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| Controlling DoD Organization: Bureau of Ordnance, Department of the Navy, Washington, DC 20350. |

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U. S. NAVAL PROVING GROUND
DAHLGREN, VIRGINIA

REPORT NO. 1094

PROJECTILES AND WARHEAD FRAGMENTATION

24th Partial Report

TESTS OF
ENERGA ANTI-TANK RIFLE GRENADES

Task Assignment XPG-Re2c-35-1-53

Copy No. 12

Classification CONFIDENTIAL

SECURITY INFORMATION
Tests of Energa Anti-Tank Rifle Grenades

PART A

SYNOPSIS

1. This test was conducted to determine lethal ranges of the nose, beam, and base fragments of the Energa anti-tank rifle grenade.

2. The maximum range for penetration of 0.040 dural by a fragment from a statically detonated Energa grenade is between 275 feet and 300 feet for the nose fragments, between 15 feet and 20 feet for the beam spray fragments, and between 20 feet and 30 feet for the base fragments.
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Tests of Energa Anti-Tank Rifle Grenades

PART B

INTRODUCTION

1. AUTHORITY:

This test was authorized by reference (a) and conducted under Task Assignment NPG-Re2c-35-1-53, reference (b).

2. REFERENCES:

   a. BUORD conf ltr S78-1(31) Re2c-JSM:rjb Ser 45688 of 6 October 1952
   b. BUORD conf ltr NP9 Re2c-JSM:rjb Ser 42665 of 29 July 1952
   c. Dept of the Army Technical Bulletin TB ORD 404 of 29 January 1951

3. BACKGROUND:

   In association with the development of an aircraft launcher for the Energa anti-tank rifle grenade for the Marine Corps, the Bureau of Ordnance directed the Naval Proving Ground to conduct tests to determine the safety of airborne aircraft against the fragments of the grenade.

4. OBJECT OF TEST:

   This test was conducted to determine the lethal fragment range of the nose, beam, and base fragments of the Energa anti-tank rifle grenade.

5. PERIOD OF TEST:

   a. Date Project Letter 6 October 1952
   b. Date Necessary Material Received 23 October 1952
   c. Date Commenced Test 3 December 1952
   d. Date Completed Test 4 December 1952
Tests of Enorga Anti-Tank Rifle Grenades

PART C

DETAILS OF TEST

6. DESCRIPTION OF ITEM UNDER TEST:

The Enorga anti-tank rifle grenade, HE, AT, T-41, is a fin stabilised, point initiated, base-detonated, shaped charge grenade containing 0.73 lbs. of RDX and TNT and weighing a total of 1.42 lbs. Three (3) fusing systems, contractors drawing numbers 20001, 2000g, and 2000f1, were used in this test. Fuze assembly drawings are shown in Figures 1 and 2.

7. PROCEDURE:

Each grenade was set in a horizontal position on a 4' high wooden stand. Dural plates, 0.040 thick, were placed at varying distances from the grenade to catch the nose (or jet) fragments (0°), the beam spray (90°) fragments and the base (180°) fragments. These plates (4' x 12') were placed sometimes horizontally and sometimes vertically and were moved to various distances until the limits of fragment penetration were obtained.

8. RESULTS AND DISCUSSION:

Twenty-eight (28) rounds of Enorga anti-tank rifle grenades, HE, AT, T-41, were statically detonated to determine the maximum lethal range and minimum safety distance against 0.040 dural aluminum plate. Detailed penetration data are given in Table I. Some fragment penetrations were obtained from the nose (0°) spray at 275 feet distance, from the beam (90°) spray at 15 feet, and from the base (180°) spray at 20 feet. No penetrations were observed at 300 feet from the nose, at 20 feet from the beam, or at 30 feet from the base. Variations of the fusing system did not affect the fragment penetration results.

CONCLUSIONS

9. The maximum range for penetration of 0.040 dural by a fragment from a statically detonated Enorga grenade is between 275 feet and 300 feet for the nose fragments, between 15 feet and 20 feet for the beam spray fragments, and between 20 feet and 30 feet for the base fragments.
Tests of Energy Anti-Tank Rifle Grenades

The tests upon which this report is based were conducted by:

W. WRIGHT, JR, Fragmentation Firing Officer
Fragmentation Division
Terminal Ballistics Department

This report was prepared by:
W. WRIGHT, JR, Fragmentation Firing Officer
Fragmentation Division
Terminal Ballistics Department

This report was reviewed by:
V. PHILIPCHUK, Fragmentation Battery Officer
Fragmentation Division
Terminal Ballistics Department
R. H. LYDDANE, Director of Research
Terminal Ballistics Department
E. L. LEVSTIK, Lieutenant Commander, USNR
Terminal Ballistics Batteries Officer
Terminal Ballistics Department
W. B. ROBERTSON, Lieutenant Commander, USN
Terminal Ballistics Officer
Terminal Ballistics Department
C. C. BRAMBLE, Director of Research, Ordnance Group

APPROVED: J. F. BYRNE
Captain, USN
Commander, Naval Proving Ground

E. A. RUCKNER
Captain, USN
Ordnance Officer
By direction
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Twenty-fourth Partial Report

on

Projectiles and Warhead Fragmentation

Final Report

on

Tests of Enorga Anti-Tank Rifle Grenades

Project No.: NPG-Re2e-35-1-53
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SECURITY INFORMATION
Tests of Energa Anti-Tank Rifle Grenades

**TABLE I**

**FRAGMENT PENETRATION DATA**

Plate: 0.040 Dural
Plate Height: 12' nose, 4' beam, 4' base
Plate Width: 8' nose, 12' beam, 12' base

<table>
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<th><strong>Nose (0°)</strong></th>
<th>Distance (feet)</th>
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<th><strong>Beam (90°)</strong></th>
<th>Distance (feet)</th>
<th>No. Penetration</th>
<th><strong>Base (180°)</strong></th>
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* nose plate 12' wide by 4' high
* nose plate 12' high by 4' wide
** base plate 12' high by 4' wide

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APPENDIX B
# Tests of Energy Anti-Tank Rifle Grenades

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