



BLASTHAWK
IoT BLAST VIBRATION MONITORING

TRIAxIAL BLAST VIBRATION · AIR-OVERPRESSURE –GPS – WI-FI - IoT

BlastHawk VIBRA

Pro-Spectrum Edition: triaxial blast vibration and air-overpressure monitor with dedicated IOT platform

Made in India

MSME · GSTIN · DGFT IEC

ISEE-grade measurement



AMW Mining & Allied Services Enterprise · BlastHawk VIBRA · Pro-Spectrum Edition
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BlastHawk VIBRA
Pro-Spectrum Edition

What this deck covers



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01

Company & Approach

Who AMW is, and why every blast is a measurement opportunity



AMW Mining & Allied
Services Enterprise

Built for the people who blast

About AMW Mining & Allied Services Enterprise



Mining engineer reviewing open-pit bench

Established 2022, Patna

Indian mining services and technology company supporting mines, quarries and infrastructure projects across India, the GCC, Africa and Southeast Asia.

Field services

DGMS and PESO statutory compliance, blast engineering and vibration control, mine planning, environmental and EIA/EMP studies, and workforce training.

Hardware & Software Labs

BlastManager Pro, MineSafety Tracker, CompliancePortal and GeoTwin Digital, a mine digital-twin platform.

Registrations and credentials

MSME (Udyam) UDYAMBR260093707 · GSTIN 10ABUPF7542H1ZO · DGFT IEC · UN Global Marketplace registered supplier.

BlastHawk VIBRA

The hardware arm of the stack: an instrument designed, manufactured and supported in India.

Every blast, on the record



Every blast is a measurement opportunity

01

Measure

Four simultaneous channels (three triaxial velocity axes plus air overpressure) on a 24-bit sigma-delta front end with GPS-disciplined timing.

02

Monitor

Live Wi-Fi streaming to phone and PC, solar-ready endurance of up to 30 days, and a sealed IP67 field build.

03

Comply

An integrated IoT platform with a standards engine, alarm workflow and one-click compliance reports.

02

The Instrument

BlastHawk VIBRA hardware, specification and field measurement



A complete blast seismograph in one case



Built for Indian and Gulf mining conditions



Field engineer installing sensor equipment on open-pit mine bench

Wi-Fi 2.4 GHz soft-AP

~10 Hz live stream

≥ 500 events on board

No SIM · no 4G

Four simultaneous channels

Three triaxial velocity channels from a 4.5 Hz geophone pod, plus air overpressure from a ½-inch IEPE microphone, recorded together.

24-bit sigma-delta front end

Simultaneous sampling with ≤ 0.005 mm/s resolution.

GPS-disciplined timing

Battery-backed RTC for accurate, traceable event times.

Wi-Fi live streaming

A built-in soft-AP streams live data to phone and PC, with no SIM required.

Specification: measurement and recording



Engineered to ISEE seismograph performance specifications

Parameter	Specification	Parameter	Specification
Channels	4 simultaneous: triaxial velocity + air overpressure	ADC	24-bit simultaneous sigma-delta
Seismic sensor	4.5 Hz triaxial geophone	Sample rates	1,024 / 2,048 / 4,096 S/s per channel; 16,384 S/s (Pro)
Velocity range	0–254 mm/s	Record modes	Waveform, histogram, combined
Resolution	≤ 0.005 mm/s	Pre-trigger	0.25 s, zero dead time
Accuracy	±5 % or ±0.5 mm/s, whichever is greater (4–125 Hz)	Seismic trigger	0.19–254 mm/s, selectable
Frequency response	2–250 Hz, flat	Acoustic trigger	92–148 dB(L)
Air overpressure	½-inch IEPE microphone, 92–148 dB(L)	Event storage	≥ 500 events, microSD (FAT32)

Specification: interface, power and build



Field-ready power, protection and connectivity

Parameter	Specification	Parameter	Specification
Timing	GPS-disciplined, battery-backed RTC	Operating temperature	−10 °C to +50 °C
Display and keypad	TFT / 8 × 20 character LCD; 8-key keypad	Ingress protection	IP67
Connectivity	Built-in 2.4 GHz Wi-Fi access point, TCP/IP	Instrument case	≈ 380 × 300 × 200 mm
Power	12 V internal battery; solar input with integrated MPPT	Geophone pod	≈ 110 × 110 × 80 mm
Autonomy	≥ 7 days on battery; up to 30 days with solar	Weight	≤ 2.0 kg
Geophone cable	25 m, screened	Geophone mounting	3 × 100 mm ground spikes
Calibration	Supplied with calibration certificate		

Measurement quality, calibration and traceability



A verified measurement chain — from a traceable calibration certificate to the stated uncertainty on every record

Traceable calibration certificate

Every instrument is supplied with a calibration certificate; triaxial geophone sensitivity and the air-overpressure channel are verified against traceable reference sources before dispatch.

