

ACSR TP (TWISTED PAIR) CONDUCTORS

FREQUENTLY ASKED QUESTIONS

Q.: What is TP conductor?

A.: TP (Twisted Pair) conductor is two standard conductors (ACSR, AAC, AAAC and ACAR) that are twisted around each other on a 9 foot lay length (left hand).

Q.: How long has TP conductor existed?

A.: TP conductor was introduced in 1974 and branded as T2 conductor. In 2000, the more generic term, TP (Twisted Pair), was adopted by the industry.

Q.: What parts of the country use TP conductors?

A.: Typically TP conductors are used where ice forms along the line in the middle of the country where cold air from Canada collides with warm air from the Gulf of Mexico producing ice and wind.

Q.: Why was TP developed?

A.: TP conductor was developed to mitigate the problem some utilities had on transmission lines with ice galloping that produced violent conductor movements that damaged towers and hardware.

Q.: Will TP conductors help with other types of conductor motion?

A.: TP conductors can reduce sub-conductor oscillation with bundled conductors.

Q.: What specification is TP manufactured to?

A.: TP conductors are manufactured to ASTM B911.

Q.: How does TP mitigate ice galloping and other types of conductor motion?

A.: The two conductors offer a changing profile into the wind and thus break up lift forces as the ice layer on the conductor produces an air foil. The constantly changing profile of TP (figure eight) disrupts these lift forces.

Q.: What is the maximum tension TP conductors can be installed?

A.: TP conductors can be sagged to the maximum tensions allowed by the NEC. TP conductors allow for the use of higher tensions compared to standard conductors.

Q.: Why can TP conductors be installed at higher tensions?

A.: TP conductors can be installed at higher tensions than standard conductors because the two conductors produce a rocking motion that translates the vibration energy into heat.

Q.: Are there any differences when installing TP conductor vs. standard ACSR?

A.: Stringing follows IEEE 524-2003. Conductor may tend to "bag" when stringing as one conductor may drop below the other. Some bagging is normal and will usually sort out after the conductor is placed using sagging tension. If bagging is still present after stringing tension, a rope can be thrown over the affected span and pulled downward with a sharp tug. Several sharp tugs should remove the excess sag and even the conductors up. Any remaining bagging must be removed by splicing out the bagged conductor.

Q.: Are the package lengths different for TP conductors?

A.: The OD of TP conductor is larger than conventional conductor and less footage can be placed on any given reel size. The TP conductor does not lay up level as does a conductor of constant diameter. This reduces the amount of cable that can be put on a given size reel. This may require more pulls than standard conductor. See the Alcan Cable Packaging manual for specific package lengths.

Q.: Are the fittings for TP conductors special?

A.: Suspension clamps for TP conductors are specially designed for the larger diameter of the twisted pair and exist in single and parallel grooved designs. Armor grip suspension units are also available for TP conductors.

Q.: How do I calculate bullwheel and sheave size for TP conductors?

A.: Refer to IEEE 524 for recommendations on bullwheel and sheave size, but use 2x the diameter of a single TP conductor. For example, if the TP conductor is 397.5 kcmil IBIS 26/7 ACSR, the maximum OD is 2x .783" or 1.566". For bullwheel size use 35x max OD of TP conductor. Use 0.55 max OD for sheave groove radius and 14x max OD for sheave diameter.

Q.: How do I calculate the "equivalent diameter" of a TP conductor?

A.: Since the TP conductors rotate around each other every 9 feet, the equivalent diameter used to calculate wind surface area is 1.637 x OD (single conductor).

Q.: Can TP be offered in conductors other than ACSR?

A.: TP is available in AAC, in addition to ACSR.

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