



Together we can turn
the dream of flying into reality

HellermannTyton – Competence for the aerospace industry



You are reinventing aerospace everyday
We are at your side



Industry expertise for your demands

With HellermannTyton you have the right specialist at your side. Whether for cable bundling and fastening systems or for cable protection and identification solutions, our components used in the aerospace industry are **certified according to the current aerospace standards**.

In order to constantly reach and maintain this high level, we place great emphasis on keeping up a **continuous interaction with our customers**. We have been working closely with the aerospace industry in this way for **over 40 years**. The result: **products that are tailored** exactly to the requirements in aircraft construction and new innovations for your individual demands.

Professional service worldwide

Our network of branch offices and distribution partners around the globe ensures a consistently high level of service, high flexibility and the fast response and delivery times you expect.



- Sales Office
- Manufacturing and Research
- Distribution Centre



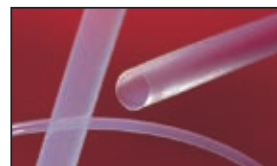
Cable ties and fastening systems.



Cable protection.



Identification systems.



Heat-shrink products.

You are always increasing your expertise
We are right there for you

There is hardly any mode of transport that is subjected to such extreme demands like an aeroplane.

With thousands of operating hours, heat, cold, temperature fluctuations and high mechanical stress, it is reassuring to know that HellermannTyton components have fulfilled these demands for over 40 years.



Quality assurance is a top priority at HellermannTyton: material testing in our laboratory facilities.

Our quality proof and awareness for your safety.

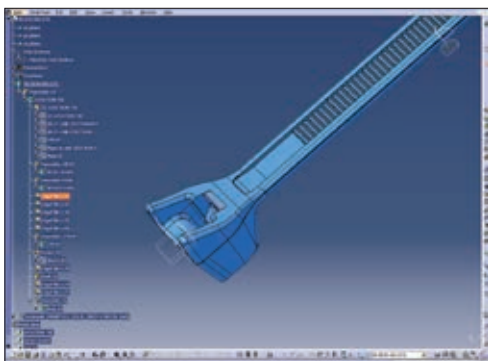
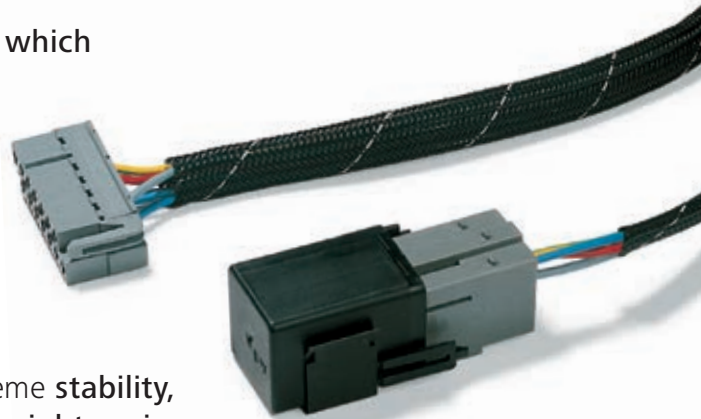
To get an aircraft into the air safely and back down on the ground, every last detail counts. A lot of **individually designed components** are needed, ideally adapted to their different application fields – from the cockpit and cabin through to the engines and empennage. In this respect, every single part must prove its **long-term reliability**.

In addition to this there are other criteria which are crucial for use in the aerospace industry: the products must be **light and sturdy**, withstand the highest mechanical loads and display **space-saving capabilities**.

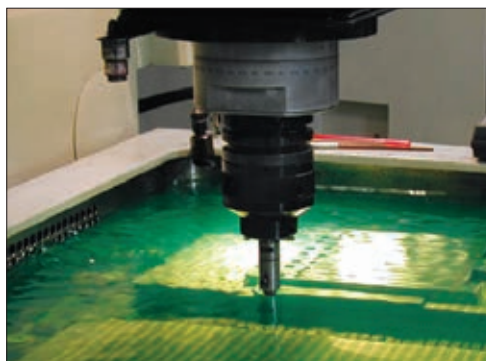
In order to achieve these results, three factors are significant:

1. The exclusive use of high quality raw materials which satisfy your and our requirements.
2. Precision fabrication at all stages using our in-house tool and mould construction.
3. Strict criteria for checking our work processes and also the quality of the range.

Our products are therefore distinguished by their extreme **stability, durability, resilience, resistance to heat and cold, weight-saving properties, shock resistance, fire safety and resistance to UV and weathering**. Now, and for the future.



New development: cable ties in the application field of the air conditioning ducts.



Innovative strength that pays off for our customers: our in-house tool and mould construction.

You expect the highest standards
We have the corresponding certificates



We ensure certified quality for perfect engineering

Safety is a top priority for you and for us. There is no doubt we follow the specifications and standards for the aerospace industry. Our products are therefore constantly tested in accordance with **the latest national and European standards.** Certified quality for your security and for the certainty of always working at the highest technical level.

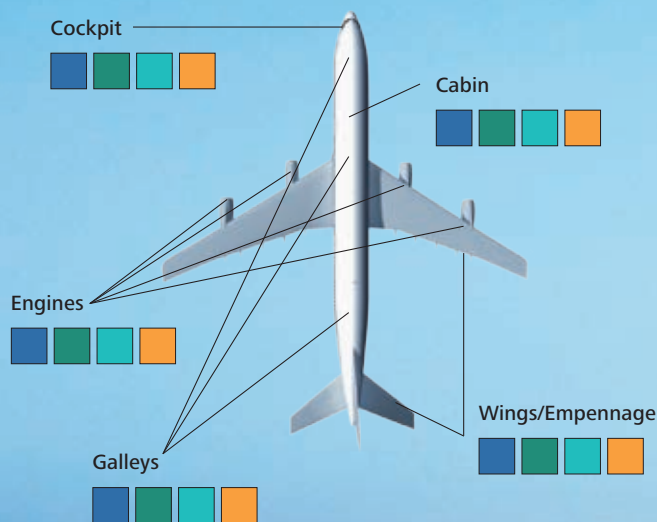
Standards Overview

ASN	Aerospatiale Normalisation	Airbus Group	ASN
BAC	Boeing Aircraft Company Standard	Boeing Corp.	BAC
DAN	Deutsche Airbus Norm	Airbus Group	DAN
DIN	Deutsches Institut für Normung	European Norms	DIN
JN	Particular specification developed for Eurofighter program	Military specification different sub groups	JN
LEA	Liste des Equivalences Approuvés	Dassault	LEA
MS	Military Standard	US Military Standard	MS
NASM	National Aerospace Standard, Metric	AIA – Aerospace Industries Association	NASM
NSA	Norme Sud Aviation	Airbus Group	NSA
PAN	Panavia Aircraft	Panavia	PAN
STD	Standard for Dassault	Dassault	STD

You need the right solution We will provide it

For every task the best solution.

From cable bundling and cable protection through to identification: HellermannTyton offers you the ideal solution for use in your aeroplanes – either from our existing range or as a customised development.



ASN

ASN-E0043		
Cable Ties Polyamide 6.6 standard	• T-Series in PA66	10
Cable Ties for outdoor use (UV-resistant)	• T-Series in PA66W black	10
Cable Ties for temperatures up to + 105°C (heat stabilised)	• T-Series in PA66HS	11
ASN-E0126		
Heat Shrinkable Tubing 2:1 flexible and coloured	• HFT-A - self extinguishing	12
ASN-E0718		
Heat Shrinkable Tubing 2:1 - PVDF	• TK20	13

BAC

BACS38K		
Cable Ties Polyamide 6.6 standard	• T-Series in PA66 natural	14
Cable Ties for outdoor use (UV-resistant)	• T-Series in PA66W black	14

DAN

DAN218		
Bottle Shapes, VG style	• Helashrink 150 Series, with rib	15
DAN341		
Right-Angle Shapes, VG-Style	• Helashrink 1100 Series, with rib	16
DAN107		
Lacing cord made of glass fibre	• LCHT4D series	17

DIN

DIN EN6049		
NOMEX® braided sleeving	• Helagain HEGMAN and HEGMANWO	18

JN

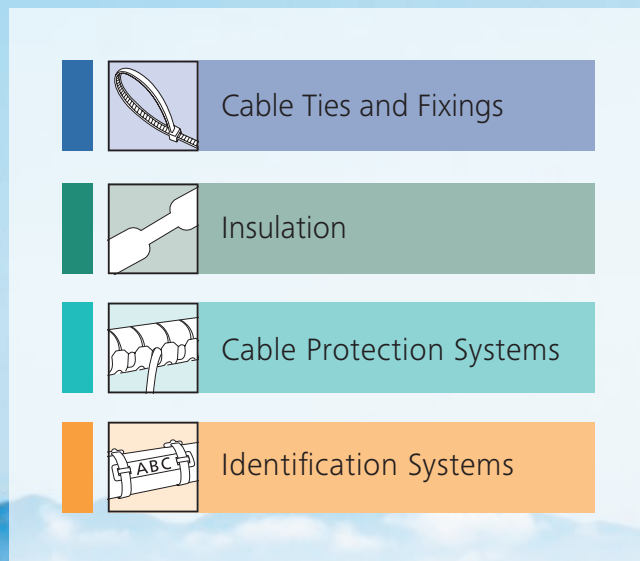
JN1000T		
Angled T-Shapes, VG style	• Helashrink 1300 Series, 30° & 45° angle	19
2-Way Outlet Shapes, VG style	• Helashrink 200 Series	19

LEA

LEA		
Bottle Shapes	• Helashrink 100 Series	20
Bottle Shapes, VG style	• Helashrink 150 Series, with rib	21
2-Way Outlet Shapes, VG style	• Helashrink 200 Series	22
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MS2191		
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NSA

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STD

MS21266		
Cable Protection for sharp-edged cut-out-sections	• Flexiform Edge Protection grommet strip	31
MS3368		
Identification ties and plates for marking cable bundles	• IT-Ties	32
NASM		
NASM21266		
Cable Protection for sharp-edged cut-out-sections	• Flexiform Edge Protection grommet strip	33
NSA		
NSA935401		
Cable Ties inside serrated	• T-Series	34
NSA940000		
Cable Ties for temperatures up to + 105°C (heat stabilised)	• T-Series	35
NSA937211		
Heat Shrinkable Tubing 2:1 flexible and coloured	• HFT-A - self extinguishing	36; 37
NSA937494		
Heat Shrinkable Tubing 2:1 - PVDF	• TK20	38
NSA937210		
Heat Shrinkable Tubing - PTFE	• TFE4 4:1	39
NSA939510		
Cable Protection for sharp-edged cut-out-sections	• Flexiform Edge Protection grommet strip	40
NSA8420		
Lacing cord made of polyamide 6	• Lacing cord LCHT1A25NA	41
Lacing cord made of meta-aramide	• Lacing cord LCHT5A30NA	41

Lacing tape made of polyamide 6	• Lacing tape LHHT1B2NA and LHHT1B3NA	42
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Lacing tape made of PTFE	• Lacing tape LHHT3A2NA and LHHT3A4NA	43
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NSA935402		
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PAN6493		
Heat Shrinkable Tubing 2:1 flexible and coloured	• HFT-A - self extinguishing	48; 49
PAN6491		
Heat Shrinkable Tubing 2:1 - PVDF	• TK20	50
PAN6480		
Halar® braided sleeving	Helagain HEGHR	51
STD		
STD78750		
Cable Ties for temperatures up to + 105°C (heat stabilised)	• T-Series in PA66HS	52
Cable Ties for higher chemical resistance and temperatures up to +170°C in E/TFE	• T-Series in E/TFE	52



Cable Ties and Fixings

Cable Ties Inside Serrated

Cable Ties Polyamide 6.6 standard

- T-Series in PA66

These cable ties are used for routing, bundling and securing of cables, pipes and hoses.

Features and Benefits

- Available in a wide range of material and sizes
- Made from 100% high quality plastic, allows for good recycling
- Inside serration for a strong hold onto bundles
- Easy application either manually or with a processing tool
- Simply to insert due to bent tail

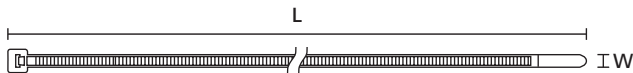


T-Series.

MATERIAL	Polyamide 6.6 (PA66)
Operating Temperature	-40 °C to +85 °C, (+105 °C, 500 h)
Flammability	UL94 V2



ASN-E0043



T-Series.

TYPE	Standards	Width (W)	Length (L)	Bundle Ø max.		Material	Colour	Pack Cont.	Application Tool No.	Article-No.
T80R	ASN-E0043-1A0P	4.7	210.0	55.0	355	PA66	Black (BK)	100	2-11	111-01243
T18R	ASN-E0043-4A9P	2.5	100.0	22.0	80	PA66	Natural (NA)	100	2;4-6;8	111-01242

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Cable Ties for outdoor use (UV-resistant)

- T-Series in PA66W black

MATERIAL	Polyamide 6.6, UV-resistant (PA66W)
Operating Temperature	-40 °C to +85 °C, (+105 °C, 500 h)
Flammability	UL94 V2



ASN-E0043



TYPE	Standards	Width (W)	Length (L)	Bundle Ø max.		Material	Colour	Pack Cont.	Application Tool No.	Article-No.
T80R	ASN-E0043-1C0P	4.7	210.0	55.0	355	PA66W	Black (BK)	100	2-11	111-01244
T80L	ASN-E0043-2C0P	4.7	390.0	110.0	355	PA66W	Black (BK)	100	2-11	111-01245
T150R	ASN-E0043-3C0P	7.6	365.0	100.0	670	PA66W	Black (BK)	100	3;9-12	111-01246
T18R	ASN-E0043-4C0P	2.5	100.0	22.0	80	PA66W	Black (BK)	100	2;4-6;8	111-01247
T30R	ASN-E0043-5C0P	3.5	150.0	35.0	135	PA66W	Black (BK)	100	2;4-6;8	111-01248

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Application Tool No.											
2	3	4	5	6	7	8	9	10	11	12	
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P	

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties for temperatures up to + 105°C (heat stabilised)

- T-Series in PA66HS



ASN-E0043



T-Series.

MATERIAL	Polyamide 6.6, heat stabilised (PA66HS)
Operating Temperature	-40 °C to +105 °C, (+145 °C, 500 h)
Flammability	UL94 V2



TYPE	Standards	Width (W)	Length (L)	Bundle Ø max.		Material	Colour	Pack Cont.	Application Tool No.	Article-No.
T50L	ASN-E0043-2B0P	4.6	390.0	110.0	225	PA66HS	Black (BK)	100	2-11	111-01272

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Application Tool No.									
2	3	4	5	6	7	8	9	10	11
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.

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Heat Shrinkable Tubing 2:1 flexible and coloured

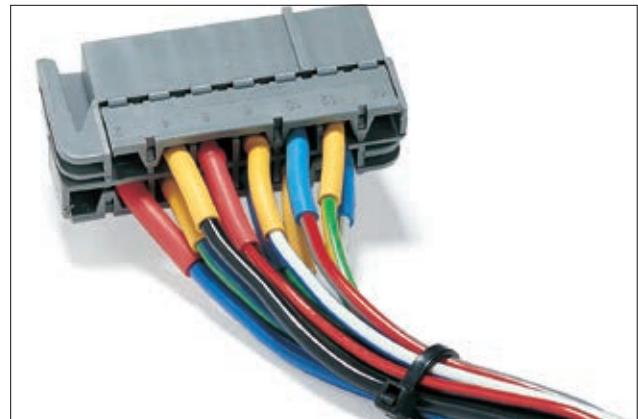
- **HFT-A - self extinguishing**

This high performance thin wall tubing is used extensively for electrical and mechanical protection. It is also well proven for sleeve marking to identify wiring circuits. It shrinks uniformly to form a permanent insulation covering.

The transparent version is used for bundling and cable protection where visual inspection is required. It is often used as a see through protective sleeve over cable markers.

Features and Benefits

- Flexible heat shrink tubing
- Fast shrinking, easy handling, good mechanical strength
- Easy to print on
- Wide range of colours
- Internal diameters up to 4 inches (101.6 mm)
- UL-224 ,CSA listed and VG approved



HFT-A conforms to major standards used in all defence industries.



