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Jet engine and fan noise

Computer-Based Estimation Procedure for Single-Stream Jet Noise.

Predict jet noise levels with Data Item 98019

The problems associated with the estimation of noise levels from jet engines are of particular concern to operators of jet-powered aircraft. There is a need to predict jet noise levels at many jet operating conditions.

Data Item 98019 provides a computerized method for estimating exhaust noise spectra from a given database. The variables considered in the interpolation/extrapolation routine on which this method is based make the procedure particularly applicable to estimating noise from a single-stream jet.

The major advantage of this method over earlier graphical approaches is the ease with which the database may be altered. This means that new data can be used as they become available without modification to the computing procedure. The database used need not be restricted to data for isolated single-stream jet but could include installation effects as well as other components of single-stream engine noise. The computation involves a least-squares surface fitting procedure that may be of bi-linear or bi-quadratic form. Appropriate weighting of the data is included.

Consider These Facts

The ESDU Engineering service is provided to all customers with an online subscription and includes:

- All new releases and amendments within your subscription.
- Customer Support for access and computer issues.
- Direct access to the engineer who will assist with Technical Issues.
- Training on the use of ESDU products.



To provide a basic prediction procedure for the estimation of far-field, jet mixing noise from static jet engines with circular nozzles, a comprehensive database is provided. The computer program may be used with the provided database or a database generated from the user's data. A computer program to generate a database from the user's data is also provided.

PREDICTION OF NOISE GENERATED BY FANS AND COMPRESSORS IN TURBOJET AND TURBOFAN ENGINES

Data Item permits the user to estimate the noise generated by axial-flow fans or compressors in turbojet and turbofan engines with and without inlet guide vanes. Sound pressure levels in one-third octave bands in the frequency range of 50Hz to 10000Hz are calculated for lossless free-field ambient conditions. The main parameters that need to be specified are the mass flow rate, the total temperature rise across a fan stage, the design point and the operating point values of the rotor tip inlet Mach number and certain data about the fan geometry.

RECOGNIZED BY AIRCRAFT AUTHORITIES AROUND THE WORLD

ESDU data and methods are recognized by bodies such as the FAA, CAA, JAA, EASA et cetera. The aircraft certification process involves review by a Designated Engineering Representative (DER). When recognized methods from ESDU are used, this process can be dramatically streamlined saving time and money for the sponsoring company.

For more information www.esdu.com

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