Verified before every campaign

On-board self-test and a site reference check confirm channel integrity, sensor coupling and GPS lock before recording begins, and log the result for the audit trail.

Uncertainty stated on every record

Reported PPV and dB(L) values carry a stated uncertainty of $\pm 5\%$ or ± 0.5 mm/s, whichever is greater (4–125 Hz), per ISO/IEC Guide 98-3, so regulatory limits are applied with a known margin.

Recalibration and certificate control

Recalibration is scheduled on an interval agreed with the operator, with certificates retained for the instrument's life and available for regulator, insurer or client audit.

The numbers regulators and engineers ask for



Measurement and analysis on every recorded event

Peak vector sum

$$PVS = \max \sqrt{T(t)^2 + V(t)^2 + L(t)^2}$$

the peak vector sum of the three orthogonal velocity components.

Scaled distance

$$SD = D / \sqrt{Q}$$

distance to the blast (m) normalised by the square root of the maximum charge per delay (kg).

Site scaling law

$$PPV = K \cdot (D/\sqrt{Q})^{-b}$$

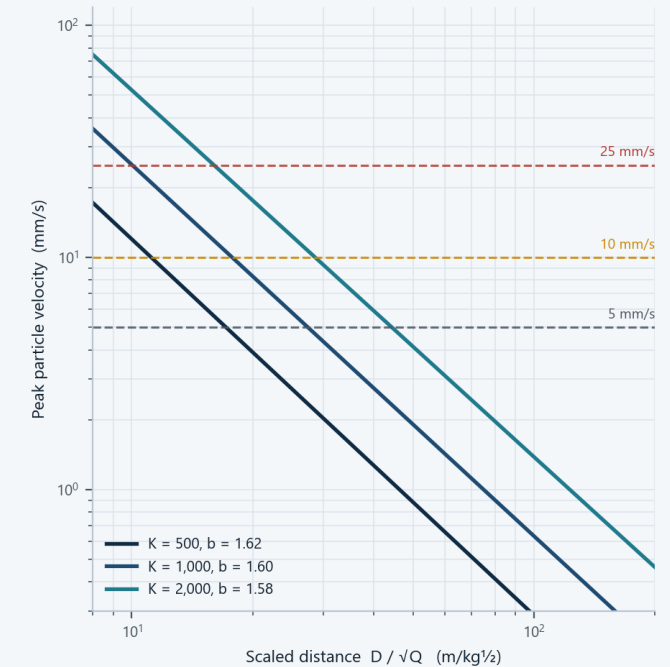
USBM-style predictive model, with site constants K and b fitted to monitored data.

Air overpressure

$$dB(L) = 20 \cdot \log_{10}(P / 20 \mu\text{Pa})$$

peak linear air-overpressure level in decibels.

Site law — illustrative



$PPV = K \cdot (D/\sqrt{Q})^{-b}$: site constants K and b are fitted to each site's monitored events, then used to set a safe maximum charge per delay.

Connectivity and field software



Live data at the bench, no SIM required

IN THE FIELD



Engineer checking live vibration data on tablet at quarry

Wi-Fi 2.4 GHz access point

Connect a phone or PC directly on site; no SIM card or 4G network required.

Live streaming

About 10 Hz live stream of all three velocity channels to phone and the PC Master Console.

Event storage and download

≥ 500 events on microSD, with one-touch event download.

PC Master Console and Android app

Configure, monitor, analyse and export on PC; field set-up, live view and event review on Android.

IoT ingest

Events push to the BlastHawk cloud platform through the site gateway.

03

The Platform

Edge-to-cloud IoT: acquisition, analysis, compliance and reporting



The BlastHawk IoT platform



Edge to cloud, on premises or private cloud

VIBRA edge node

Rugged four-channel logger: 24-bit ADC, GPS-disciplined timing, Wi-Fi soft-AP and offline event spool.