ASN-E0126



Heat Shrinkable Tubing 2:1

RoHS

MATERIAL	Polyolefin, cross-linked (PO-X)
Shrink Ratio	2:1
Operating Temperature	-55 °C to +135 °C
Min. Shrink Temperature	+100 °C
Longitudinal change after shrinkage	+5%/-10%
Dielectric Strength	20 kV/mm according to IEC 60684 P2
Flammability	Self extinguishing
Specifications	CSA, DEF STAN 59-97/3, MIL-DTL-23053/5C, NF F 00-608, SAE - AMS - DTL-23053 / 5C, UL224 125 °C 600V, VG 95343

TYPE	Standards	Size (imp.)	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Designation as per VG-Norm	Article-No.
HFT-A-2.4/1.2	ASN-E0126-01B	3/32 "	2.4	1.2	0.50	400 m	Black (BK)	VG 95343 T05 A 003 A	305-02400
HFT-A-3.2/1.6	ASN-E0126-02B	1/8 "	3.2	1.6	0.50	400 m	Black (BK)	VG 95343 T05 A 004 A	305-03200
HFT-A-4.8/2.4	ASN-E0126-03B	3/16 "	4.8	2.4	0.50	300 m	Black (BK)	VG 95343 T05 A 005 A	305-04800
HFT-A-6.4/3.2	ASN-E0126-04B	1/4 "	6.4	3.2	0.60	300 m	Black (BK)	VG 95343 T05 A 006 A	305-06400
HFT-A-9.5/4.8	ASN-E0126-05B	3/8 "	9.5	4.8	0.60	150 m	Black (BK)	VG 95343 T05 A007 A	305-09500
HFT-A-12.7/6.4	ASN-E0126-06B	1/2 "	12.7	6.4	0.60	100 m	Black (BK)	VG 95343 T05 A 008 A	305-12700
HFT-A-19.0/9.5	ASN-E0126-07B	3/4 "	19.0	9.5	0.80	50 m	Black (BK)	VG 95343 T05 A 009 A	305-19000
HFT-A-25.4/12.7	ASN-E0126-08B	1 "	25.4	12.7	0.90	50 m	Black (BK)	VG 95343 T05 A 010 A	305-25400
HFT-A-38.0/19.0	ASN-E0126-09B	1 "	38.0	19.0	1.00	50 m	Black (BK)	VG 95343 T05 A 011 A	305-38100
HFT-A-76.0/38.0	ASN-E0126-11B	3 "	76.0	38.0	1.30	25 m	Black (BK)	VG 95343 T05 A 013 A	305-76200
HFT-A-2.4/1.2	ASN-E0126-01D	3/32 "	2.4	1.2	0.50	100 m	Red (RD)	VG 95343 T05 A 003 C	305-02402
HFT-A-4.8/2.4	ASN-E0126-03H	3/16 "	4.8	2.4	0.50	75 m	Blue (BU)	VG 95343 T05 A 005 G	305-04806
HFT-A-38.0/19.0	ASN-E0126-09H	1 "	38.0	19.0	1.00	50 m	Blue (BU)	VG 95343 T05 A 011 G	305-38106
HFT-A-50.8/25.4	ASN-E0126-10H	2 "	51.0	25.4	1.10	35 m	Blue (BU)	VG 95343 T05 A 012 G	305-50806
HFT-A-2.4/1.2	ASN-E0126-01L	3/32 "	2.4	1.2	0.50	100 m	White (WH)	VG 95343 T05 A 003 L	305-02409
HFT-A-3.2/1.6	ASN-E0126-02L	1/8 "	3.2	1.6	0.50	100 m	White (WH)	VG 95343 T05 A 004 L	305-03209
HFT-A-4.8/2.4	ASN-E0126-03L	3/16 "	4.8	2.4	0.50	75 m	White (WH)	VG 95343 T05 A 005 L	305-04809
HFT-A-6.4/3.2	ASN-E0126-04L	1/4 "	6.4	3.2	0.60	75 m	White (WH)	VG 95343 T05 A 006 L	305-06409
HFT-A-9.5/4.8	ASN-E0126-05L	3/8 "	9.5	4.8	0.60	50 m	White (WH)	VG 95343 T05 A007 L	305-09509

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content.



TYPE	Standards	Size (imp.)	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Designation as per VG-Norm	Article-No.
HFT-A-12.7/6.4	ASN-E0126-06L	1/2 "	12.7	6.4	0.60	50 m	White (WH)	VG 95343 T05 A 008 L	305-12709
HFT-A-25.4/12.7	ASN-E0126-08L	1 "	25.4	12.7	0.90	25 m	White (WH)	VG 95343 T05 A 010 L	305-25409
HFT-A-38.0/19.0	ASN-E0126-09L	1 "	38.0	19.0	1.00	50 m	White (WH)	VG 95343 T05 A 011 L	305-38109
HFT-A-50.8/25.4	ASN-E0126-10L	2 "	51.0	25.4	1.10	35 m	White (WH)	VG 95343 T05 A 012 L	305-50809
HFT-A-76.0/38.0	ASN-E0126-11L	3 "	76.0	38.0	1.30	25 m	White (WH)	VG 95343 T05 A 013 L	305-76209

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content.

Heat Shrinkable Tubing 2:1 - PVDF

• TK20

Typical applications of this translucent tubing are where high-temperature performance is required. Also very suitable for applications that ask for visual inspection of covered components, or if a low friction surface is needed. TK20 is also used as oil stop for energy cables. This thin walled, translucent heat shrink tubing is often used for chemical applications.

Features and Benefits

- Semi-rigid heat shrinkable tubing made of PVDF
- Thin walled and tough
- For higher temperature applications
- Very good mechanical strength, abrasion resistance and chemical resistance
- Meets various industrial standards
- Self extinguishing, UL 224 VW1 listed



This thin walled, translucent heat shrink tubing is used for chemical applications.

MATERIAL	Polyvinylidene Fluoride (PVDF)
Shrink Ratio	2:1
Operating Temperature	-55 °C to +175 °C
Min. Shrink Temperature	+175 °C
Longitudinal change after shrinkage	+/-10% max
Dielectric Strength	≥ 30 kV/mm min. according to ASTM D2171
Flammability	UL224 VW-1
Specifications	SAE - AMS - DTL-23053 / 8, UL224 150 °C 600V VW-1, VG 95343



ASN-E0718



Heat Shrinkable Tubing 2:1



TYPE	Standards	Size (imp.)	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Length (L)	Colour	Designation as per VG-Norm	Article-No.
TK20-2.4/1.2	ASN-E0718-01	3/32 "	2.4	1.2	0.25	1.2 m	Transparent (CL)	VG95343T05F003M	311-00249
TK20-3.2/1.6	ASN-E0718-02	1/8 "	3.2	1.6	0.25	1.2 m	Transparent (CL)	VG95343T05F004M	311-00329
TK20-4.8/2.4	ASN-E0718-03	3/16 "	4.8	2.4	0.25	1.2 m	Transparent (CL)	VG95343T05F005M	311-00489
TK20-6.4/3.2	ASN-E0718-04	1/4 "	6.4	3.2	0.30	1.2 m	Transparent (CL)	VG95343T05F006M	311-00649
TK20-9.5/4.8	ASN-E0718-05	3/8 "	9.5	4.8	0.30	1.2 m	Transparent (CL)	VG95343T05F007M	311-00959
TK20-12.7/6.4	ASN-E0718-06	1/2 "	12.7	6.4	0.30	1.2 m	Transparent (CL)	VG95343T05F008M	311-01279
TK20-19.1/9.5	ASN-E0718-07	3/4 "	19.1	9.5	0.43	1.2 m	Transparent (CL)	VG95343T05F009M	311-01909
TK20-25.4/12.7	ASN-E0718-08	1 "	25.4	12.7	0.48	1.2 m	Transparent (CL)	VG95343T05F010M	311-02549
TK20-50.8/25.4	ASN-E0718-10	2 "	50.8	25.4	0.51	1.2 m	Transparent (CL)	-	311-05089
TK20-1.6/0.8	ASN-E0718-20	1/16 "	1.6	0.8	0.25	1.2 m	Transparent (CL)	VG95343T05F002M	311-00169

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content.

ASN

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Cable Ties and Fixings

Cable Ties Inside Serrated

Cable Ties Polyamide 6.6 standard

- T-Series in PA66 natural

These cable ties are used for routing, bundling and securing of cables, pipes and hoses.

Features and Benefits

- Available in a wide range of material and sizes
- Made from 100% high quality plastic, allows for good recycling
- Inside serration for a strong hold onto bundles
- Easy application either manually or with a processing tool
- Simply to insert due to bent tail



T-Series.

MATERIAL	Polyamide 6.6 (PA66)
Operating Temperature	-40 °C to +85 °C
Flammability	UL94 V2
Specifications	Cage Code 53421, DIN 30015953, GL 86 137-81 HH, SAE - AS33671, UL ZODZ.E64139



BACS38K



T-Series.



TYPE	Standards	Width (W)	Length (L)	Bundle Ø max.		Material	Colour	Pack Cont.	Application Tool No.	Article-No.
T50R	BACS38K1	4.6	202.0	50.0	225	PA66	Natural (NA)	100	2-11	112-05019
T50L	BACS38K2	4.7	390.0	110.0	225	PA66	Natural (NA)	100	2-11	112-05419
T120R	BACS38K3	7.6	387.0	105.0	535	PA66	Natural (NA)	50	3;9-11	112-12019
T50I	BACS38K7	4.6	305.0	80.0	225	PA66	Natural (NA)	100	2-11	112-05219
T18R	BACS38K9	2.5	100.0	22.0	80	PA66	Natural (NA)	100	2;4-6;8;10-12	112-01819

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Cable Ties for outdoor use (UV-resistant)

- T-Series in PA66W black

MATERIAL	Polyamide 6.6, UV-stabilised (PA66UV)	Polyamide 6.6, UV-resistant (PA66W)
Operating Temperature	-40 °C to +85 °C	
Flammability	UL94 V2	



BACS38K



TYPE	Standards	Width (W)	Length (L)	Bundle Ø max.		Material	Colour	Pack Cont.	Application Tool No.	Article-No.
T50R	BACS38K1A	4.6	202.0	50.0	225	PA66UV	Black (BK)	100	2-11	112-05060
T50L	BACS38K2A	4.7	390.0	110.0	225	PA66UV	Black (BK)	100	2-11	112-05460
T120R	BACS38K3A	7.6	387.0	105.0	535	PA66UV	Black (BK)	100	3;9-11	111-00400
T50I	BACS38K7A	4.6	305.0	80.0	225	PA66UV	Black (BK)	100	2-11	111-05256
T18R	BACS38K9A	2.5	100.0	22.0	80	PA66W	Black (BK)	100	2;4-6;8	112-01860

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Application Tool No.										
2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNPSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Bottle Shapes, VG style

- Helashrink 150 Series, with rib

Features and Benefits

- Use in conjunction with circular grooved adaptor
- For strain relief and environmental sealing



DAN218



150 Series boot recovered onto a connector.

ASN

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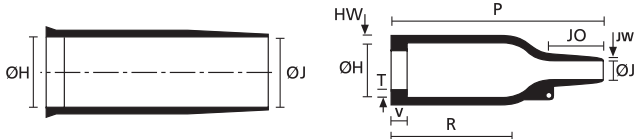
PAN

STD

For Material/Adhesive information please refer to page 53.



150 Series supplied.



a: Expanded form (supplied)

b: Fully recovered form (after heating)

TYPE	Standards	ØH min. a	ØH max. b	ØJ min. a	ØJ max. b	P ± 10%	R nom	S nom	HW ± 20%	JW ± 20%	V max	T ± 20%	Designation as per VG-Norm	Article-No.
152-42-B7	DAN218-01	24.0	10.5	24.0	6.0	38.0	21.0	10.0	1.6	0.5	3.3	1.0	-	401-52008
152-41-B7	DAN218-01-01	24.0	10.5	24.0	6.0	26.0	9.0	10.0	1.6	0.5	3.3	1.0	-	401-52001
154-42-B7	DAN218-02	30.0	14.0	30.0	6.0	55.0	32.0	13.0	1.8	1.0	3.3	1.0	-	401-54820
154-41-B7	DAN218-02-01	30.0	14.0	30.0	6.0	43.0	20.0	13.0	1.8	1.0	3.3	1.0	-	401-54001
155-42-B7	DAN218-03	31.0	18.0	31.0	7.0	67.0	35.0	18.0	1.8	1.0	3.3	1.0	-	401-55820
155-41-B7	DAN218-03-01	31.0	18.0	31.0	7.0	47.0	15.0	18.0	1.8	1.0	3.3	1.0	-	401-55001
156-42-B7	DAN218-04	36.0	22.5	36.0	8.5	80.0	42.0	20.0	2.0	1.0	3.3	1.0	-	401-56820
156-41-B7	DAN218-04-01	22.5	22.0	36.0	8.5	60.0	22.0	20.0	2.0	1.0	3.3	1.0	-	401-56001
157-42-B7	DAN218-05-01	43.0	28.0	43.0	10.0	79.0	41.0	20.0	2.2	1.0	3.3	1.7	-	401-57008
155-41-G	DAN218-03-01A	31.0	18.0	31.0	7.0	47.0	15.0	18.0	1.8	1.0	3.3	1.0	VG95343T06 A004A	401-55780

All dimensions in mm. Subject to technical changes.

For Material/Adhesive information please refer to page 53.



Insulation

Heat Shrinkable Moulded Shapes

Right-Angle Shapes, VG-Style

- Helashrink 1100 Series, with rib

Features and Benefits

- With circular grooved adaptor for strain relief



DAN341

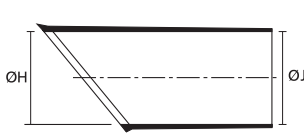


1152-4-G recovered on to a connector.

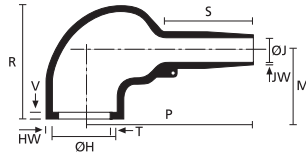
For Material/Adhesive information please refer to page 53.



1155-4 supplied.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

TYPE	Standards	ØH min. a	ØH max. b	ØJ min. a	ØJ max. b	P ± 10%	R ± 10%	HW ± 20%	JW ± 20%	V max	T ± 20%	M nom	S nom	Designation as per VG-Norm	Article-No.
1152-4-B7	DAN341-01	24.0	10.5	24.0	6.0	26.0	25.0	1.3	0.5	3.3	1.0	19	10.0	-	411-52001
1154-4-B7	DAN341-03	30.0	14.5	30.0	6.0	32.0	27.0	1.5	0.8	3.3	1.0	19	12.0	-	411-54001
1156-4-B7	DAN341-05	36.0	22.5	36.0	8.5	46.0	38.0	1.8	1.0	3.3	1.0	26	15.0	-	411-56001
1154-4-G	DAN341-03A	30.0	15.5	30.0	6.0	32.0	27.0	1.5	0.8	3.3	1.0	19	12.0	VG95343T06E002A	411-54480
1156-4-G	DAN341-05A	36.0	22.5	36.0	8.5	46.0	38.0	1.8	1.0	3.3	1.0	26	15.0	VG95343T06E004A	411-56480

All dimensions in mm. Subject to technical changes.

For Material / Adhesive information please refer to page 53.



Lacing cord made of glass fibre

- LCHT4D series

Features and Benefits

- Excellent resistance to high temperatures
- Superior fibre-to-fibre abrasion resistance



DAN107



HT Lacing Cord LCHT4.

MATERIAL	Glass Fibre (GF), Polytetrafluoroethylene (PTFE)	
Operating Temperature	-55 °C to +427 °C	
Specifications	DAN107-1	DAN107-2, NSA8420



TYPE	Standards	Nominal Ø		Weight	Finish	Colour	Reel Length	Article-No.
LCHT4D11NA	DAN107-1	1.1	216	0.15 kg	D = PTFE	Natural (NA)	500 m	174-00022
LCHT4D20NA	DAN107-2	2.0	785	0.42 kg	D = PTFE	Natural (NA)	100 m	174-00023

All dimensions in mm. Subject to technical changes.

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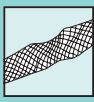
MS

NASM

NSA

PAN

STD



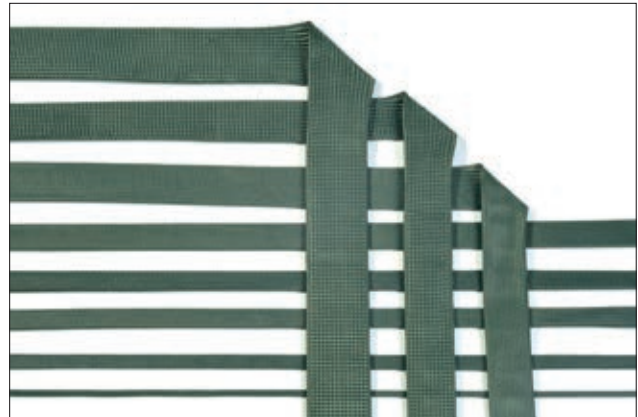
NOMEX® braided sleeving

- Helagaine HEGMAN and HEGMANWO

Helagaine HEGMAN and HEGMANWO has been designed for applications that require mechanical protection at high temperatures such as aeronautic, aerospace, military, railway and shipbuilding industries.

Features and Benefits

- Made of non-flammable meta-aramid
- Extremely flexible
- High expansion for easy installation over long lengths
- Optimal mechanical protection for harnesses
- Able to withstand the most severe environments
- Superior protection against abrasion, flames and high temperatures
- Highly resistant to radiation and fluids



Helagaine HEGMAN and HEGMANWO are available in various sizes.



DIN EN6049

MATERIAL	Polyaramid Polymetaphenylene Isophthalamide (NOMEX)
Operating Temperature	+240 °C
Melting Point	Does not melt/ Carbonisation above +370 °C
Flammability	UL94 V0 (Raw material), UL224 VW-1
Specifications	DIN EN 6049



TYPE	Standards	Bundle Ø min.	Bundle Ø max.	Colour	Reel Length	Article-No.
HEGMAN-02	DIN EN6049-003-02-5	1.0	2.0	Green (GN)	100 m	170-02100
HEGMAN-04	DIN EN6049-003-04-5	2.0	4.0	Green (GN)	100 m	170-02101
HEGMAN-06	DIN EN6049-003-06-5	4.0	8.0	Green (GN)	100 m	170-02102
HEGMAN-08	DIN EN6049-003-08-5	6.0	12.0	Green (GN)	50 m	170-02103
HEGMAN-10	DIN EN6049-003-10-5	8.0	16.0	Green (GN)	50 m	170-02104
HEGMAN-15	DIN EN6049-003-15-5	10.0	20.0	Green (GN)	50 m	170-02105
HEGMAN-20	DIN EN6049-003-20-5	12.0	24.0	Green (GN)	50 m	170-02106
HEGMAN-25	DIN EN6049-003-25-5	15.0	30.0	Green (GN)	50 m	170-02107
HEGMAN-30	DIN EN6049-003-30-5	20.0	40.0	Green (GN)	50 m	170-02108

All dimensions in mm. Subject to technical changes. Cuts in any lengths. NOMEX® is a registered trademark of DuPont. Minimum Order Quantity (MOQ) may differ from package content.

