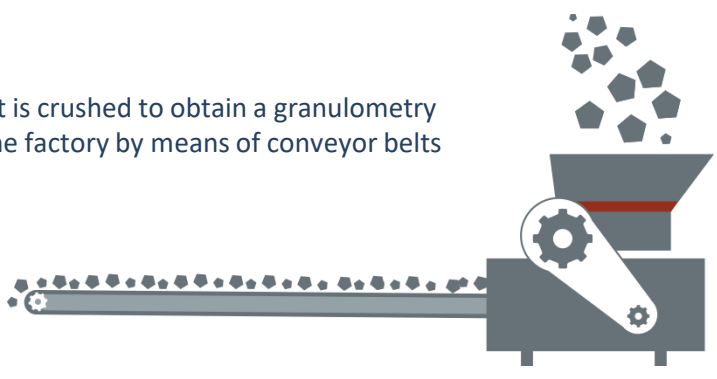
CEMENT MANUFACTURING PROCESS

Obtaining and preparing raw materials

The quarries are exploited by controlled blasting, in the case of hard materials such as limestone and slate, while in the case of soft materials (clay and marl) excavators are used for their extraction.

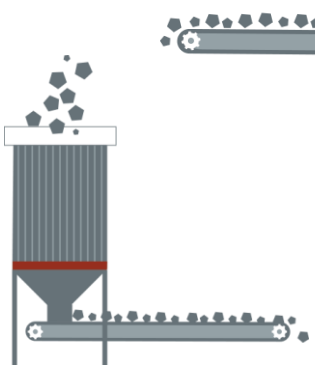
Crushing

Once the material has been extracted and classified, it is crushed to obtain a granulometry suitable for the grinding product and transferred to the factory by means of conveyor belts or trucks for storage in the pre-homogenization park.



Pre-homogeneization

The crushed material is stored in uniform layers to be subsequently selected in a controlled manner.



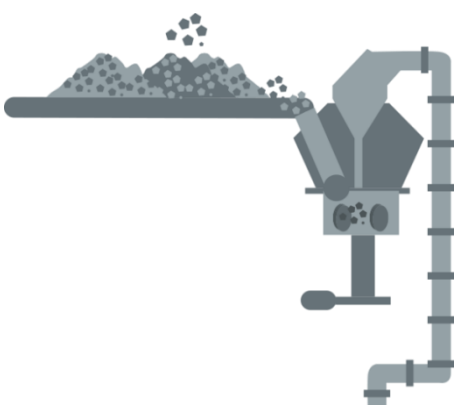
The pre-homogenization allows to prepare the adequate dosage of the different components, reducing their variability.

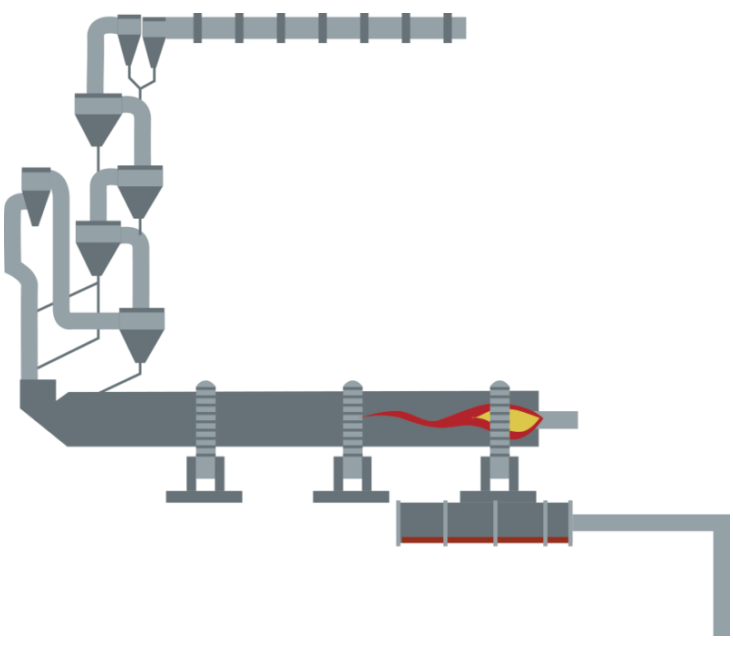
Grinding

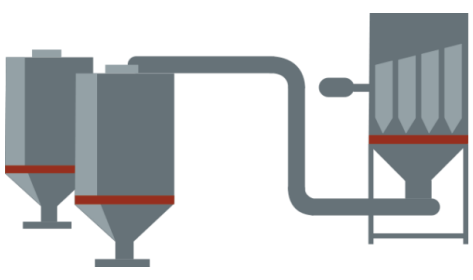
These materials are milled to reduce their size and thus favor their process in the oven.

In the vertical mill the material is crushed by the pressure performed by its rollers on a rotating table.

From there, the raw material is stored in a silo to increase the uniformity of the mixture.







Cyclone preheater

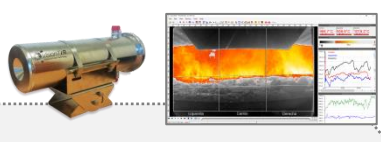
The kiln is fed through the cyclone preheater, which heats the raw material.

The raw material is introduced through the upper part of the tower and descends through it. Meanwhile, the gases coming from the kiln rise upstream, thus preheating the material, which reaches 1,000ºC before entering the kiln.

