



N1308 - STRATEGIC BUSINESS PLAN – ISO/TC 60

Executive summary

ISO/TC 60 serves the market for power transmission gears, rather than those used primarily for motion only, such as in toys and clocks. Power transmission gearing is characterized by its huge diversity and essential application into almost all industries, from transportation, industrial manufacturing, and power generation, through to such state-of-the-art technological applications as wind turbines and complex aerospace components. Gears must be capable of operating in extremes of environment. They must be available in every part of the world to support replacement demands. This requires gear products to be designed, manufactured, and measured using standardized methods. Power transmission gearing, in many forms, is a very mature product and standardization work has been taking place for more than 100 years. Nevertheless, design innovations, new materials, improved manufacturing technologies, and an increasing demand for solutions by new and developing industries, require an active standardization agenda.

Gears have been and will continue to be essential for many existing industries and in the development of new products and applications. As they are produced in extremely large numbers and with many thousands of variants, the work of ISO/TC 60 will be indispensable for the gear industry's manufacturers and users. Trade within the marketplace and end users need standardized methods when selecting and purchasing gears and when designing a product in order to obtain ease of use, good performance and replacement of components.

In addition, many of the major industries that use gear products are no longer producing for their own consumption. They are moving what has been historically captive production to an outside supplier. This outsourcing by major original equipment manufacturers (OEMs) will increase the demand on the traditional gearing industry. OEMs will continue to design their products, and then contract with suppliers to perform the manufacturing. This practice increases the need for a set of coherent, universally accepted, world-class standards like those developed by ISO/TC60.

The primary goal of ISO/TC 60 is to ensure that gear standards are created, kept up to date with changing technologies, reflect the needs of the industries concerned, and give assurance to the end users that gear products are durable and safe.

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:

ISO/TC 60 serves the market for power transmission gears, rather than those used primarily for motion only, such as in toys and clocks. Power transmission gearing is characterized by its huge diversity and essential application into almost all industries, from transportation, industrial manufacturing, and power generation, through to such state-of-the-art technological applications as wind turbines and complex aerospace components. Gears must be capable of operating in extremes of environment. They must be available in every part of the world to support replacement demands. This requires gear products to be designed, manufactured, and measured using standardized methods. Power transmission gearing, in many forms, is a very mature product and standardization work has been taking place for more than 100 years. Nevertheless, design innovations, new materials, improved manufacturing technologies and an increasing demand for solutions by new and developing industries, require an active standardization agenda.

The primary goal of ISO/TC 60 is to ensure that gear standards are created, kept up to date with changing technologies, reflect the needs of the industries concerned, and give assurance to the end users that gear products are durable and safe.

Industry production can be segmented several ways. The most common is known as “open” or “loose” gears. These are gears, produced typically in pairs – the pinion and wheel – by small and medium size suppliers. Open gears are generally produced to specifications and standards that are determined by the customer. Almost none of these manufacturers produce for their own use. The majority of these manufacturers produce smaller lots of gears for an OEM (original equipment manufacturer) or an intermediate supplier to the OEM. These manufacturers account for an estimated two-thirds of the number of manufacturers in the industry but only one-third of the value of production.

The second segment is known as “enclosed drive” manufacturers. These manufacturers supply complete assemblies, the transmission or enclosed drive, which an OEM will install in the final product. Typical applications (in addition to automotive transmissions) include drive systems for such industrial applications as material handling, high precision medical devices, lifting equipment, aerospace as well as mining and paper processing.

Many of the major industries that use gearing products are no longer producing for their own consumption. They are moving what has been historically captive production to an outside supplier. This outsourcing by major OEMs will increase the demand on the traditional gearing industry. OEMs will continue to design their products, and then contract with suppliers to do the manufacturing. This practice increases the need for a set of coherent, universally accepted, world-class standards like those developed by TC60.

The industry is increasingly global, as the cost of capital equipment with its high productivity has forced even small companies to look to the international market for customers. In many cases,

capital costs are such that companies must increase volumes to simply cover higher costs. Moreover, new equipment is a necessity as customers demand increasingly high quality and faster delivery.

These factors led naturally to industry consolidation. Facing higher economic requirements and led by financially astute managers, the industry is consolidating in an effort to meet the demands of the market in a way that provides an adequate return to investors and stakeholders.

Observed business related threats to the industry include such factors as: lack of technically skilled personnel at both the design and production levels; uncertainty of financial markets and credit availability; political influences on tariffs and supply chain; and increasing material costs and reduced availability.

