

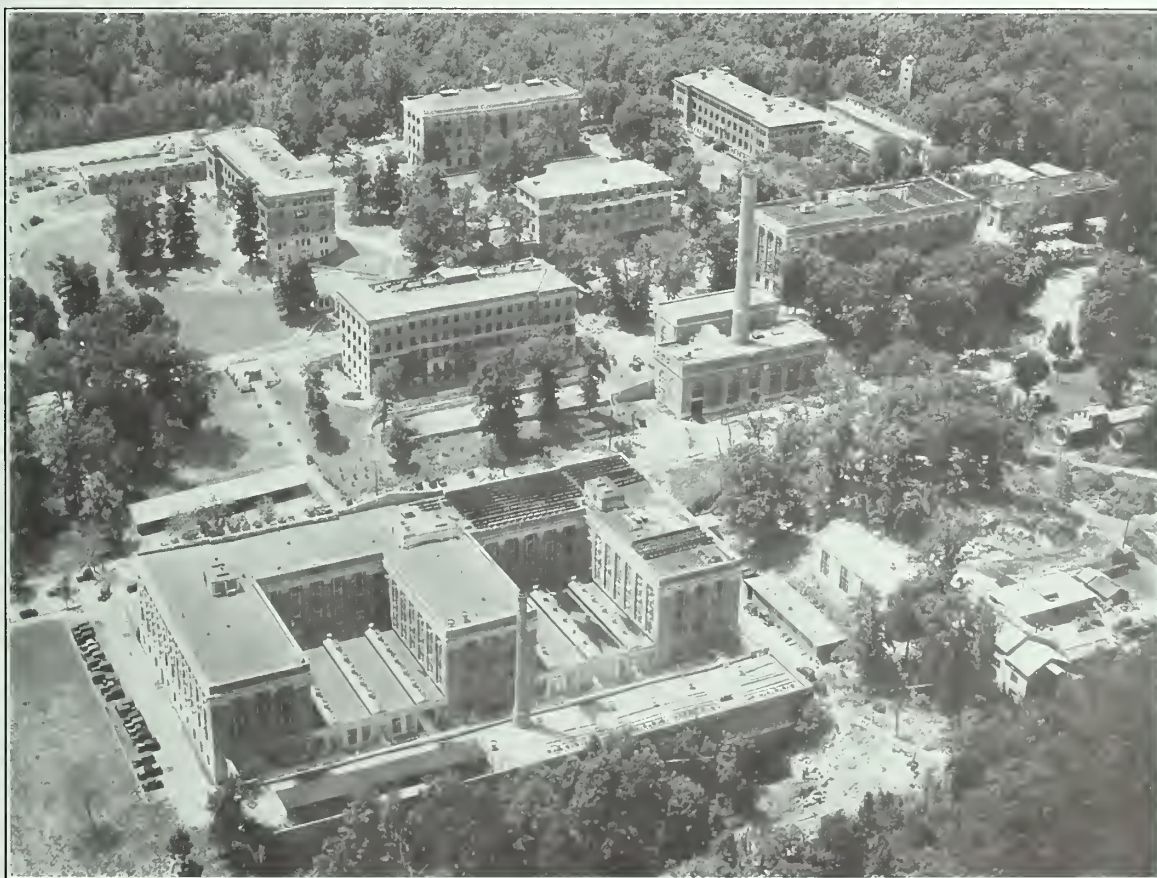
MAR 27 1933

# COMMERCIAL STANDARDS MONTHLY

Reference book not to be  
taken from the Library



*A Review of Progress in  
Commercial Standardization and Simplification*



Photographed by Army Air Corps

AIRPLANE VIEW OF BUREAU OF STANDARDS (LOOKING SOUTH)

ISSUED BY THE BUREAU OF STANDARDS OF THE UNITED  
STATES DEPARTMENT OF COMMERCE, WASHINGTON, D. C., U. S. A.

Vol. 9, No. 9



March, 1933



## The Commercial Standardization Group

A. S. McALLISTER, Assistant Director

### DIVISION OF SIMPLIFIED PRACTICE

Edwin W. Ely

The division of simplified practice cooperates with industrial and commercial groups to reduce waste, usually through eliminating unnecessary variety of product, method, or practice. Its function is to bring together all parties interested in a project of this character, and to coordinate their work in developing a simplified practice recommendation. Such work includes surveys of current practice, formulation of a simplified practice program, and presentation of that program for action by a general conference representing all interests. The division then transmits to all concerned a full report of the general conference, with a request for written acceptance of the action taken. When the volume of acceptances is sufficient to indicate initial success, the Department of Commerce indorses the program and publishes the recommendation. The division thereafter cooperates with a standing committee appointed by the industry concerned, in conducting periodic surveys to determine the degree of adherence, to maintain and extend support of the recommendation, and to secure data for reaffirmation or revision. Simplified practice may be applied to any commodity or activity in which it will reduce waste. The division stands ready to render service in developing and making effective any application of simplified practice which will reduce waste, stabilize business, or extend commerce.

### BUILDING AND HOUSING DIVISION

J. S. Taylor

The division of building and housing, formed in 1921, cooperates with business, technical, and professional groups in furthering construction activities. It works to modernize building codes and to encourage improved standards for the quality of building construction, and the practical application of the latest development in design and use of building materials.

It encourages home ownership through the development of an enlarged, steadier, more intelligent, and more discriminating demand for dwellings—the largest single class of buildings which the construction industries provide.

The division also cooperates with other governmental agencies and with many private business and professional groups in efforts to distribute building activity more evenly throughout the year and to secure less fluctuation from year to year.

The work on city planning and zoning has the broad objective of making buildings more useful through proper location with respect to other structures, stabilizing of land values and property uses, well coordinated thoroughfare systems, and well laid out public works.

### DIVISION OF SPECIFICATIONS

A. S. McAllister

The duties of the division of specifications are to promote and facilitate the use and unification of specifications. In doing so it carries on activities involving cooperation with technical societies; trade associations; Federal, State, and municipal Government specifications making and using agencies; producers, distributors, and consumers; and testing and research laboratories. It ascertains the standardization and specifications promoting activities of the associations and societies, and brings to their attention the work being done by the commercial standardization group. It brings the Federal specifications and commercial standards to the attention of the maximum number of producers and users of commodities complying with these standards and specifications. It compiles and distributes lists of sources of supply of materials guaranteed to comply with the standards and specifications. It shows both buyers and sellers the benefits from handling nationally specified, certified, and labeled commodities. The division prepares directories of governmental and nongovernmental testing laboratories and the Directory of Specifications, and is working on an encyclopedia of specifications, the first two volumes of which have been issued, namely, "Standards and Specifications in the Wood-Using Industries" and "Standards and Specifications for Non-metallic Minerals and their Products." It also aids in preparing the Standards Yearbook.

STANDARDIZATION  
...IS..  
A CONTINUING PROCESS  
~  
ITS AIM IS NOT FIXITY  
OR STAGNATION  
..BUT..  
TO ADD SERVICEABILITY  
AS OFTEN AS THE  
POTENTIAL GAIN  
MAKES IT WORTH WHILE

### DIVISION OF TRADE STANDARDS

I. J. Fairchild

The division of trade standards, on request, assists industrial and commercial groups in the voluntary establishment of standards covering grades, quality, dimensional interchangeability, or other acceptance criteria as a national basis for marketing manufactured commodities.

The detail criteria are selected or determined voluntarily by interested buyers or sellers, without any Government dictation or domination, and adjusted at a general conference of producers, distributors, and users so as to represent the composite views of all branches. The division functions chiefly as a neutral agency to see that all interested elements are given full opportunity to be heard and satisfied; to solicit and record acceptances; and to publish and promulgate the standard when a satisfactory majority of acceptances is obtained and provided there is no active opposition.

Industries are encouraged to apply self-certifying labels to products meeting the commercial standard requirements, as a means of protecting the consumer and the scrupulous seller from misrepresentation or unfair methods of marketing.

Provision is made for regular revision of the standard through the appointment of a standing committee to consider periodically any necessity for revision of the standard, in order that it may be kept constantly compatible with progress in the industry.

# COMMERCIAL STANDARDS MONTHLY

## *A Review of Progress in Commercial Standardization and Simplification*

VOLUME 9

WASHINGTON, D. C., MARCH, 1933

NUMBER 9

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### AN INVITATION TO VISIT THE BUREAU OF STANDARDS

A cordial invitation is extended to all interested in scientific progress to visit the laboratories of the Bureau of Standards when in Washington. A personally conducted trip is organized at 2.15 p. m. daily except on holidays. Special trips for groups may be arranged at other times by writing to the bureau in advance. The bureau's illustrated Visitor's Manual may be had for the asking. This lists the work in progress and gives an airplane view of the ensemble and a brief statement of typical discoveries and inventions which have been notable, basic contributions to radio, aviation, and other modern arts and industries.



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## Meeting of the Cotton Associations of the World to Consider the Approval of Universal Cotton Standards



Copies of the Universal Cotton Standards for use by the United States Department of Agriculture and the arbitration appeal committees of the principal cotton associations of the world will be offered for approval at a biennial meeting of representatives of the world cotton industry scheduled to be held in Washington on March 13. Nine European cotton associations, the United States Department of Agriculture, and the American cotton industry will have representatives at the meeting which is provided for in agreements between the Secretary of Agriculture and the European cotton associations. The Japanese associations will be represented by invitation of the Department of Agriculture.

The Universal Cotton Standards were adopted in 1923, and biennial meetings have been held since then for the purpose of approving copies of the standards. Under the Universal Standards agreements, the European cotton associations have adopted the official cotton standards of the United States for American Upland cotton, known also as the Universal Standards, as the basis of all their contracts for the purchase and sale of American cotton in which grades are specified.

The following organizations are parties to the agreements: Centro Algodonero de Barcelona, Barcelona, Spain; Bremer Baumwollbörse, Bremen, Germany; Marche de coton a Gand, Ghent, Belgium; Syndicat du Commerce des Cotons au Havre, Havre, France; The Liverpool Cotton Association (Ltd.), Liverpool, England; The Manchester Cotton Association (Ltd.), Manchester, England; Associazione Italiana Fascista degli Industriali Cotonieri, Milan, Italy; Vereeniging voor den Katoenhandel te Rotterdam, Rotterdam, Holland; Federation of Master Cotton Spinners' Association, England. The Japanese associations to be represented are the Japan Cotton Spinners' Association and the Japan Cotton Merchants' Union. The American cotton industry will be represented through the leading associations of growers, merchants, and manufacturers.

W. D. Appel, chief of the textile section, will represent the Bureau of Standards.

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## A NEW KIND OF TEXTILE SPECIFICATION

### Bureau of Standards Official Outlines Suggestions for Preparation of Consumer's Specification for Sheets

By WARREN E. EMLEY, *Bureau of Standards*

Several billion dollars a year are spent by the people of the United States for textiles. The responsibility for the wise expenditure of nearly all of this money rests upon the individual housewives. This vast buying power is rapidly becoming organized in such groups as the General Federation of Women's Clubs.

Modern technological developments and high-pressure salesmanship are making it increasingly difficult for women to identify true quality in the things presented to them for purchase.

It is obviously impractical for the individual consumer to have her purchases tested. The testing would usually cost more than the value of the goods, and a thorough examination necessarily involves destruction of the article tested.

Most women are quite cognizant of the dangers lurking in the modern advertisement. While the statements are literally true, and there is no apparent intention to deceive, nevertheless, deception does result from the overemphasis of properties which are of minor importance, or even irrelevant. A recent survey of hosiery advertisements, conducted by Miss Rosamond C. Cook, of the University of Cincinnati, showed that information about the appearance of hosiery is all that a prospective purchaser can except to get from this source.

Experience is generally relied upon as the most nearly infallible guide in the selection of materials. But modern technological developments are rapidly undermining this. When the first American rayon appeared in 1901, the entire lack of experience with this material was recognized, and it was accepted on a "try it and see" basis. It was found to be faulty in many respects—too lustrous, not elastic, too good a conductor of heat. Delustered rayon is now a familiar article. Hollow filament rayon is a poorer conductor of heat than the former type, and quite recently an elastic rayon has been developed in Germany. The wrinkleability of cotton has prevented its use for many purposes for which it might otherwise have been selected. A British inventor has recently found out how to impregnate the cotton fiber with a synthetic resin, so that the fabric made therefrom will not wrinkle so easily. Artificial wool from Italy has been on the market for some time. The Japanese have learned how to dissolve real silk, force the solution through rayon spinnerettes, and regenerate the silk. These examples are probably sufficient to bring home the fact that experience, if not valueless, is fast becoming so.

Brand names are probably the safest criteria for judging present-day qualities, but they have their drawbacks. Obviously, a nationally organized group of consumers would not care to indorse specific brands.

The value of a brand rests exclusively upon the established reputation of the manufacturer. This makes it difficult for new but deserving manufacturers to get a foothold in the business and offers a constant temptation for those whose reputations are established to trade upon that fact.

For all of these reasons there has grown up an insistent consumer demand that manufacturers label their goods showing the details of construction. This demand has been met by opposition by manufacturers. It is the purpose of this article to explain why this opposition occurs and how it can be overcome—to suggest a method of labeling which should meet with

the hearty cooperation of reputable manufacturers.

The following paragraphs, quoted from Standardization of Consumers' Goods, by Dr. Jessie V. Coles of the University of Missouri, is an excellent criterion for judging the value of the labels which have been suggested:

This article is based on a talk given before the board of directors of the General Federation of Women's Clubs. The need and value of consumer specification instead of manufacturer's specifications for the use of the consumer are discussed. Suggestions are given for preparing a consumer's specification for sheets.

In the field of consumers' goods, standardization may be described as the process of making available in commonly understood terms such information concerning characteristics of goods as will permit their identification and comparison in the market.

