# STRATEGIC BUSINESS PLAN
# ISO/TC 142

## EXECUTIVE SUMMARY

ISO Technical Committee 142 “Cleaning equipment for air and other gases” was created in 1970. The TC has been in stand-by from 1976 since its reactivation in the middle of 2005, nearly 30 years later.
Starting from 2005 the activity of the TC is continuously increasing and several national delegations are participating in the standardization work.

The committee addresses a large spectrum of applications, some more traditional and others fairly new; for this reason, the scope of the TC has been enlarged to include the new applications such as UVC and bio-filters technologies.
Cleaning equipment for removing particulate and gaseous matter from the air and from other gases is used in HVAC systems (residential, commercial and industrial use) and gas turbines. Dust control and separation technologies are used mainly to treat exhaust fumes coming from industrial activities.
It is difficult to quantify exactly the size of these markets due to the large number of uses and of equipment manufacturers; many of them are small and medium enterprises. Conservative estimates would place the overall size around 50 billion dollars per year.

The main objective is to develop a family of international standards to address the need of normalized test methods for assessing the performance of air cleaning devices. The devices to be assessed are:

- general ventilation filters for residential and commercial applications;
- EPA, HEPA and ULPA filters;
- gas-phase removal devices;
- residential, commercial and industrial air cleaners.

International standards are needed to drive to development of the global market and support the evolution of the products. New markets are becoming more and more important, besides the traditional European and American markets. The expansion of the economy in Asia is driving the growth of the air cleaning equipment market. During these years the TC has developed some standards for many important topics, such general ventilation (ISO 16890) and HEPA and ULPA filters (ISO 29463) in order to go beyond the previous situation in which different and somewhat conflicting standards were used in the different parts of the world.

Especially the new ISO 16890 standard provides the first opportunity for global harmonization as it proceeds to replace the two existing localized standards: ASHRAE 52.2 which is dominant in USA and EN779:2012 which is dominant in Europe. Both standards coexist in Asia and the Middle East.

# 1. INTRODUCTION

## *1.1 ISO technical committees and business planning*

The extension of formal business planning to ISO Technical Committees (ISO/TCs) is an important measure, which forms part of a major review of business. The aim is to align the ISO work programme with expressed business environment needs and trends and to allow ISO/TCs to prioritize among different projects, to identify the benefits expected from the availability of International Standards, and to ensure adequate resources for projects throughout their development.

## *1.2 International standardization and the role of ISO*

The foremost aim of international standardization is to facilitate the exchange of goods and services through the elimination of technical barriers to trade.

Three bodies are responsible for the planning, development and adoption of International Standards: ISO (International Organization for Standardization) is responsible for all sectors excluding Electrotechnical, which is the responsibility of IEC (International Electrotechnical Committee), and most of the Telecommunications Technologies, which are largely the responsibility of ITU (International Telecommunication Union).

ISO is a legal association, the members of which are the National Standards Bodies (NSBs) of some 164 countries (organizations representing social and economic interests at the international level), supported by a Central Secretariat based in Geneva, Switzerland.

The principal deliverable of ISO is the International Standard.

An International Standard embodies the essential principles of global openness and transparency, consensus and technical coherence. These are safeguarded through its development in an ISO Technical Committee (ISO/TC), representative of all interested parties, supported by a public comment phase (the ISO Technical Enquiry). ISO and its Technical Committees are also able to offer the ISO Technical Specification (ISO/TS), the ISO Public Available Specification (ISO/PAS) and the ISO Technical Report (ISO/TR) as solutions to market needs. These ISO products represent lower levels of consensus and have therefore not the same status as an International Standard.

ISO offers also the International Workshop Agreement (IWA) as a deliverable which aims to bridge the gap between the activities of consortia and the formal process of standardization represented by ISO and its national members. An important distinction is that the IWA is developed by ISO workshops and fora, comprising only participants with direct interest, and so it is not accorded the status of an International Standard.

# 2. BUSINESS ENVIRONMENT OF THE ISO/TC

## *2.1 Description of the Business Environment*

The following political, economic, technical, regulatory, legal and social dynamics describe the business environment of the industry sector, products, materials, disciplines or practices

related to the scope of this ISO/TC, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standards:

The scope of the Technical Committee is broad and several different business environments are included.

First of all, a standard dealing with terminology (ISO 29464) has been developed and is continuously updated to establish a common basis and language for the air filtration and separation area.

In the case of air filters for removing particulate matter used for HVAC applications (normally referred to as general ventilation filters) the new ISO 16890 was published with the hope of becoming a global standard. The ISO 16890 standard introduces a new classification system based on ePM efficiency, in this way the performance of filters can be related more directly than with previous standards to the available air pollution data improving the credibility and reputation of air filters for general ventilation.

