

# UL Control Cable

## 600V Type TC Cables — Overview

### Introduction

Belden offers a wide selection of UL-rated 600V Tray Cable for a variety of control applications.

Multi-conductor versions are available as standards from 18 to 1 AWG. 1/0 through 4/0 are also available as custom made constructions. These are unshielded and shielded versions that come with various insulation and jacket combinations.

These TC cables are installed in cable trays, ducts and conduit and can be used in direct burial applications. They are extensively used in manufacturing facilities, especially in the process industries such as petrochemical, steel, pulp and paper, cement and mining.

These flexible, space efficient cables can be substantially more economical than traditional wiring methods.

### Construction

Soft annealed bare or tinned copper conductors, with various insulation and jacketing options as seen in chart below.

### Application

These cables are suitable for installation in wet or dry locations. Cable jackets are resistant to sunlight, moisture and vapor penetration. The cables can be used in raceways (supported by messenger wire), outdoor applications and direct burial applications.

### Unshielded

Cabled non-shielded conductors provide a minimal O.D. allowing greater tray and conduit fill. Non-shielded control cable may be utilized when recommended by the equipment manufacturer and used in a metallic conduit.

### Overall Shield

Recommended for use in control applications where signals are transmitted in excess of 100 millivolts, except in areas where high voltage and current sources create excessive noise interference. The Beldfoil® shield with drain wire provides 100% coverage for maximum shield effectiveness. Copper tape shield available upon request.

Only 2-conductor round constructions can be shielded. Flat constructions cannot be shielded.

### Tray Cable Construction Options

Insulation/Jacket	UL Listed for MC and TC		Flame Tests	Ratings*
	Max. Temp Rating			
	Wet	Dry		
PVC-Nylon/PVC (THHN or THWN) 14 AWG & larger	75°C	90°C	UL 1685 FT4/IEEE 1202/383 ICEA T-29-520	ICEA S-73-532 ICEA S-95-658 ICEA S-61-402
PVC-Nylon/PVC (TFN or TFFN) 16 & 18 AWG	NA	90°C	UL 1685 FT4/IEEE 1202/383 ICEA T-29-520	ICEA S-73-532 ICEA S-95-658 ICEA S-61-402
XLPE/PVC or CPE (XHHW-2) 14 AWG & larger	90°C	90°C	UL 1685 FT4/IEEE 1202/383 VW-1 rated singles ICEA T-29-520	ICEA S-73-532 ICEA S-95-658 ICEA S-66-524
XLPE/PVC or CPE (RFH-2) 16 & 18 AWG	75°C	75°C	UL 1685 FT4/IEEE 1202/383 VW-1 rated singles ICEA T-29-520	ICEA S-73-532 ICEA S-95-658 ICEA S-66-524
FRPO/PVC 18 AWG & larger	—	75°C	UL 1685	
TPE/TPE	75°C	90°C	UL 1685	
FRPO/PVC	75°C	90°C	UL 1685	
XLPE/Haloarrest® (XHHW-2) 14 AWG & larger	90°C	90°C	UL 1685 FT4/IEEE 1202/383 ICEA T-29-520	TC-LS
XLPE/Haloarrest (RFH-2) 16 & 18 AWG	75°C	75°C	UL 1685 FT4/IEEE 1202/383 ICEA T-29-520	TC-LS
FEP/PVC	90°C	90°C	UL 1685	

CPE = Chlorinated Polyethylene • FEP = Fluorinated Ethylene-propylene • FRPO = Flame-retardant Polyolefin • PVC = Polyvinyl Chloride • TPE = Thermoplastic Elastomer • XLPE = Cross-linked Polyethylene

\*Applicable to TC-rated cables only.

### Ground Wire

- Non-insulated, bare copper ground wires are included for constructions 8 through 1 AWG. Non-insulated, bare copper, full sized ground wires may be requested on other constructions.
- All shielded PVC-Nylon/PVC constructions include full sized ground (drain) wires.

### Color Code

Multi-conductor control cables (10 AWG to 18 AWG) are printed alpha-numerically in addition to being color coded per ICEA Table E2.

8 AWG and larger are black and numbered per ICEA Method 4.

Refer to Technical Information Section for ICEA color code charts.

### Specifications

- UL Subject 1277 Type TC
- XLPE/Haloarrest jacketed cables are UL 1277 TC-LS rated
- UL Subject 1424 (per outline for NPLF requirements dated May 3, 1979)
- UL 1685 (UL 1581) Vertical Flame Test comparable to IEEE 383-1974 (70,000 BTU/hr) Flame Test

- Approved for cable tray use in Class 1, Division 2 areas, per NEC Articles 340, 318 and 501, and for Class 1 circuits as permitted in Article 725
- PVC-Nylon/PVC, XLPE/PVC and XLPE/CPE constructed cables meet IEEE 1202/IEEE 383-2003/FT4 (70,000 BTU/hr) Flame Test

### TC-ER Rated Cables

As an option, Belden offers all PVC-nylon/PVC, XLPE/PVC and XLPE/CPE jacketed tray cables with a TC-ER (Exposed Run) rating, formerly referred to as Open Wiring.

Per NEC Article 336, a TC-ER rated cable may be installed in an industrial establishment between a cable tray and the utilization equipment or device. A TC-ER rated cable must meet the crush and impact requirements of UL Type MC cable. By eliminating the need for metal conduit and/or armor, using a TC-ER rated cable results in savings in both installation and maintenance.

Standard lengths may be subject to tolerance. Custom lengths may be available upon request. Contact the Belden Electronics Division Customer Service Department for additional information. 1-800-BELDEN-1