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**GUIDING PRINCIPLES FOR THE
SELECTION OF REFERENCE VALUES
FOR ELECTRICAL STANDARDS**



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GUIDING PRINCIPLES FOR THE SELECTION of REFERENCE VALUES FOR ELECTRICAL STANDARDS

3-1 Purpose—Test results and general performance of electric apparatus, conductors and materials frequently are influenced by conditions such as Temperature, Pressure, Altitude, Density and Humidity of the surrounding air or other medium. For comparative results, it is necessary to standardize the conditions under which tests are made or to which test results are corrected. Other conditions which may affect tests or operating performance for particular apparatus are Contamination, Surges, Vibration, Shock or Radiation. Since these are not of general application, standardization should be left to the apparatus groups concerned.

This pamphlet serves as a guide in the preparation or revision of standards for testing or performance* of apparatus or materials of specific types or fields of use. If a particular existing standard calls for other provisions, the existing standard should be followed. The values given are not mandatory, but are recommended for use in preference to other values unless there are good technical or economic reasons for using others. The values recommended have in general been selected to agree with well-established practices particularly in the power and industry fields.

Provisions are made for a great variety of conditions and for widely different apparatus and materials, some of which may be of practical importance only under unusual circumstances. In an individual standard, only those quantities of real practical importance in the particular case should be used. When ranges are suggested, it is generally with the thought that acceptance tests may be made within that range. Tests may be made outside the range, if acceptable, and agreed-upon correction factors are available.

For various good reasons different reference values have become firmly established sometimes in the same field for the same type of tests. Dielectric tests on insulation are an example. Flashover tests in International usage are referred to 20C and 11 grams per cubic meter absolute humidity (65 percent relative humidity). In the U.S.A. the references for flashover tests are 25C and 0.6085 inch of mercury vapor pressure (65 percent relative humidity). For a standard laboratory atmosphere and for conditioning and weathering insulating materials, 23C and 50 percent relative humidity have been selected. Although a single set of

references might be considered desirable, the effects on such considerations as laboratory practices, catalog data and insulation levels would seem to preclude changes.

TEMPERATURES **

Definitions

3-10 Standard Reference Temperature is a suitably selected temperature value for which test records or performance data are given in records and standards of various kinds and to which the results of tests made at different temperatures are corrected for purposes of comparison and standardization.

3-11 Range of Ambient Temperatures for Tests are values defining a range of temperatures considered suitable for acceptance and check tests.

Preferred Values

3-15 Standard Reference Temperatures—Preference should be given to 20 C (68 F), 23 C (73.4 F) and 25 C (77 F).

(Although a single value would be desirable, these values have become firmly rooted in their respective fields and universal adoption of one or the other may not be practicable. More definite recommendation of one value may be made in future issues of this report if a substantial unanimity of opinion can be developed. In order to avoid further diversification of values, one of these values should be used unless there are compelling reasons for not doing so. Where International Standards give one of these values and United States Standards another, it is recommended that both sets of values be tabulated in some cases, for example, sparkover values for sphere gaps.

In specific fields, the following values have been used, although the list is by no means complete:

Dielectric tests on apparatus:

20C (68 F) International

Dielectric tests on apparatus:

25C (77 F) U.S.A.

Dielectric tests on materials:

23C (73.4 F) U.S.A.

Ohmic resistance (except in machines and apparatus)

20 C (68 F)

* For standard temperatures for rating purposes, see AIEE Standard No. 1.

** Current usage in electrical standards prescribes the use of the Centigrade temperature scale.