



BUSINESS PLAN
ISO/TC 107
Metallic and other inorganic coatings

EXECUTIVE SUMMARY

“Surface finishing” describes the processes and techniques used to complement or improve the surfaces of products, components and articles to satisfy industrial needs. These processes can be applied to improve appearance or adhesion, for corrosion protection, wear resistance and friction control. Surface finishing is an important consideration in all manufacturing and industrial activity, and encompasses the technology of applying metallic, inorganic and organic coatings to surfaces of all kinds.

The main objective of the work of the Technical Committee 107 is to implement, harmonize and improve national and regional standards, which have been developed in accordance with market needs in the countries and regions.

The market addressed by this technical committee is the sub-category of surface finishing that includes traditional metal finishing processes such as, electrodeposition, anodization, chemical conversion, porcelain enamelling and surface hardening. Processes that have grown in importance in recent years are included as well, such as thermal spraying, sputtering, ion implantation, physical and vapour deposition, autocatalytic deposition, and alloy electroplating.

According to studies on metal finishing markets, it consists of billions of US dollars in revenue annually, with the market being dominated by U.S. and Western European countries; however, the Asian market has shown a consistent increase in the last decades, with the presence of thousands of shops in China, Taiwan, India, Indonesia, Korea, Japan, Vietnam, Malaysia and the Philippines. Thus, the market for metal, and surface finishing, is very large, widely dispersed, diverse and fractionated.

The major benefit of standardization in this field is continual improvement in the quality of metallic and other inorganic coatings through the development of technically valid standards. The relevance to the marketplace stems from the belief that excellence will promote the growth of metal finishing markets, whereas coatings that do not meet service requirements will undermine those markets. The development of *global standards for the global economy* is expected to benefit and foster free trade.

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 107

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.

Surface finishing is an important consideration in all manufacturing and industrial activity, and encompasses the technology of applying metallic, inorganic and organic coatings to surfaces of all kinds.

The scope of TC 107 is identified as :

- Standardization of typical protective, decorative and engineering coatings on surfaces applied by electrolytic (excluding anodization), fusion, vacuum or chemical means, mechanical deposition, ion plating, taking into account environmental aspects of such applications.
- Standardization of typical protective and decorative non-metallic coatings (excluding organic coatings such as paints) on surfaces applied by electrolysis, fusion, vacuum, or chemical means, taking into account environmental aspects of such applications.
- Standardization of testing and inspection methods for such coatings.
- Standardization of terminology and vocabularies of such coatings.
- Standardization of preparation of the substrates prior to the application of metallic and inorganic coatings.”

In general, the objective of TC 107 is to support the metal finishing market by developing uniform international standards of quality for metallic and other inorganic coatings.

The manner in which surfaces are finished determines the properties of those surfaces and influences how products, components and other manufactured articles perform in service. The properties that may be controlled and modified by the application of metallic and other inorganic coatings are the following:

- Mechanical properties including wear, erosion, hardness, lubricity;
- Physical properties including appearance and porosity, and magnetic, electrical and electromagnetic characteristics;
- Chemical/electrochemical properties including corrosion, oxidation and catalysis; and
- Optical properties such as reflectivity, emissivity and absorptivity

Most often the purpose of applying coatings is to enhance surface appearance and increase the service life of products and other manufactured articles by preventing corrosion. By eliminating corrosion, product and environmental contamination are avoided. When surface properties meet or exceed the requirements of service, finishing technology contributes to the quality and reliability of manufactured articles, to cost savings in manufacturing and to the conservation of natural resources.

The total market for the surface finishing industry consists of supplies and services related to the preparation of metallic and other inorganic coatings of nickel and nickel alloys, copper and copper alloys, zinc and zinc alloys, gold, silver, chromium, tin and tin alloys, lead and lead alloys, iron and iron alloys, and palladium and palladium alloys.

The supply side comprises sales of metals and alloys for anode materials, salts, acids and bases, proprietary cleaners and processes for preparing metals for deposition, special proprietary organic additives for controlling the appearance and properties of coatings, wetting agents, chemical reducing agents and many other chemicals. Equipment such as polishing machines, tanks, filters, heaters, pumps, anode baskets, fixtures, racks, rectifiers, and vacuum chambers are an important part of this segment. Chemicals and associated equipment for treatment of rinse waters for the

protection of the environment may also be included. To the list may be added the analytical and other specialized laboratory equipment required for process and product control purposes.

The service side of the total market consists of the many thousands of individual and captive shops that provide metal finishing services. (Captive shops provide metal finishing services for products made by a particular company, and are owned and operated by that company. Individual or job shops are independent businesses that provide finishing services for different companies or customers.) These shops may employ less than a dozen or many hundreds of people to carry out finishing operations. The shops range from crude to highly sophisticated industrial units.

Major customer groups in the market, by industry, include the following:

- Motor vehicles (passenger cars and trucks);
- Aircraft and aerospace;
- Domestic appliances;
- Engine components;
- Battery-related products (porous foam and pre-coated metal strip);
- Electronics (connectors, printed wiring boards, components of computers)
- Plumbing fixtures;
- Jewellery;
- Furniture and luggage hardware;
- Building hardware.
- Wire goods (shopping carts, etc.)

