



TO: To Whom It May Concern
FROM: Codes & Standards
DATE: 01/26/2021
RE: Canadian Rated Conductors: C(UL) vs CSA

Technical Document

This Technical Paper from Codes & Standards will focus on one of the Thermoplastic products (THHN/THWN-2) we offer that meet both the Canadian Standard (CSA 22.2 No. 75-03) and the American Standard (UL-83) for Thermoplastic Insulated Wires and Cables. Having two country Standards for one product often provides multiple questions regarding whether this product can be used in Canada, or the United States of America, or both, and how do we know? The first place to look is on the product for the Canadian marking. Both C(UL) and CSA are Canadian markings based on the same Tri-National (USA, Canada, & Mexico) Standard (UL-83, CSA 22.2 No. 75-03, NMX-J-010-ANCE-2003) which conforms to the criteria and procedure established by the Standards Council of Canada. A product marked by C(UL) or CSA ensures the product is suitable in Canada. Below are Thermoplastic products that we offer that meet both standards.

Thermoplastic Insulated Wire:

Canadian Type: TWN75 & T90 Nylon

US Type: THHN, THWN, THWN-2

What is the difference between a conductor marked with C(UL) vs CSA? The only difference is the Nationally Recognized Testing Laboratories who performs the testing and certification of the products, either C(UL) or CSA. They both use the same standard to test and certify the product.

There are several Nationally Recognized Testing Laboratories (NRTLs) throughout the United States <https://www.osha.gov/nationally-recognized-testing-laboratory-program>. These testing laboratories are designed to certify and test products according to certain product Standards. For products listed in Canada, the most common NRTLs are Underwriters Laboratories (UL) and Canada Standards Association (CSA) who both support products that meet the Canadian requirements of building wire and cable. C(UL) refers to Canada (UL) and CSA refers to the Canadian Standards Association. Both NRTLs can test and certify products based on Canadian Standards.

Three ways to determine if a product is certified and tested to a Canadian Standard:

1. The print legend will list the testing organization, in this case, C(UL) or CSA.
2. The Canadian Standard should be referenced on the product specification or Engineering Spec., ie., CSA 22.2 No 75-03, to ensure that the correct standard was used for testing.
3. The manufacturer should also be able to provide documentation, C(UL) or CSA Certificate of Compliance.



1. PRINT LEGEND

SOLID CONDUCTOR SIZES 14 AWG THROUGH 10 AWG: ENCORE WIRE CORPORATION (SIZE) AWG TYPE THHN OR THWN-2 GR II VW-1 600 VOLTS (UL) OR AWM OR C-(UL) TYPE T90 NYLON OR TWN 75, DATE/TIME/OPER/QC

14 AWG THROUGH 8 AWG: ENCORE WIRE CORPORATION (SIZE) TYPE MTW OR THHN OR THWN-2 GR2 VW-1 600V (UL) OR AWM OR C-(UL) TYPE T90 NYLON OR TWN 75 SUPERSLICK ELITE

6 AWG THROUGH 1 AWG: ENCORE WIRE CORPORATION (SIZE) TYPE MTW OR THHN OR THWN-2 GR2 SUN-RES VW-1 600V (UL) OR AWM OR C-(UL) TYPE T90 NYLON OR TWN 75 DATE TIME OPERATOR QC SUPERSLICK ELITE

1/0 AWG THROUGH 1000 KCMIL: ENCORE WIRE CORPORATION (SIZE) TYPE MTW OR THHN OR THWN-2 GR2 SUN-RES VW-1 FT4 IEEE 1202 600V FOR CT USE (UL) OR C-(UL) TYPE T90 NYLON OR TWN 75 DATE TIME OPERATOR QC SUPERSLICK ELITE

2. ENGINEERING SPECIFICATIONS

Standards
 Underwriters Laboratories Standards UL-83, UL-1063, UL-1581, UL-1685, UL-2556; AWM Spec 1316, 1317, 1318, 1319, 1320, 1321; ASTM Stranding Class B3, B8, B787; Federal Specification A-A-59544; American National Standards Institute; **Canadian Standards Association C22.2 No. 75;**

