

SYMPOSIUM ON PARTICLE SIZE MEASUREMENT

INTRODUCTION

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In 1941, the American Society for Testing Materials published a symposium on particle size measurement. It comprised a series of papers presented at the Washington Spring Meeting of that year. The booklet has been in much demand even to this date, having been reprinted only a short while ago. A similar symposium was presented in Boston during 1958; the papers of that meeting are the basis for the present publication. The field has broadened since 1941 both with respect to methods available and as to the needs to meet new applications. It has not been possible to cover this field in all its aspects; but the coverage is representative of the current trends. To make it more complete, papers by Loveland² and O'Konski³ *et al* have been included. These are current publications of ASTM having their origin elsewhere than this symposium. The discussions of the papers has been included to insure the full value of the treatment given.

Since the monograph is largely devoted to research papers, the reader may find

himself frustrated with regard to the choice of method and to the details in using a method. The ASTM has developed a substantial amount of literature in its standards which may be helpful on that score. A list of these standards is included.

Two aspects of the situation in particle size measurement call for special note. One of these pertains to sieves. There is an ASTM specification defining sieve cloth and its tolerances (E 11 - 58 T).⁴ This is tentative because certain objection was raised concerning wire diameters and tolerances when it was offered through the American Standards Association to the International Standards Organization (ISO) for development of an international standard. The series of apertures in this specification varies by a root of two, in accordance with established practice in fields where sieves are employed. The ISO is also considering a root-of-ten series. It does not appear that this series has more merit than the established one. By far the large majority of testing sieves throughout the world are based on the root-of-two series, and it would be costly to change by any sudden step. Reasons for change are not adequately convincing. Hence, though this is a tentative specification, it is currently the best effort based on sound experience and should soon become standard. In

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² R. P. Loveland, "Methods of Particle Size Analysis," Symposium on Light Microscopy, Am. Soc. Testing Mats., p. 94 (1952). (Issued as separate publication *ASTM STP No. 143*.)

³ C. T. O'Konski, M. D. Bitron, and W. I. Higuchi, "Light Scattering Instrumentation for Particle Size Distribution Measurements," Symposium on Instrumentation in Atmospheric Analysis, Am. Soc. Testing Mats., p. 2 (1959). (Issued as separate publication *ASTM STP Mo. 250*.)

⁴ 1958 Book of ASTM Standards, Parts 3, 4, 5, 7, 8, 9, 10.

connection with sieves, it might be pointed out that there is room for sieves of smaller aperture than specified in E 11 - 58 T. Electrolytically deposited sheet with controlled apertures is noted in this symposium. Wire cloth manufacturers are now able to make apertures of $25.2\ \mu$ and hope to reach sizes of $18\ \mu$. This is promising, but it may present problems in sieving technique in these finer sizes, not to mention those of fragility of the screen plate or cloth. Such direct separations are to be desired, and the achievements toward that end are commendable and useful. A second aspect for attention is the use of electronic means for rapid registry and sorting of measurements of some criterion on each

particle. The Coulter counter reported here is indicative of a strong trend toward devices of this type still awaiting development.

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