

## Introduction

---

Complementing the product portfolio, a vast range of professional cable management accessories are also available. Products include Lacing tapes & cords, cable ties, adhesive backed mounts, push mounts, cable tie mounts and clips amongst others. With access to a considerable portfolio of cable management products, a solution can be sourced and matched to your specific requirements.

Products are available in a wide range of materials, styles, sizes and colours (from Nylon to high performance Stainless Steel). Temperature capabilities range from -80°C to +538°C.

<b>Lacing Tapes, Cords &amp; Braiding Yarns Overview</b>	<b>page 300</b>
<b>Specifying Lacing Tapes, Cords &amp; Braiding Yarns</b>	<b>page 301</b>
<b>Lacing Tapes Selection Guide</b>	<b>page 303</b>
<b>Overbraiding Selection Guide</b>	<b>page 306</b>

## Lacing Tapes, Cords & Braiding Yarns

### Overview

We offer a comprehensive range of high performance lacing tapes, cords and braiding yarns, used throughout the aerospace, electronics, medical and many smaller specialist manufacturing industries.

The lacing tapes have been manufactured to meet the CID A-A-52080-4 (MIL-T-43435) specification and cover the five materials most commonly used: Polyamide (Nylon), Polyester (Dacron®), Tetrafluorocarbon (Teflon®), Glass (Fibreglass) and heat resistant polyamide (Nomex®).

When specifying a lacing tape, performance parameters such as fibre type (raw material), size (physical dimensions), form (flat or round), finish, tensile strength and colour should be considered.



## Specifying Lacing Tapes, Cords & Braiding Yarns

### Fibre Type

#### **CID-A-A-52080 Type I - Braided Nylon (Polyamide) Lacing Tape**

- General purpose lacing tape

#### **CID-A-A-52081 Type II - Braided Polyester (Dacron®) Lacing Tape**

- Superior knot tying properties to Nylon
- High temperature performance available in a range of finishes
- Suitable for aerospace/NASA applications
- Also available "Pre-shrunk" to reduce longitudinal shrinkage

#### **CID-A-A-52082 Type III - Braided Teflon® Lacing Tape**

- High heat resistance
- Good resistance to fluids and solvents
- Suitable for aircraft engine applications
- Also available "Pre-shrunk" to reduce longitudinal shrinkage

#### **CID-A-A-52083 Type IV - Braided Fibreglass Lacing Tape**

- Extremely high temperature performance
- Very low elongation
- Minimal fibre to fibre abrasion (Teflon pre-treated yarn)
- Produced from continuous filament electrical grade glass (E-Glass)

#### **CID-A-A-52084 Type V - Braided Nomex® (Heat resistant) Lacing Tape**

- Extremely high temperature performance
- Non flammable
- Highly resistant to fluids and lubricants
- Suitable for critical aircraft harness applications, identifiable by a green coloured tracer

### Size

The physical dimensions of lacing tapes, coupled with the type of fibre used, will effect the overall strength of the finished tape. Generally, larger wire and cable bundles use tapes with a high tensile strength. The following tables provide the information required to select the lacing tape, for any given application requirement.

### Form

There are two form options available:

#### **Braided flat lacing tape**

- Used extensively throughout the aerospace industry
- Increased knot retention
- Ideal for applications requiring reductions in size and weight
- Good vibration performance with long term integrity and reliability

#### **Round and twisted braided cords**

- Good all-round performance
- Ideal for less demanding industrial and commercial harness applications

### Finishes

A wide range of lacing tape finishes are available that meet the requirements of the CID-A-A-52080 to CID-A-A-52084 (MIL-T-43435), as well as demanding industrial and commercial applications. Finishes are generally used to improve a lacing tapes physical properties and performance characteristics. The following finishes are currently available, however not all finishes are available on all products. For further information please contact us.

