

Measurement of
Dielectric Properties
under
SPACE
Conditions



STP 420
AMERICAN SOCIETY
for
TESTING and MATERIALS

MEASUREMENT OF DIELECTRIC PROPERTIES UNDER SPACE CONDITIONS

A symposium
presented at the
Sixty-ninth Annual Meeting
AMERICAN SOCIETY FOR
TESTING AND MATERIALS
Atlantic City, N.J., 26 June–1 July, 1966

ASTM SPECIAL TECHNICAL PUBLICATION NO. 420

List price \$7.25; 30 per cent discount to members



published by the
AMERICAN SOCIETY FOR TESTING AND MATERIALS
1916 Race Street, Philadelphia, Pa. 19103

© BY AMERICAN SOCIETY FOR TESTING AND MATERIALS 1967
Library of Congress Catalog Card Number: 67-17472

NOTE

The Society is not responsible, as a body,
for the statements and opinions
advanced in this publication.

Printed in Rahway, N.J.
September, 1967

Foreword

The Symposium on Measurement of Dielectric Properties Under Space Conditions was presented in two sessions during the 69th Annual Meeting of the Society, in Atlantic City, N.J., 26 June–1 July, 1966. The symposium was sponsored by Committee D-9 on Electrical Insulating Materials. The symposium chairman was R. B. Feuchtbaum, Hughes Aircraft Co. Presiding at the two sessions were K. N. Mathes, General Electric Co., and W. G. Long, Atomics International, Division of North American Aviation.

Related ASTM Publications

**Factors in the Operation of Manned Space Chambers,
STP 398 (1966), \$8.00**

Radiation Effects in Electronics, STP 384 (1965), \$5.00

**Newer Structural Materials for Aerospace Vehicles,
STP 379 (1965), \$6.00**

Contents

Introduction	1
Problems with Dielectric Measurements at Cryogenic Temperatures— K. N. MATHES AND E. J. MCGOWAN	3
Measurement of Corona Discharge Behavior at Low Pressure and Vacuum—T. W. DAKIN AND C. N. WORKS	18
Electrical Testing of Electrical Apparatus at High Temperatures in Vacuum—W. S. NEFF, W. L. GRANT, AND W. H. SNAVELY	33
Measurement of Dielectric Properties of Materials Under Vacuum, Reactor Radiation, and Cryogenic Conditions—W. D. MCMILLAN, R. L. GAUSE, E. E. KERLIN, AND J. E. WARWICK	48
Discussion	58
Parameters Affecting Dielectric Materials for Space Applications—W. G. LONG	59
In Situ Dielectric Property Measurement in Simulated Space Environ- ments—C. A. ESCOFFERY	69

