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Submodul 2: Problem and Conflict Resolution in Solar Thermal Systems

➔ The solar pump no longer circulates the solar fluid

Information – Water-Glycol Mixture

The heat transfer fluid in the solar circuit transports heat from the collector to the hot water storage tank. In the pipes of the solar collector (absorber), it heats up and transfers the heat to the domestic hot water in the storage tank via the heat exchanger. When the storage tank is fully charged, no additional solar energy can be absorbed. In this case, the solar pump switches off, and the heat transfer fluid remains stationary in the collector. Since the sun continues to heat the collector, the fluid evaporates. During this stagnation, the highest temperatures and pressures occur in the solar system.

To prevent the heat transfer fluid from freezing in winter and damaging the pipes, a water-glycol mixture is used as antifreeze. However, this mixture degrades over time. A basic buffering keeps the pH value stable (> 7.0) to prevent corrosion in the solar circuit. Under normal conditions, the heat transfer fluid lasts up to ten years but should be regularly checked for pH levels.

High temperatures (from 170 °C) can break down (“crack”) glycol, leading to acid formation and increased corrosion. Oxygen in the system accelerates this process and can cause deposits in the solar circuit. Scientific studies show that leaky systems with oxygen ingress are more problematic than high temperatures due to stagnation.

For systems with long idle periods, such as in solar heating support, an annual inspection is recommended. Maintenance contracts should clearly address these aspects.

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