HVTECK SPECIFICATIONS

# HVTECK CU 3/C 280EPR TS PVC AIA PVC 28KV 100% CSA

## PRODUCT HIGHLIGHTS

Southwire's 28KV HVTECK is a CSA armoured cable for industrial and commercial medium voltage applications. Rated FT4, -40°C, Hazardous Locations (HL) and 105°C for use in harsh Canadian environments. For installation in cable trays, duct banks, direct burial, troughs, continuous rigid cable supports and concrete encaseable.

## CONSTRUCTION

### Conductor
- Class B compressed stranded copper
  - in accordance with ASTM B3 and ASTM B8

### Options
- Class B compact stranded -8000 Series Aluminum -ACM
- Class B compact stranded copper

### Conductor Shield
- Extruded semi-conducting thermosetting polymeric layer

### Insulation
- No-lead EPR (Ethylene Propylene Rubber)
- Thickness: 0.28 inches (7.11mm) - nominal
- Insulation level: 100% - grounded system
- 105°C rated

### Insulation Shield
- Extruded Semi-conducting thermosetting polymeric layer
- CSA 68.10 - Shield Removal/termination requirements are printed on the surface
- Phase identification as per ICEA Method 3, using printed circuit numbers
- Meets requirement of ICEA but built to CSA standards

### Copper Tape Shield
- Helically wrapped 5 mil copper tape with 25% overlap

### Bonding Conductor
- Class B compressed stranded bare copper
  - in accordance with ASTM B3 and B8

### Fillers
- Non-wicking, non-hygroscopic

### Inner Jacket
- Black PVC
- Thickness:
  No.1 AWG to No.3/0 AWG = 0.11 inches (2.79mm)
  No.4/0 AWG to 500 kcmil = 0.14 inches (3.56mm)

### Armour
- Aluminum Interlocked Armour (AIA)
- Optional Galvanized Steel Interlocked Armour (GSIA)

### Overall Jacket
- Black PVC (optional colours available)
- Nominal Thickness:
  No.1 AWG to No.2/0 AWG = 0.075 inches (1.91mm)
  No.3/0 AWG to 500 kcmil = 0.085 inches (2.16mm)

### Typical Print Legend
- (CSA) SOUTHWIRE (NESC) #P# 3/C [#AWG or #kcmil] CU 280 EPR AIA 28KV 100% INS LEVEL 25% TS SUN RES 105° FT4 HL (-40°C) LTGG RoHS YEAR [SEQUENTIAL METER MARKS]

## TABLE 1 - WEIGHTS & MEASUREMENTS

| | Conductor Size * | Conductor Diameter | | Diameter Over Insulation | | Diameter Over Insulation Shield | | Bonding Cond. Size | Diameter Over Inner Jacket | | Diameter Over Armour | | Approx. Overall Diameter | | Minimum Bend Radius | | Approx. Weight of Cable | | Max. Reel Weight (reel and cable) ** | | Max. Reel Diameter / Width ** | | Max. Length of Cable on Reel ** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HVTECK Product Code | AWG or Kcmil | inches | mm | inches | mm | inches | mm | AWG | inches | mm | inches | mm | inches | mm | inches | mm | lb / 1000ft | kg/km | lbs | kg | inches | m | feet | m |
| CU280X73-001 | 1(19) | 0.322 | 8.2 | 0.912 | 23.2 | 0.992 | 25.2 | 6 | 2.406 | 61.1 | 2.736 | 69.5 | 2.886 | 73.3 | 20.2 | 513 | 3745 | 5573 | 10168 | 4612 | 108/70.5 | 2.74/1.79 | 2300 | 701 |
| CU280X73-010 | 1/0(19) | 0.362 | 9.2 | 0.952 | 24.2 | 1.032 | 26.2 | 6 | 2.492 | 63.3 | 2.822 | 71.7 | 2.972 | 75.5 | 20.8 | 528 | 4075 | 6064 | 10520 | 4772 | 108/70.5 | 2.74/1.79 | 2200 | 671 |
| CU280X73-020 | 2/0(19) | 0.405 | 10.3 | 0.995 | 25.3 | 1.075 | 27.3 | 6 | 2.585 | 65.7 | 2.915 | 74.0 | 3.065 | 77.9 | 21.5 | 545 | 4468 | 6649 | 10714 | 4860 | 108/70.5 | 2.74/1.79 | 2050 | 625 |
| CU280X73-030 | 3/0(19) | 0.456 | 11.6 | 1.046 | 26.6 | 1.126 | 28.6 | 4 | 2.695 | 68.5 | 3.025 | 76.8 | 3.195 | 81.2 | 22.4 | 568 | 5060 | 7530 | 10157 | 4607 | 108/70.5 | 2.74/1.79 | 1700 | 518 |
| CU280X73-040 | 4/0(19) | 0.512 | 13.0 | 1.102 | 28.0 | 1.182 | 30.0 | 4 | 2.876 | 73.1 | 3.206 | 81.4 | 3.376 | 85.8 | 23.6 | 600 | 5834 | 8683 | 10890 | 4940 | 108/70.5 | 2.74/1.79 | 1600 | 488 |
| CU280X73-250 | 250(37) | 0.558 | 14.2 | 1.158 | 29.4 | 1.238 | 31.4 | 4 | 2.997 | 76.1 | 3.327 | 84.5 | 3.497 | 88.8 | 24.5 | 622 | 6211 | 9244 | 10872 | 4932 | 108/70.5 | 2.74/1.79 | 1500 | 457 |
| CU280X73-350 | 350(37) | 0.661 | 16.8 | 1.261 | 32.0 | 1.341 | 34.1 | 3 | 3.220 | 81.8 | 3.550 | 90.2 | 3.720 | 94.5 | 26.0 | 661 | 7701 | 11460 | 10026 | 4548 | 108/70.5 | 2.74/1.79 | 1100 | 335 |
| CU280X73-500 | 500(37) | 0.789 | 20.0 | 1.389 | 35.3 | 1.469 | 37.3 | 3 | 3.496 | 88.8 | 3.826 | 97.2 | 3.996 | 101.5 | 28.0 | 711 | 9523 | 14172 | 11554 | 5241 | 108/70.5 | 2.74/1.79 | 1050 | 320 |

