Standardization in the Field of Industrial Air Technology

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Introduction

Standards dealing with Industrial Air Technology (IAT) are very fragmented, and a real need exists for new standards this very important field. These are required to facilitate trade and communication in this important area. Clarification of the requirements for these proposed standards is necessary before any new technical committee (TC) can be established, or before new work could be allocated to any existing TC.

Since 1996, there has been little discussion about new activities, a few work items on related subjects have however commenced under existing Technical Committees. This subject was discussed at the January 1996 INVENT Seminar, which was published in the seminar proceedings (1). Earlier The subject was also covered introduced in the INVENT News.2/1995 (2)

Standards in the "Jungle" of Normative and Voluntary Documents

Design tools are required during the various stages of the design process, from the design brief to the completed project. It is essential that the procedures for commissioning and operation/maintenance are defined in the design stage, typical factors being:

- weather data summer and winter for the climatic area
- physical and mathematical models for load calculation
- duct design programme
- verification of the product characteristics for the equipment selected
- checklists for commissioning procedures
- energy requirements and the associated audits
- air and water and environment audits

Document Classification

In any design and construction process, documents which have different status have to be considered, with attention to their actual category:

- laws and directives
- regulatory requirements, such as OEL values
- **standards related to current and proposed legislation (harmonized European standards)**
- **standards not related to legislation (majority of CEN and ISO standards)**
- guidelines, codes of good practice
- reports – such as INVENT reports, handbooks
- calculation methods available, models and databases

Several international, regional, national or local documents must be considered and interrelated as appropriate. These documents may be general, specific, administrative or technical.

Standardisation – Approach to the Problem

There are no common International or European standards existing or under preparation, covering the whole field of IAT. There have been discussions since 1993 regarding preparation of European standards in the field, summarised in (3). Some standards applicable in this field already exist, others are in preparation by different committees. These are, however, very fragmented such as the test method for specific process equipment – drawn up by one Technical Committee (TC), with the air quality aspects being dealt with by another TC.

This lack of coordination results in different terms, definitions, test methods and other important requirements. in "horizontal" fields of applications, with no direct linkage to IAT or to each other.

The essential need for standardisation has been identified by industry, first in Finland in by the INVENT Technology Programme, but the requirements of the complete multidisciplinary field is very fragmented. For industrial applications, standards for specific products are required, which have to run side by side with those necessary for systems, the associated design, commissioning and operation, and finally for the essential terminology, symbols and units.

Present Situation

1. Workload in CEN: Facts about CEN, situation at the end of 1999.

- active Technical Committees (TC's): approx. 270
- active Working Groups (WG's) under TC's: approx. 1500
- standards finalized by end 1999: approx. 5500 (this includes some 300 prestandards and CEN Technical Reports)
- standards in preparation: approx. 8000 (about one third will be Harmonized European Standards, based on a Mandate from EU/ EFTA)

2. Existing work related to Industrial Air Technology - examples

2.1. Target levels, design criteria, design methodology, design tools, system performance, commissioning

- TC 156 Ventilation for buildings/ WG's 6, 7, 8, similar work is ongoing in ISO/TC 205 "Building Environment Design"
- TC 137 Assessment of workplace exposure
- TC 122 Ergonomics
- TC 243 Contamination control technologies

2.2. Process- related work items

- TC 114 Safety of machinery; especially WG 15
- TC 121 Welding (SC 4/ WG 9, for filtration equipment)

2.3. Systems and equipment (examples)

- TC 142 Woodworking machines - safety
- TC 195 Air filters for general air cleaning

- TC 156/ WG's 3,4, and 5 concentrating on non-industrial applications
- TC 207 Furniture (incl. work item on fume cupboards)
- Fans: a basic document has been prepared. A new work item "Explosion protected fans" has been started by TC 305 Potentially explosive atmospheres. ISO/TC 117 has produced a test and terminology standards for industrial fans.

2.4. Measurement methods

- TC 264 Air pollution control/ WG 5 (total dust), WG 6 (PM 10), WG 7 (indoor air). Similar work is ongoing in ISO/TC 146 Air Quality

2.5. General items (terminology, graphical symbols etc...)

- TC 156/ WG 1 (CR 12792, for ventilation and air-conditioning terminology)
- TC 137 (EN 1540, terminology for Workplace Atmospheres).
- TC 195 is working on filter terminology
- ISO/TC 145 and ISO/TC 10 are working on graphical symbols.

Horizontal Requirements – Vertical Problems

The requirements of IAT are multidisciplinary ("horizontal") and must consider several product families, for which standards are developed independently to each other ("vertically"). This structure results in inconsistency, and conflicts with the work of practitioners who have to apply many standards e.g. in plant design will suffer. Therefore consistency throughout the standards as well as in different parts of the Design Guide Book is very important. In symbols and definitions this consistency is extremely important, otherwise only confusion and design errors will result.

Future Recommendations

IAT standardization requirements are not only for products and test methods, but also for systems and services. To allocate such a standardisation project, all associated aspects must be carefully considered, starting with the exact requirements and needs from industry and the end users. Alternative approaches (ENV's, CEN Technical Reports, improved documentation of well-established existing practice into standard format outside CEN or ISO) must also be considered.

For any heating or ventilation system a complete series of standards is required in order to cover the whole life span of the system from the design brief to demolition. In the light of this, a "design criteria" or "commissioning" standard is useless if the rest of the associated standards are lacking or non-compatible. The preparation of standards is carried out by different Working Groups, but when standards are finished, the complete framework must be critically reviewed to ensure harmonisation.

The following key requirements for standards must always be appreciated:

- the standard shall be as complete as necessary within the scope
- the standard shall be consistent, clear and accurate – and understood by a qualified person who has not participated in its preparation
- the standard shall take into account the state-of-art, but also providing flexibility for future technical development.
- the standard shall be acceptable to all member bodies especially in the view of existing national regulations.

References

1. Railio, J., Standards and other design tools. In: Tähti, E. (ed.), Seminar Presentations, January 1996 Helsinki. INVENT Report 53.
2. Railio, J., Standards for industrial ventilation? INVENT News 2/1995.
3. Curd, E., Ventilation in Europe "The work of CEN/TC 156 " Proceedings of Ventilation '97