Chapter E 402

FIXTURE WIRES

E 402.01 Use. Fixture wires are designed for installation in lighting fixtures and in similar equipment where enclosed or protected and not subject to bending or twisting in use. Also, they are used for connecting lighting fixtures to the conductors of the circuit that supplies the fixtures.

Note 1. For application in lighting fixtures, see chapter E 410.
Note 2. Fixture wires are not intended for installation as branch circuit conductors or for the connection of portable or stationary appliances.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 402.02 Minimum size. Fixture wires shall not be smaller than No. 18.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 402.03 Insulation. (1) The rubber insulations include those made from natural and synthetic rubber, neoprene and other vulcanized materials.

Note: Thermoplastic insulation may stiffen at temperatures below minus 10° C. (14° F.) and care should be used in its installation at such temperatures. It may be deformed when subject to pressure; care should be taken in its installation, as for example, at bushings, or points of support. See subsection E 373.06 (2).

(2) No conductor shall be used under such conditions that its temperature, even when carrying current, will exceed the temperature specified in table E 310.02 (1) for the type of insulation involved.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

TABLE E 402.04
ALLOWABLE CURRENT-CARRYING CAPACITY OF FIXTURE WIRE
(Based on Room Temperature of 30° C., 86° F.)

Size AWG	Fixture Wire	
	Rubber Types RF-1, RF-2, FF-1, FF-2, RFH-1, RFH-2, FFH-1, FFH-2	Thermoplastic Types TF, TFF Cotton Type CF* Asbestos Type AF* Silicone Rubber Types SF-1*, SF-2*, SFF-1*, SFF-2*
18	5	6
16	7	8
14		17

*These types are used almost exclusively in fixtures where they are exposed to high temperatures and ampere ratings are assigned accordingly.

Note: Ultimate insulation temperature. In no case shall conductors be associated together in such a way with respect to the kind of circuit, the wiring method employed, or the number of conductors, that the limiting temperature of the conductors will be exceeded.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 402.05 Overcurrent protection. See subsection E 240.05 (3).

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

TABLE E 402.06
FIXTURE WIRE

Trade Name	Type Letter	Insulation	Thickness of Insulation	Outer Covering
Rubber-Covered Fixture Wire Solid or 7-Strand	RF-1	Code Rubber	18 1/64 Inch	Non-metallic covering
	RF-2	Code Rubber	18–16 2/64 Inch	Non-metallic covering
		Latex Rubber	18–16 18 Mils	
Rubber-Covered Fixture Wire Flexible Stranding	FF-1	Code Rubber	18 1/64 Inch	Non-metallic covering
	FF-2	Code Rubber	18–16 2/64 Inch	Non-metallic covering
		Latex Rubber	18–16 18 Mils	
Heat-Resistant Rubber-Covered Fixture Wire Solid or 7-Strand	RFH-1	Heat-Resistant Rubber	18 1/64 Inch	Non-metallic covering
	RFH-2	Heat-Resistant Rubber	18–16 2/64 Inch	Non-metallic covering
		Heat-Resistant Latex Rubber	18–16 18 Mils	
Heat-Resistant Rubber-Covered Fixture Wire Flexible Stranding	FFH-1	Heat-Resistant Rubber	18 1/64 Inch	Non-metallic covering
	FFH-2	Heat-Resistant Rubber	18–16 2/64 Inch	Non-metallic covering
		Heat-Resistant Latex Rubber	18–16 18 Mils	
Thermoplastic-Covered Fixture Wire Solid or Stranded	TF	Thermoplastic	18–16 2/64 Inch	None
Thermoplastic-Covered Fixture Wire Flexible Stranding	TFF	Thermoplastic	18–16 2/64 Inch	None
Cotton-Covered, Heat-Resistant, Fixture Wire	CF	Impregnated Cotton	18–14 2/64 Inch	None
Asbestos-Covered, Heat-Resistant, Fixture Wire	AF	Impregnated Asbestos	18–14 2/64 Inch	None
Silicone Insulated Fixture Wire Solid or 7-Strand	SF-1	Silicone Rubber	18 1/64 Inch	Non-metallic covering
	SF-2	Silicone Rubber	18–14 1/32 Inch	Non-metallic covering
Silicone Insulated Fixture Wire Flexible Stranding	SFF-1	Silicone Rubber	18 1/64 Inch	Non-metallic covering
	SFF-2	Silicone Rubber	18–14 1/32 Inch	Non-metallic covering

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.