NOTE: These are minimum average dimensions as per CSA Standards.

* Other conductor sizes and outer jacket colours are available upon request. (#s in brackets represent # of strands / conductor)

** Longer maximum lengths may be possible. Standard sizes and lengths may be supplied. Reel sizes are not guaranteed. The factory reserves the right to make changes as necessary to optimize manufacturing requirements.

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## DESIGN

### Qualification Standards

- CSA C68.10 - Shielded Power Cables for Commercial and Industrial Applications - 5 to 46 KV
- CSA C68.3 - Shielded & Concentric Neutral Power Cable - 5 to 46 kV
- CSA C22.2 No. 174 - Cables in Hazardous Locations
- ICEA S-93-639 (NEMA WC 74) 5 to 46 kV - Shielded Power Cable
- AEIC CS-8 - Qualification Testing Requirements

### Flame Test Ratings

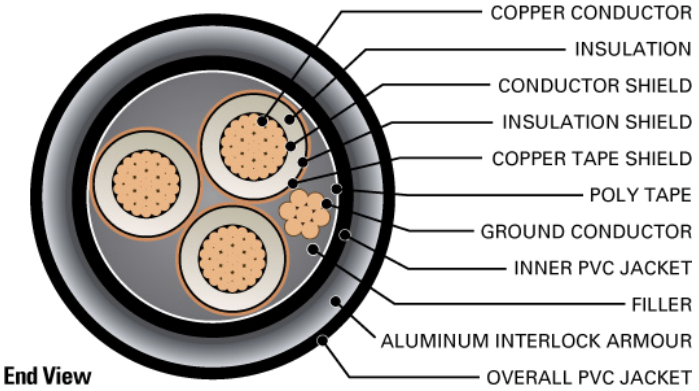
- FT1 - Flame Test - (1,706 BTU/Hr. nominal - Vertical Wire Flame Test)
- FT4, Flame Test - (70,000 BTU/Hr. - Vertical Tray Flame Test)
- IEEE 1202 - Flame Test - (70,000 BTU/Hr. - Vertical Tray Test)
- IEEE 383 - Flame Test - (70,000 BTU/Hr.)
- ICEA T-29-520 - Vertical Cable Tray Flame Test - (210,000 BTU/Hr)

### Product Ratings

- CSA C22.2 No. 2556 & No. 0.3. - Wire and Cable Test Methods
- CSA LTGG [-40°C] - as per C68.10 - for Cold Bend and Impact rating
- CSA HL - for Hazardous Locations rating
- CSA FT4 - for Flame Retardancy rating
- CSA SUN RES - for Sunlight Resistant rating