## Specifying Lacing Tapes, Cords & Braiding Yarns

MIL-Spec Finish	Finish Code	Material (% Content)	Comments
A	U	No Finish	General Purpose
B	W	Wax impregnated (15% - 32% by weight)	Enhanced Performance Good fungicidal properties Industry "Standard" Uses a microcrystalline wax
C	H	Synthetic rubber (7% - 17% by weight)	Good knot retention
C	Z	Flame retarded rubber (7% - 17% by weight)	Flame retarded Self extinguishing
C	PTH	Low out-gassing rubber (7% - 17% by weight)	Type II Polyester products ONLY Low out-gassing Suitable for NASA applications
D	T	Teflon® (10% - 20% by weight)	Type IV glass tape ONLY Reduced fibre abrasion Reduced knot slip resistance
E	R	Vinyl (15% - 30% by weight)	Good resistance to aviation fluids Fair knot resistance
F	S	Silicone resin (7% - 17% by weight)	Good knot retention properties
G	B/G	Nylon (4% - 14% by weight)	Type I Nylon (B) & V Nomex (G) ONLY Good resistance to fluids Good resistance to hydrocarbon fuels Nylon finish stiffens tape Reduced knot resistance

### Tensile Strength

The tensile strength will vary dependant on the material type and size. The tensile strength (breaking strength) of each product is thoroughly tested and measured in kilograms (kg). Please refer to the following tables or alternatively, contact us for assistance regarding your specific application requirements.

### Colour

The standard lacing tape colours are natural and black, dependant on the type of material used. For further information on the additional range of colours available, please refer to the following tables or alternatively, contact us.

## Lacing Tapes Selection Guide

### Type I CID-A-A-52080 - Braided Nylon Lacing Tape

Size	Style	Tape Width		Tape Thickness		Breaking Strength	Melting Point	Spool Sizes
		Min. (mm)	Max. (mm)	Min. (mm)	Max. (mm)			
1	26	4.57	5.59	0.33	0.48	61.23kg	+248°C	228m
2	23	2.51	3.07	0.30	0.46	36.29kg	+248°C	228m
3	18	1.96	2.39	0.28	0.43	22.68kg	+248°C	457m
4	22	1.37	1.68	0.23	0.38	11.34kg	+248°C	457m
5	20	1.14	1.40	0.15	0.36	6.80kg	+248°C	457m
N/A	21	1.42	1.73	0.13	0.28	9.07kg	+248°C	457m
N/A	15	0.74	0.89	0.03	0.23	3.18kg	+248°C	457m

Finishes	MIL Spec Finish	Finish Code	Comments
Untreated natural Nylon	A	U	General purpose
Wax impregnated	B	W	Good handling
Synthetic rubber	C	H	Excellent knot retention
Soft vinyl	E	R	Abrasion resistant finish
Polyamide (Nylon)	G	B	Resistant to oils and chemicals

#### Operating Temperature

- 55°C to +121°C

#### Ordering Information

Standard colours: Natural (Off White) & Black. Additional colours are available.  
Ordering description: Specify Style, Finish Code & Colour.  
Ordering example: 18B Black.

### Type II CID-A-A-52081 - Braided Polyester Lacing Tape

Size	Style	Tape Width		Tape Thickness		Breaking Strength	Melting Point	Spool Sizes
		Min. (mm)	Max. (mm)	Min. (mm)	Max. (mm)			
1	26D	4.57	5.59	0.33	0.48	61.23kg	+250°C	228m
2	23D	2.51	3.07	0.30	0.46	36.29kg	+250°C	228m
3	18D	1.96	2.39	0.28	0.43	22.68kg	+250°C	457m
4	22D	1.37	1.68	0.23	0.38	11.34kg	+250°C	457m
5	21D	1.14	1.40	0.15	0.36	6.80kg	+250°C	457m
N/A	20D	1.09	1.35	0.10	0.25	5.44kg	+250°C	457m
N/A	15D	0.74	0.89	0.05	0.20	1.81kg	+250°C	457m

Finishes	MIL Spec Finish	Finish Code	Comments
Untreated natural Nylon	A	U	General purpose
Wax impregnated	B	W	Good handling
Synthetic rubber	C	H	Excellent knot retention
Synthetic rubber	C	Z/PTH	Flame retarded/Low out-gassing
Vinyl	E	R	Abrasion resistant finish
Polyamide (Nylon)	G	B	Resistant to oils and chemicals

#### Operating Temperature

- 73°C to +177°C

#### Ordering Information

Standard colours: Natural (Off White) & Black. Additional colours are available.  
Ordering description: Specify Style, Finish Code, Colour & Pre-shrunk if applicable.  
Ordering example: 22D Z Black PS.

