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CERAMIC ABSTRACTS

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The American Ceramic Society

Volume 24, 1945

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General

Ceramics today. ANON. *Chem. Age* [London], 50 [1302] 550 (1944).—Ceramics are being used by manufacturers in place of plastics, steel, nickel, copper, aluminum, zinc, and rubber. Present-day industrial whiteware has characteristics that make it highly suitable for many industrial uses. Its resistance to abrasion is high. Almost the only materials that outwear whiteware are rubber-tire-tread stock and manganese steel; for some exacting uses, such as nozzles for sandblast equipment, the best ceramic nozzles will outlast manganese steel, and for lining coke chutes, hard vitreous tile is still in good condition when both steel and rubber linings are worn out. The compressive strength of ceramics ranges from 25,000 to 80,000 lb./sq. in. This compares with 9000 to 47,000 for aluminum alloys, 16,500 to 45,000 for thermosetting plastics, 7000 to 20,000 for zinc alloys, and 55,000 to 400,000 for ferrous alloys. Ceramics are low in tensile strength (1500 to 10,000 lb./sq. in.). This deficiency can often be made up by increasing the thickness or other dimensions of the ceramic unit. Resistance to chemicals is high. Ceramic ware will withstand almost any compound except hydrofluoric acid. In hardness, it exceeds most plastics and nonferrous metals; it is equal to glass and softer than alloy steels and chilled cast iron. Obstacles to the use of ceramic parts as substitutes for metal in complicated assemblies are the shrinkage and occasional warping that take place during firing, but dimensional tolerances sufficiently fine have been obtained by several newer molding methods. One method molds a part in the traditional manner but somewhat oversize. A preliminary firing shrinks the part to a certain extent but leaves it still oversize. The first firing is stopped while the material is still soft enough to machine with standard tools. The machining is done to allow an exact margin for the additional shrinkage that occurs during the second and final firing. In another method, exact parts are obtained by machining rods of fused mica and glass up to 1 in. thick. Mica and glass are not fired during the forming process because, unlike true ceramics, they soften at high temperatures, but the mica-glass material can be used like porcelain; it has the advantage of machinability and can be pressure molded like plastics. In a third method, carefully blended and moistened clays are molded under such heavy pressure that warpage is practically absent, and the result is a dense high-strength product. The fired product can be held to an accuracy of $^1/_{64}$ in. per inch of dimension, and further exactness can be obtained by grinding the finished article accurately to size. A.B.S.

Classification of natural organic binders. EDWARD P. MCNAMARA AND JAY E. COMEFORO. *Jour. Amer. Ceram. Soc.*, 28 [1] 25–31 (1945).—14 references, 7 figures.

Congress displays industry's war effort. ANON. *Amer. Foundryman*, 6 [6] 2–3 (1944).—The 48th annual convention of the American Foundrymen's Assn. is discussed. M.A.S.

Findings from Foundation surveys of war plants. F. R. HOLDEN AND W. C. L. HEMEON. Presented at meeting of Industrial Hygiene Foundation, Pittsburgh, Pa., Nov., 1944; abstracted in *Safety Eng.*, 88 [6] 63–66 (1944).—The report discusses among other things the conversion of forms of quartz into tridymite and cristobalite, which are more destructive of animal tissue than quartz. Where the clay-pot process is used in glassmaking, the reclaiming of the discarded pots produces a serious health hazard. Likewise, in the glass industry, furnace and tuille stones contain about 15% cristobalite, and the principal silicosis hazard arises in departments where the clays and furnace and tuille stones are manufactured and handled. A survey of industrial hygiene in a portion of the ceramic industry is under way, and a report is expected in 1945 in which conclusions will differ somewhat from prevalent ideas. The report gives some consideration to dust control for masons in glass and similar plants and in particular to a portable exhaust unit for a brick-cutting saw in common use. Minimizing dust around clay and flint storage bins, etc., is touched upon. Investigations have also been made in a sand-washing plant to determine what additional measures for dust control might be necessary. M.R.

Have you any idea what prospects want to know about your product? E. L. SPARKS. *Ind. Marketing*, 29 [12] 51–52, 55 (1944).—S. discusses results of a survey made among engineering and industrial readers as to possible points to be emphasized in advertising construction equipment and building materials. One of those submitting answers condemns the use of hammered or frosted glass in factory windows. He asks, "Why don't glass manufacturers advise owners or engineers to install a line of clear glass at eye level where the bulk of the windows are hammered or frost glass?" Another wanted physical data pertaining to glass block. S. found the men interviewed to be practical, common-sense folk and felt that their suggestions to manufacturers and advertisers should be heeded. M.R.

