



Blast & Ordnance Characterization

Axiometrix Solutions

APPLICATION NOTE // By Lars Winberg

Advanced Solutions for Blast & Ordnance Characterization

Understanding the acoustic and pressure effects of explosions is critical for ensuring safety, optimizing designs, and assessing the impact of explosive devices. GRAS Sound & Vibration provides industry-leading acoustic measurement solutions for characterizing impulse noise, blast wave propagation, and overpressure effects. Whether testing grenades, artillery, mines, or pyrotechnic devices, GRAS empowers defense organizations and research facilities with precise tools to measure and analyze explosive events, including confined space detonations where blast effects are magnified.

Specialized Measurement Solutions for Explosive Environments

GRAS offers robust and high-precision tools designed to meet the unique challenges of blast and ordnance characterization:

- **High-Pressure Measurement Microphones:** Designed to capture extreme sound pressure levels (SPLs) with precision, ensuring accurate characterization of impulse noise and blast effects.
- **Impulse Noise Testing Systems:** Tailored solutions for measuring peak pressure, rise time, and frequency content of explosive events.
- **Blast Wave Propagation Analysis:** Tools for capturing and analysing the behaviour of blast waves in open and confined spaces.
- **Weather-Resistant Microphones:** Ruggedized designs for outdoor testing of explosive devices under varying environmental conditions.
- **Confined Space Testing Solutions:** Specialized equipment to measure the amplified effects of explosions in enclosed environments, such as vehicles or buildings.



Applications in Blast & Ordnance Characterization

GRAS solutions are trusted by defense organizations, research institutions, and manufacturers worldwide to characterize the acoustic and pressure effects of explosive devices:

- **Grenades and Artillery:** Measure and analyze the impulse noise and blast wave propagation of grenades, artillery rounds, and other ordnance.
- **Mines and Explosive Devices:** Characterize the overpressure and acoustic effects of landmines, IEDs, and other explosive hazards.
- **Pyrotechnic Devices:** Assess the acoustic performance and safety of pyrotechnic devices used in military or industrial applications.
- **Confined Space Explosions:** Evaluate the amplified blast effects in enclosed environments, such as vehicles, bunkers, and urban settings.
- **Overpressure and Safety Assessments:** Measure overpressure effects to ensure compliance with safety standards and minimize risks to personnel and equipment.

Why Choose GRAS for Blast & Ordnance Characterization?

Extreme Precision: GRAS microphones and systems deliver reliable and accurate measurements, even in the most extreme acoustic environments.

- **Proven Expertise:** With decades of experience in acoustic measurement, GRAS is a trusted partner for defense and research organizations worldwide.
- **Rugged and Reliable:** Our products are designed to withstand the harsh conditions of explosive testing environments, ensuring consistent performance.
- **Customizable Solutions:** GRAS offers tailored configurations to meet the specific requirements of blast and ordnance characterization.
- **Global Standards Compliance:** Our solutions support testing in accordance with international safety and defense standards, ensuring compliance and reliability.

Advancing Safety and Understanding of Explosive Effects

GRAS Sound & Vibration is committed to advancing the understanding of explosive impacts through precise acoustic and pressure measurement. Our state-of-the-art solutions provide the accuracy, reliability, and customization needed to characterize and analyze explosive events, supporting safety, performance, and innovation in defense and research applications.



GRAS 67SB



GRAS 46BG



GRAS 47AC



imc ARGUSfit



imc FAMOS

Recommended Solution Configuration

Measurement of blast and ordnance noise / sounds can be divided into two main measurements:

1. **CHARACTERIZATION**
2. **IMPACT ON THE HUMAN/SOLDER**

1. Characterization

Relative close to the blast itself and further away from the blast. Recommended microphones analysis system for these measurement is:

- **GRAS 67SB** Blast Probe Microphone according to ANSI S12.42, near field
- or
- **GRAS 46BG**
- **GRAS 47AC** (Blast) 1/2" CCP Infra-Sound Microphone Set, far-field
- **imc ARGUSfit**
- **imc STUDIO**, Software for measurement and control
- **imc FAMOS**, Data analysis framework

2. Impact on the human/solder

Measuring the noise impact of a blast on a human/solder. Recommended equipment for these measurements:

- **GRAS 45CB** Acoustic Test Fixture
- **GRAS 67SB** Blast Probe Microphone according to ANSI S12.42.



GRAS 67SB



GRAS 45CB

For more information or application-specific recommendations, please contact our team of specialists.

About Axiometrix Solutions

Axiometrix Solutions is a global leader in advanced test and measurement solutions, supporting customers across aerospace, automotive, defense, audio, and electronics industries. With a strong focus on precision, reliability, and innovation, Axiometrix delivers technologies that enable accurate measurement and analysis in even the most demanding environments.

Axiometrix Solutions brings together three world-class brands:

- **GRAS Acoustics** – Specialists in high-precision measurement microphones and acoustic solutions, trusted for their accuracy, durability, and repeatability.
- **imc Test & Measurement** – Experts in intelligent data acquisition systems and real-time analysis for mechanical and mechatronic testing.
- **Audio Precision** – The industry standard in audio analyzers and electroacoustic test solutions.

Together, these brands provide a comprehensive portfolio of solutions that empower engineers and researchers worldwide to measure, analyze, and improve performance across a wide range of applications. Axiometrix Solutions operates globally through subsidiaries and distributors in more than 40 countries. Learn more at www.axiometrixsolutions.com