RESULTS OF THE MEASURING- AND EVALUATION PROGRAM OF FOUR SOLAR HOUSES IN ZOETERMEER, THE NETHERLANDS

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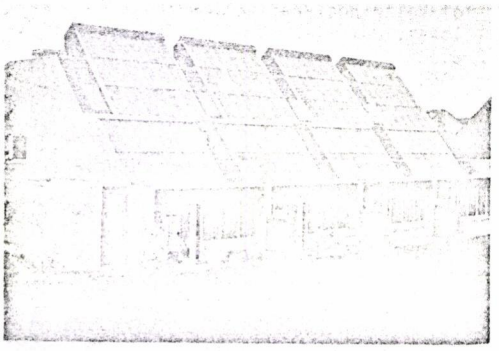
1. Introduction: This paper describes the results of an extensive monitoring program during the first heating season of four solar houses which, contrary to conventional methods, have been realized in the so-called low-cost (social) house-building sector. The houses have been built by the Verenigde Bedrijven Bredero B.V. at Utrecht, in conjunction with the Institute of Applied Physics (Technisch Physische Dienst) at Delft and the Bouwcentrum (Building Centre) at Rotterdam. The houses were occupied in August 1977. The four identical houses in a row have been provided with two types of solar collectors* (liquid- and air cooled, selective, single glased) and different heating systems have been chosen for the houses (radiator, air- and floor heating) so as to check which of these systems, in combination with a solar heating system, is to be preferred. In addition to the solar heating installations, also a number of additional energy saving measures have been applied: -additional wall, floor and roof isolation; -thermoplus glazing; a relatively small glass surface area in the north facade. The measuring- and evaluation program is a part of the Dutch National Solar Energy Program. 2. Content of the paper: A comparison of the calculated [2] and measured values of the various energy saving measures will be presented, including the calculated and measured behaviour of the different solar heating installations. The differences in the behaviour of the installations caused by the different heat distribution systems shall be evaluated. Some practical experiences with the different installations will be discussed. Several technical details of the four different technical installations will be discussed in detail. The results will be presented as much as possible according to the reporting format for solar installations as has been developed within the CEC. The mathematical model used [3] for the tuning of the various components of the solar heating installations shall be briefly discussed. Some of the attractive features of the applied spectral selective coating of tin-oxide on black enamelled steel such as the high mechanical and thermal resistance will be shown.

*Three houses are provided with 35 m^2 of black enamelled absorber plates of steel covered with a tinoxide layer [1].

References:

[1] U.S. Patent claim no. 672.677.
[2] "The Design of Four Solar Houses in Zoetermeer", The Netherlands, C. den Ouden, 2e Int. Solar Forum DGS Hamburg 12-14 July 1978, page 35-45 vol. III.
[3] Solar Heating Studies in The Netherlands, C.J. Hoogendoorn and C. den Ouden. Proceedings of the 1978 Annual Meeting of the Am. Section of



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