

SCHOTT PTR[®]70 Premium Receivers

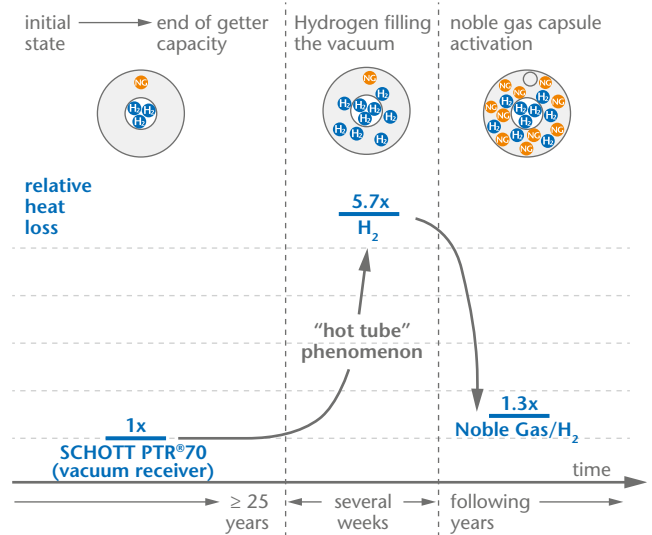
Best performance with integrated 2nd life kit

SCHOTT PTR[®]70 Premium Receivers incorporate a major benefit for power plant owners and investors: a noble gas capsule. With this solution, receivers affected from the “hot tube phenomenon”, which reduces significantly the thermal efficiency of the receiver, can be recovered easily making possible to reach again thermal efficiencies close to the initial ones. This makes possible to extend the lifetime of the receivers and to minimize the O & M costs associated with replacements increasing the overall plant profitability.



Integrated noble gas capsules

SCHOTT PTR[®]70 Premium Receivers include a new conceptual design patented by SCHOTT and are equipped with a noble gas capsule to maintain excellent thermal properties over the full operation period. The heat loss of hot tubes is typically increased by a factor of ~6 compared to the vacuum. In such a case, the activation of the integrated noble gas capsule can be carried out within minutes without interrupting the operation. The result: thermal losses are immediately reduced almost to the initial value, and the temperature of the glass tube cools down accordingly.



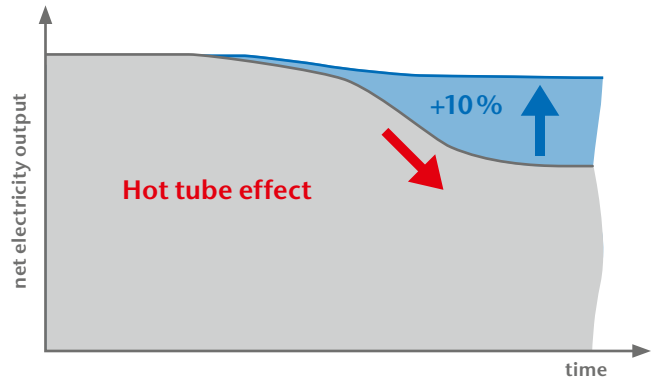
SCHOTT
solar

SCHOTT Premium Receivers with activated noble gas capsule provide 10% higher life-time output

Simulations show that solar fields with activated noble gas capsule receivers yield 10% more electricity output over 40 years of operating lifetime, as compared with conventional receivers that remain in the solar field when turning into hot tubes. Moreover, noble gas capsule solar fields almost reach the output level of solar fields with new replacement receivers. These direct benefits of maximized output and minimized O&M costs reduce risks and increase the overall profitability of the power plant.

Technical specification

Components	Specification
Dimension	<ul style="list-style-type: none"> length: 4060 mm at 20°C ambient temperature (159.8 inches at 68°F) aperture length: > 96.7% of the bulk length at 350°C/662°F working temperature
Absorber	<ul style="list-style-type: none"> outer diameter: 70 mm/2.75 inches steel-type: DIN 1.4541 or similar solar absorptance: <ul style="list-style-type: none"> $\alpha_{ISO} \geq 95.5\%$ $\alpha_{ASTM} \geq 96\%$ thermal emittance: $\epsilon \leq 9.5\%$
Glass envelope	<ul style="list-style-type: none"> Borosilicate glass outer diameter: 125 mm/4.9 inches antireflective coating solar transmittance: $\tau \geq 97\%$
Thermal losses	<ul style="list-style-type: none"> in conjunction with SCHOTT Solar CSP patented shields <ul style="list-style-type: none"> < 250 W/m (@ 400°C) < 165 W/m (@ 350°C) < 110 W/m (@ 300°C) < 70 W/m (@ 250°C)
Vacuum	<ul style="list-style-type: none"> residual gas pressure: $\leq 10^{-3}$ mbar
Noble gas capsule	<ul style="list-style-type: none"> integrated noble gas capsule for extended product lifetime
Heat transfer fluid	<ul style="list-style-type: none"> non-corrosive thermal oil with an effective partial pressure of dissolved Hydrogen of $p_{H_2} < 30$ Pa
Operating pressure	<ul style="list-style-type: none"> ≤ 41 bar (absolute)



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