Let us examine the Federal specification for sheets and see how a present-day specification is built. Let us first go back a generation or two to the days when there were no specifications. Assume that Smith and Jones are two rival sheet manufacturers, each making a good article and doing a good business. One day Smith's salesman come in off the road and say, "Mr. Smith, Jones's sheets must be better than ours. He is taking our customers away from us, and the reason isn't wholly one of price." Smith immediately buys some of Jones's sheets and sends them to the laboratory to find out all that can be learned about how those sheets were made. He also hires one of Jones's foremen to tell him things which the laboratory can not find out. From these two sources Smith finally learns all about the kind of cotton Jones used, how the yarn was spun, and how many threads per inch the weaver should put in the warp and filling, and, finally, as a check, what the weight and the breaking strength of the finished fabric should be. Smith is then able to write a specification for Jones's sheet with the certainty that a sheet made to meet the specification would be exactly like the one Jones was making.

Many manufacturers had similar experiences. Commercial testing laboratories built up improved equipment and skilled operators to test all kinds of textiles for what may be regarded as the four fundamental characteristics—fiber content, weight, tensile strength, and thread count.



Finally the large consumer entered the picture. Let us assume that the textiles committee of the Federal Specifications Board undertook to write a specification for sheets. The first logical move would be to get from the industry descriptions of the test methods already in use. In these they would find general agreement. Both manufacturers and independent laboratories had built up quite complete and creditable methods for testing sheets for the four characteristics enumerated above. The committee would then get from the Government departments, which buy sheets, samples which were known by experience to be satisfactory, and test them, using the established methods. Based on these data, numerical limits would be placed in the specification. Let us examine the results.

To meet this specification, the sheet must be made of cotton, yet linen sheets and silk sheets are on the market and are considered by many women to be better than cotton sheets.

The specification calls for a thread count of not less than 74 in the warp and 66 in the filling. It is true that too low a thread count might indicate a sleazy material. But what woman can say that a sheet having a thread count of 73 by 65 may not answer her purpose even better than the one called for by the specification?

The specification says that the weight shall be not less than 4.6 ounces per square yard. Such a sheet is satisfactory for Army camps, Federal prisons, and like uses, but is obviously too heavy for general household purposes.

The specification requires a breaking strength of 70 pounds in the warp and 70 pounds in the filling. These figures are evidently based on the test data referred to above. They bear no relation to the stresses which may be put upon a sheet, nor is there any known relation between breaking strength and durability. The new percale sheet, preferred by many women, will not meet this strength requirement.

The above criticism must not be taken as adverse to the Federal specification. It is intended to emphasize the fact that this specification is merely a description of the particular sheet which the Government wants to buy and is not a standard of quality in the sense that such a standard can be used as a basis for comparison of value.

Now suppose it were decided to use this specification as a basis for labeling. One might label sheets "guaranteed to meet Federal specification No. DDD-S-281"; but it is immediately evident that that won't do, because the sheet called for by this specification is too heavy for general household use. This fact suggests that it would be better to put the figures themselves on the label—that each sheet would be guaranteed by the manufacturer to have the thread count, tensile strength, and weight as shown on its label.

It is to this kind of a proposition that the manufacturer objects.

His objections are based on five reasons, the first two of which are the most frequently quoted and are of the least importance. They are, (1) putting a label on each sheet is a nuisance and adds to the cost, for which the consumer must eventually pay, and (2) such a label would make the manufacturer legally liable for any mistakes which might be made in his factory, and no factory can turn out a perfect product

all the time. The other three reasons are really important. Two of them are that such a label violates two of the principles set forth in the statement quoted from Miss Coles.

She states that the information given on the label should be given in commonly understood terms. The great mass of women who buy sheets have not had a special education in textile nomenclature. To them, the figures indicating the thread count, tensile strength, and weight must be utterly unintelligible, and the manufacturer objects to putting on the label a lot of information which he knows, in the vast majority of cases, will serve no useful purpose.

Miss Coles says that the information given on the labels should be such that the buyer can use it as a basis for the identification and comparison of the articles. Thread count, tensile strength, and weight serve admirably as basis for identification, but fail completely as a basis for comparison of quality. Suppose, for example, one is called upon to choose between two sheets, which, the label says, are exactly alike in every particular except thread count and price. The sheet with the higher count is the higher priced. It obviously would be—it is made of finer yarn, which costs more to spin. But the consumer is interested in the difference in value—not the difference in cost. And there is no information on the label which will enable her to judge which sheet is the better value. The manufacturer, therefore, rightly objects to putting on the label a lot of information, which, even to those who can understand it, will be valueless, or perhaps even misleading when it is used as a basis for comparing his product with that of his competitor.

The fifth reason is a corollary to the fourth. If a sheet is labeled according to the present ideas, the manufacturer is thereby restrained from any attempt to improve the quality of his product and must adhere to a strict routine. He knows that if he makes any changes whatsoever, the information on the label will tell his customers that the new sheet is different from the standard, but will not enable them to judge whether the new sheet is better or worse than the standard.

It seems obvious that such objections are valid. The way to meet them is to put on the label information of the kind demanded by Miss Coles. To do so requires, first of all, the writing of an entire new set of textile specifications, setting forth not a description of how the article can be identified but rather a standard of quality which can be used to compare the article with a competing article.

The properties of sheets may be discussed along three general lines—appearance, suitability, and durability. Under appearance may be included whiteness, draping quality, and perhaps opacity or sheerness. Under suitability may be included size, weight, and warmth. The properties of the sheet after laundering, using the standard laundry procedure, should also be considered with particular reference to changes in color, draping quality, and dimensions. Of such terms as these, a complete specification for a sheet can be made. But to do so requires the guidance of an organized group of women who are used to buying sheets and who are familiar with their behavior in service.

If such a specification for sheets were prepared the manufacturers' objections to labeling would largely



disappear. The label might read, "Guaranteed by the manufacturer to meet the requirements of the G. F. W. C. specification for quality sheets." This would be readily intelligible to every buyer of sheets. And it would form a logical basis of comparison, because, with the specification built along the lines indicated, any sheet which does not meet the requirements is obviously an inferior article.

In conclusion, the following 5-point program is offered for consideration:

1. Select some one article in the textile field on which to begin the work of preparing specifications.
2. Appoint a small committee to write a specification for this one article.

3. Have the committee request the cooperation of the Bureau of Standards in the preparation of the specification. In this connection it is emphasized that the initiative must be taken by the organized consumers and that they must retain sole authorship of the specification. The bureau can act in an advisory capacity only.

4. When the specification has been completed it may be presented to the bureau with the request that it be

considered for adoption as a commercial standard. This will result in having the specification carefully scrutinized by the entire industry and provide opportunity for manufacturers to register any objections they may have. When adopted, the commercial standard would be promulgated by the Department of Commerce, giving full credit to the authors.

5. Request the bureau to work out with the committee the details of the wording for the label. At this stage the manufacturers, having already accepted the commercial standard, could have no valid reason for objecting to the label.

There is an urgent necessity for prompt action. Manufacturers and department stores have already seen the value of the new type of specifications, and are installing new testing equipment to measure those properties of textiles in which the consumer is really interested. This will surely result in the stressing of those properties which the stores are equipped to measure, to the neglect of other properties which may be of greater importance.

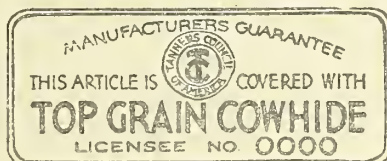
The guiding hand of the consumer is needed, and needed now.

## MARKING CAMPAIGN FOR LEATHER GOODS

The Tanners' Council of America is joining the manufacturers of luggage and other leather goods in a cooperative effort to bring about a better marking of their products for the guidance of the purchaser. The proposed plan provides for the definite and unmistakable labeling of leather goods made from top grain cowhide or top grain seal as distinguished from the same species of

leather when made of the underneath split portions. The type of labels to be used are herewith depicted.

The promoters of this plan for better merchandising set forth three objects which they hope to attain, namely, (1) to protect purchasers and stimulate their confidence in leather goods, (2) to eliminate unfair competition caused by camouflaged and misbranded merchandise, (3) to promote the sale of better-grade merchandise.



## GENERAL ELECTRIC CO. CERTIFICATE-OF-TEST PLAN

In many of the formal specifications on materials issued by the General Electric Co. provision is made for the acceptance of material upon the basis of certified results of tests made by the shipper. The certificate-of-test plan was extended in 1932 to include the purchases of material under this plan whenever the company deems the plan applicable.

According to the notification of the general extension of the plan, when called upon to do so shippers must make all of the tests which may be necessary to demonstrate that the material shipped meets the stated requirements for that material, whether these be included in formal specifications or in advice from the purchasing department describing the material and its requirements.

When the purchase order carries the notation "Certificate of test required," no material will be accepted by the company until certificates showing the results in accordance with the requirements and containing all information necessary to connect the

test results and shipment have been received by the company's testing laboratory. The company reserves the right to make check tests and to make claim for rejection and replacement of material which fails under such check tests.

## METHOD FOR KNOCK TESTS OF FUELS APPROVED

The outstanding action taken at the recent meeting of the American Society for Testing Materials committee on petroleum products and lubricants was the unanimous approval, subject to confirmation by letter ballot, of the Method for Determination of Knock Characteristics of Motor Fuels.

This is the method now known as the C. F. R. motor method and which is expected to become an ASTM tentative standard prior to April 1, 1933. Most motor fuels are given a somewhat lower octane number by the new method than that obtained by the old one, the difference being due largely to operating at a higher engine speed.



## THE ARCHITECT'S VIEWPOINT ON SPECIFICATIONS

By WALTER W. CRAPO<sup>1</sup>

Specifications have been defined as documents that describe work shown on accompanying drawings and that prescribe certain contractual relations, qualities of materials and workmanship, and methods of obtaining results, which can not be indicated clearly on the drawings or reasonably be inferred from them. It has also been said that specifications are necessary for regular and appropriate conduct of the business of all who are interested in any construction project. Preparation of proper specifications for a clear understanding of the nature of work to be done or of materials or devices to be furnished under contract, is as necessary for such purpose as are drawings. The importance of specifications is increasing as work embraced by them becomes more complex, by reason of advances in methods of construction and because of the greater variety of materials available for use. They are in fact essentially fundamental documents.

Arbitrary, unfair, or unnecessarily severe specifications, give a bad impression of the architect and usually involve either a refusal to bid or additions in price to offset unwarranted treatment that may reasonably be expected. Useless, ambiguous, indeterminate, and indefinite requirements involve uncertainties. They also cause addition of sums by bidders for self-protection. Additions so made always greatly exceed those which result from definite and exact requirements. While specifications should be so prepared as to explain the drawings, and the drawings so made as to explain the specifications, each incomplete without the other, a careful line of demarcation should be drawn between what is covered by specifications and by drawings.

Duplication of requirements, except when wisely done, usually confuses and, therefore, weakens intent. Language must not have a double meaning. Where a subject is described in general and also in particular, care must be exercised to see that ideas duplicated are identical. Unnecessary requirements, like unreasonable requirements, are often ambiguous and uncertain as to what is actually wanted and what will actually be demanded.

Specifications should be so written as to promote competition to an extent logical with the character of work for which they are prepared. However, the architect must know relative merits and characteristics, as well as market prices, of materials and devices that are available for use and most desirable for his project. He must so word his specifications that competition will be restricted to relatively similar products of equal quality and that are equally appropriate for the purpose employed. When competition is not so restricted there is no limit to profitable possibilities from the viewpoint of the contractor and no restriction as to undesirable probabilities from the viewpoint of the architect.

Perhaps the best yardstick for measuring economy and successful construction is that specification which generally permits use of only materials and devices

of well-recognized standard makes and brands, having full guarantee of the producer behind them. Notwithstanding the saying that products which are well advertised are the products which become standard, it is true that no product can long remain standard unless supported by satisfactory service. Failure of any product to fulfill what is claimed for it, regardless of cause, is certain to react against it and nullify its reputation as a standard.

Dangers of misuse of advertised products, with resulting reaction against the architect who specifies them, are very great. To prevent this hazard to his integrity the architect must adopt a policy of specifying and accepting, as far as possible, only such products as have amply demonstrated under use or performance that they will give satisfactory results, and must also require guaranties from contractors that products accepted under specifications will meet all the demands thereof. Such guaranties should include provisions for the removal of any product failing to meet the demands of specifications within a stipulated period, for the replacement with a product which will meet said demands, and for the restoration of the building to as good condition—as a result of said removal and replacement—as that in which it was before removal was made.

However, it is wrong to specify anything with respect to a product for which a guaranty is required that is clearly implied by, or not in tune with, provisions of the guaranty. It is also unreasonable to require of the contractor, under a guaranty, that which is not in his power to accomplish. Loosely drawn requirements place the architect in the hands of the contractor, to avoid claims for extra compensation. Specifications, like contracts, are enforceable only when clear beyond the possibility of misunderstanding.

With resumption of the building business, it is reasonable to assume that competition between contractors will be keener than ever, that payment of extras not originated by clients will be extremely difficult to obtain, and that, because of this situation, the architect more than ever before must produce specifications which are tightly drawn and "tailored" to fit each job.

### APPLE WRAPS

The Commercial Standard for Apple Wraps was released under date of February 10, 1933, to the acceptors of this standard who include the various manufacturers of the commodity, together with practically all of the larger apple-packing organizations in the Pacific Northwest.

The commercial standard describes both dry and oiled paper apple wraps, the latter being necessary in the prevention of a disease which occurs in cold storage which is known as "apple scald."

Copies of this standard designated "Apple Wraps, Commercial Standard CS44-32," are available from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5 cents per copy.

<sup>1</sup> Abstract of paper read before the Chicago Architects Club; member Childs & Smith, architects.



