Facade Integrated Collector

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In urban buildings, there are not always sufficient suitable and oriented roof area for the installation of solar collectors available. When installing at flat roofs, the solar collectors often form a foreign body since they are not an integral part of the architecture. For this reason solar thermal systems are still rejected by some architects and town planners. Therefore it is necessary to integrate collectors in the facades. Constructional and aesthetically attractive solutions without thermal separation are necessary. Also recyclability of the materials used and resource efficiency play a central role.

A collector element directly integrated in the façade is understood by both solar collector and heat insulation of the building envelope. There is no thermal separation between both of these in the form of rear ventilation. The façade collector which comprises a fluid-cooling absorber, a glass disk, glass bearer profiles, sealing and covering sheet materials, therefore, assumes different functions: Function as a thermal collector, improvement in heat insulation of the building respectively the attainment of passive gains, protection against atmospheric conditions an a structural design element for the façade. In accordance with the advantage of faced integrated collectors are: Cost saving as a result of joint use of building components, replacement of the conventional façade, and suitable both for new buildings and for the renovation of old buildings.

The development of façade integrated collectors for market penetration was coordinated and sponsored within the framework of EU- and IEA research programmes.

Figure 1 and Figure 2 illustrate the state of façade integrated collectors. Compared with tilted collector areas, the absorbed solar radiation is reduced by about 25% to 30% as an average; Figure 3. The difference during the heating season is smaller; Figure 4. From the energetic point of view, façade integrated collectors are acceptable in solar combined heating systems with an oversized collector area for hot water preparation outside the heating season.

More information:

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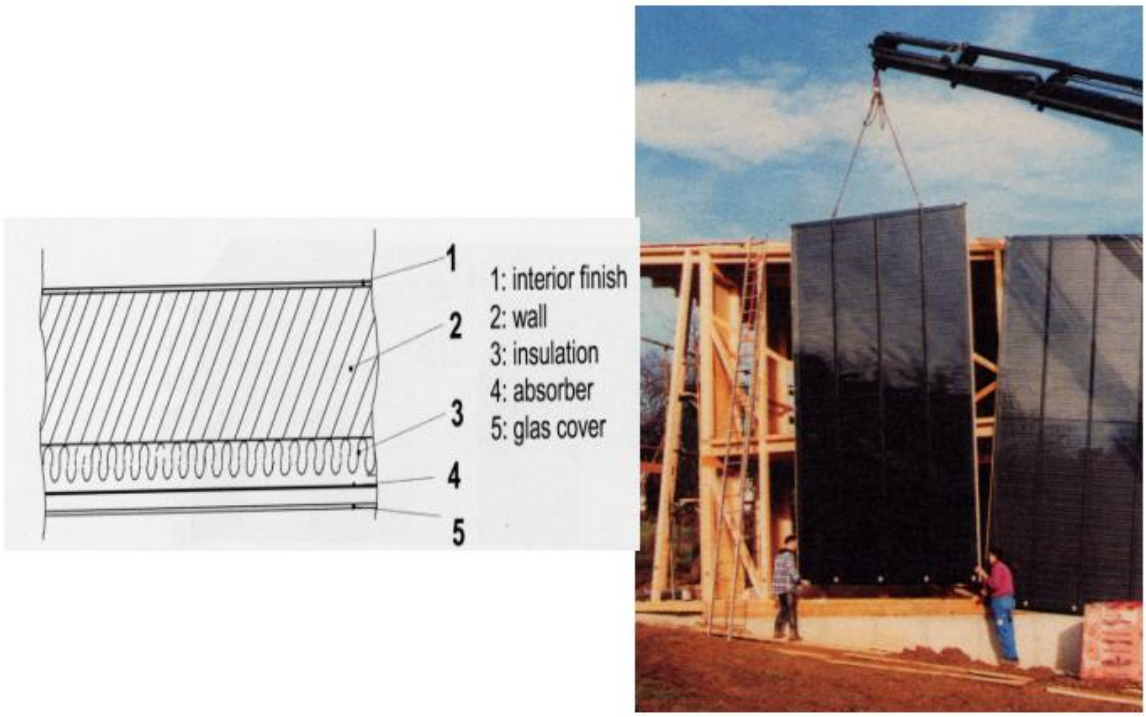

