White Paper

ReSoURCE - Refractory Sorting Using Revolutionising Classification Equipment (Horizon Europe #101058310)

The project ReSoURCE strives to innovate the full process chain of refractory recycling with an AI-supported multi-sensor sorting equipment as its core technology. If successful, the outcome will reduce Europe's CO_2 emissions by 800 k tons per year.

Extractive industries (including refractory raw material production) are responsible for 50% of the world's carbon emissions and more than 80% of biodiversity loss. To address this, the European Commission is prioritizing the funding of innovation actions that sustainably increase access to primary and secondary raw materials (SRM), in particular critical raw materials for EU industrial value chains and strategic sectors.

Refractory products are indispensable for all high-temperature processes above 1200°C, such as steel, cement, glass, and nonferrous metal production. Since the refractory lining of a furnace or vessel is designed for a specific material and application, multiple refractory product types, with different chemistries, are combined to achieve the required performance. This poses major challenges for the recycling process as the chemical composition of the recycled material is critical if it is to be used in subsequent refractory production.

In most cases the primary raw material production has the highest impact on a product's carbon footprint. Establishing a circular economy and developing an efficient recycling process for this industry is therefore essential to reduce CO2 emissions in Europe as well as preserve natural resources.

The ReSoURCE project goal is the development of a working sensor-based system for refractory waste sorting and powder handling. If the project is successful, it will enable the robust engineering of an automated sorting equipment that will increase the recycling of refractory breakout material from the current estimate of 7–30% (plus 10% of downcycling) to a total 90%. With approximately 28 million tons of used refractories generated annually, the ecological and societal benefits will be considerable.

Contact:

Project Coordinator: Dr. Saranya Azhaarudeen, Innovation Management Professional, M +43 699 1870 6422, Kranichberggasse 6, 1120 Vienna, Austria

Press Contact: Carmen Loew, Magistra Artium, Global Science Communication, Project ReSoURCE, M +43 699 1870 6523, RHI Magnesita, Kranichberggasse 6, 1120 Vienna, Austria

Fact Sheet

Name	ReSoURCE - Refractory Sorting Using Revolutionising Classification Equipment
Grant Funder	European Health and Digital Executive Agency (HaDEA), Horizon Europe Framework Program (HORIZON) under the Grant Agreement Number: 101058310
Total Budget	€8.5 million
Granted Funding	€6 million EU, €1 million UK
Funding Rate	70% industrial partner / 100% research partners
Project Duration	06/2022 - 11/2025 (42 months)
Consortium	9 members (4 academia / 5 industry)
Countries	5. Austria, England, Germany, Ireland, Norway
FTEs	18 (total) – 30 people

Consortium

	RHI Magnesita (Coordinator)	-	Refractory production & recycling	AUT
	LSA GmbH	-	Developer LIBS unit	GER
Fraunhofer	Fraunhofer Institute	-	LIBS & analysis AI algorithms	GER
	SINTEF	-	Big scale fines handling	NOR
	Montanuniversität Leoben (CMP)	-	Waste Processing Technology	AUT
	Montanuniversität Leoben (CWM)	-	Optimized pre-processing	AUT
INNOLAS	Innolas	-	Custom-made laser design	GER
neo	NEO	-	Hyperspectral imaging	NOR
cpi	CPI Ltd.	-	LCA & techno-economic analysis	UK
Crowdhelix	Crowdhelix	-	Networking / Cross-linking	IRL