

STRATEGIC BUSINESS PLAN OF ISO/TC 70

Executive summary

The Technical Committee of ISO on Internal Combustion Engines (ICEs), namely ISO/TC 70 was established in 1949 and then named as "Definitions relating to engines and machines".

In 1979, ISO/TC 70 underwent an organizational restructuring. It was allowed to cover a wider scope of work and its title was changed to "Reciprocating internal combustion engines". The title was later changed to the current "Internal combustion engines", so that rotary engines were included in its scope of work. The current scope of ISO/TC70 is defined as follows:

Standardization in the field of reciprocating and rotary displacement internal combustion engines, including definitions, performance / tests and special requirements, taking into account the relationship between engine and driven machinery and environment.

Excluded:

- reciprocating and rotary displacement engines used to propel road vehicles and aircraft.

Reciprocating and rotary displacement ICEs, which have been used to provide power for industrial drives, rail traction and ship propulsion for centuries. It is found that power produced by the ICE is more versatile than the steam engine. ICEs are able to operate by burning a variety of liquid or gaseous fuels by spark ignition, compression ignition or a combination of both. The ICE industries is and remains to be a fundamental industry to global economies and a dominant power-provider in transportation, engineering machinery, agricultural machines, marine industry and defense equipment.

The standards developed by ISO/TC 70 have reflected the global market demands for ICEs. The standardization activities have enhanced the cooperation, coordination and consensus-building in the ICE field. The global market and international trades of ICE have maintained healthy development through the availability of the standards.

ISO/TC 70 has adopted the following strategic objectives to work effectively and efficiently:

- a) To ensure ICEs and their components are designed and used in conformity with recognized environmental and safety standards and regulations;
- b) To identify ICE technologies which require the development of international standards in collaboration with relevant ISO and IEC technical committees;
- c) To ensure that the published international standards and other deliverables are reviewed regularly to meet the needs of industrial development;
- d) To contribute to the standards drafting work in both ISO, CEN and other international SDOs.

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 70

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 ISO/TC 70, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standards:

The following aspects are or will influence the work of ISO/TC 70:

- a) The whole international society is gaining an increasing awareness of the global environment. ICEs, as an integral part of human impact upon the environment, are receiving increasingly strict requirements for their production and operation, particularly with regard to their efficiency and particulate and chemical emissions;
- b) There still will be significant emphasis placed on the safety of ICEs from various regulators;
- c) Legislation imposes greater restrictions on the use of fossil fuels which in turn require a greater emphasis to be placed on the efficiency of power production across the world;
- d) There will be a growing practical co-operation by countries of the world in order to bring about the peaceful resolution of difficulties through the active participation in global standardization;
- e) New technologies related to intelligence, connectivity, electrification, hybrid power, remanufacturing and hydrogen, ammonia and other alternative fuels, etc., which require newly developed or updated International Standards.

The major trends and developments in international standardization in the field of ICEs will concentrate on the harmonization of differing and diverse national requirements and legislation. ISO/TC 70 actively recognizes this trend and through its work will help to bring about the required harmonization.

Emphasis is placed on having close co-operation with other Technical Committees (in all standards organizations) in order to ensure that there is active collaboration and participation in all relevant areas of the work programme.

ISO/TC 70 is conscious of the continuing emphasis placed on meeting tighter global environment and safety requirements both from the European Union and the international community. Certain European Directives are not always supported by adequate or relevant ICEs standards and ISO/TC 70 will continue to work closely with CEN to contribute to the perfection of relevant standards system.

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 ISO/TC 70:

Environmental issues of pollution by noise, vibration and exhaust gases play a significant part of the work of the ISO/TC70 in satisfying these market demands. As the market continues to grow and expand into third world countries, so the demand for standardization will grow as well.

The International Standards are broadly adopted by member bodies. By the end of 2022, the adoption rate in China is 91.5%, in Japan is 89%, etc.

According to latest statistics, In 2021, the import and export quantities of internal combustion engines (components and generating sets are included) in China are as follows:

Table1 Import and export quantities of ICE commodities in China, 2021 (Jan. to Dec.)

