

金めっきシールドスミカード

金めっきシールドスミカード Au-PLATING SHIELDED SUMI-CARD

RoHS Directive					
Lead Free	Hg Free	Cd Free	Cr ⁶⁺ Free	PBB Free	PBDE Free

金めっきスミカードに新グラウンド接続方式のシールド構造を付加し、“EMI 対策”、“ウィスカ対策”を両立させたフラットケーブルです。

Added the shield function to Gold plated SUMI-CARD which has an excellent whisker preventive effect.

用 途

- ・ FPD・ゲーム機・DVD・ノート PC 等、ノイズ対策を必要とする製品の機内配線。

APPLICATION

- ・ SHIELDED SUMI-CARD with Au plated is used for internal wiring of electronic equipment, FPD, game machine, DVD, notebook PC.

特 長

- ・ “EMI 対策”と“ウィスカ対策”を両立
- ・ グラウンド線ーシールドテープ間を接続することにより、EMI 特性を強化
- ・ 高屈曲性であり、摺動部にも使用可能

DESCRIPTION

- ・ Compatible both shield structure for measure against EMI and gold plated on the terminal for measure against whisker.
- ・ We have developed new connection structure between shield material and GND conductor which will be able to locate anywhere you want.
- ・ SHIELDED SUMI-CARD with gold plated has a high bending characteristic which is suitable for sliding use.

構造 CONSTRUCTION

項 目 ITEM		構 成 DETAIL
製品区分略号 SYMBOL NAME		SML2SC
導 体 CONDUCTOR	材 質 MATERIAL	軟銅箔 Annealed copper
	サイズ SIZE	0.035mm 厚× 0.3mm 巾 t:0.035mm × w:0.035mm
	めっき PLATING	全体：ニッケルめっき（厚み：0.3 μ m 以上） Whole：Nickel (Thickness：min.0.3 μ m) 末端部：金めっき（厚み：0.05 μ m 以上） Terminal：Gold (Thickness：min.0.05 μ m)
絶縁体 INSULATION	材 質 MATERIAL	ポリエステル（接着層：難燃ポリエステル系接着剤） Polyester (Adhesive layer：Flame-retardant polyester adhesive)
	色 COLOR	白 White
補強テープ SUPPORTING TAPE	材 質 MATERIAL	ポリエステル Polyester
	色 COLOR	青 Blue
シールドテープ SHIELD TAPE		PET（外層）＋金属層＋導電性フィラー（内層） PET(Outer) + Metallic layer + Copper coated with Silver(Inner)
GND 加工部絶縁テープ INSULATION FOR GND	UL 2896,20861	PPS＋粘着剤 PPS/Adhesive
	UL 21147	ポリイミド＋粘着剤 Polyimide/Adhesive

※本カタログの仕様・構成等は性能改善の為、お断り無く変更する場合がございます。

※ This specification is subject to change without a prior announcement.

UL スタイルと適用品種 UL STYLE No. AND PRODUCTS

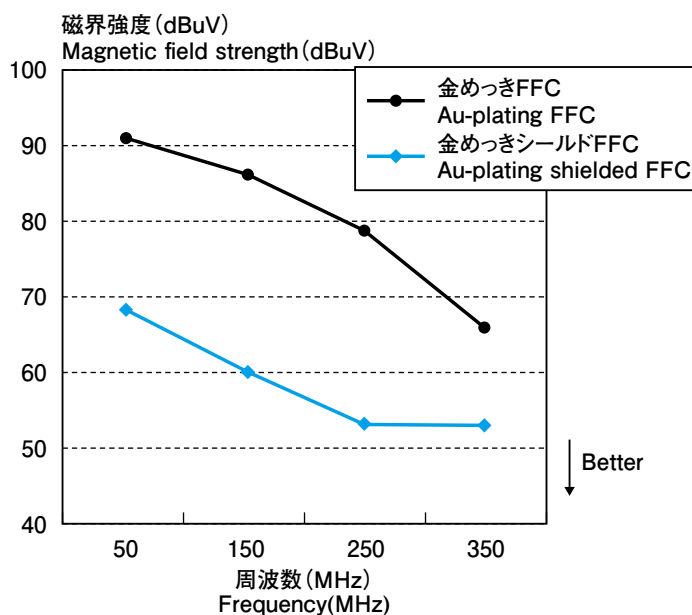
ワイヤリングハーネス (UL 認定番号 E66078 となります) WIRING HARNESS (UL Approved Number E66078)

製品区分略号 SYMBOL NAME	UL スタイル No. UL STYLE No.	UL 定格 UL RATING	導体厚 CONDUCTOR THICKNESS (mm)	仕上厚 CABLE THICKNESS (mm)
SML2SC	2896	80°C 30V	0.035	0.20
	20861	105°C 60V		0.24
	21147	80°C 60V		0.22

性能 PROPERTIES

項目 ITEM		性能 SPEC		
UL スタイル No. UL STYLE No.		UL2896	UL20861	UL21147
導体抵抗 CONDUCTOR RESISTANCE		2,200 Ω /km 以下 Max. 2,200 Ω /km		
絶縁抵抗 INSULATION RESISTANCE		1,000M Ω -m 以上 Min. 1,000 M Ω -m		
耐電圧 DIELECTRIC STRENGTH	隣接導体間 BETWEEN ADJACENT CONDUCTORS	AC500V-1 分 絶縁破壊無し AC500V-1min No Dielectric Breakdown		
	導体／シールド間 CONDUCTORS / SHIELD	AC250V-1 分 絶縁破壊無し AC250V-1min No Dielectric Breakdown		
静電容量 CAPACITANCE		579 pF/m (参考値 / Ref.)	501 pF/m (参考値 / Ref.)	552 pF/m (参考値 / Ref.)
難燃性 FLAME TEST		UL 垂直難燃試験合格 (VW - 1) VW-1 Pass		
180° 折り重ね屈曲 (自己径屈曲) FOLDING TEST		30 回以上 ※グラウンド加工部以外 Min. 30 times *Excluding the ground processing		
往復摺動 SLIDING TEST		1,500 万回以上 (摺動半径 15mmR) ※グラウンド加工部以外 Min. 15million times (15mmR) *Excluding the ground processing		

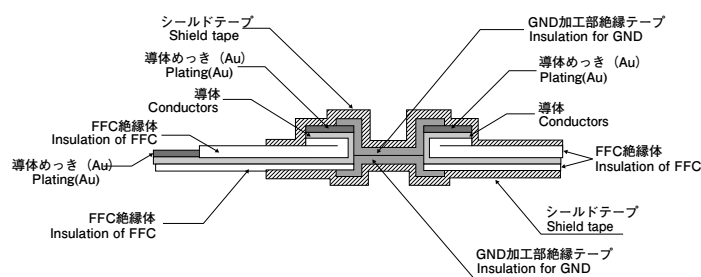
EMI 特性 EMI



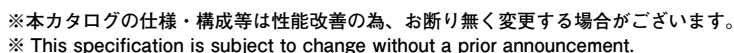
※本カタログの仕様・構成等は性能改善の為に参考値と異なり変更する場合があります。御評価をお願い致します。
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項 目 ITEM	仕 様 DIMENSION	
導体間ピッチ PITCH (P)	0.5	
導体巾 CONDUCTOR WIDTH (A)	0.3	
トータルピッチ TOTAL PITCH (TP)	体数 $P \times (n - 1)$ n= 導	
仕上巾 CABLE WIDTH (W)	$P \times (n + 1)$	
マージン巾 MARGIN WIDTH (M)	0.35	
端末厚 TERMINAL THICKNESS (TT)	0.3	
ストリップ長 STRIP LENGTH (S)	標準 3 , 4 , 5 Standard 3 , 4 , 5	
補強テープ長 SUPPORTING TAPE LENGTH (H)	標準 5 , 6 , 7 Standard 5 , 6 , 7	
絶縁長 INSULATION LENGTH (I)	BD タイプ 55 以上 BD type Min.55	AD タイプ 70 以上 AD type Min.70
全 長 CABLE LENGTH (L)	650 以下 Max.650	
グラウンド位置・本数 GROUND ROCACTION / NUMBER	グラウンド位置：任意 Ground rocation：anywhere	グラウンド本数：4 本以下 Ground number：Max 4



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HEAT SHRINKABLE TUBING FOR EUROPE





Production and Distribution Center, Norderstedt



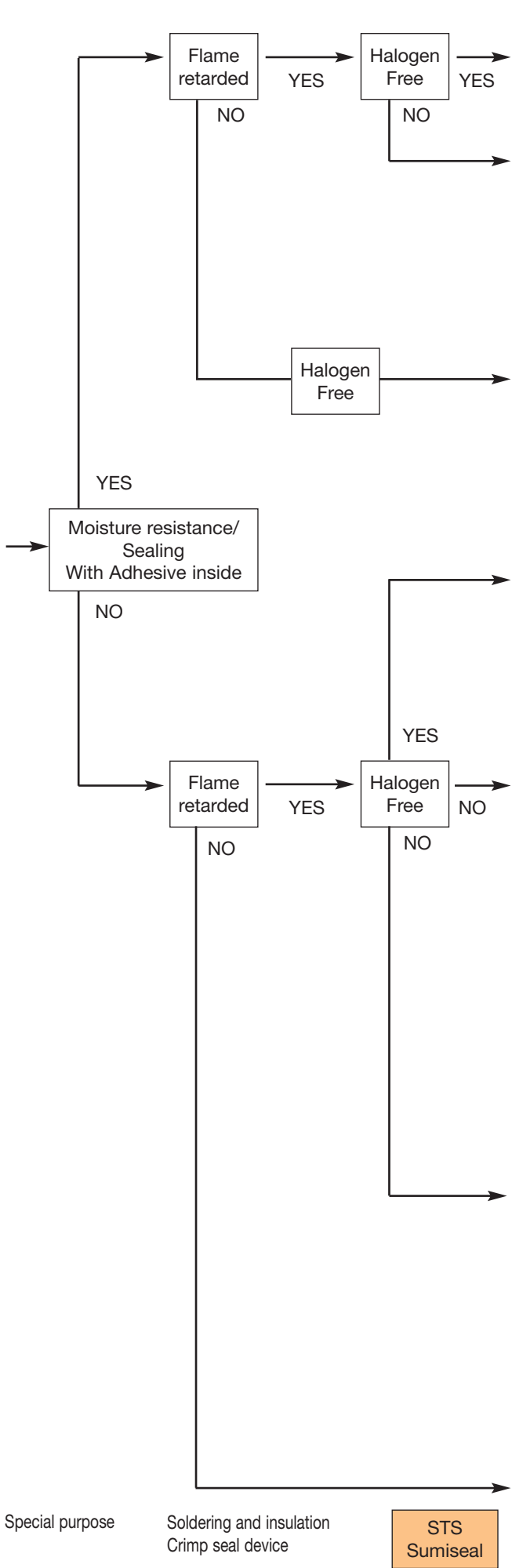
Sumitomo Electric Fine Polymer, Inc. – Japan

In 1985 SUMITOMO ELECTRIC INDUSTRIES Ltd. established a German branch in Hamburg to bring heatshrink technology to Europe. Within a few years it was decided to change this business from a trading house to a full production and distribution facility.

A purpose-built premises was established in nearby Norderstedt, a suburb of Hamburg. This area is noted for excellent access and communications. The new factory was opened in December 1989. The company is now called SUMITOMO ELECTRIC Schrumpf-Produkte GmbH (SESP) and is proud to have achieved the following in the period leading up to the new millennium:

- Succeeded in changing from a trading house to a full-scale manufacturer in its own right. We market our products and serve our customers all over Europe. All necessary production processes and operations (extrusion, irradiation, expansion and rewinding/cutting) are carried out on site.
- Opened a second production facility at nearby Wedel, on the river Elbe. This second plant includes additional warehousing.
- Increased the levels of local production and product types, to distinguish it from Japanese production.
- The SESP Quality Management System is certified in accordance with ISO 9001:2000. This assists to maintain and improve the product quality and customer service together with all the associated aspects





DUAL-WALL Polyolefin

Max. Operation Temperature	105°		3:1	W3NH
	110°	Commercial	3:1	W5B11
		Commercial	4:1	W5B11(4X)
	125°	UL/CSA/SAE-AMS	3:1	W3B2
		UL/CSA	4:1	W3B2(4X)
	130°	Commercial	3:1	SA2
	105°	Commercial	3:1	W5C
		Commercial	4:1	W5C(4X)
	110°	Semi-rigid		W5DL
		Flexible, Medium Wall		SCM2

SINGLE-WALL Polyolefin

Max. Operation Temperature	105°	Normal wall thickness	2:1	NH
		Thin wall thickness	2:1	NH(TW)
		Normal wall thickness	3:1	NH(3X)
	125°	Commercial	2:1	B11
		Commercial	3:1	B11(3X)
		UL/CSA	2:1	F2(Z)
		Thin wall UL/CSA	2:1	F4(Z)
	135°	UL/CSA/SAE-AMS	2:1	B2, B2(Y/G)
		UL/CSA	3:1	B2(3X)
		UL	4:1	B2(4X)
	150°	SAE-AMS	2:1	BR10

Special (Fluoropolymer, Elastomer)

Max. Operation Temperature	120°	SAE-AMS	Elastomer	R10
	175°	UL/CSA/SAE-AM	Cut	K
		UL/SAE-AMS	Spool	K2
	200°	SAE-AMS/UL	Fluoroplastic	KH200
		SAE-AMS	Fluoroplastic Thin wall	KH200(TW)
		SAE-AMS	Fluoro Elastomer	FE3
	230°	SAE-AMS	Fluoroplastic	KH230
		SAE-AMS	Fluoroplastic Thin wall	KH230(TW)
	250°	Silicone Rubber		SR

SINGLE-WALL Polyolefin

Max. Op. Temp.	105°	Commercial		A
	135°	SAE-AMS Clear	2:1	A2
		SAE-AMS Clear	3:1	A2(3X)
		Thin wall Automotive		B55



SUMITOMO ELECTRIC'S diverse range of SUMITUBE® heat shrinkable tubing are manufactured in more than ten colours. Their range of sizes offer a vast field of applications. The base for most of our SUMITUBE® thin wall tubing is irradiated cross-linked polyolefin. SUMITUBE® has been approved for worldwide standards and applications.

Products		Characteristics	Min. Shrink Temp. (°C)
Single Wall Polyolefin Tubings	B11	Flexible, commercial grade, flame retardant	90
	B11(3X)	Flexible, commercial grade, flame retardant, high-srink ratio	90
	B2	Very flexible, high grade, highly flame retardant	90
	B2(3X), B2(4X)	Very flexible, high grade, highly flame retardant, high-srink ratio	90
	NH, NH(TW)	Flexible, halogen free flame retardant, low smoke emission	115
	NH(3X)	Flexible, halogen free flame retardant, low smoke emission, high-srink ratio	115
	BR10	Very flexible, high temp. (150C) grade, highly flame retardant, PBB & PBBO free	100
	B55	Very flexible, light weight vor Automotive application, Halogen free	90
	F2(Z)	Very flexible, highly flame retardant, PBB & PBBO free, marking on tubing	90
	F4(Z)	Very flexible, highly flame retardant, PBB & PBBO free, marking on tubing ultra thin wall	90
	A	Flexible, commercial grade, halogen free	115
	A2, A2(3X)	Flexible, clear, clear purpose, halogen free	110
Dual Wall Polyolefin Tubings	W5B11, W5B11(4X)	Flexible, commercial grade, flame retardant, inner liner of hot melt adhesive	110
	W3B2, W3B2(4X)	Flexible, flame retardant, inner liner of hot melt adhesive	110
	W3NH	Flexible, halogen free flame retardant, low smoke emission, inner liner of hot melt adhesive	115
	SA2	Semi rigid, flame retardant, thick inner liner of hot melt adhesive	110
	W5C, W5C(4X)	Flexible, clear, inner liner of hot melt adhesive, Halogen free	110
	W5DL	Semi rigid, meltable polyolefin inner liner, Halogen free	150
Fluoro-plastics	K	Semi rigid, highly flame retardant, Polyvinylidenfluoride (Kynar)	170
	K2	Semi rigid, highly flame retardant, spool, Polyvinylidenefluoride (Kynar)	160
	KH200, KH200(TW)	Very flexible, clear, highly flame retardant, Fluoropolymer	130
	KH230, KH230(TW)	Very flexible, colour, highly flame retardant, Fluoropolymer	130
Elastomers	R10	Flexible, highly flame retardant, Elastomer	150
	FE3	Very flexible, highly flame retardant, Fluoropolymer	150
Specials	SR	Flame retardant, silicon rubber HS Tubing	140
	Sumiseal	Crimp sealing sleeve, Halogen free	150
	STS HC, LC	Solder Termination Sleeve	185, 145
	SCM2	Flexible, medium wall, inner liner of hot melt adhesive, Halogen free	90
	SCR100	Stress control sleeve for medium voltage application	150