TYPE	Standards	Bundle Ø min.	Bundle Ø max.	Colour	Reel Length	Article-No.
HEGMANWO-02	DIN EN6049-004-02-5	1.0	2.0	Green (GN)	100 m	170-02000
HEGMANWO-04	DIN EN6049-004-04-5	2.0	4.0	Green (GN)	100 m	170-02001
HEGMANWO-06	DIN EN6049-004-06-5	4.0	8.0	Green (GN)	100 m	170-02002
HEGMANWO-08	DIN EN6049-004-08-5	6.0	12.0	Green (GN)	50 m	170-02003
HEGMANWO-10	DIN EN6049-004-10-5	8.0	16.0	Green (GN)	50 m	170-02004
HEGMANWO-15	DIN EN6049-004-15-5	10.0	20.0	Green (GN)	50 m	170-02005
HEGMANWO-20	DIN EN6049-004-20-5	12.0	24.0	Green (GN)	50 m	170-02006
HEGMANWO-25	DIN EN6049-004-25-5	15.0	30.0	Green (GN)	50 m	170-02007
HEGMANWO-30	DIN EN6049-004-30-5	20.0	40.0	Green (GN)	50 m	170-02008

All dimensions in mm. Subject to technical changes. Cuts in any lengths. NOMEX® is a registered trademark of DuPont. Minimum Order Quantity (MOQ) may differ from package content.



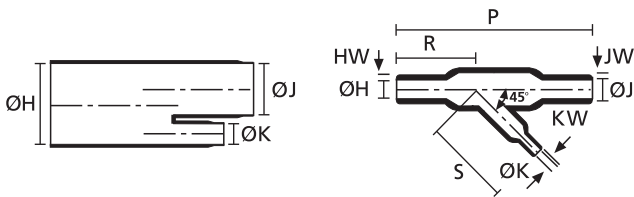
Angled T-Shapes, VG style

- Helashrink 1300 Series, 30° and 45° angle

Features and Benefits

- Strain relief, sealing and mechanical protection on cable harnesses

JN JN1000T



a: Expanded form (supplied)

b: Fully recovered form (after heating)



1303-1-G supplied / fully recovered.

For Material/Adhesive information please refer to page 53.

TYPE	Standards	ØH min. a	ØH max. b	ØJ min. a	ØJ max. b	ØK min. a	ØK max. b	P ± 10%	R ± 10%	HW ± 30%	JW ± 30%	KW ± 20%	S ± 10%	Angle	Designation as per VG-Norm	Article-No.
1306-1-G	JN1000T-E001	13.0	6.0	6.5	3.0	6.5	3.0	45.0	23.0	1.5	1.0	1.5	21.5	45 °	VG95343 T06B010A	413-06180
VG95343 T19B010A	JN1000T-P001	13.0	6.0	6.5	3.0	6.5	3.0	45.0	23.0	1.5	1.0	1.5	21.5	45 °	VG95343 T19B010A	413-06181

All dimensions in mm. Subject to technical changes. For Material / Adhesive information please refer to page 53.

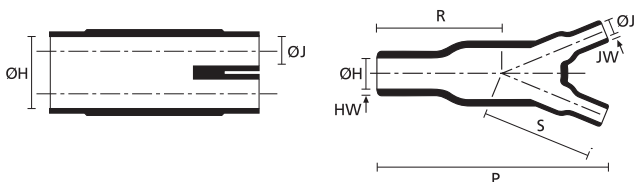
2-Way Outlet Shapes, VG style

- Helashrink 200 Series

Features and Benefits

- Mechanical tension relief in cable harnesses

JN JN1000T



a: Expanded form (supplied)

b: Fully recovered form (after heating)



Two-way outlet shape 223-2 supplied / fully recovered.

TYPE	Standards	ØH min. a	ØH max. b	ØJ min. a	ØJ max. b	P ± 10%	R ± 10%	HW ± 20%	JW ± 30%	JW nom.	S nom	Designation as per VG-Norm	Article-No.
206-1-G	JN1000T-E006	13.0	6.0	7.0	3.0	41.0	19.0	1.5	1.0	1.0	19.0	VG95343T08C001A	402-06180
203-1-G	JN1000T-E007	27.0	12.0	13.0	6.0	80.0	43.0	2.5	1.5	1.5	43.0	VG95343T08C002A	402-03180
206-1-GW24	JN1000T-P006	13.0	6.0	7.0	3.0	41.0	19.0	1.5	1.0	1.0	19.0	VG95343T19C001A	402-06184
203-1-GW24	JN1000T-P007	27.0	12.0	13.0	6.0	80.0	43.0	2.5	1.5	1.5	43.0	VG95343T19C002A	402-03184

All dimensions in mm. Subject to technical changes. For Material/Adhesive information please refer to page 53.



Insulation

Heat Shrinkable Moulded Shapes

Bottle Shapes

- Helashrink 100 Series

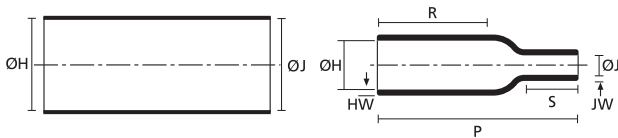
Features and Benefits

- Strain relief for connector cable
- Easy re-entry for repair when combined with hot melt adhesive



100 series supplied / fully recovered.

For Material/Adhesive information please refer to page 53.



a: Expanded form (supplied)

b: Fully recovered form (after heating)

TYPE	Standards	ØH min. a	ØH max. b	ØJ min. a	ØJ max. b	P ± 10%	HW ± 20%	JW ± 30%	S nom	Article-No.
106-1-G	01PROPM0-1-10-5	31.0	14.2	31.0	6.6	55.4	1.8	1.8	16.5	401-06005

All dimensions in mm. Subject to technical changes. For Material / Adhesive information please refer to page 53.



Bottle Shapes, VG style

- Helashrink 150 Series, with rib

Features and Benefits

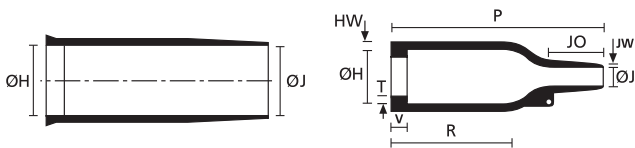
- Use in conjunction with circular grooved adaptor
- For strain relief and environmental sealing

LEA



150 Series boot recovered onto a connector.

For Material/Adhesive information please refer to page 53.



a: Expanded form (supplied)

b: Fully recovered form (after heating)



150 Series supplied.

TYPE	Standards	ØH min. a	ØH max. b	ØJ min. a	ØJ max. b	P ± 10%	R nom	S nom	HW ± 20%	JW ± 20%	V max	T ± 20%	Designation as per VG-Norm	Article-No.
158-49-G	01PROPM0-1-21-5	41.6	35.0	37.0	16.0	1.1	52.0	38.0	3.2	-	3.3	-	-	401-58079
152-42-G	01PROPM0-1K08-5	24.0	10.5	24.0	6.0	38.0	21.0	10.0	1.6	0.5	3.3	1.0	VG95343T06 B001A	401-52043
152-41-G	01PROPM0-1K08-5-001	24.0	10.5	24.0	6.0	26.0	9.0	10.0	1.6	0.5	3.3	1.0	VG95343T06 A001A	401-52041
152-52-L	01PROPM0-1K08-7	24.0	10.5	12.0	6.0	38.0	21.0	10.0	1.6	1.0	3.3	1.0	-	401-52029
154-42-G	01PROPM0-1K10-5	30.0	14.0	30.0	6.0	55.0	32.0	13.0	1.8	1.0	3.3	1.0	VG95343T06 B003A	401-54045
154-41-G	01PROPM0-1K10-5-001	30.0	14.0	30.0	6.0	43.0	20.0	1.0	1.8	1.0	3.3	1.0	VG95343T06 A003A	401-54043
154-52-L	01PROPM0-1K10-7	24.0	14.0	12.0	6.0	55.0	32.0	13.0	1.8	1.0	3.3	1.0	-	401-54028
155-42-G	01PROPM0-1K12-5	31.0	10.5	31.0	7.0	67.0	35.0	18.0	1.8	1.0	3.3	1.0	VG95343T06 B004A	401-55043
155-41-G	01PROPM0-1K12-5-001	31.0	18.0	31.0	7.0	47.0	15.0	18.0	1.8	1.0	3.3	1.0	VG95343T06 A004A	401-55041
156-42-G	01PROPM0-1K16-5	36.0	22.5	36.0	8.5	80.0	42.0	20.0	2.0	1.0	3.3	1.0	VG95343T06 B005A	401-56045
156-41-G	01PROPM0-1K16-5-001	36.0	22.5	36.0	8.5	60.0	22.0	20.0	2.0	1.0	3.3	1.0	VG95343T06 A005A	401-56042
157-43-G	01PROPM0-1K18-5	43.0	28.0	43.0	10.0	99.0	61.0	20.0	2.2	1.0	3.3	1.7	VG95343T06 C001A	401-57059
157-42-G	01PROPM0-1K18-5-001	43.0	28.0	43.0	10.0	79.0	41.0	20.0	2.2	1.0	3.3	1.7	VG95343T06 B006A	401-57057
157-41-G	01PROPM0-1K18-5-002	43.0	28.0	43.0	10.0	60.0	21.0	20.0	2.2	1.0	3.3	1.7	VG 95343T06 A006A	401-57780

All dimensions in mm. Subject to technical changes. For Material / Adhesive information please refer to page 53.

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Insulation

Heat Shrinkable Moulded Shapes

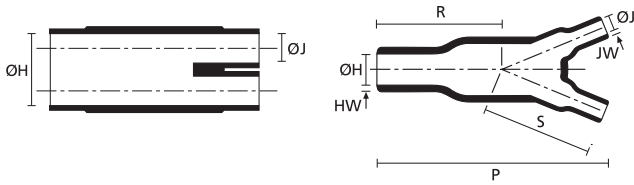
2-Way Outlet Shapes, VG style

- Helashrink 200 Series

Features and Benefits

- Mechanical tension relief in cable harnesses

LEA



a: Expanded form (supplied)

b: Fully recovered form (after heating)



Two-way outlet shape 223-2 supplied / fully recovered.

TYPE	Standards	ØH min. a	ØH max. b	ØJ min. a	ØJ max. b	P ± 10%	R ± 10%	JW ± 30%	JW nom.	S nom	Article-No.
206-1-G	01PRODM0-3-002-5	13.0	6.0	7.0	3.0	41.0	19.0	1.0	1.0	19.0	402-06036

All dimensions in mm. Subject to technical changes. For Material / Adhesive information please refer to page 53.

For Material/Adhesive information please refer to page 53.

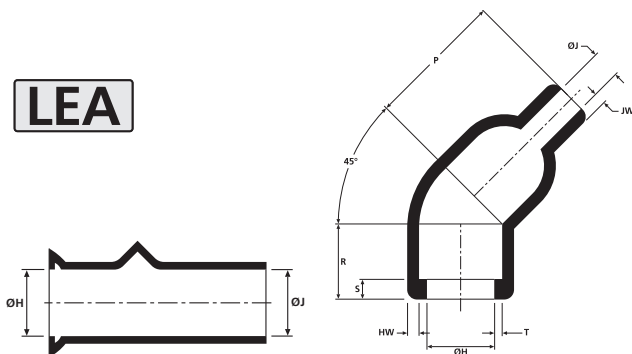
Angle Shapes

- Helashrink 1800 Series, with rib, 30°, 45°, 60° angle

Features and Benefits

- Provides strain relief and mechanical protection for harness systems
- Use in conjunction with a circular grooved adaptor

LEA



a: Expanded form (supplied)

b: Fully recovered form (after heating)



1821-42 supplied / fully recovered.

TYPE	Standards	ØH min. a	ØH max. b	ØJ min. a	ØJ max. b	P ± 10%	R ± 10%	JO ± 10%	HW ± 20%	JW ± 20%	T ± 10%	T ± 20%	S nom	Article-No.
1807-5-L	01PROPM0-2-16-7, 01PROPM0-4-16-7	18.0	18.0	14.8	7.4	43.2	7.2	15.2	1.8	1.8	-	1.0	3.0	418-07007
1821-42-G	01PROPM0-2K08-5	20.0	14.2	20.0	4.1	24.0	10.0	-	2.3	1.8	1.1	-	-	418-21013
1805-6-L	02PROPM0-2-16-7	35.6	18.8	16.0	7.0	28.0	-	-	1.5	1.5	-	-	-	418-05011

All dimensions in mm. Subject to technical changes. For Material / Adhesive information please refer to page 53.



Heat Shrinkable Tubing 2:1 flexible and coloured

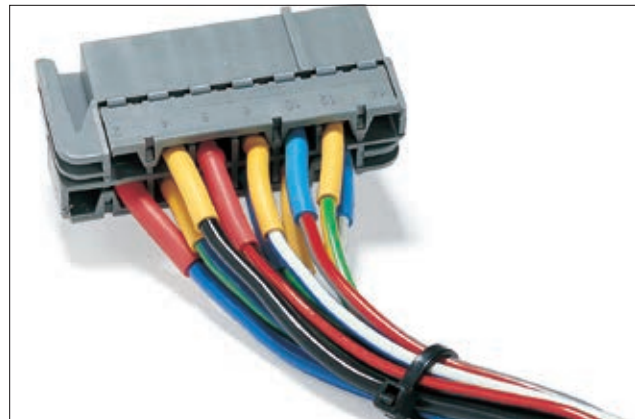
- **HFT-A - self extinguishing**

This high performance thin wall tubing is used extensively for electrical and mechanical protection. It is also well proven for sleeve marking to identify wiring circuits. It shrinks uniformly to form a permanent insulation covering.

The transparent version is used for bundling and cable protection where visual inspection is required. It is often used as a see through protective sleeve over cable markers.

Features and Benefits

- Flexible heat shrink tubing
- Fast shrinking, easy handling, good mechanical strength
- Easy to print on
- Wide range of colours
- Internal diameters up to 4 inches (101.6 mm)
- UL-224 ,CSA listed and VG approved



HFT-A conforms to major standards used in all Defence industries.

MATERIAL	Polyolefin, cross-linked (PO-X)
Shrink Ratio	2:1
Operating Temperature	-55 °C to +135 °C
Min. Shrink Temperature	+100 °C
Longitudinal change after shrinkage	+5%/-10%
Dielectric Strength	20 kV/mm according to IEC 60684 P2
Flammability	Self extinguishing
Specifications	CSA, DEF STAN 59-97/3, MIL-DTL-23053/5C, NF F 00-608, SAE - AMS - DTL-23053 / 5C, UL224 125 °C 600V, VG 95343



Heat Shrinkable Tubing 2:1

TYPE	Standards	Spld. Ø D min.	Size (imp.l)	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Designation as per VG-Norm	Article-No.
HFT-A-25.4/12.7	01PRORNF1BK	25.4	1 "	12.7	0.90	50 m	Black (BK)	VG 95343 T05 A 010 A	305-25400
HFT-A-38.0/19.0	01PRORNF1-2BK	38.0	1 "	19.0	1.00	50 m	Black (BK)	VG 95343 T05 A 011 A	305-38100
HFT-A-1.6/0.8	01PRORNF1-16BK	1.6	1/16 "	0.8	0.40	400 m	Black (BK)	VG 95343 T05 A 002 A	305-01600
HFT-A-12.7/6.4	01PRORNF1-2BK	12.7	1/2 "	6.4	0.60	100 m	Black (BK)	VG 95343 T05 A 008 A	305-12700
HFT-A-6.4/3.2	01PRORNF1-4BK	6.4	1/4 "	3.2	0.60	300 m	Black (BK)	VG 95343 T05 A 006 A	305-06400
HFT-A-3.2/1.6	01PRORNF1-8BK	3.2	1/8 "	1.6	0.50	400 m	Black (BK)	VG 95343 T05 A 004 A	305-03200
HFT-A-50.8/25.4	01PRORNF2BK	51.0	2 "	25.4	1.10	35 m	Black (BK)	VG 95343 T05 A 012 A	305-50800
HFT-A-76.0/38.0	01PRORNF3BK	76.0	3 "	38.0	1.30	25 m	Black (BK)	VG 95343 T05 A 013 A	305-76200
HFT-A-4.8/2.4	01PRORNF3-16BK	4.8	3/16 "	2.4	0.50	300 m	Black (BK)	VG 95343 T05 A 005 A	305-04800
HFT-A-2.4/1.2	01PRORNF3-32BK	2.4	3/32 "	1.2	0.50	400 m	Black (BK)	VG 95343 T05 A 003 A	305-02400
HFT-A-19.0/9.5	01PRORNF3-4BK	19.0	3/4 "	9.5	0.80	50 m	Black (BK)	VG 95343 T05 A 009 A	305-19000
HFT-A-1.2/0.6	01PRORNF3-64BK	1.2	3/64 "	0.6	0.40	400 m	Black (BK)	VG 95343 T05 A 001A	305-01200
HFT-A-9.5/4.8	01PRORNF3-8BK	9.5	3/8 "	4.8	0.60	150 m	Black (BK)	VG 95343 T05 A007 A	305-09500
HFT-A-101.6/50.8	01PRORNF4BK	101.6	4 "	50.8	1.40	25 m	Black (BK)	VG 95343 T05 A 014 A	305-91600

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content.