Fig. 1: Facade-integrated collector installation

Fig. 2: Solar-combined heating systems with facade collectors

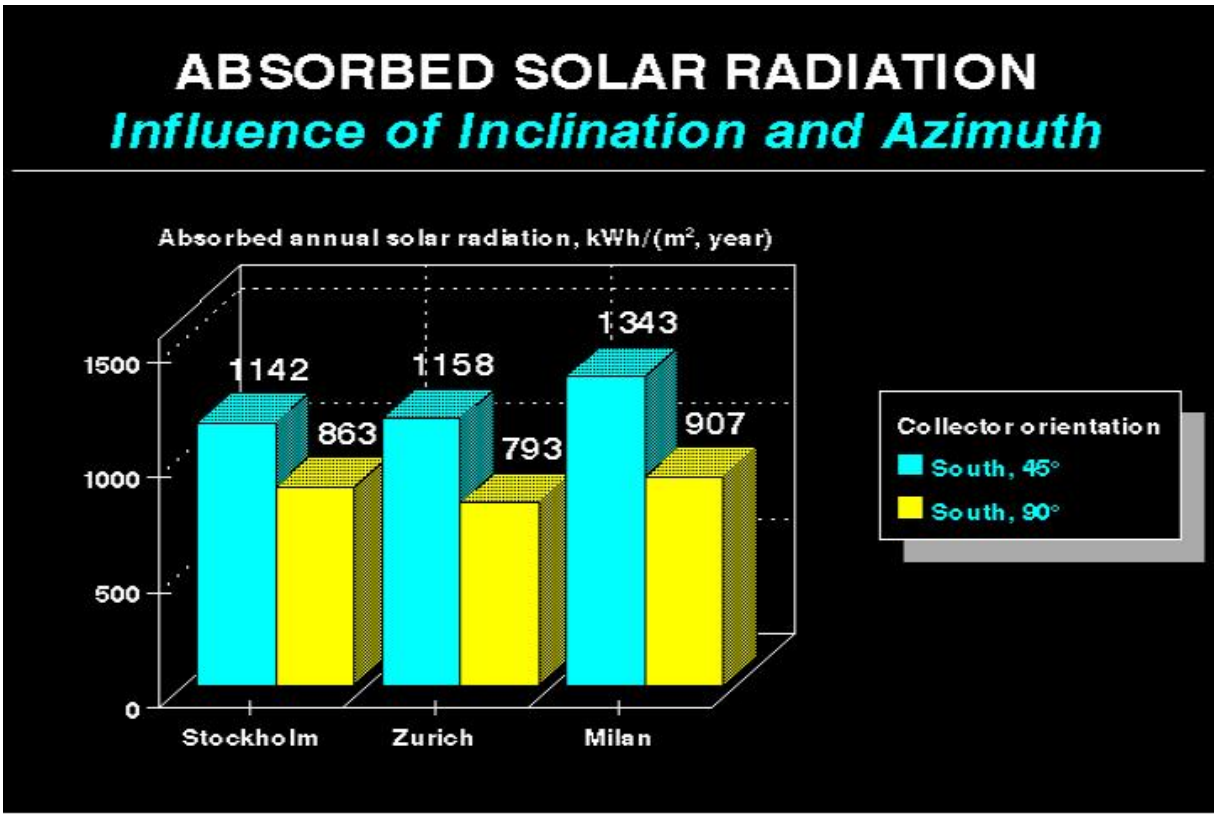

Fig. 3: Absorbed annual solar radiation on vertical and optimal inclination

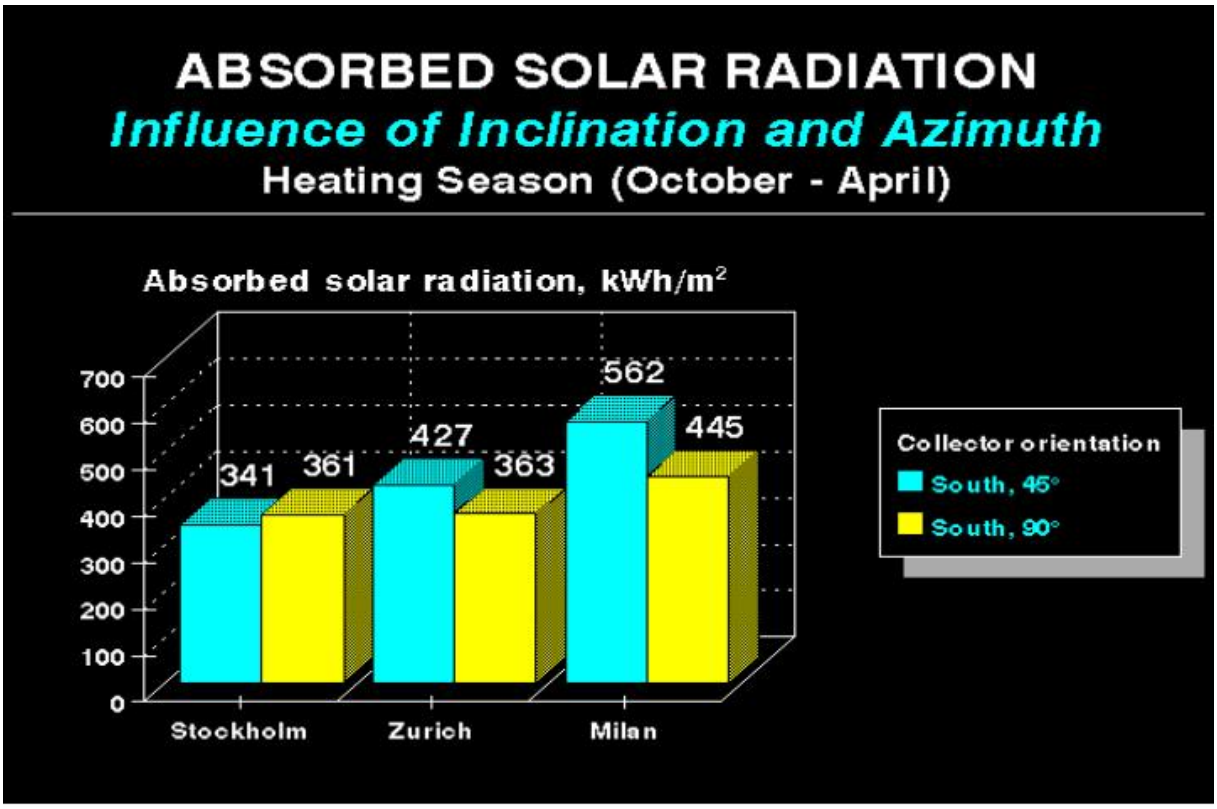

Fig. 4: During heating season absorbed solar radiation on vertical and optimal inclination