INTERNATIONAL CAVITATION EROSION TEST

IMP PAN Rep. 19/98 **Gdańsk, September 1998**

PRELIMINARY REPORT

PART I : CO-ORDINATOR'S REPORT

by

Dr Janusz Steller

Test Co-ordinator

POLISH ACADEMY OF SCIENCES
INSTITUTE OF FLUID-FLOW MACHINERY

ul.Gen.J.Fiszera 14, P.O.Box 621, 80-952 GDAŃSK, Poland

Phone: +4858 346 08 81
Fax: +4858 341 61 44
e-mail: steller@imp.gda.pl

PROF. KAZIMIERZ STELLER (1925-1992)

CONTENTS

PART I
CO-ORDINATOR'S REPORT

PART II
EXPERIMENTAL DATA

to my Father in memoriam

PREFACE

The experimental data presented in this report are the result of joint effort of 14 laboratories that have responded to the initiative of the International Cavitation Erosion Test (*ICET*), put forward by the Institute of Fluid-Flow Machinery of the Polish Academy of Sciences (*IMP PAN*) during the 7th International Conference on Erosion by Liquid and Solid Impact (*ELSI VII*) held in Cambridge, U.K., in September 1987. Each Test Participant took care by himself to provide for financial support of his contribution to the project. No such support was available from the side of the Test Co-ordinator. Wide response to the initiative can be therefore considered a measure of significance attributed by eminent research and development centres to the goals of the project.

The *spiritus movens* of the ICET was *Professor Kazimierz Steller*, head of the Department of Fluid Dynamics at the IMP PAN and initial Test Co-ordinator. His multiyear experience in the field of cavitation research and numerous international contacts were essential when discussing the idea of the project with our partners at the beginning of eighties. The ICET programme was prepared under close collaboration with *Dr Tadeusz Krzysztofowicz*, Institute of Welding and Structural Materials, Technical University of Gdańsk, and consulted with the ICET International Advisors. Dr T.Krzysztofowicz took also care for selection, heat treatment and determination of mechanical properties of the test materials.

In mid 1992 all the experimental data were already available to the Test Co-ordinator and most of the data processing work was completed. Preliminary surveys of results were presented during conferences held in 1991 and 1992 in Gdynia, Paris, Nanjing, Karlsruhe and Cambridge [1÷5]. Unexpected death of Prof. K.Steller in May 1992 and deep involvement of his research group in projects and industrial contracts vital for the position and existence of the Department have stopped further work within the framework of the ICET programme for the next four years.

The work was resumed only in 1996 by completing the documentary part of this report (*Part II: Experimental Data*) and commencing development of the ICET database comprising, among others, the tabulated volume loss vs. time curves. At the turn of 1997 and 1998 also the work on the *Co-ordinator's Report* could have been started. At the time this text is being written the *www* ICET page is already available to all the Internet users at the http://*www.imp.gda.pl/icet* address and preparations for installation of the ICET database at the IMP PAN host computer are in progress. Distribution diskettes of the database current version are attached to part II of this report.

It has been the intention of the Test Co-ordinator to comprise in this report all the data needed for independent interpretation of results and competent discussion during the ICET Seminar planned for 1999. Additional (photographic) material is available to all the ICET Contributors by direct contact with the Test Secretary or Co-ordinator

The Test Co-ordinator finds it his pleasure and duty to express sincere thanks to all his co-workers having contributed to this report by their personal effort. Special thanks are due to *Mr Andrzej Gollnau, Dr Bolesław G. Gireń,* and *Mr Marek Klein.* It was Mr A.Gollnau who prepared mailing of all the test materials and conducted most of manual data processing work. The work of Mr A.Gollnau was finished in 1996 by Dr B.G.Gireń who scanned also most of the photographic material and prepared the camera-ready copies of the second volume of this report. It was also him who has analysed metallographic data presented. The results of this analysis are presented in section 4.5 of this volume. Mr Marek Klein is responsible for development of the ICET database described briefly in section 4. He is also the editor of the ICET page available in the Internet worldwide web. Acknowledgements for technical support are due to Mrs Mrs A.Krella, J.Kudłacik, H.Dudek as well as Dr K.Krzysztofowicz and Mr A.Sugiyama.

Dr Janusz Steller
ICET Co-ordinator

Gdańsk, September 1998