2.2 Factors that may impact on market development

A major factor related to the health and welfare of citizens, consumers and workers is the belief among many environmentalists that metal finishing operations are intrinsically hazardous, inevitably lead to pollution of the environment and should be eliminated entirely. This view persists despite the fact that most metal finishing plants installed waste treatment plants many years ago and are now in compliance with existing regulations in the United States, Europe and other parts of the world. It is relatively easy to prevent metals from entering the environment from metal finishing sources. The hazards to human health associated with exposure to small amounts of many metals, with the exception of nickel or cadmium, are not known with any degree of certainty and need to be measured scientifically. The lack of good scientific information will lead to unnecessary and irrational restrictions that will have a negative impact on metal finishing markets.

Suppliers to the industry are under increasing pressure to find substitutes for existing processes and materials that are considered environmentally hazardous. In the absence of suitable alternatives, markets for certain products lines may have to be abandoned, resulting in economic loss and shrinkage of metal finishing activities.

Although the mechanical processes like abrasive blasting, grinding, and polishing can generate substantial solid waste, they generally do not generate hazardous materials in any significant quantities. The wastes generated by the chemical and electrochemical processes (like spent plating baths, spent cleaning solvent, degreaser still bottoms, industrial waste water treatment sludge, acid cleaners, and other process chemicals) make metal finishing operations some of the most heavily regulated sectors of the industrial economy. All indications are that environmental, and safety and health regulation will only become more stringent regarding the use, handling, and disposal of these materials. Facilities engaged in metal finishing operations are faced with an extensive maze of forms and reports that will lead them to the goal of regulatory compliance.

Customers are affected by environmental regulations as well, since they are subject to changes in design and styling trends that may lead to greater or less use of metal finishing services.

Technological changes and major product innovations are unlikely in traditional metal finishing processes. In the case of chemical conversion coatings, the elimination of hexavalent chromium compounds has resulted in significant changes, but at the expense of corrosion performance. The development of autocatalytic deposition favours those processes that can be operated for long periods of time without the need to discard solutions. Physical and chemical vapour deposition processes may grow in popularity if it can be established that they prevent pollution and satisfy the technical requirements of various applications.

Political changes may conceivably affect the extent to which new environmental regulations are imposed on the metal finishing industry, but are unlikely to affect enforcement of existing laws. The pressure to prevent pollution will continue into the foreseeable future.

Major technical barriers to trade may develop as a result of the divergence of national, regional and international standards. The proliferation of standardization bodies is an obstacle to the development of uniform global standards.

2.3 Quantitative Indicators of the Business Environment

The number of metal finishing shops in the United States and Canada is estimated to be of the order of 3,000. The number in Europe is of the order of 5,000. There are, also, many thousands of shops in China, Taiwan, India, Indonesia, Korea, Japan, Vietnam, Malaysia, the Philippines and other parts of the world. The total market is, thus, very large, widely dispersed, diverse and fractionated.

Detailed information about total sales and employment for this segment of the surface finishing industry is not available. Studies on metal finishing, at both regional and global scale suggest that the metal finishing market consist of billions of US dollars in revenue annually, with the market being dominated by the United States and Western European countries. The global inorganic metal finishing industry (IMFT) market is estimated to reach about \$21.1 billion in 2005 and is expected to rise at an average annual growth rate (AAGR) of 7.4%, to more than \$30 billion in 2010

The United States and Europe dominated the metal finishing market from the end of World War II until about 1970 when a series of events including fuel shortages, economic recessions and the strict enforcement of pollution control and prevention laws began to undermine that position. Fuel shortages led to the elimination of electroplated steel bumpers and other decorative trim and hardware from most passenger cars as part of an effort to reduce the weight of automobiles and increase their fuel efficiency. During economic recessions, the demand for metal finishing services declines due to the diverse nature of providing services to many industries, as happened in early 1980s when the overall demand for these services deteriorated significantly.

The most important factor may be the environment. As a result of the strict enforcement of pollution prevention regulations, many marginally profitable metal finishing shops were forced to close. The overall effect was that the metal finishing industry in the United States and Europe began to shrink.

The shrinkage in the United States and Europe was accompanied by the growth of metal finishing in other parts of the world, first Japan, then Taiwan, followed by Indonesia, Malaysia, Korea, Canada and Mexico. The growth in China over the past years has been remarkable and is expected to continue. The growth in India is now attracting attention. For instance, China has become the largest producer of powders in the world, representing more than 20% of the

estimated global market of 1.2 billion tonnes. This is due in large measure to recent innovation in curing technology, such as ultraviolet (UV) and near infrared (NIR), which are broadening market potential by opening new applications areas such as wood, plastics, papers, MDF, etc.

Much of the growth in overseas markets has a driving force the desire to take advantage of the comparatively low labour rates in some of those countries. On the other hand, as the economies of developing countries expand, domestic demand for consumer goods will increase the need for finishing services.

According to the 2002 State of the Industry survey conducted by **Finishers' Management Magazine**, most respondents—nearly 60%—say their annual sales were down an average of 21.4% in 2002, compared to 2001. This figure is even more disturbing considering that in the 2001 survey, 63% of respondents indicated that their annual sales were down an average of 14.5% compared to 2000.

On a positive note, not all participants of the Finishers' Management survey had a grim 2002. A minority—over 28%—indicated that their annual sales volume in 2002 actually was better than of 2001 by an average of 14.4%. They credited diversification and a widening of their customer base for their robust annual sales.

