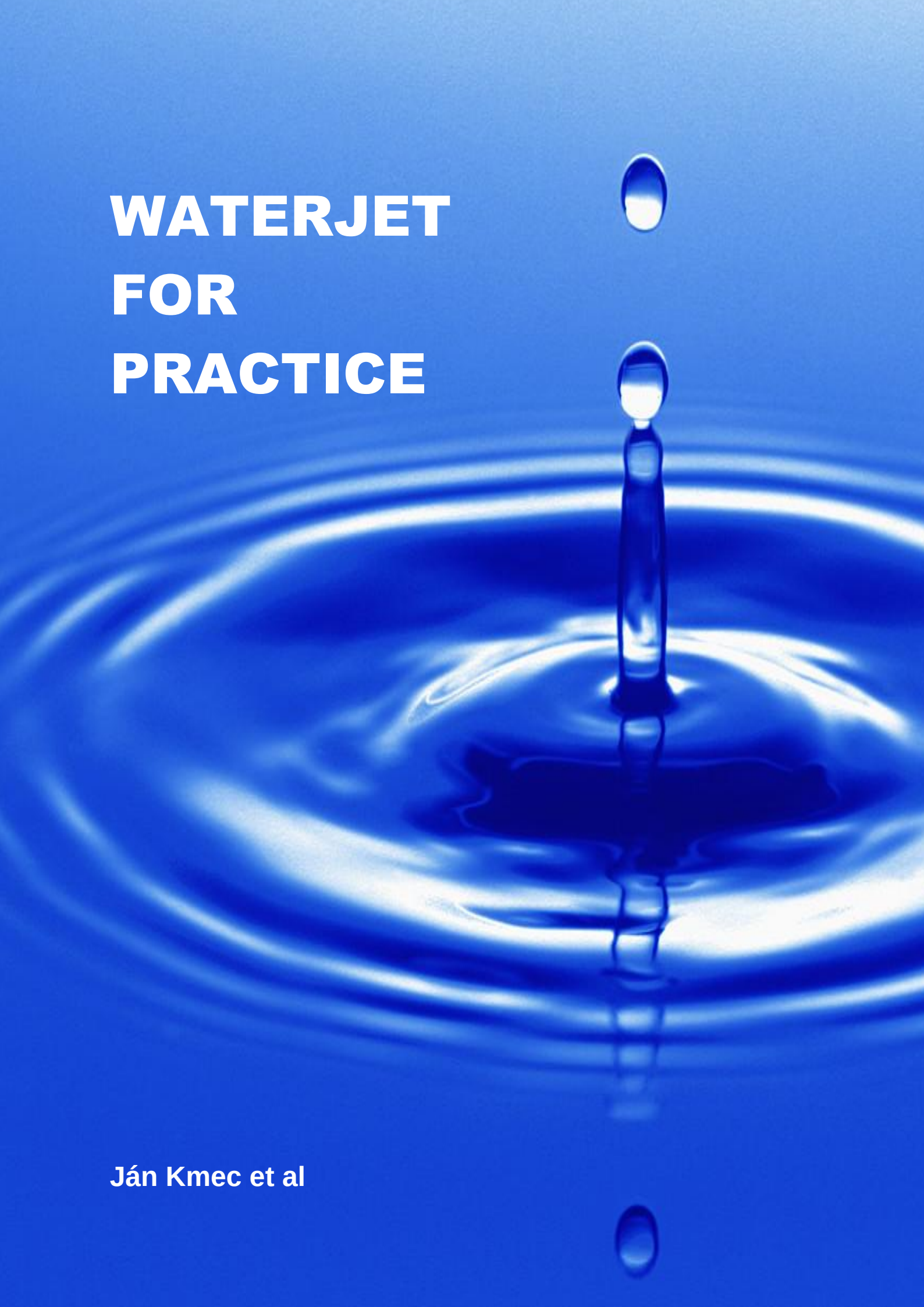
WATERJET FOR PRACTICE



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Abstract

The scientific monograph analyses recent state of liquid basic physical properties knowledge, hydrodynamic and hydraulic relations of liquids which are used in water jet technology and it also briefly introduces basic elements of hydraulic systems. It aptly describes scientific techniques of production process simulation and mathematical model creation. The paper comprehensively identifies individual categories of factors primary and secondary affecting performance, quality and price of hydroerosion progressive processes.

In the conclusion, the authors submit their own scientific and research results and their practical verifications and recommendations for practice.

The monograph is for scientific and research people in managerial, economic and technical scientific area.

Key words: *Progressive hydroerosion process, Hydroerosion categories and factors for AWJM.*

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INTRODUCTION

Power of water in a form of erosion has acted in nature for milions of years. High pressured water jet cutting – known also as *Jet-Cutting* – has been developed continually for several decades. An important motion for water jet use in manufacturing technology as a tool has come from aircrafts and space industry.

Water jet cutting technology represents high performance and shape cutting suitable for all materials. The best advantage of this technology in comparison to other cutting methods is a cold cutting process. It is used when chipless, chip and thermic production techniques provide due to mechanical and/or physical reasons unsatisfying results or they fail.

To sum up, the kinds of water jet technology can be classified according to the graphical model (Fig 1) named as „Water Jet Cutting Complex Model 1“, in abbreviation „KMWJC1“. They can be also sorted also according to the press diagram (Fig 2) for water pressure applications depending on the high-pressure pump performance and quantity of high-pressured water.

The given classification created in a firm WATING in Prešov in cooperation with Department of Technologies and Materials of Faculty of Machinery (Technical University in Košice), was formed on the base of practical knowledge from 1985 till today. Water jet as a new, inventional and progressive technology was introduced and developed in Slovakia, at that time in Czechoslovakia, 25 years ago within a scientific and manufacturing association MVVZ ROBOT Prešov.

The given classification for water jet technology in Fig 1 can be characterized also as jet technological water methods or as water jet technology, as normally used by internationally reputable research and technical community as well as by development and technology experts.

Nowadays, a perpendicular cutting area of very high quality, dimensional accuracy of a cutting shape and relatively high cutting speed can be obtained by water jet technology using values of pressure 350 MPa – 620 MPa for stationary high pressure pumps and 0,5 MPa – 320 MPa for mobile pumps.

Other technological methods, cutting abrasives and technological modifications, which definitely substantially extend application potentiality of this technology, are being developed.