Source: China Internal Combustion Engine Industry Yearbook 2022

Name	Unit	Import				Export			
		QTY	YoY INCR/%	Sum/ \$10,000	YoY INCR/%	QTY	YoY INCR/%	Sum/ \$10,000	YoY INCR/%
Total	—	—	—	1081868	-0.02	—	—	2002810	39.7
1 Total of IC engines	pcs	1488741	-24.87	521004	-8.05	21263578	14.90	515805	33.45
1.1 Diesel Engine	pcs	43627	-15.40	102988	-5.64	568273	29.28	92772	41.23
1.2 Gasoline Engine	pcs	428880	-39.51	115274	-30.08	3440555	8.82	177735	30.50
1.3 Others	pcs	1016234	-16.77	302742	3.47	17254750	15.77	245298	32.86
2 Total IC engine components	—	—	—	513313	10.29	—	—	1050844	42.02
3 Generating sets	pcs	8440	12.57	47511	-4.98	9810229	21.27	436161	41.95

Key

YoY Year-on-year

According to latest statistics, In 2022, the overseas and domestic production of land use engines in Japan are as follows.

Table 2 2022 Overseas Production of Land Use Engines of Japan

Source: Japan Land Engine Manufacturers Association

upper figure: qty

lower figure: total horse power (1000s)

		Jan-Mar	Apr—Jun	Jul—Sep	Oct—Dec	Jan-Dec
Gasoline Engine	2022	2,503,323 12,694	2395649 12381	2368563 12572	2078096 12173	9345631 49820
	2021	2,525,580 12,676	2,727,174 14,089	2,633,015 12,505	2,580,254 12,310	10,466,023 51,580
	year-to-year comparison	99.1% 100.1%	88% 88%	90% 101%	81% 99%	89% 97%
Diesel Engine	2022	103,521 3,270	105617 3075	105953 3273	98809 3154	413900 12772
	2021	112,453 3,528	109,975 3,623	101,653 3,380	93,317 2,933	417,398 13,464
	year-to-year comparison	92.1% 92.7%	96% 85%	104% 97%	106% 108%	99% 95%



Table 3 2022 Domestic Production of Land Use Engines of Japan

Source: Japan Land Engine Manufacturers Association

2022 Production of Land Use Engines

Japan Land Engine Manufacturers Association

Upper Line: Quantity(units)
Lower Line: Value(million yen)

