Федеральное агентство по образованию

Государственное образовательное учреждение
высшего профессионального образования
«Ивановский государственный
архитектурно-строительный университет»

Кафедра иностранных языков

АНГЛИЙСКИЙ ЯЗЫК

Сборник текстов
для студентов 1-2 курсов
специальности «Стандартизация и сертификация»

Иваново 2009

УДК 802 006

Издание содержит разнообразные тексты, связанные со специальностью студентов. Цель данного издания — подготовить студентов к самостоятельному переводу и анализу оригинальных научно-технических текстов.

Рецензент
кандидат филологических наук, доцент ***О.Н. Тарасова***
(Ивановский государственный архитектурно-строительный университет)

Составитель
Тихонова Ирина Константиновна

АНГЛИЙСКИЙ ЯЗЫК
Сборник текстов
для студентов 1-2 курсов
специальности «Стандартизация и сертификация»

В авторской редакции

Подписано в печать 06.04.2009. Формат 60 × 84 $^{1}/_{16}$.
Печать трафаретная. Усл. печ. л. 1,25. Тираж 50 экз.

Государственное образовательное учреждение высшего профессионального образования
«Ивановский государственный архитектурно-строительный университет»
✉ 153037, г. Иваново, ул. 8 Марта, 20

Тираж отпечатан на копировальной технике частного предприятия
ОГРН 304370230300436

PART I

What Is a Standard? What Are They for?

A standard is a voluntarily applied document that contains technical specifications based on the results of experience and technological development. Standards are the result of consensus among all the parties that are interested and involved in the relevant activity. They must also be improved by a recognized standardization body.

Standards constitute the fundamental tool for the development of trade and industry in a country, as they serve as the foundation for the improvement in the quality of corporate management, design and manufacture of products, or in the provision of services, thereby increasing competitiveness in national and international markets.

They are also extremely helpful to consumers and users, by giving them a reference point for the levels of quality and safety that they may demand of the products and services they use, and to society in general, by helping to protect the environment, improve health, or adapt surroundings to permit disabled access.

Currently, there are standards to cover almost everything; standards on the composition and characteristics of raw materials (e.g. plastics, steel, wood), standards of industrial products (e.g. screws, household appliances, tools), on consumer products (e.g. toys, furniture, shoes), machinery, cleaning services, nursing homes and much more.

Who Develops Standards?

Standards are defined as documents developed by consensus among all interested parties.

In the AENOR structure, there are technical bodies, known as standardization technical committees that study and present the needs of each sector, and develop and approve standard drafts which are later published as UNE standards. The committees consist of a chairman, a secretary belonging to a business association, and a series of spokespeople for all those bodies that have an interest in the standardization of a particular area (manufacturers, public administration, consumers, laboratories, research centers, etc.).

How Are Standards Developed?

The UNE standards development process involves a series of stages that ensure the final document is the result of consensus.

After the final draft standard has been approved by the Standardization Technical Committee, they are published in the monthly list of UNE drafts subject to an enquiry period, during which any interested individual or organization may submit comments. These comments must be sent to AENOR.

Once the comments received in this stage have been analyzed, the committee draws up the final text, which is approved and published as an UNE standard by AENOR.

Standardization World-Wide

There are two international standardization bodies: The International Electro technical Commission (IEC), responsible for developing international electro technical and electronic standards, and the International Standardization Organization (ISO), which covers all other sectors of activity. The ISO and IEC share responsibility in developing standards for information technology.

The aim of these organizations is to promote the world-wide development of standardization activities, in order to facilitate the exchange of goods and services between countries and to encourage close relations in the intellectual scientific, technical and economic fields. The World Trade Organization (WTO) recommends the use of these standards in commercial transactions.

Of all the standards, the most well-known are the ISO 9000 series, adopted by over 100 countries. These have enabled a common language to be developed that unites quality management criteria throughout the world.

Adopting international standards developed by ISO and IEC is not obligatory for the member countries of these organizations, however this is not the case for the European Standardization Organization< which obliges members to adopt, without modification, the European standards they draw up.

Therefore, the standards developed by the European Standardization Committee (CEN), the European Electro technical Standardization Committee (CENELEC) or the European Telecommunications Standards Institute (ETSI) are systematically incorporated into the AENOR catalogue.