Site gateway

Relays spooled events from the instrument, with optional MQTT gateway uplink.

BlastHawk Cloud

One service for analysis, compliance, alarms and PDF reports; on-premises or private cloud.

API and SDK

30-endpoint REST API, zero-dependency Python SDK and live WebSocket feed.

Dashboard and mobile

Live dashboard plus an installable, offline-first PWA for station status, latest events and alarm acknowledgement from the bench.

BlastHawk Cloud platform capabilities



Acquire, analyse, store, evaluate, alarm and report

Module	Capabilities
Live dashboard	KPIs, station health and auto-refresh over a live WebSocket feed
Event archive and waveforms	Searchable archive; four-channel waveforms with drag-to-zoom and PPV markers
Analysis engine	PPV and peak vector sum; dominant frequency (zero-crossing and FFT); scaled distance (USBM and ISO); site-law fit (K, b)
Compliance engine	DGMS, IS 6922, DIN 4150-3, USBM RI 8507, AS 2187.2 and ISO 4866, with PASS/FAIL and margin
Alarm engine	Rule builder, severity levels, cool-down, webhook and e-mail alerts, acknowledgement workflow, full audit trail
Reports and integration	One-click PDF reports; 30-endpoint REST API; zero-dependency Python SDK; RBAC security

Data governance, security and regulatory alignment



Monitoring data can stay inside the operator's own environment, under the operator's own controls

DATA & SECURITY



Edge-to-cloud architecture: instrument, local network and operator-controlled platform.

On-prem or private cloud

RBAC · audit trail

No external services required

Data residency by design

Operator-controlled deployment

BlastHawk Cloud runs on-premises or in a private cloud with no external services required, so records, site geometry and crew data do not leave the operator's environment.

Access control and audit trail

Role-based access control with a full audit trail records who viewed, edited, exported or acknowledged each event and report.

India — DPDP Act, 2023

Deployment options support the Digital Personal Data Protection Act, 2023 by keeping personal and site data within infrastructure the operator governs.

International — GDPR (EU/EEA)

For projects abroad the same on-premises or private-cloud model supports GDPR data-minimisation and storage-limitation obligations without cross-border transfer of monitoring records.

04

Standards & Benchmarking

Regulatory alignment and benchmarking against world-leading seismographs



Aligned with the standards your regulators apply



Instrument, monitoring method and compliance references

Standard	Scope	Category
ISEE Performance Specifications for Blasting Seismographs	Seismograph performance	Instrument performance
IS 14881:2001	Method for blast vibration monitoring	Monitoring method
DGMS (Tech)(S&T) Circular No. 7 of 1997	Damage to structures from blast-induced ground vibration	Indian limits
DGMS (Tech)(S&T) Circular No. 6 of 2007	Underground structures near opencast blasting	Indian limits
IS 6922:1973	Structures subject to underground blasts	Indian limits
DIN 4150-3	Vibrations in buildings: effects on structures	International criteria
USBM RI 8507	Structure response and damage from surface-mine blasting	International criteria
AS 2187.2	Explosives: use of explosives	International criteria
ISO 4866	Vibration of fixed structures: measurement and evaluation	International criteria

Ground-vibration limits applied in practice



Indicative PPV limits used by Indian and international regulators and standards — evaluated automatically by BlastHawk Cloud

Standard / authority	Jurisdiction	Structure or criterion	Indicative PPV limit
DGMS (Tech)(S&T) Circular 7 of 1997	India — opencast blasting	Domestic houses, structures	10 mm/s
DGMS Circular 7 of 1997	India — opencast blasting	Structures not belonging to the owner	5 mm/s
DGMS Circular 7 of 1997	India — opencast blasting	Industrial buildings (RCC / framed)	15 mm/s
DGMS Circular 7 of 1997	India — opencast blasting	Sensitive / heritage structures	2 mm/s
IS 6922:1973	India — underground blasts	Structures subject to underground blasting	Class-dependent, typically 5–15 mm/s
DIN 4150-3 (1999)	Germany / EU practice	Residential — Line 2 (10–50 Hz)	5–15 mm/s
DIN 4150-3 (1999)	Germany / EU practice	Industrial Line 1 / sensitive Line 3	20–40 / 3–8 mm/s
USBM RI 8507 (1980)	United States	Residential, drywall construction	≈12.7 mm/s below 40 Hz; up to ≈50 mm/s above
BS 7385-2:1993	United Kingdom	Residential, cosmetic-damage threshold	15 mm/s at 4 Hz rising to 40–50 mm/s
ISO 4866	International	Measurement and evaluation framework	Framework — limits set by national criteria

Indicative values, summarised for orientation from the published standards and circulars. The governing limit for a project is set by its licence conditions, regulator or client specification.