Product Overview

Operating Temp. (°C)	Size Rang (mm)	Shrink Ratio	Main Specifications	Page
-55 ~ 125	1.2 ~ 101.6	2:1		5
-55 ~ 125	3 ~ 24	3:1		6
-55 ~ 135	1.2 ~ 101.6	2:1	UL224 125°C 600V VW-1, CSA C22.2 No. 198.1 125°C 600V VW-1, SAE-AMS-DTL-23053/5 Class1	7
-55 ~ 135	1.5 ~ 101.6	3:1, 4:1	UL224 125°C 600V VW-1, CSA C22.2 No. 198.1 125°C 600V VW-1(B2(3X only)	8
-40 ~ 105	1.2 ~ 101.6	2:1	DEF-STAN 59.97 Type 8(NH only) London underground Spec. E1042-A6-March 2002	9
-40 ~ 105	1.5 ~ 40	3:1	London underground Spec. E1042-A6-March 2002	10
-55 ~ 150	3.2 ~ 25.4	2:1	SAE-AMS-DTL-23053/5 Class 1	11
-70 ~ 135	1.2 ~ 76.2	2:1		12
-55 ~ 125	1.2 ~ 50.8	2:1	UL224 125°C 600V VW-1, CSA C22.2 No. 198.1 125°C 600V VW-1	13
-55 ~ 125	1.2 ~ 25.4	2:1	UL224 125°C 300V VW-1, CSA C22.2 No. 198.1 125°C 150V VW-1	14
-55 ~ 105	1.2 ~ 76.2	2:1		15
-55 ~ 135	1.2 ~ 101.6	2:1, 3:1	SAE-AMS-DTL-23053/5 Class 2, Def stan 59-97 Type 2B (A2 only)	16
-55 ~ 110	3 ~ 40	3:1, 4:1		17
-55 ~ 110	3 ~ 52	3:1, 4:1	UL224 125°C 600V VW-1, CSA C22.2 No. 198.1 125°C 600V (Only W3B2), SAE-DTL-23053/4 Class 3	18
-55 ~ 105	3.2 ~ 25.4	3:1	London underground Spec. E1042-A6-March 2002	19
-40 ~ 130	5.8 ~ 17.8	4:1		20
-55 ~ 105	3 ~ 40	3:1, 4:1		21
-55 ~ 110	3.2 ~ 25.4	3:1	SAE-AMS-DTL-23053/4 Class 1	22
-55 ~ 175	1.2 ~ 50.8	2:1	UL224 150°C 600V VW-1, CSA C22.2No.198.1 150°C 600V VW-1, SAE-AMS-DTL-23053/8, Def-Stan 59-92 Type3, VG95343/5 F-1	23
-55 ~ 175	1.2 ~ 50.8	2:1	UL224 VW-1, SEA-AMS-DTL-23053/18 class 3	24
-55 ~ 200	3.2 ~ 25.4	2:1	SAE-AMS-DTL-23053/13, UL224 VW-1(KH200), SAE-AMS-DTL-23053/18 class 3 (KH200(TW)),	25
-55 ~ 230	3.2 ~ 25.4	2:1	SAE-AMS-DTL-23053/13(KH230), SAE-AMS-DTL-23053/18 class 3 (KH230(TW))	26
-75 ~ 120	3.2 ~ 50.8	2:1	UL224 105°C 600V VW-1,SAE-AMS-DTL-23053/1 Class2	27
-55 ~ 200	3.2 ~ 50.8	2:1	SEA-AMS-DTL-23053/13, MIL-R-46848 Type III class 1	28
-60 ~ 250	2.9 ~ 70	2:1		29
-55 ~ 105	4.2 ~ 6.4	3:1		30
-54 ~ 150, 105	2.5 ~ 13.8	2:1	NAS 1745, NAS 1747, SAE-AS83519	31
-55 ~ 110	10.2 ~ 125	3:1		32
~ 90	16 ~ 95	2:1		33

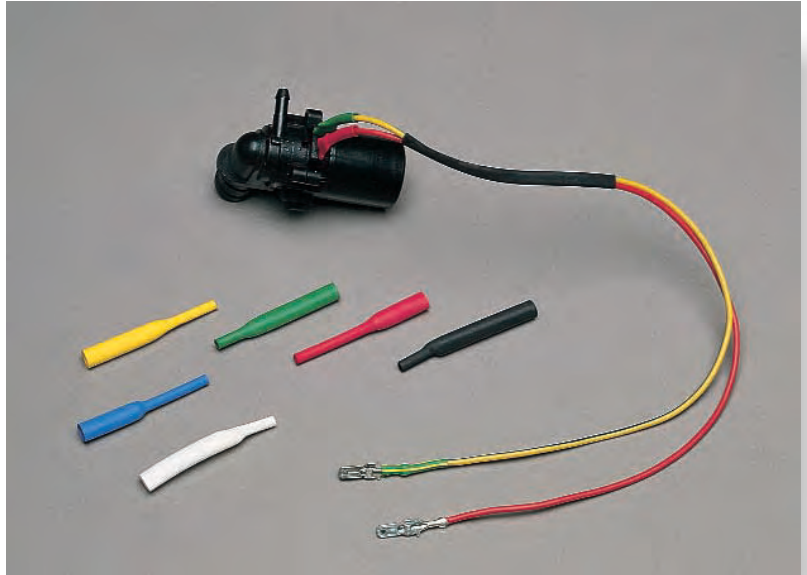


Commercial grade flame retardant flexible polyolefin tubing. Versatile, approved for many industrial applications.

Characteristics

- Operating Temperature:
-55°C–125°C
- Min. Shrink Temperature: 90°C
Shrinking start at 60°C
- Shrink Ratio: 2:1
- Dielectric Strength: 28kV/mm
- Standard Colour(s):
Black, Red, Yellow, Green, Blue, White

SINGLE WALL POLYOLEFIN



Application Fields

General insulation, cable bundling, mechanical protection in electric and automotive industries. Colour coding of cable harnesses.

Remarks

Other colours and 1.2m cut length available upon request.

Table of Standard Sizes and Packaging

B11 Type/Size (Inch)	Inside Diameter (mm)		Wall Thickness (mm) Recovered (nom.)	Quantity per Spool / Box (m)
	Expanded (min.)	Recovered (max.)		
3/64	1.20	0.60	0.41	300/900
1/16	1.60	0.80	0.43	300/900
3/32	2.40	1.20	0.51	150/900
1/8	3.20	1.60	0.51	150/900 ¹
3/16	4.80	2.40	0.51	60/600 ²
1/4	6.4	3.20	0.64	60/300 ³
3/8	9.5	4.80	0.64	60/300
1/2	12.7	6.4	0.64	60/300
3/4	19.1	9.5	0.76	60/180
1	25.4	12.7	0.89	60/180
1-1/4	31.8	15.9	1.01	60/180
1-1/2	38.1	19.1	1.02	60/180
2	50.8	25.4	1.14	60/120
3	76.2	38.1	1.27	60/60
4	101.6	50.8	1.40	60/60

Packaging of black colour:

1 = 300/900

2 = 150/600

3 = 100/300

Commercial grade flame retardant flexible polyolefin tubing with 3:1 shrink ratio

Characteristics

- Operating Temperature:
-55°C–125°C
- Min. Shrink Temperature: 90°C
Shrinking start at 60°C
- Shrink Ratio: 3:1
- Dielectric Strength: 25 kV/mm
- Standard Colour(s): Black

SINGLE WALL POLYOLEFIN



Application Fields

General insulation, cable bundling, mechanical protection in electric and automotive industries. Where high expansion ratio's are needed.

Table of Standard Sizes and Packaging

B11 Type/Size (mm)	Inside Diameter (mm)		Wall Thickness (mm)	Quantity per Spool / Box (m)
	Expanded (min.)	Recovered (max.)	Recovered (nom.)	
3/1	3.00	1.00	0.60	150/900
6/2	6.0	2.00	0.70	60/300
9/3	9.0	3.00	0.80	60/300
12/4	12.0	4.00	0.85	60/300
18/6	18.0	6.0	1.00	60/180
24/8	24.0	8.0	1.20	60/180

Very flexible highly flame retardant high grade polyolefin tubing. SAE-AMS UL and CSA recognised. Meets the requirements of a wide range of industrial and high tech standards. Very versatile through excellent balance of chemical, electrical and mechanical properties. Yellow-green striped version available.

Characteristics

- Operating Temperature:
-55°C–135°C
- Min, Shrink Temperature: 90°C
Shrinking start at 60°C
- Shrink Ratio: 2:1
- Dielectric Strength: 37 kV/mm
- Standard Colour(s):
Black, Red, Yellow, Blue, White,
Yellow-green striped (B2(Y/G))
- Specifications:
SAE-AMS-DTL-23053/5 class 1
UL224 125°C 600V VW-1, CSA C22.2
No. 198.1 125°C 600V VW-1

SINGLE WALL POLYOLEFIN



Application Fields

Wire and harness marking sleeves, colour coding, insulation, covering and jacketing of quality demanding harness systems in electrical, automotive and aeronautic industries.

Remarks

Non-standard colours and cut length of 1.2m available upon request.

Table of Standard Sizes and Packaging

B2 Type/Size (Inch)	Inside Diameter (mm)		Wall Thickness (mm) Recovered	Quantity per Spool / Box (m)
	Expanded (min.)	Recovered (max.)		
3/64	1.20	0.60	0.41 +/-0.07	300/900
1/16	1.60	0.80	0.43 +/-0.07	300/900
3/32	2.40	1.20	0.51 +/-0.07	150/900
1/8	3.20	1.60	0.51 +/-0.07	150/900
3/16	4.80	2.40	0.51 +/-0.07	60/600
1/4	6.4	3.20	0.64 +/-0.07	60/300
3/8	9.5	4.80	0.64 +/-0.07	60/300
1/2	12.7	6.4	0.64 +/-0.07	60/300
3/4	19.1	9.5	0.76 +/-0.07	60/180
1	25.4	12.7	0.89 +/-0.12	60/180
1-1/2	38.1	19.1	1.02 +/-0.15	60/180
2	50.8	25.4	1.14 +/-0.17	60/120
3	76.2	38.1	1.27 +/-0.20	60/60
4	101.6	50.8	1.40 +/-0.22	30/30

Very flexible highly flame retardant high grade polyolefin tubing. UL and CSA recognised. High shrink ratios cover large bore differences, such as harness with pre-installed connections and pre-fabricated cables.

Characteristics

- Operating Temperature: -55°C–135°C
- Min. Shrink Temperature: 90°C
Shrinking start at 60°C
- Shrink Ratio: 3:1, 4:1
- Dielectric Strength: 37 kV/mm
- Standard Colour(s): Black, Red, Yellow, Blue, White, Yellow-green striped (B2(Y/G, 3X)); Black (B2(4X))
- Specifications: UL224 125°C 600V VW-1, CSA C22.2 No. 198.1 125°C 600V OFT (B2 (3X) only)

SINGLE WALL POLYOLEFIN



Application Fields

Repair of cables with installed connectors, electrical insulation especially to cover large diameter gaps, bundling and harnessing. Yellow-green striped version where identification of the ground lead is intended.

Remarks

Non-standard colours are available upon request.

Table of Standard Sizes and Packaging

B2(3X) Type/Size (mm)	Inside Diameter (mm)		Wall Thickness (mm)	Quantity per
	Expanded (min.)	Recovered (max.)	Recovered (nom.)	Spool / Box (m)
1.5/0.5	1.50	0.50	0.50	300/900
3/1	3.00	1.00	0.60	150/900
4.8/1.6	4.80	1.60	0.65	100/500
6/2	6.0	2.00	0.70	60/300
9/3	9.0	3.00	0.80	60/300
12/4	12.0	4.00	0.85	60/300
18/6	18.0	6.0	1.00	60/180
24/8	24.0	8.0	1.20	60/180
40/13	40.0	13.0	1.25	60/180
B2(4X) (Inch)				Bag / Box (m)
1	25.4	6.6	1.52	18/90
1-1/2	38.1	9.5	1.52	12/60
2	50.8	12.7	1.52	12/60
3	76.2	19.1	1.52	4.5/27*
4	101.6	25.4	1.52	4.5/27*

Remarks

1" to 2":
Cut length 1.2 m in bags/boxes,
*3" and 4" in cut length of 0.9 m in bags/boxes

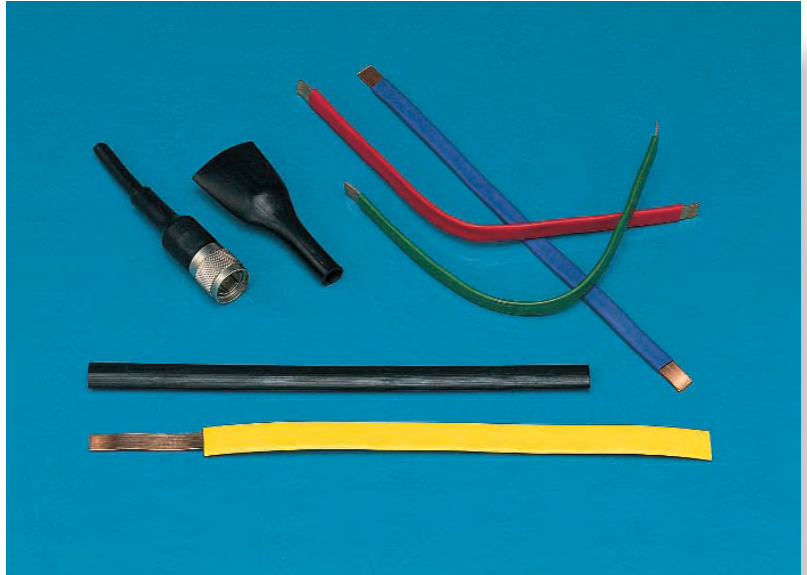


Halogen free flame retardant flexible polyolefin tubing. Low smoke index to meet strict fire security standards in electrical insulation and protection in public areas. Thin wall version.

Characteristics

- Operating Temperature:
-40°C–105°C
- Min.Shrink Temperature: 115°C
Shrinking start at 60°C
- Shrink Ratio: 2:1
- Dielectric Strength: 30 kV/mm
- Standard Colour(s):
Black, Red, Yellow, Green, Blue, White
- Specifications:
DEF-STAN 59-97 Type 8

SINGLE WALL POLYOLEFIN



Application Fields

In all smoke sensitive areas such as public buildings, public transport, power plants, hospitals, airports and submarines. London underground Spec. E1042-A6-March 2002

Remarks

Non-standard colours are available upon request.

Table of Standard Sizes and Packaging

NH Type/Size (Inch)	Inside Diameter (mm)		Wall Thickness (mm) Recovered (nom.)	Quantity per Spool / Box (m)
	Expanded (min.)	Recovered (max.)		
1/8	3.20	1.60	0.70+/-0.10	150/600
3/16	4.80	2.40	0.85+/-0.15	60/300
1/4	6.4	3.20	0.90+/-0.15	60/300
3/8	9.5	4.80	1.00+/-0.15	30/150
1/2	12.7	6.4	1.20+/-0.18	30/150
3/4	19.1	9.5	1.40+/-0.25	30/90
1	25.4	12.7	1.80+/-0.30	30/90
NH(TW)				
1/8	3.20	1.60	0.51	150/600
3/16	4.80	2.40	0.51	60/300
1/4	6.4	3.20	0.64	60/300
3/8	9.5	4.80	0.64	60/300
1/2	12.7	6.4	0.64	30/300
3/4	19.1	9.5	0.76	60/180
1	25.4	12.7	0.89	60/180
1-1/2	38.1	19.1	1.02	60/180
2	50.8	25.4	1.14	60/120
3	76.2	38.1	1.27	60/60
4	101.6	50.8	1.40	30/30

Remarks

Non-standard colours are available upon request.

Halogen free flame retardant flexible polyolefin tubing. Low smoke index to meet strict fire security standards in electrical insulation and protection in public areas. Thin wall version. 3:1 shrink ratio version.

SINGLE WALL POLYOLEFIN

Characteristics

- Operating Temperature: -40°C–105°C
- Min.Shrink Temperature: 115°C
Shrinking start at 60°C
- Shrink Ratio: 3:1
- Dielectric Strength: 30 kV/mm
- Standard Colour(s): Black



Application Fields

In all smoke sensitive areas such as public buildings, public transport, power plants, hospitals, airports and submarines. Especially for easy installation to parts with large deminsional differences.

London underground spec. E1042-A6-March 2002

Remarks

Non-standard colours are available upon request.

Table of Standard Sizes and Packaging

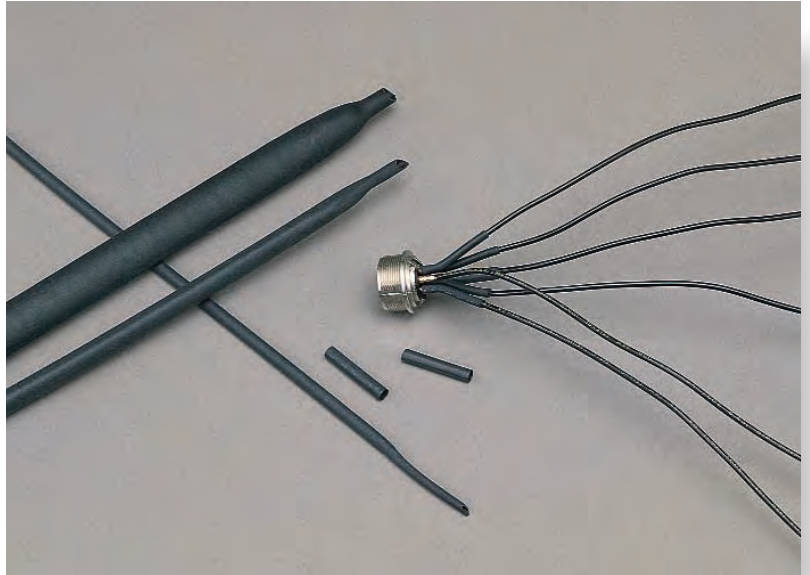
NH(3X) Type/Size (mm)	Inside Diameter (mm)		Wall Thickness (mm)	Quantity per Bag / Box (m)
	Expanded (min.)	Recovered (max.)	Recovered (nom.)	
1.5/0.5	1.50	0.50	0.50	60/600
3/1	3.00	1.00	0.60	60/600
6/2	6.00	2.00	0.70	60/300
9/3	9.0	3.00	0.80	60/300
12/4	12.0	4.00	0.85	30/120
18/6	18.0	6.00	1.00	30/60
24/8	24.0	8.0	1.20	12/60
40/13	40.0	13.0	1.25	12/60

150°C operating temperature is the top rating for polyolefin heat shrinkable tubing. The increasing environmental demands are met by not containing PBB's and PBBO's

Characteristics

- Operating Temperature: -55°C–150°C
- Min.Shrink Temperature: 100°C
Shrinking start at 70°C
- Shrink Ratio: 2:1
- Dielectric Strength: 33 kV/mm
- Standard Colour(s): Black
- Specifications: SAE-AMS-DTL-23053/5C Class1

SINGLE WALL POLYOLEFIN



Application Fields

For the use in all application where 150°C operating temperature is needed and environmental protection is required. The low shrink temperature offers economic advantages during installation.

