EXECUTIVE SUMMARY

Industrial furnaces and associated processing equipment are used widely in the world in many industrial sectors such as materials like iron and steel, nonferrous metals and glass, and machinery parts like gear, bearing and automobile, etc. The annual global production of industrial furnaces amounted to more than 13.9 billion US dollars in 2006. And the market has been expanding steadily in recent years.

However, there is not an International Standard that covers this industrial field. The main activity of TC 244 is to establish new International Standards to disseminate the technology and services of industrial furnaces and associated processing equipment through eliminating the technical barriers to trade.

In the industrial thermal processing equipment market, requirements vary greatly, involving specialist provided application-specific engineering. Key factors governing safe and effective combustion, such as chamber geometry and pressure, combustion flow patterns, methods of heat transfer, air preheating, oxygen level, emission requirements, etc. are the subject of application-by-application assessment by engineers. These factors are not generally capable of being fully tested until the specific system has been constructed and commissioned. The proposed standards will be developed to harmonize those requirements and design procedures. The methodology for energy saving evaluation will be incorporated in the proposed standards. Efficient use of energy for industrial furnaces will be one of the important issues of the sector of industry. TC 244 will also play active roles in the area by standardizing the method of heat balance of industrial furnaces.

Scope of TC 244:
Standardization of the requirements for Industrial furnaces and associated processing equipment,
This includes heated enclosures such as furnaces, ovens, kilns, lehrs and dryers, and their heating equipment such as burners, heating control equipment.
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 140 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:
Industrial furnaces and associated processing equipment are equipment which provide heat into a specified space enclosed with materials like refractory to heat materials. Industrial furnaces use two types of heat sources; one is combustible fuel like gas or oil, and the other is electricity. Industrial furnaces have a long history and have been developed with the development of whole industry. In addition, industrial furnaces are equipment which are generally designed under each specific condition which comes from the limitation of products or spatial conditions of factories, etc. Therefore, industrial furnaces and associated processing equipment are a type of equipment for which it is difficult to establish a unified standard. In that respect, it is important to promote standardization to reduce technical barriers. Industrial sectors which are expected to utilize the resulting standards are widely distributed. For example, they are iron and steel industry, non-ferrous industry, metal-products industry, electric products industry, precision-instrument manufacturing industry, food industry, and ceramic industry. The amount of energy consumption used by these industrial sectors adds up to 40% of the usage of energy by the whole industry in Japan. Under the above mentioned environment and market conditions, strong demands for quality, safety and energy saving of industrial furnaces and associated processing equipment have been raised recently.

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:

Industrial furnaces and associated processing equipment are mainly manufactured in developed countries. The types of furnaces and corresponding industries are shown in Table 1.
Table 1–Amount of sales and sales trend for 5 years (2002–2006) of furnaces classified by industry sectors in Japan

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2002 pts</td>
</tr>
<tr>
<td>Blast furnace</td>
<td>Iron and steel industry</td>
<td>236</td>
<td>13</td>
<td>100</td>
</tr>
<tr>
<td>Basic Oxygen Furnace / Converter</td>
<td>Iron and steel industry</td>
<td>75</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>Arc furnace</td>
<td>Iron and steel industry</td>
<td>31</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>Combustion furnace</td>
<td>Iron and steel industry, Cast and forging industry, Non ferrous industry, Metal products industry, Machinery, Shipbuilding, Transport machinery, Electric &amp; electronics industry, Chemistry &amp; petroleum industry, Ceramics industry</td>
<td>482</td>
<td>28</td>
<td>100</td>
</tr>
<tr>
<td>Resistance furnace</td>
<td>Precision instrument industry, Electric products industry</td>
<td>691</td>
<td>39</td>
<td>100</td>
</tr>
<tr>
<td>Induction furnace</td>
<td>Machinery products industry, Non ferrous industry</td>
<td>242</td>
<td>14</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1757</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: JIFMA (exchange rate: 0.0093US$/JPY)

Industrial furnaces and associated processing equipment, used in the iron and steel industry, which are in large-scale and few in number have been increased in this period. The total sales in 2006 are approximately 3 times of that in 2002.
The amount of sales of industrial furnaces and associated processing equipment in EU, USA and Japan is approximately US $ 14,000M in 2006. The details are shown in Table 2.