Usually the performance assessment made in the laboratory is useful to compare different products available on the market but it is not able to supply reliably what end users are mainly interested in, i.e. the actual behavior of in-service filters.

The evolution of technology has made possible to measure the performance of filters when and where they are in service. The ISO 29462 standard gives the end users a test method in order to assess the reliability of the filtration equipment, thus improving the acceptance and the use of air cleaning equipment.

In order to give an answer to increasing requests about sustainability, TC 142 is developing the ISO 12249 series standards concerning Energy Rating, Life Cycle Cost and Life Cycle Assessment and this will be one of most important jobs in the next years.

Moreover, in order to allow end users to choose freely on the market and to minimize the number of air filters stored in the warehouses of manufacturers it would be useful to standardize the face dimensions of air filters for general ventilation.

About filters with high efficiency the ISO 29463 standard has fixed the lack of only one ISO Standard covering the measurement of performance of HEPA and ULPA filters inside the laboratory. At the moment there are only little differences in the classification systems of EN 1822 and IEST (Institute of Environmental Sciences and Technology) recommended practices (RPs). The availability of an ISO standard in this area could allow to set some clear quality requirements for this true global market, allowing end users to rely on sound data to choose HEPA and ULPA filters (used in many critical applications like nuclear plants, hospitals and high technology manufacturing facilities).

Also for high-efficiency filters, mainly in some industrial applications where radioactive or toxic contaminants are present, the performance assessment made in the laboratory could be not enough. The ISO 16170 standard gives the end users a test method in order to assess the actual behavior of in-service filter systems.

In many applications, it is critical to remove gas-phase pollutants (i.e. acid gases, volatile organic compounds, etc.). ISO 10121 series standards have been developed to assess the dynamic (i.e. removal efficiency as a function of time) performance of gas-phase contamination removal equipment for HVAC applications.

Air filters are used also inside the intake of gas turbines power generation units. These filters are usually tested according to the general ventilation protocol with some modifications that make very difficult for the end user to have a clear comparison of different test reports. ISO 29461 series standards are under development to give the market an adequate assessment method also considering the extreme possible application in term of

humidity (i.e marine and off shore applications). Both static and cleanable filters are going to be covered.

Industrial air cleaning and dust control is a very important issue for environmental impact and business size. It would be important to make every effort to develop some standards useful to characterize the performance of industrial cleaning devices and cleanable filter media.

The Technical Committee has to pursue the standardization also in the case of “active” devices.

Research projects carried out in the last decade have shown that UV-C lights can be effective in neutralizing micro-organisms, but their effectiveness should be proved in order to rely on these products to actually kill the bio-contamination entering HVAC systems. Some standards are already under development and ISO 15858 has been issued in order to consider the safety point of view due to the allowable human exposure.

Another exciting challenge is the standardization of Biological equipment for waste gas treatment recently dealt with.

Electrostatic precipitators (sometimes called electronic air cleaners or electrostatic active filters) have been used for many years in industrial applications and are increasingly used in HVAC applications too, due to their low air flow resistance and good efficiency for fine particles like ETS (environmental tobacco smoke). The lack of a standardized test method for these devices prevented any possibility to compare their performance with the filters made up of fibrous media. The preparation of an ISO standard about this subject would allow a correct competition between these different technologies.

### *2.2 Quantitative Indicators of the Business Environment*

The following list of quantitative indicators describes the business environment in order to provide adequate information to support actions of the ISO/TC:

Recent studies indicate a world air filter demand between 10 and 20 billion USD in 2018 only for HVAC applications, growing at a 6% annual rate. Air filters for power generation market is worth other 20 billion USD and considering also filters for industrial applications and bio-filters the global filtration marked could be evaluated about 50 billion USD.

An approximate regional partition is 40% Pacific Area (APAC), 30% Americas and 30% Europe, Africa and Middle East (EMEA)

Ongoing investment in power generation infrastructures and increasing request of clean air for industry and people health will also support filter demand in the next future.

It is estimated that more than 500 companies are involved in the scope of ISO/TC142.

In the world there are several standards locally adopted so, often, product developed in Europe are not suitable in America and vice-versa. Most of last standards issued by TC 142 could be adopted in the whole world going beyond that market limitation.

Free access to the global market and needless of more tests on filters could save an important amount of money, facilitating competition and lowering price level.

Several organizations and governments, mainly in Europe where ISO standards developed with CEN under the Vienna Agreement are officially adopted as National Standards, take ISO TC 142 standards as basis for their regulations.

At the moment, most of the Countries represented in the ISO TC 142 are adopting as National Standard the ones developed by the TC.

## 3. BENEFITS EXPECTED FROM THE WORK OF THE ISO/TC

The standards produced by ISO/TC 142 will mitigate much of the confusion caused by a multiplicity of national standards in the industries served by the Technical Committee (TC). Additionally, by producing a "family" of standards related to the performance of air cleaning equipment, the TC will have eliminated much of the duplication of effort, time, and resources currently spent in producing and updating national standards.