The market for the gearing industry can be broken down into the following machinery sectors:

Food & Beverage Processing Machinery

- Food Processing Machinery
- Beverage Processing Machinery

Industrial Machinery

- Air & Gas Compressors
- Pumps & Fans
- Fluid Power Equipment

Machine Tools

- Cutting Machinery
- Forming Machinery

Materials Handling Equipment

- Conveyors
- Cranes
- Pulleys & Hoists

Other General Machinery

- Other Machinery Tools & Parts
- Other Machinery

Non-Manufacturing Machinery

- HVACR
- Turbines
- Generators & Gen Sets
- Elevators, Escalators & Lifts
- Industrial Furnaces & Ovens
- Vending Machinery
- Office Machinery
- Other

Special Purpose Machinery

- Mining & Quarrying Machinery
- Agricultural & Forestry Machinery
- Rubber & Plastics
- Pulp & Paper Machinery
- Printing Machinery
- Metallurgy Machinery
- Packaging Machinery
- Semiconductor & Electronics Machinery
- Textile Machinery
- Woodworking Machinery

The power transmission gearbox market is forecasted to experience significant growth in the coming years, according to a recent study by Future Market Insights. The growth of the power transmission gearbox market can be attributed to several drivers, which are discussed below.

Increasing demand for energy-efficient systems: The demand for energy-efficient systems is driving the growth of the power transmission gearbox market as gearboxes play a crucial role in reducing energy consumption. Government initiatives that followed the Paris Agreement on climate change signed in 2016 are expected to increase the global demand for electric vehicles and clean energy production in the forecast period driving demand for mechanical power transmission equipment.

Growing industrialization and urbanization: The growth of industries and urbanization is leading to an increase in the demand for power transmission gearboxes, as they are widely used in various industrial and infrastructure applications.

Growing demand for automation: The demand for automation in various industries is driving the growth of the power transmission gearbox market as gearboxes play a critical role in automated systems. The development of digital technologies, such as Industry 4.0 and the Internet of Things (IoT), is also driving the growth.

Increasing demand for high-speed machines: The demand for high-speed machines, such as high-speed trains, is driving the growth of the power transmission gearbox market as these machines require gearboxes for power transmission.

Rising demand for energy-efficient buildings: The demand for energy-efficient buildings is growing, which is driving the growth of the power transmission gearbox market as these buildings require gearboxes for power transmission.

Growing construction and infrastructure development: The growth of construction and infrastructure development is driving the growth of the power transmission gearbox market as these industries require gearboxes for various applications.

Growing demand for compact and lightweight gearboxes: The demand for compact and lightweight gearboxes is growing, which is driving the growth of the power transmission gearbox market as these gearboxes are widely used in various applications.

In this industry, the median company has about 100 employees. The largest have 1000 to 5000 employees or more. Most manufacturers produce within a specific market. Thus, concentration tends to be less of a problem than in consumer-oriented industries.

