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Thessaloniki, 25.07.11

*Ref. No: 348/11***MECHANICAL ENGINEERING
DEPARTMENT
ENERGY SECTION**

Mr. Michael Buschhoff
Managing Director
REDWELL MANUFAKTUR GmbH
Am Ökopark 3
A-8230 Hartberg

Dear Mr. Herr Buschhoff,

based on the results of the research project entitled "Evaluation of Redwell Infrared Heating Systems", which was carried out by the Laboratory of Heat Transfer and Environmental Engineering, at the Department of Mechanical Engineering of the Aristotle University Thessaloniki between May 2009 and July 2010, we would like to provide you with the following synoptic information on the results of the study.

According to the measurements, simulations and calculations that were carried out for the Redwell infrared heating panels, and taking into consideration all relevant building physics factors, resulted an energy demand figure e_p of 0,65. The aforementioned factors concern the thermal insulation and heat storage capacity of the building's envelope, the absorption and emission capacity of the construction elements, such as walls and floors, as well as the reduction of the indoor air temperature possible whilst maintaining the same thermal comfort levels.

All calculations were carried out based on the requirements of the German legislative framework of the "Energy Efficiency of Buildings (EnEV 2009)" and the DIN 4701. Regarding thermal comfort calculations, the EN-ISO 7730 and ASHRAE 55 standards were used.

Moreover, considering the use of Redwell infrared heating panels, in case of lower heat transfer coefficients for the building's envelope than those foreseen by the EnEV (e.g. for low-energy or passive house applications), a further reduction of the energy demand figure e_p by up to 0,55 is possible.

This energy demand factor implies, that a room with building elements insulated according to the specifications of EnEV 2009 can be heated by means of a Redwell infrared heating panel rated at 650 Watts, achieving the same performance as a conventional direct electrical heating system with an installed capacity of 1,000 Watts, whilst maintaining the same thermal comfort levels.

Sincerely yours,

Prof. Dr.-Ing. Agis M. Papadopoulos