## SPECIFICATIONS AND LABELS FOR TEXTILES

## Textile Buying for the Informed Home Maker Would Be Aided by System of Labeling

By RUTH O'BRIEN<sup>1</sup>

No home maker is considered wholly successful today unless she is a wise and discriminating buyer. Her ability to bake good bread and sew a fine seam may still be desirable accomplishments, but in many homes both the bread and the seam are likely to be purchased ready-made. Her problem is to select the best product obtainable for the money she has to spend. This is no easy matter, especially when she is trying to buy satisfactory clothing and other textile materials.

The extension service of the United States Department of Agriculture and the home-economics teachers of the country have attempted for many years to furnish so-called household tests by which the home maker could judge quality in textiles. She has been told to moisten a small spot of material in order to discover whether it is linen or cotton, to burn a few yarns so as to determine how much wool it contains and to do many similar things which are supposed to tell her just what she is buying.

At best, these methods are makeshifts. At one time they may have had some value, but that time has largely passed. To-day the cotton and linen or the cotton and wool are likely to be so mixed in the same yarn that the amount of each can only be determined by a textile specialist with laboratory facilities. New fabric finishes are being developed and applied to all kinds of materials, so that their quality is not easily recognized. More confusing still is the fact that the market is flooded with so many similar materials, differing in price but so nearly identical in appearance, that the ordinary household buyer can not make an intelligent choice between them. The result is that the home maker with even the best intentions and training is forced to buy largely by guess.

This is also true of most buyers for retail stores. Unless they have laboratories at their disposal, a facility now available to only a small percentage, they are at as great a loss as are the women. In fact, in the majority of cases they have less knowledge of the subject than the college or extension-trained home maker and, in addition, do not have the opportunity of watching the performance of the merchandise under actual wearing conditions.

The Bureau of Home Economics, United States Department of Agriculture, has recognized the difficulty for some time and has become interested in the possibility of setting up specifications for the more staple materials, so that the home maker can select the one best suited to her purpose within the price range she is able to pay. Grading systems involving quality specifications are used by producers and distributors of some commodities, such as meats, poultry, fruits, and vegetables. Standards for grade and staple of raw cotton have been set up by the United States Department of Agriculture and are serving a useful purpose in the trade. In fact, most wholesale buying is done to-day on the basis of some kind

of grades specifications. These are chiefly the result of demand on the part of the buyers, and are based on studies which have shown the type of specifications that would best describe each particular commodity. Much of this has been done by the Department of Agriculture. The Bureau of Home Economics suggests not only that these grades be brought into use in the retail market, so that the consumer can benefit directly by them, but also that appropriate grades and standards be extended to other household commodities, such as textiles.

The question naturally arises as to what textile specifications would be most useful to the mass of consumers. In many cases this can not be answered until studies are made to determine the particular fabric characteristics of vital importance from the consumer's viewpoint. Often this will involve fundamental research as to the effect of differences in construction upon the usefulness of the fabric. A large gap now exists between the technical information in regard to fabric manufacture and the practical information of value in everyday living. This will have to be bridged before any real help can be given the household buyer. It is this type of research upon which the Bureau of Home Economics is making a beginning. For example, a study has been completed of the kinds of wear shown by bed sheets when used under hotel conditions and an investigation is now under way in cooperation with the Bureau of Agricultural Economics on the relative wearing qualities of sheets made with different grades of cotton of the same staple length.

There are, however, many construction details now in general use among manufacturers which would be helpful to consumers even if they would not completely solve the difficulty. From the manufacturer's point of view, this would involve printing the information on a label on the fabric. On the part of the consumer it would in some cases involve learning the meaning of a few simple terms now used chiefly by textile experts.

For instance, sheeting manufacturers specify the weight per square yard of the sheeting. This tells the total weight of fiber and finishing material and is often useful in comparing sheets of different prices. Sizing is the term used for the starch and other finishing material present in cotton fabrics. A small amount must be put on the warp yarns of every fabric so that they will not break when chaffed during the weaving process. Additional sizing is added to the finished fabric to make it appear smooth and attractive to the buyer. In extreme cases such large amounts may be used as to make the sheet or other fabric appear heavier and firmer than it is, and the purchaser is misled. When the sheet is washed most of this finishing material is removed and the excessively sized fabric shows up as it really is, a very coarse, loosely woven piece of material. It would be a relatively simple and very valuable practice to tell on a label the percentage of sizing in sheets and other fabrics in which this is important. "Pure finish" is

<sup>1</sup> Chief, division of textiles and clothing, Bureau of Home Economics, U. S. Department of Agriculture.



a term sometimes used to indicate that a minimum amount of sizing has been used.

The yarn count gives the number of the yarn and shows whether fine or coarse yarns have been used. The number of twists per inch in the yarn gives a numerical measure of whether it is very loosely or very tightly twisted. This is important because a yarn may be so loosely twisted that it pulls apart easily and does not wear. The number of threads per inch warp-wise and filling-wise is a measure of how closely woven the material is.

Of course, durability is one of the qualities chiefly desired in many fabrics and unfortunately there is as yet no standard method of determining this quickly. The nearest approach to such a test is the breaking strength of the material, often spoken of as the tensile strength. Although this is not necessarily an accurate measure of wearing quality, it is often some indication.

While in general, thread count, yarn count, twist count, weight per square yard, and tensile strength tell most of the construction story concerning a fabric, cases and often additional information is needed. Take the case of blankets. These items are all important in determining quality in these articles, but information about weight and tensile strength are especially useful. Two all-wool blankets may be the same size and of very similar construction but differ markedly in the amount of wool contained in each. This, of course, influences the heat-retaining properties and is of great significance when the matter of getting one's money's worth is considered. The tensile strength tells how strong the material is. In the case of blankets containing both cotton and wool, the percentage of each fiber present is of great importance to the purchaser. Under the present merchandising practice a mixed blanket is at best labeled "part wool," and this may mean anything from 95 per cent wool to one wool yarn in the selvage. The percentage could be easily designated on a label and the buyer thus told exactly what she is buying.

### WHEELBARROWS

The majority of producers of wheelbarrows who have accepted simplified practice recommendation R105-32 have expressed their intention to extend their present methods of identifying the simplified lines by including statements in catalogues and other trade literature.

The wheelbarrow recommendation, which was proposed and developed by the industry, has been instrumental in reducing the number of styles of this commodity from 125 to 27, or approximately 78 per cent.

A number of national associations representing users of simplified commodities have for some time strongly urged that this policy be adopted by manufacturers who have accepted the various simplified practice recommendations. The general adoption of the identification plan should assist the wheelbarrow industry in maintaining close adherence to the waste-elimination program. Cooperation by distributors, buyers, and others will greatly increase the benefits and economies possible through simplified practice. When the simplified lines are so identified in trade

But certainly heat conductivity is the most important property of blankets. They are supposedly bought to keep people warm. Two things enter this property. One is how readily heat will be conducted away from a warm body through the blanket when the air outside is still. The other is how much will be lost if it is used where there is a draft or when a breeze is blowing, as is so often the case in outdoor sleeping. A blanket may be very warm in still air, but so permeable to breezes that it is not warm under other conditions. "Air permeability" and "heat conductivity" of fabrics are common terms with textile specialists and methods of determining these qualities are well worked out. A purchaser who could, by looking at the labels, compare the kind of fiber, the tensile strength, the weight, air permeability, and heat conductivity of two blankets of equal size would have a logical basis for selection.

In fact, every commodity could and should be labeled with such factual information. It would require no more ink or paper than is now used up in "sales-pressure" superlatives that really tell the purchaser nothing. Wouldn't it be fine if window shades carried labels that told what kind of fabric they were made of and their actual resistance to cracking? No vague, general claims, but statements as to exactly what kind of cleaning they will withstand and how many times a piece can be folded back and forth without cracking. That would give a real basis for choosing one rather than another. Towels could certainly be selected better if their construction details were given on the label and if such physical properties as the amount of water they would absorb and their tensile strength were emphasized rather than their glossy hems and other more superficial beauties.

Buying by specification would not mean that every purchaser would be able to buy the best on the market. Pocketbooks all have limits. But it would mean that every purchaser would know exactly what she is buying and could more wisely decide what is the best selection for her, taking all things into consideration.

literature their selection can be made without difficulty, and much waste now incurred in checking files and auxiliary records for these data is eliminated.

The identification plan, as applying to simplified practice recommendations, is described and illustrated in a mimeographed report, copies of which may be had on request to the division of simplified practice, Bureau of Standards.

### OPEN WEB STEEL JOISTS

Simplified practice recommendation R94-30, covering open web steel joists, has been reaffirmed, without change, by the standing committee of the industry.

This recommendation, which was proposed and developed by the industry, is concerned only with joists between 8 and 16 inches in depth and not longer than 24 times their depth, and specifies properties and allowable loads in pounds per linear foot. In formulating this simplified list of definite depth dimensions it was necessary to include designations, stresses, resisting moments in inch-pounds, and maximum and reaction in pounds.



## USE OF SPECIFICATIONS BY COUNTY AGENCIES

### Few of the County Governments Utilize Completely the Specification Methods of Purchasing

By SPENCER H. REED, *Bureau of Standards*

While the majority of States and over 200 cities of the United States employ purchasing methods which compare favorably with the best modern practices of private business, the governments of the 3,072 counties of the country, aside from notable exceptions, adhere to procurement methods which are many years old.

Although each county is free within certain limits to determine how it shall conduct its own business transactions, county government is regulated by State law in practically all States, and county purchasing officers are for the most part established under general permissive statutes. We find, for example, that the general law of New York is supplemented by special laws which prescribe a definite purchasing organization for each of certain counties. A county in Oklahoma reports that the last State legislature placed the purchasing power upon each officer and holds him fully responsible for his expenditures. In certain counties of Minnesota, Indiana, and other States centralized purchasing has been established bit by bit in the form of special laws.

If we add to such purchasing variations already named those which inherently flow from county governments widely divergent in character and needs, it is at once clear why there are such marked differences displayed in the procurement methods even in adjoining counties of the same State.

In order to secure as much data as possible upon county purchasing and to bring up to date its earlier published material on the subject, the Bureau of Standards recently requested the treasurers of the more than 3,000 counties to furnish the names and titles of the officials responsible for making purchases in their respective counties. Examination of the 1,700 replies received from as many different counties of the United States conclusively indicates the marked predominance of a decentralized system of purchasing in county government.

When the treasurers indicated that there was more or less centralization in purchasing, a questionnaire relative to county procurement methods was addressed to the individual holding the office of, or equivalent to that of, purchasing agent. Replies were received from 422 counties, representing every State in the Union but Delaware, Nevada, New Hampshire, and Rhode Island.

The survey shows that frequently the list of county purchasers is as long as the list of county officials, and more often than not the official buys without written specifications, adequate test, or careful planning. In many counties the official board, functioning as a unit, at times independently, but generally in conjunction with the county engineer and school superintendent, is reported as procuring the necessary supplies and equipment for the county. Often the board authorizes the heads of departments and institutions to make ordinary purchases for their respective units. More frequently, however, the board assigns to one of its own members, or other county official, such as the county clerk, the county auditor, or the county re-

corder, the task of buying on a part-time basis in connection with his regular work.

Delegation of authority by the board, especially in populous counties where the material wants are extensive, occasionally takes the form of a purchasing committee or a regularly organized purchasing bureau. Purchases in the counties of a few States are made by or under the authority of the county judge; while in other counties purchasing is done by the various county officials under the authority of the county court, which usually consists of three judges. Subdivisions corresponding to counties in other States are called parishes in Louisiana, the buying for which is generally done by or under the authority of the police juries.

Centralized purchasing, generally defined as the delegation to a single office of the authority to purchase supplies, materials, and equipment needed for use by all the several branches of government, occurs in very few counties of the United States—probably not more than 100, largely in California, North Carolina, and New York. Many examples of centralized county purchasing are to be found in California, where the State has passed laws permitting its counties to adopt the county-manager plan of government and to establish centralized purchasing. Questionnaires returned from this State show that at least 13 of its 57 counties have centralized purchasing departments, all but 2 of which purchase for every office of the county.

Practically all counties employing a centralized purchasing system appear to maintain a complete and efficient organization for buying, often comparable to that found in representative industries. The purchasing agent buys all supplies (schools and other institutions excepted in some counties, but not all), generally according to specification and after consultation with the using departments. Further, county laboratories are maintained or commercial or university laboratories made use of for testing purposes. The survey shows that pronounced savings are often effected through the adoption of such centralized purchasing.

The county-manager plan of operation mentioned in connection with California has also been adopted in Albermarle, Arlington, and Washington Counties, Va. A modification of this plan, possessing many of its essential features, has been in use in Alamance, Cleveland, Davidson, Guilford, and Robeson Counties, N. C.; and in Augusta, Fairfax, and Pittsylvania Counties, Va. Proposed changes in county governments, usually involving the introduction of the county-manager plan, have been given consideration in Alabama, Colorado, Florida, Georgia, Indiana, Iowa, Kansas, Mississippi, Missouri, North Dakota, Ohio, Oklahoma, Oregon, and South Carolina. In California, Iowa, Maine, Maryland, Montana, New Hampshire, New Mexico, North Carolina, North Dakota, Oklahoma, South Dakota, Virginia, and Wyoming the State constitutions permit the counties to adopt such a form of government as the county-



manager plan, whereas in other States enabling acts by the legislatures would be required.

If the definition of centralized purchasing already given is modified so as to read "the delegation to a single office of the authority to purchase supplies, materials, and equipment needed for use by all the several branches of government, except highways, schools, hospitals, and eleemosynary institutions," the counties reporting such a system, plus those having fully centralized purchasing, will be found in practically every State of the Union and will exceed 300.