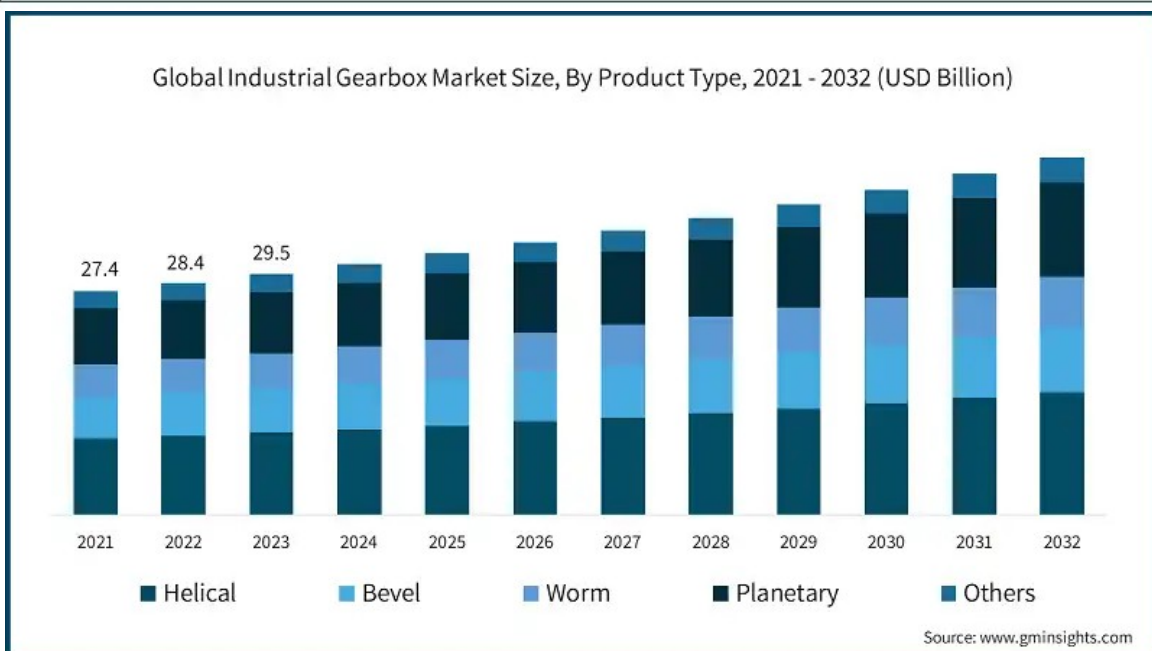
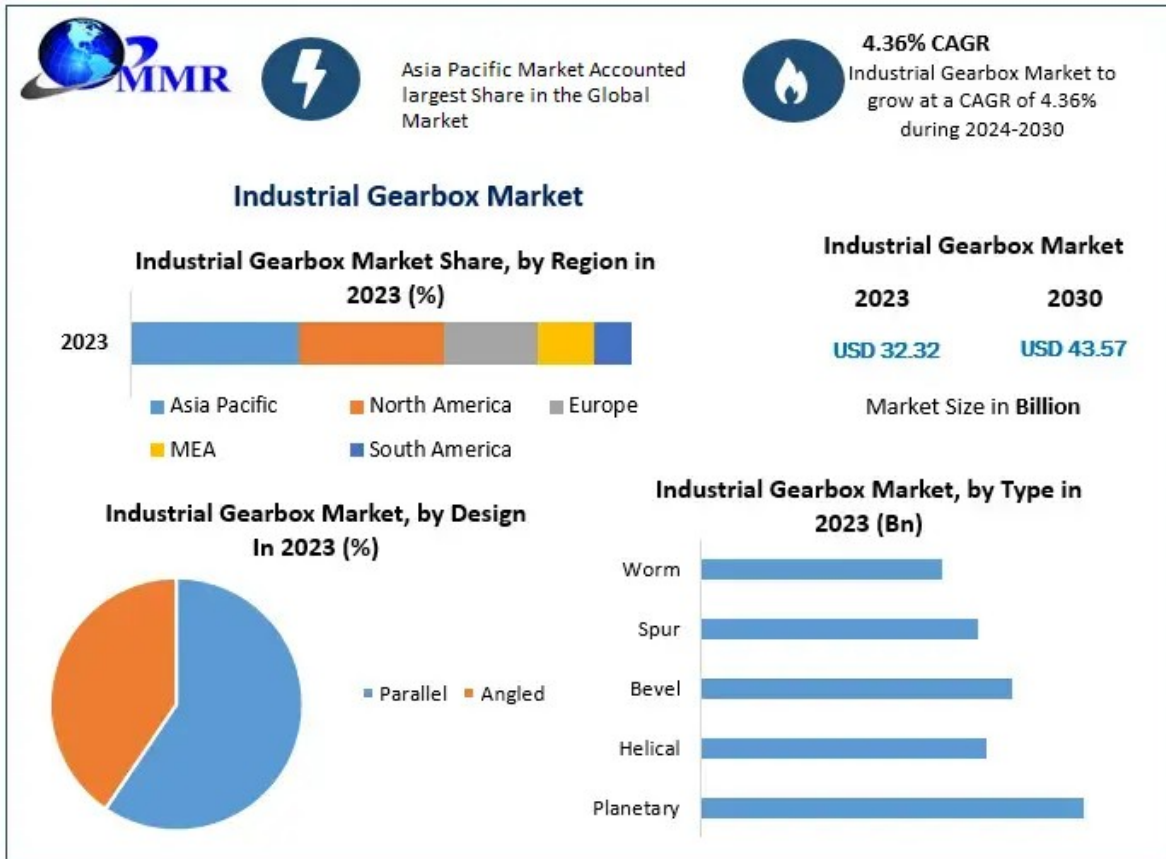
With respect to new technologies, the gear industry is very much affected by innovations in manufacturing, metallurgy, and surface finish technology. Such as new materials, additive manufacturing, engineered plastics, and new lubricants. The industry faces a threat from increasingly competitive motor and electronic control technology that eliminate the need for a gearbox.

