

# Halogen-Free Flame Retardant Nylon Spiral Wrap

## specifications

Halogen-free, low smoke, nylon spiral wrap for cable/wire/hose protection and bundling in applications where toxicity and self-extinguishing behavior are of primary concern.



### Halogen-Free Flame Retardant Nylon Spiral Wrap

<b>Outside diameter</b> 0.25" (6.4mm):	T25NZFR-C20
<b>Outside diameter</b> 0.38" (9.5mm):	T38NZFR-C20
<b>Outside diameter</b> 0.50" (12.7mm):	T50NZFR-C20
<b>Outside diameter</b> 0.75" (19.1mm):	T75NZFR-C20

## technical information

<b>Material:</b>	Nylon 6 (Polyamide 6)	
<b>Maximum continuous use temperature:</b>	149°F (65°C) per UL 746B – RTI (Relative Thermal Index) based on mechanical strength without impact	
<b>Heat deflection temperature:</b>	ISO 75/A-0.4 N	190°C typical
	ISO 75/A-1.8 N	70°C typical
<b>Tensile strength:</b>	ISO 527	85 N/mm <sup>2</sup>
<b>Elongation at break:</b>	ISO 527	>10% typical
<b>Tensile modulus:</b>	ISO 527	3600 N/mm <sup>2</sup>
<b>Notched izod impact strength:</b>	ISO 180/23°C	3-7 Kg/cm
<b>Flammability:</b>	UL94	V-0
<b>FMVSS302:</b>	ISO 3795	<100 mm/minute
<b>UL recognition:</b>	File E141152	
<b>General chemical resistance (these are general guidelines and may not represent your specific case):</b>	Concentrated acid	Poor
	Dilute acids	Poor
	Bases	Good/Fair
	Aromatics hydrocarbons	Good
	Halogenated hydrocarbons	Fair/Poor
	Alcohols	Good
	Salt	Good
<b>Smoke and toxicity behavior</b>	Detailed charts shown on next page: ASTM E 662-12 flaming mode and non-flaming mode Boeing BSS 7239 (Rev A 1-18-88) (@ 1 mm) DIN 54837: 2007-12 and DIN 5510-2:2009-05 (@ 0.6 mm)	

## key features and benefits

<b>Halogen-free nylon material</b>	Low smoke, low toxicity and excellent flammability rating (UL 94V-0)
<b>Spiral wrap design</b>	Provides cable/wire/hose abrasion protection; harnesses multiple cables and hoses into a single manageable bundle, allows breakouts of single/multiple cables

## applications

Halogen-free flame retardant nylon spiral wrap is used to protect cables/wires/hoses and provides exceptional flammability performance and low toxicity – well-suited to challenging applications such as transportation, aerospace, and underground.

# Halogen-Free Flame Retardant Nylon Spiral Wrap

Part Number	Color	Length Per Reel		Bundle Diameter Range		Outside Diameter		Temperature Range	Wall Thickness	
		Ft.	m	In.	mm	In.	mm		In.	mm

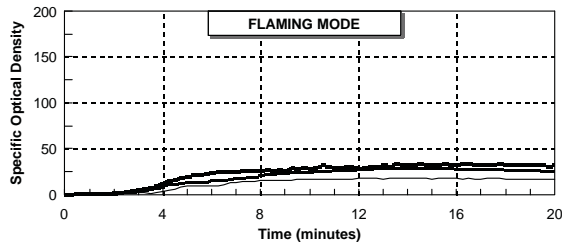
## Halogen-free Flame Retardant Nylon Spiral Wrap

Part Number	Color	Length Per Reel (Ft.)	Length Per Reel (m)	Bundle Diameter Range (In.)	Bundle Diameter Range (mm)	Outside Diameter (In.)	Outside Diameter (mm)	Temperature Range	Wall Thickness (In.)	Wall Thickness (mm)
T25NZFR-C20	Black	100	30.5	3/16 – 2	4.8 – 50.8	0.25	6.4	-40°F to 149°F (-40°C to 65°C)	0.023	0.58
T38NZFR-C20				5/16 – 3	7.9 – 76.2	0.38	9.5		0.030	0.76
T50NZFR-C20				3/8 – 4	9.5 – 101.6	0.50	12.7		0.032	0.81
T75NZFR-C20				5/8 – 5	15.9 – 127.0	0.75	19.1		0.035	0.89

## Smoke and Toxicity Behavior per ASTM E 662 and BSS 7239

### ASTM E 662-12

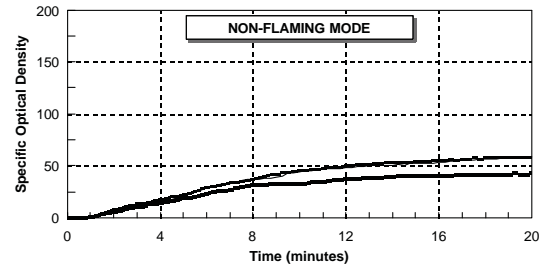
Specific Optical Density of Smoke Generated by Solid Materials