Grand Total			Gasoline Engine									Diesel Engine								Gas Engine										
			Water-Cooled	Air-Cooled						Total	Water-Cooled						Air-Cooled	Total												
				less than 3PS			3PS and over				less than 10PS			10PS and over less than 30PS					30PS and over less than 100PS			100PS and over less than 500PS			500PS and over less than 1000PS			1000PS and over		
				Sub Total	2-cycle	4-cycle	Sub Total	2-cycle	4-cycle		Sub Total	2-cycle	4-cycle	Sub Total	2-cycle	4-cycle			Sub Total	2-cycle	4-cycle	Sub Total	2-cycle	4-cycle	Sub Total	2-cycle	4-cycle	Sub Total	2-cycle	4-cycle
Jan to Mar	2021	1,031,423 162,417	547,208 12,931	4,646	416,905	402,291	14,614	125,657	38,804	86,853	465,738 146,335	17,621	197,516	190,521	44,642	663	471	14,304	18,477 3,151											
	2022	986,689 172,913	483,375 12,680	3,311	353,813	334,688	19,125	126,251	34,723	91,528	480,909 156,425	20,106	219,133	183,357	42,766	802	838	13,907	22,405 3,808											
	22/21	95.7% 106.5%	88.3% 98.1%	71.3%	84.9%	83.2%	130.9%	100.5%	89.5%	105.4%	103.3% 106.9%	114.1%	110.9%	96.2%	95.8%	121.0%	177.9%	97.2%	121.3% 120.9%											
Apr to Jun	2021	1,012,083 169,647	491,819 11,961	4,460	384,159	364,143	20,016	103,200	25,987	77,213	497,549 154,823	18,736	209,215	208,187	43,925	769	589	16,128	22,715 2,863											
	2022	941,897 153,721	473,512 12,097	2,375	365,488	356,065	9,423	105,649	28,479	77,170	438,829 137,634	18,167	212,568	152,922	38,535	782	766	15,089	29,556 3,990											
	22/21	93.1% 90.6%	96.3% 101.1%	53.3%	95.1%	97.8%	47.1%	102.4%	109.6%	99.9%	88.2% 88.9%	97.0%	101.6%	73.5%	87.7%	101.7%	130.1%	93.6%	130.1% 139.4%											
Jul to Sep	2021	980,618 166,251	479,937 11,615	3,493	374,636	354,404	20,232	101,808	25,696	76,112	477,996 151,650	19,337	210,445	197,645	37,857	695	581	11,436	22,685 2,986											
	2022	934,908 172,662	431,794 12,017	1,943	322,339	311,003	11,336	107,512	19,982	87,530	476,225 156,378	20,373	226,344	177,145	37,713	781	881	12,988	26,889 4,267											
	22/21	95.3% 103.9%	90.0% 103.5%	55.6%	86.0%	87.8%	56.0%	105.6%	77.8%	115.0%	99.6% 103.1%	105.4%	107.6%	89.6%	99.6%	112.4%	151.6%	113.6%	118.5% 142.9%											
Oct to Dec	2021	933,141 160,529	448,926 11,043	2,976	334,368	315,751	18,617	111,582	29,696	81,886	465,738 146,335	17,621	197,516	190,521	44,642	663	471	14,304	18,477 3,151											
	2022	888,654 177,761	381,989 11,545	2,332	265,665	251,287	14,378	113,992	27,306	86,686	483,649 162,123	18,675	227,400	181,718	40,717	849	1,041	13,249	23,016 4,093											
	22/21	95.2% 110.7%	85.1% 104.5%	78.4%	79.5%	79.6%	77.2%	102.2%	92.0%	105.9%	103.8% 110.8%	106.0%	115.1%	95.4%	91.2%	128.1%	221.0%	92.6%	124.6% 128.0%											
Jan to Dec	2021	3,988,535 673,592	1,967,890 47,550	15,575	1,510,068	1,436,589	73,479	442,247	120,183	322,064	1,940,378 613,844	73,222	847,662	788,864	169,939	2,978	2,578	55,135	80,267 12,198											
	2022	3,752,148 677,057	1,770,670 48,339	9,961	1,307,305	1,253,043	54,262	453,404	110,490	342,914	1,879,612 612,560	77,321	885,445	695,142	159,731	3,214	3,526	55,233	101,866 16,158											
	22/21	94.1% 100.5%	90.0% 101.7%	64.0%	86.6%	87.2%	73.8%	102.5%	91.9%	106.5%	96.9% 99.8%	105.6%	104.5%	88.1%	94.0%	107.9%	136.8%	100.2%	126.9% 132.5%											

Remarks:

- Exclude automobile, marine, locomotive and aircraft applications
- Statistics of Gas Engine have been indicated since 2014.
- LEMA's statistics show the sum of LEMA members only.



3 Benefits expected from the work of the ISO/TC 70

The main benefits that result from the work of ISO/TC 70 are as follows:

- a) To eliminate International and European trade barriers by ensuring that contradictions and/or repetitions are eliminated from the International Standards under its responsibility;
- b) To promote ever better safety requirements through agreeing consensual rules so as to minimize, and wherever possible eliminate, risk to persons and goods;
- c) To protect the environment from unacceptable damage;
- d) To harmonize test methods and quality criteria;
- e) To save cost and time.

In liaison with ISO/TC70 application standards may be prepared by other Technical Committees for engines used in the particular area of responsibility of these Technical Committees. In this case, the standards of ISO/TC 70, including terminology standards and performance/ test standards, shall be referenced.

A special agreement has been made between ISO/TC 70 and ISO/TC 110 (Industrial trucks) whereby TC 70 has the agreed responsibility to draft standards related to industrial trucks where they occur within the scope detailed above. This agreement has been put in place as it was recognized that ISO/TC 110 does not have the expertise, or have the remit directly within its scope, to draft engine related standards on its own behalf, for instance those related to exhaust emissions.

4 Representation and participation in ISO/TC 70

4.1 Membership

Countries/ISO member bodies that are P and O members of ISO/TC 70.

