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THE AERODYNAMICS AND PROCESS IN THE VORTEX CHAMBERS.

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At present, the vortex chambers are widely used in the existing technological process and new technologies are appeared on its base. Such usage should be more effective if there are the methods of the aerodynamics and process in the vortex chambers calculation. In literature it is known separate researches of the aerodynamics and process in the vortex chambers, made by different authors. There are also the methods of the aerodynamics different sides calculation.

Suggested monograph is distinguished itself by the systematic character these problems complete set and completion of the considering. Here it is researched incompressible and compressible flow of the mono-phased medium, and two-phased medium motion as well. All problems are considered theoretically and experimentally, are given methods process calculation and its realization in the form of programs for computers, are given practical recommendations.

The monograph consists of 10 chapters. The first 6 chapters are devoted to mono-phased medium the chapters from 7 to 9 are devoted to two-phased medium, and the 10-th one - to atmosphere vortexes. In the first part the author has received numerical and analytical solutions for Navier-Stockes equations in the one-two-dimensional model of the vortex chamber. It has permitted him to create the method of the incompressible (the 5-th chapter) and compressible (the 6-th chapter) flow in vortex chambers calculation. The fourth chapter is devoted to the experimental researches of the vortex chamber aerodynamics, which are based on the systematical researches, generally by the author himself. The results of the experiments are tabulated and given in the appendixes. The author spared much attention to the truth of the measurement results, that is why given data can be used not only as a bank of data for the further theories but also as the based material for control of the new experiments.

Apparently, here it is for the first time considered the calculation of the compressible flow and it is received the results not only speed and pressure but for density, temperature and other parameters as well. It is of large, practical interest considered in this work the problem of vortex chambers optimization and criteria for its modeling.

In the monograph it is systematized representations on the interaction of the particle and flow in the vortex chamber and received the results for different regimes of the particle motion in the fluid. On this base it is considered the problems of gas clearing for different kinds of separators and, that is very important, it is developed the method of the separation efficiency calculation, which is given in the form of the program-me for computer. It permits to calculate the efficiency of dust separators, not resorting to its testing. It is also considered here the mechanics of rotating and weighted layers. Received methods of process calculations will permit to use more effectively vortex chambers in industrial scales.

The book will be of interest for meteorologists the results, received for tornado. The methods of the whirlpools calculation when outflow from reservoirs can be practically adopted in technique.

The monograph is written in the clear language, it abounds in experimental results and calculations on the whole and will be interest for students and specialists.

C O N T E N T S

The corrected in January 2010 book (Smulsky J.J. The Aerodynamics and Processes in the Vortex Chambers. - Novosibirsk: Publishers "Science". - 1992. - 301 p. (In Russian)) *can be copied in a djvu-format here:* http://www.ikz.ru/~smulski/Aerpro/aerpro.djvu. The computer *programs to the book on the FORTRAN* can be copied here: http://www.ikz.ru/~smulski/Aerpro/PrgrmAVC.rar. Information about program in Russian see: http://www.ikz.ru/~smulski/Aerpro/ReadMe.pdf .