<table>
<thead>
<tr>
<th></th>
<th>A Production</th>
<th>B Export</th>
<th>A-B Domestic consumption</th>
<th>C Import</th>
<th>A-B+C Apparent consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU</td>
<td>9 500</td>
<td>4 400</td>
<td>5 100</td>
<td>1 100</td>
<td>6 200</td>
</tr>
<tr>
<td>USA</td>
<td>2 000</td>
<td>1 700</td>
<td>300</td>
<td>1 000</td>
<td>1 300</td>
</tr>
<tr>
<td>Japan</td>
<td>2 400</td>
<td>300</td>
<td>2 100</td>
<td>500</td>
<td>2 600</td>
</tr>
<tr>
<td>Developing countries</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3 800</td>
<td>3 800</td>
</tr>
<tr>
<td>Total</td>
<td>13 900</td>
<td>6 400</td>
<td>7 500</td>
<td>6 400</td>
<td>13 900</td>
</tr>
</tbody>
</table>

Notes:
Denomination: Million US $
Sources are from JIFMA and VDMA.
Exchange rate: 1€=1.5784US$ 1JPY=0.0093US$

Types of industrial furnaces and associated processing equipment vary widely among countries. Recently, due to rapid industrialization of developing countries, the demands of industrial furnaces and associated processing equipment are significantly increasing and the trend is expected to last in the future. Under these circumstances, it is essential to develop International Standards regulating evaluations and safety requirements for industrial furnaces and associated processing equipment.

3 BENEFITS EXPECTED FROM THE WORK OF THE ISO/TC

The benefits of international standardization of industrial furnaces and associated processing equipment are:
1. global harmonization of safety requirements and design procedures of industrial furnaces and associated processing equipment,
2. to eliminate trade barriers,
3. to disseminate the state of the art technology of industrial furnaces and associated processing equipment, and

In the international market of industrial furnace and associated processing equipment, there is no International Standard which covers industrial furnaces and associated processing equipment. It is important to establish relevant and appropriate International Standards for the industry. In this respect with the expected benefits listed above, the work of TC 244 can be of help for those who design and use industrial furnaces and associated processing equipment.
4 REPRESENTATION AND PARTICIPATION IN THE ISO/TC

4.1 Countries/ISO members bodies that are P and O members of the ISO committee

4.2 Analysis of the participation

Currently, TC 244 consists of 25 member bodies whereby 18 of them are P-members and the other 7 are O-members. The state of participation is illustrated in Table 3.

Table 3 - TC 244 members: participating status and regional distribution

<table>
<thead>
<tr>
<th>Region</th>
<th>P-member</th>
<th>O-member</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>Egypt</td>
<td>South Africa</td>
</tr>
<tr>
<td>North America</td>
<td>Canada, USA</td>
<td></td>
</tr>
<tr>
<td>South America</td>
<td>Argentina</td>
<td>Colombia</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>Australia, China, India, Japan, Korea, Republic of</td>
<td>Malaysia</td>
</tr>
<tr>
<td>Europe</td>
<td>Austria, Belgium, France, Germany, Netherlands, Poland, Romania, Sweden, United Kingdom</td>
<td>Czech Republic, Finland, Italy, Spain</td>
</tr>
</tbody>
</table>

From an energy saving point of view, it is desirable that more developing countries will join TC 244.

5 OBJECTIVES OF THE ISO/TC AND STRATEGIES FOR THEIR ACHIEVEMENT

5.1 Defined objectives of the ISO/TC

Industrial furnaces and associated processing equipment are one of the important equipment among manufacturing industries and a large number of industrial furnaces and associated processing equipment are produced and operating in the world.

In terms of developing International Standards, safety related items are especially crucial. TC 244 will elaborate a package of International Standards regarding safety related items in the early stage of the development of the International Standards.

Environment issues including the global warming can be one of our important perspectives in developing International Standards. Evaluation of the consumption of energy with unified International Standards leads to more efficient use of energy.

It is important to construct new standards timely with these practical subjects. Other subjects which are not mentioned above will be incorporated accordingly.

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

TC 244 will start with sorting out and organizing the existing regional standards which center on EN (Europe), NFPA (USA) and JIS (Japan). Based on that basis, TC 244 will go over the country-specific requests and problems. Then, TC 244 will promote the standardization considering current needs of the market.
6 FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE ISO/TC WORK PROGRAMME

Aspects of the resulting standards, regarding safety and evaluation of the performance of industrial furnaces and associated processing equipment are important not only for the manufacturers but also for the users. Reflecting a diverse range of views of developing countries in the new standards is the challenging part of the work of TC 244 for developing and disseminating the new standards. TC 244 will encourage the participation of developing countries and play a role in disseminating the technology of the industrial furnaces and associated processing equipment.

7 STRUCTURE, CURRENT PROJECTS AND PUBLICATIONS OF THE ISO/TC

This section gives an overview of the ISO/TC's structure, scopes of the ISO/TCs and any existing subcommittees and information on existing and planned standardization projects, publication of the ISO/TC and its subcommittees.

7.1 Structure of the ISO committee

7.2 Current projects of the ISO technical committee and its subcommittees

7.3 Publications of the ISO technical committee and its subcommittees

Reference information

Glossary of terms and abbreviations used in ISO/TC Business Plans

General information on the principles of ISO’s technical work