Electroplating continues to be the most performed process, dominating two categories. Most respondents (56.3%) indicated electroplating as a primary process while an additional 39.4% said it was a secondary or tertiary process. "Other" trailed electroplating as the second most performed process—in both the primary process category (21.8%) and the secondary or tertiary process category (26%). "Other" operations include galvanizing, black oxidizing, polishing and stripping.

Powder coating, painting, anodizing and e-coat processes have all maintained consistent levels of activity from 2001 to 2002. In comparison, electroless nickel and mechanical finishing have made some gains. In 2002, 20.1% of respondents indicated electroless nickel as a primary process—up from 13.2% in 2001. It is also becoming more common as a secondary process. Meanwhile, mechanical finishing's upward movement was even more pronounced from 5.6% saying it was a primary process in 2001 to 13.4% in 2002.

The Finishers' Management survey uncovered the top three industries served by surface finishers—automotive (31.9%), heavy industrial (29.4%) and aerospace/airline (23.5%). In these industries and in every other industry listed, most respondents reported dwindling annual sales, compared to 2001. This downward trend was most pronounced in the housewares industry, with a whopping 83.3% of respondents saying annual sales were down from 2001.

“In conclusion, many in the metal finishing industry may be gearing for a tough year, but on the bright side, the few companies that are prospering have revealed strategies that others can use to flourish in difficult times. Such businesses are fostering loyal customers, developing new ones and taking on tough jobs that call for very short lead times.”

3 BENEFITS EXPECTED FROM THE WORK OF THE ISO/TC 107

The standards in the field of metallic and other inorganic coatings may be placed into the following categories:

- Standard specifications that specify minimum coating thickness for all commercially important metallic and other inorganic coatings as related to service or end-use requirements. These standards provide or refer to test methods for determining that the

specified requirements (thickness, corrosion performance, appearance, etc.) have been satisfied;

- Standard test methods that define procedures for measuring the properties of metallic and other inorganic coatings; and
- Standard vocabularies in various languages that codify technical terms and definitions to facilitate communication, and avoid confusion and misunderstanding in business transactions. The major benefit of standardisation in this field is continual improvement in the quality of metallic and other inorganic coatings through the development of technically valid standards. The relevance to the marketplace stems from the belief that excellence will promote the growth of metal finishing markets, whereas coatings that do not meet service requirements will undermine those markets. The development of *global standards for the global economy* is expected to benefit and foster free trade.

4 REPRESENTATION AND PARTICIPATION IN THE ISO/TC 107

4.1 Countries/ISO members bodies that are P and O members of the ISO/TC 107 committee

The ISO/TC 107 consists of 45 members: 17 Participant members and 28 Observer members.

Table 1. List of P and O member of the TC 107

| Country | P/O | Body |
|--------------------|-----|--|
| Belgium | P | NBN, Bureau de Normalisation |
| China | P | SAC, Standardization Administration of China |
| Czech Republic | P | CNI, Czech Standard Institute |
| Finland | P | SFS, Finnish Standards Association |
| France | P | AFNOR, Association française the normalisation |
| Germany | P | DIN, Deutsches Institut für Normung |
| Italy | P | UNI, Ente Nazionale di Unificazione |
| Japan | P | JISC, Japanese Industrial Standard Committee |
| Netherlands | P | NEN, Nederlands Normalisatie-instituut |
| Poland | P | PKN, Polish Committee for Standardization |
| Portugal | P | IPQ, Instituto Portugues da Qualidade |
| Russian Federation | P | GOST R, Federal Agency on Technical Regulating and Metrology |
| South Africa | P | SABS, South Africa Bureau of Standards |
| Spain | P | AENOR, Asociación Española de Normalización y Certificación |
| Sweden | P | SIS, Swedish Standards Institute |
| United Kingdom | P | BSI, British Standards Institution |
| Argentina | O | IRAM, Instituto Argentino de Normalización y Certificación |
| Australia | O | SA, Standards Australia |
| Austria | O | ON, Österreichisches Normungsinstitut |
| Brazil | O | ABNT, Associação Brasileira de |

| | | Normas Técnicas |
|------------------------------|---|--|
| Bulgaria | O | BDS, Bulgarian Institute for Standardization |
| Croatia | O | HZN, Croatian Standards Institute |
| Denmark | O | DS, Dansk Standard |
| Greece | O | ELOT, Hellenic Organization for Standardization |
| Hungary | O | MSZT, Magyar Szabványügyi Testület |
| Iceland | O | IST, Icelandic Standards |
| India | O | BIS, Bureau of Indian Standards |
| Indonesia | O | BSN, Badan Standardisasi Nasional (National Standardization Agency, Indonesia) |
| Iran, Islamic Republic of | O | ISIRI, Institute of Standards and Industrial Research of Iran |
| Ireland | O | NSAI, National Standards Authority of Ireland |
| Israel | O | SII, Standards Institution of Israel |
| Lithuania | O | LST, Lithuanian Standards Board |
| Luxembourg | O | SEE, Service de l'Energie de l'Etat Organisme Luxembourgeois de Normalisation |
| Norway | O | SN, Standards Norway |
| Philippines | O | BPS, Bureau of Product Standards |
| Romania | O | ASRO, Asociatia de Standardizare din România |
| Saudi Arabia | O | SASO, Saudi Arabian Standards Organization |
| Serbia | O | ISS, Institute for Standardization of Serbia |
| Switzerland | O | SNV, Swiss Association for Standardization |
| Tanzania, United Republic of | O | TBS, Tanzania Bureau of Standards |
| Thailand | O | TISI, Thai Industrial Standards Institute |
| Tunisia | O | INNORPI, Institut national de la normalisation et de la propriété industrielle |
| Turkey | O | TSE, Türk Standardlari Enstitüsü |
| Venezuela | O | FONDONORMA, Fondo para la Normalización y Certificación de la Calidad |

In the table 2 it is shown the places where the ISO/TC 107 plenary meetings have taken place.

