SOLPART

High Temperature Solar-Heated Reactors for Industrial Production of Reactive Particulates

European funded project - Grant Agreement number 654663

Deliverable D4.3

WP4 – Design, construction and implementation of the pilot scale solar unit

Deliverable D4.3 Report on the construction of the solar unit sub-systems

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Introduction and Objectives

The objective of deliverable D4.3 is to present the construction of the solar reactor for the SOLPART pilot scale plant. It includes final drawing of equipment and construction report.

The major challenge to be addressed by the construction of the solar reactor, the hot storage and referral system is the availability of Alloy 800 HT for a small quantity in a relatively short time. Material used for the other equipment are more common and therefore easier to supply even for a small quantity.

Given that the product will react at around 900°C, significant constraints have been faced regarding the instrumentation and more precisely the level switch in the 2 way air-valve and the hot storage. Indeed, these sensors will operate at high temperature in a dusty environment.

Finally, the entire loop and more precisely the reactor and the cavity have to be implemented into an existing solar tower with its specific constraints such as the height of the focal point or the available space into the aperture. Moreover, other equipment such as the hot storage, 3-way air-valve and the product cooler have to be implemented into the existing metallic structure situated outside. This has been taken into account for the erection. Indeed, in order to minimize the erection time on site, each equipment is designed with its own supporting frame in accordance with the free space in the existing structure.

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