

IndustrialNet™ Cabling – 600V and Power Limited Tray Cable (PLTC) Explained

With the demanding environments of a plant/factory floor, Ethernet cabling components are required to be reliable and robust with protection against vibration, high temperatures, UV resistance, EMI, and oil/chemical resistance.

600V Rated Cabling

The NFPA 70/NEC (National Electrical Code) specifies that Class 1 power circuits and Class 2/3 communications circuits be routed in separate pathways, be spaced apart or have insulation rated for the maximum voltage (600V) applied to the conductors of all cables located within the pathway.

Because network cabling is not designed to carry these power voltages, the cable jacket must be constructed of the appropriate insulation to meet this voltage isolation withstand requirement. By upgrading the jacket insulation “withstand voltage” users eliminate the possibility of hazardous power voltages being carried on network wiring in the event of a failure.

600V rated cables provide a cost saving by avoiding the need to separate your network infrastructure from high voltage drive cables using additional conduit or other means of separation.

Underwriters Laboratory standard UL 758, “Appliance Wire Marking (AWM)” defines the testing requirements.

Panduit’s 600V stranded conductor cable and patch cord offering complies with AWM Style 2463 for multi-conductor cable using non-integral jacket. Style 2463 specifies a rating to 80° C, 600V AC withstand, and cable flame. The cable is flame rated for CMX/CM per UL 1685.

The cables shown below allow for patch runs between automation devices /appliances in industrial environments; rated for 600V panel or on-machine applications when the space is shared with high voltage power cables.

Cable Type	Part Number	Category	Type	Jacket Material	Colors	Part Description	MOQ (reels)
IndustrialNet	ISFCH5C02A**-XG	Cat5e	Stranded	600V rated (TPE)	BL, RD, GY, TL, YL, BU	Copper Cable, Industrial, Cat5e, 2-pair, 24/7 AWG stranded, SF/UTP, CM, 1000ft/305m reel	9
	ISFCH5C02A**-XS	Cat5e	Stranded	600V rated (TPE)	BL, RD, GY, TL, YL, BU	Copper Cable, Industrial, Cat5e, 2-pair, 24/7 AWG stranded, SF/UTP, CM, 1000ft/305m reel	1
	ISFCH5C04A**-XG	Cat5e	Stranded	600V rated (TPE)	BL, RD, GY, TL, YL, BU	Copper Cable, Industrial, Cat5e, 4-pair, 24/7 AWG stranded, SF/UTP, CM, 1000ft/305m reel	5
	ISFCH5C04A**-XS	Cat5e	Stranded	600V rated (TPE)	BL, RD, GY, TL, YL, BU	Copper Cable, Industrial, Cat5e, 4-pair, 24/7 AWG stranded, SF/UTP, CM, 1000ft/305m reel	1
	ISFCH6X04A**-UG	Cat6A	Stranded	600V rated (TPE)	BL, TL	Copper cable, Industrial 600V, Cat6A 4-pair, 24AWG stranded, SF/UTP, CMX	20
	ISFCH6X04A**-US	Cat6A	Stranded	600V rated (TPE)	BL, TL	Copper cable, Industrial 600V, Cat6A 4-pair, 24AWG stranded, SF/UTP, CMX	1
	ISFCH6X04B**-UG	Cat6A	Stranded	600V rated (TPE)	BL, TL	Copper cable, Industrial 600V, Cat6A 4-pair, 26AWG stranded, SF/UTP, CMX	20
	ISFCH6X04B**-US	Cat6A	Stranded	600V rated (TPE)	BL, TL	Copper cable, Industrial 600V, Cat6A 4-pair, 26AWG stranded, SF/UTP, CMX	1

Panduit's 600V rated industrial patch cords utilize the stranded cable above.

ISTPHCH*M** Cat5E performance

ISTPH6X*M** Cat6A performance

Panduit's 600V solid conductor cable offering complies with AWM Style 21047 for multi-conductor cable with extruded non-integral jacket. Style 21047 specifies a rating to 75° C, 600V AC withstand, and cable flame. The cable is flame rated for CMR per UL 1666.

The cables shown below allow for longer network channel runs between automation devices /appliances in industrial environments and entry into panels when connecting network switching where high voltage cables are present.

