

NEC COMPLIANT APPLICATIONS OF TRAY CABLE TYPE TC-ER-JP

SYNOPSIS: TConfusion and misinformation exist regarding NEC requirements for acceptable uses of TC-ER-JP cable. Tray Cable Type TC-ER-JP is recognized in the NEC as a suitable wiring method in one- and two-family dwelling units for both power and control circuits. When installed in accordance with the requirements of the NEC, it can be used safely to connect a multitude of different types of equipment. This document answers the questions about Type TC-ER-JP cable construction along with where and how it can be installed.

➤ WHAT IS TYPE TC-ER-JP CABLE

Type TC-ER-JP cable is Tray Cable that has been additionally evaluated for applications not covered for basic Tray Cable. The “ER” stands for exposed runs, and the “JP” stands for joist pull. The “ER” rating means that the cable has been tested to withstand the same crush and impact levels as MC Cable (Metal Clad). The “JP” rating means the cable has been tested for pulling through structural members without damage.

➤ WHERE DOES THE NEC COVER TC-ER-JP CABLE FOR USE IN ONE- AND TWO-FAMILY DWELLINGS

Type TC cable is covered in Article 336 of the NEC. TC-ER-JP cable is specifically mentioned in Section 336.10, covering uses permitted. Section 336.10(9) permits TC-ER-JP cable in one- and two-family dwelling units for both power and control circuits. When this cable is used as interior wiring, it must be installed per the requirements of Part II of Article 334, which covers Type NM and NMC cable. When this cable is used as exterior wiring, it must be installed per the requirements of Part II of Article 340, which covers underground cable, Type UF.

➤ WHAT ARE SOME APPLICATIONS OF TC- ER-JP CABLE IN ONE- AND TWO-FAMILY DWELLINGS

TC-ER-JP cable can be used for wiring between a generator and associated equipment such as a transfer switch, or between the service panel and an electric vehicle charge port.

➤ WHAT REQUIREMENTS APPLY WHEN TC-ER-JP CABLE IS USED IN ONE- AND TWO-FAMILY DWELLINGS FOR INTERIOR WIRING, WHERE IT IS EXPOSED WHEN INSTALLED

TC-ER-JP cable used for interior wiring, where it is exposed, will need to comply with the requirements of Section 334.15, which covers exposed work. Assuming the cable will not be installed above suspended ceilings or in unfinished basements and crawl spaces, the requirements of Section 334.15 would apply. This section requires the cable to closely follow the surface of the building finish and be protected from physical damage where necessary. The physical damage requirement is specified in Section 334.15(B). It states that where necessary, protection shall be provided by specific types of metal raceways and PVC conduit or other approved means. The “approved means” is whatever the inspecting AHJ will accept. The “where necessary” part is also at the discretion of the AHJ.

➤ WHEN INSTALLING EXPOSED RUNS OF TC-ER-JP CABLE, NEC SECTION 334.15 REQUIRES THE CABLE TO BE PROTECTED FROM PHYSICAL DAMAGE WHERE NECESSARY. IF CONDUIT OR TUBING IS USED TO PROTECT THE CABLE FROM PHYSICAL DAMAGE, DOES NEC CHAPTER 9, TABLE 1 APPLY WHICH COVERS ALLOWABLE CONDUCTOR FILL.

Table 1 of Chapter 9 applies only to complete conduit or tubing systems. It does not apply to sections of conduit or tubing used to protect exposed wiring and cable from physical damage.

➤ **WHAT REQUIREMENTS APPLY WHEN TC-ER-JP CABLE IS INSTALLED ABOVE SUSPENDED CEILINGS OR IN UNFINISHED BASEMENTS AND CRAWL SPACES OF ONE- AND TWO-FAMILY DWELLINGS**

Section 300.11(B) covers wiring systems installed above suspended ceilings. It has some basic requirements and then the section is subdivided into fire-rated and non-fire rated assemblies with differing requirements. As a general requirement, cables may not be supported by ceiling grids. Section 334.15(C) covers exposed work in unfinished basements and crawl spaces. Where cable is run at angles with joists in these spaces, it is permissible to secure cables not smaller than two 6 AWG or three 8 AWG conductors directly to the lower edges of the joists. Smaller cables must be run either through board holes in joists or on running boards.

➤ **IS IT POSSIBLE TO USE TC-ER-JP CABLE OUTDOORS OR UNDERGROUND**

TC-ER-JP cable is able to be used outdoors when rated UV (ultraviolet) and underground when rated for direct burial. The cable will be marked or identified for these applications.

➤ **IS IT POSSIBLE TO SIZE TC-ER-JP CABLE USING 75C AMPACITIES IN NEC TABLE 310-16 IN ANY APPLICATION**

Section 336.10(9) contains an exception which allows TC-ER-JP cable rated 75C minimum to be sized using 75C ampacities in Table 310-16 when used to connect a generator and associated equipment having terminals rated 75C. For example, if the terminals of the generator and a transfer switch used to secure both ends of the cable are marked for 75C, the 75C ampacities could be used to size the cable.

➤ **NEC SECTION 445.13(A) REQUIRES THE AMPACITY OF THE CONDUCTORS FROM THE GENERATOR OUTPUT TERMINALS TO THE FIRST OVERCURRENT PROTECTIVE DEVICE TO BE AT LEAST 115 PERCENT OF THE NAMEPLATE CURRENT RATING OF THE GENERATOR. CAN THE CONDUCTORS BE SIZED AT 100 PERCENT OF THE NAMEPLATE RATING IF THE OVERCURRENT PROTECTIVE DEVICE IS AN INTEGRAL PART OF THE GENERATOR.**

Section 445.13(A) has an exception which allows these conductors to be sized at 100 percent of the nameplate rating if the generator has built in protection against overloading. Most generators sold for home standby use have a built-in circuit breaker upstream of the output terminals which prevents the generator from overloading.

BEST PRACTICE: As local inspectors may not be aware of NEC requirements for TC-ER-JP cable, and to preclude delays in final inspection approval, TCERDirect® and Gen-Pro Products strongly encourage that prior to using TC-ER-JP cable in one- and two-family dwellings, installers should confirm with their local building inspector that the proposed installation meets with their approval.

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