## Lacing Tapes Selection Guide

Type III CID-A-A-52082 - Braided Teflon® Lacing Tape								
Size	Style	Tape Width		Tape Thickness		Breaking Strength	Melting Point	Spool Sizes
		Min. (mm)	Max. (mm)	Min. (mm)	Max. (mm)			
2	256	2.74	3.35	0.23	0.36	13.61kg	+327°C	228m
4	231	1.50	1.83	0.23	0.36	6.80kg	+327°C	457m
N/A	230	0.71	0.86	0.64	0.79	6.35kg	+327°C	457m
N/A	302	0.25	-	-	-	1.81kg	+327°C	457m

**Note:** Residual shrinkage is <3% after 16 hours at 218°C.

Finishes	MIL Spec Finish	Finish Code	Comments
Untreated natural Teflon	A	U	Poor knot tying characteristics
Synthetic rubber	C	H	Improved knot retention

### Operating Temperature

- 177°C to +288°C

### Ordering Information

Standard colours: Natural (Dark Brown) Only. Teflon fibres cannot be dyed or coloured.

Ordering description: Specify Style, Finish Code, Colour and Pre-shrunk (PS) if applicable.

Ordering example: 230H PS natural.

Type IV CID-A-A-52083 - Braided Fibreglass Lacing Tape								
Size	Style	Tape Width		Tape Thickness		Breaking Strength	Melting Point	Spool Sizes
		Min. (mm)	Max. (mm)	Min. (mm)	Max. (mm)			
1	26X	5.16	6.30	0.33	0.48	90.72kg	+1150°C	228m
2	23X	2.51	3.07	0.33	0.48	45.36kg	+1150°C	228m
3	18X	1.96	2.39	0.33	0.48	34.02kg	+1150°C	457m
4	22X	1.37	1.68	0.33	0.48	22.68kg	+1150°C	457m
N/A	21X	1.73	2.11	0.30	0.46	31.75kg	+1150°C	457m

**Note:** All fibreglass tapes are pre-coated with a Teflon polymer to minimise fibre to fibre abrasion.

Finishes	MIL Spec Finish	Finish Code	Comments
Untreated natural Fibreglass	A	U	Poor knotting characteristics
Synthetic rubber	C	Z	Improved knot retention
Teflon	D	T	Improved abrasion resistance
Silicone	F	S	Improved knot retention

### Operating Temperature

- 55°C to +427°C

### Ordering Information

Standard colours: Natural (White) Fibreglass cannot be dyed, but the finish may be pigmented black.

Ordering description: Specify Style, Finish Code and Colour.

Ordering Example: 23XT Black.

## Lacing Tapes Selection Guide

### Type V CID-A-A-52084 - Braided Nomex® Lacing Tape

Size	Style	Tape Width		Tape Thickness		Breaking Strength	Melting Point	Spool Sizes
		Min. (mm)	Max. (mm)	Min. (mm)	Max. (mm)			
1	726	4.57	5.59	0.33	0.48	38.56kg	+371°C	228m
2	723	2.51	3.07	0.28	0.43	22.68kg	+371°C	228m
3	718	1.73	2.11	0.23	0.38	15.88kg	+371°C	457m
4	722	1.27	1.55	0.18	0.33	11.34kg	+371°C	457m
N/A	1342	2.06	2.51	0.43	0.58	31.75kg	+371°C	228m
N/A	946	0.30	-	-	-	2.27kg	+371°C	457m

**Note:** Braided Nomex lacing tape shrinkage is <2% at +260°C.

Finishes	MIL Spec Finish	Finish Code	Comments
Untreated natural Nomex	A	U	General purpose
Wax impregnated	B	W	Good handling
Synthetic rubber	C	H	Excellent knot retention
Synthetic rubber	C	Z	Plus Flame retarded
Silicone	F	S	Improved knot retention
Polyamide (Nylon)	G	G	Resistant to oils and chemicals

### Operating Temperature

- 55°C to +260°C

### Ordering Information

Standard colours: Natural (Off White) with a Green tracer. Additional colours are available with or without tracer.

Ordering description: Specify Style, Finish Code and Colour.

Ordering example: 726Z Natural

### Tuf-Test Non-Braided Lacing Tape

Tuf-Test is a low cost, non MIL-Spec lacing tape, suitable for industrial & commercial harness applications.

Size	Style	Tape Width Nominal (mm)	Tape Thickness Nominal (mm)	Breaking Strength	Spool Sizes	Bobbin Sizes
1	70	2.29	0.48	31.75kg	686m	18m
2	50	1.78	0.41	22.68kg	914m	27m
3	35	1.57	0.33	15.88kg	914m	41m

**Note:** Style 70 complies with the IBM specification 147440. Finish uses a fungicidal micro-crystalline wax (24% - 40%).