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:

The Global Gear Market size is expected to reach USD 222.12 billion in 2025 and grow at a CAGR of 5.77% to reach USD 294.03 billion by 2030. Source: [HYPERLINK "https://www.mordorintelligence.com/industry-reports/global-gear-market"](https://www.mordorintelligence.com/industry-reports/global-gear-market)<https://www.mordorintelligence.com/industry-reports/global-gear-market>.

The market has seen substantial growth in recent years and is expected to continue its upward trend in the future. The market in East Asia has been experiencing significant growth in recent years and is poised to continue its upward trend in the coming years. Western Europe was the second largest region of the market. Specifically for industrial gearboxes, the following charts demonstrate the size and growth predictions.



3 Benefits expected from the work of the ISO/TC

It has been indicated that gears have been and will continue to be essential for many existing industries and in the development of new products. As they are produced in extremely large numbers and with many thousands of variants, the work of ISO/TC 60 will be indispensable for the gear industry's manufacturers and users. This is valid for products to be designed, manufactured, and measured using standardized methods. Trade within the marketplace and end users need standardized methods when selecting and purchasing gears and when designing a product in order to obtain ease of use, good performance and replacement of components.

Continued work in the TC will increase the understanding of gearing and gearboxes, which will lead to higher power density that uses less raw materials, alternative lubricants, increased reliability, and alternative materials and more efficient manufacturing methods.

Switzerland
United Kingdom
United States

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

5.1 Defined objectives of the ISO/TC

The objectives of TC 60 include:

1. To elaborate a coherent library of standards that fulfil the needs of identified users and satisfy the ever-increasing global marketplace and supply chain covering specification, design, manufacturing, measurement and use of gears and drive components for power transmission applications in an efficient, timely and cost-effective manner.
2. To ensure through a regular program of review that standards already published and available for use are up to date, reflecting the needs and technology at the time of review.
3. To review and adjust the work program as necessary to ensure that market needs are met.
4. To promote use of an internationally recognized standard vocabulary and system of product definitions for industry by the elaboration of nomenclature standards.
5. To provide calculation methods to determine capacities, test methods and selection methodology for gears used principally in power transmission applications.

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

In order to conduct its work effectively, ISO/TC 60 operates essentially as an administrative committee, appointing as many working groups as necessary for elaboration of the standards. A TC meeting is held jointly with its two subcommittees approximately once every 2 years to address administrative issues, conduct goal setting and priorities. This method has been chosen to enable unhindered collaboration between those committee members who have a direct interest in the development of specific standards. The strategies to achieve the objectives of TC 60 include:

1. Establish working groups or sub-groups for each work item with designated project leaders and operate with a project-based approach to standards development.
2. Establish priority of work items within subcommittees and working groups, giving priority to the timely circulation of documents and adherence to target dates.
3. Conduct meetings when necessary and use other means of communication to resolve issues and process documents (e.g., Internet meetings, e-mail).
4. Coordinate concurrent meetings in the same location with multiple working groups.
5. Use a single language for meetings to obviate the problems of time and expense of organizing interpreters and translation.

Although, in certain circumstances, the TC or SC's will handle a particular task, the majority of the standards development work is carried out in the working groups, sub-groups and editorial groups. The Convenor and the members of each group are selected for their expertise in the technology under consideration. In general, the working groups meet two times per year, with the work continuing by correspondence throughout the year.

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

The following factors have been identified which may affect, to a lesser or greater degree, the development of particular TC 60 standards:

- a. Difficulty in finding project leaders who have the available resources to drive the work and a limited supply of new expert participants at the WG level to offset the retirement, withdrawal of, or reduction in commitment from, key members.
- b. Unavailability of responsive support at the WG level to assist the quick development of projects, due perhaps to a lack of individual resources or adequate technical resources to ensure the preparation of relevant standards.
- c. Changing ISO requirements that require accelerated project deadlines, such as eliminating the 48-month project and changing the requirements of a Technical Report.
- d. Continued funding and support of ISO activities by the national bodies.

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 60 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](#)
- [Work programme](#) (published standards and standards under development)

Reference information

[Glossary of terms and abbreviations used in ISO](#)

[General information on the principles of ISO's technical work](#)