Cable Type	Part Number	Category	Type	Jacket Material	Colors	Part Description	MOQ (reels)
IndustrialNet	IFRH5C04**-UG	Cat5e	Solid	600V rated	BL,RD	Copper Cable, Industrial 600V, Cat5e, 4-pair, 23/1 AWG, F/UTP, CMR, Black, 1000ft/305m reel	5
	IFRH5C04**-UG-S	Cat5e	Solid	600V rated	BL,RD	Copper Cable, Industrial 600V, Cat5e, 4-pair, 23/1 AWG, F/UTP, CMR, Black, 1000ft/305m reel	1
	IFRH5C02**-UG	Cat5e	Solid	600V rated	BL,RD	Copper Cable, Industrial 600V, Cat5e, 2-pair, 23/1 AWG, F/UTP, CMR, Black, 1000ft/305m reel	9
	IFRH5C02**-UG-S	Cat5e	Solid	600V rated	BL,RD	Copper Cable, Industrial 600V, Cat5e, 2-pair, 23/1 AWG, F/UTP, CMR, Black, 1000ft/305m reel	1
	IFRH6C04**-UG	Cat6	Solid	600V rated	BL, RD	Copper Cable, Industrial 600V, Cat6, 4-pair, 23/1 AWG, F/UTP, CMR, Black, 1000ft/305m reel	20
	IFRH6C04**-UGS	Cat6	Solid	600V rated	BL, RD	Copper Cable, Industrial 600V, Cat6, 4-pair, 23/1 AWG, F/UTP, CMR, Black, 1000ft/305m reel	1

PLTC Cabling

What's a Power Limited circuit?

Power limited circuits: A Class 1 **circuit** is the portion of the wiring system between the load side of the overcurrent protection device (OCPD) or the **power-limited** supply and the connected load. For example, Class 1 **power-limited circuits** are supplied by a **power** supply with an output that does not exceed 30 volts and 1,000 volt-amps.

A Power Limited Tray Cable (PLTC) can be used in a tray with limited power cables “which some interpret as lower voltage” and that can be up to 300V.

So, in other words, if you have a 300V power cable running in a tray, a 600V PLTC communication cable would be able perform with no impact caused by the power cables generated heat or signal interference.

PLTC communication cable meets NEC/NFPA 70 and UL requirements for installation in cable trays. This higher performance is due to the construction and thickness of the cable jacket insulation.

The UL standards

- Require that every reel of cable be subjected to a 1.5 KVAC Dielectric Withstand Test to insure the cable has no shorts or insulation breakdown.
- Require the cable to pass the UL 1685 flame test (70,000Btu/h vertical tray flame test).
- Require the cable complies with the UL13 rating related to the cable jackets UV and oil resistance.
- The UL 1277 spec refers to a 90C temperature rated PVC.
- Require the cable jacket must be a gas/vapor-tight continuous sheath

Panduit has two types of PLTC cables:

IURTH5C04BL-UG: cable complies with UL AWM 2570 for 80C, 600V/1000V PVC jacket.

ESFLHT5C0***-X: PROFINET cable complies with UL AWM 2463 for 80C, 600V PVC jacket.

Cable Type	Part Number	Category	Type	Jacket Material	Colors	Part Description	MOQ (reels)
IndustriaNet	ESFLHT5002FGR-X	Cat5e	Stranded	600V PLTC	GR	Copper Cable, Industrial PROFINET, Cat 5e, 2-pair, 22 AWG Stranded, High flex, SF/UTP, PLTC, 600 V rated, CM/CMX, Green, Oil and Sun resistant, 1000 ft box	20
	ESFLHT5002FGRXS	Cat5e	Stranded	600V PLTC	GR	Copper Cable, Industrial PROFINET, Cat 5e, 2-pair, 22 AWG Stranded, High flex, SF/UTP, PLTC, 600 V rated, CM/CMX, Green, Oil and Sun resistant, 1000 ft box	1
	ESFLHT5002GR-X	Cat5e	Solid	600V PLTC	GR	Copper Cable, Industrial PROFINET, Cat 5e, 2-pair, 22 AWG Solid, SF/UTP, PLTC, 600 V rated, CM/CMX, Green, Oil and Sun resistant, 1000 ft box	20
	ESFLHT5002GRXS	Cat5e	Solid	600V PLTC	GR	Copper Cable, Industrial PROFINET, Cat 5e, 2-pair, 22 AWG Solid, SF/UTP, PLTC, 600 V rated, CM/CMX, Green, Oil and Sun resistant, 1000 ft box	1
	IURHT5004BL-UG	Cat5e	Solid	600V PLTC	BL, RD	Copper Cable, Industrial 600V PLTC, Cat5e, 4-pair, 22/1 AWG, U/UTP, CMR, Black, 1000ft/305m reel	5

Applications:

Since Ethernet technology is now becoming common in motor control centers (MCCs) and switch gear, the cabling design and selection must be reliable and robust. In MCCs, drives produce enough EMI to interfere with many commercial grade Ethernet cables. Moreover, the need to monitor and control these devices may demand that the cable enter the MCC and/or control panels and to be routed within these enclosures. As a result, an appropriately-rated Ethernet cable with excellent noise immunity and the ability to run on or near appliances/devices is needed.

