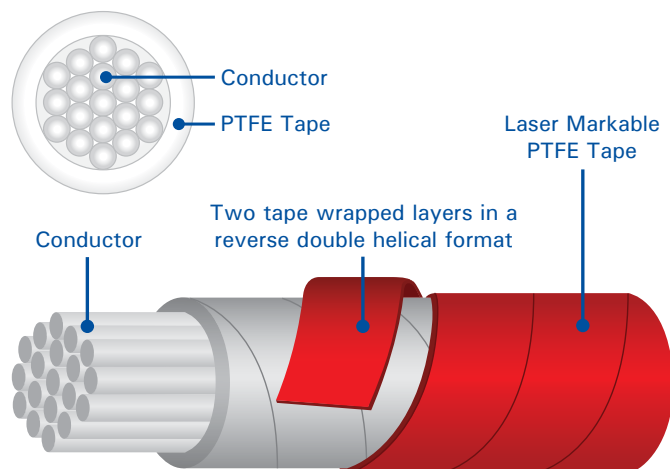


TuffSpec® Wires

INTRODUCTION

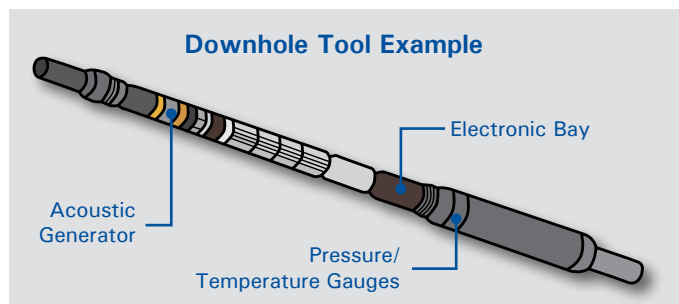
Carlisle Interconnect Technologies (CarlisleIT) introduces TuffSpec®, our new line of PTFE tape wrapped hook up wire designed for the extremely harsh environments of the oil and gas industry. TuffSpec is manufactured using CarlisleIT's proprietary Seamless tape technology that provides the advantages of a tape wrap with the look and feel of an extruded product. A double helical wrap provides an exceptionally consistent insulation that is more durable than extruded PTFE insulations. TuffSpec is available in both 200°C (silver) and 260°C (nickel) versions. Downhole tooling and perforating guns are typical applications.

STANDARD CONFIGURATION OVERVIEW



KEY FEATURES

- » Double helically wrapped PTFE tape
- » Seamless tape construction which provides the smooth surface of an extruded product
- » 20% improved insulation tensile strength compared to extruded PTFE
- » 10% less insulation thickness and improved concentricity compared to extruded PTFE



