



## Description of the result

Developed and validated a real-time hyperspectral imaging platform for automated classification of refractory materials on a conveyor belt. The system identifies and sorts used refractories into recycling categories using spectral and multivariate analysis, demonstrating reliable inline performance and smooth integration with other sensing and sorting technologies.

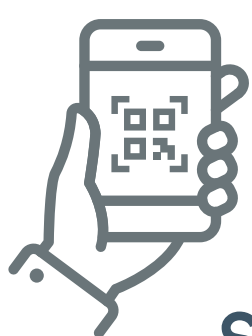


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## Problem addressed

Efficient recycling of used refractories is hindered by their heterogeneous composition and contamination. Manual sorting is slow and inaccurate, reducing recovery and quality. Automated, reliable real-time material identification is needed to achieve high-throughput, sustainable recycling.



Scan to learn more about  
material classification with HSI



## Main features & benefits

The solution combines high-speed hyperspectral imaging with robust multivariate modeling to deliver precise, real-time material classification on conveyor belts. High spectral and spatial resolution ensures accuracy under varying conditions, while adaptable models support optimization and new material classes. Its non-contact, continuous operation boosts sorting accuracy, throughput, and recycling yield, enhancing efficiency and sustainability in material recovery processes.

## Contact & Further Information

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## Target users /stakeholders

- Recycling and waste management firms needing automated, high-throughput sorting.
- Mining and raw material operators optimizing ore and mineral classification.
- Refractory and ceramics manufacturers pursuing closed-loop recycling and quality control.
- Equipment integrators and robotics providers developing automated sorting lines.
- Research and technology centers focused on process monitoring and circular economy.
- Environmental agencies and policymakers supporting sustainable resource recovery.



## Who Is Leading the Development?

**neo**  
NORSK ELEKTRO OPTIKK AS

**Fraunhofer**  
ILT

**RHI MAGNESITA**



## Exploitation potential



Exploitation potential as a standalone hyperspectral classification module, part of integrated sensor systems, or a customizable service, enabling licensing, OEM integration, and tailored deployments across recycling, mining, and process monitoring industries.



## Technical facts

The solution includes 2 high resolution hyperspectral cameras working in the VIS-NIR-SWIR spectral region, custom broadband illumination sources and an industrial computer for control and data analysis. It can be mounted on top of most industrial conveying systems.

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