Loading Factor Performance of a Centrifugal Compressor Impeller: Specific Features and Way of Modeling

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Abstract : A loading factor performance is necessary for the modeling of centrifugal compressor gas dynamic performance curve. Measured loading factors are linear function of a flow coefficient at an impeller exit. The performance does not depend on the compressibility criterion. To simulate loading factor performances, the authors present two parameters: a loading factor at zero flow rate and an angle between an ordinate and performance line. The calculated loading factor performances of non-viscous are linear too and close to experimental performances. Loading factor performances of several dozens of impellers with different blade exit angles, blade thickness and number, ratio of blade exit/inlet height, and two different type of blade mean line configuration. There are some trends of influence, which are evident – comparatively small blade thickness influence, and influence of geometry parameters is more for impellers with bigger blade exit angles, etc. Approximating equations for both parameters are suggested. The next phase of work will be simulating of experimental performances with the suggested approximation equations as a base.

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Keywords : loading factor performance, centrifugal compressor, impeller, modeling

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