TuffSpec® Wire

SPECIFICATION DATA

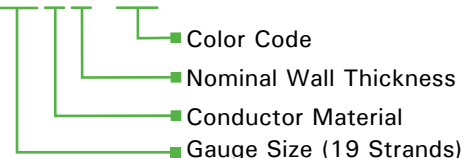
Wire Size AWG	Stranding	Part Number	Diameter		Resistance Ohm/m @ 20°C		Tank Test Direct Current*	Weight lbs./1000 ft (kg/1000 m)	
			Conductor Inch (mm)	Insulation Inch (mm)	Silver	Nickel		Silver	Nickel
250 Volts – 60 Hz RMS – 750 Volts D.C. – 0.004 in Nom. Wall									
28	19 X 40	TS-28x4-xx	0.015 (0.38)	0.023 (0.58)	61.5	63.5	3000	0.8 (1.19)	0.8 (1.19)
26	19 X 38	TS-26x4-xx	0.019 (0.48)	0.027 (0.69)	38.4	42.2	3000	1.2 (1.79)	1.2 (1.79)
24	19 X 36	TS-24x4-xx	0.024 (0.61)	0.032 (0.81)	24.3	25.9	3000	1.8 (2.68)	1.8 (2.68)
22	19 X 34	TS-22x4-xx	0.03 (0.76)	0.038 (0.97)	15.1	16	3000	2.8 (4.17)	2.8 (4.17)
20	19 X 32	TS-20x4-xx	0.038 (0.97)	0.046 (1.17)	9.2	9.8	3000	4.3 (6.40)	4.3 (6.40)
18	19 X 30	TS-18x4-xx	0.047 (1.19)	0.055 (1.40)	5.8	6.1	3000	6.4 (9.52)	6.5 (9.67)
16	19 X 29	TS-16x4-xx	0.053 (1.35)	0.061 (1.55)	4.5	4.8	3000	8 (11.90)	8.1 (12.05)
14	19 X 27	TS-14x4-xx	0.066 (1.68)	0.074 (1.88)	2.9	3	3000	12.4 (18.45)	12.5 (18.60)
600 Volts – 60 Hz RMS – 1800 Volts D.C. – 0.0065 in Nom. Wall									
28	19 X 40	TS-28x6-xx	0.015 (0.38)	0.028 (0.71)	61.5	63.5	5000	1 (1.49)	1.4 (2.08)
26	19 X 38	TS-26x6-xx	0.019 (0.48)	0.032 (0.81)	38.4	42.2	5000	1.4 (2.08)	1.5 (2.23)
24	19 X 36	TS-24x6-xx	0.024 (0.61)	0.037 (0.94)	24.3	25.9	5000	2 (2.98)	2.1 (3.12)
22	19 X 34	TS-22x6-xx	0.03 (0.76)	0.043 (1.09)	15.1	16	5000	3.1 (4.61)	3.1 (4.61)
20	19 X 32	TS-20x6-xx	0.038 (0.97)	0.051 (1.30)	9.2	9.8	5000	4.7 (6.99)	4.6 (6.84)
18	19 X 30	TS-18x6-xx	0.047 (1.19)	0.06 (1.52)	5.8	6.1	5000	6.8 (10.12)	6.9 (10.27)
16	19 X 29	TS-16x6-xx	0.053 (1.35)	0.066 (1.68)	4.5	4.8	5000	8.5 (12.65)	8.6 (12.80)
14	19 X 27	TS-14x6-xx	0.066 (1.68)	0.079 (2.01)	2.9	3	5000	13 (19.34)	13.1 (19.49)
1000 Volts – 60 Hz RMS – 3000 Volts D.C. – 0.009 in Nom. Wall									
28	19 X 40	TS-28x9-xx	0.015 (0.38)	0.033 (0.84)	61.5	63.5	8000	1.2 (1.79)	1.6 (2.38)
26	19 X 38	TS-26x9-xx	0.019 (0.48)	0.037 (0.94)	38.4	42.2	8000	1.7 (2.53)	1.7 (2.53)
24	19 X 36	TS-24x9-xx	0.024 (0.61)	0.042 (1.07)	24.3	25.9	8000	2.3 (3.42)	2.4 (3.57)
22	19 X 34	TS-22x9-xx	0.03 (0.76)	0.048 (1.22)	15.1	16	8000	3.4 (5.06)	3.4 (5.06)
20	19 X 32	TS-20x9-xx	0.038 (0.97)	0.056 (1.42)	9.2	9.8	8000	5.1 (7.59)	5 (7.44)
18	19 X 30	TS-18x9-xx	0.047 (1.19)	0.065 (1.65)	5.8	6.1	8000	7.3 (10.86)	7.4 (11.01)
16	19 X 29	TS-16x9-xx	0.053 (1.35)	0.071 (1.80)	4.5	4.8	8000	9 (13.39)	9.1 (13.54)
14	19 X 27	TS-14x9-xx	0.066 (1.68)	0.084 (2.13)	2.9	3	8000	13.6 (20.24)	13.7 (20.39)

Insulation O.D is ±0.002"

*Tank Test conducted on a 10 ft. sample from each production Lot

PART NUMBER EXAMPLE

TS-14S9-01



Color Codes:

00 Black	05 Green
01 Brown	06 Blue
02 Red	07 Violet
03 Orange	08 Gray
04 Yellow	09 White

Conductor Material:

S Silver
SA Silver Alloy
NA Nickel Alloy