

4. DIELECTRICS AND DIELECTRIC PHENOMENA

UNDERGROUND WIRES

William Callender

Vol. i—1884, pp. 1-8, paper No. 3

Description of methods of applying Bitite (vulcanized bitumen) to the insulation of underground conductors as used in English built-in conduit systems.

Discussion, pp. 9-12, by Messrs. W. D. Sargent and Wm. H. Preece.

General remarks on the feasibility of operating underground circuits.

UNDERGROUND ELECTRICAL SYSTEMS

Sydney F. Shelbourne

Vol. iii—1886, pp. 31-48

General discussion of the problems involved in the operation of the electric circuits underground. Description of the properties of various duct materials. Explanation of the relation between specific capacity and insulation quality. Discussion of the qualities of cable insulating materials. Account of troubles with corrosion of lead sheaths. Suggested methods of avoiding inductive disturbances on arc lighting cables and particularly telephone and telegraph lines.

Discussion, pp. 49-66, by Messrs. Frank L. Pope, W. D. Lockwood, T. D. Lockwood, C. O. Mailloux, G. C. Maynard, Sydney F. Shelbourne, ——— Young, Ralph W. Pope and O. E. Michaelis.

Experience with lead covered cables underground. Explanation of the corrosion of lead.

LEAD ENCASED CONDUCTORS

David Brooks

Vol. iv—1887, pp. 201-205

References to early attempts to use lead covered conductors and troubles encountered in cable insulation. Fundamental discovery that made lead covered insulated conductors practicable. Advantages of lead covered cables.

No discussion.

OIL VERSUS AIR AS AN INSULATING MEDIUM

James B. Williams

Vol. ix—1892, pp. 601-613

Account of qualitative experiments on the leakage resistance characteristics of different kinds of oil.

No discussion.

MICANITE, AND ITS APPLICATION TO ARMATURE INSULATION

Edward P. Thompson for Charles W. Jefferson and Arthur H. S. Dyer Vol. ix—1892, pp. 798-810

Brief reference to early methods of insulating armatures. Characteristics of mica and description of different commercial forms of magnetite used in the insulation of armatures and commutators.

Discussion, pp. 811-823, by Messrs. W. J. Hammer, W. A. Anthony, Carl Hering, Charles W. Jefferson, R. W. Pope, F. B. Crocker, E. P. Thomson, L. W. Kingsley, C. P. Steinmetz, J. B. Williams and A. E. Kennelly.

General remarks on the characteristics and testing of insulation.

4. DIELECTRICS AND DIELECTRIC PHENOMENA 21

NOTE ON THE DISRUPTIVE STRENGTH OF DIELECTRICS

Charles P. Steinmetz Vol. x—1893, pp. 85-105

Experimental investigation of the dielectric strength of various insulating materials as shown by curves plotted between sparking distance and e. m. f. Equation for striking e. m. f. of various materials.

Discussion, pp. 106-115, by Messrs. J. B. Williams, F. B. Crocker, Carl Hering, Alexander MacFarlane and Charles P. Steinmetz.

General remarks on dielectric strength tests. Results of tests by other investigators.

EFFECT OF TEMPERATURE ON INSULATING MATERIALS

George F. Sever, A. Monell and C. L. Perry Vol. xiii—1896, pp. 223-230

Description of test of the insulation resistance of various insulating materials at different temperatures. Results plotted as curves.

Discussion, pp. 230-243, by Messrs. C. P. Steinmetz, F. B. Crocker, C. F. Scott, C. L. Perry and A. E. Kennelly

Account of tests on effect of temperature on insulating materials. Relation of insulation resistance to dielectric strength.

THE EFFECT OF HEAT ON INSULATING MATERIALS

Putnam A. Bates and Walter C. Barnes Vol. xiv—1897, pp. 253-263

Description of test together with results with fiber insulation. The object being to discover the bearing of various surrounding conditions upon the result.

Discussion, pp. 264-273, by Messrs. F. B. Crocker, F. A. C. Perrine, Elihu Thomson, William Esty, J. H. Bates, C. P. Steinmetz and A. E. Kennelly.

Effect of moisture upon insulation.

INSULATION AND CONDUCTION

Reginald A. Fessenden Vol. xv—1898, pp. 119-151

Theory of the conduction of electricity in solids, liquids, and gases, Requirements of an insulating material. Dielectric properties of various types of insulating materials.

Discussion, pp. 151-160, by Messrs. F. B. Crocker, W. S. Franklin, M. I. Pupin and R. A. Fessenden.

General remarks on the theory of insulation and conduction.

DIELECTRIC STRENGTH OF AIR

Charles P. Steinmetz Vol. xv—1898, pp. 281-326

Description of an extensive experimental investigation of the dielectric strength of air under various conditions. Striking distances between various shaped electrodes. Calculation of the potential distribution between cylindrical electrodes.

Discussion, pp. 327-329 and 402, by Messrs. A. Vosmaer, Harold B. Smith and Charles P. Steinmetz.

High potential transformers for insulation testing.

HIGH-VOLTAGE POWER TRANSMISSION

Charles F. Scott

Vol. xv—1898, pp. 531-576

Account of experience and tests made upon the high-tension system at Telluride. Experience covering insulators, corona loss, transformers and lightning protection. Results of Mershon's tests upon corona losses, together with extensive extracts from his report.

No discussion.