Standardization of tools for indoor air quality characterization

Sascha Nehr

Outline

(i) Structure and work of ISO

(ii) Current standardization projects related to Indoor Air Quality (IAQ)

(iii) Future ISO projects related to IAQ

About ISO

The International Organization for Standardization (ISO) is an independent, non-governmental membership organization and the world's largest developer of voluntary International Standards.

ISO is a network of 165 national standards bodies. Each member represents ISO in its country, publishes ISO standards and influences the development of ISO standards by participating and voting in ISO committees.

ISO has published more than 20000 International Standards covering almost every industry, from technology, to food safety, to agriculture and healthcare.

ISO in figures (2014)

MEMBERS

NATIONAL STANDARDS BODIES
165

119
MEMBER BODIES

42
CORRESPONDENT MEMBERS

4
SUBSCRIBER MEMBERS

ISO/TC

TECHNICAL BODIES
3 511 comprising

TECHNICAL COMMITTEES
238

WORKING GROUPS
2 592

SUBCOMMITTEES
521

AD HOC STUDY GROUPS
160

MEETINGS

TECHNICAL MEETINGS
In progress – on average, each working day of the year somewhere in the world
19

TECHNICAL MEETINGS IN 2014
1995

NUMBER OF COUNTRIES HOSTING TECHNICAL MEETINGS
46

DEVELOPMENT OF INTERNATIONAL STANDARDS

PORTFOLIO OF ISO STANDARDS
by sector at the end of 2014
20 493

% of International Standards
% of DIS and FDIS

27.4 % 26 %
Engineering technologies

22.7 % 21.5 %
Materials technologies

17.1 % 19 %
Electronics, information technology and telecommunications

10.6 % 9.7 %
Transport and distribution of goods

9.3 % 10 %
Generalities, infrastructures, sciences and services

5.6 % 3.8 %
Agriculture and food technology

4 % 6.1 %
Health, safety and environment

2.5 % 2.7 %
Construction

0.8 % 1.3 %
Special technologies

INTERNATIONAL STANDARDS AND STANDARDS-TYPE DOCUMENTS
published in 2014
1468

NEW PROJECTS REGISTERED
1852

WORK ITEMS
listed on the work programmes of technical committees
4696

WORK ITEMS AT PREPARATORY STAGE
1429

COMMITTEE DRAFTS
1067

DRAFT INTERNATIONAL STANDARDS (DIS) AND FINAL DRAFT INTERNATIONAL STANDARDS (FDIS)
2200

Source: http://www.iso.org/iso/home/about/iso-in-figures.htm

Standard Development

	6 stages	Action	Default path	Shortest path
1	Proposal NP	Proposal to start a new project	NP	NP Straight to DIS
2	Preparatory WD *	Expert consensus within working group	WD	
3	Committee CD *	Committee consensus	CD	
4	Enquiry DIS	National consensus	24 months to reach DIS	12 months to reach DIS
5	Approval FDIS *	YES or NO vote	FDIS	
6	Publication	ISO International Standard	Up to 36 months IS	Down to 9 months IS

* OPTIONAL

ISO/TC 146 Air Quality

Scope

Standardization in the field of air quality, including the setting of terms and definitions, air sampling, measurement technology and reporting about characteristic data.

Subcommittees

ISO/TC 146/SC 1	Stationary Source Emissions
ISO/TC 146/SC 2	Workplace Atmospheres
ISO/TC 146/SC 3	Ambient Atmospheres
ISO/TC 146/SC 4	General Aspects
ISO/TC 146/SC 5	Meteorology
ISO/TC 146/SC 6	**Indoor Air**

ISO/TC 146/SC 6 Indoor Air

Scope of ISO/TC 146/SC 6

- Standardization of any matters within the scope of ISO/TC 146 dealing with indoor air
- Gases, particles, odours, micro-organisms, and emissions from building products and furnishings
- Definition of the indoor environment:

  Dwellings, having living rooms, bedrooms, DIY rooms, recreation rooms and cellars, kitchens and bathrooms;

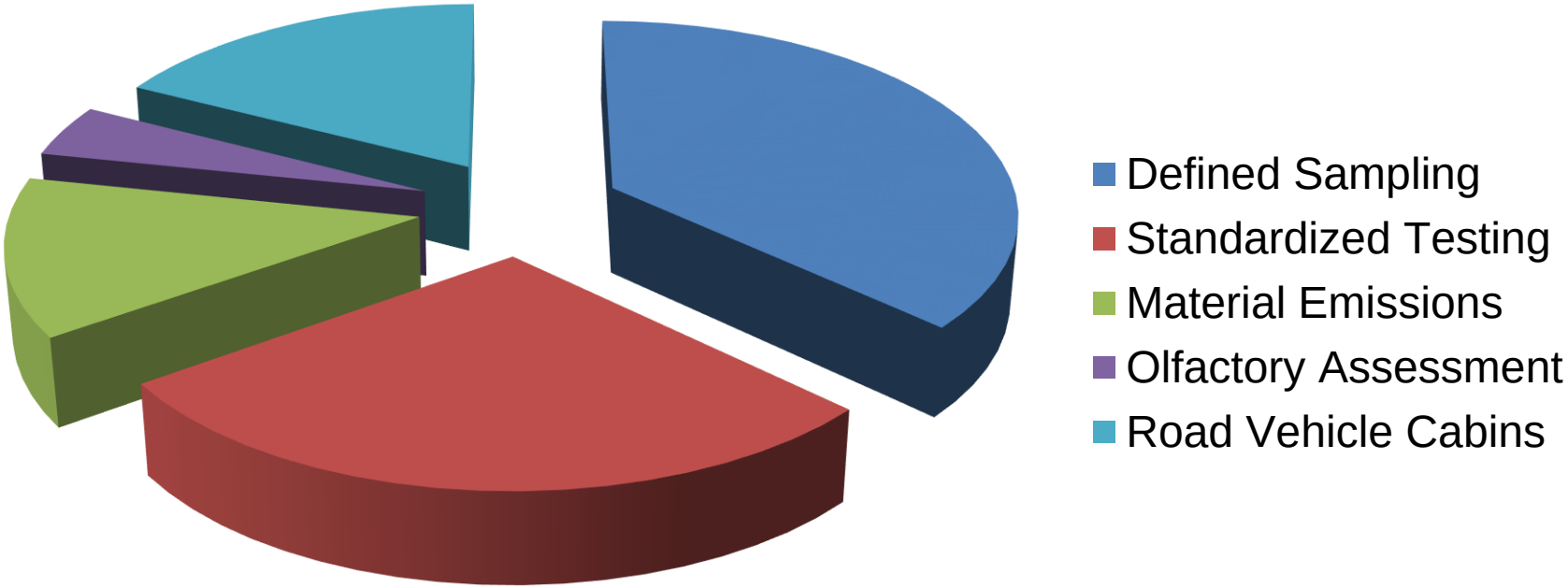
  workrooms or work places in buildings which are not subject to health and safety inspections in regard to air pollutants (for example offices, sales premises);

  public buildings (for example hospitals, schools, kindergardens, sports halls, libraries, restaurants and bars, theatres, cinemas and other function rooms);

  cabins of vehicles

ISO Standards on Indoor Air Quality

Total Number: 50 (41 published)



ISO Standards on Indoor Air Quality

Defined sampling and standardized testing	Material and product emissions	Olfactory assessment
ISO 16000 series: ▪ VOCs ▪ Individual organics – PCB, PCDD, PCDF – Flame retardants, plasticizers – Amines ▪ Carcinogens – Asbestos – Formaldehyde ▪ Moulds ▪ Airborne particles	ISO 12219 series, ISO 16000 series, European Standard prEN 16738: ▪ Construction products ▪ Floor and wall coverings ▪ Furniture and furnishings ▪ Mattresses and bedding ▪ Textiles and leather ▪ Consumer goods ▪ Air purifiers (sorptive media, active cleaners) ▪ Car interior trim	ISO 16000-28 and -30: ▪ Tests performed on site or in labs ▪ Human panel evaluation ▪ Odour acceptability, intensity, hedonic tone Ongoing standardization activities involve the odour assessment in car interiors.