Table of Standard Sizes and Packaging

BR10 Type/Size (Inch)	Inside Diameter (mm)		Wall Thickness (mm) Recovered	Quantity per Spool / Box (m)
	Expanded (min.)	Recovered (max.)		
1/8	3.20	1.60	0.51 +/-0.07	150/900
3/16	4.80	2.40	0.51 +/-0.07	60/600
1/4	6.4	3.20	0.64 +/-0.07	60/300
3/8	9.5	4.80	0.64 +/-0.07	60/300
1/2	12.7	6.4	0.64 +/-0.07	60/300
3/4	19.1	9.5	0.76 +/-0.07	60/180
1	25.4	12.7	0.89 +/-0.12	60/180

Very flexible light weight polyolefin tubing. Flame retardant to automotive standard and halogen free. Specially designed to meet the requirements of the automotive industry. Nevertheless very versatile.

Characteristics

- Operating Temperature:
-70°C–135°C
- Min. Shrink Temperature: 90°C
Shrinking start at 60°C
- Shrink Ratio: 2:1
- Dielectric Strength: 22 kV/mm
- Standard Colour(s): Black

SINGLE WALL POLYOLEFIN



Application Fields

Electrical insulation of cable harnessing and other components. Protection of pipes in automobiles. For all applications where a light weight halogen free tubing is required. The light weight supports weight reducing efforts in today's automobile industries.

Table of Standard Sizes and Packaging

B55 Type/Size (mm)	Inside Diameter (mm)		Wall Thickness (mm) Recovered	Quantity per Spool / Box (m)
	Expanded (min.)	Recovered (max.)		
1.2	1.20	0.60	0.31 +/-0.07	500/2500
1.6	1.60	0.80	0.33 +/-0.07	500/2000
2.4	2.40	1.20	0.36 +/-0.07	500/2000
3.2	3.20	1.60	0.39 +/-0.07	300/1500
4.8	4.80	2.40	0.42 +/-0.07	150/750
6.4	6.4	3.20	0.45 +/-0.07	100/500
9.5	9.5	4.80	0.48 +/-0.07	100/500
12.7	12.7	6.4	0.52 +/-0.07	100/500
19.1	19.1	9.5	0.58 +/-0.07	100/500
25.4	25.4	12.7	0.67 +/-0.12	100/500
38.1	38.1	19.1	0.76 +/-0.15	100/300
50.8	50.8	25.4	0.85 +/-0.17	100/200
76.2	76.2	38.1	0.95 +/-0.20	80/80

Very flexible highly flame retardant polyolefin tubing. UL and CSA recognised and marked. Low shrink temperature. Free of PBB's and PBBO's

Characteristics

- Operating Temperature: -55°C–125°C
- Min. Shrink Temperature: 90°C
Shrinking start at 60°C
- Shrink Ratio: 2:1
- Dielectric Strength: 40 kV/mm
- Standard Colour(s): Black
- Specifications:
UL224 125°C 600V VW-1, CSA
C22.2 No. 198.1 125°C 600V
- Marking:
 125°C VW-1  SUMITOMO-K
 SUMITUBE F2(Z) CAT 940
 CSA 125°C VW-1 -F- Made in SFP
 125°C VW-1  SUMITOMO-G
 SUMITUBE F2(Z) CAT 940
 CSA 125°C VW-1 -F- Made in SESP

SINGLE WALL POLYOLEFIN



Application Fields

All general purpose applications in electronic and electromechanical industries. Light harnesses, bundling, colour coding, insulation of soldered or crimped connectors in electronic equipment.

Remarks

Non-standard colours and 1.2m cut length available upon request.

Table of Standard Sizes and Packaging

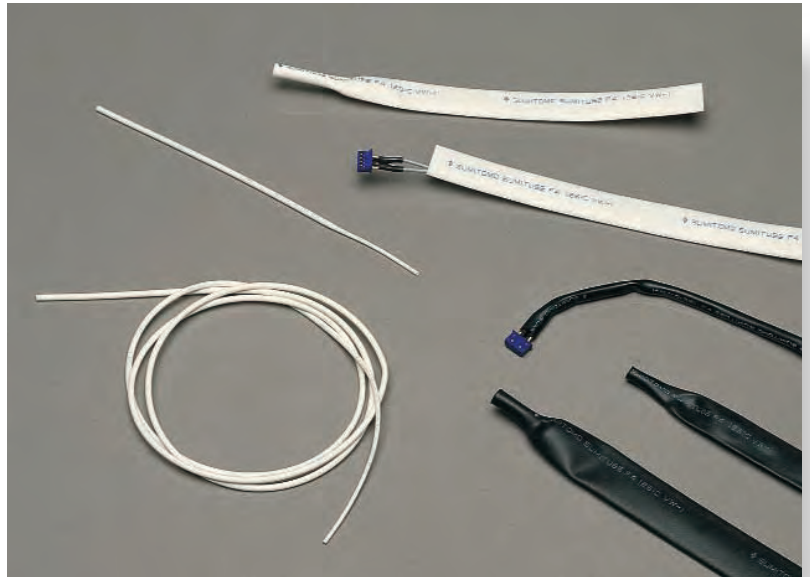
F2(Z) Type/Size (Inch)	Inside Diameter (mm)		Wall Thickness (mm)		Quantity per Spool / Box (m)
	Expanded (min.)	Recovered (max.)	Recovered (min.)		
3/64	1.20	0.60	0.33		300/900
1/16	1.60	0.80	0.36		300/900
3/32	2.40	1.20	0.44		150/900
1/8	3.20	1.60	0.44		150/900
3/16	4.80	2.40	0.44		60/600
1/4	6.4	3.20	0.56		60/300
3/8	9.5	4.80	0.56		60/300
1/2	12.7	6.4	0.56		60/300
3/4	19.1	9.5	0.69		60/180
1	25.4	12.7	0.77		60/180
1-1/2	38.1	19.1	0.87		60/180
2	50.8	25.4	0.97		60/120

Very flexible highly flame retardant polyolefin tubing. UL and CSA recognised and Marked. Extra thin wall for faster shrinkage and handling in tight area. Free of PBB's and PBBO's.

Characteristics

- Operating Temperature:
-55°C–125°C
- Min. Shrink Temperature: 90°C
Shrinking start at 60°C
- Shrink Ratio: 2:1
- Dielectric Strength: 26 kV/mm
- Standard Colour(s): Black
- Specifications:
UL224 125°C 300V VW-1, CSA C22.2
No.198.1 125°C 150V OFT
- Marking:
 125°C VW-1
  SUMITOMO-K
 SUMITUBE F4(Z) CAT 942
 CSA 125°C VW-1 -F-

SINGLE WALL POLYOLEFIN



Application Fields

For compact jacketing of sensitive components in tight areas. Cable harnessing, insulation, dirt and dust protection in electronics and other temperature sensitive cables or components.

Table of Standard Sizes and Packaging

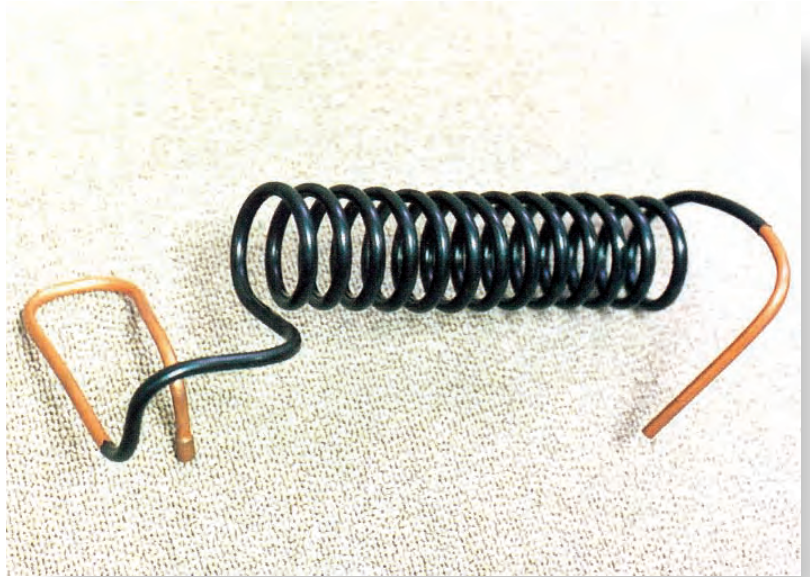
F4(Z) Type/Size (Inch)	Inside Diameter (mm)		Wall Thickness (mm) Recovered (min.)	Quantity per Spool / Box (m)
	Expanded (min.)	Recovered (max.)		
3/64	1.20	0.60	0.25	300/900
1/16	1.60	0.80	0.25	300/900
3/32	2.40	1.20	0.30	150/900
1/8	3.20	1.60	0.30	150/900
3/16	4.80	2.40	0.30	60/600
1/4	6.4	3.20	0.36	60/300
3/8	9.5	4.80	0.36	60/300
1/2	12.7	6.4	0.36	60/300
3/4	19.1	9.5	0.43	60/180
1	25.4	12.7	0.51	60/180

Commercial grade flexible polyolefin hologen free tubing for a wide range of applications, especially where good abrasion or chemical resistance is required.

Characteristics

- Operating Temperature: -55°C–105°C
- Min. Shrink Temperature: 115°C
Shrinking start at 80°C
- Shrink Ratio: 2:1
- Dielectric Strength: 45 kV/mm
- Standard Colour(s): Black, Transparent

SINGLE WALL POLYOLEFIN



Application Fields

General insulation of wire terminations and fasten connectors. Mechanical and abrasion protection of pipes and other components.

Remarks

Non-standard colours are available upon request.

Table of Standard Sizes and Packaging

A Type/Size (Inch)	Inside Diameter (mm)		Wall Thickness (mm) Recovered (nom.)	Quantity per Spool / Box (m)
	Expanded (min.)	Recovered (max.)		
3/64	1.20	0.60	0.40	300/900
1/16	1.60	0.80	0.43	300/900
3/32	2.40	1.20	0.51	150/900
1/8	3.20	1.60	0.51	150/900
3/16	4.80	2.40	0.51	60/600
1/4	6.4	3.20	0.64	60/300
3/8	9.5	4.80	0.64	60/300
1/2	12.7	6.4	0.64	60/300
3/4	19.1	9.5	0.76	60/180
1	25.4	12.7	0.89	60/180
1-1/2	38.1	19.1	1.02	60/180
2	50.8	25.4	1.14	60/120
3	76.2	38.1	1.07	60/60

Halogen free flexible polyolefin hologen free tubing. Good insulation and chemical properties. Clear colour allows marker tags/identification marks to be viewed through the tube after installation.

Characteristics

- Operating Temperature:
-55°C–135°C
- Min. Shrink Temperature: 110°C
Shrinking start at 80°C
- Shrink Ratio: 2:1
- Dielectric Strength: 46 kV/mm
- Standard Colour(s): Transparent
- Specifications:
SAE-AMS-DTL-23053/5 class 2,
DEF-STAN 59-97 Type 2B (A2 only)

SINGLE WALL POLYOLEFIN



Application Fields

For all general purpose applications, covering capacitors, bundling and jacketing of cables where visual inspection is required. Positioning of marking tags on hoses or other components.

Remarks

Cut length of 1.2m are available upon request.

Table of Standard Sizes and Packaging

A2 Type/Size (Inch)	Inside Diameter (mm)		Wall Thickness (mm) Recovered (nom.)	Quantity per Spool / Box (m)
	Expanded (min.)	Recovered (max.)		
3/64	1.20	0.60	0.41 +/-0.07	300/900
1/16	1.60	0.80	0.41 +/-0.07	300/900
3/32	2.40	1.20	0.51 +/-0.07	150/900
1/8	3.20	1.60	0.51 +/-0.07	150/900
3/16	4.80	2.40	0.51 +/-0.07	60/600
1/4	6.4	3.20	0.64 +/-0.07	60/300
3/8	9.5	4.80	0.64 +/-0.07	60/300
1/2	12.7	6.4	0.64 +/-0.07	60/300
3/4	19.1	9.5	0.76 +/-0.07	60/180
1	25.4	12.7	0.89 +/-0.12	60/180
1-1/2	38.1	19.1	1.02 +/-0.15	60/180
2	50.8	25.4	1.14 +/-0.17	60/120
3	76.2	38.1	1.27 +/-0.20	60/60
4	101.6	50.8	1.40 +/-0.22	30/30
A2(3X)				
1.5/0.5	1.50	0.50	0.50	300/900
3/1	3.00	1.00	0.60	150/900
6/2	6.00	2.00	0.70	60/300
9/3	9.0	3.00	0.80	60/300
12/4	12.0	4.00	0.85	60/300
18/6	18.0	6.00	1.00	60/180
24/8	24.0	8.00	1.20	60/180
40/13	40.0	13.0	1.25	60/180



Flame retardant dual wall polyolefin tubing. Flexible with inner wall of hot melt adhesive. High shrink ratio eases installation on transitions with large diameter gaps.

Characteristics

- Operating Temperature:
-55°C–110°C
- Min. Shrink Temperature: 110°C
Shrinking start at 60°C
- Shrink Ratio: 3:1, 4:1
- Dielectric Strength: 30 kV/mm
- Standard Colour(s): Black

DUAL WALL POLYOLEFIN



Application Fields

For moisture protection and environmental sealing of harnesses, connectors and ultrasonic splices where a flame retardant jacket is required.

Remarks

Non-standard colours, larger sizes and spools up to size 12/4 mm are available upon request.

Table of Standard Sizes and Packaging

W5B11 Type/Size (mm)	Inside Diameter (mm)		Wall Thickness (mm)		Quantity per Bag / Box (m)
	Expanded (min.)	Recovered (max.)	Recovered nom.	(inner liner)	
3/1	3.20	0.60	0.96 (0.35)		60/600
4.5/1.5	4.80	1.50	1.10 (0.60)		60/300
6/2	6.4	2.00	1.20 (0.65)		60/300
9/3	9.5	3.00	1.30 (0.65)		30/150
12/4	12.7	4.00	1.40 (0.75)		30/150
19/6	19.0	6.0	1.80 (0.80)		18/90
24/8	24.0	8.0	2.50 (1.00)		18/90
40/13	40.0	13.0	2.50 (1.00)		6/24
W5B11(4X)					
4/1	4.00	1.00	1.00 (0.50)		60/300
8/2	8.0	2.00	1.20 (0.65)		30/150
12/3	12.0	3.00	1.40 (0.75)		30/150
16/4	16.0	4.00	1.80 (0.90)		30/150
24/6	24.0	6.0	2.20 (0.90)		18/90
32/8	32.0	8.0	2.50 (1.00)		12/60

Remarks

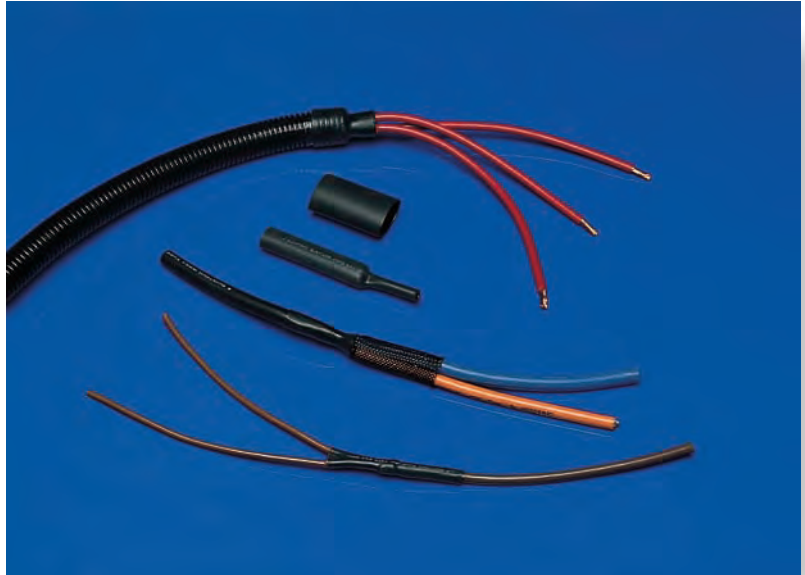
Non-standard colours, larger sizes are available upon request.

Flame retardant dual wall polyolefin tubing. Flexible with inner wall of hot melt adhesive. High shrink ratio eases installation on transitions with large diameter gaps.