### Operating Temperatures

- -40°C - CSA Cold Bend and Impact Temperature
- -25°C - Min. Installation Temperature
- 105°C - Max Continuous Operating Temperature
- 140°C for Emergency Overload Temperature
- 250°C for Short Circuit Temperature



End View

## TABLE 2 - ENGINEERING SPECIFICATIONS

| HVTECK Product Code | Maximum Pulling Tension | | DC Resistance @ 25°C $R_{DC}$ | | AC Resistance @ 90°C 60 Hz (triplex formation) $R_{AC}$ | | Inductance L | | Capacitance C | | Inductive Reactance @ 60Hz (triplexed) $X_L$ | | Capacitive Reactance @ 60Hz (triplexed) $X_C$ | | Positive - Sequence Impedance* | Zero - Sequence Impedance* | Short Circuit Current (each phase conductor) @ 60Hz | Allowable Ampacities in Ventilated Cable Tray † | Allowable Ampacities Directly Buries in Earth ‡ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | lb | Newtons | Ω / 1000 ft. | Ω / km | Ω / 1000 ft. | Ω / km | mH / 1000 ft | mH / km | µF / 1000 ft | µF / km | Ω / 1000 ft. | Ω / km | MΩ • 1000ft | MΩ • km | Ω / 1000ft | Ω / 1000ft | kAmps | Amps | Amps |
| CU280X73-001 | 2009 | 8935 | 0.129 | 0.423 | 0.161 | 0.529 | 0.1210 | 0.3971 | 0.0472 | 0.1549 | 0.0456 | 0.1497 | 0.0562 | 0.0171 | 0.162 + j0.048 | 0.527 + j0.355 | 5.7 | 202 | 226 |
| CU280X73-010 | 2534 | 11274 | 0.102 | 0.335 | 0.128 | 0.419 | 0.1165 | 0.3823 | 0.0508 | 0.1668 | 0.0439 | 0.1441 | 0.0522 | 0.0159 | 0.128 + j0.046 | 0.490 + j0.340 | 7.2 | 231 | 256 |
| CU280X73-020 | 3194 | 14209 | 0.081 | 0.266 | 0.101 | 0.333 | 0.1124 | 0.3687 | 0.0547 | 0.1794 | 0.0424 | 0.1390 | 0.0485 | 0.0148 | 0.102 + j0.045 | 0.461 + j0.325 | 9.0 | 265 | 290 |
| CU280X73-030 | 4027 | 17914 | 0.064 | 0.211 | 0.080 | 0.264 | 0.1082 | 0.3550 | 0.0592 | 0.1942 | 0.0408 | 0.1338 | 0.0448 | 0.0137 | 0.081 + j0.043 | 0.435 + j0.308 | 11.4 | 303 | 327 |
| CU280X73-040 | 5078 | 22590 | 0.051 | 0.167 | 0.064 | 0.210 | 0.1043 | 0.3422 | 0.0641 | 0.2104 | 0.0393 | 0.1290 | 0.0414 | 0.0126 | 0.065 + j0.041 | 0.414 + j0.291 | 14.3 | 348 | 369 |
| CU280X73-250 | 6000 | 26689 | 0.043 | 0.141 | 0.054 | 0.178 | 0.1021 | 0.3349 | 0.0673 | 0.2209 | 0.0385 | 0.1263 | 0.0394 | 0.0120 | 0.055 + j0.040 | 0.398 + j0.276 | 16.9 | 384 | 408 |
| CU280X73-350 | 8400 | 37365 | 0.031 | 0.101 | 0.039 | 0.128 | 0.0969 | 0.3181 | 0.0761 | 0.2496 | 0.0365 | 0.1199 | 0.0349 | 0.0106 | 0.040 + j0.038 | 0.373 + j0.250 | 23.7 | 468 | 485 |
| CU280X73-500 | 12000 | 53379 | 0.022 | 0.071 | 0.028 | 0.091 | 0.0921 | 0.3020 | 0.0869 | 0.2851 | 0.0347 | 0.1139 | 0.0305 | 0.0093 | 0.028 + j0.036 | 0.349 + j0.223 | 33.9 | 565 | 571 |

* Calculations are based on 5 mil 25 % over lapping copper tape shield / Conductor temperature of 90°C / Shield temperature of 45°C / Earth resistivity of 100 ohms-meter

† Ampacities are based on Table D17N of the 2015 Canadian Electrical Code Part I (40°C Ambient Air Temperature, indoor installation)

‡ Ampacities are based on Table D17E of the 2015 Canadian Electrical Code Part I

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