3. CERTIFICATE OF COMPLIANCE



Certificate of Compliance

Certificate Number: LL 114998-1 Date Issued: January 5, 2000

Issued To: Encore Wire Corporation
 1410 Millwood Road
 P.O. Box 1149
 McKinney, TX 75069
 U.S.A.
 Attention: Mr. James F. Holloway

The products listed below are eligible to bear the CSA Mark shown



Issued by: D. Hawkes

Signature: 

PRODUCTS
 CLASS 5832 02 - WIRES - Thermoplastic
 Thermoplastic Insulated Wire, Types TW, TW75, TWN75, and T90 Nylon, single conductor construction rated at 600V.

Note: This Report also covers the conversion of the above wire types to Label/Licensing Service.

APPLICABLE REQUIREMENTS

CSA Std C22.2 No	75-M1983	- Thermoplastic-Insulated Wires and Cables
Electrical Notice 405C		- Dual Marking of Wires, Cables, Flexible Cords, Appliance Wiring Material, Liquid-tight Conduit, Flexible Metal Conduit and Tubing
Informs, Wire and Cable No	40	- Publication of Electrical Bulletin No 1451, Requirements for 600V Type TWN 75 Power Cable
Electrical Bulletin No	1451	- Requirements for 600V Type TWN 75 Insulated Conductors



Despite the harmonization of the Tri-National Standards (America, Canada, & Mexico), there are differences in some of the required testing and marking that should be noted in the Table below. However, if an Encore Wire product is marked CSA or C(UL), it has met the necessary requirements of Canada and can be verified by the manufacturer or Nationally Recognized Testing Laboratories.

Summary Comparison of UL, CSA, and ANCE Requirements of Thermoplastic Insulated Wire & Cable

Description	REQUIREMENTS		
	UL (America)	CSA (Canada)	ANCE (Mexico)
Scope	Thermoplastic insulated wire and cable, 600 V, single conductors	Thermoplastic insulated wire and cable, 600 V, single conductors	Thermoplastic insulated wire and cable, 600 V, single conductors
Conductors	Copper, Copper-Clad Aluminum, & Aluminum	No Copper-Clad Aluminum	No Copper-Clad Aluminum No Aluminum
Nylon Jacket	THHN, THWN, THWN-2,	TWN75, T90 Nylon	TWN75, T90 Nylon
Flame Test Requirements	Must Pass FV-1/Vertical Flame FT 1 is optional VW-1 optional	Must Pass FV-1/Vertical Flame Must pass FT1 VW-1 optional	Must Pass FV-1/Vertical Flame FT 1 is optional VW-1 optional
Sunlight Resistance	Weather Resistance is 720 Hours Test	Weather Resistance is 1000 Hours Test	Weather Resistance Is 720 Hours Test
Markings	CT use for single conductors 1/0 AWG Larger	CT is not recognized in Canada	CT use for single conductors 4 AWG and larger

Frequently Asked Question

1. Is your THHN/THWN-2 Canadian rated? Encore Wire’s THHN/THWN-2 has a quad rating (THHN/MTW/THWN-2/T90) and is also constructed like Canada’s T90 Nylon. It has been tested and certified by UL and is marked C(UL), thus it will meet the Canadian requirements.
2. Why is the customer requesting a CSA Mark in Canada? CSA, like UL, is a Nationally Recognized Testing Laboratory (NRTL). In Canada, it may be more common for inspectors and customers to see the CSA mark. However, the mark only identifies who tested and certified the product. As long as the product meets the Canadian Standard, the customer should accept the CSA or C(UL) mark on the product.
3. Does Encore Wire have other products that are rated for Canada? Yes. Please contact your Sales Rep or Codes & Standards and we can guide you to some of these products.