Table 2. Venues for the ISO/TC 107 plenary meetings

| | | |
|-----------------|------|-------------------|
| 1 st | 1962 | Torino, Italy |
| 2 nd | 1977 | Budapest, Hungary |
| | 1978 | London, England |
| | 1980 | Philadelphia, USA |
| 3 rd | 1981 | Lake Como, Italy |
| 4 th | 1982 | Berlin, Germany |
| 5 th | 1983 | Ronneby, Sweden |

| | | |
|------------------|------|-----------------------------|
| | 1984 | Torino, Italy |
| | 1986 | Gaithersburg, USA |
| | 1987 | Oxford, Great Britain |
| 7 th | 1988 | Umag, Yugoslavia |
| 8 th | 1990 | Helsinki, Finland |
| 9 th | 1991 | Warsaw, Poland |
| 10 th | 1993 | Cascais, Portugal |
| 11 th | 1995 | Gaithersburg, USA |
| 12 th | 1997 | Thun, Switzerland |
| 13 th | 1998 | Cascais, Portugal |
| 14 th | 1999 | Lidingo, Sweden |
| 15 th | 2000 | Cape Town, South Africa |
| 16 th | 2002 | Orlando, USA |
| 17 th | 2003 | Madrid, Spain |
| 18 th | 2006 | Seoul, Korea |
| 19 th | 2007 | Helsinki, Finland |
| 20 th | 2008 | Margarita Island, Venezuela |

***1st meeting was in Torino, Italy. There were other meetings of SC 1 and SC in the 1970s, but there were no records of the dates or which SCs. TC 107 meeting was not held every year, therefore, the number 2nd, 3rd, 4th, meeting may not tie up properly. Often in the 1960s and 1970s, only SC 1, SC 2, SC 3, and/or SC 7 meetings were held without Plenary.**

4.2 Analysis of the participation

The members of this technical committee represent countries where metal finishing is long-established or where the technology is rapidly expanding. Greater representation from countries in South America and Southeast Asia is desirable. Nevertheless, perhaps 90% of the major market forces are represented directly or indirectly on the committee.

Individual delegates to meetings of the committee represent the major supply houses, metals producers, metal finishers, and customers of metal finishing services. All industrial sectors (customers) are not equally represented. For example, greater participation of metal finishers, consumers and government representatives would be helpful.

4.3 “ISO/TC 107 – A Legend of Times Gone By” a brief history of the ISO/TC 107, by Dr. G.P. Ray

“Arriving in Seoul, Korea, late on a Saturday night, exhausted after a long flight involving changing of planes, waiting at airports and cooped up in planes for hours because of either “technical problems” or just unexplained delays involving one of the “best airlines” in the world and a nine hour time difference, it was difficult not to ponder on whether a long journey of twenty five plus hours would put off many delegates to attend this first meeting of ISO/TC 107 to a far away city in Asia, especially in a freezing winter month, invited by the first Asian Secretariat of TC 107, KATS. Sitting down in the bus which went on and on for hours in the dark with sub zero temperature outside, the half asleep, jetlagged mind could only reflect the past meetings in warmer months of the years, with the legendary figures of international standardisation Andre Saboz- Bachofen (Switzerland), Boris Joffe, Fielding Ogburn (USA) et al, some of them helping to organise the formation meeting of TC 107 in Torino, Italy, in 1961 under the auspices of UNIPREA, a member of the UNI Federation of Standards organisations (UNI being the Italian Member Body of ISO), for greater harmonisation in metal finishing standards; that meeting ultimately led to the formation of ISO/TC 107 in Torino, in 1962. In the later years, such legends of standardisation, Allen Grobin,

James Long and George DiBari of USA , Tony Such of UK, Tadeusz Biestek of Poland, Felix Heiling of Germany et al took over where Saboz, Joffe, Ogburn et al left off. Some of them were remembered on the first day of TC 107 Plenary session on 7 March 2006 in Seoul by the longest serving associate of ISO/TC 107 present at that meeting, convener of TC 107/SC 3/WG 3 and present chairman of TC 107/SC 3, in a short tribute to honour the departure of another leading light of international standardisation, Felix Heiling of Germany.

History of ISO reveals that International Standardization originated in the electrotechnical field in 1906, although work in other fields, mainly on mechanical engineering, was carried out by the International Federation of the National Standardizing Associations (ISA) from 1926 to 1942. Then, in 1946, delegates from 25 countries met in London and decided to create a new international organisation which was finally set up in February 1947. Thus the international organisation dedicated to comprehensive standardisation, with the exception of electrical and electronic engineering standards responsibility of which belong to IEC (International Electrotechnical Commission) and telecommunication standards belonging to ITU (International Telecommunication Union), came into existence. ISO, (International Organisation for Standardization) – the name ISO derived from Greek “isos”, meaning “equal” and whatever the country or whatever the language the short form is always ISO - is a worldwide federation of national standards bodies with the objective of promoting the development of standardisation and related activities in the world to assist international exchange of goods and services, and developing cooperation in the areas of intellectual, scientific, technological and economic activities; the results of technical work, involving interests of producers, users, consumers, governments and the scientific community, are published as International Standards.

