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# **EXPLOSIVES POWER AND POWER INDEX**

**CUFS 2416 EXPLOSIVE AND POST BLAST INVESTIGATION**

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B.SC. FORENSIC SCIENCE (SEM 6)  
SCHOOL OF FORENSIC SCIENCES  
BHUBANESHWAR CAMPUS

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- Introduction
- Explosive Power

# EXPLOSIVE POWER

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- **Explosive power** refers to the destructive energy released by an explosive material upon detonation. It is typically measured by the amount of pressure, heat, and damage generated by the explosion.
- Explosive power is the ability to produce a maximum amount of force in a very short period of time

# EXPLOSIVE POWER

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- It is the total work done by a standard quantity of explosive.

$$\textit{Explosive power} = Q \times V$$

- It is used to determine the potential of an explosive to cause harm or damage.
- Explosive power is an important factor in evaluating the suitability of an explosive for specific applications, as well as its handling, storage, and transport requirements.

# DETERMINATION OF **EXPLOSIVE POWER**

- The most commonly used method - **Calorimetry**
- Other methods –
  - measuring the **pressure generated** by the explosion – **BALLISTIC MORTAR TEST**
  - measuring the **amount of damage** caused by the explosion – **TRAUZL LEAD BLOCK TEST**

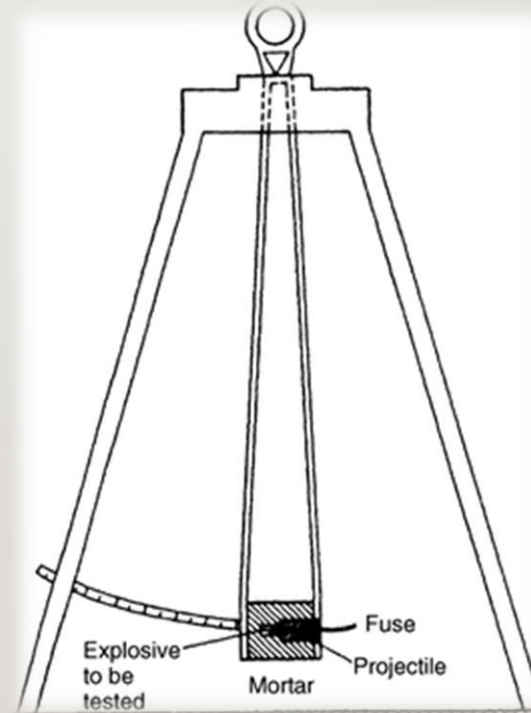


FIG. – BALLISTIC MORTAR TEST

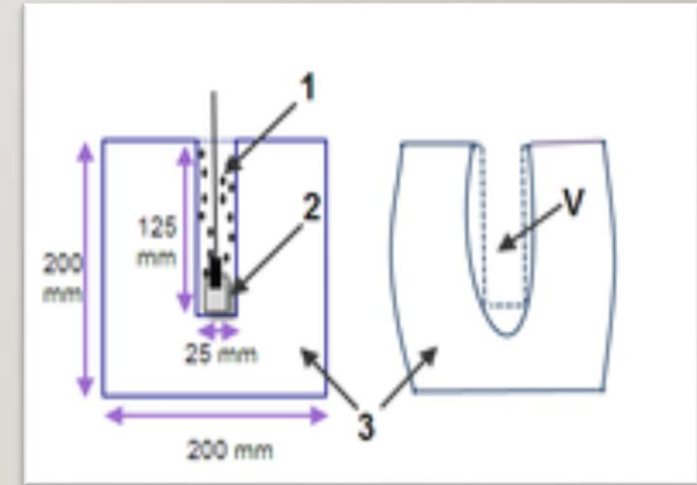


FIG. – TRAUZL LEAD BLOCK TEST

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In an explosive reaction, heat and gases are liberated. The volume of gas  $V$  and the heat of explosion  $Q$  can both be calculated independently but these values can be combined to give the value for the explosive power :

$$\text{Explosive power} = Q \times V$$

- The value for the explosive power is then compared with the explosive power of a standard explosive (picric acid) resulting in the power index , where data for  $Q_{(\text{picric acid})}$  and  $V_{(\text{picric acid})}$  are  $3250 \text{ kJ kg}^{-1}$  and  $0.83 \text{ l dm}^3 \text{ g}^{-1}$ , respectively.

$$\text{Power Index} = \frac{Q \times V}{Q_{(\text{picric acid})} \times V_{(\text{picric acid})}} \times 100 \quad (5.13)$$

# The power index of some primary and secondary explosive substances taking picric acid as the standard

Explosive substance	$Q_v$ /kJ g <sup>-1</sup>	$V$ /dm <sup>3</sup> g <sup>-1</sup>	$Q_v V \cdot 10^4$	Power index/%
<i>Primary explosives</i>				
Mercury fulminate	1755	0.215	37.7	14
Lead styphnate	1885	0.301	56.7	21
Lead azide	1610	0.218	35.1	13
<i>Secondary explosives</i>				
Nitroglycerine	6194	0.740	458.4	170
EGDN	6658	0.737	490.7	182
PETN	5794	0.780	451.9	167
RDX	5036	0.908	457.3	169

**THANK YOU.**

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