Twisted Pair Cables

Upon a closer inspection of the internet or telephone communication cables, one could uncover the fact that the wires in the in insulated rubber band are in fact twisted. The main reason for that is to attenuate external electro-magnetic interference, which could degrade the performance of the circuit and lead to an increase in error rate for transmitted data, something we would very much like to avoid, since we enjoy our clear, noiseless means of communications.

An immediate or rather primitive classification of the twisted cables can be done by the criteria of shielding, and, as such, we have Shielded TP or Unshielded TP. While the unshielded TP are used more generally used for individual users, the shielded ones (or foiled if we wish to get technical) are more high-end and serve additional purposes, mainly, protection. While they both serve the exact same purpose, the Shielded is more challenging to install due to its thickness and rigidity, is more expensive, contains a built in Static Energy Discharger and requires better grounding.

It would be wise to point out there is a difference between Foiled TP and Shielded TP, while technically, both provide additional insulation, STP provides shielding for individual wires and the whole cable, while FTP only adds shielding to the whole cable and have a slightly lower impedance than STP, but ultimately used for same speed connections and serve the same purpose of additional protection.

Another, more advanced means of categorization is by speed! Tighter twists result in a faster data transmission rate:

* *Category 1* – designates the cables for classical analogical telephony;
* *Category 2* – describes the cables for digital and analogical telephony, but which does not offer data transmitting services at superior speeds;
* *Category 3* – cables that can be used for usual speed LAN-s, Ethernet 802.3 type, with speeds up to 16Mbps and Token Ring networks at 4Mbps;
* *Category 4* – defines cables with high performances, having transmission characteristics that exceed 20Mbps;
* *Category 5* – describes cables suitable for Fast Ethernet networks at 100Mbps speed. This cable category is frequently used in cabling, because it offers high performances;
* *Category 5e* – describes cables suitable for Gigabit Ethernet networks at 1Gbps speed. This cable category is also frequently used in cabling, because it offers high performances;
* *Category 6* – allows data transmission up to 155Mbps;
* *Category 7* – allows data transmission up to 1Gbps.

Twisted cables have 2 wires for reception (3 and 6) and 2 wires for transmission (1-2). This is the default arrangement and is commonly known as Media Dependent Interface (or MDI for short). There are 2 types of connections available: crossover and straight-through, used for devices of the same type, respectively different type. In the crossover connection, the reception is being reversed with transmission to allow the flow of data. Additionally, all 4 wires are used for both transmission and reception in a Gigabyte connection.