European standards facilitate the removal of technical barriers to trade among European Union member countries and their importance is shown in the EU policy (New Approach), which aims to harmonies national member state legislation, basing its requirements on the specifications included in the European standardization documents explicitly mentioned in legal texts.

Certification

Certification is the process carried out by a recognized body, independent of the interested parties, which demonstrates that a company, product, process, service or person complies with the requirements defined in standards or technical specifications.

After ensuring that the products or services comply with certification process requirements, the applicant requests certification from AENOR by sending the necessary documentation. This is the point at which the certification process begins.

For a product or service to be certified, it has to pass a number of evaluations, including:

- Checking the quality system applied to the manufacture of the product or in proving the service.
- Taking samples and testing the product.
- Inspecting the service.

The inspections and tests examine the product or service characteristics and check that they comply with the standard requirements.

The final result is the concession of the certificate, which states that the product or service complies with the standard and thereby grants the right to use the corresponding mark, which, from this monument on, may be used on the certified products.

Standardization in Russia

The standardization works in Russia are based on the Law “On Standardization” of the Russian Federation promulgated in 1993 and the set of standards of the State Standardization System. The standardization must be based on the mutual will of all the interested parties developing, manufacturing and consuming products to reach consent taking account of the opinion of every party.

The normative documents effective in the territory of the Russian Federation are the following:

- State Standards of Russian Federation.
- International (regional) standards, rules, norms and recommendations on standardization applied in the established order.
- All-Russian classifiers of technical and economic information.
- Branch standards.
- Standards of enterprises.
- Standards of scientific, technical, engineering societies and other associations.

The state standards are developed on the products, works and services of inter-industry importance. State standards set requirements for safety of products, works, services, environment, life, health, property, technical and informational compatibility, unity of methods of control and of marking. State Standards are mandatory for State bodies and subjects of economic activity. The Technical Committees (TC) are formed to organize and execute the standardization works on specific products, technologies or activities, and to execute the international (regional) standardization works on these objects. The State Standardization works are executed under the State standardization plans developed by Gosstandart of Russia and State Committee for Construction of Russia, taking into account the strategic directions they fix for the State standardization works, long-term working programs of TCs, proposals of enterprises and State bodies. The State standards and All-Russian Classifiers of Technical and Economic Information are adopted by Gosstandart of Russia, for the construction and construction materials manufacturing they are adopted by State Committee for Construction of Russia.

Organization of operations in standardization:

1. The Committee of the Russian federation for standardization, metrology and certification will be responsible for state management of standardization in the Russian Federation including coordination with state management bodies of the Russian Federation , interrelation with authorities of republics within the Russian Federation, areas, regions, autonomous region, cities.

2. Gosstandart of Russia according to this law will establish general organizational and technical rules for standardization activities, forms and methods for interrelations between subjects of economic activity and with state management bodies.

Terminology Update

Probably the first engineering project to run into trouble because of language problems was the Tower of Babel, but it was not the last one. Misunderstanding because of the inaccurate use of words has not disappeared. It is the major function of the Committee on Terminology (COT) to help in minimizing this problem by promoting the writing and use of standard definitions.

Ideally every technical term should have one standard definition. This, however, is not realistic because many words have acquired quite special meanings in various technical fields. In this case, to avoid confusion, such terms should be delimited to the fields in which they are applied. For example, the term “density” has 31 definitions. In some cases two subcommittees of the same technical committee have different definitions of the same term. It is necessary to improve this situation and set the cooperation between technical committees and particularly between their terminology subcommittees in reaching this goal.

PART II

Standards for Performance of Building Construction

Building codes are concerned with protecting health, safety and public’s general well-being. To do this, building codes rely on standards issued by many different organizations. For example, *The Building Officials and Code Administrators International (BOCA), Basic National Building Code*, a total 249 standards of 37 different organizations are listed. Most of these are materials and product standards, but other standards are more general and basic in nature.

A careful examination of a building code will usually reveal that there are many instances in which the building official empowered, required to use his judgment in evaluating the safety and reliability of certain building constructions. Committee on the Performance of Building Constructions' standards has developed a number of standards that are intended to offer assistance in making evaluations.

Most building codes, particularly having to do with residential constructions, are written in terms of common construction practices. However, building codes usually make provisions for alternate constructions. For example, the Council of American Building Officials (CABO) states:

Section R-108 – Alternate Materials and Systems.