The world-wide community of users of the standards will benefit by having the ISO standards available as references. National standards-writing bodies or their agents can then address the specific needs of the various industries in writing more specific guidelines for those industries.

## 4. REPRESENTATION AND PARTICIPATION IN THE ISO/TC

### *4.1 Membership*

Countries/ISO member bodies that are P and O members of the ISO committee

### *4.2 Analysis of the participation*

The participation in this TC is quite wide. In over ten years after the re-activation of this TC the number of P-members has continuously increased. The plenary meetings are usually attended by the delegations of about 12-13 P-members.

The intention is to involve also other emerging economic areas and countries like India and Turkey.

Looking at the map of P and O member it is possible to note the absence of most south of the world countries. Maybe that depends on other priorities than air filters, although air filtration business could be a symptom of increasing quality of life, connected i.e. to energy production or improved medical care.

Internal liaison with the ISO/TC 142 are:

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| IEC/TC 59 | Performance of household and similar electrical appliances |
| ISO/TC 22/SC 34 | Propulsion, powertrain and powertrain fluids |
| ISO/TC 23 | Tractors and machinery for agriculture and forestry |
| ISO/TC 24/SC 4 | Particle characterization |
| ISO/TC 85/SC 2 | Radiological protection |
| ISO/TC 86 | Refrigeration and air-conditioning |
| ISO/TC 94 | Personal safety -- Personal protective equipment |
| ISO/TC 118/SC 4 | Compressed air treatment technology |
| ISO/TC 127 | Earth-moving machinery |
| ISO/TC 146 | Air quality |

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| ISO/TC 146/SC 1 | Stationary source emissions |
| ISO/TC 192 | Gas turbines |
| ISO/TC 205 | Building environment design |
| ISO/TC 209 | Cleanrooms and associated controlled environments |
| ISO/TC 229 | Nanotechnologies |

International organizations in liaison with the ISO/TC142 are:

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| CIE | International Commission on Illumination |
| ETN | European Turbine Network |
| EUROVENT | European Committee of Air Handling and Refrigeration Equipment Manufacturers |

## 5. OBJECTIVES OF

## THE ISO/TC AND STRATEGIES FOR THEIR ACHIEVEMENT

### *5.1 Defined objectives of the ISO/TC*

The TC elaborated a package of International Standards in the general ventilation and high efficiency air filters sector including the assessment of their performance and continuously work in order to keep them updated.

The TC established a basic terminology for the industry addressing cleaning equipment for air and other gases.

Industrial air cleaners as “new” cleaning systems, like UV and biofilters, are being treated according to the requests of P-members.

### *5.2 Identified strategies to achieve the ISO/TC’s defined objectives*

Every effort is made to minimize the time and work necessary to write and keep updated the above standards mentioned.

The documents necessary to develop the International Standards are made available to qualified experts on the ISO Livelink web site.

The structure of the TC is kept as simple as possible to minimize the number of meetings and of documents necessary to produce the International Standards. Whenever possible working group meeting are organized in conjunction with international conferences and/or exhibitions. Working groups take also advantage from the ISO web conference tool.

To work efficiently and effectively, ISO/TC 142 organizes once a year a meeting week in which as much as possible the meetings of working groups take place in conjunction with the plenary meeting.

Mail ballots are used to speed up the procedures necessary to move on the documents along their way.

## 6. FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE ISO/TC WORK PROGRAMME

The structure and working practices adopted by ISO/TC142 allow the ongoing of the activities in a reasonable manner.

However, the main factors that affect the smooth progression and completion of the work programme can be reassumed as:

- Many of the convenors, experts and project leaders come from the industry and the time they can devote to the standardization activity is sometime in conflict with their work
- Some working groups (especially those dealing with new technologies like UV and biofilters) suffer from a limited number of participants.
- The development of ISO 12249 series concerning the energy rating and life cycle cost is dependent upon funding being available to undertake the necessary pre-normative research.
- The number of active working groups has increased significantly over the last years and this is a challenge for members to keep focus and discipline.

## 7. STRUCTURE, CURRENT PROJECTS AND PUBLICATIONS OF THE ISO/TC

### Information on ISO online

The link below is to the TC's page on ISO's website: ISO TC 142 on ISO Online

Click on the tabs and links on this page to find the following information:
- About (Secretariat, Secretary, Chair, Date of creation, Scope, etc.)
- Contact details
- Structure (Subcommittees and working groups)
- Liaisons
- Meetings
- Tools
- Work programme (published standards and standards under development)

### Reference information

***Glossary of terms and abbreviations used in ISO/TC Business Plans***

***General information on the principles of ISO's technical work***