Solar360 Mobile Energy

A handbook for solar central receiver design

Overview

How to choose a solar central receiver?

Only one diameter and one thickness must be selected. In solar central receivers, the tube length, Hreq, corresponds to the linear section that is exposed to solar radiation. The connections between bundles and inlet and outlet pipes are covered by a screen or a small wall; (35) meanwhile, the linear section is still exposed to the Sun.

What are the different types of solar receivers?

(16) There are different designs of solar receivers, such as the open volumetric air receiver, (17−19) the porous cavity receiver, (20) the particle solar receiver, (21) and the central or tubular receiver.

What is a central receiver CSP plant?

In this work, a central receiver CSP plant is considered. These facilities have a solar field surrounding a central structure, commonly a tower built with cement or iron, (31) on top of which the receiver is placed. The receiver is set considering that the entire external surface is exposed to solar radiation.

What data is required for the design of a receiver?

The data related to weather and radiation conditions are the inputs that the model requires for the design of the receiver. In particular, the essential data for the present model are wind speed, atmospheric temperature, and DNI data, which are presented in Figures S1–S3 of the Supporting Information.

What is the mechanical design of a receiver?

Receiver Design The mechanical design of the receiver involves the definition of the geometry of the equipment. This geometry is related to the number of tubes that provide the contact area and guide the molten salts through the receiver. The areas involved are Areq,min, Aflow, Aob, and Aproj.

What is the mechanical design of a molten salt receiver?

The mechanical design of the receiver involves the definition of the geometry of the equipment. This geometry is related to the number of tubes that provide the contact area and guide the molten salts through the receiver. The areas involved are Areq,min, Aflow, Aob, and Aproj. where HFmax is the maximum heat flow across tube wall (kW/m 2).

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This Handbook describes central receiver technology for solar thermal power plants. It contains a description and assessment of the major components in a central receiver system configured for utility scale production of electricity ...

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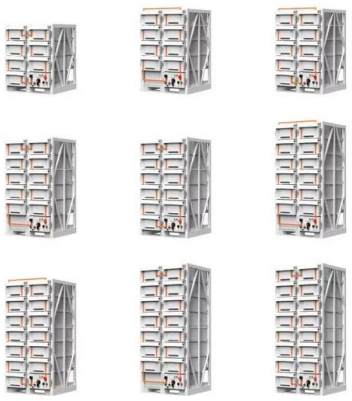

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