Regulatory criteria are frequency-dependent



How a ground-vibration limit is applied to an event — and why the platform evaluates curves, not single numbers

Why limits depend on frequency

Building response is frequency-dependent: low-frequency ground motion excites structures most, so most modern criteria are curves, not single numbers.

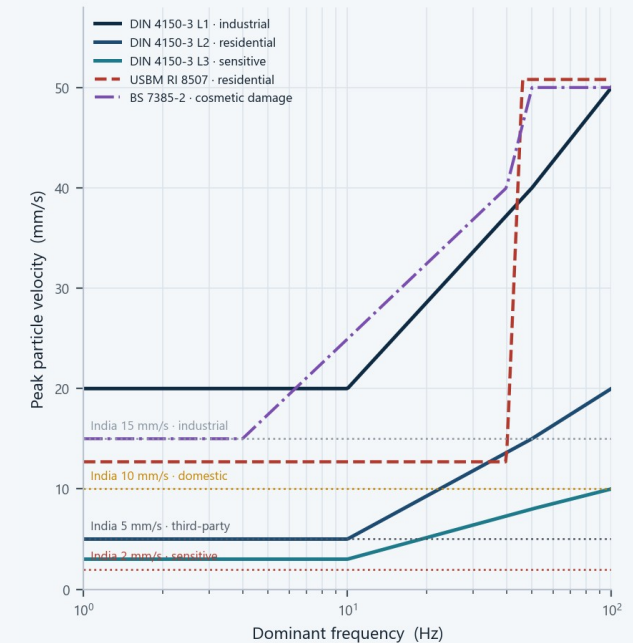
Fixed and frequency-dependent limits

Indian DGMS and IS limits are applied as fixed PPV ceilings; DIN, USBM and BS criteria are frequency-dependent envelopes.

Automated evaluation

BlastHawk Cloud plots every event against the selected criterion and returns PASS/FAIL with the margin to the limit.

Criteria envelopes — illustrative



Illustrative criterion curves traced from published values. The governing criterion is selected per project; the instrument measures the response and the platform applies the limit.

Comparison with world-leading seismographs



Measurement and recording performance

Parameter	BlastHawk VIBRA	Instantel Minimate Plus	Nomis Mini-SuperGraph II
Channels	3 triaxial + 1 AOP (4 simultaneous)	4 (triaxial + mic); 8-ch option	3 triaxial + 1 sound (4)
Velocity range	0–254 mm/s	0–254 mm/s	0–254 mm/s
Resolution	≤ 0.005 mm/s	0.005 mm/s (0.000625 with preamp)	0.00078 mm/s @ 16-bit
Frequency response	Flat 2–250 Hz	2–250 Hz (1–315 Hz DIN)	2–400 Hz (1 Hz optional)
Sample rate	1,024–4,096 S/s (16,384 Pro)	1,024–4,096 S/s (65,536 single-ch)	1,024–16,384 S/s
Event storage	≥ 500 events (microSD)	300 events (1,500 optional)	65,000 events
Battery endurance	≥ 7 days (30 with solar)	210 h continuous	Up to 7 days

Competitor figures are indicative, drawn from published manufacturer datasheets; BlastHawk VIBRA figures reflect current product specification. All third-party trademarks are the property of their respective owners.

Comparison with world-leading seismographs (continued)



Field build, connectivity, platform and support

Parameter	BlastHawk VIBRA	InstanTel Minimate Plus	Nomis Mini-SuperGraph II
Enclosure	IP67	Weatherproof	IP67
Weight	≤ 2.0 kg	1.4 kg	1.9 kg
Dimensions	380 × 300 × 200 mm	81 × 91 × 160 mm	152 × 108 × 76 mm
Connectivity	Wi-Fi soft-AP + TCP	RS-232 / modem	RS-232 / USB
Live streaming	Yes: phone + PC	Via modem (Auto Call Home)	Via modem
GPS timing	GPS-disciplined	Optional GPS	Optional GPS
Solar autonomy	Integrated MPPT	Not integrated	Not integrated
Cloud platform	BlastHawk Cloud (built-in)	BlastWare (PC software)	Included PC software
Support model	Direct, India	Distributor network	Distributor network

Competitor figures are indicative, drawn from published manufacturer datasheets; BlastHawk VIBRA figures reflect current product specification. All third-party trademarks are the property of their respective owners.

