



Technically Superior Products
Environmentally Friendly Production
Economical Manufacturing Processes

**Cement Replacement
Technology that
doesn't cost the earth**



● Environmentally Friendly Production

Cenin's technology is an innovative, award winning, tried, tested and patented, sustainable cement replacement manufacturing technology.



Developed from over 45 years of industrial knowledge combined with 15 years of university based research and testing in some of the UK's leading academic institutions, the process involves no quarrying of raw materials, reduces landfill by utilising industrial waste (by-products), is economically advantageous to the user and significantly improves the performance of concrete and concrete products.

● The manufacture of cement is one of the most significant producers of greenhouse gases on the planet. With the increasing demand for construction materials worldwide it is projected that the world will need up to 5 billion tonnes of cement by 2025. This will add a further 2 billion tonnes of green house gas emissions being released into the atmosphere. In addition over 1.6 tonnes of raw material are quarried for every tonne of cement produced. The quarrying

Global climate change is one of the biggest environmental issues facing society today . The effects of Global climate change, including droughts, heavy rainfall and extreme flooding, are already being felt.



activity, combined with the necessity to heat to temperatures that releases the captured CO₂ from the quarried materials creates nearly 1 tonne of CO₂ emissions per tonne of cement produced.

● Using Cenin's technology greenhouse gas emissions are dramatically reduced because the cement is manufactured from industrial by-products negating the need for quarrying raw materials.

● Cenin is also pioneering the use of ultra low carbon energy sources such as biogas and renewable wind energy to further reduce CO₂ emissions to practically zero.

● Typically the technology can modify pozzolanic materials such as power-station fly ash, burnt clays and ash from CHP plants, material which, although they may not have cementitious properties in themselves, with the use of Cenin's technology can be chemically engineered to create a chemical reaction with Portland cement during the hydration process to improve the properties of concrete.

Technology that's good for the environment

The emissions associated with conventional Portland cement production are 853 kilograms of CO₂ per tonne of cement*

*(British Cement Association)

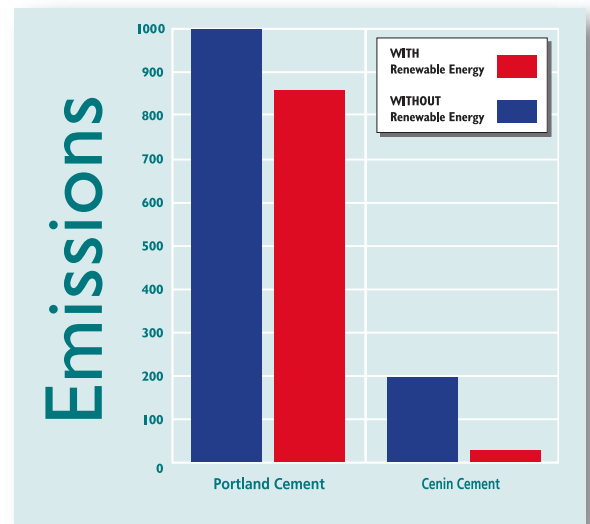


Cenin's technology reduces greenhouse gas emission overheads to virtually zero by a combination of the innovative use of renewable energy and converting existing industrial by-products (waste) into an adaptable, multi purpose cement replacement.

● Cenin Ltd is currently operating a manufacturing plant at Stormydown, Bridgend, Wales, UK using this technology. It started production in July 2008 and the product has been enthusiastically received by a number of major players in the construction industry. Due to anticipated future demand for the product it is envisaged that a second production facility will be constructed in 2009.

Environmental advantages

- Ultra Low Carbon Products
- Virtually zero CO₂ emissions
- Conserves natural resources
- Local production reduces transportation
- Reduces pollution and landfill
- Ethical sustainable technology



“The new technologies developed are innovative and could have a revolutionary effect on building supplies and their environmental impact.”

Peter Davies, Independent Chair of Judges, Sustainable Development Commissioner for Wales, UK Sustainable Development Commission

Technically Superior Products

We provide sustainable technologies that balance environmental and economic benefits for the production of technically superior cement replacements.

Cenin's adaptable system has proven higher strength, lower permeability and is more durable than concrete made with ordinary Portland cement.

Unlike any other process currently available this technology process can change the properties of the cementitious material to suit the needs of the end users

Cenin's technology can tailor make a product for a particular purpose and can vary characteristics such as setting time to suit seasonal variations in temperature.

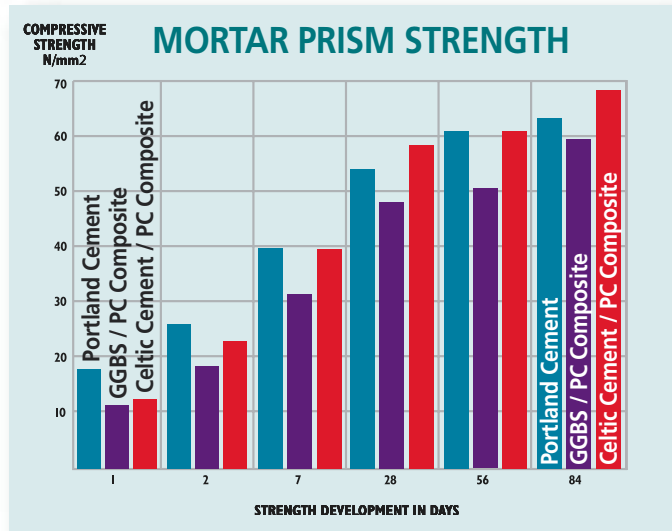
performance and fully integrated quality control systems to ensure technical reproducibility.

