

New fan standard for energy efficiency

by Mike Duggan, Secretary, ISO/TC 117, Fans

When the ISO technical management board passed a resolution this year encouraging technical committees for energy-intensive industries to launch standardization on energy efficiency, the ISO technical committee ISO/TC 117, Fans, was already a year into producing their own standard – ISO 12759, Efficiency classification for fans.



Example of an axial fan installation.

Time is energy

The last decade has seen not only an escalation in the price, but also an increasing awareness of the finite life of many fossil fuels. There is also a growing desire to minimize carbon dioxide emissions to restrict global warming. This has led many countries to look closely at their energy usage.

To maintain economic growth, there is therefore a need to promote energy efficiency. This requires better

selection of equipment by users and better design by manufacturers.

Fans of all types are used for ventilation and air conditioning, for process engineering (such as drying, cooling and combustion air supply) and for agriculture. Indeed, the energy usage by fans has been calculated to be nearly 20 % of the total usage of electricity in Europe – second only to pumps. This figure is similar in the USA and other developed countries.

In Europe, the Directive on the Eco-design of Energy-using Products (EuP) conducted several preparatory studies to examine different product types. The study for fans – known as “Lot 11” – has looked in detail at the entire fan market for the past three years.

This study, and the raised awareness of energy efficiency, inspired the UK fan manufacturers’ trade association to propose the development of a new ISO standard on energy classification for fans. And it wasn’t just Europe. There was immediate support for the proposed new standard from the USA, where energy efficiency is also heading industry agendas. Australia and China are also conducting research into improving and classifying efficiency.

A global industry

The fan industry is global, with a considerable level of exporting and licensing. This makes it highly desirable that any standards produced can be implemented on a worldwide basis, and that there should be a unique set of recommendations.

The industry believes that there is now a widespread need for recog-

niton of minimum efficiency standards. To encourage their implementation, a classification system was proposed which incorporates a number of efficiency bands. It is anticipated that with the passing of time the lower bands could be withdrawn. With improvements in technology, higher efficiency bands may need to be added.

As concerns the future ISO 12759, national differences or priorities have been taken into account. For instance, in Europe, the requirement is mostly for motor and fan impeller combinations, whereas in the USA the majority of fans are sold as bare shaft fans with the motor or drive mechanism being supplied separately. The ISO standard sets fan efficiency grades (FEG) for both bare shaft fans, and fan-motor efficiency grades (FMEG) for driven fans.

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The classification of fan efficiency grades and fan-motor efficiency grades is based on the fan energy efficiency, commonly referred to as the overall efficiency. This is the ratio of the energy the fan delivers to the air, to the energy delivered by the motor.

About the author



Mike Duggan is the Secretary of ISO technical committee ISO/TC117, Fans. He graduated with a First Class Honours degree in Mechanical Engineering

from Swansea University in 1978, and since 1990 has been the Technical Manager of the Federation of Environmental Trade Associations (FETA), a part of which is the Fan Manufacturers Association.



Assembly of a 6 megawatt mixed-flow fan.

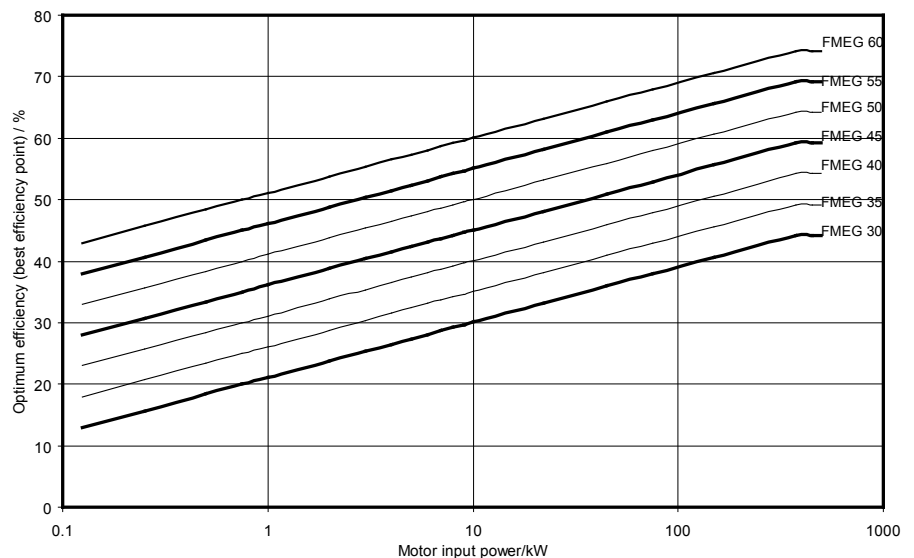
The standard contains several graphs showing efficiency grades against fan diameter for bare shaft fans and efficiency grades against input power for driven fans.

Quite early into the standard's development, the European Commission expressed a keen interest, as they saw that it could offer a good way of showing compliance with their EuP directive. Similarly, both the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and Air Movement and Control Association (AMCA) International in the USA intend to use the methodology in their standards and regulations.

Transparency and flexibility

So what practical difference will ISO 12759 make? The classification system of efficiency bands will lead to greater transparency of a fan's energy efficiency. Future energy labelling requirements coming from legislation will further aid that transparency. And with future improvements in technology and manufacturing processes, the minimum efficiency grades may be reviewed and increased in time.

Members of ISO/TC 117, Fans, still have some work to do before the standard is published, but they have been pleased with the level of interest the stand-



Example of efficiency grades for motor-driven axial fans.

ard has prompted so far. For instance, the latest efficiency working group meeting in Madrid, Spain, was the largest of any recent ISO/TC 117 meeting – a testament to how seriously people are taking energy efficiency.

It would appear that this standard is going to benefit just about everyone. Manufacturers will benefit from a standardized methodology to follow. In addition they will benefit from a scale of energy grades to aim for. Users and specifiers of fans will have an easy-to-use system for choosing a fan based on its efficiency. Legislators will be able to refer to the new ISO standard when setting energy targets in directives and reg-

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ulations. And ISO will have a standard which meets their goals.

Nobody believes that energy efficiency targets will remain constant. Both users who have to pay for the energy to run the fans and legislators who want to push the boundaries will be looking for incremental increases in efficiency levels. The standard, which is expected to be published in 2010, has been developed in such a way as to meet and evolve with industry's changing needs. ■