Characteristics

- Operating Temperature:
-55°C–125°C
- Min. Shrink Temperature: 110°C
Shrinking start at 65°C
- Shrink Ratio: 3:1, 4:1
- Dielectric Strength: 30 kV/mm
- Standard Colour(s): Black
- Specifications:
UL224 125°C 600V, CSA CC22.2
No.198.1-99 125°C 600V (W3B2 only)

DUAL WALL POLYOLEFIN



Application Fields

For moisture protection and environmental sealing of harnesses, connectors and ultrasonic splices where a flame retardant jacket is required.

Remarks

Non-standard colours, larger sizes and spools up to size 12/4 mm are available upon request.

Table of Standard Sizes and Packaging

W3B2 Type/Size (mm)	Inside Diameter (mm)		Wall Thickness (mm)		Quantity per Bag / Box (m)
	Expanded (min.)	Recovered (max.)	Recovered nom.	(inner liner)	
3/1	3.20	0.60	0.96	(0.35)	60/600
4.5/1.5	4.80	1.50	1.06	(0.60)	60/300
6/2	6.4	2.00	1.19	(0.65)	60/300
9/3	9.5	3.00	1.27	(0.65)	30/150
12/4	12.7	4.00	1.40	(0.75)	30/150
19/6	19.0	6.0	1.80	(0.70)	18/90
24/8	24.0	8.0	2.50	(1.00)	18/90
40/13	40.0	13.0	2.50	(1.00)	6/12
W3B2(4X)					
4/1	4.00	1.00	1.00	(0.50)	60/300
8/2	8.0	2.00	1.20	(0.50)	30/150
12/3	12.0	3.00	1.40	(0.60)	30/150
16/4	16.0	4.00	1.80	(0.80)	30/150
24/6	24.0	6.0	2.25	(0.80)	18/90
32/8	32.0	8.0	2.55	(1.00)	6/12
52/13	52.0	13.0	2.55	(1.10)	6/12

Remarks

Non-standard colours, larger sizes are available upon request.

Halogen free flame retardant flexible polyolefin halogen free tubing. Flexible with inner wall of hot melt adhesive. High shrink ratio eases installation on transitions with large diameter gaps.

Characteristics

- Operating Temperature:
-40°C–105°C
- Min. Shrink Temperature: 115°C
Shrinking start at 60°C
- Shrink Ratio: 3:1
- Dielectric Strength: 20 kV/mm
- Standard Colour(s): Black

DUAL WALL POLYOLEFIN



Application Fields

In all smoke sensitive areas such as public buildings, public transport, power plants, hospitals, airports and submarines. London underground spec. E1042-A6-March 2002

Table of Standard Sizes and Packaging

W3NH Type/Size (Inch)	Inside Diameter (mm)		Wall Thickness (mm) Recovered nom. (inner liner)	Quantity Bag/Box(m)
	Expanded (min.)	Recovered (max.)		
3/1	3.20	1.00	0.95 ± 0.15	60/600
4.5/1.5	4.80	1.50	1.10 ± 0.15	60/600
6/2	6.4	2.00	1.20 ± 0.20	60/300
9/3	9.5	3.00	1.30 ± 0.20	60/300
12/4	12.7	4.00	1.40 ± 0.20	30/150
19/6	19.1	6.00	1.80 ± 0.25	30/150
24/8	24.0	8.00	2.50 ± 0.40	18/90
40/13	40.0	13.00	2.50 ± 0.40	6/12
50/19	50.0	19.00	4.00 nom	-/22
120/40	120.0	40.00	3.00 nom	-/30

Semi rigid flame retardant polyolefin tubing with a thick inner liner of hot melt adhesive. Excellent tensile strength and strain relief. Thick adhesive liner provides excellent moisture protection. Ideal for electrical connections and splices in automobiles.

Characteristics

- Operating Temperature: -40°C–130°C
- Min. Shrink Temperature: 110°C
Shrinking start at 60°C
- Shrink Ratio: 4:1
- Dielectric Strength: 19.7 kV/mm
- Standard Colour(s): Black

DUAL WALL POLYOLEFIN



Application Fields

Sealing and protection of connections and harness in the automotive industry.

All applications which require good temperature resistance, good electrical properties and very good moisture protection.

Table of Standard Sizes and Packaging

SA2 Type/Size (mm)	Inside Diameter (mm)		Wall Thickness (mm) Recovered nom. (inner liner)	Quantity per Box (m)
	Expanded (min.)	Recovered (max.)		
5.8/1.2	5.80	1.26	1.20 (0.56)	300
7.5/1.6	7.5	1.64	1.52 (0.76)	300
10.9/2.4	10.9	2.40	1.91 (1.02)	150
17.8/4.4	17.8	4.45	2.41 (1.37)	90

Flexible polyolefin halogen free tubing with inner liner of hot melt adhesive. High shrink ratio eases installation on transitions with large diameter gaps. Transparent colour enables visual inspection of substrate.

Characteristics

- Operating Temperature: -55°C–105°C
- Min. Shrink Temperature: 110°C
Shrinking start at 60°C
- Shrink Ratio: 3:1, 4:1
- Dielectric Strength: 30 kV/mm
- Standard Colour(s): Transparent

DUAL WALL POLYOLEFIN



Application Fields

Waterproof sealing and encapsulation of connectors, harnesses, ultra-sonic splices and water sensitive electrical components. Especially where visual inspection is required.

Table of Standard Sizes and Packaging

W5C Type/Size (mm)	Inside Diameter (mm)		Wall Thickness (mm) Recovered nom. (inner liner)	Quantity per Bag / Box (m)
	Expanded (min.)	Recovered (max.)		
3/1	3.00	1.00	0.96 (0.35)	60/600
4.5/1.5	4.50	1.50	1.06 (0.60)	60/300
6/2	6.0	2.00	1.19 (0.65)	60/300
9/3	9.0	3.00	1.27 (0.65)	30/150
12/4	12.0	4.00	1.40 (0.75)	30/150
19/6	19.0	6.0	1.80 (0.70)	18/90
24/8	24.0	8.0	2.50 (1.00)	18/90
40/13	40.0	13.0	2.50 (1.00)	6/24
W5C(4X)				
4/1	4.00	1.00	1.00 (0.50)	60/300
8/2	8.0	2.00	1.20 (0.50)	30/150
12/3	12.0	3.00	1.40 (0.50)	30/150
16/4	16.0	4.00	1.80 (0.60)	30/150
24/6	24.0	6.0	2.25 (0.80)	18/90
32/8	32.0	8.0	2.55 (1.00)	6/24

Semi rigid polyolefin halogen free tubing with inner jacket of meltable polyolefin. Meltable inner liner fills interstices and voids without adhering to most substrates. Provides good abrasion, fluid resistance and high tensile strength.

Characteristics

- Operating Temperature:
-55°C–110°C
- Min. Shrink Temperature: 150°C
Shrinking start at 70°C
- Shrink Ratio: 3:1
- Dielectric Strength: 36 kV/mm
- Standard Colour(s): Black
- Specifications:
SAE-AMS-DTL-23053/4 class 1

DUAL WALL POLYOLEFIN



Application Fields

For all applications where environmental sealing and filling of voids and interstices is intended. Water protective encapsulation of sensitive components where adherence to substrates is not desired.

Remarks

Non-standard colours sizes are available upon request.

Table of Standard Sizes and Packaging

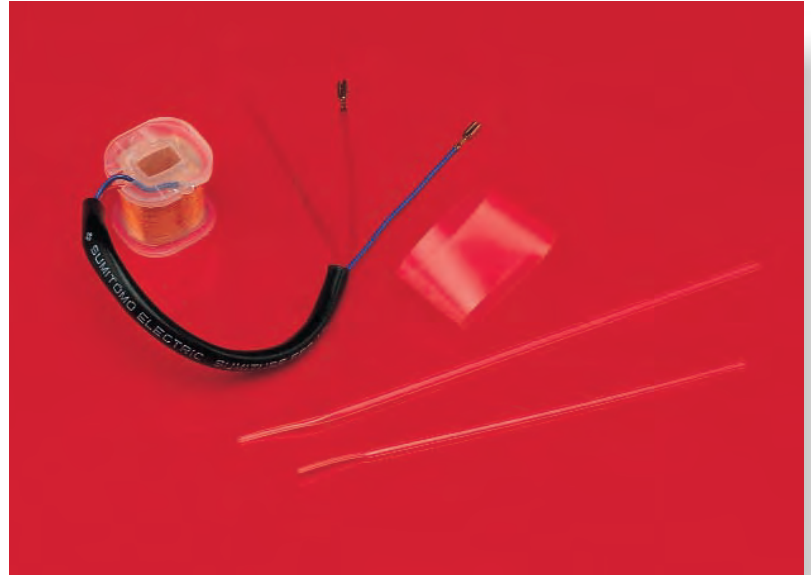
W5DL Type/Size (Inch)	Inside Diameter (mm)		Wall Thickness (mm) Recovered nom. (inner liner)	Quantity per Bag / Box (m)
	Expanded (min.)	Recovered (max.)		
1/8	3.20	0.60	0.97 (0.50)	60/600
3/16	4.80	1.50	1.10 (0.65)	60/300
1/4	6.4	2.00	1.20 (0.70)	60/300
3/8	9.5	3.00	1.27 (0.75)	30/150
1/2	12.7	4.00	1.40 (0.80)	30/150
3/4	19.1	8.0	1.65 (1.00)	18/90
1	25.4	10.2	1.90 (1.00)	18/90

Semi-rigid highly flame retardant polyvinylidene fluoride tubing. High temperature rated thin wall tube with high dielectric strength. Excellent electrical properties, good resistance to chemicals and solvents, low friction surface.

FLUOROPLASTIC

Characteristics

- Operating Temperature:
-55°C–175°C
- Min. Shrink Temperature: 170°C
Shrinking start at 130°C
- Shrink Ratio: 2:1
- Dielectric Strength: 43kV/mm
- Standard Colour(s): Transparent
- Specifications:
UL224 150°C 600V VW-1 , CSA
C22.2No.198.1 150°C 600V VW-1 ,
SAE-AMS-DTL-23053/8,
VG 95343 part 5 Type F-1,
DEF STAN 59-97 Type3



Application Fields

For insulation or strain relief of components in high temperature environments. Applications requiring good cut through resistance, mechanical strength or resistance to chemicals. Applications where a low friction surface is needed. As oil stop for energy cables.

Remarks

Opaque and tint colours upon request.

Table of Standard Sizes and Packaging

K Type/Size (Inch)	Inside Diameter (mm)		Wall Thickness (mm) Recovered	Quantity per Bag / Box (m)
	Expanded (min.)	Recovered (max.)		
3/64	1.20	0.60	0.25 +/-0.05	150/1500
1/16	1.60	0.80	0.25 +/-0.05	150/1500
3/32	2.40	1.20	0.25 +/-0.05	150/900
1/8	3.20	1.60	0.25 +/-0.05	150/900
3/16	4.80	2.40	0.25 +/-0.05	60/600
1/4	6.4	3.20	0.30 +/-0.07	60/300
3/8	9.5	4.80	0.30 +/-0.07	60/300
1/2	12.7	6.4	0.30 +/-0.07	30/300
3/4	19.1	9.5	0.43 +/-0.07	30/180
1	25.4	12.7	0.48 +/-0.07	18/180
1-1/2	38.1	19.1	0.51 +/-0.07	12/180
2	50.8	25.4	0.51 +/-0.07	12/120

Flexible highly flame retardant polyvinylidene fluoride tubing. High temperature rated thin wall tube with high transparency. Excellent chemical and mechanical properties. Low friction surface. Higher flexibility and lower shrink temperature allows easier installation than Sumitube® K.

Characteristics

- Operating Temperature:
-55°C–175°C
- Min. Shrink Temperature: 160°C
Shrinking start at 120°C
- Shrink Ratio: 2:1
- Dielectric Strength: 35 kV/mm
- Standard Colour(s): Transparent
- Specifications:
MIL-DTL-23053/18 class 1, UL224
VW-1

FLUOROPLASTIC



Application Fields

Covering sensors, heating elements and other components which have to withstand high environmental temperatures. Applications requiring good cut through resistance, mechanical strength or resistance to chemicals.

Remarks

Opaque and tint colours upon request.

Table of Standard Sizes and Packaging

K2 Type/Size (Inch)	Inside Diameter (mm)		Wall Thickness (mm) Recovered	Quantity per Spool / Box (m)
	Expanded (min.)	Recovered (max.)		
3/64	1.20	0.60	0.25 +/-0.05	300/900
1/16	1.60	0.80	0.25 +/-0.05	300/900
3/32	2.40	1.20	0.25 +/-0.05	150/900
1/8	3.20	1.60	0.25 +/-0.05	150/900
3/16	4.80	2.40	0.25 +/-0.05	60/600
1/4	6.4	3.20	0.30 +/-0.07	60/300
3/8	9.5	4.80	0.30 +/-0.07	60/300
1/2	12.7	6.4	0.30 +/-0.07	60/300
3/4	19.1	9.5	0.43 +/-0.07	60/180
1	25.4	12.7	0.48 +/-0.07	60/180
1-1/2	38.1	19.1	0.51 +/-0.07	60/180
2	50.8	25.4	0.51 +/-0.07	60/120

High temperature rated with low shrink temperature. Superb clarity, fluid resistance and low outgassing.

Characteristics

- Operating Temperature:
- 55°C–200°C
- Min. Shrink Temperature: 130°C
Shrinking start at 70°C
- Shrink Ratio: 2:1
- Dielectric Strength: 35 kV/mm
- Standard Colour(s): Transparent
- Specifications:
SAE-AMS-DTL-23053/13, UL VW-1 (KH200), SAE-AMS-DTL-23053/18 class 3 (KH200(TW))

FLUOROPLASTIC



Application Fields

Bundling, harnessing and environmental protection where transparency, resistance to aggressive solvents and high temperatures as well as low outgassing is required.

Table of Standard Sizes and Packaging

KH200 Type/Size (Inch)	Inside Diameter (mm)		Wall Thickness (mm)	Unit length (m)
	Expanded (min.)	Recovered (max.)	Recovered	
1/8	3.20	1.60	0.80 +/-0.15	30m
3/16	4.80	2.40	0.90 +/-0.15	30m
1/4	6.4	3.20	0.90 +/-0.18	30m
3/8	9.5	4.80	0.90 +/-0.18	30m
1/2	12.7	6.4	0.90 +/-0.18	30m
3/4	19.1	9.5	1.10 +/-0.20	30m
1	25.4	12.7	1.20 +/-0.28	30m
KH200(TW)				
1/8	3.20	1.60	0.27 +/-0.04	150m
3/16	4.80	2.40	0.27 +/-0.04	60m
1/4	6.4	3.20	0.33 +/-0.05	60m
3/8	9.5	4.80	0.33 +/-0.05	30m
1/2	12.7	6.4	0.33 +/-0.05	30m
3/4	19.1	9.5	0.43 +/-0.07	1.2m
1	25.4	12.7	0.48 +/-0.07	1.2m

Flexible flame retardant elastomeric polyolefin tubing. Excellent abrasion resistance and outstanding resistance to chemicals and solvents. Good properties remain also at very low temperatures.

Characteristics

- Operating Temperature:
- 55°C–230°C
- Min. Shrink Temperature: 130°C
Shrinking start at 70°C
- Shrink Ratio: 2:1
- Dielectric Strength: 35 kV/mm
- Standard Colour(s): Black
- Specifications:
SAE-AMS-DTL-23053/13 (KH230),
SAE-AMS-DTL-23053/18 class 3
(KH230(TW))

FLUOROPLASTIC



Application Fields

Bundling, harnessing and environmental protection where resistance to aggressive solvents, high temperatures and low outgassing is required.

Table of Standard Sizes and Packaging

KH200 Type/Size (Inch)	Inside Diameter (mm)		Wall Thickness (mm)		Unit length (m)
	Expanded (min.)	Recovered (max.)	Recovered		
1/8	3.20	1.60	0.80 +/-0.15		30m
3/16	4.80	2.40	0.90 +/-0.15		30m
1/4	6.4	3.20	0.90 +/-0.18		30m
3/8	9.5	4.80	0.90 +/-0.18		30m
1/2	12.7	6.4	0.90 +/-0.18		30m
3/4	19.1	9.5	1.10 +/-0.20		30m
1	25.4	12.7	1.20 +/-0.28		30m
KH200(TW)					
1/8	3.20	1.60	0.27 +/-0.04		150m
3/16	4.80	2.40	0.27 +/-0.04		60m
1/4	6.4	3.20	0.33 +/-0.05		60m
3/8	9.5	4.80	0.33 +/-0.05		30m
1/2	12.7	6.4	0.33 +/-0.05		30m
3/4	19.1	9.5	0.43 +/-0.07		1.2m
1	25.4	12.7	0.48 +/-0.07		1.2m



Flexible highly flame retardant elastomer tubing. Combines excellent chemical and abrasion resistance. Good properties remain also at very low temperatures.

Characteristics

- Operating Temperature:
-75°C–120°C
- Min. Shrink Temperature: 150°C
Shrinking start at 100°C
- Shrink Ratio: 2:1
- Dielectric Strength: 25 kV/mm
- Standard Colour(s): Black
- Specifications:
UL224 105°C 600V VW-1,
SAE-AMS-DTL-23053/1 Class2

ELASTOMER



Application Fields

Jacketing of cables and harnesses in environments with large temperature variations. e.g. Ground support in heavy duty vehicles. Recommended for all applications where excellent resistance against chemicals and solvents is required.

