International Organization for Standardization
Organisation internationale de normalisation
Международная организация по стандартизации

STRATEGIC BUSINESS PLAN – ISO/TC 24

Executive summary

The scope of ISO/TC 24 covers standardization pertaining to equipment and methods used in particle characterization and size classification of particulate material in solid or liquid state.

Particle size analysis and characterization is intensely used in almost all industrial processes and productions (e. g. production of cement) or other processed material which is ground, milled or crushed.

The chemical process industries alone include large multi-national corporations. Some 80 % of their products, employees, and international trade rely on an accurate knowledge of particle size distribution for success.

Industry environmental agencies, hospitals, and universities all need good procedures for dispersing powders and stabilizing the resulting suspensions in liquid if they are to obtain the accurate particle size distributions vital to fulfilling their production, application, or research functions.

In the past ten years the technology of particle size measurement has changed considerably:

- Many particulate products with new chemical compositions have been introduced (catalysts, reinforcing fibers, superconductors);
- Many major products have been introduced using particles of smaller sizes (ceramics, electronics, photography, nanoparticles);
- Product specifications have become more restrictive, so that more accurate particle size analyses are now required;
- The introduction of inexpensive computers has allowed both novel and more sophisticated methods for measuring particle size distribution;
- New classes of chemicals have been introduced for dispersing powders in liquids (star polymers, dispersants based on group transfer polymerization, geminal multifunctional dispersants).

For example, the availability of thousands of possible dispersing agents and many techniques for deagglomerating powders in liquids has made it very difficult for analysts faced with a new powder to decide which method of deagglomeration and which stabilizing surfactant are likely to be successful in making a stable dispersion of that powder in the liquid used with a specific particle size analysis method. Moreover, standards on tests for particle size analysis and characterization are required for quality assurance, accreditation and certification.

Nanotechnology promises significant social benefits, including enhancements in medical diagnosis and treatment, more efficient energy sources, optimized materials and electronic products and cleaner environment. On the other hand, the comparative lack of scientific knowledge on the effects of nanomaterials has led to concern over the environmental, health and safety risks potentially associated with nanotechnology and its particulate products. International standardization has to ensure that the full potential of nanotechnology is realized and that nanotechnology is safely integrated into society. As a ‘horizontal’ committee, ISO/TC 229 will not develop application specific standards, except where there is clear demand and there is no existing committee with expertise in the area. ISO/TC 24, especially SC 4 Particle Characterization, works with its liaison to coordinate and harmonize the development of measuring methods standards for particles in powders, suspensions, emulsions or aerosols.

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 accurate measurement of particle size distribution is of fundamental importance to process control and quality in many industries, such as:

- Automation Technology,
- Bioprocess Engineering,
- Chemical Nanotechnology,
- Engineering and Reaction Technology,
- Environmental Technology,
- Equipment and Plant Engineering,
- Food Technology and Agriculture,
- Construction and Timber,
- Laboratories,
- Quarries, Sand and Gravel,
- Fossil Raw Materials,
- Materials Technology and Testing,
- Aerosol Process Engineering,
- Molecular Biotechnology,
- Multiproduct Plants,
- Packaging / Tank Cleaning,
- Pharmaceutical Technology,
- Safety Technology,
- Quality Assurance.

Particle size determination is essential in the manufacture of many of today's processed materials. Achieving the optimum particle size can affect the consistency and quality of these materials.

Particle size distributions affect decisions e. g. on whether soil is suitable for construction materials, whether pharmaceutics will dissolve at the rate required for effective treatment, whether particles in the air are likely to penetrate into and remain in the lungs, and whether a bulk material will be free-flowing or will not flow out of a hopper silo.

The field of nanotechnology raises challenges in the health, safety, environmental, regulatory and ethical domains. Risks must be assessed with respect to effects of nanoparticles and other nanomaterials on human health and the environment, leading to a demand for specific metrology tools and standards for the effective measurement of exposure to nanomaterials, and for nanoparticle production methods. Particle characterization methods down to the nanoscale are needed as tools for ecotoxicity studies and in medical fields particularly for analysing and reducing exposure to toxic materials.

The accurate and reproducible measurement of particle characteristics of nanoscale materials is essential for quality and process control, commercial transactions and effective regulation. Scientists, manufacturers, governments, regulators and health and environmental protection

agencies need measurement systems and evaluation protocols supported by well founded and robust standards.

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:

It is not possible to quantify the total scales, total employment or total international trade because of the large numbers of the diverse methods and applications of particle technology as shown in clause 1. Additionally, it has to be stated that the worldwide compilation of scales is not feasible by ISO/TC 24.

For example particles are either the end product of or an important part of the production process for some 80 % of the output of chemical process industry. Particles play a similarly large role in the other industries listed in clause 1.

Due to this importance of particle technology with all its applications, large fairs and exhibitions take place around the world (e. g. ACHEMA with more than 4000 exhibitors and 144.000 visitors from 145 countries, POWTEC with more than 800 exhibitors and 14.000 visitors, POWTEX with more than 215 exhibitors and 18.000 visitors, IPB Powder & Bulk Solids Processing with more than 170 exhibitors and 11.000 visitors, PITTCON, etc.).

3 Benefits expected from the work of the ISO/TC

The guidelines in the standards prepared by ISO/TC 24 should make the process of selecting methods for particle size analysis and characterization more efficient, since it is the combination of experience from many international industrial experts in this area. Since most of the people doing particle size analysis are not well-versed in this field, these standards will save many hours of failure and frustration. Moreover, they omit trade barriers for particle size analysis equipment. Additionally, the standardized products test methods of ISO/TC 24 allow a common assessment of properties of products which is needed for worldwide trade.

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

Major manufacturers of chemicals, manufacturers of instruments to measure particle size, manufacturers of industrial screens, trade groups for the entire particle technology market sector, leading academic laboratories and industrial consultants are represented in the TC.

Major industrial countries from Europe, America and Asia are represented in the TC. These countries mainly produce the equipment and are the main users of particle technology.

5 Objectives of the ISO/TC and strategies for their achievement

5.1 Defined objectives of the ISO/TC

The assigned task of ISO/TC 24 and its SCs is to prepare and to administer standards so that reproducible and reliable particle and particle systems characterization can be made.

5.2 Identified strategies to achieve the ISO/TC's defined objectives

The work items were chosen on priority; parallel work of the SCs and WGs on different methods of particle size analysis. There is no work in CEN, but CEN is referring on standards prepared by ISO/TC 24.

In the field of nanotechnologies SC 4 supports standardization coordination within the liaison to ISO/TC 229 and to CEN/TC 352, e. g. concerning mandate M/461 of the European Commission.

6 Factors affecting completion and implementation of the ISO/TC work programme

Funding of the secretaries of TCs, SCs and WGs is a constant challenge.

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 24 on ISO Online

Click on the tabs and links on this page to find the following information:

- About (Secretariat, Committee Manager, Chair, Date of creation, Scope, etc.)
- Contact details
- Structure (Subcommittees and working groups)
- Liaisons
- Meetings
- Tools
- Work program (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