BLEACHMAG® NATURAL $Mg(OH)_2$ WITH LOW CO_2 EMISSIONS ; MILL OPERATION EXPERIENCES AND COST SAVINGS IN TMP AND PRC-APMP – EUROPIREN B.V.

Don, H.,[1] Gusev, S.,[2] Ratala, P.[3] and Fredrikson, A.[4]

[1]Europiren B.V., The Netherlands.

[2]Russian Mining Chemical Company LLC, Russia.

[3]Oy Chemec Ab, Finland.

[4]A Fredrikson Research & Consulting Ltd, Finland.

The European production capacity of caustic soda has recently decreased by over 20% due the ban on the use of mercury cell technology. Together with the ever increasing costs because of more stringent environmental legislation it makes magnesium hydroxide the preferred alkali in pulp bleaching.

Europiren B.V. offers a mineral magnesium hydroxide that offers at least the same performance as synthetic magnesium hydroxide in pulp bleaching, but also offers some additional advantages. This product, which is marketed under the name Bleachmag® is selected by means of a unique X-ray sorting technique which safeguards a very high quality consistency and very low transition metal content. The production does not involve any chemical processing nor a calcination step. As a result the carbon footprint is up to 85% lower than a synthetic magnesium hydroxide, made out of calcined dolime or limestone and magnesium chloride from either sea water or deep well brine. Another advantage of Bleachmag® is the absence of chlorides (causing corrosion) and sulphates (causes scaling).

Confirmed benefits in reduction of COD levels, increased yield, reduced oxalate scaling combined with lower alkali costs do support the use of Bleachmag®.

We present mill experiences from two printing paper mills. The one is using Norway spruce round wood for TMP production. In that mill mechanical pulp is bleached in single stage at the high consistency tower. We could follow the levels of brightness before and after the bleaching tower. As the use of magnesium hydroxide increases the levels of residual peroxide — the pulp is bleached already in the medium consistency system when un-bleached pulp is first time diluted with bleaching department waters. And which is very rarely reported was the lowered demand for slimeside agents use in paper machine, which is caused by the increased residual peroxide levels in the circulation waters. With the use of magnesium hydroxide the mill could also reduce their dosage of sodium silicate by 45% and also their use of chelates was reduced. Simultaneously physical pulp properties and brightness levels were maintained in target values just below 80% ISO-Brightness. The mill gained large benefits also in disappeared oxalate scales in mixing reactor, with the magnesium hydroxide addition.

The other printing paper mill is using aspen round wood and PRC-APMP process. The chips are first bleached with standard alkaline peroxide and in the inter-stage HC-bleaching sodium alkali was replaced with magnesium hydroxide. The mill followed very carefully the physical and optical properties of pulp. Again the use of magnesium hydroxide did not affect negatively to the brightness values and other negative effect like decomposition of peroxide was nonexistent. After the trial period, it was found that with the addition of magnesium hydroxide to the inter-stage bleaching a maximum replacement ratio was between 30–70%. Maximum replacement ratio was found in respect of target strength properties of pulp, which were found to decrease below target values when the replacement ratio was increased above the mentioned level. Nevertheless the PRC-APMP mill can lower their bleaching costs when constant use of magnesium hydroxide slurry is initiated and the bleaching recipe in respect of chelates and sodium silicate is further optimized.