



STRATEGIC BUSINESS PLAN – ISO/TC 221 'GEOSYNTHETICS'

Executive summary

Geosynthetics are now commonly accepted as solutions to situations in geotechnical engineering projects, with the greatest use of geosynthetics being in the public sector (roads, waterways, coastal defence, landfills etc). and an increasing use in environmental engineering.

In most projects the cost of the geosynthetics used forms only a very limited part of the total project cost, usually between 3 and 5%. The most important driving factor of the market and of standardisation is an economic one. In a number of projects, the use of geosynthetics has resulted in savings of 30% in total project costs. Increasingly geosynthetics are offering unique solutions as well as replacing other more traditional civil engineering components.

The risk of subsequent damage and the consequences of wrong material selection or design are substantial – up to more than 100% of the total project costs. This figure does not take into account the safety risks to people or neighbouring structures should, for example, a reinforced retaining wall or tunnelling fail. It is important therefore to advise professionals not just of the ability of geosynthetics to provide cost effective solutions to many civil engineering problems but how to do this safely and to make the appropriate choices from a widening variety of materials with seemingly overlapping capabilities.

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:

2.1.1 Technological advances in the industry

The geosynthetic industry has evolved with new products being developed regularly. The industry started out as an offshoot of the textile industry but has grown and diversified to include other groups of products such as: geomembranes or geobarriers (including GCL's), geocomposite materials, geogrids, geonets and geocells. This development continues with new classifications of geosynthetics being added annually.

These products have basic functions which are defined as: separation, filtration, drainage, reinforcement, protection and stabilization, also containment (primary and secondary) as well as erosion control and specialties such as use in asphalt reinforcing

The products are used in many applications including: roads and paved areas, railways, earthworks, canals, reservoirs, solid and liquid waste containment, underground structures and tunnels.

The development during the last 35 years of geosynthetics as construction materials has resulted in a lack of adequate national standards in many countries and varying requirements in others creating confusion and barriers to trade in others.

The task of construction quality assurance bodies in assessing and comparing geosynthetic products to see if they meet the required characteristics or fulfill a function is difficult, particularly if the source of the product is difficult to trace.

Over the last 35 years the rapid and widespread application of geosynthetics together with the increasing sophistication of the products, has meant that in many countries, adequate standards for geosynthetics are lacking or non-existent.

2.1.2 Environmental issues

Geosynthetics are durable and generally resistant to degradation, however their inert nature means that the waste or surplus product can be disposed of without the danger of contamination. The permanence of the geosynthetic means that it is often used to assist the environment by its use as a containing barrier for toxic materials. Another environmental aspect of geosynthetics is that the functional lifetime is extremely long, in many cases over one hundred years.

2.1.3 Real or potential barriers to trade related to the scope of the ISO committee

The term stabilization has been misused by the industry for a number of years, a recent development in Europe whereby one manufacturer has sought approval for a product to be used for this function which has potentially excluded other products from this function. In the first instance Technical Reports will be produced describing the design processes that can be used

to design and specify the appropriate geosynthetic material. The intention would then be to upgrade the documents to TS or IS status at the earliest opportunity.

2.1.4 National, regional and international regulations

In Europe, the Construction Products Regulations have to be followed and there is a mandate which sets out the properties to be declared for Geosynthetics in the specific applications. Regulations and specifications for geosynthetics exist in a number of countries. As geosynthetics are construction products, they are subject to the provisions of the Construction Products Regulations within Europe, its interpretative documents and mandates issued on specific topics. In the case of geosynthetics the mandates M/107 Geotextiles and M/386 apply. This work has been stopped due to the legal challenges of managing various states national standards within the CEN format. We await the outcome of this within the European commission which is taking time and has effectively stalled some of the CEN standards which are currently “stuck in limbo”.

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:

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These are estimates based on recent studies of certain markets combined with limited publicly available data and market reports. Data are for 2019 2022.

MARKET DATA

Global Totals	Area (million m ²)	Value (\$ millions)
Geotextiles and related products	6350	9200
Geomembranes (incl. GCLs)	1120	4810

Output by Region (all geosynthetics)	Area (million m ²)	% domestic	% export
North America	2300	85	15
Europe	1600	84	16
Asia	3150	91	9
Rest of the World	400	100	0

Market by Region	Geotextiles and related products (million m ²)	Geomembranes incl. GCLs (million m ²)
North America	1500	500
Europe	1250	140
Asia	2900	330
Rest of the World	700	150

ACTIVE COMPANIES IN THE SECTOR

Sector	No. of major companies	No. of minor companies
Geotextiles & related products	27	71
Geomembranes incl. GCLs	16	26

Other information

Over the next few years it is hoped that data will be gathered to enable the following information to become available:

- Estimated employment (world-wide) in the sector over the last 3 years;
- Estimated percentage of products in the marketplace self-declared or certified to the ISO committee's International Standards over the past 3 years;
- Real examples of increased income and/or cost savings achieved through implementation of the ISO committee's International Standards;
- Estimated number of organizations (world-wide) requiring compliance with the ISO committee's International Standards by suppliers, contractors and other service providers;
- Total number of the ISO committee's International Standards cited as normative references in International Standards of other ISO committees;
- Total number of national adoptions of the ISO committee's International Standards.

