
Prospects in combined turbomolecular vacuum pumps development

© K.E. Demikhov, N.K. Nikulin, E.V. Svichkar

Bauman Moscow State Technical University, Moscow, 105005, Russia

The paper presents the analysis of general approaches for high-vacuum pumping systems choice depending on service conditions, which is essential to provide dry vacuum system pumping that is determined by various technological processes. It describes the main structures of modern combined turbomolecular vacuum pumps. Generally molecular flow parts as forevacuum stages are mounted in the researched combined turbomolecular vacuum pumps. The analysis of prospective developments in the researched pumps has been carried out as well. Molecular – viscous flow parts that have a number of advantages in comparison with molecular flow parts are considered as an alternative to molecular stages.

A gas flow in molecular stage channels of a combined turbomolecular vacuum pump in a viscous flow mode has been investigated by means of STAR-CCM+ fluid dynamics software package. Design parameter are provided for the whole turbomolecular vacuum pump flow part taking into account the effect of running clearances between a pump stator and its rotor.

Keywords: *molecular vacuum pump, molecular-viscous vacuum pump, vacuum, viscous flow mode, gas flow, screw channel, geometrical parameters.*

Demikhov K.E., D. Sci. (Eng.), Professor, Head of the Vacuum and Compressor Equipment Department of Bauman Moscow State Technical University, Scientist of Russian Federation. Author of more than 170 publications.

Nikulin N.K. (b. 1946) graduated from Bauman Moscow Higher Technical School in 1970. Ph.D., Assoc. Professor of the Vacuum and Compressor Equipment of Bauman Moscow State Technical University. Working in the field of vacuum technology more than 32 years. Author of over 100 scientific proceedings.

Svichkar E.V. graduated from the Bauman Moscow State Technical University in 2005. Assoc. Professor of the Vacuum and Compressor Equipment of Bauman Moscow State Technical University. Baumann. Working in the field of vacuum technology 8 years. Author of 15 scientific papers. e-mail: svic@bk.ru
