

## STATIC AND DYNAMIC ANALYSIS OF IMPULSE GAS SEAL

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Impulse seal is the type of non-contacting seal. Work of seal is based on the creation of a high-frequency pulse pressure in handling the cells. In this case it receives the name of pulsed compaction. It consists of an axially movable ring, closed chambers, a rotating wear band and radial feeders.

There are two steps of calculation of impulse gas seal system. They are static and dynamic analysis. The static one includes the construction of the static characteristics. They are dependence on clearance and leaks. The coefficient of the hydrostatic hardness is determined during this step.

The static analysis is based on the equation of the axial rotor equilibrium and on the equation of expenditure balance in the elements of a hydraulic canal.

The dynamic analysis consists of three steps. The first one is to estimate the amount of own frequency of axially movable ring fluctuations. The second step is construction of the amplitude and phase frequency characteristics. The last one is the most important step. It is the analysis of dynamic stability.

The dynamic analysis is based on the equation of the rotor axial fluctuations and the equation of expenditure balance.

The advantages of impulse gas seals are reversibility, low sensitivity to physical properties of sealing fluid, ensuring good heat sink, no restrictions for the rotation frequency. The main disadvantage of this type of seals is the tube feeders presence, because of danger of clogging up.

Impulse seals successfully operate on pump shafts, at thermal and nuclear power stations, in turbo-pump aggregates, engines, launch vehicles, as well as pumps at petrochemical plants. The use of it saves energy and improves environmental safety.

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