R-108.1-General. The provisions of the code are not intended to limit the appropriate use of materials, equipment or methods of design or construction not specifically prescribed by this Code., provided the Building Official determines that the proposed alternate materials, equipment or methods of design or construction are at least equivalent of that prescribed in this code in suitability, quality, strength, effectiveness, fine resistance, durability and safety.

The document further states:

R-108.2- Tests Determination of equivalence shall be based on design or testing methods specified by Chapter 26 of this Code or by other such standards approved by the Building Officials.

Obviously, these standards can and do serve the building official in establishing the suitability of the alternative construction under consideration.

In the ideal approach to the design of a building, the designer determines what the building must do, or how it will perform, and then selects the constructions that will meet the level of performance required. Obviously, there must be some standardized means of evaluating the performance of the proposed construction. Committee seeks to meet this need.

Standards are intended to measure the performance of building constructions independently of materials. Therefore, they are extremely useful for the innovator who is trying a new material or a new system of construction.

A case in point is truss. Following World War II, any new ideas were advocated with the intent of expediting and improving the construction of single family, detached housing. Prominent among these new ideas was the wood roof truss, which permits rapid and economical erection of roof ceiling structure of the house. Different types were proposed, but since most of these means of connections were much stiffer than the pin connection of the usual structural analysis, testing was considered essential in evaluating the suitability of a given design. Methods of Testing Truss Assemblies, published recently, meet this need.

Interest in total building testing in situ expanded greatly during the energy crisis. It soon became obvious that air leakage was a major contributor to heat loss, particularly in all well insulated building, and consequently, that field test methods were needed. Committee on the Performance of Building Constructions' Standards responded to this need by developing three standards: E 741, Methods for Measuring Air Leakage by the Tracer Dilution Method; E 741, Method for Measuring Air Leakage by Fan Pressurization Method; F 783, Method for Field Measurement of Air Leakage through Installed Exterior Windows and Doors.

It is difficult to foresee what new needs will arise for performance standards in building constructions, but judging from past experience, the demand will grow at an increasing rate. Committee is ready to meet these needs as expeditiously as possible.

Performance of Exterior Building Wall Systems

The exterior walls of the building comprise a relatively small portion of the total of most structures, measured in terms of cost, use of materials, time invested.

The exterior walls of the building establish the style, the appeal, the aesthetic character of the building. They become a corporate image for the owners and occupants, become landmarks of sorts. The exterior walls must perform a myriad of physical and utilitarian functions. So, they must be structurally sound, able to resist and withstand the internal and imposed loads, must be the fire barriers, thermal and sound separations, durable and economically maintainable for the life of the structure, provide light control and security. In the past years there have been many changes in the materials and types of exterior wall systems. Walls have become taller, thinner and lighter in weight.

The results of some of these innovations have not always been successful. Failures, or nonperformance, of exterior walls are cited as the second or third most prevalent complaint about new buildings. There are several lists of items to be considered in the design of building walls, there is no true performance based design and evaluation procedure for walls.

The failure of exterior building wall systems involves life threatening situations, with the exception of reinforced walls to earthquake situations. A failure, whether it is water infiltration, air infiltration or whatever cause, can be exceedingly expensive and may destroy the aesthetics and utility of the building.

It is this situation that prompted the formation of Subcommittee E06.55 on Exterior Building Wall Systems within Committee E-6 on Performance of Building Constructions. The purpose of it is to develop a standard performance criteria format by which any designer may evaluate the selection of the materials, systems or components. He may also consider the joints, connections, and make a judgment of their expected performance and useful life. It is the task of the subcommittee to interact and use all of the available information, test methods, evaluation procedures and data from other committees and subcommittees, as well as from outside groups. At the organizational meeting of the subcommittee, 18 performance characteristics for exterior building walls were identified. The resulting standard will provide methods for the evaluation of any system, material, subsystem or component in an exterior building wall, as well as its level of performance and expected life.

Overall Performance of Buildings

Buildings often do not work as well as expected. As the field of building diagnostics emerges, people are beginning to understand how and why competent people, designing and building in accordance with normal, good practice in their fields, still miss the mark.

