PREFACE

This twenty-third volume of the "Thermophysics" series is devoted to the study of heat transfer and turbulent mixing in gas-cooled channels considering the effect of body forces (natural convection, or bouyancy, and centrifugal forces) conducted at the Institute for Physical Engineering and Problems of Energy Research of the Lithuanian Academy of Sciences (now Lithuanian Energy Institute). The current study continues the cycle of investigations into local heat transfer and turbulent transport in smooth and rough annular channels variable fluid properties which were considered in "Thermophysics 8, 21", viz. in "Heat Transfer in Gas-Cooled Annular Channels" (1977) by J. Vilemas, B. Čėsna and V. Survila and "Heat Transfer Enhancement in Gas-Cooled Channels" (1989) by J. Vilemas, V. Šimonis and J. E. Adomaitis.

The present monograph presents the results of detailed measurements of hydrodynamic and thermal characteristics in a vertical tube with coincident directions of forced and free convections (aiding flows) at various heat loads, and also in curved tubes and coils. Numerical results for the characteristics of turbulent transport in mixed turbulent convection are reported.

The comprehensive numerical and experimental investigation of heat transfer and turbulent transport provided an explanation of some specific features of heat transfer in such intricate flows. The information obtained is needed for improving the operational reliability of various state-of-the-art gas-cooled heat exchangers.

Experimental apparatus and investigation techniques are described. The results are correlated in the form of similarity relations suitable for practical application over a wide range of operating conditions and geo-

metric parameters. Some of the most characteristic experimental data are tabulated in the appendices.

The monograph includes the results of studies performed by the present authors in collaboration with V. Kaupas, V. Mikaila, V. Šimonis, V. Šukys, E. Ušpuras, J. E. Adomaitis, R. Pabarčius, B. Teškevičienė and other researchers.

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Authors