

## Chapter E 127

## LINE INSULATORS

E 127.01	Application of rule	E 127.05	Test voltages
E 127.02	Material and marking	E 127.06	Factory tests
E 127.03	Electrical strength of insulators in strain position	E 127.07	Selection of insulators
		E 127.08	Protection against arcing
E 127.04	Ratio of flash-over to puncture voltage		

**E 127.01 Application of rule.** These requirements apply only to supply lines. (See subsection E 124.03(5) for insulation requirements for neutral conductors).

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 127.02 Material and marking.** Insulators for operation on supply circuits at voltages of 2,300 and above shall be of porcelain, made by the wet process or one equally suitable as regards electrical and mechanical properties, or other material which will give equally good results in respect to mechanical and electrical performance and durability. They should be marked by the maker with his name, trademark, or identification number so applied as not to reduce the electrical or mechanical strength of the insulator.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 127.03 Electrical strength of insulators in strain position.** Where insulators are used in strain position they shall have not less electrical strength than the insulators generally used on the line when under the normal mechanical stresses imposed by the loadings specified in chapter E 125.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 127.04 Ratio of flash-over to puncture voltage.** Insulators shall be designed so that their dry flash-over voltage is not more than 75% of their puncture voltage at a frequency of 60 cycles per second.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 127.05 Test voltages.** Insulators when tested under American Standards Association specifications shall not flash-over at values less than given in table 30.

**TABLE 30**  
**TEST-VOLTAGE REQUIREMENTS**  
(For application see sections E 127.07 and E 127.09)

Nominal Voltage	Minimum Test Dry Flash-over Voltage of Insulators	Nominal Voltage	Minimum Test Dry Flash-over Voltage of Insulators
750	5,000	46,000	125,000
2,400	20,000	69,000	175,000
7,200	40,000	115,000	315,000
13,200	55,000	138,000	390,000
23,000	75,000	161,000	445,000
34,500	100,000	230,000	640,000

(Interpolate for intermediate values)

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 127.06 Factory tests.** Each insulator or insulating part thereof for use on lines operating at voltages in excess of 15,000 volts between conductors shall be subjected to a routine dry flash-over test at the factory for a period of 3 minutes at a frequency of 60 cycles per second or to any other test sanctioned by good modern practice, such as high-frequency tests.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 127.07 Selection of insulators.** (1) **INSULATION OF CONSTANT-CURRENT CIRCUITS.** Insulators for use on constant-current circuits shall be determined on the basis of the nominal full-load voltage of the circuit.

(2) **INSULATORS FOR SINGLE-PHASE CIRCUITS DIRECTLY CONNECTED TO THREE-PHASE CIRCUITS.** Insulators used on single-phase circuits directly connected to three-phase circuits (without intervening transformers) shall have a flash-over voltage not less than that required for the insulators on the three-phase circuits.

(3) **INSULATORS FOR NOMINAL VOLTAGES BETWEEN CONDUCTORS.** In selecting insulators of the test voltage to be used for any nominal voltage between conductors, consideration shall be given to the conditions under which the line will operate as follows:

(a) Where the system is of moderate extent, in open country, subject to intermittent rains and moderate lightning, insulators having flash-over values not less than given in table 30 shall be used.

(b) Where operating conditions are more severe than set forth in (1) above, due to extent of system, prevalence of exceptionally severe lightning, bad atmospheric conditions (caused by chemical fumes, smoke, cement dust, salt fog, or other foreign matter), or to a long, dry season with heavy dust accumulation followed by moisture, insulators having a higher flash-over than given in table 30 or other equally effective means of increasing insulation shall be used. The increase is to be determined by local conditions and experience.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.

**E 127.08 Protection against arcing.** In installing the insulators and conductors, such precautions as are sanctioned by good modern practice shall be taken to prevent, as far as possible, any arc from forming or to prevent any arc which might be formed from injuring or burning any parts of the supporting structures, insulators or conductors which might render the conductors liable to fall. In no case shall the insulation at crossings be less than that employed in adjacent sections of the line.

**History:** Cr. Register, November, 1961, No. 71, eff. 12-1-61.