The answer has three parts. Making building work is an extraordinary complex task. The typical procedures and project organization for building design and construction often fail to expose potential problems at the proper stage for efficient and economical resolution. Buildings are constructed of thousands of different kinds of components. Some components are manufactured and delivered to the site in finished forms, ready to be installed, other components arrive at the site in finished forms, but must be cut and fitted. Some building materials, such as concrete or paint, do not have final, fixed forms until they are placed or applied at the site.

Architects, builders and owners often fail to get full value from buildings because the design or construction of one component or aspect of a project has failed to take into account the properties or planning of another part of the project. For example, the design of a lighting system may be based on assumptions about the planned layout of furniture and office landscape screens that will not, in fact, be built into the facility. Assembly of manufactured components may require compliance with tolerances that are not achievable with typical field construction methods.

There is a need for standard practices and guides that will ensure high overall performance of new constructions, and for improving the performance of existing buildings and their facilities.

Subcommittee E06.25 on the Overall Performance of Buildings was established to develop the necessary standard practices and technical publications. The subcommittee deals with the results of the building process, with how the overall building performs, as distinct from the performance of its parts: the subsystems, components, parts and materials, each taken separately. E06.25 focuses on how all these parts come together to make a complete, finished facility that meets the needs of owners, operators and users.

The subcommittee's first project is to develop a standard guide for evaluating the overall performance of existing buildings. The need for this guide was emphasized by members from organizations that own a large stock of existing buildings, by people who have to deal with labor grievances about the physical setting for work. The subcommittee is also preparing standard guides on tools for diagnostics and evaluation, and on levels of confidence in diagnosis and evaluation. The guides will deal with specific functional types, such as hospitals, museums and offices. All these standard guides are intended to become sections in a standard manual for improving overall performance of buildings.

The manual is planned in three parts.

- Fundamentals, providing the broad background and context for considering overall building performance.

- General procedures applicable to improve the performance regardless of the facility's functional type.
- Procedures for specific, functional types of building or space, such as schools, museums, hospitals, offices, houses, bedrooms and conference facilities.

Fire and Buildings

Committee E-5 on Fire Standards celebrated eight decades of fire standards development. Fire in the United States remains a significant problem. However, fire deaths have decreased about 23 % on a per capita basis. This percentage translates into approximately 1,400 precious lives spared in that time.

Man was not always in need of so much information about fire. At one time, one merely needed to ask if a structure was made of wood or stone, as far as homes and other buildings were concerned. Society was satisfied with the knowledge that wood burned and stone did not. Nowadays, the use of new materials made their way into buildings, rendering the wood and stone criterion inadequate. Firstly the Subcommittee on Fireproofing Materials formulated standard tests to which fireproofing materials should be subjected. Tests for floor systems, columns and partitions were suggested. That was just the beginning. During 1917 and 1918 the National Fire Protesting Assn. (NFPA) organized a series of conferences with national engineering organizations to discuss the whole question of fire performance of buildings and the use of fire tests to assist in fire safe design. As a result of conferences, a new standard for fire endurance was proposed and adopted.

Six subcommittees were formed in 1932 for the only purpose of addressing the fire resistance of combustible materials. E 69, Test Method for Combustible Properties of Treated Wood by the Fire-Tube Apparatus; and E160 Test Method for Combustible Properties of Treated Wood by the Crib Test, were official standards in 1947.

In the 1940s, Committee P became Committee E-5, and the fire problem with regard to windows assemblies, noncombustible materials, roof coverings and wood used for interior finish were addressed. Such interior finishes, the amount of smoke released by them, and the measurement of their flame spread characteristics, were examined as early as 1922. The tunnel test was adopted in 1950, and it became a full standard, E 84, Test Method for Surface Burning Characteristics of Building Materials in 1961.From the 1950s to the 1960s 11 new standards were developed by the committee. In total E-5 has written 20 standards in keeping with its scope "to develop, revise, approve fire standards intended for analysis and assessment of the fire performance of materials, products, systems within their environment; the development, revision and approval of fire standards intended to measure and describe the response of materials, products and systems to sources of heat or flame under controlled conditions; and the administration and evaluation of fire research programs."

For 80 years, E-5 has consistently developed standards suitable for many areas of general fire safety, which translates into the protection of human life.

