X-MET 8000 Series: Practical Selection Guide

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Quick Reference: Which Model for Which Requirement

If your requirement is...	Choose
A simple, cost-effective XRF for daily metal sorting and basic QC	**Smart**
The best balance of analytical capability and capital cost	**Optimum**
Maximum analytical features within the X-MET 8000 series	**Expert**
Geology, mining, soils, and field-based elemental analysis	**Expert Geo**

X-MET 8000 Smart

For: Scrap yards, metal recyclers, incoming inspection stations, training facilities
Value driver: Lowest total cost of ownership in the series
Limitation: Light elements (Mg, Al, Si, P, S) not reliably determinable

The Smart is the entry configuration. It performs alloy identification and quantitative analysis for elements K through U. It is physically identical to the other models (same weight, same durability, same battery life) but analytically focused on the 95% of scrap-sorting scenarios that do not require light-element discrimination.

Buy this model if:

- Your budget is constrained and you need proven ROI within 6–12 months
- Your workflow is standard ferrous and non-ferrous metal sorting
- You do not analyse aluminium alloy series that require Mg/Si discrimination
- Operator simplicity and minimal training are priorities

Do not buy this model if:

- You need to distinguish 5xxx from 6xxx aluminium alloys
- You need to separate AISI 303 from 304 stainless steel
- You analyse hot samples above 100°C
- Your application involves soils, ores, or REE minerals

X-MET 8000 Optimum

For: PMI contractors, production QC departments, field inspection teams, premium scrap operations
Value driver: Light-element capability at a mid-market price point
Key differentiator: 6-position filter wheel + optional HERO™ (400°C)

The Optimum is the series' best-selling configuration because it hits the value sweet spot for professional users. The 6-position filter wheel enables reliable Mg, Al, Si, P, S determination — expanding the analytical range from K–U (Smart) to Mg–U. This is not an incremental improvement; it is a step-change in capability that enables aluminium alloy series differentiation, 303/304 separation, and professional-grade PMI.

The HERO™ heat-resistant window option (400°C sample temperature) is a genuine operational enabler for in-service inspection where production shutdown is not economically viable.

Buy this model if:

- You perform PMI and need light-element capability
- You work with aluminium alloys requiring Mg/Si/P/S determination
- You may encounter hot samples and want the HERO™ option
- You need dual-battery autonomy for field work
- You want professional capability without Expert-level capital cost

Do not buy this model if:

- Your application is limited to basic sorting (Smart is sufficient and cheaper)
- You require CRM-traceable empirical calibrations for regulatory compliance (see Expert)
- Your primary work is geochemistry or REE analysis (see Expert Geo)

X-MET 8000 Expert

For: Nuclear, petrochemical, aerospace, defence, arbitration laboratories
Value driver: CRM-traceable accuracy with maximum detection limits
Key differentiator: Empirical calibrations + camera standard + best-in-series precision

The Expert is the flagship for a reason. The addition of empirical calibrations built on Certified Reference Materials (CRM) provides a level of analytical confidence that the Fundamental Parameters method alone cannot match. In industries where material misidentification can result in catastrophic failure, regulatory penalty, or litigation, this confidence is not optional — it is mandatory.

The camera is standard equipment, not an optional extra. This reflects the Expert's positioning as a professional tool where precise sample positioning and visual documentation are non-negotiable.

Buy this model if:

- You operate in a regulated industry requiring maximum analytical confidence
- You perform trace analysis at 0.01% and below
- You need to separate grades that are analytically marginal for lower-tier models
- You require results that are defensible in arbitration or legal proceedings
- You want the camera as standard with no hidden upgrade costs

Do not buy this model if:

- Standard PMI and production QC are your primary tasks (Optimum covers 90% of these)
- Capital budget is constrained and Optimum capability is sufficient
- Your work is geochemical rather than metallurgical (see Expert Geo)

X-MET 8000 Expert Geo

For: Mining companies, exploration consultancies, environmental contractors, geological surveys
Value driver: REE capability + BOOST™ detector + integrated GPS
Key differentiator: 25 mm² SDD with BOOST™ — not available on any other X-MET 8000 model

The Expert Geo is not a metal analyser that also does soils. It is a geochemistry instrument built on the X-MET 8000 platform. The 25 mm² detector with BOOST™ patented electronics delivers approximately 2.5x the fluorescence collection efficiency of the standard detector. This translates to detection limits 1.5–2x lower for trace elements in geological matrices — the difference between finding an ore anomaly and missing it.

REE capability (La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu + Y) is unique to this model. No other X-MET 8000 configuration can determine rare earth elements.

Integrated GPS is standard, not optional. Every measurement is automatically georeferenced — ready for direct import into ArcGIS, QGIS, or equivalent GIS platforms.

Buy this model if:

- Your work involves mineral exploration or resource estimation
- You need REE analysis capability
- You perform soil contamination screening (EPA Method 6200 compliant)
- You build geochemical maps and require GPS-integrated data capture
- You work on contaminated site assessment or remediation projects

Do not buy this model if:

- Your work is primarily metallurgical (Smart/Optimum/Expert are purpose-built for metals)
- You do not need REE, GPS, or ppm-level geochemical sensitivity
- Cost efficiency for standard alloy sorting is your priority

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Cost-Efficiency Summary

Model	Capital Cost	Cost per Analysis	Best For
Smart	Lowest	Lowest	High-volume basic sorting
Optimum	Mid-range	Low	Professional PMI and QC
Expert	High	Moderate	Critical / regulated applications
Expert Geo	High	Moderate	Geoscience and environmental

Final Note

The X-MET 8000 series is not a product line where you "buy the best you can afford." It is a series of purpose-built configurations. Buying Expert Geo for scrap metal sorting is as inefficient as buying Smart for REE exploration. Match the model to the application — that is how you optimise both capital expenditure and analytical return.

About the Author

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This guide was prepared based on Hitachi High-Tech Analytical Science technical documentation and extensive field deployment experience. Confirm current specifications and pricing with the manufacturer or authorised distributor.