Purchasing in the county actually begins when the using agency notifies the buying agency of its needs. While such notification may, and probably often does take the form of a mere verbal request, the orthodox way is through the written requisition. After the requisition has been approved, naturally the next thing is to let the public know what material or service is required. This is done in various ways—most commonly through the direct request for quotations. While all purchases involving an expenditure of several hundred dollars must generally be submitted to bid, purchases of a lesser value are often handled directly by the board or other authorized county official. The ultimate responsibility for approving invoices for payment in counties is usually a function of the county board.

Obviously, in order to make an intelligent bid, the bidder should be fully informed as to what he will be expected to furnish. Such details are generally predicated upon certain standards established by Federal, State, and local governments and by various societies and associations. Of course all commodities used by a government can not be standardized, but many can be and are, with a resultant reduction in cost and an improved delivery service for the purchaser.

It is a significant fact that approximately 75 per cent of the 422 counties replying to the questionnaire reported the use of specifications. In more than 34 per cent of the counties either the county engineer, highway commissioner, or superintendent of road construction, as his title may be, drafts the specifications, chiefly for roads, bridges, sea walls, and other similar construction work. The specifications are generally subject to the approval of the county administrative body. In many counties purchases for the highway department are procured under State highway department specifications.

Purchasing agents prepare specifications for general supplies and equipment in 23 per cent of the counties reporting. The county board, or officials designated by it, drafts the required specifications in 17 per cent of the reporting counties. In a number of counties specifications are drafted by the various department heads and in others by technical officers consulting the using department. Frequently the combined efforts of the county engineer, county chemist, lawyer, purchasing agent, and user are employed. In some counties various qualified experts are used in drawing specifications for particular lines. More than 22 per cent of the reporting counties consult the using departments of the government concerning their specification needs.

Approximately 46 per cent of the 422 counties furnishing data purchase on standard specifications of national technical societies and trade associations, 32 per cent on specifications prepared by their own government, 17 per cent on Federal Government specifications, and 16 per cent on trade brands. It should, of course, be borne in mind that certain counties indicated the use of two, three, or even all of the methods referred to, depending upon the nature of the commodity procured.

Comparatively few counties of the United States reported the maintenance by their own government of laboratories for testing, or the employment of commercial, university, or other laboratories for such purposes. Of the 149 counties, representing 34 States, reporting the use of laboratories for testing commodities purchased by the county, 4 use their own county laboratory; 83 use university or college laboratories; 46, their State laboratory; and 10, other laboratories. One, Riverside County, Calif., uses commercial, State, and local laboratories. Eleven use commercial and university laboratories; 10, State and university laboratories; 7, State and commercial laboratories; 7, university and other laboratories; 2, commercial, university, and other laboratories; and 1, Federal, State, commercial, and university laboratories.

Although deliveries to counties are usually examined by more or less rule-of-thumb methods, leaving much to be desired, there are many exceptions. It was found that 126 reporting counties employ inspectors of one kind or another, many of whom are reported to be highly trained. Of course the purchases made by some counties are not large enough to justify the employment of skilled inspectors. In such cases the various receiving agencies examine and pass upon incoming supplies.

Only 20 counties reported the use of performance tests, and more of these were counties with a centralized purchasing system. An occasional county with a decentralized system reported the use of trained inspectors and tests. At least 14 of the counties of California resort to inspection and tests in their purchasing.

While the list of progressive county organizations making use of centralized purchasing as a means of effective service to the residents and taxpayers of the county is not a long one, it is quite impressive so far as savings made over decentralized methods is concerned. Reported savings from 53 counties of 22 States range anywhere from 5 to 50 per cent, with the average for the group at about 22 per cent. Quite a number of counties reported a saving of 25 per cent or greater on the purchase of their school supplies through centralized buying.

Naturally there are limits to the feasibility and efficiency of a completely centralized purchasing system in sparsely settled counties. For them it might well be an expensive luxury, except in the purchase of the more commonly used materials. The solution to their problem may lie in county consolidation, already considered by 64 counties of 20 States, or in cooperative purchasing, whereby two or more adjacent counties would pool their needs and purchase on joint contracts.



## BUREAU OF STANDARDS' INFORMATION SERVICE

### General Public Kept Informed of Progress at Bureau Through Interviews, Articles in the Press, and Visits to the Laboratories

By HUGH G. BOUTELL, *Bureau of Standards*

The general public is showing a growing interest in the work of the National Government. This is as it should be, for the Government exists to serve the people and they have a right to know how their money is being spent. It is important that funds be expended so as to yield the maximum service. The returns rendered by some branches of the Government are quite obvious to every one. Other branches are technical or scientific in character and not so easily appreciated by the layman; as, for example, the work of the Bureau of Standards.

The general public is kept informed of the work in progress at the bureau's laboratories through correspondence, telephone conversations, personal interviews, distribution of official publications—including the monthly *Journal of Research*, *Technical News Bulletin*, and *Commercial Standards Monthly*—articles in magazines, and releases to the newspapers. Just as an interpreter must have a good knowledge of two languages, so is it necessary that the personnel of the bureau's information section know the language of the scientist and engineer and the everyday language of the lay public. The interpreter must not be content with literal translations. He must convert one idiom into another if the meaning is to be understood. This is one of the most difficult tasks performed by the information section. To write about scientific matters in popular language and to make statements intelligible and accurate is no easy task. Then, too, the average man has only a limited time to devote to the reading of accounts of scientific work. Press releases and popular articles must be brief, and in striving for brevity there is danger of omitting some essential point. Great care must be used in checking the popular statement with the original material. Scientific men are necessarily cautious and do not wish to approve a statement which is not absolutely correct. This does not always go hand in hand with news value and human interest.

Photographs taken in the bureau's laboratories are an excellent means for informing the public about the work. A few photographs are furnished by the bureau's photographer, but most of those appearing in the illustrated sections of the newspapers are made by the press services. In arranging for photographs, the inherent modesty of scientific men becomes evident. They almost invariably object to posing with their apparatus. Yet the press photographer insists on this, and probably with reason, for a picture of laboratory equipment with no one operating it is certainly "dead." Then, too, everyone likes to see the man who does the job, and is generally surprised to find that he looks like any other human being.

A great number of telephone inquiries are received each day. Questions on the general work of the bureau are answered directly, while those concerning special subjects are referred to the proper division or section or in some cases to other branches of the Government. This routing of telephone calls requires an intimate knowledge of the bureau's organization and

of the work in progress. There are 68 specialized sections in the bureau and some 500 research and standardization projects always under way, so that to keep in touch with all of them is no small task. There is nothing more exasperating to the person making a call than to be referred to three or four different offices before reaching the proper party. This condition the information section tries to avoid, though occasionally mistakes are made, particularly if the inquirer fails to state accurately what he wishes to know.

The number of nontechnical visitors to the bureau has increased tremendously during the last two or three years. At certain seasons, as in the spring, the number of sightseers taxes the limited resources available. The bureau is housed in 19 buildings on a site of over 56 acres and to inspect even a few of the laboratories takes considerable time. It has been necessary to set aside a definite time (2.15 in the afternoon) for the start of a tour of the bureau. This trip is made every day except on Saturdays, Sundays, and holidays. Each member of the section's staff goes around at least once a week, and this undoubtedly helps in keeping the staff in touch with the work being done at the bureau.

Callers, other than general visitors, range all the way from inventors of perpetual-motion machines to high officials of large industrial concerns and distinguished foreign diplomats and scientists. Naturally, each case requires a quick sizing up and special treatment. Always it is the desire to help the visitor as much as possible and to put him in touch with the proper member of the bureau's staff. The inventors are sometimes troublesome. They do not want real help, because that may mean disagreeing with them. They ask for and sometimes demand the bureau's indorsement of their ideas. Pointing out to them that their invention is contrary to well-known natural laws merely convinces them, perhaps, of the stupidity of all Government employees and they generally leave with the remark that they will be forced to sell their invention to some foreign power. In spite of all this, they have their use, for they help to enliven what might have been a dull day.

The distribution of the official stock of the bureau's publications is a very important task. About 200 of these papers, in many different series, are published each year. A certain definite procedure, involving several distinct steps in which the author of the paper cooperates with the information section, is followed in all cases. The official editions of the bureau's publications are strictly limited, and care must be used to distribute the few available copies to those who have actual need for them. In general, this distribution is limited to Government departments, public libraries, and experts who have cooperated in the work with which the paper deals or who are engaged in similar investigations in other laboratories. A mailing list made up of important libraries in this country and abroad is maintained. Keeping this list up to date and arranging, with the help of the bureau's library,



for exchange of publications is a part of the routine work. The distribution of the catalogue of over 2,500 publications which have been issued by the bureau is an important duty.

The Technical News Bulletin of the bureau is based upon the reports made each month by the division chiefs to the director, and it also contains some items specially written in the divisions and in this section. The items include records of progress of work in the laboratories, important conferences which have been held at the bureau, and reviews of publications. In addition to these special abstracts of publications a list is included of all papers by members of the bureau's staff which have appeared during the month in the bureau's series and in outside journals. The

Technical News Bulletin is useful to those who have only a general concern in the work or, who wish to purchase occasional publications dealing with their particular interests.

Another method by which the public is kept informed of the publications released by the bureau is through announcement leaflets which are sent without charge to a large mailing list. These are issued once a month and give the series, number, title, and price, as well as a short abstract, of all new publications.

An earnest effort is being made to keep the public informed of what goes on at the Bureau of Standards. The work required involves some difficulties, but it appears to have met a real need with a fair degree of success.

## STANDARD COLORS AND FINISHES FOR CAST STONE

Reference samples (approximately 4½ by 6½ by 1 inch) showing the proposed standard colors and finishes for cast stone are now available to established manufacturers of this commodity from the Cast Stone Institute. Each reference sample will be accompanied by full information as to the composition, including small samples of aggregate, cement, and color used in it. The reference samples are duplicates of the 14 original proposed standard samples selected in June, 1932, from an exhibit of 104 unidentified samples submitted by 31 manufacturers, both members and nonmembers of the institute. One-half of each original sample was maintained at the Bureau of Standards and one-half was sent to the Cast Stone Institute to be duplicated in the laboratory of the Portland Cement Association.

The reference samples are not intended to limit the range of colors and finishes in which cast stone shall be produced. Their function is to provide a simple and effective means of specifying the colors and finishes which they represent. Standard samples representing other colors and finishes may be adopted as the demand arises.

In furnishing manufacturers with reference samples, together with information as to their ingredients, size of aggregate, etc., the institute does not consider that it is disclosing data supplied by any manufacturer, since with two exceptions this information was not available on the original samples. The institute does not know how the original samples were made. It does, however, furnish general information as to how the reference samples were produced with no obligation on the part of manufacturers to use the same materials and methods in making their own cast stone to match the samples.

It should be clearly understood that the samples and formulas furnished by the institute are intended only as guides to manufacturers in matching the color and finish of the original samples. They are not to be considered as representing the "ideal" cast stone in the sense of being the most perfect and most desirable cast stone that can be made. Experienced manufacturers may be able to make improvements in the formulas which will produce cast stone of higher physical quality and greater durability. All cast stone used on Government buildings must conform to the requirements of Federal specification SS-S-721

Complete sets of reference samples have been placed in the following Federal construction departments at Washington:

Department of Commerce, Bureau of Standards (master samples).

Treasury Department, Supervising Architect's Office.

Navy Department, Bureau of Yards and Docks.

War Department, Construction Division, Office of Quartermaster General.

Department of the Interior, Office of Indian Affairs.

Veterans' Administration.

Genuine interest and approval of the reference sample method as a means of specifying cast stone on public work with assurance of getting a satisfactory product, were expressed informally by the heads of the construction departments, designers, and chief specification writers of the above offices.

As rapidly as additional sets of reference samples can be made they will be placed in State and municipal construction departments.

A geographical list of manufacturers will be made up as quickly as possible by the assistant secretary of the Cast Stone Institute showing sources from which cast stone matching the proposed standard samples is available. This list will be distributed to Federal, State, and municipal construction departments, private architects, and general contractors.

If the standard sample plan is found, after reasonable trial, to provide a satisfactory method for specifying colors and finishes for cast stone, a general conference of all interests of the industry, namely, producers and users, will be held to consider it as a basis for the establishment of a commercial standard.

The Cast Stone Institute plans to carry on an aggressive campaign for the strict enforcement of the proposed standard sample specifications and will offer its inspection and testing services to architects and construction agencies specifying cast stone according to standard samples. An arbitration committee consisting of five members has been appointed to make final decision in the settlement of misunderstandings or disputes arising from claims concerning off-color or finish samples or shipments.

Further information concerning the standardization program or manufacturers' reference samples may be had from the division of trade standards, Bureau of Standards, Washington, D. C., or from C. G. Walker, assistant secretary, Cast Stone Institute, 33 West Grand Avenue, Chicago, Ill.



## SCOPE OF STANDARDIZATION

### Advances in Craftsmanship Made Permanent Through Standardization

By H. D. HUBBARD, *Bureau of Standards*

This century has seen few things as significant as the rise of standardization as a method of human progress. It has, to a scarcely realized extent, taken hold of the details of our industrial régime. Its immediate aims are so well known as to suggest a brief review of its wider aspects.

Modern knowledge is classified by standard systems in which minute subdivisions are given code numbers. This makes possible modern bibliographies, libraries, and card indexes into which flow vast volumes of data oriented by code number. This standardization harvests discovery, classifying and making it available, speeding up its utilization.

Our epoch is a "machine age." A book embodies knowledge; a machine embodies skill standardized, energized to do a service in a standard way. In "mass production" standardization is the basis, framework, and method of the machine process, for all machine dimensions and process characteristics are measured for service.

Human activities are based on time schedules, with times allotted for food, work, rest, and play. Trains on schedule time carry people to meet countless appointments and duties. The flow of raw materials and power is scheduled to produce for industry the staples in the quantities and at the times and places to meet the measured demands. Business engages to supply at each set time and place the things called for, to fit the measured supply to the measured need.