Mist and dust collection. C. E. LAPPLE. *Heating, Piping and Air Conditioning*, 16 [7] 410–14; [8] 464–68; [10] 578–81 (1944).—L. reviews the purposes of mist and dust collecting and summarizes the characteristics of dust. The main reasons for industrial dust collection are (1) nuisance elimination, (2) improvement of product quality, (3) reduction of equipment maintenance, (4) elimination of safety and health hazards, and (5) recovery or collection of powdered products. To properly design industrial control equipment it is necessary to recognize and understand the fundamental properties and characteristics of gas dispersoids. These include particle size (cement dust is one of the largest of common dusts), particle classification, explosion hazards, and health hazards. L. then discusses the methods of measurement and the character of atmospheric pollution. Dust fall, use of Ringelmann charts, impingers, precipitators, filters, and atmospheric pollution data are included. Finally, he covers the sampling of process and ventilation gases to determine the performance of dust-collecting equipment, to evaluate the need for installing a system, or to obtain information for design. 43 references, 4 illustrations. M.R.

Noted engineer stresses research at meeting. H. F. UTLEY. *Pit and Quarry*, 37 [6] 76, 78 (1944).—At a meeting held in Los Angeles, Nov. 9, 1944, Stanton Walker discussed the research activities of the National Sand and Gravel Assn. and the National Ready Mixed Concrete Assn. He devoted much time to the simplification of sizes for coarse aggregates as well as to the research developments in fine aggregates. It was decided to form committees of producers from the northern and southern parts of California to work jointly with committees of Government engineers to facilitate reducing the large number of sizes of aggregates now being produced. 1 photograph. M.R.

Organization of research. A. PARKER. *Jour. Inst. Fuel*, 17 [96] 154–58 (June, 1944); abstracted in *Bull. Brit. Non-Ferrous Metals Research Assn.*, No. 182, p. 220 (Aug., 1944).—P. characterizes organization of research in universities and colleges, special research institutes, individual industrial undertakings, cooperative industrial undertakings, and cooperative industrial research. The Department of Scientific and Industrial Research and the Fuel Research Station are described, and the selection of a research staff is discussed.

Prevention of pneumoconiosis. ANON. *Chem. Age* [London], 51 [1312] 180–81 (1944).—Pneumoconiosis is a group name for all lung diseases caused by dust particles; two forms of it are silicosis and asbestosis. The best methods of prevention are (1) replacement of the substance producing the obnoxious dust by a harmless one, e.g., alumina in place of flint for "dusting" and bedding in pottery manufacture and artificial abrasive materials for sandstone in grinding; (2) prevention of the escape of dust into the workshop atmosphere, usually by means of hoods and air suction; (3) the use of respirators by all workers likely to be affected; and (4) copious general ventilation. In the British Isles, the Factories' Act, 1937, requires that provision shall be made for rendering harmless as far as prac-

ticable all dust, etc., that may be injurious to health; that means shall be taken for preventing the inhalation of dust; and that persons shall be excluded from workrooms in which siliceous dust is produced during the intervals allowed for meals or rest. In addition, various regulations have been made for the control of special industries or processes; sandblasting may be done only in an enclosed chamber in which no other work is ordinarily performed and in which efficient means are provided to prevent the escape of dust outside the chamber. Another set of regulations applies to processes carried out in quarries in which the stone contains at least 80% silica. Machines used for the crushing and grinding of stone must be entirely enclosed or provided with efficient arrangements to prevent the escape of dust. In deciding the harmfulness of dust, it is necessary to know its chemical and mineralogical nature, its concentration, and other physical characteristics, including the mass concentration, i.e., the weight of dust in unit volume of the dust cloud, the number of particles per unit volume, and the size distribution of the particles. Information about the size of the dust particles is necessary because it is unlikely that many particles larger than about 10 microns reach the deeper part of the lungs. The smaller dust particles are regarded as the more dangerous. Various instruments have been devised for sampling air-borne dusts. They entrap the dust particles from a known volume of air on a glass surface or in liquid. The particles are then counted under the microscope; in some cases the particle diameters are also measured, and the particle-size distribution is thus ascertained. The available instruments differ considerably in their sampling efficiencies, so that for the same dust cloud different instruments may give substantially different results. The thermal precipitator sampling instrument is highly efficient. The dust is deposited on two microscope cover slips which are subsequently mounted on slides. The dust particles are counted and measured under a high-power microscope. A.B.S.