Table of Standard Sizes and Packaging

R10 Type/Size (Inch)	Inside Diameter (mm)		Wall Thickness (mm)	Quantity per Spool / Box (m)
	Expanded (min.)	Recovered (max.)	Recovered	
1/8	3.20	1.60	0.70 +/-0.20	150/600
3/16	4.80	2.40	0.85 +/-0.25	60/300
1/4	6.4	3.20	0.89 +/-0.25	60/300
3/8	9.5	4.80	1.01 +/-0.25	30/150
1/2	12.7	6.4	1.22 +/-0.38	30/150
3/4	19.7	9.5	1.45 +/-0.38	30/90
1	25.4	12.7	1.78 +/-0.38	30/90
1-1/4	31.8	15.9	2.20 +/-0.51	30/90
1-1/2	38.1	19.1	2.41 +/-0.51	30/90
1-3/4	44.5	22.2	2.71 +/-0.51	30/60
2	50.8	25.4	2.79 +/-0.51	30/60

Extremely flexible flame retardant fluoroelastomer tubing. Resistant to most mineral and synthetic oils, hydraulic fluids and solvents. Very good abrasion resistance also in high temperature environments.

Characteristics

- Operating Temperature:
-55°C–200°C
- Min. Shrink Temperature: 150°C
Shrinking start at 50°C
- Shrink Ratio: 2:1
- Dielectric Strength: 17 kV/mm
- Standard Colour(s): Black
- Specifications:
SAE-AMS-DTL-23053/13,
MIL-R-46846 Type III class 1

FLUOROELASTOMER



Application Fields

Applications in high temperature areas with severe solvents, fuels and aggressive chemicals such as engine compartments.

Table of Standard Sizes and Packaging

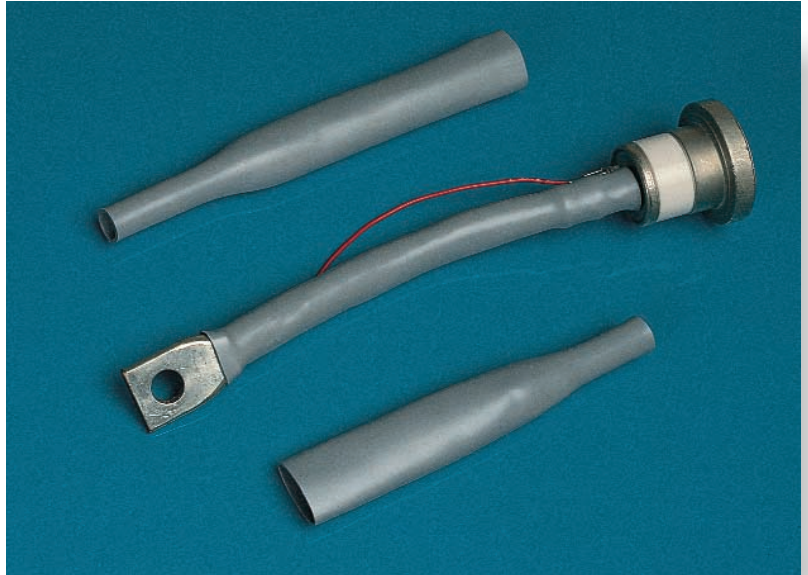
FE3 Type/Size (Inch)	Inside Diameter (mm)		Wall Thickness (mm) Recovered	Quantity per Spool / Box (m)
	Expanded (min.)	Recovered (max.)		
1/8	3.20	1.60	0.80 +/-0.18	30/300
3/16	4.80	2.40	0.90 +/-0.18	30/300
1/4	6.4	3.20	0.90 +/-0.18	30/300
3/8	9.5	4.8	0.90 +/-0.18	30/150
1/2	12.7	6.4	0.90 +/-0.18	30/150
3/4	19.1	9.5	1.10 +/-0.28	30/90
1	25.4	12.7	1.20 +/-0.28	30/90

Halogen free Flame retardant Silicone rubber tubing. High temperature rated to protect from water and weather. Remains flexible at low temperatures. Very good electrical and mechanical properties.

Characteristics

- Operating Temperature:
-60°C–250°C
- Min. Shrink Temperature: 140°C
Shrinking start at 60°C
- Shrink Ratio: 2:1
- Dielectric Strength: 20 kV/mm
- Standard Colour(s): Grey

SILICON RUBBER



Application Fields

For all kind of electrical insulation in high temperature environments such as heater coils, thermistors, AC and DC generator cables, lightning and engine harnesses.

Remarks

Other sizes are available upon request.

Table of Standard Sizes and Packaging

SR Type/Size (mm)	Inside Diameter (mm)		Wall Thickness (mm) Recovered (nom.)	Quantity per Bag / Box (m)
	Expanded (min.)	Recovered (max.)		
2.9	2.90	1.60	1.0	100/100
4.9	4.90	2.60	1.0	100/100
5.8	5.80	3.40	1.0	100/100
7.8	7.8	4.20	1.0	100/100
11.0	11.0	5.80	1.5	50/100
15.5	15.5	8.5	1.5	50/50
21.0	21.0	11.5	2.0	25/25
23.0	23.0	16.0	2.0	20/20
31.5	31.5	18.0	2.0	20/20
43.0	43.0	24.0	3.0	20/20
55.0	55.0	30.0	3.0	10/10
66.0	66.0	37.0	3.0	10/10
70.0	70.0	44.0	3.0	5/5

Halogen free crimp shield tubing. Three colour coded sizes, excellent strain relief, solvent and moisture resistant, visually inspectable, good physical and electrical properties.

Characteristics

- Operating Temperature: -55°C–110°C
- Min. Shrink Temperature: 150°C
- Dielectric Strength: 15 kV/mm
- Standard Colour(s): Red, blue, yellow, coded by size

SPECIAL PRODUCT



Application Fields

Used as watertight crimp splices covered with dual wall heat shrinkable tubing and not meltable inner liner.

Remarks

Application Voltage:
up to 600V

Table of Standard Sizes and Packaging

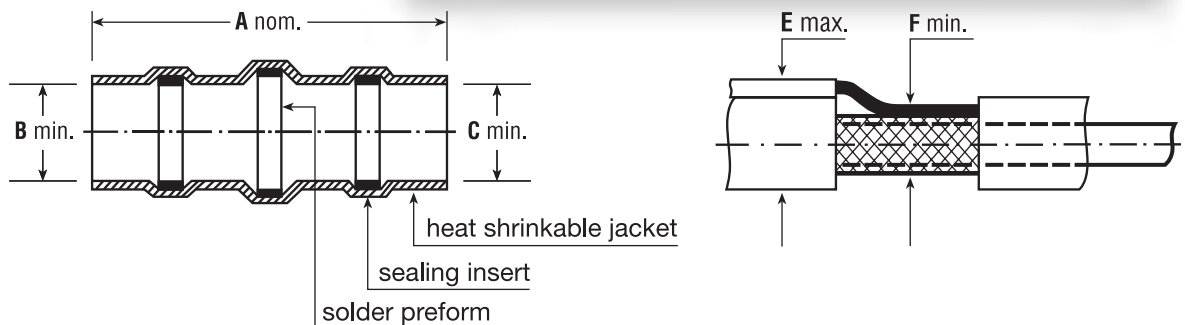
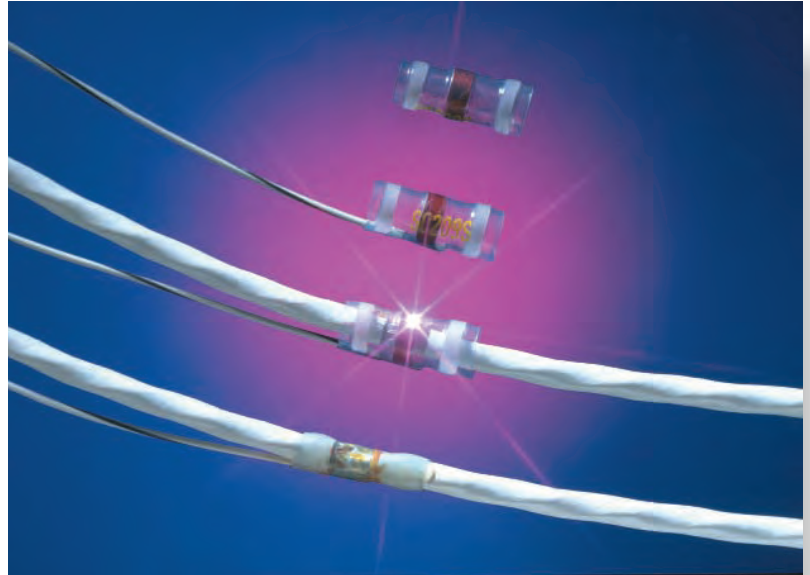
Type No.	Wire Size mm ² /A.W.G	Length (mm)	Quantity (pcs) Small box/M.O.Q
# 1 (Red)	0.5-1.5/22-16	36 +/-1.5	1000/5000
# 2 (Blue)	1.5-2.5/16-14	36 +/-1.5	1000/3000
# 3 (Yellow)	4.0-6.0/12-10	41 +/-1.5	500/2000

Designed for determining wire and cable with tin coated or silver plated Shield tubing. Conforming to MIL-DTL-23053/8 and pre-fluxed (SRMAP or RMA Per QQ-S-571) solder pre-form and meltable sealing inserts. Used with convection (hot air) heating tools.

SPECIAL PRODUCT

Characteristics

- Operating Temperature:
-54°C-105°C (L-C),
-54°C-150°C (H-C),
- Min. Shrink Temperature: 145°C (L-C),
185°C (H-C)
- Shrink Ratio: 2:1
- Dielectric Strength: 15 kV/mm
- Standard Colour(s):
Tint blue transparent
- Specifications: NAS 1745



Application Fields

Terminations on wire and cable with tin coated or silver plated shields.

Table of Standard Sizes and Packaging

STS H-C	Dimension as supplied (mm)			Installation Reference (mm)		Cross Reference NAS P/N
Part No.	A (nom.)	B (min.)	C (min.)	E (max.)	F (min.)	
H-C-1	16.0	2.0	2.5	2.5	1.0	1745-1
H-C-2	16.0	2.8	3.3	3.3	1.5	1745-2
H-C-3	16.0	4.6	5.1	5.1	2.5	1745-3
H-C-4	19.1	6.1	6.4	6.4	3.3	1745-17
H-C-5	19.1	7.1	7.6	7.6	4.1	1745-4
H-C-6	27.9	11.2	11.7	11.7	5.7	1745-18
H-C-7	27.9	13.3	13.8	13.8	8.9	1745-19
STS L-C						
L-C-1	16.0	2.0	2.5	2.5	1.0	1745-13
L-C-2	16.0	2.8	3.3	3.3	1.5	1745-14
L-C-3	16.0	4.6	5.1	5.1	2.5	1745-15
L-C-4	19.1	6.1	6.4	6.4	3.3	1745-23
L-C-5	19.1	7.1	7.6	7.6	4.1	1745-16
L-C-6	27.9	11.2	11.7	11.7	5.7	1745-24
L-C-7	27.9	13.3	13.8	13.8	8.9	1745-25

Flexible dual Medium wall tubing, halogen free with 3:1 shrink ratio. Quick and easy to install with strong adhesive for excellent insulation and complete waterproofing.

Characteristics

- Operating Temperature: -55°C–110°C
- Min. Shrink Temperature: 90°C
- Shrink Ratio: 3:1
- Dielectric Strength: 21 kV/mm
- Standard Colour(s): Black

DUAL WALL POLYOLEFIN



Application Fields

Encapsulating and anti-corrosion protection of metal pipes. Insulation for communication equipment and cables. Alternative to taping in medium voltage applications.

Table of Standard Sizes and Packaging

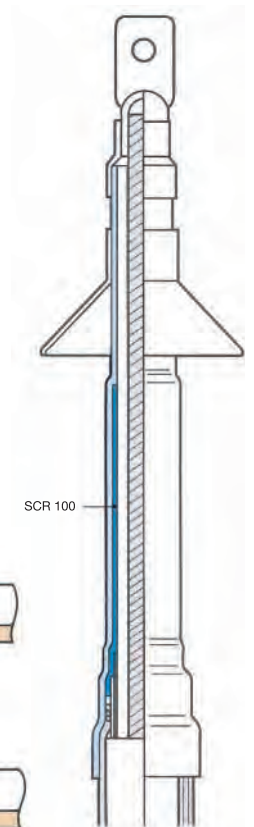
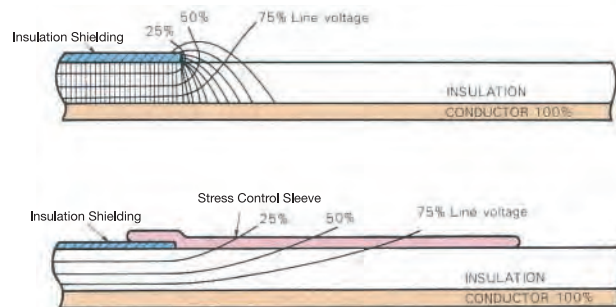
SCM2	Inside Diameter (mm)			Wall Thickness (mm)	Quantity per Bag / Box (m)
Size	Expanded (min.)	Recovered (max.) (outer layer only)	Recovered (max.) (not guaranteed)	Recovered (nom)	
04	10.2	3.80	2.30	1.50	12/120
07	19.0	5.60	4.10	2.00	12/120
11	28.0	9.5	6.5	2.00	12/60
13	33.0	10.2	7.8	2.00	12/60
15	38.1	12.7	10.3	2.30	12/48
17	44.0	14.0	11.6	2.30	12/48
20	52.1	18.2	15.8	2.30	6/30
27	70.0	25.5	23.1	2.30	6/24
35	90.0	30.0	27.6	2.50	3.6/18
50	125.0	40.0	37.6	2.50	2.4/24

Heat shrinkable stress control Sleeve for cables up to 36KV**Characteristics**

- Operating Temperature: up to 90°
- Min. Shrink Temperature: 150°C
- Volume resistivity: $1 \times 10^{10} \Omega\text{-cm}$
- Standard Colour(s): Black

SPECIAL PRODUCTS

- Quick and easy to install
- Flexible at low temperature
- Electrical stress control at the end of cable shielding

**Application Fields**

Medium Voltage termination & joints

Table of Standard Sizes and Packaging

Size	Inside Diameter (mm)		Wall Thickness (mm)		Quantity per Spool / Box (m)
	as supplied (min.)	after shrinkage (max.)	as supplied (nom.)	after shrinkage (max.)	
8/16	16.0	8.0	0.7	1.8	25/100
10/20	20.0	10.0	0.7	1.6	25/100
12/26	26.0	12.0	0.9	2.5	25/50
15/30	30.0	15.0	1.0	2.7	25/50
20/45	45.0	20.0	1.2	3.0	20/40
30/65	65.0	30.0	1.4	3.3	20/40
45/95	95.0	45.0	1.6	3.6	10/10

Irrax® Sleeve SCT100

Heat shrinkable Anti Tracking Tube for cables up to 36KV

Irrax® Sleeve SCC100

Heat shrinkable Conductive Tubing for MV cables up to 36KV

HOW TO USE

Selection of tubing size

- Inside diameter „expanded“ must be larger than the largest outside diameter of the object to be covered in order to fit smoothly.
- In order to obtain proper results inside diameter „recovered“ should be smaller than the smallest outside diameter of the object to be covered.

Shrinking process

- Cut the tubing to the required length. Make sure to cut straight and rectangular.
- Slide the sleeve over the object to be covered. Be careful not to damage the tubing on sharp edges.
- Heat with heat-gun or other appropriate shrink tool. Select a temperature equal or higher than the minimum shrink temperature indicated, taking into account the heat resistance of the object to be covered. Begin on one end of the tubing thus preventing air traps to occur.

NOTICE

The information contained in this catalogue is believed to be correct and in accordance with accepted engineering practices. Because of the varied nature of the uses for these products each user should make their own evaluations regarding the suitability of these products for their specific application. Sumitomo Electric Schrumpf-Produkte GmbH makes no warranties regarding the accuracy and completeness of the information and data contained herein, and disclaims any liability from the use or misuse of its products. Sumitomo Electric Schrumpf-Produkte GmbH shall not be liable for any injury, loss damage either directly, indirectly or as a consequence arising from the use or misuse of its products mentioned in this catalogue, other than replacement of materials considered defective.

