

## Isentropic Flow Calculator Program for Different Types of Gases

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There are numerous modern-day applications of isentropic flow in both natural and industrial processes. This paper is about the design of an isentropic flow calculator that can be used to calculate isentropic flow parameters for different types of gases. Calculators for isentropic flow calculations have already been developed but most of them are limited to air which is the only gas whose isentropic flow properties at different sonic conditions has already been tabled and documented. For this reason, we developed an isentropic flow calculator program that will make it easier to come up with solutions for most of the problems encountered in real life both in the classroom and in the industry. The software is programmed in the Java language which offers numerous advantages over other programming languages. Testing of the software's capability was done by comparing its tabular output for air against the available tables and confirmed that they were a match. The program uses the basic equations of compressible fluid flow analysis to output data which includes the Mach number, the area ratio, whether flow is subsonic or supersonic, pressure ratio, density ratio among other information. This output is not limited to air as a gas only but applies to all Ideal gases and more can be added to the list if the gas properties are known. The net result is a program that reduces the time spent on calculating flow parameters and also improves on the accuracy of the data required.