Relative Room Humidity: 36%		Test Duration: 20 min.			Chamber Wall Temp: 35°C	
Flaming Mode	Test	#1	#2	#3	Average	Specified Maxima
Specific Optical Density at 1.5 minutes	1	3	1	2	100	
Specific Optical Density at 4.0 minutes	13	10	3	8	200	
Maximum Specific Optical Density	33	30	18	27	–	
Maximum Corrected Optical Density	32	30	17	26	–	

### ASTM E 662-12

Specific Optical Density of Smoke Generated by Solid Materials



Relative Room Humidity: 36%		Test Duration: 20 min.			Chamber Wall Temp: 35°C	
Non-Flaming Mode	Test	#1	#2	#3	Average	Specified Maxima
Specific Optical Density at 1.5 minutes	4	6	4	5	100	
Specific Optical Density at 4.0 minutes	14	18	16	16	200	
Maximum Specific Optical Density	43	59	59	54	–	
Maximum Corrected Optical Density	41	57	57	52	–	

### Boeing BSS 7239 (Rev.: A 1-18-88) – Toxic Gas Generation

	Flaming Mode	Non-Flaming Mode	Typical Specified Maxima
Carbon Monoxide (CO ppm)			
at 1.5 minutes	<1	<1	–
at 4.0 minutes	73	<1	–
at maximum	243	24	3500
Nitrogen Oxides (as NO2 ppm)	<1	<1	100
Sulphur Dioxide (SO2 ppm)	<6	<6	100
Hydrogen Chloride (HCl ppm)	<12	<12	500
Hydrogen Fluoride (HF ppm)	<12	<12	200
Hydrogen Bromide (HBr ppm)	<3	<3	–
Hydrogen Cyanide (HCN ppm)	22	2	150
Original Weight (g)	5.90	5.44	–
Final Weight (g)	0.50	5.04	–
Weight Loss (g)	5.40	0.40	–
Weight Loss (%)	91.53	7.35	–
Time to Ignition (s)	10	Did not ignite	–
Burning Duration (s)	Not determinable	–	–

# Halogen-Free Flame Retardant Nylon Spiral Wrap

## Fire Behavior and Side Effects per DIN 54837 and DIN 5510-2

<b>DIN 54837:</b>	<b>2007-12</b>	Testing of materials, small components and component section for rail vehicles
<b>DIN 5510-2:</b>	<b>2009-05</b>	Determination of burning behavior using a gas burner Preventive fire protection in railway vehicles Part 2: Fire behavior and fire side effects of material and parts Classification, requirements and test methods

Dimension of the product: outer diameter 12 mm; wall thickness 0.6mm

## Measured values and test results

Panduit Spiral Wrap, product nr. T50NZFR-C20								
		1	2	3	4	5	Average	Expanded uncertainty
Time to ignition of the sample(s)		3	3	3	3	3	3.0	0.9
Time of sustained burning(s)		0	0	0	0	0	0	(-)
Glowing	Begins after (s)	(-)	(-)	(-)	(-)	(-)	(-)	(-)
	Time (s)	(-)	(-)	(-)	(-)	(-)	(-)	(-)
Flame level	Maximum (cm)	25	30	25	25	30	27.0	7.7
	Reached after (s)	129	124	132	128	130	128.6	8.4
Flaming droplets / particles	[yes/no]	yes	yes	yes	yes	yes	yes	(-)
	Burning time (s)	0	0	0	0	0	0	(-)
Smoke density	Maximum (%)	5.8	5.4	5.6	6.9	4.6	5.7	2.4
	Reached after (s)	132	141	137	135	139	136.8	9.8
	Integral (% min)	13.9	9.1	10.9	12.0	10.8	11.3	5.0
Length of damaged area (cm)		16	15	17	16	15	15.8	2.4
Extinguishing of test specimen with fire-extinguisher after (s)		(-)	(-)	(-)	(-)	(-)	(-)	(-)
Burn through of test specimen [yes/no]		yes	yes	yes	yes	yes	yes	(-)
<b>Behavior during the tests:</b> Material has melted and deformed during test period.								

The product **Panduit Spiral Wrap, product nr. T50NZFR-C20** is classified according to the DIN-5510 – 2: 2009-05, articles 4.2, 4.3 and 4.4 to the following classes:

**flammability class: S4,**  
**smoke production class: SR2,**  
**flaming droplets / particles class: ST2**

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HSSP03--WW-ENG  
1/2013