Masonry Structures: the Eastern Earthquake Hazard

Today more than 70 million people in the United States are exposed to earthquake hazards. This includes ground shaking, surface faulting and other earthquake induced dangers. In this country, earthquakes, during the 20th century alone, have resulted in over 1,380 deaths and have caused more than $5 billion in damage.

From these statistics it is evident that earthquakes do pose a major threat to the American people. In the eastern United States especially, where previously an earthquake problem had not been recognized, this situation is magnified by the potential hazard of structures that were not designed to withstand seismic forces. Unreinforced masonry structures represent the greatest life threatening hazard in the event of an earthquake.

The rate of earthquake in the east is six to seven times lower than that for the west. Because of the infrequency of eastern earthquakes and because visible faults are not produced, eastern citizens overlook this hazard and are poorly prepared to cope with its damaging effects. For this reason, the potential for earthquake damage in the east is much higher than for the west. Otto Nuttli, director of hazard studies at Arizona State Univ., believes that there is a 50% chance that a large earthquake will occur in the eastern United States within the next 20 years.

Existing masonry structures in the east represent 80 to 90% of the total life threat faced if an earthquake we to occur in this region. To help decrease this hazard, unreinforced structures should undergo a structural dynamic analysis to determine their resistance to seismic loading. If a structure is found to be less than adequate in resisting seismic forces, the designer has three available options.

1. Retrofitting the structures to increase its resistance to ground forces.
2. Reducing the use of the structure, thus, decreasing its loss potential.
3. Demolishing the structure and constructing a new one that follows earthquake resistant design standards.

Because of the high cost and time-consuming analysis involved with any of these options, many designers are now incorporating earthquake resistant design of masonry structures. This prevents the later problems and is much less expensive. Masonry structures may be efficiently designed to withstand earthquakes by either using reinforcing steel in areas of high seismic risk or masonry ties in areas of lower seismic risk.

In order to improve seismic design of masonry structures, research is needed in the area of masonry response to seismic loading. The national Earthquake Hazards Reduction Act included material response studies conducted by the National Bureau of Standards (NBS).The NBS Center for Building Technology is the only federal agency conducting extensive research on the response of both reinforced and unreinforced masonry to ground shaking.

To help satisfy the need of further masonry studies, a group known as the Technical Coordinating Committee for Masonry Research was established by the National Science Foundation (NSF) to coordinate and propose a program to implement more research into the seismic design of masonry.

If this research is implemented by NSF, it will represent a major accomplishment in establishing masonry as a seismic construction material. As more research is conducted, designers will realize that masonry can withstand ground shaking forces as well as any other building material when properly reinforces and designed to do so.

Asbestos in Buildings

There is no doubt about the deadly consequences of inhalation of asbestos “dust” in dwellings. For buildings level for allowable airborne asbestos concentration or exposure levels are not specified. Airborne asbestos may represent only a small fraction of all fibers in the air of buildings, and because of problems in techniques of measurement, identification and quantification are difficult. Improved methods and standards are needed.

The Service Employees International Union, covering service workers in school buildings, established standards for inspection of school buildings for asbestos, and for corrective actions when needed to protect public health. There was the need to develop standards in several areas: for determining when asbestos containing materials in buildings are hazardous; standards for visual inspection of building components and systems; standards to identify and distinguish the different mineralogical types of asbestos; standards for protection of persons performing them; and others.

Several committees have been active in this area. Subcommittee E04.11 on Electron Metallography of Committee E-4 on Metallography has conducted laboratory studies of the determination of asbestos fiber concentration. Concerned directly with asbestos in buildings, Committee E-6 on Performance of Building Constructions continues to be active in developing standards relating to friable asbestos materials in buildings, and to treating or stabilizing such installations. Regulations have required that friable asbestos-containing fire-proofing and insulation applied to structural members be removed prior to demolish and renovation of buildings. Friable asbestos material means any material that contains more than one percent asbestos by weight and that can be crumbled, pulverized or reduced to powder when dry. The crumbling or dusting of these materials is a major concern because friable behavior under demolition or renovation conditions can affect air conditions through emission of asbestos particulates. A lot of tests were organized with Subcommittee C16.32 on Mechanical Properties of thermal insulation, Test Method for Tumbling Friability of Preformed Block-Type Thermal Insulation. However, the test specimens did not represent any commercially available insulation materials. It was felt that more tests should be undertaken using real world materials. But the financial support was temporary and no conclusions were reached.

