

APPLICATION OF MICROSILICA IN AUTOCLAVED PRODUCTS

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Abstract

The effect of using microsilica in air-cured fibre cement products has been investigated widely by many groups, and its benefit has been recognized by the industry. In other types of fibre cement product produced by autoclave technology, the use of microsilica has also been developing as producers move to non-asbestos products. Today, quartz sand is the traditional source of SiO₂ in autoclave recipes, so microsilica is not automatically used. However, microsilica is being used by a growing number of producers, to improve strength and durability. Microsilica is also being used in autoclaved products as a process aid and to reduce delamination in autoclaved sheets. The typical dosage of microsilica in autoclaved products to achieve significant benefit is in the range of 3% -10% of the total recipe.

This paper examines the application of microsilica in autoclaved non-asbestos flat sheets. Microsilica was tested at 3%, 5%, 7% and 10% dosage in recipes and bending strength and other physical performance was evaluated and microstructure and phases were analyzed by SEM (Scanning Electron Microscopy) and XRD (X-ray diffraction). The mechanism of the microsilica effect and the related autoclave reaction is discussed. The paper shows that microsilica can improve the bending strength, freeze-thaw resistance and other properties of autoclaved products.

1. The following properties of samples were evaluated.

Bending strength

Moisture movement

Dry density

Water absorption

Flexural toughness

2. The microstructure and phases of the product were studied.