3 Benefits expected from the work of the ISO/TC

The anticipated benefits from the work of ISO/TC 221 on Geosynthetics fall into three categories:

- 1) Technical,
- 2) Economic, and
- 3) Environmental

The nature of geosynthetics production is such that some local or national markets are unable to absorb the total production of one factory and almost all companies export a high percentage.

The growth of the industry continues to be dynamic, new applications are being found and new products and product variations are constantly emerging. By the use of standard methodologies for determining material properties and performance, all materials are being evaluated on the same basis. Like materials are being evaluated based on like properties.

The need to evaluate and compare existing and new products on a common base facilitates international trade and establishes competition resulting in product improvement and cost savings.

By tradition or design many countries have used less than objective local standards in evaluating geosynthetics to the disadvantage of imported products. The adoption of uniform geosynthetic standards will remove such hidden barriers to trade. This more open market results in better designs, with better and longer term performance of the products and projects. It also allows for easier communication as everyone is "talking the same language".

Many countries have yet to instigate national geosynthetic standards and many others have incomplete and out of date standards taken from one, or often more than one, other national standard. The establishment of a comprehensive set of ISO geosynthetic standards that are rigorously reviewed technically, will enable countries without standards or with incomplete standards, to quickly implement a complete set of national standards. The adoption of ISO standards also ensures that the standard is kept up to date and that new standards are easily integrated.

International professional Engineering Societies and Associations such as the International Geosynthetics Society (IGS) and the International Society for Soil Mechanics and Foundation Engineering support and promote the ISO standards.

The economic benefits due to the activity of ISO/TC 221 will also include reduced costs for testing and evaluation as a result of standardization. This ultimately leads to reduced costs for materials, for design work, and for installation work. Better designs result in longer project service life, which reduces long-term maintenance costs. As a result of reduced costs, increased use of geosynthetic products should result.

The above areas are the generalized benefits that will result from the work of ISO/TC 221.

4 Representation and participation in the ISO/TC

4.1 Membership

<https://www.iso.org/committee/270590.html>

4.2 Analysis of the participation

There is a significant geographical gap in the membership of the committee from South America where there are only 2 'O' members and no 'P' members.

To encourage active participation from all regions of the world, the TC continues to attempt to rotate the location of physical meetings in a cycle Europe, Americas, Far East.

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

5.1 Defined objectives of the ISO/TC

The objectives of ISO/TC 221 are to contribute to the elimination of technical barriers to trade and to facilitate the international market for geosynthetic products.

In particular, the aim is to establish standards to characterise geosynthetics through classification and by determination of their chemical and physical properties.

Through the liaison with CEN/TC 189 and CEN TC 250/SC7 the aim is to give standards an international diffusion and thus develop further the global market.

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

The key objective of ISO/TC 221 is to produce International standards in the field of geosynthetics to meet the needs of a fast evolving industry, co-operating via the Vienna Agreement with CEN in order to achieve that aim. In addition, the committee seeks to act as a forum for the development of International standards for a developing industry.

The package of standards is initially aimed at the evaluation of prime product properties that are necessary for the main civil engineering applications. These standards address the identification, mechanical properties, hydraulic properties and durability of the geosynthetic.

Almost all of the prime ISO geosynthetic standards will build on the work of CEN via the Vienna Agreement however note will be taken of other well-established National standards. In all the identified ISO topics there exist at least one European or North American standard in present use and it is envisaged that ISO geosynthetic standards will emerge from harmonization rather than new drafting.

When ISO/TC 221 determines that an existing standard is internationally relevant and has been developed in accordance with the principles of openness, due process, and international participation, ISO/TC 221 will recognize that document as an internationally accepted standard and will not pursue any effort to duplicate or harmonize the body of work contained therein.

ISO/TC 221 is currently developing a suite of documents which will provide guidance to designers using geosynthetics in their projects. The Technical Reports 'Design Using Geosynthetics' will be in ten parts covering all of the major functions and applications of geosynthetics.

Due to the historic co-operation between CEN and other standards bodies, not least North America, many of the required areas of harmonization have been identified. There is extensive use of the Vienna Agreement to minimize duplication of work, with many projects being developed with CEN lead. It is understood that most of the future work will be channelled to ISO/TC 221 for ongoing revision and updating.

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

There are no definite factors affecting the completion and implementation of the work programme, but it is recognized that the participation of experts in the drafting and development of the projects is increasingly difficult, due to time and financial constraints.

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:

<https://www.iso.org/committee/270590.html>

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 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](#)