4.2 Analysis of the participation

By the end of Oct. 2023, ISO/TC70 consists of 16 P-members and 22 O-members.

Note: Saudi Arabia (SASO) and Spain (AENOR) has been upgraded to P-member between 2020 to 2022. India (BIS) has been downgraded to O-member in 2023 and reinstated as P-member later in 2023 .

Among the P-members, 13 are developed countries (according to the list of Developing countries in ISO by region).

International organizations in liaison with the ISO/TC70 are CECE, CIMAC, EC-European Commission, EUROMOT, IACS- classification, UNESCAP and WCO.

Since 2009, P-members and several O-members have acted positively in casting votes and providing comments.

The following table summarizes the participation of members and liaison organization in the

ISO/TC70 plenary meeting since 2009:

P-member/ Liaison	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Austria (ASI)			☐	☐		☐									
Belgium (NBN)								☐			☐				
China (SAC)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Finland (SFS)	☐														
France (AFNOR)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐			
Germany (DIN)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
India (BIS)															
Iran (INSO)					☐										
Italy (UNI)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Japan (JISC)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Russian Federation (GOST R)															
Saudi Arabia (SASO)			☐												
Spain (UNE)															
Switzerland (SNV)			☐									✓			
United Kingdom (BSI)	☐	☐	☐	☐	☐	☐	☐								
United States (ANSI)		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
IACS		☐	☐	☐		☐	☐	☐	☐			☐			☐

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

5.1 Defined objectives of the ISO/TC 70

ISO/TC 70 will elaborate a package of International Standards in the ICEs sector including the following aspects:

- a) To ensure that ICEs are designed and used in conformance with recognized environmental and safety standards and regulations;
- b) To identify, by liaison with other relevant ISO/TCs, any technical areas requiring the development of International Standards;
- c) To keep under review current, relevant International Standards and any other deliverables, in order to establish whether changes are necessary to drafts under development in ISO/TC 70;
- d) To progress drafting work both in ISO and the European Committee for Standardization (CEN) in accordance with the following guidelines and aims:
 - ISO standards that are of interest to CEN (especially those that are safety related) shall, wherever possible, be referenced in the relevant CEN standards under preparation as well as those already in existence;
 - When it is felt necessary to convert ISO standards into CEN standards, this should be accomplished using either the CEN Primary Questionnaire (PQ), CEN Unique Acceptance Procedure (UAP) or the Vienna agreement depending upon the nature and status of the ISO draft.
- e) Through the adoption of ISO standards as EN standards, ISO standards may, de facto become mandatory regulations for the engine trade in EC Countries;
- f) In order to prevent serious confusion and in particular where they are related to safety standards, EN standards should be produced quickly in order to replace the National standards already.

5.2 Identified strategies to achieve the ISO/TC 70's defined objectives

In order to be able to draft standards and answer queries quickly and effectively, ISO/TC 70 has been maintaining a stable and dynamic organizational structure. All the Sub Committees (SCs) and Working Groups (WGs) have full responsibility for the technical and presentational contents of the standards under its responsibility.

To work efficiently and effectively, ISO/TC 70 organizes once a year a plenary meeting week in which as much as possible the meetings of working groups, subcommittees and the TC take place. The meetings are conducted by correspondence, physical meetings, teleconferences, ZOOM system and so on.

ISO/TC70 works closely with the liaison committees both in ISO and IEC, as well as the liaison organizations on the projects, by exchanging liaison reports or participating meetings.

6 Factors affecting completion and implementation of the ISO/TC 70 work programme

The level of technical expertise within ISO/TC70 is kept constantly under review in order to ensure that all the relevant areas are covered. Nominations of experts are requested when specific areas of expertise or additional support are required.

ISO/TC70 makes inventive, effective and efficient use of its resources and this, in conjunction with the support and guidance provided through the ISO Central Secretariat will help to ensure that all its objectives are met.

However, the development of standards can be affected to a greater or lesser extent by the following constraints which exist in the current economic environment:

- a) Drafters priority conflicts between their work and standards commitments;
- b) The cost of hosting and attending meetings at all levels;
- c) Sometimes it is difficult to have the required at least 4 P-members participate in a new project.

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 70 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 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](#)