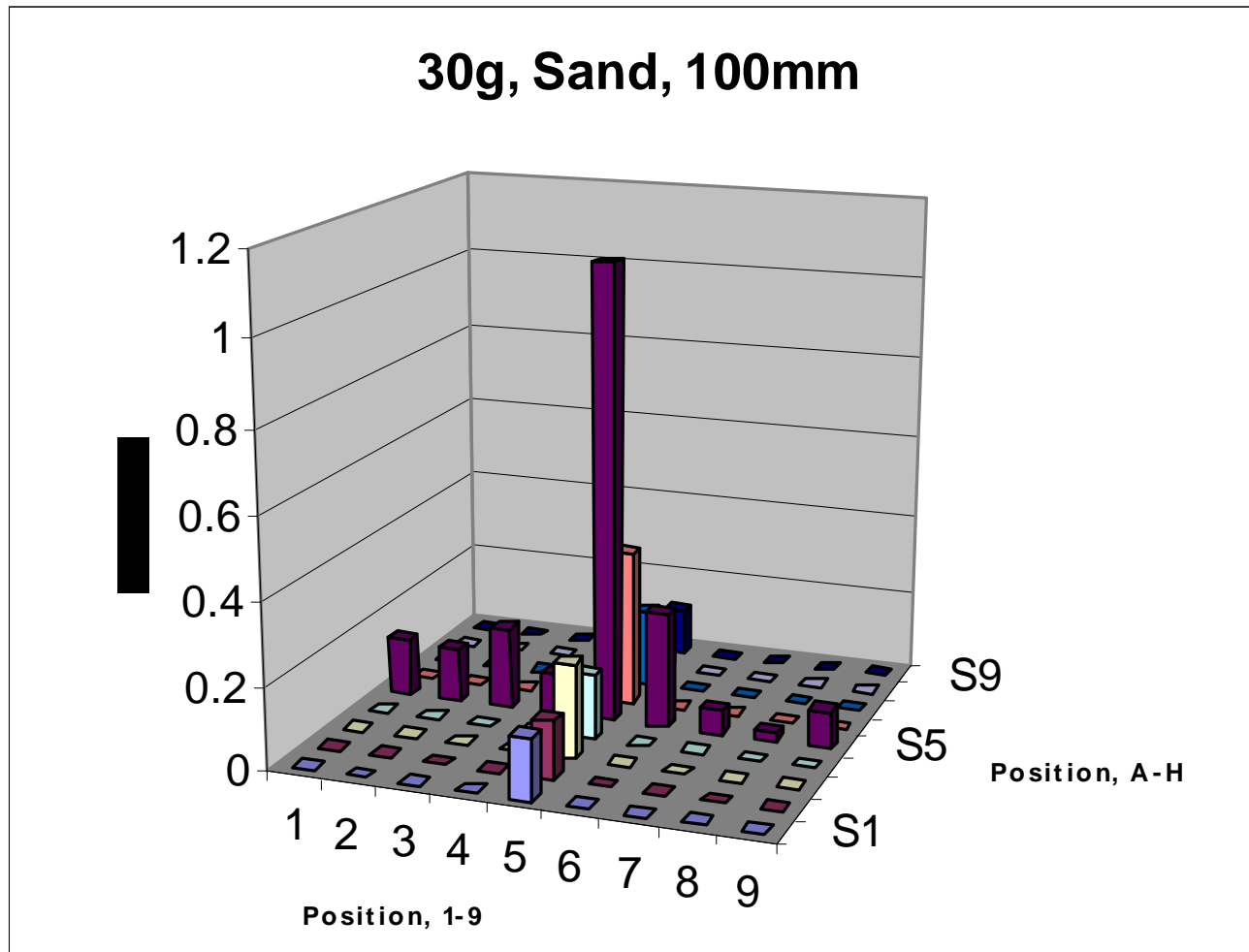
Test Methods



Test Methods



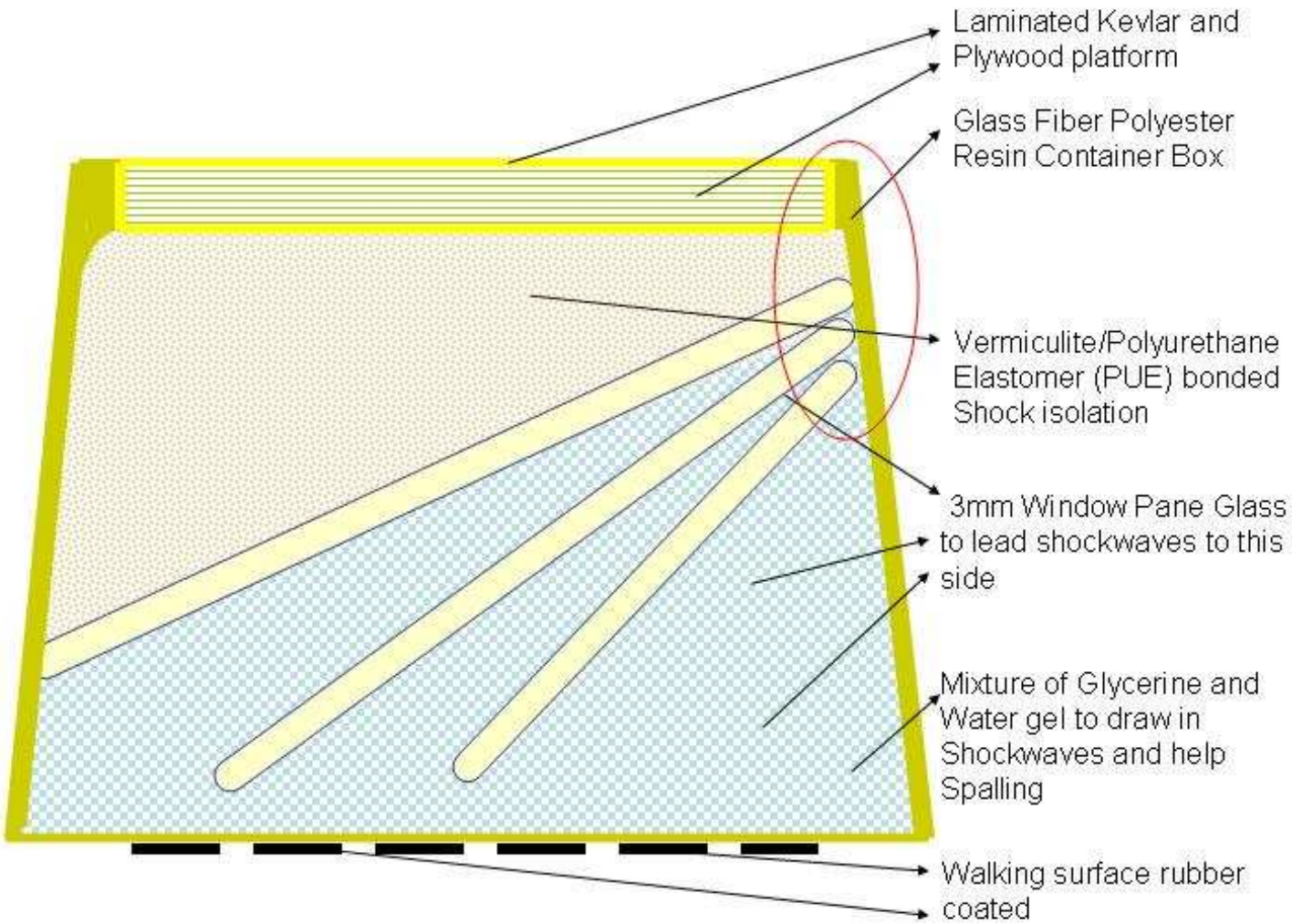
Test Methods



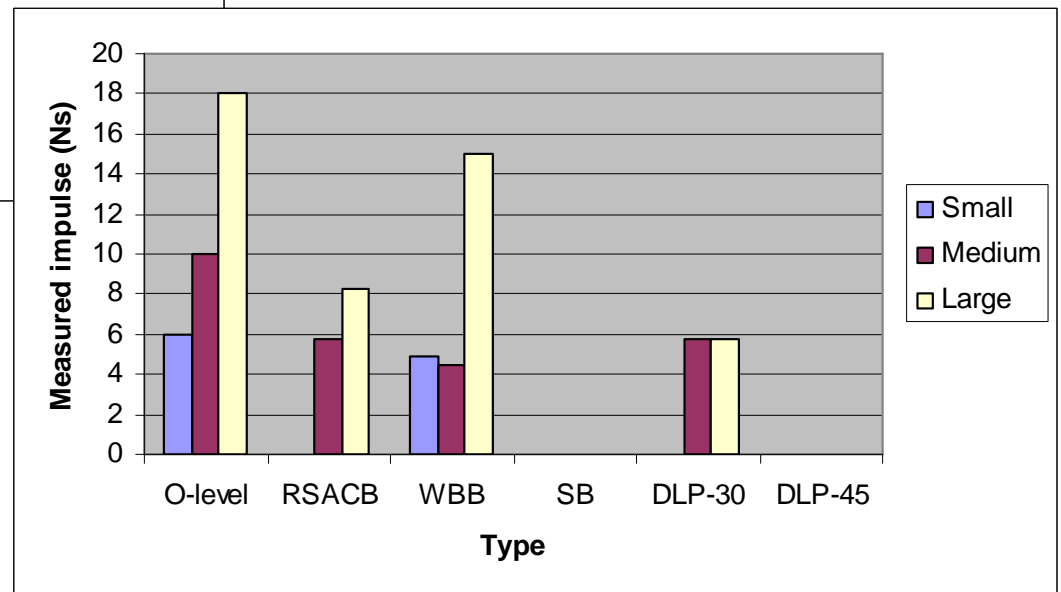
