

Cable Lore



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WHAT CABLE SHOULD I CHOOSE – DURASHEATH-900, Unicon, OR TPE?

Durasheath-900 is the "Old Pro" among 600-volt cable constructions. Unicon and TPE are more recent innovations, but have already established excellent performance records. They meet the toughest criterion of all - customer acceptance.

The properties and enviable service record of Durasheath-900 are traditional and there is no question that this cable is going to be preferred by certain users, such as some heavy industrials and utilities. Unicon or TPE, however, will be the choice where smaller diameters and cost are significant.

Unicon and TPE both carry RHH-RHW Underwriters' Labels. The unit covering wall thicknesses of the two materials are the same. The excellent flexibility, ease of stripping, and flame-resistance of Unicon make it the first choice for most 600-volt applications.

At present, Unicon does not carry the USE label but it is cleared for direct burial in non-code applications. TPE does have Underwriters' USE Approval but only when heavier walls than the standard for Type RHH-RHW are used. TPE does not have the good flexibility and excellent flame-resistance of Unicon, but these characteristics are not especially necessary in direct burial application, whereas mechanical protection is important; therefore, TPE is generally the first choice - particularly for URD secondary application.

The following table lists the properties of Unicon and TPE with comments on the significance of each characteristic. THW is also shown for comparison. All three of these unit covering materials will give satisfactory service - however, each material has advantages that should be considered for the planned application.

Property	UNICON		TPE*		THW		Remarks
	Speci- fied	Typi- cal	Speci- fied	Typi- cal	Speci- fied	Typi- cal	
Tensile, Psi	1500	1875	1500	2200	2000	2300	All three meet U/L requirements. Field experience shows that materials with these physical properties withstand rough handling.
Elongation, %	200	450	150	250	150	250	
Oxygen Bomb (168 Hrs. 80C)							
Tensile, % Orig.	75	95	75	98	-	-	Although TPE shows better retention of physical properties after aging than does Unicon, both give satisfactory service at normal operating temperatures. THW is also satisfactory, but being a thermoplastic will cold flow at moderately elevated temperatures.
Elong., % Orig.	75	96	75	93	-	-	
Air Oven (168 Hrs. - 121C)							
Tensile, % Orig.	85	105	70	97	75	105	THW is also satisfactory, but being a thermoplastic will cold flow at moderately elevated temperatures.
Elong., % Orig.	50	70	70	114	50	83	
Oil-Resistance (18 Hrs. - 121C)							
Tensile, % Orig.	-	85	-	40	-	-	Oil-Resistance is not a requirement of U/L; however the excellent oil-resistance of Unicon is an extra.
Flame-Resistance							
U/L Horizontal	Pass	Pass	Pass	Pass	-	Pass	Both Unicon and THW have excellent flame-resistance. The flame-resistance of TPE is poor, making it necessary to apply a flame-retarding paint for protection.
U/L Vertical	-	Pass	-	Fail	Pass	Pass	

*Painted

Property	UNICON		TPE*		THW		Remarks
	Speci- fied	Typi- cal	Speci- fied	Typi- cal	Speci- fied	Typi- cal	
Mechanical Moisture Absorption 7-Day - 70C Mg./Sq. In.	20	10	15	2	20	15	TPE has outstanding moisture resistance but both Unicon and THW are satisfactory in this respect.
Cold Bent Test -40	-	Pass	-	Pass	-	Pass	Low temp. properties could be rated TPE best, Unicon second, and THW last.
IRK	2000	3000	2000	70,000	500	4500	TPE has high insul. resistance. Both Unicon and THW have satisfactory values.
SIC - 60-Cycle - 75C	8	6.6	8	3.8	10**	8*	The SIC values of Unicon and THW are high compared to TPE but are satisfactory for 600-V service.
Electrical Moisture Absorption - 60-Cycle 75C Increase in SIC							THW is not as good as TPE or Unicon on electrical moisture absorption but the THW values are satisfactory.
1-14 Days	6	0	8	0	10**	5*	
7-14 Days	2.5	10	4	10	5**		
Stiffness Ratio	-	1.0	-	1.6	-	1.4	Unicon is considerably more flexible than the other two materials.
Stripability	-	Ex- cel- lent	-	Poor	-	Fair	Ease of stripping is a very definite advantage of Unicon in making terminations.

*Painted
**1000-Cycle