Utilization of Bypass Dust within a Cement Factory

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Abstract
Cement by-pass dust is a major nuisance from both economical and environmental points of view. Although several applications have been suggested for its use, to date, no single application could make use of the huge amount of dust to be disposed of, reaching hundreds of tons per day per furnace. In the present thesis, several alternative uses were tried, so as to use the dust within the premises of the factory. Adding the dust to raw meal proved ineffective, as it increases the level of chloride in different parts of the production system. Grinding by-pass dust with clinker also proved unpractical because of operational problems associated with the use of air swept ball mills in the grinding operation. Tests were made to follow up the different properties of cement and cement paste at varying levels of dust addition. It was thus possible to add up to 1% bypass-dust to the final cement product without altering its quality. By-pass dust was used as an addition to cement to form plain concrete elements to be used on site. Compressive strength and slump were followed as function of curing time and percent by-pass addition. It was possible to use 15% dust addition without fluorescence problems. Using an alternative source of low chloride clay, it was possible to reduce the by-pass rate from 8 tpd down to 4.5 tpd by blending this clay in a 50-50 % ratio with cheap clay.

Keywords
Bypass dust, Cement factory,