Ensures the shortening of aging time, stabilization of product quality, and cost reduction.

Pressurization-type Steam Aging Equipment for Steel Slag

Features

- Shortening of aging time (from 2 days to 2 hours).
- Stabilization of product quality
- Cost reduction (energy and labor costs)

Overview

Steel Slag Steel slag, which is generated as a by-product at the time of steel refining, is composed mostly of calcium. Therefore, steel slag hardens when it reacts with water. That is why steel slag is widely utilized for construction materials, such as roadbeds. The use of steel slag makes sturdy roadbeds that will not be easily rutted, thus ensuring comfortable road traffic and contributing to a reduction in road repair costs.

Conventional Problems The volume of the unmelted quicklime (CaO) in steel slag expands when it reacts with water. Therefore, steel slag needs aging processing, in which the slag reacts with water or steam before use so that the slag will fully expand. The natural aging of steel slag requires two years. The conventional open yard steam aging of steel slag requires at least two days, and it has a large number of problems, such as the requirement of huge aging yards and workforce to protect the slag with covers.

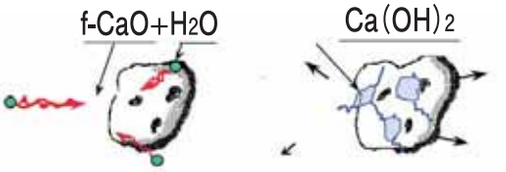
Solution of Problems This technology has attained an increase in the efficiency of aging by allowing steel slag to react under a pressurized steamy atmosphere, thus making it possible to increase the speed of reaction 24 times as high as that obtained in open yards. Sumitomo Metal Industries devised a number of streamlining means including the introduction of a device to transfer slag buckets automatically by cart into a large-scale pressure container. Thereby, the reduction of energy and labor costs was achieved. Moreover, this technology eliminated the necessity of vast aging yards.

Award History

Clean Japan Center: Industrial Science and Technology Policy and Environment Bureau Director-General's Prize of Fiscal 2007 for Resource Recycling Technology and System.

Supply List

- **Sumitomo Metal Industries, Ltd. Wakayama Steel Works**
- **Company H Shimane**
- **Company S Hyogo**

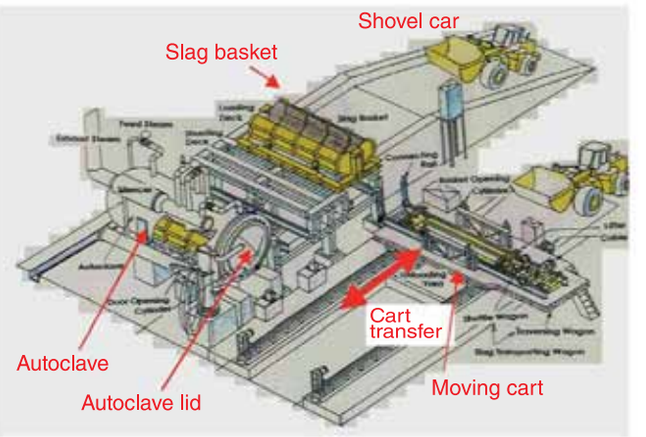


Volumetric expansion rate 3～6%
The volumetric expansion rate must not exceed 1.5% for roadbed reinforcement (JIS standards).

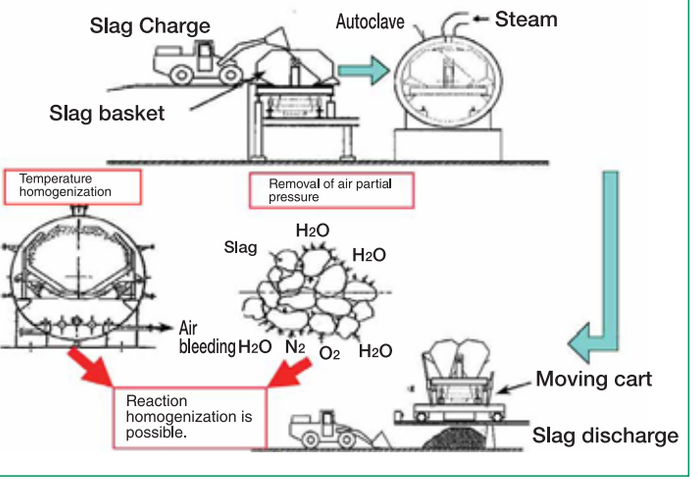
	(Treatment time)	
Natural aging: Left as it is in open yards	→ 2 years	Conventional technology
Hot-water aging: Dipped into 80℃ water in pits	→ 1 week	
Open yard steam aging: Promotion of agent with steam in open yards	→ 2 days	

Pressurization-type steam aging (newly developed)→2 hours

Concept of aging



Outline of Pressurization-type Aging Equipment



Features of Pressurization-type Aging

Effects

◎Contribution to Realization of Recycling Society

The introduction of pressurization-type steam aging equipment enables aging processes in a short time. In addition, the equipment realizes an improvement in the reliability of product quality by the equalization of hydration reaction along with the mitigation of aging yards in area, aging equipment costs, and labor with the employment of carry-in and take-out mechanisms. Moreover, the equipment reduces the final disposal quantity of waste, prevents secondary contamination, and halves the specific consumption of steam, thus greatly contributing the realization of a recycling society with a reduction in environmental impact.

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