Compliance, marking and environmental conformance



Design and documentation aligned to the product-compliance regimes Indian and international buyers expect

Electromagnetic compatibility

Designed to the IEC 61326-1 family for electrical equipment for measurement and control, covering the instrument and its 2.4 GHz field network.

Ingress and environmental build

IP67 sealing to IEC 60529, with a –10 °C to +50 °C operating range and a transport-case build for field handling and road transport.

Materials and market access

RoHS- and REACH-conscious bill of materials; CE, UKCA and FCC market-access documentation can be prepared on request for export supply.

Statutory registrations

MSME (Udyam), GSTIN, DGFT IEC and UN Global Marketplace registration support domestic procurement and international export.

05

Why VIBRA & Commercial

Make-in-India engineering, applications, support and supply terms



Designed, engineered and manufactured in India



100% indigenous R&D · Make in India · Atmanirbhar Bharat

IN THE FIELD



Electronics engineer assembling circuit board in Indian manufacturing workshop

Full-stack R&D

Hardware, firmware, embedded software, cloud and analytics designed in-house in India, from circuit board to cloud.

Made in India

Assembled and manufactured in India; not a rebadged or imported instrument.

IP owned in India

Schematics, firmware and algorithms owned and controlled in India.

Assured spares and support

Spares, firmware updates and technical support managed in India, directly by the engineers who designed it, with no distributor layer.

Built for Indian mines

Engineered for Indian and Gulf site conditions, standards and duty cycles.

From open pits to urban tunnels



Applications across mining, quarrying and civil works

IN THE FIELD



Tunnel construction site with drilling rig and workers

Open-pit mines

Production blasts, wall control and slope stability.

Quarries and aggregates

Ground-vibration and air-overpressure compliance at the site boundary.

Tunnelling and civil works

Controlled blasting near structures and buried services.

Construction and demolition

Monitoring in urban and sensitive areas.

Environmental and regulatory

Vibration and air-overpressure records for EIA/EMP studies, and compliance against DGMS, IS and international limits.

Environment, health, safety and ESG integration



Blast-vibration and air-overpressure records feed environmental and safety management, not just blasting control

Environmental management

Records form the blast-related evidence base for an ISO 14001 environmental management system and for consent and permit conditions.

Occupational health and safety

Trended exposure data supports ISO 45001 arrangements and duty-of-care around blasting and blasting-adjacent work.

Neighbour and community relations

Objective, timestamped records let operators answer complaints with evidence and demonstrate compliance to communities and authorities.

Sustainability and ESG reporting

PPV, air-overpressure and blast-efficiency trends can be summarised for annual sustainability and stakeholder reporting.

Deployment in four steps



From site survey to compliance report

1

Site survey and placement

- Choose monitoring points
- record distance to the blast
- fix and couple the geophone pod

2

Configure trigger and channels

- Set trigger levels
- choose sample rate
- select record mode

3

Monitor and capture events

- Live Wi-Fi view
- events auto-record with pre-trigger
- offline event spool

4

Analyse, report and comply

- Export data
- evaluate against limits
- generate compliance reports

Why BlastHawk VIBRA



The case for VIBRA, at a glance

IN THE FIELD



Blasting crew walking along open-pit mine bench at sunset

Built and supported in India

Designed, manufactured and supported directly by AMW, with no distributor layer.

Four channels, one instrument

Three triaxial velocity channels plus air overpressure, recorded simultaneously.

Live Wi-Fi streaming

Watch data as it happens, with no SIM, no 4G and no subscription.

Rugged, solar-ready field build

Sealed IP67 enclosure and screened geophone pod; ≥ 7 days on internal power, up to 30 days with solar input.

Integrated IoT platform

Events flow straight into BlastHawk Cloud for analysis, compliance checks and reporting.

