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The High Efficiency SRB Solar Thermal Collector: A by-product of the CERN Accelerator Technologies

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Vacuum is the best thermal insulator made available by Nature. Thanks to the reduced thermal losses provided by vacuum, the SRB solar thermal collector may reach temperatures up to 400°C without the help of light focussing mirrors. This is a very important feature for Central Europe, where diffuse light, which cannot be focused, may exceed 50% of the available solar power.

The vacuum inside the collector is maintained by a Getter pump powered by sun. Getter pumping, in the form of a getter ribbon subtended along 23 km of the machine, was adopted for the first time for the Large Electron Positron collider (LEP) at CERN. Later a Getter film, coating the internal walls of the room temperature vacuum chambers, was developed and adopted for the CERN Large Hadron Collider (LHC).

The thin film getter coating technology was also adopted for the SRB collector, which is now produced industrially in Spain, close to Valencia. The collector is particularly suited to produce process heat for Industry at temperature from 80°C to 250°C in Central Europe, but also for district heating, cooling, air conditioning and water desalination. Recently a roof of the Geneva Airport has been equipped with about 300 collectors (total solar field surface area about 1200 m²) for heating during winter and air conditioning during summer.

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