Time measurements to-day are taking account of the latest findings of astronomy, which is so precise that a change of 40 seconds in 80 years has been measured. For small time intervals the oscillation of a quartz crystal at constant temperature is used to standardize radio-frequency (waves per second) and inversely to measure time, giving a time scale subdivisible into hundred-millionths of a second or less. Any radiation frequently emitted by an atom is thus like the ticking of an atomic clock, the oscillation mechanism of which causes hundreds of trillions of waves per second. The accurate standardization of these frequencies—some of which, like those of the iron atom, have thousands of distinctive rates—is the basis of spectroscopy, which has created a new astronomy, a new chemistry, and a new physics.

Standardization is the modern way of making permanent each advance. It assures that never again shall there be a "lost art," for arts and crafts are run by measured records or standards. We begin to normalize even the skill of the craftsman in motion studies. Marey and Gilbreth, studying motions, have given us an art for portraying skilled fingers in vital operations of industry. Time and trajectory of such motions are embodied in time-scaled wire models for study. The photocyclochronograph and high-speed cameras record the ensemble permitting the analysis of each detail.

Man's mental response is gaged. We know how fast a person should respond to stimuli through eye, ear, tongue, nose, or touch. The strength of each muscle

is measurable by dynamometers. Each detail of physical life is subjected to analysis, measurement, record. Normal magnitudes of physical and mental behavior are deduced from thousands of individual measurements, and these standard norms become bases of reference for diagnosis, prognosis, and prescriptive régime.

Standards of measurement multiply. They give the net work of measures to which all standardization is referred. Standards, exact and constant, are being supplied to all nations. The requisite science for precise measurement is being steadily developed. Units are devised to standardize the measured data of matter and energy.

Position on the earth is being standardized by using a single zero for longitude, one for latitude, and one for altitude—mean sea level. These three bases, however, formerly gave variable results. After decades of measurements by a chain of observers around the world, we now standardize the variation-of-latitude measurement by numerical data, graphs, and formulas. Knowing how the pole of the earth's rotation wanders around its pole of figure, we stabilize our coordinates of position, while the variation of mean sea level is still a problem of precise geodesy.

Standard values of physical aspects of matter and energy are called "constants." They are basic for processes in industry and experiment in science. They comprise melting points, heats of combustion; mechanical equivalents of heat, light, and electric energy; hardness of metals; densities of materials, their strength, yield point, and elastic limits; the characteristics of radiation, the quantum, the velocity of light, and countless other magnitudes which are wrought into controls to guide experiment and production. The ice and steam points fix and bound the fundamental interval of temperature from which the temperature scale extends downward to absolute zero, upward to the temperatures of the stars. These extensions are fixed by reference points, freezing points, boiling points, or the ionizing temperatures of elements. They gage and make usable those aspects and potencies which inhere in the nature of things. In their totality physical constants are the precise quantitative description of nature and its phenomena. Vast numbers of such data are printed in engineering handbooks and enter into the design of structures everywhere.

The need for uniform usage leads to accepting the best known value as standard for computation, experiment, design, or secondary standardization. Atomic weights experimentally determined are reviewed by an international commission on atomic constants and its decisions fix the standard atomic weights for chemistry.

Such quantitative data or constants are often in the form of an equation, a nomogram, or a graphic curve which sums up whole series of quantitative data, even replacing tables. The standard or characteristic curve, such as the hysteresis loop or the stress strain



diagram, is significant and affords a standard means of studying cycles of variation. Examples are the steam engine indicator diagram and time-pressure curves for the high-powered gun or the human heart. Such curves are studied in the diagnosis of defective operation. They are standards related to physical constants.

Initially man devised new utilities to meet his needs. An arrow-head was made. Its design and the method of making it were preserved, reused, bequeathed as priceless craftsmanship—standardized for a standard need. Man first took nature, doubtless, as given selecting what he found at hand to serve his need. Even to-day survives a feeling that the user must take industrial products as given, selecting what he finds to fill his needs. A new note is a persistent insistence that the use must fix the standard. This is an engineering ideal, for it meets a need by specific design, creating a product suited to the need.

Standardization begins to pervade all human activity. The beaten path is the standardized path, beaten smooth by footsteps which stabilize their own standards as the river cuts the channel which guides its flow. Human action, too, beats its trails into habits—standard reactance with its economy of time and energy and its skill stored in neutral arcs and automatic responses. Language is a standard vehicle for the commerce of ideas for which the alphabet gives standard symbols. Words are standard symbols of standard concepts.

Symbols are basic tools of thought and communication. They must be reasonably standard and of single-valued meaning. They are used in formulas, graphs, and equations as shorthand for important basic quantities. The use of graphic symbols for functioning parts of a radio set-up is an example of an ideographic language. The standard graphic symbols in a radio hook-up diagram are self-explanatory almost without any text. Altogether symbols now multiplying in great numbers and being standardized for countless uses, constitute the universal graphic vocabulary of a fast developing ideographic language, of which the standard symbols of music and mathematics already in world-wide use are brilliant examples.

The scope of standardization comprises (1) standardization of basic tools of thought and expression—words or terms, abbreviations, symbols, definitions, and the interpretations and conditions governing their use; (2) standardization of dimension, size, form, and the magnitudes of pertinent characteristics and properties of matter and energy; (3) standardization of correlated dimensional interrelations, such as preferred numbers, staple series of size or grades, allowances and tolerances, or other seriation of serviceability factors which constitute standard practice or process. The coordination of the machine process calls for staples of standard size, design, and material, and set time, place, and quantities to be delivered. These insure the smooth functioning and economy of production and transportation. An equally standard system of devices for utilizing such staples must be provided. However, rigid standardization does not hold back innovations, so strong is the feeling that standardization should imply, if not the ideal, at least the best feasible.

Modern standardization provides that a specification shall be reviewed and revised to keep pace with prog-

ress both in science and industry and in the user's ideals of satisfying service. This minimizes the lag in using new discovery—a real problem of human progress.

With the tendency for standardization to expand its scope to comprise every controllable thing comes the parallel movement to measure each need so that a standard can be gaged to satisfy accurately such need. As we measure the foot to supply the well-fitting shoe. This tendency, despite the simplification of varieties for the same need, may increase the total by providing more specialized satisfactions of more unit needs. The use of diverse surgical instruments specialized for a vast variety of operations is an example.

The factor analysis essential to standardization of process stimulates the development of measured controls. These may be so accurate that high quality becomes automatic, uniform, never failing. Such analysis is a first step in turning over handicraft to the automatic machine. As the essential motions are derived from the analysis and the measured controls devised, skill becomes incorporable in mechanism; from which stage the automatic machine is but a step.

The number of items to be standardized is so vast that no wholly centralized standardization service is practicable. Everywhere all interests concerned with each item are busily experimenting in the laboratory; observing service, its flaws and successes; measuring needs to be met; or creating new standards. Doubtless every user, by approval, criticism, report, or suggestion, aids in standardizing the products he uses.

The Bureau of Standards at Washington is our key institution for standards and standardization. Its scope as given by Congress has a breadth commensurate with the modern conception of measurement and standardization. Its findings are based on accurate measurements and sound scientific principles. As such they are impersonal, hence unbiased and dependable. Its value to the Nation has been immeasurable in those intangible values on which our material civilization rests, while the more measurable aspects of its work has paid its cost and returned to the nation tangible values many times its cost.

The scope of standardization is clearly enlarging and its key position in industrial and scientific progress entitles it to the fullest possible cooperation of all concerned. Standardization is more than the act of bringing the user and the maker together in a clear understanding on the quality of service. Its aim is also to satisfy the user's needs with increasing efficiency and economy. It conserves all gains achieved while serving as the vehicle for further advance.

### WOODEN BUTTER TUBS

Simplified practice recommendation R135-32, covering wooden butter tubs, is now available in printed form and may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents each.

This simplification program, which was proposed and developed by the industry, relates to the dimensions for the inside diameters of the top and bottom, the vertical depth, and the outside length of stave for the 10, 33, and 63 to 64 pound tubs.



## AIDS TO THE CONSTRUCTION INDUSTRY

### The Laboratories of the Bureau of Standards Help to Improve Materials for the Construction Industry

By HENRY D. HUBBARD, *Bureau of Standards*

Most of the specialized scientific and technical sections of the Bureau of Standards are concerned in some way with tests and researches on building materials and appliances or with construction practice.

Researches on materials range from the pure physics and chemistry of structural materials to the mechanics of stress and strain, from service tests of paints to the concrete foundations of a skyscraper. Materials of construction have in interest as subject matter for enterprise. They form an epic of industry—stone cut from the hills, clay dug from the soil, metals scooped from mines, lime blasted from the mountains, wood hewn from the forests, gravel deposited by glaciers, sand pulverized by the sea. Nature seems to conspire to produce vast stores of structural materials for man's use in building his habitation. Interesting and important, also, are the structures reared of these materials—skyscrapers with frames of steel, dams of concrete, highways of broken rock and cement,

bridges of steel wire or metal beams. The processes which fit materials for their uses also have their interest. For many years the Department of Commerce through its Bureau of Standards has gained much new data on how construction materials behave—results of experiments and tests measuring their quality for Government use. This information provides a basis for drafting and keeping Federal specifications current and to add to the technique of using largely for governmental purposes.

Important materials and problems are constantly under investigation—Portland cement, paints and other protective coatings, concrete, clay products, lime, glass, metals and metallic structural elements, roofing materials, and so on. The functions of structural materials are many—load bearing, wear resistance, weather endurance, fire resistance, lightning protection, wind resistance, noise reduction, corrosion prevention, preservation from decay or other deterioration, decoration, light transmission, thermal insulation, carrying capacity. Such functions serve the occupants of structures. A single material may serve several such functions. To evaluate a material for its functional service in a structure specifications and tests are designed. These give maker, dealer, and user a clear mutual understanding of the specified measurements which determine behavior or quality for structural service. Specifications describe the acceptable measurements of the pertinent properties which serve the functions desired. Many materials are tested in the laboratory and in service. Laboratory tests must be correlated with actual service if the results are to predict potential utility in works of construction.

Research on structural materials at the Bureau of Standards is, in general, devoted to problems of an entire industry and not to such as industry can handle as well or better alone. Some demand ample research facilities and staff to duplicate which would be wasteful for private industries. Others call for attack by pure sciences—physics and chemistry—rather than merely by technologists. Others are such as the bureau is especially fitted for, involving methods of measurement to gain quantitative control of processes—a control which invariably will reproduce a high quality once attained by prescription of the measured conditions which first produced such quality.

Structural materials must be safe. They may carry loads that tend to crush. Tests at the bureau furnish in advance reliable data for construction engineers in planning the safe and satisfactory design of Government structures. Building materials and materials used in construction of other kinds are the basis of

This is the third of a series of articles by Mr. Hubbard, assistant to the Acting Director of the Bureau of Standards, outlining the work of the bureau as it concerns the construction industry. These articles will cover research, testing, simplified practice recommendations, commercial standards, and the certification and labeling plan.

great industries. Their annual cost to the Nation and the loss from misuse justify Congress in providing for investigative researches by the Government on structural materials to secure the needed information to improve them or the processes which make them, or to aid in their efficient utilization. The properties of materials are, after all, the real objects of purchase, sale, and use. The bureau's experimental researches determine these properties, by service tests or tests under simulated service conditions. The results permit intelligent planning of construction.

Among the hundreds of bureau publications of concern to construction there have been 33 on brick and its problems, 34 on concrete, 31 on cement, 11 on columns, 16 on floors, 20 on fire tests and prevention, 17 on hollow building tile, 25 on structural metals, 54 on paint and paint materials, 12 on sound proofing, and 9 on waterproofing. Many give the first results of researches at the Bureau of Standards. Published results enter building practice to add efficiency and economy to construction.

A basic publication is "Physical Properties of Materials" (C101). This gives the strength and related properties compressive, tensile, shearing strengths; ductility; modulus of elasticity; and other related properties of certain engineering materials, covering iron, carbon steels, alloy steels, wire and wire rope, semisteel, aluminum, copper, and miscellaneous materials. It gives also the properties of metals at elevated temperatures, their fatigue and impact properties and the effect of heat treatment and cold-working. In this, other testing laboratories, manufacturing concerns, engineering offices, and technical societies and institutions joined. Twenty-seven definitions of



terms pertinent to the various properties are given, together with a discussion of the nomenclature of copper alloys: Correspondence disclosed the fact that such a compilation was greatly needed.

The advent of corrosion resisting chromium-nickel alloys, the advent of high-strength steels, and the demonstration of the economy and effectiveness of modern welding methods are examples of new subjects, almost revolutionary in their application to construction work, which demand accurate up-to-date numerical and quantitative information.

Another publication, "The Testing of Materials" (C45), was prepared for business and industrial groups from the user's point of view in a fairly popular style for the nontechnical reader. The subjects discussed are classes of materials, properties of materials and their determination, the measure of quality, specifications or standards of quality, improvement of specifications, and the several aspects of each class of materials in some detail. Structural materials include clay products, wood, metals, lime, cement plasters and stucco, paints, bituminous roofing.

A separate publication (M65), entitled "Purchasing Commodities by Weight or Measure," gives many useful hints affecting the measuring and weighing of materials.

"Materials for the Household" (C70) describes common structural and other materials to stimulate interest in and give data on household materials, explaining their nature and their desirable properties, to aid in their intelligent selection and promote their effective use and preservation. For each material this publication discusses the following aspects: Composition, definition, sources, properties, uses, tests, preservation, hints as to choice and use, and references to the literature for all who desire further study. Introductory sections treat of the uses of materials, selecting household materials, standards of quality for household materials, properties of materials, make-up of household materials. The 259 pages of this document make a useful reference book.