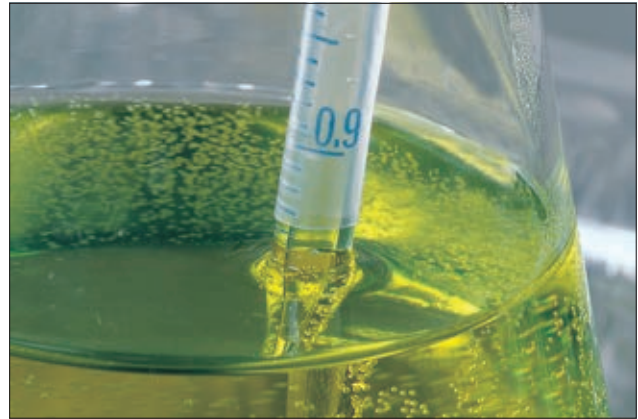
Heat Shrinkable Tubing 2:1 -PVDF

- KYNAR®

For electrical insulation and strain relief of connectors, solder joints, resistors, thermo-switches and many other parts.

Features and Benefits

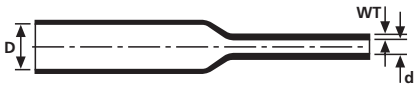
- Semi-rigid transparent heat shrink tubing
- High chemical and puncture resistance
- Extra thin wall tubing
- High temperature performance
- Self extinguishing
- Very good electrical and mechanical qualities
- Transparent material allows visual inspection of covered components



This thin walled, translucent heat shrink tubing is used for chemical applications.



MATERIAL	Polyvinylidene Fluoride (PVDF)
Shrink Ratio	2:1
Operating Temperature	-55 °C to +175 °C
Min. Shrink Temperature	+175 °C
Longitudinal change after shrinkage	-5% max.
Dielectric Strength	30 kV/mm according to IEC 60684 P2
Flammability	UL224 VW-1
Specifications	DEF STAN 59-97/3, MIL-DTL-23053/8, UL224 150 °C 600V VW-1



TYPE	Standards	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Length (L)	Colour	Article-No.
KYNAR® 1/2	01PROKYN1-2TR	12.7	6.4	0.30	1.2 m	Transparent (CL)	332-01279
KYNAR® 1/4	01PROKYN1-4TR	6.4	3.2	0.30	1.2 m	Transparent (CL)	332-00649
KYNAR® 1/8	01PROKYN1-8TR	3.2	1.6	0.25	1.2 m	Transparent (CL)	332-00329
KYNAR® 3/16	01PROKYN3-16TR	4.8	2.4	0.25	1.2 m	Transparent (CL)	332-00489
KYNAR® 3/32	01PROKYN3-32TR	2.4	1.2	0.25	1.2 m	Transparent (CL)	332-00249
KYNAR® 3/4	01PROKYN3-4TR	19.0	9.5	0.43	1.2 m	Transparent (CL)	332-01909
KYNAR® 3/64	01PROKYN3-64TR	1.2	0.6	0.25	1.2 m	Transparent (CL)	332-00129
KYNAR® 3/8	01PROKYN3-8TR	9.5	4.8	0.30	1.2 m	Transparent (CL)	332-00959

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content.

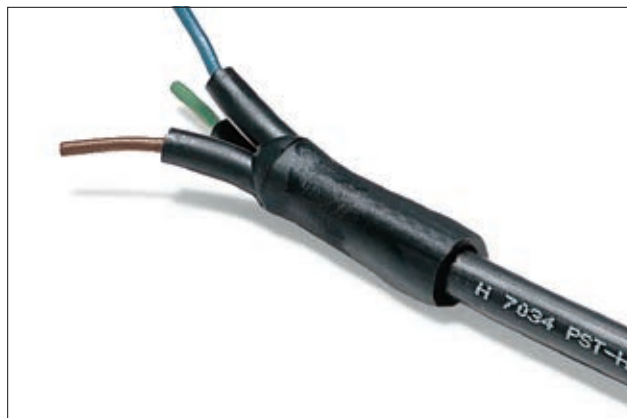
Heat Shrinkable Tubing 2:1 - Elastomer

- PST-H

PST-H is used for long-term protection of cables and wire harnesses in military equipment, motor sports, and aviation.

Features and Benefits

- Flexible, high performance elastomeric tubing
- Resistant to diesel, aviation and hydraulic fluids
- Used in aerospace, defence, railway and automotive applications
- VG approved shrink tubing



PST-H tubing with a break out boot.

ASN

BAC

DAN

DIN

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MS

NASM

NSA

PAN

STD

LEA

MATERIAL	Elastomer, cross-linked (POA)
Shrink Ratio	2:1
Operating Temperature	-75 °C to +150 °C
Min. Shrink Temperature	+135 °C
Longitudinal change after shrinkage	-10% max.
Dielectric Strength	20 kV/mm according to IEC 60684 P2
Flammability	Self extinguishing
Specifications	DEF STAN 59-97/3, NF F 00-608, VG 95343



RoHS 

TYPE	Standards	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Article-No.
PST-H-25.4/12.7	01PR025-1BK	25.4	12.7	1.80	50 m	Black (BK)	342-22540
PST-H-38.0-19.0	01PR025-1-1-2BK	38.0	19.0	2.40	30 m	Black (BK)	342-23810
PST-H-12.7/6.4	01PR025-1-2BK	12.7	6.4	1.20	100 m	Black (BK)	342-21270
PST-H-6.4/3.2	01PR025-1-4BK	6.4	3.2	0.90	300 m	Black (BK)	342-20640
PST-H-19.0/9.5	01PR025-3-4BK	19.0	9.5	1.40	50 m	Black (BK)	342-21900
PST-H-9.5/4.8	01PR025-3-8BK	9.5	4.8	1.00	100 m	Black (BK)	342-20950

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content.



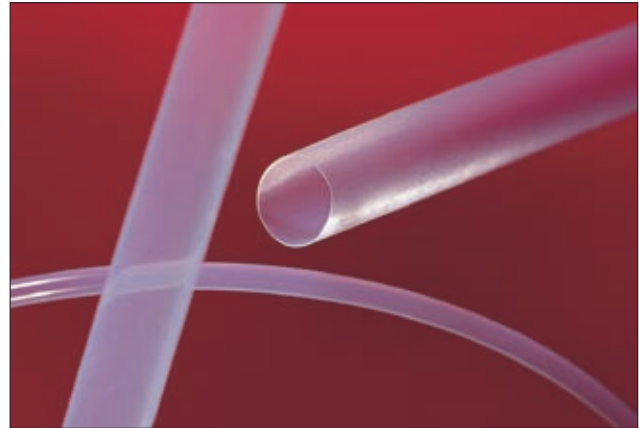
Heat Shrinkable Tubing - PTFE

- TFE4 4:1

TFE is ideal for high temperature applications, where resistance to aggressive fluids is required or a very thin walled tubing is needed, for example in pH-measuring instruments. TFE tubing is also used to reduce movement due to friction, covering cylinders for example.

Features and Benefits

- PTFE heat shrink tubing
- Very high temperature resistance
- Extra thin wall translucent tubing
- High abrasion resistance and good resistance against aggressive chemicals
- Available in either 2:1 (TFE2) or 4:1 (TFE4) shrink ratios



TFE is available in either 2:1 or 4:1 shrink ratios.

LEA

**Cut lengths available on request.
Please contact us!**



Heat Shrinkable Tubing 4:1

RoHS ✓

MATERIAL	Polytetrafluoroethylene (PTFE)
Operating Temperature	-70 °C to +260 °C
Min. Shrink emperature	+350 °C
Longitudinal change after shrinkage	-20% max.
Dielectric Strength	40 kV/mm according to DIN 53481
Flammability	Non burning

TYPE	Standards	Supplied Ø D min.	Recov. Ø d max.	Size (imperial)	Wall (WT)	Length (L)	Colour	Shrink Ratio	Article-No.
TFE4 64	01PROPTF1-4TR	6.4	1.60	1/4 "	0.30	1.2 m	Transparent (CL)	4:1	339-00651
TFE4 32	01PROPTF1-8TR	3.2	0.94	1/8 "	0.25	1.2 m	Transparent (CL)	4:1	339-00331
TFE4-5/64	01PROPTF5-64TR	2.0	0.64	-	0.22	1.2 m	Transparent (CL)	4:1	339-10000

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content.



Heat Shrinkable Tubing 2:1 - Fluoroelastomer

- Viton®-E

Viton®-E is used for reliable protection against aggressive chemicals in high temperature environments like engine compartments and turbines. It is also used when protective tubings are required to remain flexible at low temperatures.

Features and Benefits

- High temperature resistant fluoroelastomeric heat shrink tubing
- Very good electrical, chemical and mechanical features
- Resistant to many fuels, oils and lubricants
- Flexible even at very low temperatures



Viton®-E for flexibility and protection against aggressive chemicals.

ASN

BAC

DAN

DIN

JN

LEA

MS

NASM

NSA

PAN

STD

LEA

MATERIAL	Fluoropolymer cross-linked (FPMX)
Shrink Ratio	2:1
Operating Temperature	-55 °C to +220 °C
Min. Shrink Temperature	+175 °C
Longitudinal change after shrinkage	-10% max.
Dielectric Strength	15 kV/mm
Flammability	VG 95343
Insulation Class	C (VDE 0530)
Specifications	VG 95343



Heat Shrinkable Tubing 2:1

RoHS

TYPE	Standards	Size (imp.)	Spld. Ø D min.	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Designation as per VG-Norm	Article-No.
VITON®-E-25.4/12.7	01PROVYT1BK	1 "	25.4	12.7	1.80	25 m	Black (BK)	VG 95343 T 05 E 007 A	330-02540
VITON®-E-38.0/19.0	01PROVYT1-1-2BK	1 "	38.0	19.0	2.40	15 m	Black (BK)	VG 95343 T 05 E 008 A	330-03810
VITON®-E-12.7/6.4	01PROVYT1-2BK	1/2 "	12.7	6.4	1.20	25 m	Black (BK)	VG 95343 T 05 E 005 A	330-01270
VITON®-E-6.4/3.2	01PROVYT1-4BK	1/4 "	6.4	3.2	0.90	50 m	Black (BK)	VG 95343 T 05 E 003 A	330-00640
VITON®-E-3.2/1.6	01PROVYT1-8BK	1/8 "	3.2	1.6	0.70	50 m	Black (BK)	VG 95343 T 05 E 001 A	330-00320
VITON®-E-50.8/25.4	01PROVYT2BK	2 "	50.8	25.4	2.80	15 m	Black (BK)	VG 95343 T 05 E 009 A	330-05080
VITON®-E-4.8/2.4	01PROVYT3-16BK	3/16 "	4.8	2.4	0.80	50 m	Black (BK)	VG 95343 T 05 E 002 A	330-00480
VITON®-E-19.0/9.5	01PROVYT3-4BK	3/4 "	19.0	9.5	1.40	25 m	Black (BK)	VG 95343 T 05 E 006 A	330-01900
VITON®-E-9.5/4.8	01PROVYT3-8BK	3/8 "	9.5	4.8	1.00	25 m	Black (BK)	VG 95343 T 05 E 004 A	330-00950

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content.



Lacing Tapes LTHT

- Lacing tape LTHT2E4BK

Features and Benefits


- High tensile strength
- Vinyl chloride surface finishing provides good abrasion resistance



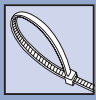
Lacing cord LTHT2E4BK.

MATERIAL	Polyester (PET)
Operating Temperature	-67 °C to +177 °C
Specifications	LEA, MIL-A-A-52081, NSA8420



TYPE	Standards	Width (W)	Thickness (T)		Weight	Finish	Colour	Reel Length	Article-No.
LTHT2E4BK	01FFFTF4BK	1.5	0.30	113	0.6 g/m	E = Vinyl	Black (BK)	500 m	174-00024

All dimensions in mm. Subject to technical changes.



Cable Ties for outdoor use (UV-resistant)

• T-Series in PA66W black

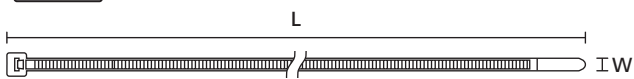
These cable ties are used for routing, bundling and securing of cables, pipes and hoses.

Features and Benefits

- Available in a wide range of material and sizes
- Made from 100% high quality plastic, allows for good recycling
- Inside serration for a strong hold onto bundles
- Easy application either manually or with a processing tool
- Simply to insert due to bent tail



MS3367



T-Series.



T-Series.

MATERIAL	Polyamide 6.6, UV-stabilised (PA66UV)	Polyamide 6.6, UV-resistant (PA66W)
Operating Temperature	-40 °C to +85 °C	
Flammability	UL94 V2	



TYPE	Standards	Width (W)	Length (L)	Bundle Ø max.	N	Material	Colour	Pack Cont.	Application Tool No.	Article-No.
T50R	MS3367-1-0	4.6	202.0	50.0	225	PA66UV	Black (BK)	100	2-11	112-05060
T50L	MS3367-2-0	4.7	390.0	110.0	225	PA66UV	Black (BK)	100	2-11	112-05460
T120R	MS3367-3-0	7.6	387.0	105.0	535	PA66UV	Black (BK)	100	3;9-11	111-00400
T18R	MS3367-4-0	2.5	100.0	22.0	80	PA66W	Black (BK)	100	2;4-6;8	112-01860
T30R	MS3367-5-0	3.6	148.0	35.0	135	PA66UV	Black (BK)	100	2;4-6;8	112-03060
T50I	MS3367-7-0	4.6	305.0	80.0	225	PA66UV	Black (BK)	100	2-11	111-05256

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Cable Ties Polyamide 6.6 standard

• T-Series in PA66 natural



MS3367

MATERIAL	Polyamide 6.6 (PA66)
Operating Temperature	-40 °C to +85 °C
Flammability	UL94 V2
Specifications	Cage Code 53421, DIN 30015953, GL 86 137-81 HH, SAE - AS33671, UL ZODZ.E64139



TYPE	Standards	Width (W)	Length (L)	Bundle Ø max.	N	Material	Colour	Pack Cont.	Application Tool No.	Article-No.
T50R	MS3367-1-9	4.6	202.0	50.0	225	PA66	Natural (NA)	100	2-11	112-05019
T50L	MS3367-2-9	4.7	390.0	110.0	225	PA66	Natural (NA)	100	2-11	112-05419
T120R	MS3367-3-9	7.6	387.0	105.0	535	PA66	Natural (NA)	50	3;9-11	112-12019
T18R	MS3367-4-9	2.5	100.0	22.0	80	PA66	Natural (NA)	100	2;4-6;8;10-12	112-01819
T30R	MS3367-5-9	3.6	148.0	35.0	135	PA66	Natural (NA)	100	2;4-6;8	112-03019
T50I	MS3367-7-9	4.6	305.0	80.0	225	PA66	Natural (NA)	100	2-11	112-05219

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Application Tool No.											
2	3	4	5	6	7	8	9	10	11	12	
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P	

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties and Fixings

Clips, Clamps and Plugs

Aluminium P-Clips

- ALU-P-Clip with / without chloroprene Insert

Manufactured from a high quality aluminium these P-Clips provide flexibility and yet give a permanent fixing in the most arduous of environments. The addition of a Chloroprene insert provides the cable or pipe bundle with a high degree of protection against vibration, reduces noise and also offers electrical isolation.

Features and Benefits

- Simple, secure pipe or cable fixing (e. g. caravan construction)
- Combine with chloroprene insert for vibration resistance (e. g. retain capacitors on PCB)
- Ideal for use in high temperatures
- Suitable for applications needing strength of metal components

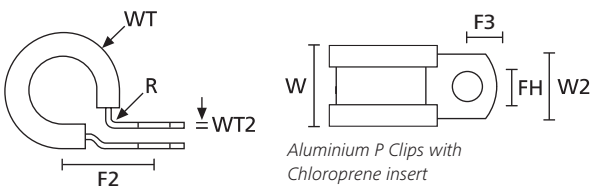


P-Clips manufactured in polyamide, aluminium or aluminium with chloroprene insert.



MS2191

MATERIAL	Aluminium-alloy (AL), Chloroprene (CR)
Operating Temperature	-20 °C to +80 °C



TYPE	Standards	Width (W)	Width (W2)	Wall (WT)	Wall (WT2)	Hole Ø (FH)	Fixing Hole Centres (F2)	Bundle Ø max.	Radius (R)	Material	Colour	Article-No.
ALU10C	MS2191 DG08	16.3	12.7	3.70	0.8	5,2	16.6	12.7	1.6	AL, CR	Black (BK)	211-15100
ALU12C	MS2191 DG10	16.3	12.7	4.50	1.3	5,2	19.9	15.9	2.8	AL, CR	Black (BK)	211-15120
ALU15C	MS2191 DG13	16.3	12.7	4.50	1.3	5,2	22.3	20.6	2.8	AL, CR	Black (BK)	211-15150
ALU23C	MS2191 DG21	16.3	12.7	4.50	1.6	5,2	29.4	33.3	3.2	AL, CR	Black (BK)	211-15230
ALU26C	MS2191 DG24	16.3	12.7	4.50	1.6	5,2	31.7	38.1	3.2	AL, CR	Black (BK)	211-15260
ALU30C	MS2191 DG28	16.3	12.7	4.50	1.6	5,2	34.9	44.5	3.2	AL, CR	Black (BK)	211-15300

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content.



Cable Protection for sharp-edged cut-out-sections

- Flexiform Edge Protection grommet strip

Flexiform grommet strip is used to protect cables routed through sharp-edged cutout sections.

Features and Benefits

- Very flexible
- Easily and securely applied without adhesives
- Very high abrasion resistance
- Close-fitting rail for effective, orderly-looking protection

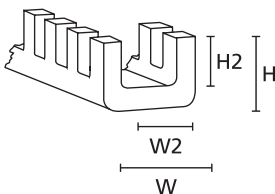


Optimal protection of cables and wires at panel edges.



