

SCALE WATCHERTM USED IN THE QUENCHING PROCESS AT THE SIDMAAR COKING PLANT

Quenching of coke now an uninterrupted process

Maintenance and downtime in coke plant dramatically reduced

Producing coke – the fuel used by blast furnaces – involves the “pre-burning” of coal. This process must be terminated at the proper time to keep the coal from being completely consumed. Steelmakers use quenching water for this purpose. The equipment used to spray this quenching water over the coke, however, takes a real beating. Obstructions caused by Calcium deposits constitute the chief problem. After Sidmar, a steel manufacturer based in Belgium, installed a ScalewatcherTM, problems with Calcium practically disappeared.



Sidmar coke plant



Front side of oven chambers



Reverse side of oven chambers

During the production of coke, the coal is heated to around 1000°C. The volatiles escape along with the coke oven gas that will be recycled elsewhere in the steel plant. The resulting product is coke consisting of almost 100% pure carbon. The production of coke is a mechanised operation that almost always takes place on the grounds of the steel plant itself (photo 1).

The coal falls from above into the oven chambers and the coke is pushed out to one side of the oven by pushers (photo 2) that also tip it into a car (photo 3) that takes it to a quenching station.



(Quenching station (Photo 4)



Quenching station (Photo 5)

If the cokes were not quenched, it would continue to smoulder and eventually burn up entirely. The process ends when the quenched coke is deposited onto a sieve that transports it over conveyor belts to the blast furnace's storage area (photo 6).



Conveyer belt with coke (6)



Spiral sieve (7)

Crucial production process

Since supplying the blast furnaces with coke can never be interrupted, the production process of this fuel that takes place ahead of the steel production itself is crucial. And the quenching of the coke is precisely the step in this process where problems frequently occur. Sometimes, these problems are so serious that the coke plant has to shut down temporarily to attend to necessary maintenance work. When the situation gets this bad, the cause is almost always a problem involving the quenching process. And the parts of the quenching station that spray water over the coke are the Achilles' heel in the production process of coke.

Heat and calciferous water

The jets from which the quenching water is sprayed onto the coke can become clogged by calcium deposits. The combination of extreme heat and calciferous (hard) water provides the perfect set of conditions for the accumulation of Calcium deposits. After a relatively short production period of a few months, the previously clean spiral sieves (photos 7 and 8) have clearly become completely obstructed and no longer function properly. Maintenance services are then called in to work as fast as they can on a difficult job to rectify the adverse effects of calcium deposits.



Spiral sieve (8)



The installation (9)

The solution

Steel manufacturer Sidmar wanted to eliminate this problem once and for all. In their search for a solution, they contacted **Scalewatcher**TM. Sidmar wanted to have a **Scalewatcher**TM installed for a trial period to see if it would make a visible difference in regard to Calcium deposits. The **Scalewatcher**TM was installed during the summer of 2002 (photo 9) immediately after the Calcium deposits had been cleaned off the parts. The result is that since August 2002, not only have there been no interruptions in the quenching operation, but the quenching station still shows practically no signs of Calcium deposits. What's more, the used quenching water and the production process of coke are the same as before the installation of the **Scalewatcher**TM.