It will be recalled that the clay-products laboratory of the Bureau of Standards demonstrated experimentally methods of blending and treating American clays for use in duplicating the performance of certain foreign clays. The working of clays was studied to establish a basis for the development of specifications for clays and clay products. The early publication "The Technical Control of the Colloidal Matter in Clays" was a basic scientific paper describing research showing that as the colloids in clay largely fix its plasticity the control of such colloids is a means to perfect the quality for specific purposes.

In these researches it was found possible by suitable blending and chemical and heat treatment to produce clays of certain desired qualities. This dissipated the fiction that only imported clays are suitable for certain uses. As a result of experiments and demonstrations, some previously useless clay banks became of potential value to the clay industry. They also threw light on preheating, burning time, temperature, mechanical working, chemical treatment, and other technical controls of clay products technology. For example, overplastic clays which ordinarily check and crack would behave normally after suitable preheating.

Although brick is an ancient structural material, modern science has much to say on its production and use, its behavior, and service characteristics. The bureau has conducted many researches on brick as a material of construction. These have included tests of bricks from 250 plants scattered throughout the United States. Measurements were made of water absorptions, strengths in compression, bending and tension, and resistance to freezing and thawing exposure. A portable machine was devised to measure the transverse strength of brick.

The cause and cure of scum and efflorescence on face-brick walls were studied. Experiments disclosed the importance during burning of such variables as temperature, humidity, concentration of sulphur dioxide and other gases upon the soluble salt formation. The composition of the scum and methods for its mitigation were ascertained and published.

The uses of brick were also studied. Brick masonry piers 30 inches square and 10 feet high and walls 6 feet long and 9 feet high were tested in compression to determine the load-carrying capacity of brick masonry composed of different kinds of bricks, mortars, bondings, and workmanship. Two hundred and twenty of such large specimens were crushed to destruction in these investigations. Other specimens of brick masonry were subjected to fire tests. The bureau's program of investigations of the structural properties of brick masonry has probably never been surpassed.

In studies of the structural stability of hollow-tile walls, over 100 large masonry specimens were tested to determine the compressive and transverse strengths of hollow-tile walls. These experiments showed that using the same tile, the nature of the mortar joint materially affected the compressive strength of the walls, the strengths depending upon the strength of the mortar and the proportion of the tile given a bedding by the mortar. Resistance to fire exposure was studied in an elaborate investigation which included the testing of more than 200 specimens of hollow-tile masonry, including 70 walls similar in size to a full partition wall of a building. Although the fire resistance was affected somewhat by the type of clay used in the manufacture of the units, the design of the units and kind of mortar and workmanship used in the construction of the masonry had greater effects upon the resistance to fire exposure. The value of hollow tile in combination—hollow-tile and reinforced-concrete floors—was studied by testing beams, slabs, and full-size floor structures under load.

Marble, on account of its texture and the great variety of colorings, is a material that may be used for interior decoration with beautiful and artistic results. It is therefore deserving of proper care and preservation. The bureau has published *A Study of Problems Relating to the Maintenance of Interior Marble* (T350). This paper gives formulas for the removal of various stains that may occur on marble surfaces. Various methods for the maintenance and preservation of interior marble are discussed and described. Particular attention is given to scouring materials and their proper use.

Limestone is probably the most widely used stone for building construction in the United States at the present time. A bureau publication *Physical Prop-*



erties of the Principal Commercial Limestone Used for Building Construction in the United States (T349) gives data on the physical properties of this material. In addition, new information is given on the causes of discolorations of limestone masonry and the relative staining qualities of limestone are dis-

cussed. The nature, causes, and effects of efflorescence on limestone masonry are considered. The results of a comprehensive study of the results of weathering of limestone are given. The principal deposits of limestone used for obtaining this material for building construction are briefly described.

## HARDWARE FOR METAL DOORS

Commercial Standard for Template Hardware Has Been Revised, Effective January 1, 1933

The development of hollow metal doors set in metal frames for reducing fire hazards has now reached the stage where they are no longer unusual or novel, but are rather the normal expected equipment for the modern office building.

One of the major problems which has been the cause of much perturbation in the industry is the matter of application of locks, hinges, and other items of builders' hardware, largely because these items can not be applied by the old familiar methods which are common in the case of wood doors and trim. Of course, it is not practicable to mortise hollow metal doors or metal frames on the job so that they will receive locks and hinges. Although it is quite possible to drill and tap small holes on the job for the fastening screws, it is much more convenient to have this work also done at the factory.

It was the natural custom in the early days to select the same locks and the same hinges normally used with wood doors and to require that they be drilled to template. Each manufacturer developed his own template for each type and size of lock and hinge. Before the bucks, jambs, or metal doors could be fabricated it was necessary to know not only what company was to furnish the hardware but also what individual items were to be used. With this knowledge in hand the metal door manufacturer obtained from the hardware manufacturer drawings indicating the templates for the items selected, and not until then could the production of the metal doors and jambs be completed.

According to custom, builders' hardware was one of the last items to be selected for a given project, as it is not applied until the building is in the last stages of completion.

Since the masonry work could not proceed until the bucks were set in place, and the bucks could not be manufactured until the hardware was selected, delays were the natural result, and no one seemed to be directly responsible. The architect criticized the hollow metal door manufacturer. The hollow metal door manufacturer claimed that the hardware manufacturer had not supplied templates, and the hardware manufacturer blamed the architect for not having selected the hardware.

Although in 1924 the volume of template hardware business was not sufficient to warrant a complete redesign of locks in order that they might assemble in standard mortises, a few years' experience with the difficulties mentioned above led the two groups of manufacturers in 1928 to embark upon a program of national standardization of templates for hinges,

cylinder lock fronts and strikes, and their corresponding mortises. After a prolonged and concerted effort, details of these standard templates were accepted by both industries and published under the title "Builders' Template Hardware, Commercial Standard CS9-29" issued by the United States Department of Commerce.

The standard templates thus established provide a complete line of full mortise hinges; a limited line of half-surface, half-mortise, and full-surface hinges; and a line of cylinder locks with the functions usually required for corridor doors, communicating office doors, and closet doors, or, in other words, the items in greatest demand. This makes it possible to produce the bucks and jambs and the hollow metal doors immediately after letting the contract without knowledge as to which make and catalogue number of locks or hinges are to be supplied.

After four years of use it was found advisable to revise the standard in some minor details and this revision has been accepted by the producers, distributors, and users, becoming effective January 1, 1933. Printed pamphlets embodying this revision will be available in due course from the Superintendent of Documents, Government Printing Office, Washington, D. C., under the title "Builders' Template Hardware, Commercial Standard CS9-33."

Letters from both manufacturing groups indicate that the difficulties imposed by nonstandard templates have not yet been completely eliminated on account of the all too frequent practice of requiring in specifications merely that the hardware be "drilled to template." This permits the hardware manufacturer to supply hardware to his own templates, which he is inclined to do on occasion, rather than to standard templates, possibly in order to cut corners on the quality of the hardware furnished or to work off stocks of hardware manufactured for wood doors.

If the architects will specify that "hardware for metal doors and trim shall be drilled to standard template, CS9-33," the requirement will be immediately understood in the trade. The template standards will become a part of the contract and the competition will be on a more comparable and fairer basis. Production of metal doors and trim will be facilitated, installation delays will be avoided, and there will be adequate provision for easy replacement after the building is turned over to the owner. Since the parts which have been standardized are not normally exposed to view, all of these benefits can be obtained without any sacrifice or limitation on selection of design or on architectural treatment.



## BEWILDERED BUYERS BEG FOR STANDARDS

By I. J. FAIRCHILD, *Bureau of Standards*

The mails are constantly bringing to the Bureau of Standards, to the Better Business Bureaus, and to trade associations, letters from bewildered buyers, harassed merchants, and anxious manufacturers asking for standards, specifications, and buying guides which will sift the wheat from the deceptive chaff in modern merchandise.

It happens occasionally that industries are awakened to the necessity of establishing commercial standards by complaints from individual users. The following will serve as an example of a complaint sent to the Department of Commerce by a club member in the State of New York, which reads as follows:

I am here on my vacation, but my regular profession is closely associated with commercial and civic associations. I have just been through another unhappy experience which has led to this inquiry.

In its dealings with trade associations has the department ever made representations to the national trade body of the shirt manufacturers calling for a change in their universal policy of selling shirts at one size which invariably shrink to a size that is not at all what the customer desired? Without attempting to more than state the well-known problem in these few words, I would welcome any advice you can place in my hands as to moves made by the department to correct this practice.

Although not a direct result of the above letter, it was doubtless complaints of a similar nature which lead the National Association of Shirt Manufacturers to propose a commercial standard covering measurements and minimum shrinkage requirements for the various common sizes of men's shirts.

Sometimes it is the dealer who complains. The following is taken from a letter from a store in Arizona:

It is the dealer who must tussle with this situation, and the public who are not familiar with the various markings don't get what they want.

Another practice which is brought very forcibly to the retailer and which is an out and out steal is in the conversion of grey goods at the dye works.

When we buy 8 ounce 29-inch and 10 ounce 36-inch khaki, we get about 7 ounce 27-inch and 9 ounce 34-inch, and in some instances the weight is still less, yet we have to sell this canvas as full weight.

If we order a bale of canvas, say 8/29, 800 yards (400 pounds) from the jobber, to be sent to the dye works to be converted into khaki, we will receive from the dye works 800 yards 27-inch material weighting 7 ounces, a shortage of from 44 to 60 pounds in weight.

In dyeing this canvas it is stretched to the limit decreasing the width about 2 inches. Mineral dye used should add some weight, but I am told that the loss in yardage makes up this difference, yet the canvas loses an ounce (per yard) in weight.

This surplus in ends is retained by the dye works and that is why they have job lots of canvas for sale.

Now, if it is necessary to stretch this canvas, why not mark it at its actual weight and give the merchant all the canvas he has paid for?

The foregoing remarks apply to the situation prior to the establishment of the Commercial Standard for Cotton Fabric Tents, Tarpaulins, and Covers, CS28-32, which requires that all tents, tarpaulins, and cov-

ers, whether waterproofed or not, shall be marked to show the weight of the grey goods in ounces per square yard. Formerly they were marked in ounces per linear yard in a wide range of widths and the weight in ounces might indicate either the grey weight or the waterproofed weight, which left the buyer with no means of deciphering the confused marking.

The following quotes in part a letter from a Better Business Bureau:

One of our affiliated \* \* \* tells us that there is considerable confusion in retail hosiery advertising due to the fact that there seem to be no standards for the various weights of hosiery. As you undoubtedly know, hosiery is

designated as service weight, semiservice weight, chiffon, etc., but there seems to be no clear understanding as to just what each term signifies.

For example, hosiery designated as "service weight" by one manufacturer might be of the type which another manufacturer considered "semiservice," and this has created a situation where those terms have become, to some extent, meaningless to the public.

A number of such letters could be cited, as well as countless others which are not quite so specific on the causes of failure, but which reflect a conviction on the part of the signer that the buyer should be provided with real data which will permit him to recognize the substandard items, known in trade vernacular as "dreck," "schlag," "borax," "brummagen," and so on.

Contrary to a prevalent impression, the Bureau of Standards has no arbitrary authority to initiate or promulgate commercial standards, but it does assist groups who approach it voluntarily for assistance in the establishment and promulgation of standards as a basis for buying or selling manufactured products. Any organized group or individual company may request cooperation of the Bureau of Standards in the establishment of a commercial standard. It is not necessary that the request come from an association or other trade organization, although experience indicates that standards sponsored by such organizations are more likely to be finally accepted than those proposed by single companies.

Industries which have a strong central organization sometimes find it possible to control to a certain extent some essential elements of their relations with the buying public. Individuals who have charge of making awards under competitive bids have doubtless observed evidence of such control. Those groups which can muster sufficient cooperative control of marketing policies are seldom found among the ranks of those who request the establishment of commercial standards.

According to my observation only those industries which find themselves in difficulty through demoralization of grades or qualities, skimp cutting, misrepresentation, or which face a general loss of reputation are likely to go to such lengths. They feel that something really drastic should be done, that control

This is the third of a series of articles by Mr. Fairchild, chief, division of trade standards, Bureau of Standards, searching into the whys and wherefores of commercial standards. This one is an answer to the questions "Who Requests Them?" and "How Are They Produced?"



of conditions has passed out of their hands, and that they must put into the hands of the buyer a weapon which may be used against any producers who make unwarranted claims about the quality of their products or misrepresent them in such a way as to be detrimental to the entire industry. I have observed that few industries take such a step until they feel compelled to do so by the force of circumstances.

By means of a commercial standard, these groups take the consumer into partnership (for selfish reasons, to be sure) in order that the consumer may help police the industry, but the net result is a tremendous advantage to the consumer which he has not possessed previously, namely, a nationally accepted basis for direct comparison of prices and a definite justification for the rejection of substandard goods.

#### HOW ARE COMMERCIAL STANDARDS PRODUCED?

Generally speaking some producer or consumer group submits a tentative specification and requests the cooperation of the Bureau of Standards in establishing a commercial standard. The records of the division of specifications are examined for other specifications covering the same commodity, and copies of such specifications, if any, are obtained. Interested technical laboratories of the Federal Government are then consulted for suggestions in order that the proposed specification may not be out of line with the trends of thought or the latest research developments on the subject. A preliminary conference of interested producers is arranged to determine whether the proposed standard can be made to represent the composite views of the producer groups and whether it can be adjusted so as to form a satisfactory basis for guaranteeing quality to prospective customers.

With this accomplished, a general conference of producers, distributors, and users is then called for further adjustment of the standard in order that it may be made acceptable alike to all who sell or buy the commodity. After the standard is adjusted to meet the approval of the general conference and to satisfy substantiated criticism which may have been submitted in writing, it is then circulated by the Bureau of Standards to all producers and to representative distributors and users for written acceptance. The acceptance form states that the undersigned accepts the standard as his standard of practice in the production, distribution, or use, as the case may be, of that particular item, and that he will use such effort as may be appropriate to secure additional adherence whenever the opportunity offers.