Removal of the asbestos-containing materials was considered the surest way to eliminate the asbestos hazard, but in many cases, the difficulty of the removal, the cost and other factors make the encapsulation treatment attractive. It was indicated that a standard specification for encapsulant materials was strongly needed. Work completed at Battelle Columbus Labs. determined the desirable characteristics of encapsulant materials. A large representative task group of Committee D-1 on Paint, and Related Coatings and Materials, Subcommittee E06.21 and others met on many occasions to evaluate existing and proposed laboratory and field test methods. It prepared the following standards: Standard Specification for Encapsulating Agents for Friable Asbestos-Containing Building Materials, Standard Test Method for Encapsulating Agents for Friable Asbestos-Containing Building materials. Future work will permit completion of the original charge to provide both standard material specifications and test methods.

C is for Cement

In 1898 eight committees on cement and mortars were formed. By 1901 members representing several committees consolidated and formed one committee, Committee "C" on Standard Specifications for Cement. The committee reported that samples of cements, including five Portland cements, were sent to 30 laboratories for testing.

As the result, Portland cement was defined as the finely product resulting from the calcinations to incipient fusion of mixture of properly proportioned materials, and to which no addition greater than 3% has been made subsequent to calcinations. All cement specified according to the document was to be packaged in bags of 94 lbs or barrels containing 4 bags.

Inspection and tests were also to be performed on cement. There was a test for specific gravity, requiring that the cement be thoroughly dried at 100 degrees C and the specific gravity not to be less than 3.10. The time of setting could be in not less than 30 minutes, and the hard set in not less than 1h, not more than 10 h. Tensile strength requirements varied from 150-650 lbs strength depending on the duration of the test. The cement's constancy of volume was to be indicated by pats in different environmental conditions. The tests were to be performed in accordance with those proposed by the Committee on Uniform Tests of Cement, then a part of the American Society of Civil Engineers. Change was still in the works for the standard, and a few decades later the standard had been recast in a form similar to how it appears today. The special subcommittee was organized to convey "their thoughts on how many and what types of Portland cement should be recognized in the standard specifications of the Society, as well as just what chemical and physical test limits should be set up for each type."(SN Bulletin, January 1940).

Today, C150, Specification for Portland cement, covers eight types of the material, five of which were included in the 1940 version of the standards. Type I may be used when the special properties specified for any other type are not required. This is the most commonly produced and used cement. Similar to Type I are the cements of Type II category, with requirements that provide for moderate sulfate resistance or moderate heat of hydration. Type III takes into consideration applications where high early strength is needed. For example, if a highway is to be opened as soon as possible, this type of cement might be used. These first three types also have air entraining variations, Types IA, IIA, IIIA, when that particular property is needed. Type IV is for use when a low heat of hydration is desired, keeps the interior heat from building up and possibly causing thermal stress cracking. Finally, Type V, for use when high sulfate resistance is required, may be called for when the soil or groundwater has high sulfate content.

Whatever the need of the construction industry, where Portland cement finds its greatest use, C 150 is useful. The almost innumerable revisions to the document demonstrate its flexibility in continuing to meet those needs.

PART III

Solar Systems for Domestic Dwellings Heat E-44 Group

The members of Subcommittee E44.06 on Heating and cooling Systems, a branch of Committee E-44 on Solar and Other Renewable Energy Conversion, have seen a standard they developed move to the final stages of balloting and approval. The document is E 1056, Practice for Installation and service of Solar Domestic Water Heating Systems for one and Two Family Dwellings, which was presented for Society ballot. The intent of the document is to help ensure adequate operation and safety of such systems. E 1056 suggests also methods for a system's improved operation and effectiveness. The standard can serve as a guide to manufacturers, distributors, regulatory officials, and owners.

E 44.06 is now concentrating on a standard that covers procedures for on-site inspection and verification of the operation of solar domestic hot water systems using flat plate or concentrating type collectors. The document's aim is that on-site performance measurements and acceptance criteria are required after system installation to ensure that the system is operating as advertised or specified. The subcommittee needs additional input in developing this practice, which is meant to provide a simple and economical acceptance test to verify for the purchaser that critical components are functioning as well as to establish baseline data reflecting the overall short-term system heat output.