Enos A. Stewart, founder and owner of the Stark Brick Company. ANON. *Bull. Amer. Ceram. Soc.*, 24 [1] 1-2 (1945).—1 photo.

Symposium on the Organization, Direction, and Support of Research: Advancement of learning in the United States in the postwar world. J. B. CONANT. *Proc. Amer. Phil. Soc.*, 87 [4] 291-98 (Jan. 29, 1944). Organization, direction, and support of research in the physical sciences. H. S. TAYLOR. *Ibid.*, pp. 299-306. Discovery and interpretation of biological phenomena. D. W. BRONK. *Ibid.*, pp. 307-12. Critique of medical research. A. GREGG. *Ibid.*, pp. 313-20. Political economy in the modern state. H. A. INNIS. *Ibid.*, pp. 323-41. War and research in social science. R. F. NICHOLLS. *Ibid.*, pp. 361-64; abstracted in *Bull. Brit. Non-Ferrous Metals Research Assn.*, No. 185, p. 307 (Nov., 1944).

SEPARATE PUBLICATIONS

Industry and Research. ANON. *Federation of British Industries Brochure*, 24 pp. (Oct., 1943); abstracted in *Bull. Brit. Non-Ferrous Metals Research Assn.*, No. 174, p. 370 (Dec., 1943).—The importance and achievements of industrial research, its present position and organization, and suggestions for development are presented. Considerable reference is made to research associations and to the need for their increased support.

Scientific Research and the Universities in Postwar Britain. ANON. *Parliamentary and Scientific Committee Brochure*, 18 pp. (Oct., 1943); abstracted in *Bull. Brit. Non-Ferrous Metals Research Assn.*, No. 174, p. 370 (Dec., 1943).—After a concise demonstration of the case for a great increase in industrial and all other types of scientific research in this country, the supply and training of research personnel are considered. A two- or three-fold expansion of university and other facilities for the training of scientists, with correspondingly increased Government financial support, is demanded. Fifteen "proposals" are formally stated.

TECHNICAL BOOKS REPUBLISHED

The following technical volumes have been republished in the United States under licenses issued by the Alien Property Custodian and are available to the industry at the prices indicated from publisher, Edwards Brothers, Inc., Ann Arbor, Mich.

Eitel, Wilhelm (editor)
Glastechnische Tabellen: Physikalische und chemische Konstanten der Gläser. Unter Mitwirkung von H. Alterthum ... u. a. ... herausgegeben von Wilhelm Eitel, Marcello Pirani, und Karl Scheel. Berlin, Springer, 1932. xi + 714 pp. Price $24.00.

Eitel, Wilhelm
Physikalische Chemie der Silikate. 2, völlig neubearb. Aufl. Leipzig, Barth, 1941. vii + 826 pp. illus. Price $21.00

Koeppel, Claus
Feuerfeste Baustoffe silikatischer und silikathaltiger Massen. Leipzig, Hirzel, 1938. xvi + 296 pp. illus. (Chemie und Technik der Gegenwart. 18). Price $6.00.

Salmang, Hermann
Die physikalischen und chemischen Grundlagen der Keramik. Berlin, Springer, 1933. viii + 229 pp. Price $5.75.

Schmid, Erich
Kristallplastizität. Berlin, Springer, 1935. 373 pp. Price $9.65.

Smits, Andreas
Die Theorie der Komplexität und der Allotropie. Berlin, Verlag Chemie, 1938. xii + 372 pp. Price $8.50.

Strunz, Hugo (editor)
Mineralogische Tabellen, im Auftrage der Deutschen mineralogischen Gesellschaft herausgegeben. Leipzig, Akademische Verlagsgesellschaft, 1941. 287 pp. Price $7.35.

Stuckert, Ludwig
Die Emailfabrikation, ein Lehr- und Handbuch für die Emailindustrie. Berlin, Springer, 1941. vi + 300, (2) pp. Price $9.00.

Volmer, Max
Kinetik der Phasenbildung. Dresden, Steinkopff, 1939. xii + 220 pp. Price $4.75.