Following acceptance by a satisfactory majority of production by volume and in the absence of active opposition, the commercial standard is then published by the Department of Commerce. Copies are sent to all acceptors and copies are made available at a nominal price through the Superintendent of Documents, Washington, D. C.

A standing committee of representative producers, distributors, and users is appointed for the purpose of initiating suggestions and sifting recommended revisions in order that the standard may be adjusted from time to time to keep it abreast of progress in the industry.

In this connection the question is often asked, "Do commercial standards permit advance in new design or do they tend to stifle initiative?" Some instances

have been observed where industries in their zeal to correct present evils have recommended standards which seem to leave little room for modification or improvement, and in such instances the group has been warned against too strict a limitation of the process of manufacture or standardization of details which might better be left open. Generally speaking, however, the producer groups are sufficiently farsighted to guard against any difficulties in that direction.

Rear Admiral George H. Rock, who recently retired from active service in the Navy, put the matter very clearly in a letter dated September 23, 1932, to the American Standards Association in which he said, "I do not believe it has been found that promulgation of a reasonable workable standard has unduly limited any engineer in the advancement of his art. When engineers have the frame of mind that a standard, because it is once published, is the final word in human accomplishments along that particular line, it should be time to change the engineers."

The appointment of standing committees was arranged to provide an easy means of revising commercial standards and more especially to give a small committee the definite responsibility of seeing to it that standards are revised as needed.

It will be clear from the above that the Federal Government makes no attempt to initiate commercial standards, neither does it undertake to impress its views upon the industry, but, on the contrary, its function is to serve as a coordinator to safeguard the integrity of the process and see that all who are directly concerned have an equal opportunity to present their views. The commercial standard is produced by voluntary cooperation and serves to clarify the understanding between buyer and seller on the more important attributes of a manufactured commodity.

#### BUREAU CIRCULAR ON INKS

A publication of the Bureau of Standards of considerable general interest which has just been issued is designated as Circular C400 on Inks. This circular in part replaces an older publication, C95, and is an enlargement of a mimeographed letter Circular LC-331 prepared by the bureau in 1932 and which has had a wide distribution.

The present circular outlines briefly the history of iron gallotannate writing inks, gives formulas for three kinds of them, and has something to say about the aging of writing and the restoration of faded writing. This is followed by short discussions of several other kinds of inks, including colored writing inks, drawing, stamp pad, recording, and other varieties. Printing inks and others that depend upon pigments for their color and special properties are in a class by themselves. They are discussed in the circular, but no formulas for them are given. The methods of testing provided for in the specifications under which the Federal Government purchases inks are described and an appendix contains sections on weights and measures, equipment for making ink in the home, and on dyes suitable for a variety of inks. A brief bibliography is included.

Copies of the circular may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 10 cents each.



## QUALITY IMPROVEMENT PROGRAM FOR ELECTRICAL APPLIANCES

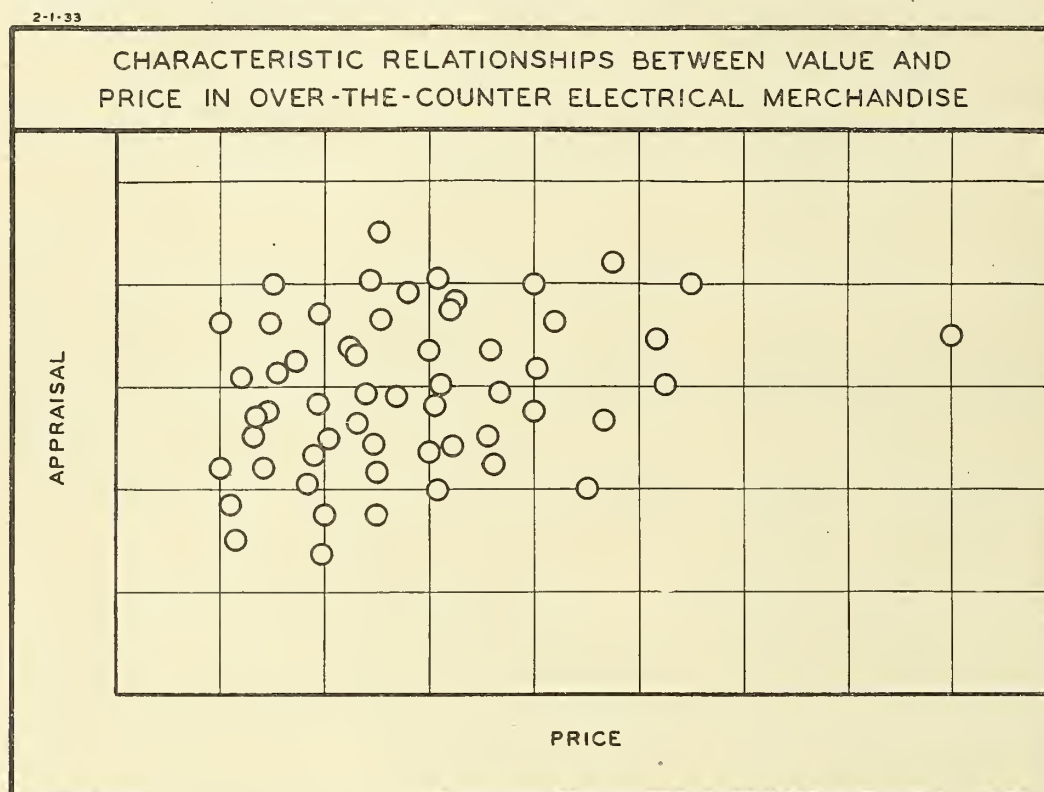
Program of Association of Edison Illuminating Companies Has Raised Efficiency of Products

By PRESTON S. MILLER<sup>1</sup>

In 1929 some of the electric light and power companies inaugurated the quality improvement program of the Association of Edison Illuminating Companies. The action was taken because of dissatisfaction due to the large number of unsatisfactory electrical appliances which were finding their way into the market and because of the concern as to the growing cost of servicing consumer equipment. The association designated an appliance committee, consisting of leading central station executives, with a subcommittee of technical and commercial men, to afford detail guid-

found among the less costly types of equipment which were first investigated that there is no reasonable relationship between value and price. In each price class the better brands have been found to be superior to the poorer brands of higher price classes. A representative picture of such findings appears in the accompanying chart, which is not based upon specific data and does not apply to any particular type of equipment, but rather is intended to afford an indication of the relationship of value to price found in over-the-counter electrical merchandise as a whole.

Whenever deficiency, weakness, or inferiority of any kind has been disclosed by tests in any product, the matter has been taken up confidentially with the producer who has been urged to make the needed corrections. Test results thus laid before producers have rarely encountered any challenge. With very few exceptions, either with or without investigation, they have been accepted by the producers. A recent count showed that there have been 380 separate transactions, in which reports of inferiority of product were laid before the producers. It is not possible accurately to determine the results in all cases. Not infrequently producers



ance and designated electrical testing laboratories as its technical agent to do the necessary testing and related work.

In the early stages of the work, surveys have been made of every known brand of certain types of customer electrical equipment, with more highly developed and thorough testing than has ever before been undertaken in such work. Laboratory tests and practical service experiments have been utilized in an effort to evaluate the performance qualities, the result being expressed as an "appraisal." The value so appraised includes all the principal features of service worth, such as effectiveness, durability, convenience, safety, and so on. In general, it has been

have been unwilling to admit inferiority of their products, but have quietly proceeded to make corrections of which the testing organization has known nothing until the improved product was found upon the market. In other cases producers have frankly worked with the testing organization, improving products where the need was found to exist and affording the testing organization the satisfaction of feeling that its work has been constructive. Approximately the results in these 380 transactions are thought to be as follows:

In 114 cases some improvement has been effected.

In 136 cases the product criticized has been withdrawn from the market.

Cases still under negotiation, 130.

Just how much influence the quality improvement program has had in bringing about this result

<sup>1</sup> President, Electrical Testing Laboratories; secretary, Association of Edison Illuminating Companies, Eightieth Street and East End Avenue, New York, N. Y.



it is impracticable to know with certainty. For example, in more than one case a producer has reported that he had reached the same conclusion about his product as had the testing organization, and had reached it simultaneously. The foregoing summary, however, is the best estimate which the testing organization has been able to make of the results in this direction. The procedure is not standardized. It has been found necessary to be guided by circumstances, adapting the procedure as may be required. Two different procedures are here described for illustration.

*Heater cords.*—The most thoroughgoing and critical study of heater cords which has ever been made led to the conclusion that the customary method of constructing heater cords was not of a nature to impart maximum durability, which is a leading requirement for such products. So, although it was contrary to approved practice, electrical testing laboratories felt it necessary to draw up a prescription for construction of heater cords. After some time this prescription received the indorsement of the principal electrical manufacturers in this field. Copies were then distributed to all known manufacturers of heater cords, with the result that there are now available on the market heater cords which have several times the durability of most of those which were on the market three years ago. The products of most of the leading manufacturers in this field have been greatly improved through this quality improvement work. The improvement has involved no increase in the price of these products, but has grown out of greater intelligence in design.

*Electric space heaters.*—Domestic electric service is shown by records to be remarkably free from hazard. Statements that serious hazards are prevalent are untrue and are likely to be made for commercial rather than safety reasons. Of the very few fatalities which have occurred in domestic service, a considerable percentage have been occasioned by electric space heaters in bathrooms. These have been attributable to inadequate electrical insulation in such equipment. A survey was therefore made by Electrical Testing Laboratories of every known brand of electric space heater, and in each case where tests disclosed electrical insulation to be inadequate, the findings were laid before the producer who was urged to correct the design in order to increase the safety of his product. Such correction has been made in a number of products and is pending in others.

In this short paper there is no opportunity to describe several other procedures which have been followed. Methods have differed, but the objective has been the same, namely, to improve the quality of electrical equipment offered for sale to the public.

When tests of all brands of a particular type of equipment are completed, the results are reported privately to the electric light and power companies which support this work and enter into their purchasing decisions to any degree that they desire. Reports are supplied also to the producers, giving them, not for publication but for engineering guidance, data to show how their products compare in quality with the average of all products and with the best and poorest products on the market. This places the manufacturer in a position to know just where he needs to effect improvement if his product is to be among the

leaders in quality. Throughout, the purpose is to make available to the manufacturer information that will show any deficiencies in his product, but to avoid conveying information that will tell him how to make corrections.

The latest development in this program, inaugurated last autumn, is the preparation of purchase specifications for electrical equipment and provision for certifying to the supporting electric light and power companies, and possibly to others who may support the activity, those brands which comply with the specifications. Where really superior equipment can be obtained without undue cost, these specifications call for superior equipment. Where such is not the case, specifications call for two grades of equipment, respectively, "acceptable" and "superior." The acceptable grade is safe and serviceable, representing the minimum quality that from the point of view of utility companies ought to be offered to the public.

Through this quality improvement program and the specification-test-certification development it is hoped to inject higher ideals of quality into the electrical appliance market, to insure better rewards for those who attain to such ideals, and to improve the satisfaction to be derived from electric service. All of these things are attainable without increasing price and sometimes with the accompaniment of decreased price. For it is to be observed that the same designing skill and competency which result in making products better are likely to result as well in making products less costly.

The motives of the electric light and power companies in inaugurating and supporting this program are obvious. Their business will prosper best if their customers experience complete satisfaction in the use of electrical appliances. They have grasped an opportunity and perhaps have discharged a moral responsibility. Nevertheless I can not conclude this article without expressing the indebtedness of the electrical industry and of the public to the electric light and power companies who through these means are endeavoring to improve electric service.

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## ARCHITECTS GROUP GUIDED BY SHINGLE STANDARDS

At a meeting of the Westchester (N. Y.) Society of Architects the commercial standard for red cedar shingles CS31-31, and the laying recommendations therein were made the basis of a resolution to broaden the possible use of high-grade wood shingles.

This resolution suggests that the building codes should be so amended as to provide for the use as roof covering, on properly separated residences and accessory structures outside of fire limits, of edge grain wood shingles of a thickness known as 5/2 or greater, when such shingles conform to the quality requirements of commercial standard CS31-31 of the Bureau of Standards, United States Department of Commerce, and are so identified, and when they are laid in accordance with recommendations therein.



## "WHEN YOU BUY SHEETS"<sup>1</sup>

Standardization Committee of American Home Economics Association Issues Leaflet to Aid Consumer in Making Purchases

Be sure you know the size of the bed before buying the sheet. A sheet that is too small to be tucked in well under the mattress is a poor investment. Lengths of sheets are given in terms of length before hemming. For a standard mattress 74 inches long and 5 inches thick a 108-inch sheet, after allowing 10 inches for hems and shrinkage, will give a 7-inch tuck-in at the top and bottom. A 99-inch sheet allows only 2 or 3 inches for a tuck-in if used with this size mattress. This is too little to hold the sheet firm in place.

Many sheets shrink from 6 to 8 inches in length. Practically all shrink somewhat, but one which has been unduly stretched in manufacture will shrink more. It is sometimes possible to detect excessive stretching by the pulled or distorted appearance of some of the yarns. Unbleached sheets shrink more than bleached ones. Sheets which are always ironed from selvage to selvage gradually increase in width and decrease in length.

Price is not a reliable guide to quality. Neither are superlative adjectives of advertisements and salesmen. Although there is much to be learned about the best ways to construct sheeting, it is recognized that thread count, tensile strength, sizing, and weight are significant factors in determining its durability.

