

Fast Charging of Solar-Powered Containers in Cement Plants





Overview

This work describes the implementation of concentrated solar energy for the calcination process in cement production. Approach used for providing solar energy includes the utilisation of a solar tower sy.

How much energy does a cement plant need?

Another challenge lies in the higher energy demand for induction-based systems. As discussed, process modeling suggests that an electrified cement plant using an induction-based pre-calciner may require a total energy input of 4.75 GJ per ton of clinker, which is higher than the 3.7 GJ/ton required by conventional fossil-fuel-fired plants 174.

What is concentrated solar power (Cao)?

Concentrated solar power (CaO) has emerged as a promising technology for harnessing solar energy, offering the advantage of inherent thermal energy storage for dispatchable electricity production (Khan et al., 2022b, Khan et al., 2022a, Khan et al., 2023b, Khan et al., 2023a).

Why is energy storage important for cement manufacturing?

Without robust energy storage solutions, fluctuations in power availability could introduce instability into cement manufacturing operations. Additional challenges such as the need for substantial grid infrastructure upgrades, and the geographic mismatch between renewable energy availability and industrial hubs exist.

Is calcium-based sorbent a good option for large-scale solar energy storage?

The high energy density, fast reaction kinetics, and low cost of calcium-based sorbents make CaL an attractive option for large-scale solar energy storage (Khan et al., 2022a).



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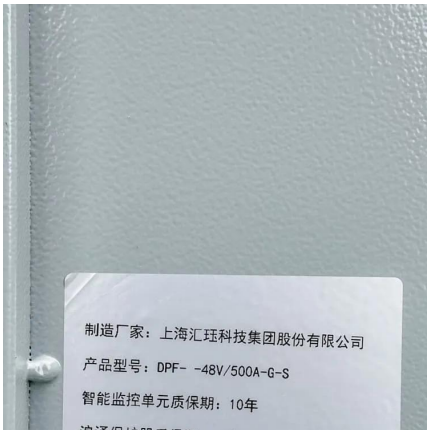
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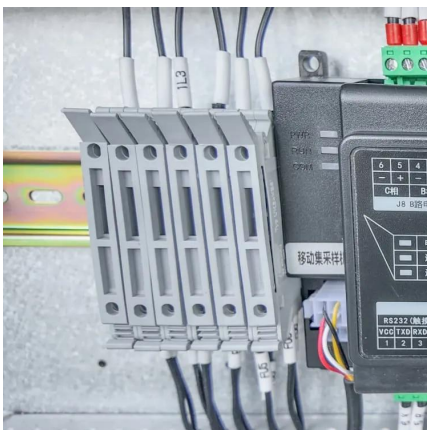


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