Use of ZIrconia in the Coating of Steel Pockets

Snani Louafi[1]; Hamoudi El-Hachmi[2]

.1 Metal Physics Laboratory and Property of Materials Annaba Algeria
.2.Department of Metallurgy and Materials Engineering Annaba Algeria
Mail: snanilaoufi@yahoo.fr

Abstract:

It is known that the equipment of mills working in harsh conditions, so to protect them, all are coated with a refractory lining which choice is made based on conditions specific to each aggregate.

It is also known that a poor quality brick causes premature discontinuation of facilities which have a negative impact on productivity of the mill.

The objective of our work is improving the life of refractory of steel pockets of oxygen steelmaking No. 1 Arcelor-Mittal which uses for lining his pockets the pure alumina bricks (86% Al_2O_3) for the upper (in contact with the slag) and the background and the lower walls of bricks made of alumina (36 to 39%) and silica (SiO_2 ≤ 60%).

The performance of this coating are 29.07casts per year on average but with 5.6% of campaigns that have made between 12 and 19 casts this is very low and caused a lot of stops.

To reduce these premature wear we have recommended for lining the bricks of high alumina content for the top pockets and bricks in zirconia- silica (SiO_2 55% and 35% ZrO_2) for the rest. This gave better results since we have been able to achieve 17 campaigns with an average of 39- 40 mergers. But the most important thing to note is that, for about 80% of the campaigns, we have achieved between 35 and 47mergers in average with a max of 54 casts, the shorter campaigns
have been 24 casts (5.90%).

Thus, the use of bricks in zirconia has improved the life of the pockets of about 18casts per campaign. This has resulted in increasing the productivity of the mill.

Keywords: zirconia, coating, alumina, pocket, refractory.