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ORDERING

SUMITOMO ELECTRIC Schrumpf-Produkte GmbH

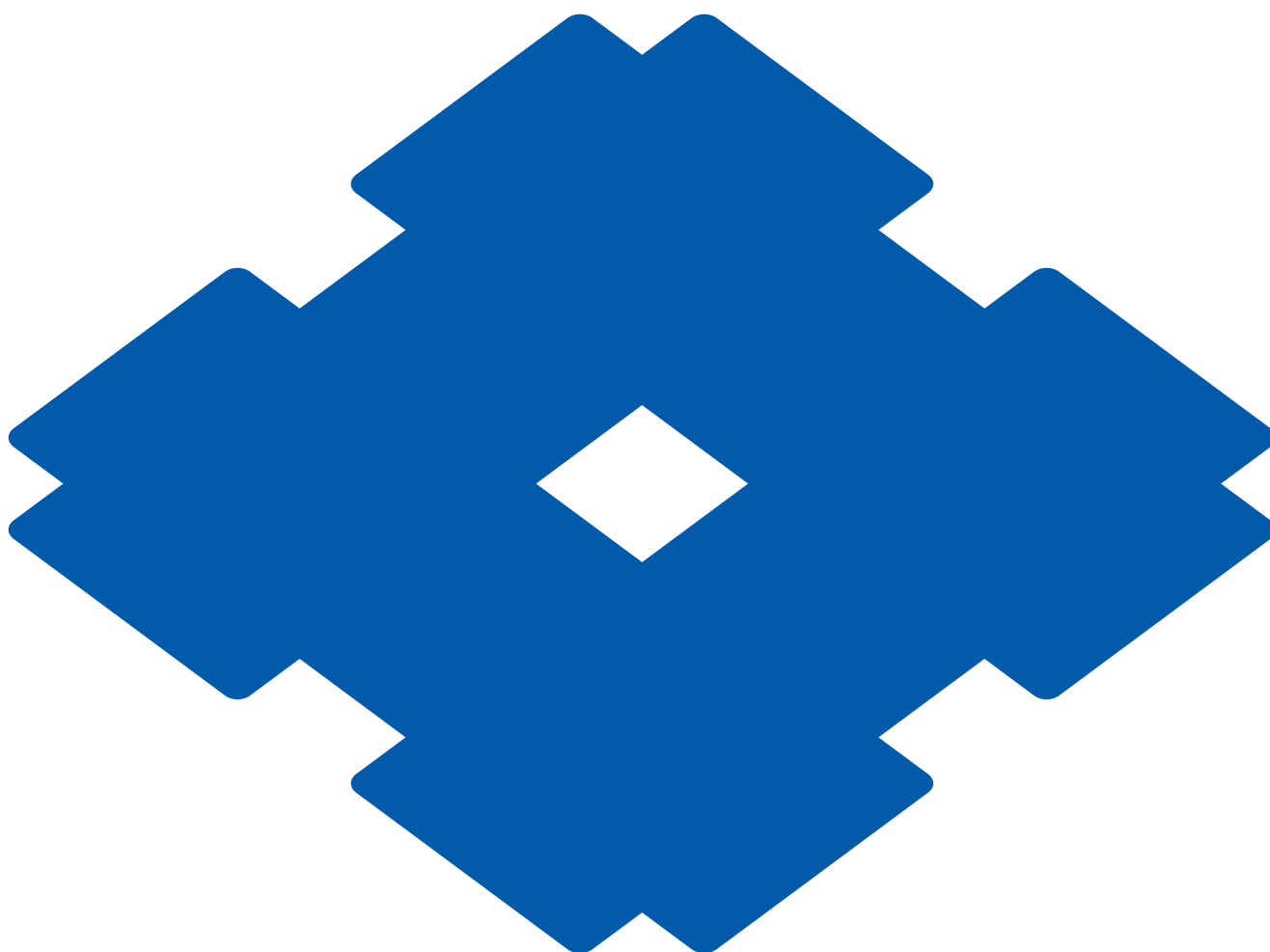
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高定格ハロゲンフリースミカード

高定格ハロゲンフリースミカード
High rating halogen-free Sumi-Card

用途

- ・液晶テレビのLED バックライト用途を中心として高定格電圧対応可能な製品が強く求められております。
- ・また、同時に環境対応品（ハロゲンフリー）も求められております。これらご要求に対応するため、新規に独自開発した絶縁フィルムを使用した高定格ハロゲンフリーフラットケーブルです。

特長

- ・独自の非照射新規絶縁フィルム（ハロゲンフリー系接着剤）
- ・高電圧定格実現
- ・金めっき対応可能

APPLICATION

- ・ The High Rating HF(halogen-free) product is demanded particularly for LCD TV – LED Back light unit. To meet this demand, We have released the High Rating HF Sumi-Card which is used new developed our original insulation film.

DESCRIPTION

- ・ New Sumitomo original insulation material (Non-irradiate and halogen-free)
- ・ High Rating (P1.0 : 105℃ ,300V、P0.5 : 105℃ ,150V)
- ・ Available for Au-plating

構造 CONSTRUCTION

項目 ITEM		構成 DETAIL
製品区分略号 SYMBOL NAME		SML2CD
製品構造 PRODUCT TYPE		錫めっきタイプ Tin Plated Copper type
導 体 CONDUCTOR	標準 STANDARD	錫めっき軟銅箔（めっき厚 1 μ m 以上） Tinned copper (Thickness of tin plating:Min.1 μ m)
	SNT2 ウィスカ対策品 ANTI-WHISKER	錫めっき軟銅箔（めっき厚 0.4+0.2/-0.1 μ m(純錫厚 0.1 $\pm$ 0.1 μ m)） Tinned copper (Thickness of tin plating : 0.4+0.2/-0.1 μ m, pure tin plating : 0.1 $\pm$ 0.1 μ m)
絶縁体 INSULATION	絶縁層 INSULATION LAYER	ポリエステル Polyester
	接着層 ADHESIVE LAYER	ハロゲンフリー難燃ポリエステル系接着剤 halogen-free flame retardant polyester
	色 COLOR	白 White
補強テープ SUPPORTING TAPE	材 質 MATERIAL	ポリエステル Polyester
	色 COLOR	青 Blue

※本カタログの仕様・構成等は性能改善の為、お断り無く変更する場合がございます。

※ This specification is subject to change without a prior announcement.

項 目 ITEM		構 成 DETAIL	
製品区分略号 SYMBOL NAME		SML2CD	
製品構造 PRODUCT TYPE		AUP タイプ AUP type	
導 体 CONDUCTOR	標準 STANDARD	軟銅箔 Annealed copper	
	めっき (全体) PLATING (whole)	ニッケルめっき Nickel Plating	
	厚み THICKNESS	AUP	AUPT
		0.3 μ m 以上 Min. 0.3 μ m	
	めっき (端末部) PLATING (Terminal)	金めっき Au Plating	
	厚み THICKNESS	AUP	AUPT
		0.05 μ m 以上 Min. 0.05 μ m	0.05 μ m 以上 Min. 0.15 μ m
絶縁体 INSULATION	絶縁層 INSULATION LAYER	ポリエステル Polyester	
	接着層 ADHESIVE LAYER	ハロゲンフリー難燃ポリエステル系接着剤 halogen-free flame retardant polyester	
	色 COLOR	白 White	
補強テープ SUPPORTING TAPE	材 質 MATERIAL	ポリエステル Polyester	
	色 COLOR	青 Blue	

性 能 (例) PROPERTIES (EXAMPLES)

製品区分略号 SYMBOL NAME		構 成 DETAIL	
UL スタイル No. UL STYLE No.		5463	5460,5461
導 体 CONDUCTOR	サイズ NOMINAL DIMENSION	0.035 × 0.3 mm	0.05 × 0.7 mm
	ピッチ PITCH	0.5 mm	1.0 mm
難燃性 FLAME TEST		VW - 1 合格 VW - 1 PASS	
導体抵抗 CONDUCTOR RESISTANCE		2,200 Ω /km 以下 Max. 2,200 Ω /km	600 Ω /km 以下 Max. 600 Ω /km
絶縁抵抗 INSULATION RESISTANCE		1,000M Ω -m 以上 Min. 1,000 M Ω -m	
耐電圧 (隣接導体間) DIELECTRIC STRENGTH (Between Adjacent Conductors)		AC2,000V-1 分 絶縁破壊無し AC2,000V-1min No Dielectric Breakdown	
屈曲性 FLEXIBILITY	往復摺動 SLIDING	15mmR,1,000 回 / 分,25mm 1,000 万回以上 15mmR,1,000 cycles/min,25mm Min.10M cycles	
	180° 折り重ね屈曲 FOLDING TEST	30 回以上 Min. 30 cycles	100 回以上 Min. 100 cycles
摩耗強度 ϕ 0.5mm, 600g, 60 回 / 分 ABRASION TEST ϕ 0.5mm, 600g, 60cycles/min		10,000 回以上 Min. 10,000 cycles	

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※ This specification is subject to change without a prior announcement.

UL スタイルと適用品種 UL STYLE No. AND PRODUCTS

製品区分略号 SYMBOL NAME	製品構造 PRODUCT TYPE	UL スタイルNo. UL STYLE No.	UL 定格 UL Rating	導体厚 CONDUCTOR THICKNESS (B) (mm)	CABLE THICKNESS (T) (mm)	導体間ピッチ Pitch (mm)		
						1.25	1.0	0.5
SML2CD	錫めっきタイプ (カス対策含む) Tin Plated Type (Including SNT2)	5460	105°C 150V	0.035	0.16	○	○	×
				0.05	0.18	○	○	×
		5461	105°C 300V	0.035	0.16	○	○	×
				0.05	0.18	○	○	×
		5463	105°C 150V	0.035	0.16	×	×	○
				0.05	0.18	×	×	○
	AUP タイプ AUP Type	5460	105°C 150V	0.035	0.16	×	△	×
				0.05	0.18	×	○	×
		5461	105°C 300V	0.035	0.16	×	△	×
				0.05	0.18	×	○	×
		5463	105°C 150V	0.035	0.16	×	×	○
				0.05	0.18	×	×	×

○：標準品

○：Sumitomo Standard

△：特殊仕様

△：Special Specification

×

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公称寸法 NOMINAL DIMENSION

錫めっき、SNT2 タイプ (TIN PRATED, SNT2 TYPE)

単位 Unit : mm

項 目 ITEM	寸 法 DEMENSION			
導体間ピッチ PITCH (P)	1.25	1.0		0.5
導体幅 CONDUCTOR WIDTH (A)	0.80	0.70	0.60	0.30
マージン幅 MARGIN WIDTH (M)	0.85	0.65	0.70	0.35
トータルピッチ TOTAL PITCH (TP)	$P \times (n + 1)$ n= 導体数 n=number of conductors			
仕上幅 CABLE WIDTH (W)	$P \times (n + 1)$ n= 導体数 n=number of conductors			
絶縁長 INSULATION LENGTH (I)	$P \times (n + 1)$			
全 長 CABLE LENGTH (L)	20 以上任意 (P1.25,P1.0 の AD タイプは 30 以上) Min. 20(P1.25,P1.0 AD type:Min30)			
端末厚 TERMINAL THICKNESS (TT)	0.30			
剥離長 STRIP LENGTH (S)	4,5,6,			
補強テープ長 SUPPORTING TAPE LENGTH (H)	6,8,10,15,20			

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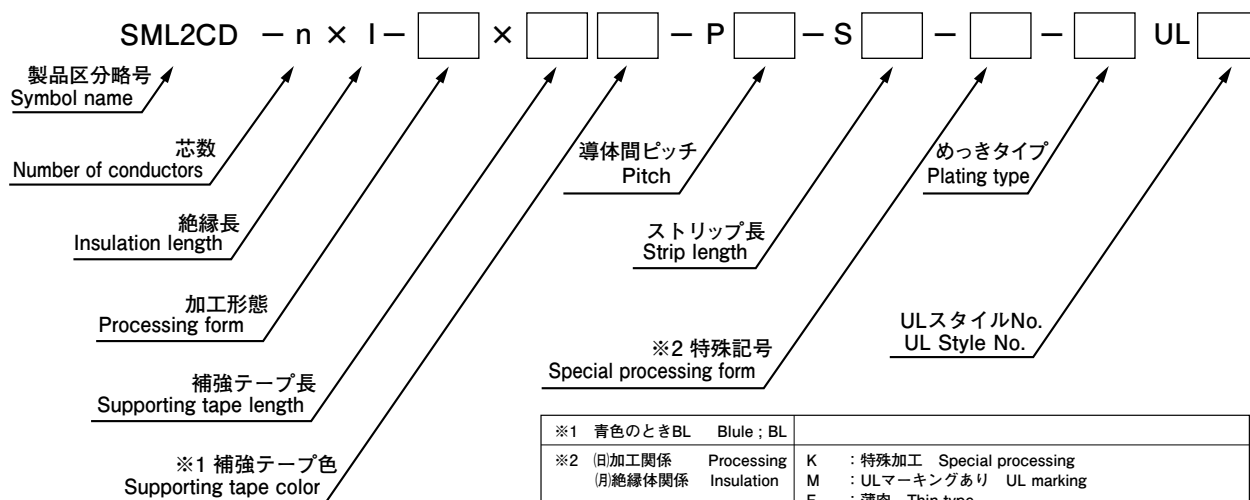
※ This specification is subject to change without a prior announcement.

AUP タイプ (AUP TYPE)

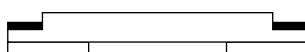
単位 Unit : mm

項 目 ITEM	仕 様 DEMENSION	
導体間ピッチ PITCH (P)	0.5	1.0
導体幅 CONDUCTOR WIDTH (A)	0.30	0.70
マージン幅 MARGIN WIDTH (M)	0.35	0.65
トータルピッチ TOTAL PITCH (TP)	P × (n + 1) n= 導体数 n=number of conductors	
仕上幅 CABLE WIDTH (W)	P × (n + 1) n= 導体数 n=number of conductors	
絶縁長 INSULATION LENGTH (I)	20 以上任意 Min. 20	30 以上任意 Min. 30
全 長 CABLE LENGTH (L)	650mm 以下 /650mm 超は要相談 MAX. 650mm/Negotirble over 650mm	
端末厚 TERMINAL THICKNESS (TT)	0.30 ± 0.05	
剥離長 STRIP LENGTH (S)	4,5,6,	
補強テープ長 SUPPORTING TAPE LENGTH (H)	6,8,10	

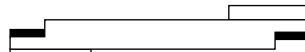
品名呼称 NOMENCLATURE



加工タイプ PROCESSING FORM



両端末同じ方向に補強テープ
Supporting tapes at both ends
are on the same side



両端末逆方向に補強テープ
Supporting tapes at both ends
are on the opposite side

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ジャンパーリード

ジャンパーリード
JUMPER LEAD

RoHS Directive					
Lead Free	Hg Free	Cd Free	Cr ⁶⁺ Free	PBB Free	PBDE Free

ジャンパーリードは、機器内部配線用リード線として最も汎用的なリード線です。独自の照射技術により半田耐熱性を向上させた照射タイプ、ハロゲンフリータイプ他、品揃えが豊富です。

JUMPER LEAD is one of the most popular internal wiring materials. JUMPER LEAD has variety of insulation material.

用 途

・オーディオ、DVD、電話機、OA 機器その他電子器内部配線。

APPLICATION

JUMPER LEAD is used for internal wiring of electronic equipment such as audio, DVD, phone, OA equipment and so on.

特 長

・定格 300V・105℃の UL 規格および CSA 規格も取得。
・基板への半田付実装や挿抜型コネクタへの嵌合可能。

DESCRIPTION

・ Certification : UL standard certifies UL2651 and UL4478 as 105℃ , 300V rating. UL2651 and 4478 are certified for CSA standard, too.
・ Application : Soldering to PCB or fitting with connector.

構造 CONSTRUCTION

UL スタイル No. UL STYLE No.		2651		4478 ハロゲンフリー HALOGEN FREE
UL 定格 UL RATING		105℃ , 300 V		
製品区分略号 SYMBOL NAME		SMV2J	SMV2RJ	SMV2RJ-HF
導体 CONDUCTOR		7/0.16 (OM-1S) 7/0.16 (OM-CP)		
絶縁体 INSULATION	材 質 MATERIAL	難燃 PVC FRPVC	照射架橋 PVC FRXLPVC	照射架橋ポリエチレン XLPE
	色 COLOR	空 Sky blue	アイボリーホワイト Ivory white	白 White

性 能 PROPERTIES

UL スタイル No. UL STYLE No.		2651	4478 ハロゲンフリー HALOGEN FREE
難燃性 FLAME TEST		VW-1 合格 VW-1Pass	
導体抵抗 CONDUCTOR RESISTANCE		175 Ω /km 以下 (OM-1S) 286 Ω /km 以下 (OM-CP) Max. 175 Ω /km (OM-1S) Max. 286 Ω /km (OM-CP)	
絶縁抵抗 INSULATION RESISTANCE		1,000M Ω -m 以上 Min. 1,000M Ω -m	
耐電圧(導体 / 水中間) DIELECTRIC STRENGTH (Conductors / Water)		AC2,000V-1 分 絶縁破壊無し AC2,000V-1min No Dielectric Breakdown	

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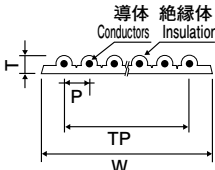
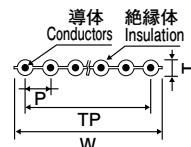
※ This specification is subject to change without a prior announcement.

