



Increasing clinker capacity

Denis Gagnon, P.Eng., Project & Maintenance Manager and Luc Papillon, President & CEO explain the modifications to Ciment Québec's plant in Canada.



Introduction

Ciment Québec Inc. operates one cement plant located on the north shore of the St-Lawrence River, 50 km west of Quebec city, Canada.

It began producing cement in 1951 and its last kiln line (Number 5) has been operating since 1983, replacing the existing wet kilns. Kiln line no. 5 is a Fuller 4 stage preheater - precalciner with a Loesche vertical roller mill LM

30.41, a 4.88 m X 42.67 m long Allis Chalmers kiln (L/D ratio is 8.75:1) and a 3.05m x 19.81 m long Fuller grate cooler equipped since 1994 with a fixed clinker inlet distribution system (KIDS) from IKN.

The nominal rated capacity of the line is 2300 tpd of clinker but various modifications were performed over the years which gradually increased clinker capacity. This article will describe the most recent upgrades.

Modifications

At the winter shutdown of 1999, the kiln's four ESP units were replaced by three Proceair-Sonair baghouse with Goretex membrane bags. The new filters resulted in better control of emissions than the very old ESP dating back to the early 1960s. The feed rate of the kiln was therefore increased. The kiln baghouse fan motor, wheel and housing were also upgraded for a higher capacity as well as the



The 2250 kw cement mill before commissioning.



Masch. Koppern's Hexadur tyres and rollers for the hydraulic roller press.

preheater fan motor which was changed from 1875 to 2250 kW.

Following the opening of its North American office, Loesche America performed a thorough investigation of the deficiencies in production capacity of Ciment Québec's raw grinding mill which had never reached its nominal rated capacity since being commissioned in 1983.

This led to a major retrofit of the Loesche vertical raw mill during the 2000 winter shutdown, by installing a new step design

grinding table, a new louvre ring design, larger tyres on the rollers and a LSKS 54 high efficiency separator. On a 1 yr period, the results showed that the mill capacity has increased by more than 15% on type I raw mix and 18% on type II raw mix, in turn increasing the amount of clinker produced. At the end of 2000, a fourth identical kiln baghouse (Procedair-Sonair) was installed, helping the clinker production capacity to pass over 2500 tpd.

The cement grinding plant (2

kW x 825 Kw and 3 kW x 940 kW ball mills plus one pre-grinding 1050 kW 48.30 hydraulic roller press) was also modified to include a 6th mill line (3.66 x 12.95 long, 2250 kW). This closed circuit line includes baghouses for the mill and the separator and a TSV 3600 THF high efficiency separator from FCB, the first on a cement mill in North America.

The two rollers in the roller press were changed at the end of last year for the latest high wear resistant rollers with Hexadur tyres from Masch. Koppern, with an expected running life of over 15 000 hrs. These are the first of their type installed in North America.

Finally, last year saw the development and implementation of an expert system for the pyroprocess line, which enhances the expert systems already developed and installed on the vertical raw grinding mill, on the roller press and on the cement mills.

This year the winter shutdown (24 days of feed interruption which began in mid-March) will see additional major improvements. The 1950 Raymond bowl mill model 593 for coal will be retrofitted with a Loesche high efficiency separator. The two Fuller-Kinyon 300 M pumps feeding the preheater will become a standby circuit and be replaced by an Aumund 90 m high bucket elevator.

Stage one of the preheater's two cyclones will be equipped with the latest PMT Vortex finder guide vanes, which should lead to a 30% decrease of pressure drop at that level. Finally, the Fuller clinker grate cooler will be retrofitted and become an IKN pendulum cooler, complete with new fans and a four roller clinker crusher.

Conclusion

These improvements, combined with those of the last few years are expected to boost clinker capacity by more than 20% over the nominal design, which will permit Ciment Québec to continue its development in different markets while assuring its customers the highest quality products available.