Services and support



From the people who built the instrument

Direct support

Engineers who designed VIBRA, based in India; no distributor layer

Training

Operator training on set-up, monitoring, analysis and reporting

Calibration

Certificate with every unit; recalibration of in-service instruments

DGMS services

Certified DGMS vibration monitoring, site-law and safe-charge studies

Commercial terms



Supply, support and ordering information

Term	Details
Pricing	On request; formal quotation within one business day
Taxes	GST extra as applicable (GSTIN 10ABUPF7542H1ZO)
Delivery	[Enter delivery period and basis]
Payment terms	[Enter payment terms]
Warranty	[Enter warranty period and coverage]
Calibration	Calibration certificate with every instrument; recalibration service available
Installation and training	On-site set-up and operator training available
Monitoring as a service	Certified DGMS blast vibration monitoring by AMW engineers
Export supply	Under DGFT IEC; UN Global Marketplace registered supplier
Offer validity	[Enter validity period]

Global supply, deployment and support



Commercial and logistics terms for Indian and international customers

Item	Provision
Price	On request; formal quotation within one business day
Taxes and duties	GST extra in India; import duties and local taxes to the buyer's account
Incoterms	EXW, FOB or DAP as agreed, under Incoterms 2020
Export documentation	Export supply under DGFT IEC; registered on the UN Global Marketplace
Currency	Quotation in INR or USD
Delivery	Schedule confirmed with the order
Installation and commissioning	On-site set-up and operator training available
Warranty and service	Warranty and coverage as agreed in the order; recalibration and spares available
Monitoring as a service	Certified DGMS blast-vibration monitoring by AMW engineers
Offer validity	As stated in the quotation

Technical annex: integration and IT



For IT, integration and security teams

Item	Detail
Default access point	Wi-Fi 2.4 GHz soft-AP; TCP 192.168.4.1:8080
Live stream	~10 Hz, all three velocity channels, to phone and PC Master Console
On-board storage	≥ 500 events on microSD (FAT32); offline event spool
Platform service	Python 3.12 + FastAPI with SQLite; one service for analysis, compliance, alarms and PDF reports
Interfaces	30-endpoint REST API; WebSocket /ws/live; optional MQTT gateway uplink
SDK	Zero-dependency Python SDK
Mobile	Installable, offline-first PWA
Deployment	On-premises or private cloud; no external services required
Security	Role-based access control (RBAC); full audit trail

06

Annexure & References

Reference standards, compliance evidence and technical documentation



Annexure A — Indian standards and regulations



Primary Indian standards, regulator circulars and specifications referenced in this deck

Reference	Title / scope	Type
IS 6922:1973	Criteria for safety and design of structures subject to underground blasts	Indian standard
IS 14881:2001	Method for measurement of ground vibration induced by blasting	Indian standard
DGMS (Tech)(S&T) Circular No. 7 of 1997	Damage to structures from blast-induced ground vibration	Indian regulator
DGMS (Tech)(S&T) Circular No. 6 of 2007	Blasting near underground structures in opencast mines	Indian regulator
ISEE Performance Specifications	Performance specifications for blasting seismographs	Industry specification
ISO/IEC 17025	Competence of testing and calibration laboratories	Metrology / QA

Cited for reference only; documents are held by their respective issuing bodies.

Annexure B — International standards and product compliance



International criteria, product-compliance standards and metrology references

Reference	Title / scope	Type
DIN 4150-3 (1999)	Vibration in buildings — effects on structures	International standard
USBM RI 8507 (1980)	Structure response and damage from surface-mine blasting	Research report
BS 7385-2:1993	Evaluation and measurement for vibration in buildings	International standard
AS 2187.2 (2006)	Explosives — storage, transport and use	International standard
ISO 4866:2010	Vibration of fixed structures — measurement and evaluation	International standard
IEC 61326-1	EMC — electrical equipment for measurement and control	Product compliance
IEC 60529	Degrees of protection provided by enclosures (IP code)	Product compliance
ISO/IEC Guide 98-3 (GUM)	Guide to the expression of uncertainty in measurement	Metrology
ISO 14001 / ISO 45001	Environmental and occupational health and safety management	Management systems

Cited for reference only; documents are held by their respective issuing bodies.

Let's make every blast measurable

BlastHawk VIBRA · Pro-Spectrum Edition

Request a site demonstration

See VIBRA record, stream and report a blast at your own site. A formal quotation follows within one business day.

Call or WhatsApp

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