What are the analytical methods of interest for future ISO standards?

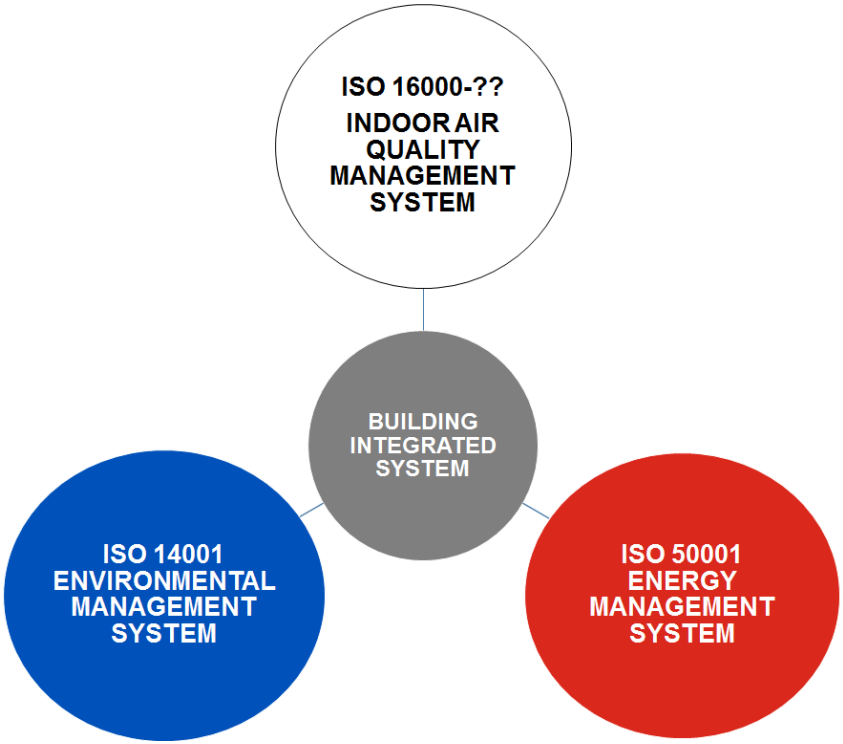
- Determination of carboxylic acids
- Determination of amines, notrosamines, imines
- Congener-specific analysis of organophosphates
- ???

How to predict concentrations of indoor air pollutants?

- Indoor detailed chemical model (INDCM)
  - Carslaw et al., *EST*, **2012**
  - Carslaw et al., *Atmos. Env.*, **2007**
- Interaction with Chemistry and Aerosols (INCA-INDOOR)
  - Schoemaecker et al., *Indoor Air Conf.*, **2014**
- CONTAM
  - National Institute of Standards and Technology
- ConsExpo 5.0
  - National Institute for Public Health and the Environment, NL
- Skin Absorption Model (SAM)
  - Shen et al., *Food and Chemical Toxicology*, **2014**
- ???

How to implement measures for improving indoor air quality?

- International harmonization of product labelling
- Guidance to sustainable construction products
- Elaboration of an Indoor Air Quality Management System



Do we need ISO Standards for the assessment of air quality in other indoor environments?

- Passenger planes
- Railed vehicles
- Watercrafts
- ???

SC 6 Members

ISO/TC 146/SC 6 - Indoor air

Why get involved?

[1] Early access to information that could shape the market in the future
[2] Giving your institution a voice in the development of standards
[3] Keep market access open

Secretariat | Participating Countries (22) | Observing Countries (9)

Thank you!

For future collaboration please contact:
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The Technical Work