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Design and analysis of a new calorimeter for inline characterization of solar concentrating collectors working fluids

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There is a need for a fast change of the global energy resource model as we've known for some time that fossil fuels are no longer a viable solution either for the future or for the environment well fare. Among other renewable energy sources Concentrating Solar Energy (CSE) is a very promising one due to its particular features namely its dispatchability. A brief introduction to different concentrating solar technologies is made. The great majority of solar concentrating systems use some kind of heat transfer fluids (HTF). Its choice depends on their favourable thermodynamic behaviour and operation range.

Knowledge and control of their thermophysical properties are mandatory during operation as they tend to degrade over time and data from manufacturer becomes unreliable. The level of certification is very important to have a thorough knowledge of the HTF properties for a rigorous calculation of the collectors' performance. This report presents a revision of the literature of HTF and calorimetry and a proposal and methodology for the development of a new improved inline calorimeter.

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