MS21266

MATERIAL	Polyamide 6 (PA6)
Operating Temperature	-60 °C to +95 °C
Flammability	UL94 HB
Specifications	NASM21266, PAN 6480-A

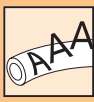


TYPE	Standards	Panel Thickness	Width (W)	Width (W2)	Height (H)	Height (H2)	Material	Colour	Pack Cont.	Article-No.
G51NA	MS21266-1N	0.4 - 1.3	3.9	1.5	4.3	2.7	PA6	Natural (NA)	25 m	251-21109
G51NB	MS21266-2N	1.3 - 2.1	4.6	2.4	4.3	2.7	PA6	Natural (NA)	25 m	251-21209
G51NC	MS21266-3N	2.1 - 3.3	5.7	3.5	4.3	2.7	PA6	Natural (NA)	25 m	251-21309
G51ND	MS21266-4N	3.3 - 4.8	8.4	5.1	6.2	4.3	PA6	Natural (NA)	25 m	251-21409
G51NE	MS21266-5N	4.8 - 6.5	9.9	6.7	6.4	4.5	PA6	Natural (NA)	25 m	251-21509
G51NF	MS21266-6N	6.5 - 8.1	11.4	8.3	6.8	4.8	PA6	Natural (NA)	25 m	251-21609
G51NG	MS21266-7N	8.1 - 9.7	13.2	10.1	6.8	4.8	PA6	Natural (NA)	25 m	251-21709
G51NH	MS21266-8N	9.7 - 12.9	16.4	13.2	6.8	4.8	PA6	Natural (NA)	25 m	251-21809

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content. Flexiform grommet strips are not self-adhesive and therefore not suitable for outer edges.

TYPE	Standards	Panel Thickness	Width (W)	Width (W2)	Height (H)	Height (H2)	Material	Colour	Pack Cont.	Article-No.
G51TA	MS21266-1T	0.4 - 1.3	3.9	1.5	4.3	2.7	PTFE	Natural (NA)	3 m	251-30109
G51TB	MS21266-2T	1.3 - 2.1	4.6	2.4	4.3	2.7	PTFE	Natural (NA)	3 m	251-30209
G51TC	MS21266-3T	2.1 - 3.3	5.7	3.5	4.3	2.7	PTFE	Natural (NA)	3 m	251-30309
G51TD	MS21266-4T	3.3 - 4.8	8.4	5.1	6.2	4.3	PTFE	Natural (NA)	3 m	251-30409
G51TE	MS21266-5T	4.8 - 6.5	9.9	6.7	6.4	4.5	PTFE	Natural (NA)	3 m	251-30509
G51TF	MS21266-6T	6.5 - 8.1	11.4	8.3	6.8	4.8	PTFE	Natural (NA)	3 m	251-30609
G51TG	MS21266-7T	8.1 - 9.7	13.2	10.1	6.8	4.8	PTFE	Natural (NA)	3 m	251-30709
G51TH	MS21266-8T	9.7 - 12.9	16.4	13.2	6.8	4.8	PTFE	Natural (NA)	3 m	251-30809

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content. Flexiform grommet strips are not self-adhesive and therefore not suitable for outer edges.



Identification ties and plates for marking cable bundles

- IT-Ties

One of the major benefits is the ability to both secure and identify cable bundles at the same time.

Features and Benefits

- Identification ties made of Polyamide 6.6
- For simple identification and securing of cable bundles in one step
- Printable labels are available for a professional finish
- Manual or temporary marking is possible with an indelible pen (T82S-BK / T82R-RD)

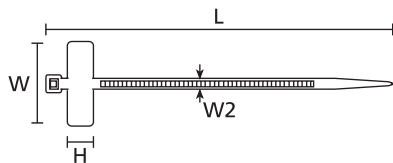


One operation with two benefits.

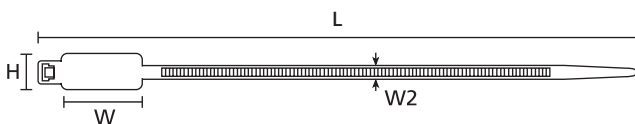


MS3368

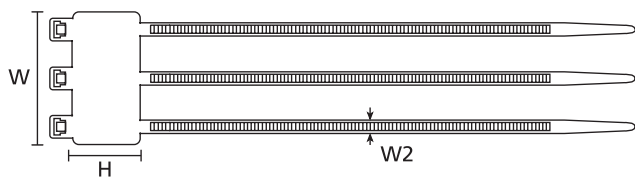
MATERIAL	Polyamide 6.6 (PA66)
Operating Temperature	-40 °C to +85 °C
Flammability	UL94 V2
Specifications	Cage Code 53421, DIN 30015953, SAE - AS33681, UL ZOD22.E64139



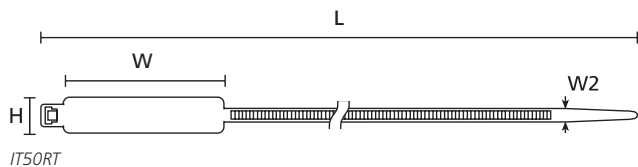
IT18R



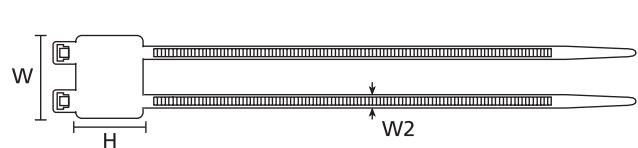
IT50R



IT50L



IT50RT



IT50RD

TYPE	Standards	Bundle Ø min.	Bundle Ø max.	Width (W)	Height (H)	Length (L)	Width (W2)	N	Rec. Labels	Material	Colour	Pack Cont.	Article-No.
IT50R	MS3368-1-9A	9.5	44.5	28.0	12.9	203.0	4.6	225	TAG23-10TD1	PA66	Natural (NA)	100 pcs.	111-85019
IT50L	MS3368-2-9A	19.0	100.0	56.0	12.8	390.0	4.7	225	TAG52-10TD1	PA66	Natural (NA)	100 pcs.	111-85319
IT50RD	MS3368-3-9C	10.0	44.0	29.0	26.3	205.0	4.7	225	TAG26-21TD1	PA66	Natural (NA)	50 pcs.	111-85219
IT50RT	MS3368-4-9D	10.0	44.0	46.0	26.3	205.0	4.7	225	TAG43-21TD1	PA66	Natural (NA)	50 -pcs.	111-85119
IT18R	MS3368-5-9E	4.8	19.0	25.0	8.0	100.0	2.4	80	TAG23-06TD1	PA66	Natural (NA)	200 pcs.	111-81818

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content.



Cable Protection for sharp-edged cut-out-sections

- Flexiform Edge Protection grommet strip

Flexiform grommet strip is used to protect cables routed through sharp-edged cut-out sections.

Features and Benefits

- Very flexible
- Easily and securely applied without adhesives
- Very high abrasion resistance
- Close-fitting rail for effective, orderly-looking protection

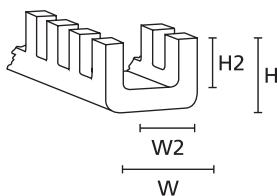


Optimal protection of cables and wires at panel edges.

NASM

NASM21266

MATERIAL	Polytetrafluoroethylene (PTFE)	Polyamide 6 (PA6)
Operating Temperature	-60 °C to +260 °C, intermittent +350 °C	-60 °C to +95 °C
Flammability	UL94 V0	UL94 HB
Specifications	PAN 6480-A	NASM21266, PAN 6480-A



RoHS ✓

HF ✓

RoHS ✓

TYPE	Standards	Panel Thickness	Width (W)	Width (W2)	Height (H)	Height (H2)	Material	Colour	Pack Cont.	Article-No.
G51NA	NASM21266-1N	0.4 - 1.3	3.9	1.5	4.3	2.7	PA6	Natural (NA)	25 m	251-21109
G51NB	NASM21266-2N	1.3 - 2.1	4.6	2.4	4.3	2.7	PA6	Natural (NA)	25 m	251-21209
G51NC	NASM21266-3N	2.1 - 3.3	5.7	3.5	4.3	2.7	PA6	Natural (NA)	25 m	251-21309
G51ND	NASM21266-4N	3.3 - 4.8	8.4	5.1	6.2	4.3	PA6	Natural (NA)	25 m	251-21409
G51NE	NASM21266-5N	4.8 - 6.5	9.9	6.7	6.4	4.5	PA6	Natural (NA)	25 m	251-21509
G51NF	NASM21266-6N	6.5 - 8.1	11.4	8.3	6.8	4.8	PA6	Natural (NA)	25 m	251-21609
G51NG	NASM21266-7N	8.1 - 9.7	13.2	10.1	6.8	4.8	PA6	Natural (NA)	25 m	251-21709
G51NH	NASM21266-8N	9.7 - 12.9	16.4	13.2	6.8	4.8	PA6	Natural (NA)	25 m	251-21809

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content. Flexiform grommet strips are not self-adhesive and therefore not suitable for outer edges.

TYPE	Standards	Panel Thickness	Width (W)	Width (W2)	Height (H)	Height (H2)	Material	Colour	Pack Cont.	Article-No.
G51TA	NASM21266-1T	0.4 - 1.3	3.9	1.5	4.3	2.7	PTFE	Natural (NA)	3 m	251-30109
G51TB	NASM21266-2T	1.3 - 2.1	4.6	2.4	4.3	2.7	PTFE	Natural (NA)	3 m	251-30209
G51TC	NASM21266-3T	2.1 - 3.3	5.7	3.5	4.3	2.7	PTFE	Natural (NA)	3 m	251-30309
G51TD	NASM21266-4T	3.3 - 4.8	8.4	5.1	6.2	4.3	PTFE	Natural (NA)	3 m	251-30409
G51TE	NASM21266-5T	4.8 - 6.5	9.9	6.7	6.4	4.5	PTFE	Natural (NA)	3 m	251-30509
G51TF	NASM21266-6T	6.5 - 8.1	11.4	8.3	6.8	4.8	PTFE	Natural (NA)	3 m	251-30609
G51TG	NASM21266-7T	8.1 - 9.7	13.2	10.1	6.8	4.8	PTFE	Natural (NA)	3 m	251-30709
G51TH	NASM21266-8T	9.7 - 12.9	16.4	13.2	6.8	4.8	PTFE	Natural (NA)	3 m	251-30809

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content. Flexiform grommet strips are not self-adhesive and therefore not suitable for outer edges.



Cable Ties and Fixings

Cable Ties Inside Serrated

Cable Ties inside serrated

• T-Series

These cable ties are used for routing, bundling and securing of cables, pipes and hoses.

Features and Benefits

- Available in a wide range of material and sizes
- Made from 100% high quality plastic, allows for good recycling
- Inside serration for a strong hold onto bundles
- Easy application either manually or with a processing tool
- Simply to insert due to bent tail

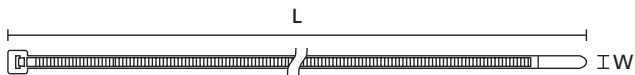


T Series for bundling and securing of cables for a wide range of applications, available in various colours and materials.



NSA935401

MATERIAL	Polyamide 6.6 (PA66)	Polyamide 6.6, heat stabilised (PA66HS)
Operating Temperature	-40 °C to +85 °C, (+105 °C, 500 h)	-40 °C to +105 °C, (+145 °C, 500 h)
Flammability	UL94 V2	



T-Series.



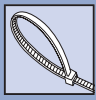
TYPE	Standards	Width (W)	Length (L)	Bundle Ø max.	N	Material	Colour	Pack Cont.	Recomm. Tools	Article-No.
T18R	NSA935401-03	2.5	100.0	22.0	80	PA66HS	Black (BK)	100 pcs	2;4-6;8	111-01250
T30R	NSA935401-04	3.5	150.0	35.0	135	PA66	Black (BK)	100 pcs	2;4-6;8	111-01540
	NSA935401-04	3.5	150.0	35.0	135	PA66HS	Black (BK)	100 pcs	2;4-6;8	111-01259
	NSA935401-04	3.5	150.0	35.0	135	PA66HS	Black (BK)	500 pcs	2;4-6;8	111-01460
T50R	NSA935401-05	4.6	200.0	50.0	225	PA66HS	Black (BK)	100 pcs	2-11	111-01252
T50I	NSA935401-06	4.6	300.0	85.0	225	PA66HS	Black (BK)	100 pcs	2-11	111-01254
T50L	NSA935401-08	4.6	390.0	110.0	225	PA66HS	Black (BK)	100 pcs	2-11	111-01272
T150R	NSA935401-10	7.6	365.0	100.0	670	PA66HS	Black (BK)	100 pcs	3;9-12	111-01255
T120L	NSA935401-12	7.6	760.0	225.0	535	PA66HS	Black (BK)	50 pcs	3;9-11	111-01256
T30LL	NSA935401-13	3.5	290.0	80.0	135	PA66HS	Black (BK)	1,000 pcs	2;4-6;8	111-01261
T50R	NSA935401-05G	4.6	200.0	50.0	225	PA66HS	Green (GN)	100 pcs	2-11	111-00839
T18R	NSA935401-03R	2.5	100.0	22.0	80	PA66HS	Red (RD)	1,000 pcs	2;4-6;8	111-01909
T30R	NSA935401-04R	3.5	150.0	35.0	135	PA66HS	Red (RD)	100 pcs	2;4-6;8	111-01409
T50R	NSA935401-05R	4.6	200.0	50.0	225	PA66HS	Red (RD)	100 pcs	2-11	111-01262
T50I	NSA935401-06R	4.6	300.0	85.0	225	PA66HS	Red (RD)	100 pcs	2-11	111-00840
T50L	NSA935401-08R	4.6	390.0	110.0	225	PA66HS	Red (RD)	100 pcs	2-11	111-00836
T120L	NSA935401-12R	7.6	760.0	225.0	535	PA66HS	Red (RD)	50 pcs	3;9-11	111-00837
T50R	NSA935401-05Y	4.6	200.0	50.0	225	PA66HS	Yellow (YE)	100 pcs	2-11	111-01214

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Application Tool No.

2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties for temperatures up to + 105°C (heat stabilised)

- T-Series

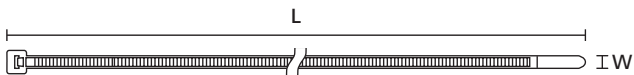


NSA940000




T Series for bundling and securing of cables for a wide range of applications, available in various colours and materials.

MATERIAL	Polyamide 6.6, heat stabilised (PA66HS)
Operating Temperature	-40 °C to +105 °C, (+145 °C, 500 h)
Flammability	UL94 V2



T-Series.

TYPE	Standards	Width (W)	Length (L)	Bundle Ø max.		Material	Colour	Pack Cont.	Recomm. Tools	Article-No.
T18R	NSA940000-23301	2.5	100.0	22.0	80	PA66HS	Orange (OG)	1,000 pcs.	2,4-6;8	111-01678
T30R	NSA940000-23302	3.5	150.0	35.0	135	PA66HS	Orange (OG)	100 pcs.	2,4-6;8	111-01679
T50R	NSA940000-23303	4.6	200.0	50.0	225	PA66HS	Orange (OG)	100 pcs.	2-11	111-01680
T50I	NSA940000-23304	4.6	300.0	85.0	225	PA66HS	Orange (OG)	100 pcs.	2-11	111-01681
T50L	NSA940000-23305	4.6	390.0	110.0	225	PA66HS	Orange (OG)	100 pcs.	2-11	111-01682
T120R (E)	NSA940000-23306	7.6	387.0	100.0	535	PA6HS	Orange (OG)	100 pcs.	3,9-12	111-01683
T120L	NSA940000-23307	7.6	760.0	225.0	535	PA66HS	Orange (OG)	50 pcs.	3,9-11	111-01684

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content.

Application Tool No.										
2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.

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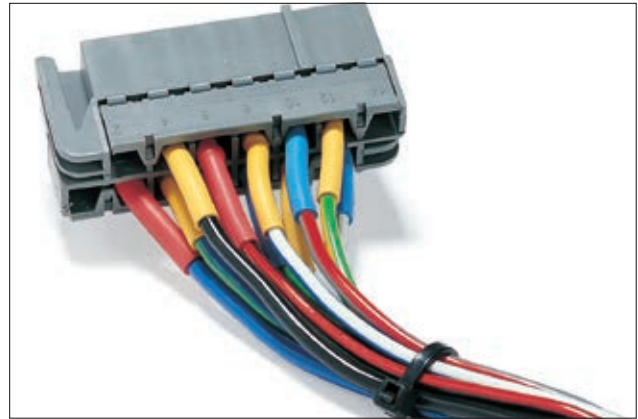
Heat Shrinkable Tubing 2:1 flexible and coloured

- HFT-A - self extinguishing

This high performance thin wall tubing is used extensively for electrical and mechanical protection. It is also well proven for sleeve marking to identify wiring circuits. It shrinks uniformly to form a permanent insulation covering. The transparent version is used for bundling and cable protection where visual inspection is required. It is often used as a see through protective sleeve over cable markers.

Features and Benefits

- Flexible heat shrink tubing
- Fast shrinking, easy handling, good mechanical strength
- Easy to print on
- Wide range of colours
- Internal diameters up to 4 inches (101.6 mm)
- UL-224 ,CSA listed and VG approved



HFT-A conforms to major standards used in all Defence industries.



