

- 3029 Rinehart J S
SURFACE ENERGY, A MODE FOR ENERGY ABSORPTION DURING
IMPACT
American Journal of Physics
1953, Vol. 21, pp. 305-307.

The role that pulverization of the target material may play in absorbing the energy of an impacting missile is discussed. The energy absorbed depends upon the area of the new surfaces formed. Correlation is made to impact of meteorites.

- 3030 Krafft J M
SURFACE FRICTION IN BALLISTIC PENETRATION
Journal of Applied Physics
1955, Vol. 26, pp 1248-1254.

The frictional adhesion between projectile and target during a ballistic penetration has been measured with a torsion-type Hopkinson bar. The apparatus allows measurement of the torsional adhesion of a spinning projectile during target penetration. By assuming the friction resisting rotation to be equal to that resisting axial penetration, the energy loss due to friction was computed. The results show that the torque time pattern during penetration of a "mechanically" clean projectile can be predicted with the assumption of a frictional energy loss just sufficient to keep the sliding surfaces at the melting temperature of the metal. Metallographic analysis of the target metal at the projectile interface gives a further indication of a molten interface. In these tests, sliding friction accounts for about 3 per cent of the striking energy of the projectile common surface contaminants, not necessarily special lubricants, reduce this loss to less than 1 per cent. (Author's abstract)

- 3031 Thomson W T
AN APPROXIMATE THEORY OF ARMOR PENETRATION
Journal of Applied Physics
1955, Vol. 26, pp. 80-82.

The problem of armor penetration of thin plates is considered from a quasi-dynamical approach. Equations are derived for the energy dissipation due to plastic deformation and for heating of the projectile target interface. Both the conical and the ogival head are considered in the application of the general equations. (Author's abstract)

- 3032 de Callatay X
BEHAVIOR OF METALS UNDER IMPACT LOADING AND THE
MECHANISM OF CRATERING
University of Utah, Institute for the Study of Rate Processes, October 1956
Library of Congress P. B. 125534.

- 3033 Kinser G D, Masket A V H and Streeter J R
MEASUREMENT OF FORCES WHICH RESIST PENETRATION OF STJ
ARMOR, MILD STEEL AND 24 ST Aluminum
April 1944, U. S. Naval Research Laboratory
Library of Congress P. B. 120710.
- 3034 Kinser G D
PENETRATION OF FACE-HARDENED BULLET-PROOF ARMOR BY
SOLID CALIBER .27 BULLET
May 1944, U. S. Naval Research Laboratory.
- 3035 Irwin G. R and Webster R A
EFFECT OF YAW UPON PENETRATION: THE EFFECT UPON BULLETS
PENETRATING VERY THIN DURALUMIN SHEETS; THE USE OF SHIELD-
ING STRUCTURES IN THE FORM OF GRARRINGS. FIFTH PARTIAL
REPORT ON LIGHT ARMOR
June 1939, U. S. Naval Research Laboratory
Library of Congress P. B. 122806.
- 3036 Kinser G D and Jantzen A C
VELOCITY LOSS OF A 1/2 INCH MODEL PROJECTILE WHEN IT PEN-
ETRATES 1/32 INCH COLD-ROLLED SHEET STEEL
March 1944, U. S. Naval Research Laboratory
Library of Congress P. B. 120743.
- 3037 Kinser G D
EFFECTS OF TEMPERATURE ON THE RESISTANCE TO IMPACT PEN-
ETRATION AND HARDNESS OF SOFT HOMOGENEOUS ARMOR AND
FACE-HARDENED BULLET-PROOF STEEL AND A DESCRIPTION OF
A NEW BASIC FEATURE OF IMPACT PENETRATION
June 1942, U. S. Naval Research Laboratory
Library of Congress P. B. 120678.
- 3038 Clay W G and Partridge W
WAX MODELING STUDIES OF HIGH-SPEED IMPACT
June 1956, Utah University
Library of Congress P. B. 123452.
- 3039 Partridge W S and Clay W G
STUDIES OF HIGH-VELOCITY IMPACT IN WAX
Journal of Applied Physics
1958, Vol. 29, No. 6, pp. 939-942.

Wax targets are used to study the condition when impact velocities are greater than the sonic velocity of the target. The penetration was found to vary linearly with the cube root of the pellet velocity up to velocities in excess of twice the sonic velocity of the target material.