

## Development of a tube receiver for 900°C outlet temperature

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The objects of receiver development are increase of efficiency and lifetime and decrease of costs. To increase the efficiency of a tube receiver for a micro gas turbine the thermal radiation leaving the cavity and the reflection losses as the main losses have to be reduced. To increase the lifetime of a receiver a basic strategy is to reduce the maximum material temperature. For the receiver made of nickel-base alloys a target of 950°C maximum material temperature has been set. To limit material and fabrication costs the overall absorber-tube length for the first design was set to 100m. As collector and distributor can be main cost drivers the layout should allow a simple design.

Using a previously developed 3D-finite-element-model three different layouts of a tube receiver were examined. To allow the application of the parallel developed multilayer-tube the layouts were restricted to straight tubes. The different layouts were rated according to the objects. Furthermore the benefit of an intermediate mixture of the absorber-tube streams was analyzed.

To test and measure tubes under conditions similar to the receiver a test rig with a radiative oven was developed. As temperature measurements with thermocouples disturb the heat flux a pyrometer measurement system was chosen. Design of the oven and of the measurement system will be presented.