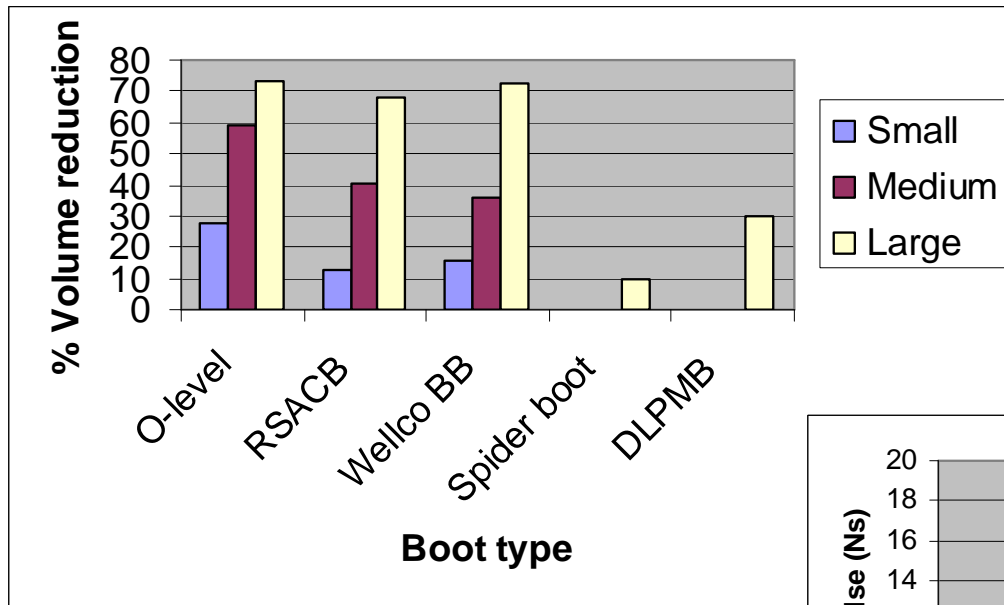
Protection Concepts



Protection Concept



Test Results



Test Results



Conclusions

- Shock the prime cause of tissue/bone damage
- Blast secondary abrasive type injuries
- Some protective concepts that may lead to feasible solutions
- Very difficult to protect against the large type a/p mine (200g)

Questions?

Thank you for listening