ISO, a non-governmental organisation (NGO), is a network of the national standards 2 institutes of 157 countries on the basis of one member per country and its members are not delegates of national governments.

A “member body” of ISO is the national body “most representative of standardisation in its country” and only one such body is acceptable for membership of ISO. Most of the ISO member bodies are governmental institutions or organisations integrated in public law and the rests have close relationships with public administration in their countries.

Among 157 members, 103 are “P members”, i.e., “Participating Members”, designated with full voting rights on technical and policy committees of ISO. There are 45 “Correspondent members”, organisations in countries which do not have fully developed national standards activity and usually known as “O” members, have observer status with no voting rights. The remaining 9 are known as “Subscriber members”, with very small economics and with reduced membership fees, who want to maintain contact with international standardization. The technical work of ISO is carried out by Technical Committees (TC). At present ISO has 229 Technical Committees - one of them is TC 107, Metallic and other Inorganic Coatings, the scope of which refers to:

Standardization of the characteristics of protective and decorative metallic coatings applied by electrolysis, fusion, vacuum or chemical means, mechanical deposition, ion plating

Standardization of the characteristics of protective and decorative coatings non-metallic coatings (excluding paint and other organic coatings) on metal surfaces applied by electrolysis, fusion, vacuum or chemical means. Standardization of testing and inspection methods for such coatings.

Standardization of the preparation of substrates prior to the deposition of metallic and inorganic coatings.

The 18th meeting of TC 107, the first in Asia and the first Asian country (The Korea Agency of Technology and Standards (KATS)) to form the Secretariat of ISO Technical Committee 107, was held on March 7 to March 9, 2006, in Seoul, Korea, under the chairmanship of Dr Sung Namkoong

of HYUNDAI HYSCO (Korea), Mr Klaus Scharwächter of DIN (Germany) as vice-chairman and Prof Soo-Wohn Lee (Korea) as the Secretary of TC 107. The meeting was well attended; there were 18 delegates in attendance from China, Finland, Germany, Korea, Poland, Portugal and the United Kingdom, i.e., 7 out of 18 Participating (P) member countries were represented at the Plenary session. Details of the meeting have already been given in the Secretary's Report to the Members, accessible via TC 107 Folder of ISO/CS server.

Brief history of TC 107 reveals some of its larger than life protagonists, such as Szabo, Joffe, Such, Grobin et al.

Szabo, born in Hungary, emigrated to Switzerland at the age of 10, received his PhD in Britain's University of Manchester before going to Argentina and returning to Switzerland as Research Director of Brown, Boverly & Co Ltd. He was well known for his linguistic abilities and used his talent to bring about compromises in international standardization, when needed. According to late Allen Grobin, he was always chosen to write the English version of the resolutions of the meetings because of his exceptional language ability and talent for compromise. Following second World War, he became more and more convinced about the need for greater harmonisation in metal finishing standards to assist acceptance of products in international trade, and was instrumental in organising the planning conference in 1961, leading to the formation of TC 107. At the first TC 107 meeting in 1962, he was the obvious choice for the chairmanship of TC 107/SC 1, the subcommittee on Terminology responsible for the preparation of a standard for the definition of terms used in the metal finishing industry. After several years of research and planning, he presented two working drafts, "Surface Treatment and Metallic Coatings – General Classification of Terms" and "Electroplated and Related Processes – Vocabulary", in 1966, in English as well as in German, French and Russian. Following various balloting procedures, these documents, a monumental task that forever will be a tribute to Szabo for his perseverance and foresight, were finally published in 1973 as ISO 2079 and ISO 2080. He revised these documents with assistance of R W Polleys of USA in 1980 and the revised versions were issued in 1981. Further revision was planned in 1990 under the chairmanship of R W Polleys and wide-ranging discussions of the documents took place at Szabo's last ISO meeting in Cascais, Portugal, in 1993 ; but Szabo did not see the publication of the second revised documents , he died in his sleep on March 11, 1995, at his home in Baden, Switzerland.

His empathy is exemplified in one of the anecdotes revealed in Allen Grobin's personal communication to me and later quoted in his "Standards Topics" ("Plating and Surface Finishing", AESF, p125, May 1995), referring to a story of Second World War when an American bomber flew into neutral Swiss airspace to avoid pursuing German fighters. He radioed the American to land his plane immediately but the command was ignored whereupon he commenced firing at him. The pilot radioed back to Andre , "You missed me" at which he replied, "I know" !

Subcommittee SC 1, Terminology and its working group on vocabulary, produced revised document, following discussion at length at Orlando ISO meeting , which was voted as DIS - 11 out of 12 P-members voting in favour and one voting against, with comments from six members. At 2003 ISO meeting in Madrid it was decided by TC 107 Secretariat to re-type the document incorporating the comments, if appropriate, and register it for FDIS vote. However, due to sudden resignation of the Secretariat within a few months of the meeting, this undertaking for what was known as Szabo Standards, for which Szabo and Polleys worked so intensely and for so long, has not yet materialised.