The technology has also been verified by accredited independent laboratories in the UK, the main research work was carried out at the School of Civil Engineering Cardiff University.

Adaptable

Unlike any other process currently available this process can change the properties of the cementitious material to suit the needs of the end users e.g. reduce the heat of hydration in hot climatic conditions or increase the heat of hydration in harsh winter environments

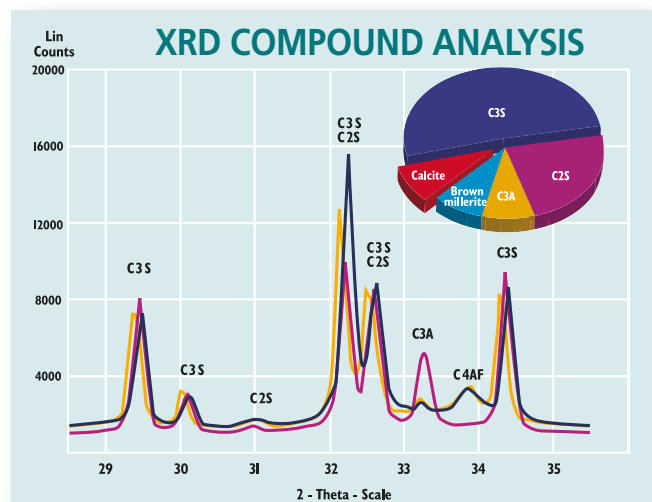
This technology can also be applied to existing manufacturers of slag cement to improve their performance on setting times, strength development and cold climate concreting.



The Technology changes the rules for the precast and ready-mix industries because instead of trying to make the best of cement substitutes supplied to them, companies can now specify and design the cementitious materials they need.

How is the technology different?

- The technology is based on a patented process that incorporates industrial knowledge, emission and technical control, using thermal treatment, chemical blending, and particle size analysis.
- The process is an environmental and economic solution to industrial requirements based on technical



Extensive Material Selection & Testing

Over fifty industrial wastes and by-products have been examined, tested and recorded in an extensive database with significant results, including a wide range of slags from all sectors of the steel producing industries.



The technology has been developed today, with the future of cement production in mind, based on years of industrial knowledge and experience.

		PC	GGBS	PFA	SDP	WCP
Calcium	CaO	65.089	36.859	6.34	46.86	44.316
Silica	SiO ₂	21.635	34.553	40.17	24.98	30.662
Alumina	Al ₂ O ₃	4.883	13.018	24.37	11.42	11.279
Iron	Fe ₂ O ₃	2.827	0.347	5.42	1.10	1.159
Magnesium	MgO	1.396	12.127	1.91	5.29	5.964

PC Portland cement, GGBS Ground Granular Blast Furnace Cement, PFA Pulverised Fuel Ash, SDP Cenin Semi-dry Cement, WCP Cenin Wetcast Cement

XRD & XRF Analysis



Technical Control on Cement Management

● The technology has been developed and driven by industrial demand and is truly based on technical performance.

High performance

● Using cutting edge analysis systems such as x-ray diffraction (XRD) and x-ray fluorescence (XRF) combined with particle size analysis (PSA) monitoring our technology can produce a far superior product.



Cenin have developed a range of alternative cements from Industrial by-products that comply with all the requirements of EN196 standards. These materials were often land filled or stockpiled causing environmental damage.

● Economical Manufacturing Processes

This technology has endless possibilities for large consumers (or Groups of smaller companies) to use the technology themselves under licence to produce their own cement replacements.



If you have an interest in cement as a producer, consumer or industrialist and are looking for an environmentally friendly, economic solution to lowering your carbon footprint and financial overheads then you need to speak to us!

- Industries worldwide dispose of billions of tonnes of industrial by-products and waste to landfill or stockpile large quantities causing a blot on the landscape and polluting the local environment.
- Many of these by-products contain some of the main chemical elements that are found in Portland cement or cement substitutes. Our technology can chemically modify these materials to provide a low carbon, high strength, durable cement substitute for the construction industry.

APPLICATIONS

- Volume Precast
- Readymix Concrete
- Ground Stabilization
- Specialist Applications
- Sea defence systems



The technology has been tested further in an operational production environment on a range of industrial by-products designed for a variety of end uses.

Ultra Low-Carbon Innovation

An entirely new, award winning, patented and innovative way of manufacturing cement replacements from industrial by-products using low levels of alternative, sustainable, ultra low-carbon energy at a local level.



Cenin are looking for Partners :

● In primary Industries with suitable raw materials:

- Steel Industry with sources of Iron or steel Slag
- Power Industries with sources of ashes from Coal or Biomass Plants

● Users or supplies of Cementitious Materials:

- Cement and Cement replacement manufactures
- Concrete producers

● Business Opportunities:

- Sustainable investors could see opportunities to create new businesses

Key Advantages

- Sustainable, low energy products
- Attractive Low Carbon status
- Provides a high performance tailor made cement replacement from local by-products

This is a truly green sustainable technology that reduces environmental damage by not using virgin materials, with low energy inputs and the fact it can be produced at a local level limits damaging transportation and completes the sustainability cycle.



The technology will be most suitable for industries which are looking for ways to reduce their carbon footprint.

**Call us, we'll be pleased to discuss your particular needs.
Visit Us, and see the technology in action.**

See what Cenin Ltd cement technology can do for your business

Cenin Ltd.

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