Clinker process: kiln

As the material progresses inside the kiln, the temperature increases until it reaches 1,500ºC, producing the complex chemical reactions that produce the clinker.

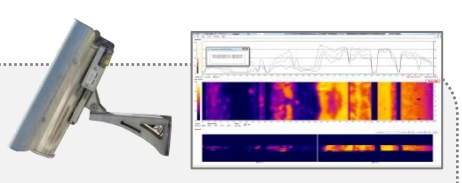
To reach the necessary temperatures for processing the raw materials and for the production of clinker, the kiln has a main flame that burns at 2,000ºC.



ProTIR | Burning zone

Infrared thermal imaging system for continuous temperature monitoring

Monitoring the temperatures within the burning zone is important for quality and efficiency. Our ProTIR system will provide accurate temperature monitoring at the burning zone to driving off unwanted elements as gases and creating clinker of the required composition.



RKS300 | Kiln shell

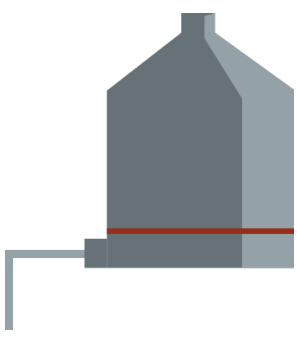
Rotary Kiln Monitoring System

Continuous monitoring along the entire rotary kiln length is important to ensure proper kiln-hell safety and durability and optimize kiln efficiency. RKS300 System will provide real-time inspection of the entire kiln length, allowing the detection and measurement of all hotspots on the kiln shell, even at an early stage.

Clinker process: cooler

At the exit of the kiln, the clinker is introduced into the cooler, which injects cold air from the outside to reduce its temperature from 1,400ºC to 100ºC.

The hot air generated in this device is reintroduced into the furnace to promote combustion, thus improving the energy efficiency of the process.



ProTIR | Clinker cooler

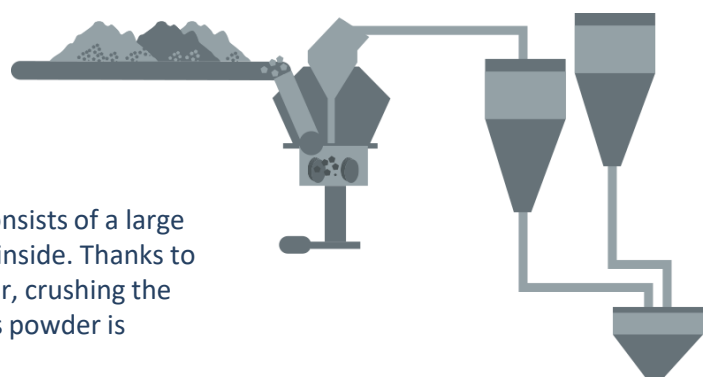
Infrared thermal imaging system for continuous temperature monitoring

It is essential to monitor and measure temperature inside coolers to improve operational efficiency and combustion control. ProTIR System will detect snowmen, redrivers and other anomalies that take place in coolers. Also, our system will help you to make routine plant maintenance and shutdowns more predictable and less disruptive to the process.

Clinker grinding and cement manufacturing

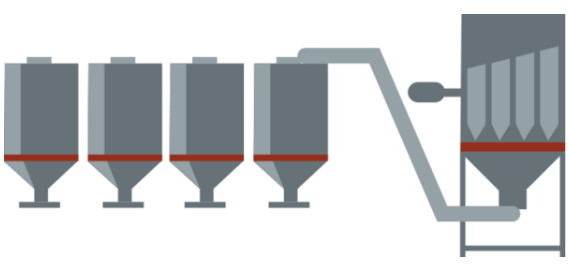
The clinker is mixed with gypsum and other additions within a cement mill.

The mills can be made of rollers and balls. The latter consists of a large tube that rotates on itself and that contains steel balls inside. Thanks to the rotation of the mill, the balls collide with each other, crushing the clinker and the additions until a fine and homogeneous powder is obtained: the cement.



Cement storage

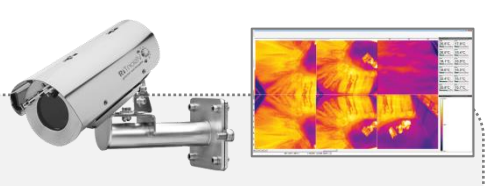
The cement is stored in silos, separated according to its classes.



FireTIR | Almacenamiento de cemento

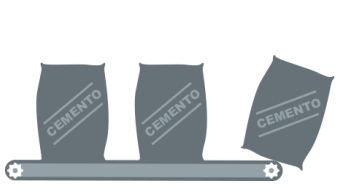
Thermography system for early fire detection

In the silos where the cement is stored, the FireTIR system is a flexible solution based on radiometric infrared cameras that allow the early detection of fire and hot spots, before a deflagration occurs.



Packaging or bulk shipment.

The cement is bagged or unloaded in a tanker truck for transport by road or rail.



Do you need more information
or more specific advice for your case?

CONTACT OUR EXPERTS IN VISION

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More information in WWW.VISIONTIR.COM

Multispectral Vision Technology

Cement manufacturing process information source: IECA (Instituto Español del Cemento y sus Aplicaciones).
The systems for the monitoring and control of the cement manufacturing process are provided by VisionTIR.