"As we become more of a one world", wrote another luminary of international standardization, late Allen Grobin, "the mistake of defining things in terms of one geographic area over another becomes increasingly significant. " (for instance: "buffing"⁴ (USA) in favour of "mopping" (Europe, Asia and elsewhere) – "buffing", a deprecated term, was fully defined in terms of "mopping" in ISO 2080, "Standards Topics", Plating & Surface Finishing, AESF, p 48, July 1997). Hence, the revised

and yet to be published standards of SC 1 listed geographic varieties in the terminology as well as provided original definition of terms and cross-referenced related terms.

One of the other founding members of TC 107, Boris B Joffe, a naturalised citizen of USA, was one of the foremost authorities in the field of thickness measurements of coatings, especially by non-destructive testing methods, and pioneered many innovations in the design of instruments used for this purpose. He was chairman of Twin City Testing of USA, and chaired US Technical Advisory Group to TC 107 from 1972 until his death in 1998; he also chaired TC 107/SC3, sub-committee for "Electroplated Coatings and Related Finishes" from 1994 when USA assumed responsibility of TC 107 secretariat. He received ASTM's (USA) highest award, Award of Merit and Fellow of the Society in 1981, for his contribution to national and international standardization. Allen Grobin once told me, concerning international meetings on standardization, that "The single most important things that Boris taught me (Allen) was to 'listen carefully to what is being said and try to understand the thoughts that are being expressed; remember that English is a second language for most of the other delegates.'" Boris said the same to me at an ISO meeting in Gaithersburg in 1995 when I was drafting a standard for TC 107/SC 2 on thickness testing of coatings.

Previous to Boris Joffe's chairmanship of TC 107/SC 3, the sub-committee was chaired in 1980s by Tony Such of UK, Research Director of a well known UK Chemical company supplying chemicals and equipments to metal finishing industry and joint author of the book "Nickel and Chromium Plating". In the 1980s, SC 3 flourished under his chairmanship and was a hub of activity for development of standards on electroplated coatings and related finishes, as well as on hydrogen embrittlement problem associated with electroplated and autocatalytic coatings. This was also a decade of standardization activities for corrosion and porosity tests of electrodeposited coatings (TC 107/SC 7), sub-committee of which was guided by Prof Tadeusz Biestek of Poland, author of an outstanding book on Phosphating.

In 1994, TC 107 Secretariat was taken over by ANSI of USA from UNIPREA, with Allen Grobin, Head of IBM Standards Project Authority and chairman of ASTM committee on metallic coatings, as the Secretary. He started to revamp the waning TC 107 Secretariat with a surge of development of new standards, restoring TC 107/SC 3, Electrodeposited coatings and related finishes, to its former success of 1980s and SC 2 and SC 7 with new chairman and secretary. Allen, a most affable and open-minded person, contributed regularly in the AESF journal, "Plating and Surface Finishing", reporting and explaining the activities of TC 107 as well as discussing the development of the standards in his "Standard Topics"; he was convinced that standards must be universal, not regional, and written not "by the experts for the experts sitting in their offices" but for the ordinary users throughout the world - for example those on the shop floor, customers or purchasers who are not knowledgeable on the subject, for the non-professionals et al - to appreciate the purpose of writing the standards and comprehend their contents. That was also the way of thinking of those far-sighted authors, from Szabo to Heiling, over the decades that they presided over; Allen articulated their vision in his monthly writings in the AESF journal.

Subsequent to Allen Grobin's sudden death in 1998, which was mourned by TC 107 and ASTM metallic coatings' committee members with tears in their eyes, George Di Bari, author of "Nickel Currents", an international newsletter on nickel plating, winner of Frederick Lowenheim (1987), AESF Scientific Achievements (1988) and AESF Boris Joffe (2003) awards, assumed responsibility as TC 107 secretary. Allen and George, in association with the UK committee on electrodeposited coatings and related finishes, worked assiduously to develop single harmonised coating standards under ISO-CEN Vienna agreement. UK have already drafted harmonised ISO standards on zinc and cadmium coatings with conversion coating requirements and further work is in progress to reconcile procedural differences between ISO and CEN documents in order to produce harmonised standards. It was very unfortunate that George DiBari had to retire due to ill health so soon after the 2003 ISO meeting in Madrid, leaving much of his work unfinished. However, his single handed contribution to TC 107 secretariat will never be forgotten.

Following sudden departure of the US Secretariat, many ISO standards of subcommittee SC 3 that were still in draft voting stages needed urgent retrieval. Present SC 3 chairman, having been involved in the past in drafting many, if not most, of them, has taken over all these documents with the expectation that membership will be helpful to facilitate their progress speedily. SC 3 has also led the way in drafting standards related to hydrogen embrittlement and test methods for nearly three decades and the convener of SC 3/WG 3 has always been the custodian of the documents produced by the working group. Hopefully, the aspirations of all those past leading lights of standardization will come to fruition one day.

For the other subcommittees:

Subcommittee SC 2, Methods of inspection and coordination of test methods, responsible for standards for general test methods, has been handed over to TC 107 by its secretariat (UK) after having completed its current work, for future action.

Subcommittee SC 4, Hot-dipped coatings, prepares standards for galvanized coatings of zinc and aluminium, and is ably guided by its present chairman, Bill Smith. Subcommittee

SC 5, Thermal spraying, responsible for preparation of standards for thermal spray coatings of zinc and aluminium, was disbanded after having completed its work around 1995. It is now a Working Group under TC 107 chaired by Simo - Pekka Hannula of Finland. Subcommittee

SC 6, Vitreous and porcelain enamels, accountable for preparation of standards for porcelain enamel coatings and supporting test methods, was disbanded and later converted to a Working Group in 2003 under TC 107 chaired by John Mullis of UK.