Other standards projects under consideration by the group include sizing for domestic solar hot water systems, model curricula for training solar system installers, collector absorber stagnation and collector rain leakage.

Profilometers Record Road Roughness

The roads traveled day by day are narrow or wide, local or highway, asphalt or concrete, straight or curving, smooth or rough. This last characteristic is perhaps the one thing a driver and passengers really notice.

Maintaining the road involves knowing what the profile is. Call it smoothness or roughness, such knowledge is acquired from measuring methods that can be assigned to one of two classes. Class I systems measure the true road profile within the range of the measuring device, but independent of the dynamics of the vehicle carrying this device. This standard is E 950, Test Method for Measuring the Longitudinal Profile of Vehicular Traveled Surfaces with an Internal Profilometer, which uses measurement of the distance between between an inertial plane of reference and the surface to detect changes in elevation.

Class 2 systems measure the response of a dynamic system, such as a passenger car or special trailer, to road roughness. Such systems are called Response Type Road Roughness Measuring Systems or RTRRM's. The data generated by such systems depends on the dynamic characteristics of the vehicle and the measuring speed. A standard method for use of such systems is in preparation within E-17.

Profilometers are the preferred way for measuring road roughness. Only four states owned high speed profilometers for many years. The small follower wheels, used to trace the pavement profile, limited the surveying speed and required frequent maintenance. In recent years noncontact sensors were developed to replace these wheels. In addition, digital signal processing technology has replaced the analog systems, providing better accuracy and reliability. Thus, there is renewed interest in high speed profilometry, and several states have already acquired noncontact profilometers.

A program for evaluating and correlating profilometers was sponsored by Federal Highway Administration (FHWA) and held at the University of Michigan. Eleven profilometers participated, all operating on the inertial reference principle originally developed by General Motors. The difference in design was considerable. Five units were very similar, using light beam sensors, another on laser sensors, two used acoustic sensors, and two others used sensing wheels. The data was currently analyzed at the University of Michigan, Transportation Research Institute. A report will be issued when the study is complete.

Practice Determines Asphalt Volume Correction

Asphalts change in volume with a change in temperature and are loaded or transferred at widely varying temperatures. Volume correction factors, which are provided in D 4311, Practice for Determining Asphalt Volume Correction to a Base Temperature, are used to adjust bulk volumes measured at those temperatures to corresponding volumes at a base temperature of either 60 degrees F or 15 degrees C for the purpose of custody transfer and accounting operations.

D 4311 works out tables of volume correction factors that may be used to convert volumes of asphalt measured at different temperatures to a volume at a standard base temperature. These tables are for all types of asphalts except emulsified asphalts.

The standard is under the jurisdiction of Committee D-4 on Road and Paving Materials and is the direct responsibility of Subcommittee D 04.40 on Asphalt Specifications.

СТАНДАРТ, СТАНДАРТИЗАЦИЯ

В переводе с английского «стандарт» означает «норма, образец». В технике стандарт – это образец, эталон, модель, с которыми сравнивают промышленную продукцию, нормы, правила и т.д. Словом «стандарт» называют и технический документ, устанавливающий важнейшие свойства, типы, виды, марки и другие требования, которые подлежат выполнению предприятиями и организациями. А сам процесс установления норм и правил, и составление этого технического документа называют стандартизацией.

Официальной датой начала государственной стандартизации считается 15 сентября 1925 года, когда был создан комитет по стандартизации. Первая группа стандартов была утверждена 7 мая 1926 года.

Установлены 4 категории стандартов: ГОСТ – Государственный стандарт, РСТ – республиканский стандарт, ОСТ – отраслевой стандарт, СТП – стандарт предприятий. ГОСТ имеет силу закона для всех организаций и предприятий нашей страны. СТП обязателен только для завода или фабрики, которые его утвердили. Стандартом может служить не только тот или иной документ, но и промышленное изделие или какая-либо заданная программа или правило и т.д.

Стандарты должны быть перспективными, отражать не только достигнутый уровень техники, но и завтрашний день. Только тогда соответствие изделия стандарту становится показателем его высокого качества.

В нашей стране стандарты регулярно пересматривают, как правило, не реже, чем один раз в пять лет.

Стандартизация является важнейшим фактором научно-технического прогресса.