公称寸法 NOMINAL DIMENSION

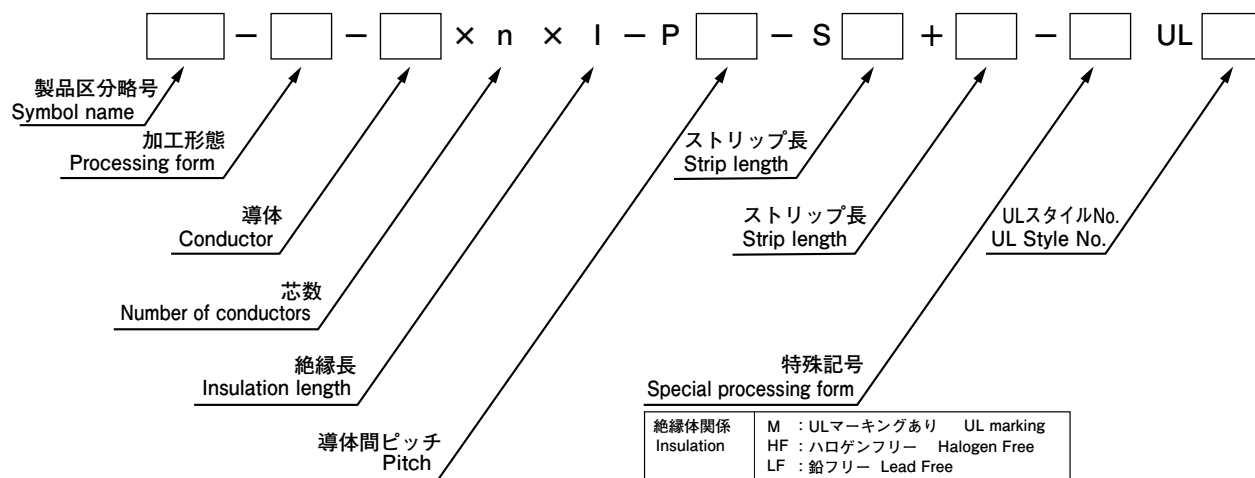
単位 Unit : mm

UL スタイル No. UL STYLE No.	2651	4478 ハロゲンフリー HALOGEN FREE
導体間ピッチ PITCH (P)	1.25, 1.5, 2.0, 2.5, 2.54	1.5, 2.0, 2.5, 2.54
トータルピッチ TOTAL PITCH (TP)	$P \times (n-1)$	
仕上巾 CABLE WIDTH (W)	$P \times n$	
仕上厚 CABLE THICKNESS (T)	0.95	
絶縁長 INSULATION LENGTH (I)	20 以上 Min. 20	
ストリップ長 STRIP LENGTH (S)	標準 Standard	3, 3.5, 4, 4.5, 5
	フォーミング Forming	サヤ残し (4.5) 3.5F ~ 5F

形 状 SHAPE

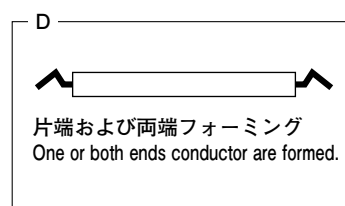
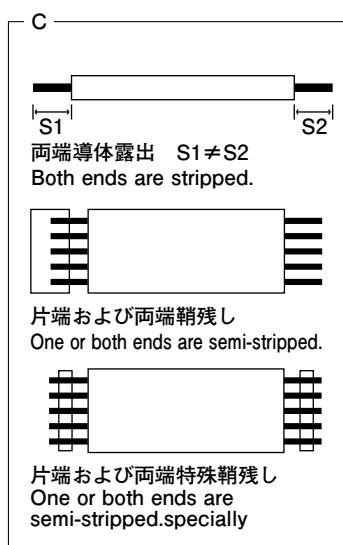
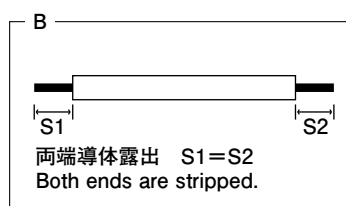
UL スタイル No. UL STYLE No.	2651	4478 ハロゲンフリー HALOGEN FREE
		

品名呼称 NOMENCLATURE



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加工タイプ PROCESSING FORM



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金めっきスミカード

金めっきスミカード
Au-PLATING SUMI-CARD

RoHS Directive					
Lead Free	Hg Free	Cd Free	Cr ⁶⁺ Free	PBB Free	PBDE Free

金めっきスミカードは、ウィスカ発生による短絡事故を防止可能なフラットケーブルです。

Au-PLATING SUMI-CARD is the flat cable whose wiring system enables to prevent a short circuit caused by "whisker".

用 途

・ FPD・DVD・プリンター・スキャナー・ゲーム機・ノートPC、他の内部配線。

APPLICATION

・ Au-PLATING SUMI-CARD is used for internal wiring of electronic equipment, FPD, DVD, game machine, notebook PC, printer, scanner and so on.

特 長

・ 鉛フリー対応製品
・ ウィスカ発生による短絡事故を防止可能
・ 従来製品（錫めっき品）と同等性能を維持

DESCRIPTION

・ Lead-Free product
・ Enables to prevent a short circuit caused by "whisker"
・ Maintains the performance equaled to the conventional (tinned) products

構造 CONSTRUCTION

項 目 ITEM		構 成 DETAIL	
製品区分略号 SYMBOL NAME		SML2CD	
製品構造 PRODUCT TYPE		AUP タイプ AUP type	
導 体 CONDUCTOR	材 質 MATERIAL	軟銅箔 Annealed copper	
	めっき (全体) PLATING (whole length)	ニッケルめっき Nickel Plating	
	厚み THICKNESS	AUP	AUPT
		0.3 μ m 以上 Min. 0.3 μ m	
	めっき (端末部) PLATING (terminal)	金めっき Au Plating	
	厚み THICKNESS	AUP	AUPT
		0.05 μ m 以上 Min. 0.05 μ m	0.15 μ m 以上 Min. 0.15 μ m
絶縁体 INSULATION	絶縁層 INSULATION LAYER	ポリエステル Polyester	
	接着層 ADHESIVE LAYER	難燃ポリエステル系 Frame-Retardant Polyester	
	色 COLOR	白 White	
補強テープ SUPPORTING TAPE	材 質 MATERIAL	ポリエステル Polyester	
	色 COLOR	青 Blue	

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項 目 ITEM		構 成 DETAIL		
製品区分略号 SYMBOL NAME		SML2CD		
製品構造 PRODUCT TYPE		AUP3 タイプ AUP3 type		
導 体 CONDUCTOR	材 質 MATERIAL	軟銅箔 Annealed copper		
	めっき (端末部) PLATING (terminal)	ニッケルめっき Nickel Plating		
		AUP3F	AUP3	AUP3T
		0.8 μ m 以上 Min. 0.8 μ m		2.0 μ m 以上 Min. 2.0 μ m
		金めっき Au Plating		
		AUP3F	AUP3	AUP3T
		0.03 μ m 以上 Min. 0.03 μ m	0.08 μ m 以上 Min. 0.08 μ m	
絶縁体 INSULATION	絶縁層 INSULATION LAYER	ポリエステル Polyester		
	接着層 ADHESIVE LAYER	難燃ポリエステル系 Frame-Retardant Polyester		
	色 COLOR	白 White		
補強テープ SUPPORTING TAPE	材 質 MATERIAL	ポリエステル Polyester		
	色 COLOR	青 Blue		

UL スタイルと適用品種 UL STYLE No. AND PRODUCTS

製品区分略号 SYMBOL NAME	製品構造 PRODUCT TYPE	UL スタイル No. UL STYLE No.	UL 定格 UL RATING	導体厚 CONDUCTOR THICKNESS (B) (mm)	仕上厚 CABLE THICKNESS (T) (mm)	導体間ピッチ PITCH (P) (mm)	
						0.5	1.0
SML2CD	AUP タイプ AUP Type	2896 薄肉タイプ Thin type	80°C、30 V	0.035	0.11	○	○
		20861	105°C、60 V	0.05	0.16	×	○
				0.035	0.14	○	△
		21147 ハロゲンフリー (HF)	80°C、60 V	0.05	0.14	×	○
				0.035	0.12	○	○
		20706 ハロゲンフリー (HF)	105°C、60 V	0.05	0.13	×	△
				0.035	0.11	○	○
	AUP3 タイプ AUP3 Type	2896 薄肉タイプ Thin type	80°C、30 V	0.035	0.11	○	×
				0.025 高屈曲 (High Flex)	0.09	○	×
		20861	105°C、60 V	0.035	0.14	○	×
		21147	80°C、60 V	0.035	0.12	△	×
				0.025	0.11	△	×

○：標準品

△：特殊仕様

×

○：Sumitomo Standard

△：Special Specification

×

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性能 (例) PROPERTIES (EXAMPLES)

		構 成 DETAIL		
UL スタイル No. UL STYLE No.		2896	20861	
導 体 CONDUCTOR	サイズ NOMINAL DIMENSION	0.035 × 0.3 mm		0.05 × 0.7 mm
	ピッチ PITCH	0.5 mm		1.0 mm
難燃性 FLAME RETARDANT		VW - 1 合格 UL VW - 1 Pass		
導体抵抗 CONDUCTOR RESISTANCE		2,200 Ω /km 以下 Max. 2,200 Ω /km		600 Ω /km 以下 Max. 600 Ω /km
絶縁抵抗 INSULATION RESISTANCE		1,000M Ω -m 以上 Min. 1,000 M Ω -m		
耐電圧 (隣接導体間) DIELECTRIC STRENGTH (Between Adjacent Conductors)		AC500V-1 分 絶縁破壊無し AC500V-1min No Dielectric Breakdown		
屈折試験 FLEXING TEST	往復摺動 SLIDING TEST	5mmR,700 回 / 分,20mm 10,000 回以上 5mmR,700 cycles/min,20mm Min.10,000 cycles	15mmR,1,000 回 / 分,25mm 1,000 万回以上 15mmR,1,000 cycles/min,25mm Min.10,000,000 cycles	10mmR,1,000 回 / 分,20mm 1,000 万回以上 10mmR,1,000 cycles/min,20mm Min.10,000,000 cycles
	180° 折り重ね屈曲 FOLDING TEST	30 回以上 Min. 30 cycles		100 回以上 Min. 100 cycles
摩耗強度 φ 0.5mm, 600g, 60 回 / 分 ABRASION TEST φ 0.5mm, 600g, 60cycles/min		1,000 回以上 Min. 1,000 cycles		10,000 回以上 Min. 10,000 cycles

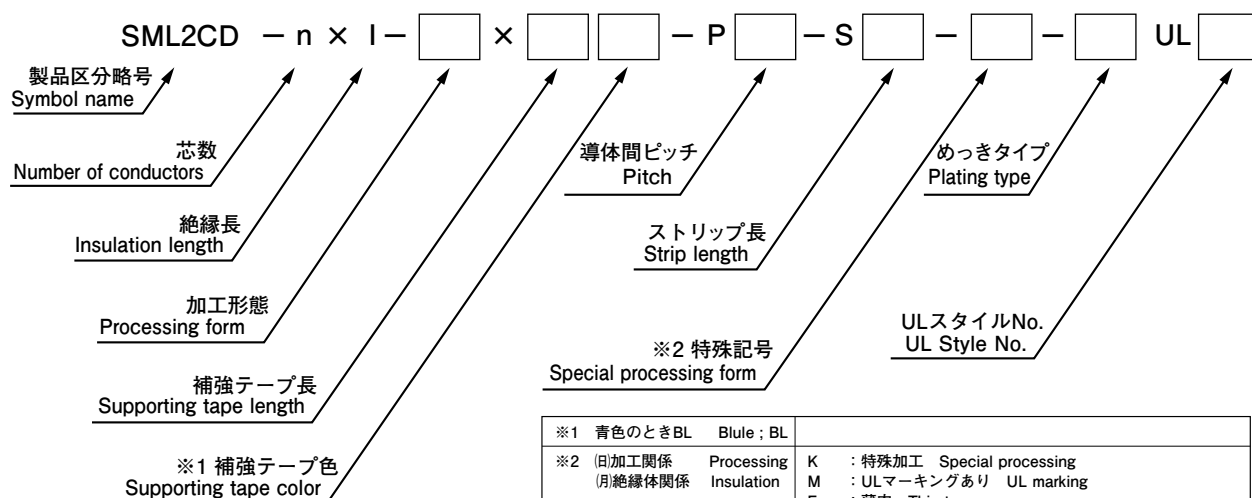
公称寸法 NOMINAL DIMENSION

単位 Unit : mm

項 目 ITEM	仕 様 DIMENSION	
導体間ピッチ PITCH (P)	0.5	1.0
導体幅 CONDUCTOR WIDTH (A)	0.30	0.70
マージン幅 MARGIN WIDTH (M)	0.35	0.65
トータルピッチ TOTAL PITCH (TP)	P × (n - 1) n= 導体数 n=number of conductors	
仕上幅 CABLE WIDTH (W)	P × (n + 1) n= 導体数 n=number of conductors	
絶縁長 INSULATION LENGTH (I)	20 以上任意 Min. 20	30 以上任意 Min. 30
全 長 CABLE LENGTH (L)	650mm 以下 / 650mm 超は要相談 MAX. 650 mm / Negotiable if over 650mm	
端末厚 TERMINAL THICKNESS (TT)	0.30 ± 0.05	
剥離長 STRIP LENGTH (S)	4, 5, 6	
補強テープ長 SUPPORTING TAPE LENGTH (H)	6, 8, 10	

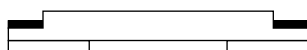
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品名呼称 NOMENCLATURE



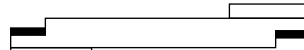
加工タイプ PROCESSING FORM

BDタイプ
BD type



両端末同じ方向に補強テープ
Supporting tapes at both ends
are on the same side

ADタイプ
AD type



両端末逆方向に補強テープ
Supporting tapes at both ends
are on the opposite side

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スミカード®

スミカード®
SUMI-CARD™

RoHS Directive					
Lead Free	Hg Free	Cd Free	Cr ⁶⁺ Free	PBB Free	PBDE Free

スミカード®はコネクタへのワンタッチ挿抜を可能にしたフラットケーブルのスタンダードです。

SUMI-CARD™ is world standard flat cable.

用 途

・ FPD・DVD・プリンター・スキャナー・ゲーム機・ノート PC、他の内部配線。

APPLICATION

・ SUMI-CARD™ is used for internal wiring of electronic equipment, FPD, DVD, game machine, notebook PC, printer, scanner and so on.

特 長

- ・ 薄く、フレキシブルかつ軽量で機器の小型・軽量化に対応
- ・ コネクタとの挿抜が容易で誤配線を防止でき、補修が可能
- ・ 定格 30V・80℃から 300V・105℃まで各種 UL 規格を取得
- ・ 難燃グレードは全て UL 規格 VW-1 に合格

DESCRIPTION

- ・ Efficient downsized wiring system
- ・ Insulation thickness is thin
- ・ Easy to connect, prevent mis-wiring
- ・ Rating voltage 30 V, rating temperature 80℃～
rating voltage 300 V, rating temperature 105℃
- ・ The vertical flame retardant test based on UL VW-1

構造および性能 CONSTRUCTION&TYPICAL PROPERTIES

項 目 ITEM		構 成 DETAIL	
製品区分略号 SYMBOL NAME		SML2CD	SML2XCD
導 体 CONDUCTOR	標準 STANDARD	錫めっき軟銅箔 (めっき厚 1 μm 以上) Tinned copper (Thickness of tin plating: Min. 1 μm)	
	SNT2 ウィスカ対策品 ANTI-WHISKER	錫めっき軟銅箔 (めっき厚 0.4+0.2/-0.1 μm (純錫厚 0.1 ± 0.1 μm)) Tinned copper (Thickness of tin plating : 0.4+0.2/-0.1 μm, pure tin plating : 0.1 ± 0.1 μm)	
絶縁体 INSULATION	絶縁層 INSULATION LAYER	ポリエステル Polyester	
	接着層 ADHESIVE LAYER	難燃ポリエステル系 Frame-Retardant Polyester	架橋ポリオレフィン Cross-Linked Polyolefin
	色 COLOR	白 White	
補強テープ SUPPORTING TAPE	材 質 MATERIAL	ポリエステル Polyester	
	色 COLOR	青 Blue	

性 能 (例) PROPERTIES (EXAMPLES)

製品区分略号 SYMBOL NAME		SML2CD	SML2XCD
UL スタイル No. UL STYLE No.		2896	20783
導 体 CONDUCTOR	サイズ NOMINAL DIMENSION	0.035 × 0.8 mm	0.035 × 0.8 mm
	ピッチ PITCH	1.25 mm	
難燃性 FLAME TEST		VW - 1 合格 VW - 1 PASS	
導体抵抗 CONDUCTOR RESISTANCE		750 Ω /km 以下 Max. 750 Ω /km	750 Ω /km 以下 Max. 750 Ω /km
絶縁抵抗 INSULATION RESISTANCE		1,000M Ω -m 以上 Min. 1,000 M Ω -m	
耐電圧 (隣接導体間) DIELECTRIC STRENGTH (Between Adjacent Conductors)		AC500V-1 分 絶縁破壊無し AC500V-1min No Dielectric Breakdown	AC2,500V-1 分 絶縁破壊無し AC2,500V-1min No Dielectric Breakdown
撓動試験 FLEXING TEST	往復撓動 SLIDING TEST	15mmR, 1,000 回 / 分, 25mm 1,500 万回以上 15mmR, 1,000 cycles/min, 25mm Min. 15,000,000 cycles	5mmR, 700 回 / 分, 20mm 50 万回以上 5mmR, 700 cycles/min, 20mm Min. 500,000 cycles
	180° 折り重ね屈曲 FOLDING TEST	100 回以上 Min. 100 cycles	50 回以上 Min. 50 cycles
φ 0.5mm, 600g 摩耗強度 φ 0.5mm, 600 g ABRASION TEST		10,000 回以上 Min. 10,000 cycles	

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UL スタイルと適用品種 UL STYLE No. AND PRODUCTS