Subcommittee SC 7, Corrosion tests, prepares standards for corrosion and for porosity tests and is chaired by Lech Kwiatkowski with Dorota Hitczenko as secretary to the subcommittee. Subcommittee

SC 8, chemical conversion coatings, responsible for standards for conversion coatings, is now chaired by Korea.

TC 107's history will not be complete without a mention of Felix Heiling. Felix Heiling's involvement with the International Standards Organisation, TC 107, began during his participation at CEN/TC 262, "Metallic and other inorganic coating's" committee. He was recipient of DIN award, in 1984, and ISO/TC 107 Secretariat honoured him with the first Boris B Joffe award of the American Electroplaters and Surface Finishers Society (AESF), in 2000, for his outstanding contribution to international standardisation. He was always ready to lend a hand in my effort to develop standards, for example, those related to hydrogen embrittlement and test methods, cleaning of metallic surfaces prior to application of coatings as well as for harmonisation of ISO standards under ISO-CEN Vienna agreement. His outstanding contribution to national and international standardization is comparable to that of his contemporaries of TC 107.

I first met Andre Saboz, Boris Joffe, Tony Such, Tadeusz Biestek, Allen Grobin, George DiBari et al when I presented the first drafts, first among many in the following 19 years, of hydrogen embrittlement standards on behalf of UK at the ISO meeting in 1980. At the tea break on the first morning of the meeting, while everyone was having coffee, being an awkward consumer I asked for tea as coffee was no good for dunking biscuits in it. Of course disaster was waiting to happen when the soggy biscuit collapsed in the tea and splashed hot tea all over my shirt. Suddenly there was pin drop silence – I didn't realise that my unconventional behaviour in an international gathering was being closely watched with interest by all. As I was leaving to change the shirt apologising to the gathering that I made a fool of myself, a hand landed on my shoulder with a deep voice saying , "You haven't made a 'fool of yourself', whatever you do here is still standard" !

It was of course Andre Szabo to lessen my embarrassment. Kindness, encouragement and assistance of all of them - Szabo, Boris Joffe, Tony Such, who asked me to revise UK's Institute of Metal Finishing's 1979 publication "Thickness Testing of Electroplated and Related Coatings", which in the end I had to rewrite and publish in 1993, well-regarded Tadeusz Biestek, for whom I used to draft Reports and Resolutions for sub-committee SC 7, George Di Bari and my esteemed collaborator Allen Grobin, who was always the first one to welcome me immediately on my arrival at the hotel for ISO meetings and was consistently my staunch defender and adviser on standardization all through those years in the 1980s and 1990s for the only non-European at the ISO meetings (with some occasional ventures in 1980s by my comrade Dr Carrel Pattyranie of Sweden) - had always been very much appreciated and memories of all of them including those colleagues, the Tunturi pair of Finland, Terry Latter and Ken Cosslett of UK, Carel Pattyranie of Sweden, Malcolm Vowles of South Africa, James Menturweck and James Long of USA, Lech Kwiatkowski and Dorota Hitczenko of Poland as well as those not mentioned in this narrative, are and will always be highly cherished.

Dr G P Ray
Convener, ISO/TC107/SC 3/WG 3
Chairman, ISO/TC 107/ SC 3

PS: "I very much enjoyed reading your summary of the history of ISO TC 107 and especially liked your lighthearted personal touch. The meeting that I first attended was the one in Philadelphia in 1980. We collected \$10,000 from various suppliers to host the event. Boris Joffe decided to have 3 dinners for the delegates, each one better than the other. The final one was a formal dinner in one of Philadelphia's foremost hotels. We exceeded the budget; the deficit, I believe, was made up by Boris Joffe personally. Anyway I have happy memories of the ISO meetings and the wonderful delegates. I, too, regret not being able to complete much of the work in progress after the Madrid meeting, but in addition to the problem with my heart I was disappointed in the difficulty of completing various projects...it seemed that something always happened that made completion of a revised document impossible. And the relationship between ISO and CEN just added to the frustration. And the work load kept growing and became unmanageable. Last I heard you were having health problems, but I hope you are feeling okay now.
Regards, **George Di Bari.**" **21 August 2006**

5 OBJECTIVES OF THE ISO/TC 107 AND STRATEGIES FOR THEIR ACHIEVEMENT

5.1 *Defined objectives of the ISO/TC 107*

The overall objective is to develop technically valid standard specifications, test methods, and vocabularies for the metallic and other inorganic coatings that are utilised for protective, decorative and engineering purposes. The market requires ever-increasing excellence in the performance of these coatings, for example, improved corrosion and wear resistance, increased product service life, the preservation of surface appearance and other coating properties. The development of technically valid standards in this field helps to satisfy the ever-increasing demand for excellence. These standards must be responsive to the needs of the marketplace and developed on a timely basis to ensure industry support.