MATERIAL	Polyolefin, cross-linked (PO-X)
Shrink Ratio	2:1
Operating Temperature	-55 °C to +135 °C
Min. Shrink Temperature	+100 °C
Longitudinal change after shrinkage	+5%/-10%
Dielectric Strength	20 kV/mm according to IEC 60684 P2
Flammability	Self extinguishing
Specifications	CSA, DEF STAN 59-97/3, MIL-DTL-23053/5C, NF F 00-608, SAE - AMS - DTL-23053 / 5C, UL224 125 °C 600V, VG 95343



TYPE	Standards	Spld. Ø D min.	Size (imp.)	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Designation as per VG-Norm	Article-No.
HFT-A-3.2/1.6	NSA937211-002B	3.2	1/8 "	1.6	0.50	400 m	Black (BK)	VG 95343 T05 A 004 A	305-03200
HFT-A-4.8/2.4	NSA937211-003B	4.8	3/16 "	2.4	0.50	300 m	Black (BK)	VG 95343 T05 A 005 A	305-04800
HFT-A-6.4/3.2	NSA937211-004B	6.4	1/4 "	3.2	0.60	300 m	Black (BK)	VG 95343 T05 A 006 A	305-06400
HFT-A-9.5/4.8	NSA937211-005B	9.5	3/8 "	4.8	0.60	150 m	Black (BK)	VG 95343 T05 A007 A	305-09500
HFT-A-12.7/6.4	NSA937211-006B	12.7	1/2 "	6.4	0.60	100 m	Black (BK)	VG 95343 T05 A 008 A	305-12700
HFT-A-19.0/9.5	NSA937211-007B	19.0	3/4 "	9.5	0.80	50 m	Black (BK)	VG 95343 T05 A 009 A	305-19000
HFT-A-25.4/12.7	NSA937211-008B	25.4	1 "	12.7	0.90	50 m	Black (BK)	VG 95343 T05 A 010 A	305-25400
HFT-A-38.0/19.0	NSA937211-009B	38.0	1 "	19.0	1.00	50 m	Black (BK)	VG 95343 T05 A 011 A	305-38100
HFT-A-50.8/25.4	NSA937211-010B	51.0	2 "	25.4	1.10	35 m	Black (BK)	VG 95343 T05 A 012 A	305-50800
HFT-A-76.0/38.0	NSA937211-011B	76.0	3 "	38.0	1.30	25 m	Black (BK)	VG 95343 T05 A 013 A	305-76200
HFT-A-2.4/1.2	NSA937211-001B, NSA937211-010B	2.4	3/32 "	1.2	0.50	400 m	Black (BK)	VG 95343 T05 A 003 A	305-02400
	NSA937211-001D	2.4	3/32 "	1.2	0.50	100 m	Red (RD)	VG 95343 T05 A 003 C	305-02402
HFT-A-3.2/1.6	NSA937211-002D	3.2	1/8 "	1.6	0.50	100 m	Red (RD)	VG 95343 T05 A 004 C	305-03202
HFT-A-4.8/2.4	NSA937211-003D	4.8	3/16 "	2.4	0.50	75 m	Red (RD)	VG 95343 T05 A 005 C	305-04802
HFT-A-6.4/3.2	NSA937211-004D	6.4	1/4 "	3.2	0.60	75 m	Red (RD)	VG 95343 T05 A 006 C	305-06402
HFT-A-9.5/4.8	NSA937211-005D	9.5	3/8 "	4.8	0.60	50 m	Red (RD)	VG 95343 T05 A007 C	305-09502
HFT-A-12.7/6.4	NSA937211-006D	12.7	1/2 "	6.4	0.60	50 m	Red (RD)	VG 95343 T05 A 008 C	305-12702
HFT-A-19.0/9.5	NSA937211-007D	19.0	3/4 "	9.5	0.80	25 m	Red (RD)	VG 95343 T05 A 009 C	305-19002
HFT-A-25.4/12.7	NSA937211-008D	25.4	1 "	12.7	0.90	25 m	Red (RD)	VG 95343 T05 A 010 C	305-25402

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content.



TYPE	Standards	Spld. Ø D min.	Size (imp.)	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Designation as per VG-Norm	Article-No.
HFT-A-101.6/50.8	NSA937211-012D	101.6	4 "	50.8	1.40	25 m	Red (RD)	VG 95343 T05 A 014 C	305-91602
HFT-A-3.2/1.6	NSA937211-002L	3.2	1/8 "	1.6	0.50	100 m	White (WH)	VG 95343 T05 A 004 L	305-03209
HFT-A-6.4/3.2	NSA937211-004L	6.4	1/4 "	3.2	0.60	75 m	White (WH)	VG 95343 T05 A 006 L	305-06409
HFT-A-9.5/4.8	NSA937211-005L	9.5	3/8 "	4.8	0.60	50 m	White (WH)	VG 95343 T05 A007 L	305-09509
HFT-A-12.7/6.4	NSA937211-006L	12.7	1/2 "	6.4	0.60	50 m	White (WH)	VG 95343 T05 A 008 L	305-12709
HFT-A-19.0/9.5	NSA937211-007L	19.0	3/4 "	9.5	0.80	25 m	White (WH)	VG 95343 T05 A 009 L	305-19009
HFT-A-25.4/12.7	NSA937211-008L	25.4	1 "	12.7	0.90	25 m	White (WH)	VG 95343 T05 A 010 L	305-25409
HFT-A-38.0/19.0	NSA937211-009L	38.0	1 "	19.0	1.00	50 m	White (WH)	VG 95343 T05 A 011 L	305-38109
HFT-A-2.4/1.2	NSA937211-010L	2.4	3/32 "	1.2	0.50	100 m	White (WH)	VG 95343 T05 A 003 L	305-02409
HFT-A-50.8/25.4	NSA937211-010L	51.0	2 "	25.4	1.10	35 m	White (WH)	VG 95343 T05 A 012 L	305-50809
HFT-A-101.6/50.8	NSA937211-012L	101.6	4 "	50.8	1.40	25 m	White (WH)	VG 95343 T05 A014 L	305-91609

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content.

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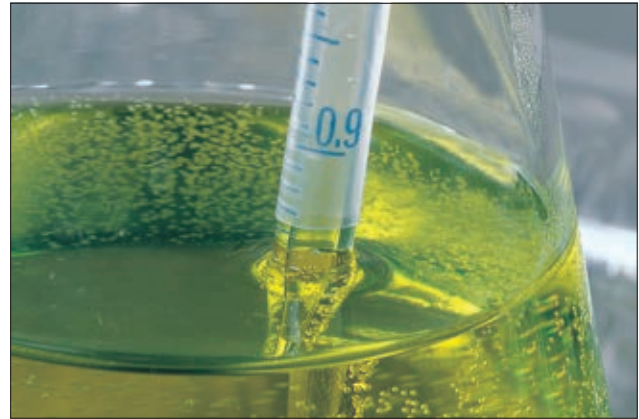
Heat Shrinkable Tubing 2:1 - PVDF

- TK20

Typical applications of this translucent tubing are where high-temperature performance is required. Also very suitable for applications that ask for visual inspection of covered components, or if a low friction surface is needed. TK20 is also used as oil stop for energy cables. This thin walled, translucent heat shrink tubing is often used for chemical applications.

Features and Benefits

- Semi-rigid heat shrinkable tubing made of PVDF
- Thin walled and tough
- For higher temperature applications
- Very good mechanical strength, abrasion resistance and chemical resistance
- Meets various industrial standards
- Self extinguishing, UL 224 VW1 listed



This thin walled, translucent heat shrink tubing is used for chemical applications.



NSA937494

MATERIAL	Polyvinylidene Fluoride (PVDF)
Shrink Ratio	2:1
Operating Temperature	-55 °C to +175 °C
Min. Shrink Temperature	+175 °C
Longitudinal change after shrinkage	+/-10% max
Dielectric Strength	≥ 30 kV/mm min. according to ASTM D2171
Flammability	UL224 VW-1
Specifications	SAE - AMS - DTL-23053/8, UL224 150 °C 600V VW-1, VG 95343



Heat Shrinkable Tubing 2:1



TYPE	Standards	Size (imp.)	Spld. Ø D min.	Recov. Ø d max.	Wall (WT)	Length (L)	Colour	Designation as per VG-Norm	Article-No.
TK20-2.4/1.2	NSA937494-001	3/32 "	2.4	1.2	0.25	1.2 m	Transparent (CL)	VG95343T05F003M	311-00249
TK20-3.2/1.6	NSA937494-002	1/8 "	3.2	1.6	0.25	1.2 m	Transparent (CL)	VG95343T05F004M	311-00329
TK20-4.8/2.4	NSA937494-003	3/16 "	4.8	2.4	0.25	1.2 m	Transparent (CL)	VG95343T05F005M	311-00489
TK20-6.4/3.2	NSA937494-004	1/4 "	6.4	3.2	0.30	1.2 m	Transparent (CL)	VG95343T05F006M	311-00649
TK20-12.7/6.4	NSA937494-006	1/2 "	12.7	6.4	0.30	1.2 m	Transparent (CL)	VG95343T05F008M	311-01279
TK20-19.1/9.5	NSA937494-007	3/4 "	19.1	9.5	0.43	1.2 m	Transparent (CL)	VG95343T05F009M	311-01909
TK20-25.4/12.7	NSA937494-008	1 "	25.4	12.7	0.48	1.2 m	Transparent (CL)	VG95343T05F010M	311-02549

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.

Heat Shrinkable Tubing - PTFE

- TFE4 4:1

TFE is ideal for high temperature applications, where resistance to aggressive fluids is required or a very thin walled tubing is needed, for example in pH-measuring instruments. TFE tubing is also used to reduce movement due to friction, covering cylinders for example.

Features and Benefits

- PTFE heat shrink tubing
- Very high temperature resistance
- Extra thin wall translucent tubing
- High abrasion resistance and good resistance against aggressive chemicals
- Available in either 2:1 (TFE2) or 4:1 (TFE4) shrink ratios



TFE is available in either 2:1 or 4:1 shrink ratios.

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NSA937210

Cut lengths available on request.
Please contact us!

MATERIAL	Polytetrafluoroethylene (PTFE)
Operating Temperature	-70 °C to +260 °C
Minimum Shrink Temperature	+350 °C
Longitudinal change after shrinkage	-20% max.
Dielectric Strength	40 kV/mm according to DIN 53481
Flammability	Non burning

RoHS 



Heat Shrinkable Tubing 4:1

TYPE	Standards	Supplied Ø D min.	Recov. Ø d max.	Size (imperial)	Wall (WT)	Length (L)	Colour	Shrink Ratio	Article-No.
TFE4-5/64	NSA937210MB0100	2.0	0.6	5/64 "	0.22	1.2 m	Transparent (CL)	4:1	339-00209
TFE4-1/8	NSA937210MB0200	3.2	0.9	1/8 "	0.25	1.2 m	Transparent (CL)	4:1	339-00329
TFE4-1/4	NSA937210MB0300	6.4	1.6	1/4 "	0.30	1.2 m	Transparent (CL)	4:1	339-00649
TFE4-3/8	NSA937210MB0400	9.5	2.4	3/8 "	0.30	1.2 m	Transparent (CL)	4:1	339-00959
TFE4-1/2	NSA937210MB0500	12.7	3.7	1/2 "	0.38	1.2 m	Transparent (CL)	4:1	339-01279
TFE4-5/8	NSA937210MB0600	15.9	4.5	5/8 "	0.38	1.2 m	Transparent (CL)	4:1	339-01599
TFE4-3/4	NSA937210MB0700	19.1	5.7	3/4 "	0.38	1.2 m	Transparent (CL)	4:1	339-01909
TFE4-1	NSA937210MB0800	25.4	7.1	1 "	0.38	1.2 m	Transparent (CL)	4:1	339-02549
TFE4-1 1/4	NSA937210MB0900	31.8	8.8	1 "	0.38	1.2 m	Transparent (CL)	4:1	339-03189

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Cable Protection for sharp-edged cut-out-sections

- **Flexiform Edge Protection grommet strip**

Flexiform grommet strip is used to protect cables routed through sharp-edged cut-out sections.

Features and Benefits

- Very flexible
- Easily and securely applied without adhesives
- Very high abrasion resistance
- Close-fitting rail for effective, orderly-looking protection

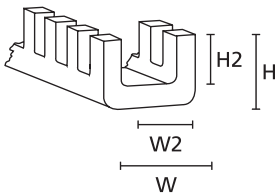


Optimal protection of cables and wires at panel edges.



NSA939510

MATERIAL	Polyamide 6 (PA6)
Operating Temperature	-60 °C to +95 °C
Flammability	UL94 HB
Specifications	NASM21266, PAN 6480-A



TYPE	Standards	Panel Thickness	Width (W)	Width (W2)	Height (H)	Height (H2)	Material	Colour	Pack Cont.	Article-No.
G51NA	NSA939510AN	0.4 - 1.3	3.9	1.5	4.3	2.7	PA6	Natural (NA)	25 m	251-21109
G51NB	NSA939510BN	1.3 - 2.1	4.6	2.4	4.3	2.7	PA6	Natural (NA)	25 m	251-21209
G51NC	NSA939510CN	2.1 - 3.3	5.7	3.5	4.3	2.7	PA6	Natural (NA)	25 m	251-21309
G51ND	NSA939510DN	3.3 - 4.8	8.4	5.1	6.2	4.3	PA6	Natural (NA)	25 m	251-21409
G51NE	NSA939510EN	4.8 - 6.5	9.9	6.7	6.4	4.5	PA6	Natural (NA)	25 m	251-21509
G51NF	NSA939510FN	6.5 - 8.1	11.4	8.3	6.8	4.8	PA6	Natural (NA)	25 m	251-21609
G51NG	NSA939510GN	8.1 - 9.7	13.2	10.1	6.8	4.8	PA6	Natural (NA)	25 m	251-21709
G51NH	NSA939510HN	9.7 - 12.9	16.4	13.2	6.8	4.8	PA6	Natural (NA)	25 m	251-21809

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content. Flexiform grommet strips are not self-adhesive and therefore not suitable for outer edges.



Lacing cord made of polyamide 6

- Lacing cord LCHT1A25NA

Features and Benefits

- General purpose lacing cord with high tensile strength




NSA8420



Lacing cord LCHT1A25NA.

MATERIAL	Polyamide 6.6 (PA66)
Operating Temperature	-55 °C to +121 °C
Specifications	MIL-T-43435, NSA8420

RoHS ✓

TYPE	Standards	Nominal Ø		Weight	Finish	Colour	Reel Length	Article-No.
LCHT1A25NA	NSA8420-0	2.5	1,250	2.84 g/m	A = Uncoated	Natural (NA)	200 m	174-00227

All dimensions in mm. Subject to technical changes.

Lacing cord made of meta-aramide

- Lacing cord LCHT5A30NA

Features and Benefits

- Excellent resistance to high temperatures
- Flame resistant
- Very good tensile strength




NSA8420



Lacing cord LCHT5A30NA

MATERIAL	Meta-Aramid
Operating Temperature	-55 °C to +260 °C, intermittent +360 °C
Specifications	A-A-52084, NSA8420

RoHS ✓

TYPE	Standards	Nominal Ø		Weight	Finish	Colour	Reel Length	Article-No.
LCHT5A30NA	NSA8420-5	3.0	1,380	5.54 g/m	A = Uncoated	Natural (NA)	100 m	174-00230

All dimensions in mm. Subject to technical changes.

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Lacing tape made of polyamide 6

- Lacing tape LTHT1B2NA and LTHT1B3NA

Features and Benefits

- High tensile strength
- Surface finishing with fungicide




NSA8420



Lacing tape of the LTHT1B series.

MATERIAL	Polyamide 6.6 (PA66)
Operating Temperature	-55 °C to +121 °C
Specifications	A-A-52080, NSA8420



TYPE	Standards	Width (W)	Thickness (T)		Weight	Finish	Colour	Reel Length	Article-No.
LTHT1B3NA	NSA8420-3	2.3	0.30	226	0.4 g/m	B = Microcrystalline fungicide wax	Natural (NA)	500 m	174-00020
LTHT1B2NA	NSA8420-4	3.6	0.30	362	0.7 g/m	B = Microcrystalline fungicide wax	Natural (NA)	250 m	174-00229

All dimensions in mm. Subject to technical changes.

Lacing tape made of polyester

- Lacing tape LTHT2E4BK

Features and Benefits

- High tensile strength
- Vinyl chloride surface finishing provides good abrasion resistance




NSA8420



Lacing cord LTHT2E4BK.

MATERIAL	Polyester (PET)
Operating Temperature	-67 °C to +177 °C
Specifications	A-A-52081, NSA8420



TYPE	Standards	Width (W)	Thickness (T)		Weight	Finish	Colour	Reel Length	Article-No.
LTHT2E4BK	NSA8420-8	1.5	0.30	113	0.6 g/m	E = Vinyl	Black (BK)	500 m	174-00024

All dimensions in mm. Subject to technical changes.



Lacing tape made of PTFE

- Lacing tape **LTHT3A2NA** and **LTHT3A4NA**

Features and Benefits

- Excellent resistance to high temperatures
- Very good chemical resistance



NSA8420



Lacing cord of the **LTHT3A** series.

MATERIAL	Polytetrafluoroethylene (PTFE), high tenacity multifilaments
Operating Temperature	-73 °C to +232 °C
Specifications	A-A-52082, NSA8420



TYPE	Standards	Width (W)	Thickness (T)		Weight	Finish	Colour	Reel Length	Article-No.
LTHT3A4NA	NSA8420-1	1.6	0.33	67	0.6 g/m	A = Uncoated	Natural (NA)	1,000 m	174-00011
LTHT3A2NA	NSA8420-2	2.7	0.33	133	1.2 g/m	A = Uncoated	Natural (NA)	700 m	174-00012

All dimensions in mm. Subject to technical changes.

Lacing tape made of glass fibre

- Lacing tape **LTHT4C2NA**

Features and Benefits

- High tensile strength
- Synthetic rubber surface finishing provides very good knotting characteristics



NSA8420



Lacing tape **LTHT4C2NA**.

MATERIAL	Glass Fibre (GF)
Operating Temperature	-55 °C to +427 °C
Specifications	A-A-52083, NSA8420



TYPE	Standards	Width (W)	Thickness (T)		Weight	Finish	Colour	Reel Length	Article-No.
LTHT4C2NA	NSA8420-7	3.2	0.40	889	0.6 g/m	D = PTFE	Natural (NA)	250 m	174-00253

All dimensions in mm. Subject to technical changes.

