

CEMENT

An arcane – but still essential product

By Ole M. Restad

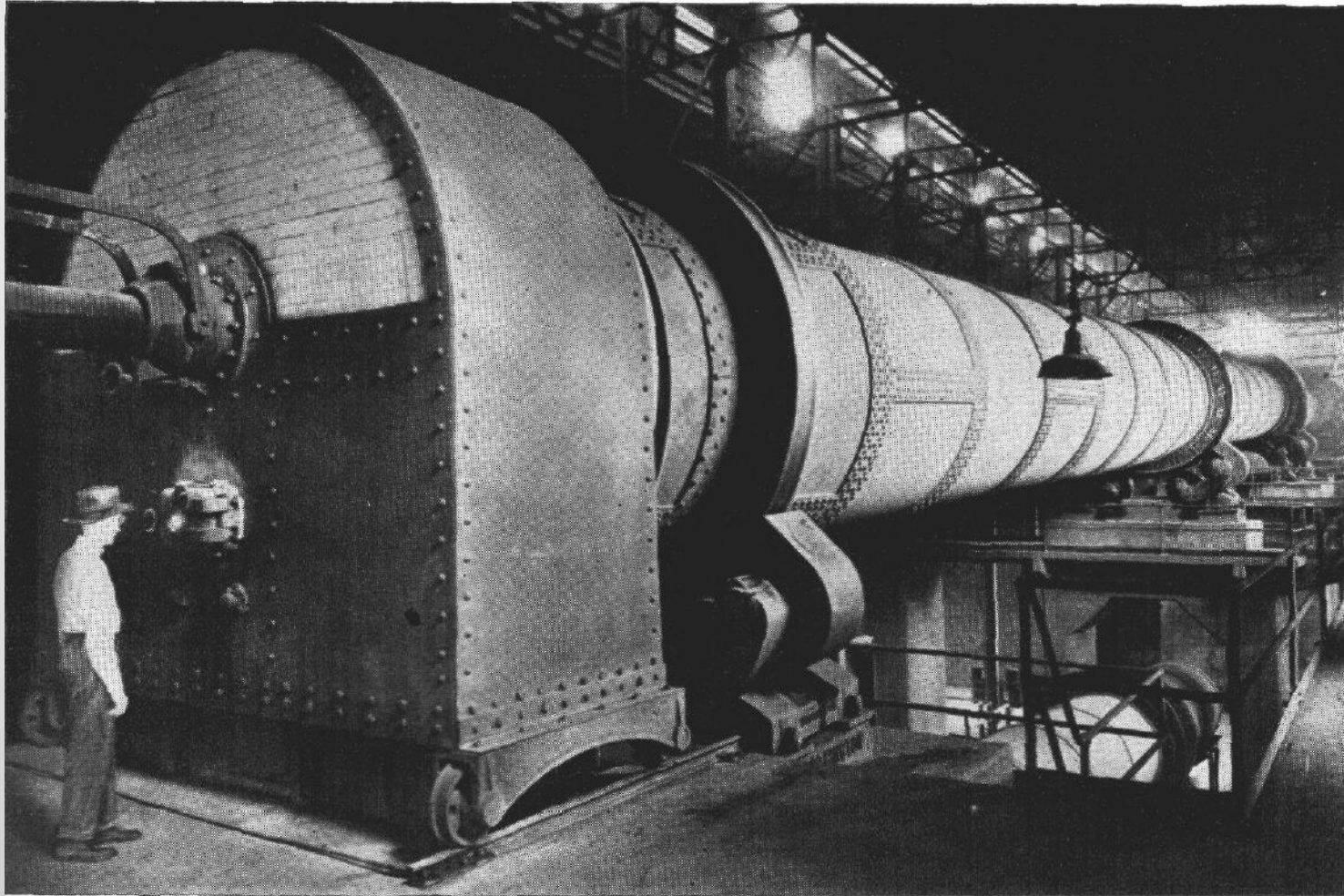


A QUICK REVIEW

- Used in the Roman Empire for buildings that still are in service (Low-burned limestone with 25-75% volcanic tuff)
- 'Portland' type cement in use since 1760
- Patented in 1824 under the name 'Portland Cement' (Name is due to its colour's resemblance to the quarried Portland (UK) stone)
- *"Portland cements are made by heating a mixture of limestone and clay to partial fusion. In order to obtain the desired properties, other substances are sometimes added to the raw mixture, as iron ore or silica. The resulting clinker is finely pulverized with the addition of gypsum to give about 2% SO₃ in the cement. Small amounts of other impurities are always present."*

(From "PORTLAND CEMENT" by R. H. BOGUE, Washington DC, August 1949)

CEMENT KILN 1949



TECHNICAL IMPROVEMENTS

- Wet- and dry processes in operation side by side from the beginning, but wet process often preferred
- Dust abatement becoming an issue in the –60ies, firstly to accommodate public demand, later also as a recapture tool to reduce production losses
- But: Technology largely unchanged until the first energy crisis in the -70s
- Since then, the industry has been under constant pressure to improve
- Resulting in (amongst other):
 - Conversion from oil to coal
 - Shift from wet to dry process
 - Increased degree of automation
 - Increase of individual production unit size
 - Introduction of the precalciner
 - Improvement of the preheater
 - Increased use of calcined materials (BF slag and similar)
 - Introduction of clinker coolers with better heat recovery
 - Use of grinding aid
 - Introduction of alternative fuels
 - Introduction of alternative RMs
 - Introduction of less energy requiring cement types
- Changes that has kept the Industry in Europe!

EMERGING TECHNOLOGIES

- The industry is at large a very open society with very few secrets. (Excl. white cement)
- Trade secrets normally comprise economical data
- Technology improvements are normally achieved by process equipment suppliers
- Every shift in technology will have to be adapted to the individual plant
- Sometimes modifications done in one plant is incompatible with an identical, but differently located other plant
- If 'Emerging Technologies' indiscriminately are implemented in a model like RAINS, the industry fear that:
 - The fact that the designed production process often is adapted to local conditions will evade the regulators
 - The same will use such data as "proof" of the industry's resistance towards reform
 - Inadequate technical solutions for resolve of a 'problem' may be attempted induced
 - Burdens will be placed on the industry which it is unable to sustain
- Which finally will underpin the incitement to shift to locations outside Europe

APPLIED TECHNOLOGIES



- Abatement installations at one of the Indocem plants owned by Heidelberg Cement outside Jakarta, Indonesia
- Excerpt from Annual report 2004:
“Indocement accomplished a number of milestones in terms of exports as it witnessed growing demands and orders for specific types of cement from mature markets such as the USA in 2004. The year witnessed the introductory sales of Type II/V Cement in two new markets in the USA. Cement export sales volume increased by 28.2% while clinker export rose by 19.1% compared to those achieved in 2003. Indocement’s major overseas markets comprised of Ghana, Bangladesh, Nigeria, USA and Singapore.”
- Indocem’s total production in 2004 amounted to 12.5 mill tonnes



www.cembureau.be