5.2 *Identified strategies to achieve the ISO/TC 107's defined objectives*

Market relevance would be further improved for the benefit of suppliers, metal finishers, customers and consumers by implementing the following strategies, initiatives and new work items:

- Incorporating improved processes, coatings and test methods in new or existing standards on a timely basis. Active participation of experts from plating supply houses, from metal finishing companies and other stakeholders will be sought to achieve this;
- Streamlining procedures for standards development wherever possible without compromising the technical validity of the project, including expediting the development of international standards by relying on electronic communication and other ways to improve productivity;
- Determining the acceptability of substitute coatings or processes vis-à-vis existing ones prior to initiating new work;
- Developing a standard method of designating metallic and other inorganic coatings consistent with existing ISO Directives;
- Developing standard formats for specifications, test methods and other documents;
- Developing standards for the preparation of metals prior to coating, for metals used as anode, and for salts used in various metal finishing processes;
- Publishing a technical report on the prevention of pollution in electroplating and other metal finishing processes;
- Developing new and improved standard test methods that are more precise, less costly and superior to traditional ones, and when necessary, determining the precision of new test methods by statistical means involving inter- and intra-laboratory studies;
- Fostering close co-operation between national, regional and international bodies so that uniform standards are established world-wide. For example, efforts to co-operate with CEN/TC 240 and CEN/TC 262 will be continued in an effort to eliminate duplication and make best use of scarce human resources
- Meetings of the committee, its subcommittees and working groups, will continue to be scheduled every 12 to 18 months for the foreseeable future.

6 FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE ISO/TC 107 WORK PROGRAMME

The potential risks to completion of the current work programme and to the future effectiveness of this committee include the following:

- Consolidation of the supplier-base may be accompanied by cut-backs in technical personnel making it difficult to find experts who have the time or are willing to actively participate in committee work;
- The lack of participation of metal finishers may interfere with the development of practical standards;
- The relatively small participation of customers of metallic and other inorganic coatings may make it difficult to identify new applications for metallic and other inorganic coatings;

- The difficulty of finding experts to develop standards for some of the newer deposition processes may be an obstacle to broadening the market relevance of the work of the committee;
- The generally low rate of innovation in this field may make it increasingly difficult to identify commercially relevant projects, in which case the activities of the committee may be limited to routine maintenance of existing standards, making it difficult to maintain the interest and enthusiasm of delegates;
- Finding laboratories to undertake the research necessary to determine the technical validity of a new specification or the precision of a new test method may hamper the development of reliable standards;
- The delegates that attend regular meetings of ISO/TC 107 are ageing. Finding replacements for them is difficult. Young experts, with a few exceptions, do not attend committee meetings and as a result, it is becoming increasingly difficult to identify new subcommittee chairmen and working group convenors;
- In Europe, there is a tendency for national bodies to place greater priority on the work of CEN than on that of ISO, and this is having a negative effect on the manpower available for the work of this committee;
- National, regional and international bodies compete in the same marketplace and the failure to harmonize their activities threatens the development of uniform standards of quality on a global level;
- Because of their lack of financial and human resources to support these activities, national standards organisations are unwilling or unable to assume the subcommittee secretariats or host meetings, and this may affect the structure of the committee and its ability to conduct its work.

7 STRUCTURE, CURRENT PROJECTS AND PUBLICATIONS OF THE ISO/TC 107

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 TC 107 committee

This section gives an overview of the existing structure of TC 107 and its resources. Only structures directly responsible for standardization projects (WIs) are listed. Therefore, no co-ordination or advisory groups are included. Again, the aim of this listing is to demonstrate the adequacy of available resources with regard to the anticipated workload.

ISO/TC 107 – Metallic and other inorganic coatings

Chairman: Dr. Sung Namkoong

Vice-Chairman: Mr. Klaus Scharwächter

Secretary: Prof. Soo W. Lee
Secretariat: KATS

The Korea Agency of Technology and Standards (KATS) continue to provide financial support to ISO/TC 107.

The 20th Plenary Meeting of the Committee is scheduled to take place in February 2008 in Margarita Island, Venezuela. This will be the first time that the ISO/TC 107 will have its plenary meeting in Latin-America. In this way, the ISO/TC 107 is broadening its international participation.

7.1 ISO/TC 107 Working Groups

WG 1, Thermal Spraying – Simo-Pekka Hannula, *Convener*; Xuebin Zhen, *Secretary*

WG 2, Vitreous and porcelain enamel coatings – John Mullis, *Convener*

WG 3, Terminology – Simo-Pekka Hannula, *Convener*; Yi Zeng, *Secretary*.

(The change of convener was not carried out or implemented)

7.2 Subcommittee and Subcommittee Working Groups

SC 2, Methods of inspection and coordination of test methods, (BSI)-Vacant

SC 3, Electrodeposited coatings and related finishes, (BSI): Paul Ray, *Chairman*; Sik-Chol Kwon, *Secretary*.

SC 3/WG 1, Autocatalytic nickel (BSI) – Philip D. Stapleton, *Convener*.

SC 3/WG 3, Hydrogen embrittlement prevention and testing (BSI) – Paul Ray, *Convener*.

SC 4, Hot dip coatings (galvanized, etc.),(BSI) - William Smith, *Secretary*; Bernard Shelley, *Secretary support*; William Smith, *Chairman*.

SC 7, Corrosion tests,(PKN) - Lech Kwiatkowski, *Chairman*; Dorota Hitczenko, *Secretary*.

SC 8, Chemical conversion coatings (KATS) – Do-Yon Chang, *Chairman*; Man-Been Moon, *Secretary*.

7.2 Current projects of the ISO technical committee 107 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