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Silicone band

- SI band

Silicone band is used where electrical cable bundles are attached to connectors.

Features and Benefits

- Very good temperature and flammability characteristics



NSA935403



SI silicone band.



MATERIAL	Silicone (SI)
Operating Temperature	-40 °C to +180 °C, intermittent +250 °C
Shore Hardness A	60±5
Flammability	UL94 V0
Specifications	NSA935403



TYPE	Standards	Width (W)	Thickness (T)	Colour	Reel Length	Article-No.
SI Band	NSA935403-01	19.0	1.00	Brown (BN)	100 m	253-19101

All dimensions in mm. Subject to technical changes.



Identification ties and plates for marking cable bundles

- IT Ties

One of the major benefits is the ability to both secure and identify cable bundles at different times.

Features and Benefits

- Identification ties made of Polyamide 6.6, heat stabilised
- For simple identification and securing of cable bundles in one step
- Printable labels are available for a professional finish
- Manual or temporary marking is possible with an indelible pen (T82S-BK / T82R-RD)

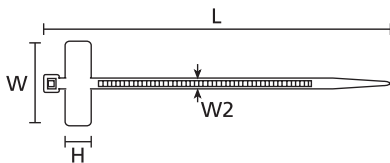


A clearly better way of identifying cables and pipes.



NSA935402

MATERIAL	Polyamide 6.6, heat stabilised (PA66HS)
Operating Temperature	-40 °C to +125 °C
Flammability	UL94 V2
Specifications	Cage Code 53421, DIN 30015953, SAE - AS33681, UL-ZODZ2.E64139



IT18R

TYPE	Standards	Bundle Ø min.	Bundle Ø max.	Width (W)	Height (H)	Length (L)	Width (W2)		Rec. Labels	Material	Colour	Pack Cont.	Article-No.
IT18R	NSA935402-51	4.8	19.0	25.0	8.0	100.0	2.4	80	TAG23-06TD1	PA66HS	Natural (NA)	200	111-81818

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

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Cable Ties and Fixings

Cable Ties Outside Serrated

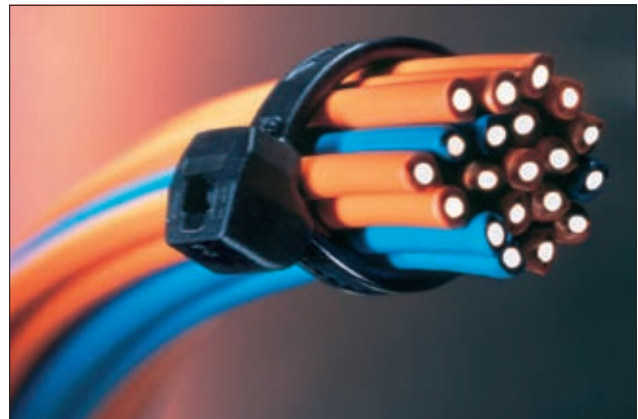
Cable Ties for thin-walled bundles

- OS-Series

OS-Series cable ties are used in many areas where thin-walled or soft insulation wires and cable are being installed, e. g. automotive and aircraft industry. OS ties made from PA66V0 material are suitable for applications where safety regulations are required, e.g. reduction of smoke and dangerous gases.

Features and Benefits

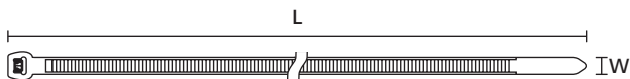
- Outside serrated cable tie with smooth surface to the bundle
- Tie follows the contours of the cable bundle perfectly
- Takes up less space due to curved head
- Easy insertion and high tensile strength
- For higher temperature or Limited Fire Hazard demand: Material PA46 or PA66V0
- Easy application either manually or with a processing tool



The contoured head needs less installation space, provides low insertion force and offers high strength.

PAN PAN6481

MATERIAL	Polyamide 6.6, heat stabilised (PA66HS)
Operating Temperature	-40 °C to +105 °C
Flammability	UL94 V2



OS-Series



The new head design of the OS Series

TYPE	Standards	Width (W)	Length (L)	Bundle Ø min.	Bundle Ø max.	N	Material	Colour	Pack Cont.	Recomm. Tools	Article-No.
T18ROS	PAN6481B3-01B	2.5	100.0	1.6	20.0	80	PA66HS	Black (BK)	100 pcs.	2;4-6	118-04700
T30ROS	PAN6481B3-02B	3.4	145.0	1.6	35.0	135	PA66HS	Black (BK)	100 pcs.	2;4-6;8	118-04800
T30LOS	PAN6481B3-03B	3.4	200.0	1.6	50.0	135	PA66HS	Black (BK)	100 pcs.	2;4-6;8	118-04900
T50SOS	PAN6481B3-04B	4.6	150.0	1.6	35.0	225	PA66HS	Black (BK)	100 pcs.	2;4-8	118-05850
T50ROS	PAN6481B3-05B	4.6	200.0	1.6	50.0	225	PA66HS	Black (BK)	100 pcs.	2;4-8	118-05050
T50MOS	PAN6481B3-06B	4.6	245.0	1.6	66.0	225	PA66HS	Black (BK)	100 pcs.	2;4-8	118-00018
T50LOS	PAN6481B3-07B	4.6	384.0	1.6	110.0	225	PA66HS	Black (BK)	100 pcs.	2;4-8	118-05900
T120ROS	PAN6481B3-08B	7.6	385.0	5.0	105.0	535	PA66HS	Black (BK)	100 pcs.	3;9-12	118-00066

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Application Tool No.

2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties for high temperatures up to +240 °C

- PEEK Ties, outside serrated

PEEK ties have been designed for the use in hazardous environments. Their suitability for high temperature applications makes them ideal for use in the drilling industry, railway, offshore or automotive industry. The excellent chemical and radium ray resistance is predestined for applications in medical engineering, chemical industry and power stations. With regard to the aerospace industry, PEEK ties are suitable due to their good weight to tensile strength ratio. Because of this combination of different properties, PEEK ties can replace metal solutions.

Features and Benefits

- For high temperature applications from -55° C up to +240° C
- Outside serrated cable tie with smooth surface to the bundle
- Close fit to the cable bundle due to the deepening head shape
- Easy insertion combined with high tensile strength
- Takes up less space due to the curved head
- Combines the performance of a metal tie with the ease of use of a polyamide cable tie
- Easy application either manually or with a processing tool

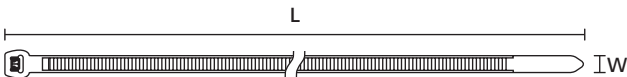


The contoured head takes up less space, gives a low insertion force and offers high strength.

MATERIAL	Polyetheretherketone (PEEK)
Operating Temperature	-55 °C to +240 °C
Flammability	UL94 V0
Specifications	GL, VDE



PAN6481



PEEK-Series

TYPE	Standards	Width (W)	Length (L)	Bundle Ø min.	Bundle Ø max.		Colour	Material	Pack Cont.	Recomm. Tools	Article-No.
PT2A	PAN6481E5-02	3.4	145.0	4.0	35.0	230	Beige (BGE)	PEEK	100 pcs.	6;8	118-00032
PT3B	PAN6481E5-06	4.7	250.0	4.0	65.0	300	Beige (BGE)	PEEK	100 pcs.	6-8;10-12	118-00116

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Application Tool No.

2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.

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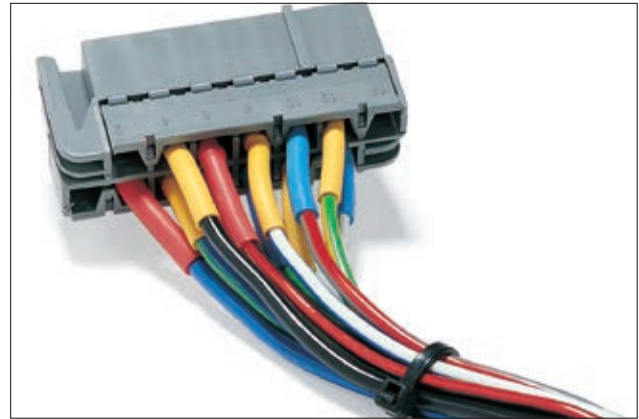
Heat Shrinkable Tubing 2:1 flexible and coloured

- **HFT-A - self extinguishing**

This high performance thin wall tubing is used extensively for electrical and mechanical protection. It is also well proven for sleeve marking to identify wiring circuits. It shrinks uniformly to form a permanent insulation covering. The transparent version is used for bundling and cable protection where visual inspection is required. It is often used as a see through protective sleeve over cable markers.

Features and Benefits

- Flexible heat shrink tubing
- Fast shrinking, easy handling, good mechanical strength
- Easy to print on
- Wide range of colours
- Internal diameters up to 4 inches (101.6 mm)
- UL-224 ,CSA listed and VG approved



HFT-A conforms to major standards used in all Defence industries.



MATERIAL	Polyolefin, cross-linked (PO-X)
Shrink Ratio	2:1
Operating Temperature	-55 °C to +135 °C
Minimum Shrink Temperature	+100 °C
Longitudinal change after shrinkage	+5%/-10%
Dielectric Strength	20 kV/mm according to IEC 60684 P2
Flammability	Self extinguishing
Specifications	CSA, DEF STAN 59-97/3, MIL-DTL-23053/5C, NF F 00-608, SAE - AMS - DTL-23053 / 5C, UL224 125 °C 600V, VG 95343



Heat Shrinkable Tubing 2:1

TYPE	Standards	Supplied Ø D min.	Size (imperial)	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Designation as per VG-Norm	Article-No.
HFT-A-3.2/1.6	PAN6493A	3.2	1/8 "	1.6	0.50	400 m	Black (BK)	VG 95343 T05 A 004 A	305-03200
	PAN6493AA	3.2	1/8 "	1.6	0.50	100 m	Red (RD)	VG 95343 T05 A 004 C	305-03202
	PAN6493AB	3.2	1/8 "	1.6	0.50	100 m	Blue (BU)	VG 95343 T05 A 004 G	305-03206
	PAN6493AC	3.2	1/8 "	1.6	0.50	100 m	Yellow (YE)	VG 95343 T05 A 004 E	305-03204
	PAN6493AE	3.2	1/8 "	1.6	0.50	100 m	White (WH)	VG 95343 T05 A 004 L	305-03209
HFT-A-4.8/2.4	PAN6493B	4.8	3/16 "	2.4	0.50	300 m	Black (BK)	VG 95343 T05 A 005 A	305-04800
	PAN6493BA	4.8	3/16 "	2.4	0.50	75 m	Red (RD)	VG 95343 T05 A 005 C	305-04802
	PAN6493BB	4.8	3/16 "	2.4	0.50	75 m	Blue (BU)	VG 95343 T05 A 005 G	305-04806
	PAN6493BC	4.8	3/16 "	2.4	0.50	75 m	Yellow (YE)	VG 95343 T05 A 005 E	305-04804
	PAN6493BE	4.8	3/16 "	2.4	0.50	75 m	White (WH)	VG 95343 T05 A 005 L	305-04809
HFT-A-6.4/3.2	PAN6493C	6.4	1/4 "	3.2	0.60	300 m	Black (BK)	VG 95343 T05 A 006 A	305-06400
	PAN6493CA	6.4	1/4 "	3.2	0.60	75 m	Red (RD)	VG 95343 T05 A 006 C	305-06402
	PAN6493CB	6.4	1/4 "	3.2	0.60	75 m	Blue (BU)	VG 95343 T05 A 006 G	305-06406
	PAN6493CC	6.4	1/4 "	3.2	0.60	75 m	Yellow (YE)	VG 95343 T05 A 006 E	305-06404
	PAN6493CE	6.4	1/4 "	3.2	0.60	75 m	White (WH)	VG 95343 T05 A 006 L	305-06409

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



TYPE	Standards	Supplied Ø D min.	Size (imperial)	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Designation as per VG-Norm	Article-No.
HFT-A-9.5/4.8	PAN6493D	9.5	3/8 "	4.8	0.60	150 m	Black (BK)	VG 95343 T05 A007 A	305-09500
	PAN6493DA	9.5	3/8 "	4.8	0.60	50 m	Red (RD)	VG 95343 T05 A007 C	305-09502
	PAN6493DB	9.5	3/8 "	4.8	0.60	50 m	Blue (BU)	VG 95343 T05 A007 G	305-09506
	PAN6493DC	9.5	3/8 "	4.8	0.60	50 m	Yellow (YE)	VG 95343 T05 A007 E	305-09504
	PAN6493DE	9.5	3/8 "	4.8	0.60	50 m	White (WH)	VG 95343 T05 A007 L	305-09509
HFT-A-12.7/6.4	PAN6493E	12.7	1/2 "	6.4	0.60	100 m	Black (BK)	VG 95343 T05 A 008 A	305-12700
	PAN6493EA	12.7	1/2 "	6.4	0.60	50 m	Red (RD)	VG 95343 T05 A 008 C	305-12702
	PAN6493EB	12.7	1/2 "	6.4	0.60	50 m	Blue (BU)	VG 95343 T05 A 008 G	305-12706
	PAN6493EC	12.7	1/2 "	6.4	0.60	50 m	Yellow (YE)	VG 95343 T05 A 008 E	305-12704
	PAN6493EE	12.7	1/2 "	6.4	0.60	50 m	White (WH)	VG 95343 T05 A 008 L	305-12709
HFT-A-19.0/9.5	PAN6493F	19.0	3/4 "	9.5	0.80	50 m	Black (BK)	VG 95343 T05 A 009 A	305-19000
	PAN6493FA	19.0	3/4 "	9.5	0.80	25 m	Red (RD)	VG 95343 T05 A 009 C	305-19002
	PAN6493FB	19.0	3/4 "	9.5	0.80	25 m	Blue (BU)	VG 95343 T05 A 009 G	305-19006
	PAN6493FC	19.0	3/4 "	9.5	0.80	25 m	Yellow (YE)	VG 95343 T05 A 009 E	305-19004
	PAN6493FE	19.0	3/4 "	9.5	0.80	25 m	White (WH)	VG 95343 T05 A 009 L	305-19009
HFT-A-25.4/12.7	PAN6493G	25.4	1 "	12.7	0.90	50 m	Black (BK)	VG 95343 T05 A 010 A	305-25400
	PAN6493GA	25.4	1 "	12.7	0.90	25 m	Red (RD)	VG 95343 T05 A 010 C	305-25402
	PAN6493GB	25.4	1 "	12.7	0.90	25 m	Blue (BU)	VG 95343 T05 A 010 G	305-25406
	PAN6493GC	25.4	1 "	12.7	0.90	25 m	Yellow (YE)	VG 95343 T05 A 010 E	305-25404
	PAN6493GE	25.4	1 "	12.7	0.90	25 m	White (WH)	VG 95343 T05 A 010 L	305-25409
HFT-A-38.0/19.0	PAN6493H	38.0	1 "	19.0	1.00	50 m	Black (BK)	VG 95343 T05 A 011 A	305-38100
	PAN6493HA	38.0	1 "	19.0	1.00	50 m	Red (RD)	VG 95343 T05 A 011 C	305-38102
	PAN6493HB	38.0	1 "	19.0	1.00	50 m	Blue (BU)	VG 95343 T05 A 011 G	305-38106
	PAN6493HC	38.0	1 "	19.0	1.00	50 m	Yellow (YE)	VG 95343 T05 A 011 E	305-38104
	PAN6493HE	38.0	1 "	19.0	1.00	50 m	White (WH)	VG 95343 T05 A 011 L	305-38109
HFT-A-2.4/1.2	PAN6493X	2.4	3/32 "	1.2	0.50	400 m	Black (BK)	VG 95343 T05 A 003 A	305-02400
	PAN6493XA	2.4	3/32 "	1.2	0.50	100 m	Red (RD)	VG 95343 T05 A 003 C	305-02402
	PAN6493XB	2.4	3/32 "	1.2	0.50	100 m	Blue (BU)	VG 95343 T05 A 003 G	305-02406
	PAN6493XC	2.4	3/32 "	1.2	0.50	100 m	Yellow (YE)	VG 95343 T05 A 003 E	305-02404
	PAN6493XE	2.4	3/32 "	1.2	0.50	100 m	White (WH)	VG 95343 T05 A 003 L	305-02409
HFT-A-1.6/0.8	PAN6493Y	1.6	1/16 "	0.8	0.40	400 m	Black (BK)	VG 95343 T05 A 002 A	305-01600
	PAN6493YA	1.6	1/16 "	0.8	0.40	400 m	Red (RD)	VG 95343 T05 A 002 C	305-01602
	PAN6493YB	1.6	1/16 "	0.8	0.40	400 m	Blue (BU)	VG 95343 T05 A 002 G	305-01606
	PAN6493YC	1.6	1/16 "	0.8	0.40	400 m	Yellow (YE)	VG 95343 T05 A 002 E	305-01604
	PAN6493YE	1.6	1/16 "	0.8	0.40	400 m	White (WH)	VG 95343 T05 A 002 L	305-01609

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.

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Heat Shrinkable Tubing 2:1 - PVDF

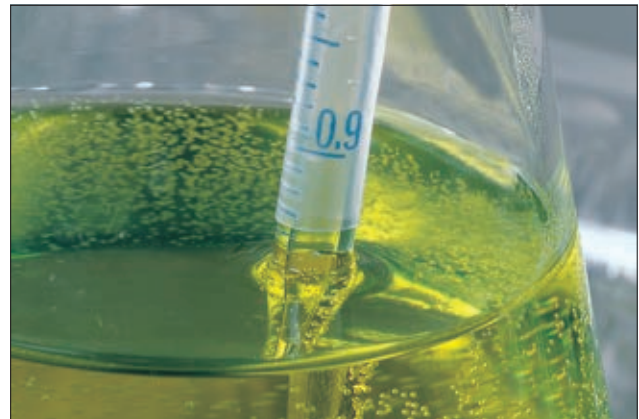
- TK20

Typical applications of this translucent tubing are where high-temperature performance is required. Also very suitable for applications that ask for visual inspection of covered components, or if a low friction surface is needed. TK20 is also used as oil stop for energy cables.

