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The Evolution of Tundish Working Lining Mass as the Example of Sustainability and Eco design of refractory masses

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The aim of this self-setting monolithic refractory mass was to be the example of the easy and clean tundish work lining performance for a steel plant. This contribution will present the history and the evolution of this tundish working refractory product in the Steelmaking world during this recent years. The development of Coldmag in Europe and America had its origin in 2007 and 2010 respectively, by a close cooperation with Celsa France and Arcelor Mittal (AM Olaberria in Spain and AM Acindar in Argentina), with a first paper and congress contribution in the IAS international Meeting in Argentina in 2011. The different requirements of the different steel producers forced and allowed Magna to introduce interesting modifications in the current tundish performance. This paper shows the evolution and adaptation of the Coldmag self-setting tundish working lining enhancing the sustainability and the environmentally-friendly materials design.

This self-setting material basically consists in a dead burned magnesite in an adequate grain size distribution and special system of liquids binders added to shape the mass. The monolithic shape is achieved at room temperature, over a cold or a warm safety lining condition. The characterization includes X-ray diffraction and fluorescence analysis, thermogravimetric, mechanical resistance and thermal conductivity determination, considering the different developments introducing in the last years for fulfilling the worldwide customers requirements.

Including a continuous mixer machine, the application of this material is much easier and cleaner: no dust or vapors are produced. Health and safety conditions are improved using this system. The additives involved as well as the improvements regarding the raw materials used, probably makes Coldmag self-setting material the most environmentally-friendly known way for tundish.

The energy and time efficiency, as well as the steel cleanliness, is noticeable enhanced using Coldmag. As a self-hardening material it does not need to be heated for its application.

Actually, Working together with our customers collaborators, this development allows us to close the circle of the sustainability by recovering and processing the refractory residues after the desludging of the tundish.

Keywords: Self-setting; Environmentally-friendly, Tundish Working refractory lining; Circular Economy

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