*Thread count.*—The number of yarns to the inch will indicate the relative fineness and closeness of the weave. In a recent study of 109 sheets they were found to vary from a sleazy one of 54 warp or lengthwise yarns and 47 filling or crosswise yarns to one of very fine, closely woven yarns with 109 yarns in the warp and 97 in the filling. The average number of warp or lengthwise yarns in the 109 sheets was 73, while the average number of filling or crosswise yarns was 62.

*Tensile strength.*—The tensile strength of both the warp and the filling of a sheet is an important index of its wear value because it is the measure of the pull the fabric will stand before it breaks. Usually the tensile strength of the warp is slightly higher than that of the filling, but it is well if there is not too much difference between the two. Otherwise, one set of yarns will tend to break or tear before the others begin to weaken. Tests on 109 different sheets showed them to vary from one of low quality, which would resist a pull of only 27 pounds on the warp and 21 pounds on the filling threads, to one which would resist a pull of 68 pounds on warp and 69 pounds on filling. The average tensile strength of the warp of the 109 sheets was 53 pounds and of the filling 50 pounds. At least one retail store has set 50 pounds as the minimum tensile strength for both the warp and filling of all the sheets it handles.

*Sizing.*—In order to improve the appearance of a loosely woven, poor quality of sheeting, manufacturers sometimes add a sizing of starch, china clay, or other

substance. This may make the material seem heavy and give it a smooth finish. However, the sizing washes out in laundering, so that a heavily sized sheeting becomes sleazy and fuzzy in appearance. Excessive sizing can be recognized by holding the cloth over a dark surface and rubbing it vigorously between the two hands. The sizing will fall out as a fine powder on the dark surface. Since it serves only to deceive the customer and adds nothing to the value of the sheeting, ask the percentage of sizing present and choose sheeting with little or none.

*Weight.*—The weight of a sheet is important and often explains differences in price. It usually varies from about 3¼ to 5¼ ounces per square yard of sheeting. The choice is somewhat a matter of personal preference. Heavy sheets wear longer, do not wrinkle as much, and therefore are more comfortable to sleep on and give a more tailored appearance to the bed than do light weight ones. But they cost more both to buy and launder and are heavier to handle. A good middle-of-the-road rule is: Never buy a sheet so light in weight that it is sleazy nor so heavy that it is cumbersome. In a heavily sized sheet, the weight may be misleading, as it will include sizing as well as cotton. Unbleached sheets are often heavier when new because they contain natural impurities which are removed later by laundering.

*The yarn.*—The best yarns are regular in diameter, contain few short fibers, and have their fibers mixed uniformly and arranged as nearly parallel as possible. Examine the yarns before buying the sheet. When sheeting is being purchased by the yard, ravel out a few yarns and observe their strength; untwist them and note the average length of the fibers used. A very loosely twisted yarn does not wear well. The fiber lengths of American-grown cotton vary from approximately ¾ to 1½ inches. The best sheets contain cotton at least 1 inch in length. Yarns made of short fibers are not as durable, and the fabric has a more fuzzy appearance and soils more quickly than when long fibers have been used.

*Flaws in the fabric.*—Poor construction means thick and thin places in the same cloth, puckers, improperly laced warp and filling, imperfect selvages, broken, split, or missing yarns, and knots. All such flaws have a direct bearing on the life of the material. A "first" is a sheet practically free from flaws. A "second" is a sheet which is imperfect in some respect. What is called a "first" and what is called a "second" depends on the standards set up by the manufacturer. It is possible that the wear value of a "second" may be practically identical with that of a "first"; it depends on the nature of the imperfection. Before buying a sheet which is sold as a "second" find out why it has been so classified and judge for yourself whether or not the wear value is impaired by the flaws.

*The selvages.*—The selvages are often the weakest parts of a sheet and break long before the rest of the fabric shows signs of wear. It pays to examine the selvages carefully. Buy a sheet with a strong, well-

<sup>1</sup>"When You Buy Sheets," a consumer purchasing leaflet prepared by the committee on standardization of consumers' goods of the American Home Economics Association, 620 Mills Building, Washington, D. C.; copies are obtainable direct at prices approximately equivalent to postage. "Buying Blankets," another of the series, appeared in the December, 1932, Commercial Standards Monthly.



made selvage. See that all the yarns are fastened securely into a good, firm edge. The taped selvage is being used on many sheets as an extra precaution.

*Wearing qualities.*—How long should a sheet last? The answer depends upon its construction and the care it receives. In a wearing test on some medium-weight sheets in which they were washed after each night of use, one group had lost only 40 per cent of their strength after being washed 125 times and it was only after 200 times that they could be considered worn out. They were used and washed 170 times before a single break occurred. Good care lengthens the life of any sheet. Exposed ends of wires on the bed springs and broken or rough edges on bedsteads often catch and tear the bedding. Strong bleaches and washing aids used in laundering gradually weaken a fabric. When selvages are not ironed out straight, they tend to fold back in hard creases along which the

yarns eventually break. Sheets should be torn and not cut into sheet lengths. If cut, the sheets are often crooked after laundering and the hems uneven and drawn. Make sure you get torn sheets. The hems should be even, folded on the thread of the fabric, sewed neatly with strong thread, and preferably closed at the ends. The ends of the sewing threads should be securely fastened.

Until a satisfactory grading system is worked out, the committee recommends that labels be attached to sheeting and sheets stating:

1. Minimum tensile strength of warp and filling.
2. Minimum thread count of warp and filling.
3. Maximum percentage of sizing in the fabric.
4. Weight in ounces per square yard of fabric.

For sheets the following should be added:

5. The width and length (before hemming).
6. Whether they are "firsts" or "seconds."

## AMERICAN STANDARDS ASSOCIATION

Current developments of the following standardization projects under the auspices and procedures of the American Standards Association have been reported by that association:

*Shaft couplings.*—The American standard for shaft couplings, integrally forged flange type for hydroelectric units, has been published by the American Society of Mechanical Engineers, sponsor for the project.

*Safety code for paper and pulp mills.*—A revised draft of the Safety Code for Paper and Pulp Mills has been forwarded to members of the sectional committee for their consideration prior to the holding of a meeting of the committee within the next few weeks. This proposed revision is the first revision of the code since it was approved as an American standard in 1925, and it is planned to incorporate many suggestions for improvement which have been submitted by the paper and pulp mills section of the National Safety Council, the sponsor for this safety code.

*Spur gear tooth form.*—The new American standard on spur gear tooth form covering  $14\frac{1}{2}^\circ$  composite system,  $14\frac{1}{2}^\circ$  full depth involute system,  $20^\circ$  full depth involute system, and  $20^\circ$  stub involute system, has been published by the American Society of Mechanical Engineers. The American Gear Manufacturers Association and the American Society of Mechanical Engineers are sponsors for the project under the procedure of the American Standards Association.

*School lighting.*—The new standards of school lighting, recently approved by the American Standards Association, have been published by the Illuminating Engineering Society. The standards were prepared under the joint sponsorship of the Illuminating Engineering Society and the American Institute of Architects.

## FEDERAL SPECIFICATIONS

Thirty-one specifications were acted on by the Federal Specifications Board during the month of February. Of this number, 14 proposed specifications and 17 revisions have been sent out for official comment and criticism. Copies of these specifications are available in mimeographed form, and further information can be obtained from the Federal Specifications Board, Bureau of Standards, Washington, D. C.

New designation	Specifications proposed	Old F. S. B. No.
RR-G-661	Folders, pressboard, file size.....	-----
	Cards, guide (card size).....	-----
	Cards, guide, calendered (file size).....	-----
	Cards, guide, pressboard (file size).....	-----
	Cards, index, chemical wood.....	-----
	Cards, index, 50 per cent rag.....	-----
	Cards, index, 100 per cent rag, for permanent records.....	-----
	Gratings, steel (flooring, landings, steps, etc.), shore and marine use (except for naval vessels).....	-----
	Casters for wood chairs.....	-----
	Pads, stamp.....	-----
	Pins, office.....	-----
	Tables, office, steel.....	-----
	Bleaching material (chlorinating agents).....	-----
	Panelboards, automatic, circuit-breaker type.....	-----
Specifications for revision		
T-T-901a	Twine, hemp.....	-----
HH-C-571a	Cork, granulated, insulating.....	-----
HH-C-581	Woven cotton fabric, asphalt-saturated.....	294
HH-F-241	Felt, coal-tar-saturated (for) roofing and waterproofing.....	81
SS-A-701	Asphalt primer.....	87
SS-C-151	Bituminous plastic cement.....	380
SS-R-451	Asphalt roof coating, brushing consistency.....	424
SS-A-693	Asphalt (for) mineral-surfaced roofing, waterproofing, and damp proofing, and unsurfaced built-up roofing.....	84, 85, 88
R-P-381	Coal-tar pitch (for) mineral-surfaced roofing, and waterproofing, and damp proofing.....	80, 83
HH-F-191	Felt, asphalt-saturated (for) flashings, and roofing and waterproofing.....	86, 295
SS-R-501	Roofing, asphalt-prepared.....	214
SS-R-511	Roofing, prepared, asphalt and asbestos, mineral-surfaced.....	423
SS-R-521	Roofing and shingles, asphalt prepared, mineral-surfaced.....	296
SS-S-791	Surfacing materials for bituminous built-up roofing.....	82
ZZ-M-81	Matting, rubber (for use around electrical apparatus or circuits not exceeding 3,000 volts to ground).....	414
GGG-R-791	Rules.....	419
LLL-C-571a	Cork, compressed (cork board).....	-----



## NEWS IN BRIEF

The Polish Standardization Committee has recently published, for general comment and criticism, proposed standards for escutcheons; interior door locks; symbols for the most important physical units; bolts, nuts, screws, studs, and taps; wrench openings and clearances; twist drills; lathe dogs, straight and bent tails; and wheels, star, and lever type handles.

With 43 State legislatures meeting this year and 25 giving consideration to uniform traffic measures, it is expected that further progress will be made in 1933 toward complete uniformity in motor-vehicle regulation throughout the Nation, according to information made public by the National Conference of Street and Highway Safety. Thirty-four States have made the Uniform Vehicle Code or parts of it State law.

An international electrical exhibition will be held from April 15 to 24, 1933, at The Hague, Netherlands. All electrical appliances shown are subject to approval of a special commission to prevent exposition of unreliable material. The show will be held in cooperation with the Municipal Electric Works of The Hague and is largely designed to encourage use of current-consuming equipment for home and industry.

A bottling company at Boston makes use of a photocell installation to count the crates of filled bottles as they go out to the shipping room. This conveyor, however, has a transfer from one belt to another, and as the boxes make the change they are tipped first one way, then in the reverse direction. The resulting interruption of light between boxes passing over the peak at the transfer point provides just the place for installing the photocell beam and so an accurate count is made.

Governor Pinchot, of Pennsylvania, has appointed a commission on fire-fighting standards to inquire particularly into the matter of standardizing fire-hydrant and fire-hose couplings and "to present such general conclusions pertinent to the prevention of fires as may be reached by the commission during the course of its investigations." The commission is requested to recommend what legislation, if any, is desirable to bring about standardization, "having in mind the impoverished treasuries of many of the smaller fire companies in boroughs and townships."

Thirty engineers of radio manufacturers held an important meeting recently at Detroit on the development of automotive radio. The conference was directed by the chairman of the Radio Manufacturers' Association standards committee. Special work was accomplished on B power supplies of various types and work begun on standardized instruction for ignition suppression. A subcommittee was appointed to prepare specifications on the measurement of sensitivity in automobile receivers. Other subcommittees will cooperate with the automotive engineers' wire committee on the subject of connecting cables for radio receivers and work on standard instructions for ignition suppression methods, including a standard "suppressor kit" and instructions for car antenna installation.

There is no accepted bacteriological standard for natural bathing waters. Much depends upon the source of the bacteria found. For example, investigations made by the New Jersey State Department of Health along the New Jersey coast, traced the sewage to the bathing waters and found *B. coli* content to the extent of 100 per cm<sup>3</sup>. This demonstrates the need of chlorination.

The officials of a New York newspaper had the problem of detecting, before their papers were printed, whether the ink would show through enough to disturb the reader. This problem was solved by the development of an opacity meter using a photronic cell, a microammeter, and an ordinary 100-watt lamp. With this equipment they have already classified over 500 samples of newsprint.

Local rules supplementing a minimum national code are inevitable and proper, said George Andrea, of Milwaukee, in an address before the annual meeting of the National Electrical Contractors Association "but for the benefit of the public and the industry as a whole, studies should be undertaken to assemble these additional rules, classify them, and thus make it possible to obtain some degree of uniformity throughout the country with respect to these appendixes.

The American Public Health Association announces a new edition of Standard Methods for the Examination of Water and Sewage, prepared in cooperation with the American Water Works Association. The previous edition of this book is dated 1925. In the new edition, the seventh, many important additions and changes occur. For example, the section dealing with the method for the treatment of total hardness has been extensively revised, and many other methods of analysis that are not yet recommended as standard procedure, but which may be of use, are presented in abstract, with references.

The Commission of Chemical Technology, a division of the Polish Standardization Committee, has approved those parts of the proposed standard for anthracite coal which deal with calorimetric determination of heat of combustion and heat value, determination of moisture content, and determination of ash. The commission is now engaged on other sections of the proposed standard relating to volatile matter, sampling, and coke. At the request of the Polish-Dantzig Refinery Association it has also begun work on specifications for edible fats and oils.

Leading asphalt companies of the United Kingdom have recently formed a trade association and propose to make all asphalt resources jointly available to members in an effort to assure a product of specified characteristics. The organization, known as the Natural Asphalt Mineowners and Manufacturers' Council, also plans to standardize the manufacture and application of asphalt for building construction. Problems of the members concerning raw materials, technical equipment, research, and executive practice, are to be handled by the association.



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—President Hoover, at the laying of the corner stone of the new building of the U. S. Department of Commerce, June 10, 1929.



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