This thin walled, translucent heat shrink tubing is often used for chemical applications.

Features and Benefits

- Semi-rigid heat shrinkable tubing made of PVDF
- Thin walled and tough
- For higher temperature applications
- Very good mechanical strength, abrasion resistance and chemical resistance
- Meets various industrial standards
- Self extinguishing, UL 224 VW1 listed



This thin walled, translucent heat shrink tubing is used for chemical applications.



PAN6491

MATERIAL	Polyvinylidene Fluoride (PVDF)
Shrink Ratio	2:1
Operating Temperature	-55 °C to +175 °C
Minimum Shrink Temperature	+175 °C
Longitudinal change after shrinkage	+/-10% max
Dielectric Strength	≥ 30 kV/mm min. according to ASTM D2171
Flammability	UL224 VW-1
Specifications	SAE - AMS - DTL-23053 / 8, UL224 150 °C 600V VW-1, VG 95343

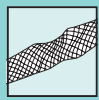


Heat Shrinkable Tubing 2:1



TYPE	Standards	Size (imperial)	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Length (L)	Colour	Designation as per VG-Norm	Article-No.
TK20-3.2/1.6	PAN6491A	1/8 "	3.2	1.6	0.25	1.2 m	Transparent (CL)	VG95343T05F004M	311-00329
TK20-4.8/2.4	PAN6491B	3/16 "	4.8	2.4	0.25	1.2 m	Transparent (CL)	VG95343T05F005M	311-00489
TK20-6.4/3.2	PAN6491C	1/4 "	6.4	3.2	0.30	1.2 m	Transparent (CL)	VG95343T05F006M	311-00649
TK20-9.5/4.8	PAN6491D	3/8 "	9.5	4.8	0.30	1.2 m	Transparent (CL)	VG95343T05F007M	311-00959
TK20-12.7/6.4	PAN6491E	1/2 "	12.7	6.4	0.30	1.2 m	Transparent (CL)	VG95343T05F008M	311-01279
TK20-19.1/9.5	PAN6491F	3/4 "	19.1	9.5	0.43	1.2 m	Transparent (CL)	VG95343T05F009M	311-01909
TK20-25.4/12.7	PAN6491G	1 "	25.4	12.7	0.48	1.2 m	Transparent (CL)	VG95343T05F010M	311-02549
TK20-2.4/1.2	PAN6491X	3/32 "	2.4	1.2	0.25	1.2 m	Transparent (CL)	VG95343T05F003M	311-00249
TK20-1.6/0.8	PAN6491Y	1/16 "	1.6	0.8	0.25	1.2 m	Transparent (CL)	VG95343T05F002M	311-00169

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



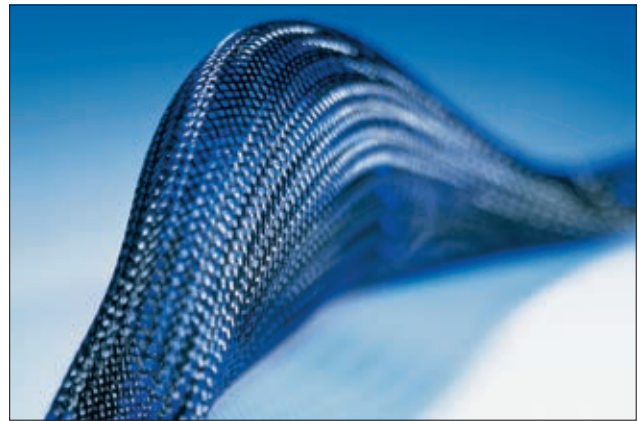
Halar® braided sleeving

- Helagain HEGHR

HelaGain HEGHR offers mechanical protection wherever superior resistance to high temperatures, chemicals or fire are required.

Features and Benefits

- Made of Halar®
- Highly flexible
- Expansion ration of 3:1
- Excellent resistance to high temperatures
- Good resistance to chemicals
- Good flame resistance
- Easy to apply over irregular shapes
- Good abrasion protection



Helagain HEGHR braided sleeving.

MATERIAL	Ethylene ChloroTriFluoroEthylene (E/CTFE)
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PAN6480



TYPE	Standards	Bundle Ø min.	Bundle Ø max.	Colour	Article-No.
HEGHR 6	PAN6480D3-64-02	3.0	9.0	Black (BK)	890-31280
HEGHR 12	PAN6480D3-127-02	6.4	19.1	Black (BK)	890-31274
HEGHR20	PAN6480D3-190-02	12.0	27.0	Black (BK)	890-31276
HEGHR 30	PAN6480D3-300-02	19.1	44.5	Black (BK)	890-31275
HEGHR 45	PAN6480D3-476-02	30.0	60.0	Black (BK)	890-31279

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content
 General linguistic usage for raw material E/CTFE is Halar® which is a registered trademark of Solvay Specialty Polymers..

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Cable Ties and Fixings

Cable Ties Inside Serrated

Cable Ties for temperatures up to + 105°C (heat stabilised)

- T-Series in PA66HS

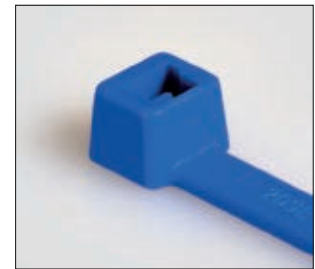
These cable ties are used for routing, bundling and securing of cables, pipes and hoses.

Features and Benefits

- Available in a wide range of material and sizes
- Made from 100% high quality plastic, allows for good recycling
- Inside serration for a strong hold onto bundles
- Easy application either manually or with a processing tool
- Simply to insert due to bent tail



T-Series in PA66HS.



T-Series in E/TFE.

MATERIAL	Polyamide 6.6, heat stabilised (PA66HS)
Operating Temperature	-40 °C to +105 °C, (+145 °C, 500 h)
Flammability	UL94 V2
Specifications	DIN 30015954, UL-ZODZ2.E85319, VG U48/04101



STD78750



T-Series.

TYPE	Standards	Width (W)	Length (L)	Bundle Ø max.	N	Material	Colour	Pack Cont.	Recomm. Tools	Article-No.
T18R	STD 78750-00	2.5	100.0	22.0	80	PA66HS	Natural (NA)	100 pcs.	2;4-6;8	111-01959
T30R	STD 78750-01	3.5	150.0	35.0	135	PA66HS	Natural (NA)	100 pcs.	2;4-6;8	111-03259
T80R	STD 78750-02	4.7	210.0	55.0	355	PA66HS	Natural (NA)	100 pcs.	2-11	111-05059
T80L	STD 78750-04	4.7	390.0	110.0	355	PA66HS	Natural (NA)	100 pcs.	2-11	111-05459

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Cable Ties for higher chemical resistance and temperatures up to +170°C in E/TFE

- T-Series in E/TFE

MATERIAL	Ethylene Tetrafluoroethylene (E/TFE)
Operating Temperature	-80 °C to +170 °C
Flammability	UL94 V0



STD78750

TYPE	Standards	Width (W)	Length (L)	Bundle Ø max.	N	Material	Colour	Pack Cont.	Recomm. Tools	Article-No.
T50L	STD 78750A07	4.7	382.0	105.0	222	E/TFE	Aquamarine (AE)	100	2-11	111-01469
T120R	STD 78750A08	7.6	387.0	100.0	310	E/TFE	Aquamarine (AE)	50	3;9-11	111-01404

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Application Tool No.										
2	3	4	5	6	7	8	9	10	11	
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.

Adhesive for Heat Shrinkable Moulded Shapes

Adhesive Specifications				
	W / W2	WM250	V9500	HMT200A
Adhesive	Hot melt adhesive	Hot melt adhesive	Two part, black, epoxy adhesive	Hot melt adhesive tape
Operating Temperature	-55 °C to +80 °C	-55 °C to +80 °C	-75 °C to +150 °C	-55 °C to +105 °C
Softening Point Adhesive	+95 °C	+95 °C		+110 °C
Supplied Form	pre-applied	pre-applied	cartridge	tape
Shelf life	5 years	5 years	18 months	5 years
Solvent Resistance	Fair under splash conditions	Fair under splash conditions	De-icing fluid: Excellent, Petrol: Excellent, Lubricating Oil: Excellent, Hydraulic Oil: Excellent	Fair under splash conditions

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Materials for Heat Shrinkable Moulded Shapes

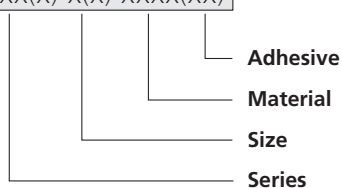
Material Specifications				
	G	B7	B8	-9
Material	Fluid resistant elastomer	Semi-rigid flame retarded polyolefin	Semi-rigid flame retarded polyolefin	Modified elastomer blend
Operating Temperature	-75 °C to +150 °C	-55 °C to +135 °C	-55 °C to +100 °C	-55 °C to 120 °C
Minimum Shrink Temperature	+135 °C	+135 °C	+135 °C	+135 °C
Specification	DEF STAN 59-97, BSG198 Part 5	MIL-I-81765/1 Type 1, DEF STAN 59-97, BSG198 Part 5	EA-TS 09-11	SCX15112
Tensile Strength	15 MPa	13 MPa	15 MPa	12 MPa
Elongation at break	580 %	500 %	500 %	500 %
Dielectric Strength	14 kV/mm	14 kV/mm	15 kV/mm	20 kV/mm
Flammability for Material	excellent	excellent	good	excellent
Features and Benefits	Excellent resistance to fuels	Good physical and chemical resistance	Good physical and reasonable chemical resistance	Good physical and reasonable chemical resistance
Typical Application	Military and general high performance harnessing	Military and general high performance harnessing	Power/utility shapes	Military and general high performance harnessing

A wider range of material/adhesive combinations are available in the moulded shapes catalogue.

Order Example

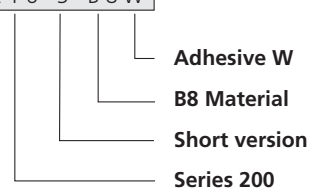
Type:

XXX(X)-X(X)-XXXX(XX)



Example:

216-3-B8W



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111-00400	T120R	BACS38K3A	14	112-05419	T50L	BACS38K2	14
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111-00836	T50L	NSA935401-08R	34	112-05460	T50L	BACS38K2A	14
111-00837	T120L	NSA935401-12R	34	112-05460	T50L	MS3367-2-0	29
111-00839	T50R	NSA935401-05G	34	112-12019	T120R	BACS38K3	14
111-00840	T50I	NSA935401-06R	34	112-12019	T120R	MS3367-3-9	29
111-01214	T50R	NSA935401-05Y	34	118-00018	T50MOS	PAN6481B3-06B	46
111-01242	T18R	ASN-E0043-4A9P	10	118-00032	PT2A	PAN6481E5-02	47
111-01243	T80R	ASN-E0043-1A0P	10	118-00066	T120ROS	PAN6481B3-08B	46
111-01244	T80R	ASN-E0043-1C0P	10	118-00116	PT3B	PAN6481E5-06	47
111-01245	T80L	ASN-E0043-2C0P	10	118-04700	T18ROS	PAN6481B3-01B	46
111-01246	T150R	ASN-E0043-3C0P	10	118-04800	T30ROS	PAN6481B3-02B	46
111-01247	T18R	ASN-E0043-4C0P	10	118-04900	T30LOS	PAN6481B3-03B	46
111-01248	T30R	ASN-E0043-5C0P	10	118-05050	T50ROS	PAN6481B3-05B	46
111-01250	T18R	NSA935401-03	34	118-05850	T50SOS	PAN6481B3-04B	46
111-01252	T50R	NSA935401-05	34	118-05900	T50LOS	PAN6481B3-07B	46
111-01254	T50I	NSA935401-06	34	170-02000	HEGMANWO-02	DIN EN6049-004-02-5	18
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111-01256	T120L	NSA935401-12	34	170-02002	HEGMANWO-06	DIN EN6049-004-06-5	18
111-01259	T30R	NSA935401-04	34	170-02003	HEGMANWO-08	DIN EN6049-004-08-5	18
111-01261	T30LL	NSA935401-13	34	170-02004	HEGMANWO-10	DIN EN6049-004-10-5	18
111-01262	T50R	NSA935401-05R	34	170-02005	HEGMANWO-15	DIN EN6049-004-15-5	18
111-01272	T50L	ASN-E0043-2B0P	11	170-02006	HEGMANWO-20	DIN EN6049-004-20-5	18
111-01272	T50L	NSA935401-08	34	170-02007	HEGMANWO-25	DIN EN6049-004-25-5	18
111-01394	T50R	STD 78750A06	52	170-02008	HEGMANWO-30	DIN EN6049-004-30-5	18
111-01404	T120R	STD 78750A08	52	170-02100	HEGMAN-02	DIN EN6049-003-02-5	18
111-01409	T30R	NSA935401-04R	34	170-02101	HEGMAN-04	DIN EN6049-003-04-5	18
111-01460	T30R	NSA935401-04	34	170-02102	HEGMAN-06	DIN EN6049-003-06-5	18
111-01469	T50L	STD 78750A07	52	170-02103	HEGMAN-08	DIN EN6049-003-08-5	18
111-01540	T30R	NSA935401-04	34	170-02104	HEGMAN-10	DIN EN6049-003-10-5	18
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111-01679	T30R	NSA940000-23302	35	170-02106	HEGMAN-20	DIN EN6049-003-20-5	18
111-01680	T50R	NSA940000-23303	35	170-02107	HEGMAN-25	DIN EN6049-003-25-5	18
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111-01682	T50L	NSA940000-23305	35	174-00011	LTHT3A4NA	NSA8420-1	43
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111-01684	T120L	NSA940000-23307	35	174-00020	LTHT1B3NA	NSA8420-3	42
111-01909	T18R	NSA935401-03R	34	174-00022	LCHT4D11NA	DAN107-1	17
111-01959	T18R	STD 78750-00	52	174-00023	LCHT4D20NA	DAN107-2	17
111-03259	T30R	STD 78750-01	52	174-00024	LTHT2E4BK	01FFFF4BK	28
111-05059	T80R	STD 78750-02	52	174-00024	LTHT2E4BK	NSA8420-8	42
111-05256	T50I	BACS38K7A	14	174-00227	LCHT1A25NA	NSA8420-0	41
111-05256	T50I	MS3367-7-0	29	174-00229	LTHT1B2NA	NSA8420-4	42
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111-85119	IT50RT	MS3368-4-9D	32	211-15150	ALU15C	MS2191 DG13	30
111-85219	IT50RD	MS3368-3-9C	32	211-15230	ALU23C	MS2191 DG21	30
111-85319	IT50L	MS3368-2-9A	32	211-15260	ALU26C	MS2191 DG24	30
112-01819	T18R	BACS38K9	14	211-15300	ALU30C	MS2191 DG28	30
112-01819	T18R	MS3367-4-9	29	251-21109	G51NA	MS21266-1N	31
112-01860	T18R	BACS38K9A	14	251-21109	G51NA	NASM21266-1N	33
112-01860	T18R	MS3367-4-0	29	251-21109	G51NA	NSA939510AN	40
112-03019	T30R	MS3367-5-9	29	251-21209	G51NB	MS21266-2N	31
112-03060	T30R	MS3367-5-0	29	251-21209	G51NB	NASM21266-2N	33
112-05019	T50R	BACS38K1	14	251-21209	G51NB	NSA939510BN	40
112-05019	T50R	MS3367-1-9	29	251-21309	G51NC	MS21266-3N	31
112-05060	T50R	BACS38K1A	14	251-21309	G51NC	NASM21266-3N	33
112-05060	T50R	MS3367-1-0	29	251-21309	G51NC	NSA939510CN	40
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251-21509	G51NE	NSA939510EN	40	305-04802	HFT-A-4.8/2.4	NSA937211-003D	36,37
251-21609	G51NF	MS21266-6N	31	305-04802	HFT-A-4.8/2.4	PAN6493BA	48,49
251-21609	G51NF	NASM21266-6N	33	305-04804	HFT-A-4.8/2.4	PAN6493BC	48,49
251-21609	G51NF	NSA939510FN	40	305-04806	HFT-A-4.8/2.4	ASN-E0126-03H	12
251-21709	G51NG	MS21266-7N	31	305-04806	HFT-A-4.8/2.4	PAN6493BB	48,49
251-21709	G51NG	NASM21266-7N	33	305-04809	HFT-A-4.8/2.4	ASN-E0126-03L	12
251-21709	G51NG	NSA939510GN	40	305-04809	HFT-A-4.8/2.4	PAN6493BE	48,49
251-21809	G51NH	MS21266-8N	31	305-06400	HFT-A-6.4/3.2	ASN-E0126-04B	12
251-21809	G51NH	NASM21266-8N	33	305-06400	HFT-A-6.4/3.2	01PRORNF1-4BK	23
251-21809	G51NH	NSA939510HN	40	305-06400	HFT-A-6.4/3.2	NSA937211-004B	36,37
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251-30609	G51TF	MS21266-6T	31	305-09500	HFT-A-9.5/4.8	NSA937211-005B	36,37
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251-30809	G51TH	MS21266-8T	31	305-09504	HFT-A-9.5/4.8	PAN6493DC	48,49
251-30809	G51TH	NASM21266-8T	33	305-09506	HFT-A-9.5/4.8	PAN6493DB	48,49
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