### Operating Temperature

- 55°C to +121°C

### Ordering Information

Standard colour: Natural (Off White).

Standard packaging: Spools & bobbins are available subject to an MOQ.

Ordering description: Specify Style and Put-up.

Ordering example: 70 Tuf-Test Box.



## Overbraiding Selection Guide

### Nomex® Overbraiding Yarn (Type PAA MIL-C-572)

Nomex® is an electrical grade material constructed of a continuous filament, non-melting, aromatic Polyamide Yarn.

Yarn Size	No. of Filaments	Breaking Strength	Melting Point	Yarn Elongation	Spool Size
200 denier	100	0.85kg (min)	+371°C	35%	4572m
1200 denier	600	5.22kg (min)	+371°C	37%	762m

Overbraiding Finishes		Comments
U	Untreated	General Purpose
B	Bonded with non-corrosive, flame retardant Polyamide	Superior abrasion resistance Excellent fluid resistance

### Operating Temperature

- 55°C to +260°C

### Ordering Information

Standard colours: Natural (Off White), and Green. Additional colours are also available, however specific colour requirements cannot be guaranteed.

### Put-up

T: Up to 8 parallel ends wound on cardboard tubes.

R: Up to 8 parallel ends wound on plastic ratchet bobbins.

Put-up	Length		Width		Height (Braid)	Tube (Dia. max)	Taper (max)
	<i>inc. tube</i>	<i>braid only</i>	<i>tube only</i>	<i>bobbin</i>			
T	133.5	120.65	6.35	-	47.63	20.96	30°
R	155.58	134.94	-	46.04	44.45	7.94	-

**Note:** Both T and R Put-up formats are suitable for use on the New England Butt No. 2 Braiding Machines. Each package, tube (T) or ratchet (R) is marked with the material type, denier, number of ends, manufacturer (Gudebrod) and the lot number. Colour variations of dyed Nomex® are considered normal.

### Ordering Information

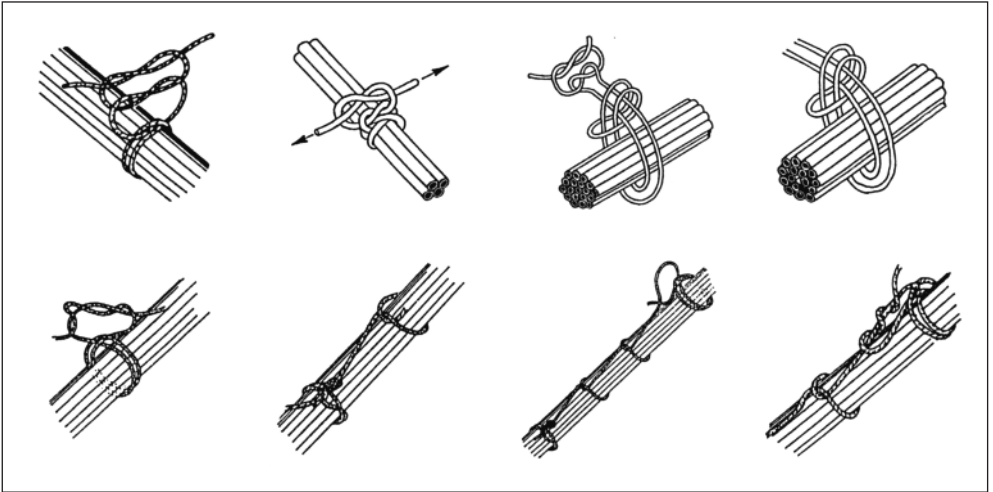
Ordering description: Specify the denier, finish, colour, number of ends, material & bobbin requirements.

Ordering example: 200 B Natural 1x4 Nomex® R.

**Note:** Polyester overbraiding yarn (MIL-C-572 Type PSTR) is also available.

## Overbraiding Selection Guide

## Recommended Knots



## Approvals Overview

- Airbus NSA 8420
- Boeing BMS-13-54D
- CID A-A52080-4 (Type 1-5)
- Eurofighter J96.502§
- Eurofighter JN 1127-8
- Eurofighter JN 1127-12
- Mcdonnell Douglas ps 17115
- Panavia J96.502
- Panavia 6481
- Panavia 75.8999
- Raytheon 268-10-11
- Rolls Royce ESW 1900
- Sikorsky SS 7057
- Westland EE 423

**Note:** For further information on the range of lacing tapes, cords and braiding yarns available, or assistance with your specific requirements please contact us.