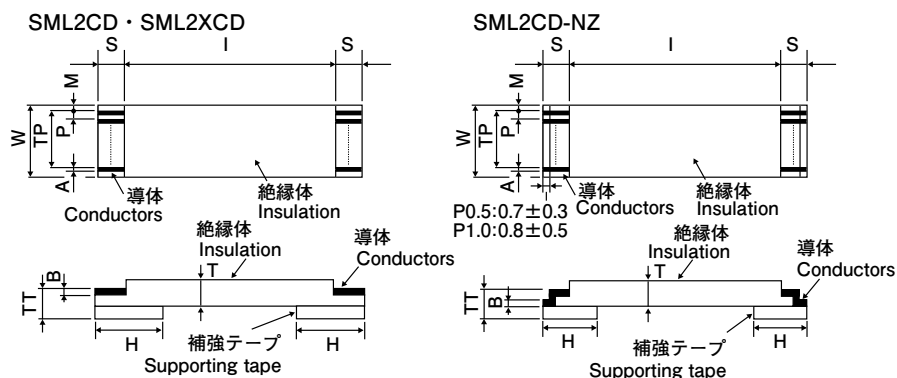
製品区分略号 SYMBOL NAME	UL スタイル No. UL STYLE No.	UL 定格 UL Rating	導体厚 CONDUCTOR THICKNESS (B) (mm)	仕上厚 CABLE THICKNESS (T) (mm)	導体間ピッチ PITCH (P) (mm)		
					1.25	1.0	0.5
SML2CD	2896	80°C、30 V	0.05	0.20	○	○	△
			0.035	0.18	○	○	△
	2896 薄肉タイプ Thin type	80°C、30 V	0.035	0.11	○	○	○
			0.05	0.20	○	○	△
	20624	80°C、60 V	0.035	0.18	○	○	○
			0.05	0.16	○	○	△
	20861	105°C、60 V	0.035	0.14	○	○	○
			0.05	0.14	○	○	○
SML2XCD	21147 ハロゲンフリー Halogen Free	80°C、60 V	0.035	0.12	○	○	○
			0.05	0.20	○	○	×
	20783	105°C、300 V	0.035	0.18	○	○	×
			0.05	0.18	×	×	○
	20941	105°C、90 V	0.035	0.16	×	×	○
			0.05	0.16	×	×	○

○：標準品 △：特殊仕様 ×：製造不可
 ○：Sumitomo Standard △：Special Specification ×：Unavailable

公称寸法 NOMINAL DIMENSION

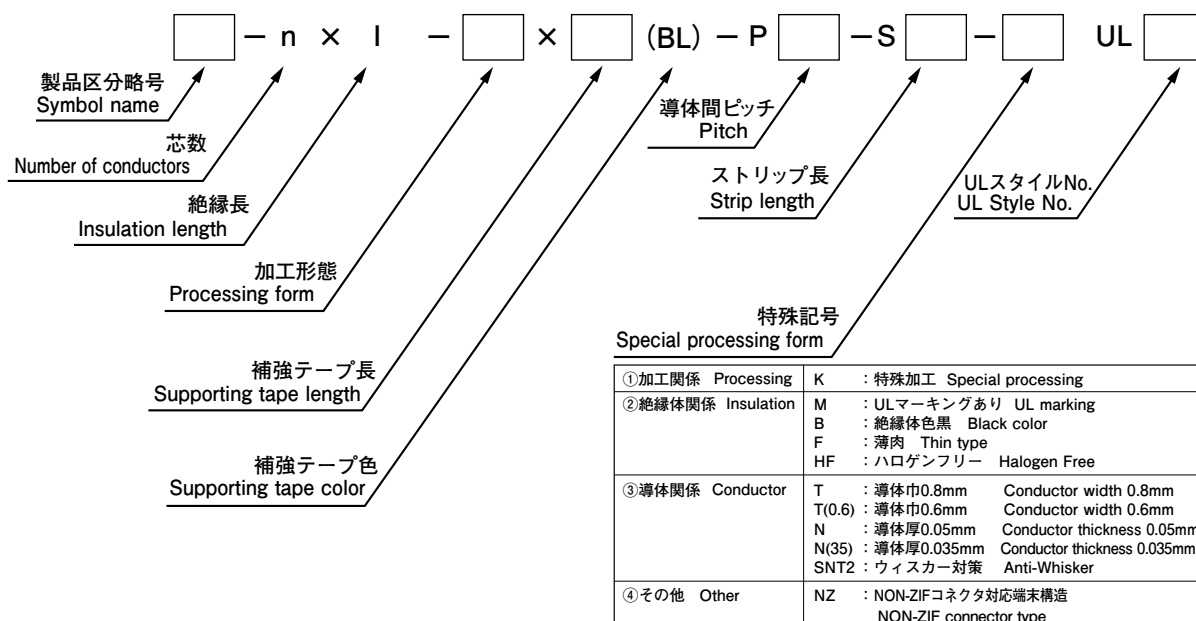
単位 Unit : mm

項 目 ITEM	寸 法 DIMENSION			
導体間ピッチ PITCH (P)	1.25	1.0		0.5
導体巾 CONDUCTOR WIDTH (A)	0.80	0.70	0.60	0.30
マージン巾 MARGIN WIDTH (M)	0.85	0.65	0.70	0.35
トータルピッチ TOTAL PITCH (TP)	$P \times (n - 1)$ $n = \text{導体数}$ $n = \text{number of conductors}$			
仕上巾 CABLE WIDTH (W)	$P \times (n + 1)$			
絶縁長 INSULATION LENGTH (I)	30 以上 (Min.30)			20 以上 (Min.20)
端末厚 TERMINAL THICKNESS (TT)	0.30			
ストリップ長 STRIP LENGTH (S)	4, 5, 6			
補強テープ長 SUPPORTING TAPE LENGTH (H)	6, 8, 10, 15, 20			

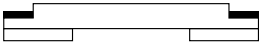
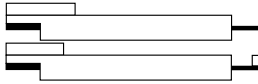


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品名呼称 NOMENCLATURE



加工タイプ PROCESSING FORM

製品区分略号 SYMBOL NAME	BD 両端末同じ方向に補強テープ Supporting tapes at both ends are on the same side	AD 両端末逆方向に補強テープ Supporting tapes at both ends are on the opposite side	ES 片端補強テープ、片端導体露出（サヤ残し加工を含む） Supporting tapes at one end, and the other end is stripped for soldering(including semi-strip type)
SML2CD SML2XCD			
SML2CD-NZ			

※本製品は車載用途に適さない場合がございますので、御使用前に弊社営業にご相談下さい。

※ This product is not suitable for automobile application in some cases. Please contact our sales office before you use this product.

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高周波対応スミカード

高周波対応スミカード
SUMI-CARD for high frequency

RoHS Directive					
Lead Free	Hg Free	Cd Free	Cr ⁶⁺ Free	PBB Free	PBDE Free

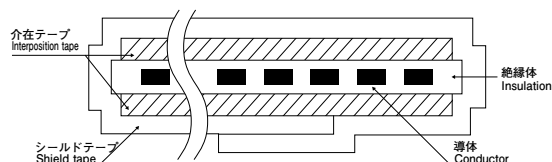
高周波対応スミカードは、AV 機器内部配線向け端子間ピッチ 0.5mm のフレキシブルフラットケーブルハーネスです。高速伝送規格で要求されるインピーダンスコントロール性能を併せ持つシールドスミカードの派生製品で、一般用途向け金めっきスミカードをベースとする Type I と、信号伝送品質を重視した Type II をラインナップしております。

用 途

- ・液晶 TV の LCD パネル駆動用信号伝送配線
- ・メモリーカードリーダ実装サブ基板との内部配線
- ・HDMI ポート実装サブ基板との内部配線

特 長

- ・汎用：CUP と専用：ALZ の 2 種類のシールドテープをラインナップ
- ・高周波特性は、シールドテープ種別と金めっき手法に依存
- ・Type I はニッケルめっき軟銅箔仕様で、Type II は軟銅箔導体仕様
- ・固定配線でのご使用を推奨



構 造

- ・UL のカテゴリは AWM ではなく、WIRING HARNESS となります。(UL 認定番号 E66078)
- ・インピーダンス調整のために介在テープを使用しております。
- ・シールド層を導体とは独立に GND と接続するための導電性テープ (金めっき銅箔テープ、グラウンドバーに相当) を有します。

SUMI-CARD for high frequency is Flexible Flat Cable harness for internal wiring in AV equipment. This product achieves a good balance between Noise suppression and Impedance control by derivative technology of SHIELD SUMI-CARD. Type I is based on a gold-plated SUMI-CARD for general uses. Type II is based on a gold-plated SUMI-CARD for special design for high-speed signaling.

APPLICATION

- ・LVDS wiring for LCD driving signal transmission.
- ・USB wiring between main-board and memory reader device.
- ・HDMI wiring between main-board and HDMI port.

DESCRIPTION

- ・Two kinds of shield tape are available. A commodity type is "CUP". A purpose-built type is "ALZ".
- ・The high frequency characteristic depends on shield tape and plating way of conductor.
- ・This product is classified roughly into two kinds by a kind of the conductor type of core-FFC.
- ・The conductor of core-FFC for "Type I" is Nickel plated annealed copper, for "Type II" is annealed copper.
- ・This product is not suitable for sliding use.

CONSTRUCTION

- ・This product is assembled with a FFC, interposition tape for impedance adjustment, shield tape for electro shielding, and electro-conductive tape for grounding electrode.
- ・The UL-category of this product is not AWM but WIRING HARNESS. (UL approved No. E66078)

Type I の構造 CONSTRUCTION LIST OF "TYPE I"

項 目 ITEM	構 成 DETAIL		
導 体 CONDUCTOR	ニッケルめっき軟銅箔, 0.035 × 0.3mm (全体にめっき), ニッケルめっき厚: 0.3um 以上 金めっき厚: 0.05um 以上 (開口部のみにめっき) Nickel plated annealed copper, 0.035 × 0.3mm, Nickel plating thickness: Min.0.3um, Terminal Au plating thickness: Min.0.05um		
絶縁体 INSULATION	ポリエステル (接着層: 難燃ポリエステル系接着剤) Polyester (Flame-retardant polyester adhesive)		
補強テープ SUPPORTING TAPE	ポリエステル Polyester		
UL 定格 UL-RATING STYLE No.	80°C /60V AWM21147	105°C /60V AWM20706	105°C /60V AWM20861
ハロゲンフリー対応 HALOGEN FREE STATUS	ハロゲンフリー HF	ハロゲンフリー HF	非ハロゲンフリー Non-HF
介在テープ INTERPOSITION TAPE	ポリオレフィン樹脂 Polyolefin resin		
シールドテープ SHIELD TAPE	ALZ ALPET (斜線状エチレン酢酸ビニル系接着剤) ALZ Aluminum-clad PET (Zebra-coated ethylene-vinyl acetate adhesive)		ALZ CUP 銀蒸着 PET (導電性 ポリエステル系接着剤) CUP Silver evaporated PET (Electro-conductive polyester adhesive)
導電性テープ ELECTRO-CONDUCTIVE TAPE	錫めっき銅箔テープ (シールド接地用電極) Tinned copper tape (for grounding electrode of shield tape)		

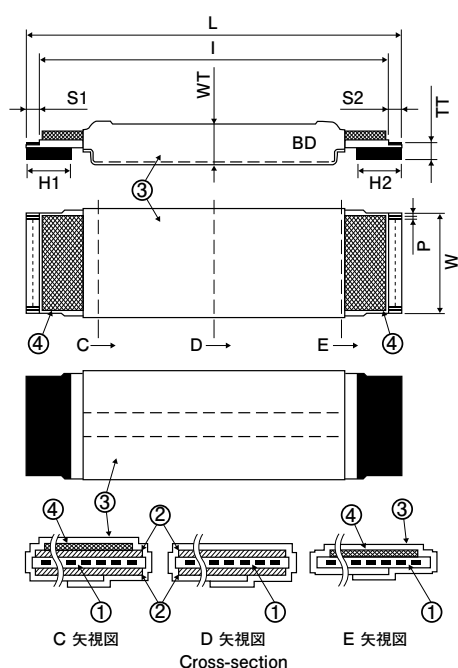
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Type II の構造 CONSTRUCTION LIST OF "TYPE II"

項目 ITEM	構成 DETAIL
導 体 CONDUCTOR	軟銅箔, 0.035 × 0.3mm (開口部のみにめっき), 下地ニッケルめっき厚: 0.8μm 以上、金めっき厚: 0.08μm 以上 Annealed copper, 0.035 × 0.3mm Nickel plating thickness: Min.0.8 μm, Au plating thickness: Min.0.08μm, only exposed area
絶縁体 INSULATION	ポリエステル (接着層: 難燃ポリオレフィン系接着剤) Polyester (Flame-retardant polyolefin adhesive)
補強テープ SUPPORTING TAPE	ポリエステル Polyester
UL 定格 UL-RATING STYLE No.	80°C /60V AWM5442
ハロゲンフリー対応 HALOGEN FREE STATUS	非ハロゲンフリー Non-HF
介在テープ INTERPOSITION TAPE	ポリオレフィン樹脂 Polyolefin resin
シールドテープ SHIELD TAPE	ALPET (斜線状エチレン酢酸ビニル系接着剤) ALZ Aluminum-clad PET (Zebra-coated ethylene-vinyl acetate adhesive)
導電性テープ ELECTRO-CONDUCTIVE TAPE	錫めっき銅箔テープ (シールド接地用電極) Tinned copper tape (for grounding electrode of shield tape)

形 状 SHAPE



- (田) スミカード® SUMI-CARD™
 (月) 介在テープ INTERPOSITION TAPE
 (火) シールドテープ SHIELD TAPE
 (水) 導電性テープ ELECTRO-CONDUCTIVE TAPE

代表寸法 DIMENSION (EXAMPLE)		
項目 ITEM		寸法 DIMENSION UNIT. mm
名 称 DESCRIPTION	記 号 SYMBOL	
端子間ピッチ TERMINAL PITCH	P	0.5 ± 0.03
端末厚 TERMINAL THICKNESS	TT	コネクタ推奨寸法 Connector maker recommendation dimension
ストリップ長 STRIP LENGTH	S1, S2	
補強テープ長 SUPPORTING TAPE LENGTH	H1, H2	
絶縁長 INSULATION LENGTH	I	50 ≤ I < 800
ケーブル全長 CABLE LENGTH	L	I + S + S
ケーブル厚 CABLE THICKNESS	WT	(0.74)

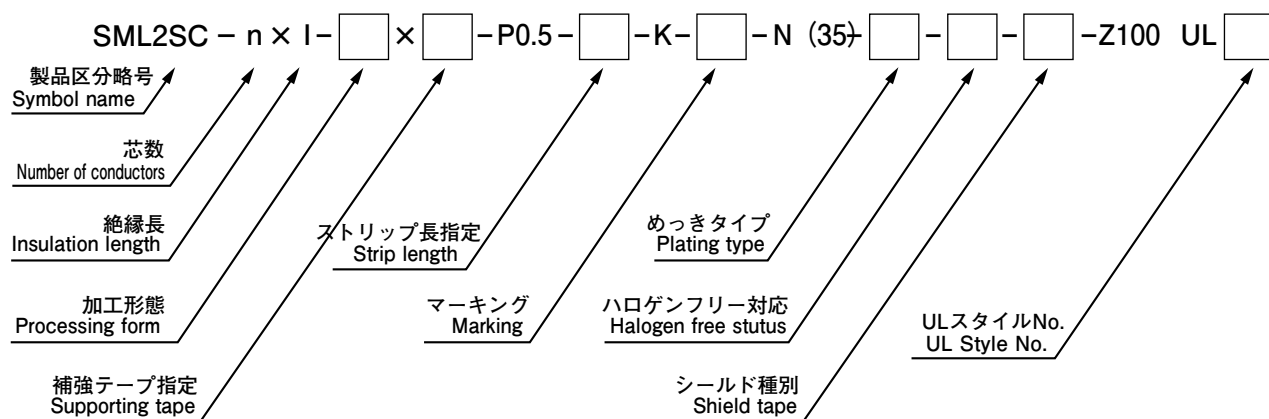
- ・ AD タイプも製作可能です。
 ・ プラグタイプも対応可能です。
- ・ AD type is available.
 ・ Plug terminal type is available.

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性能 (例) PROPERTIES (EXAMPLES)

項目 ITEM	TYPE I CUP	TYPE I ALZ	TYPE II ALZ
インピーダンス (差動モード) DIFFERENTIAL MODE IMPEDANCE	92 Ω typ. 90 ± 10 Ω	90 Ω typ. 90 ± 10 Ω	96 Ω typ. 100 ± 10 Ω
信号伝送品質 SIGNAL INTEGRITY	△	○	◎
耐屈曲性能 FLEX TESTING DURABILITY	△	×	×

品名呼称 NOMENCLATURE



項目 ITEM	マーキング MARKING	ハロゲンフリー HALOGEN FREE	端子めっき TERMINAL PLATING	シールドテープ SHIELD TAPE	ULスタイルNo. UL Style No.
タイプ I 非ハロゲンフリー TYPE I NON-HF	-M	—	-AUP	-CUP or -ALZ	UL20861
タイプ I ハロゲンフリー TYPE I HF	—	-HF	-AUP	-ALZ	UL21147, UL20706
タイプ II 非ハロゲンフリー TYPE II NON-HF	—	—	-AUP3	-ALZ	UL5442

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高温高湿対応スミカード

高温高湿対応スミカード
SUMI-CARD for high temperature, high humidity

用 途

- ・ 車載機器用途を中心に、高耐熱・高耐湿、且つ長期信頼性をもつ製品が要求されます。このご要求に対応するために新規に独自開発した絶縁フィルムを使用し、優れた耐環境性能をもつフラットケーブルです

特 長

- ・ 高耐熱・高耐湿性能を非照射にて実現
(85℃、85%×1,000 時間保証)
- ・ 従来より厳しい耐環境性能を要求される室外設置の車載機器にも対応可能 (ミリ波レーダー等)
- ・ イラックススミカードの代替品としても適用可能
- ・ 金めっき対応可能

APPLICATION

- ・ In the major market of automotive electronics, it's strongly required the high reliability products like high heat resistance and high humidity resistance. SUMI-CARD for high temperature, high humidity is now under developing to achieve higher performance with the combination of our own high performance insulation material.

DESCRIPTION

- ・ High performance with heat resistance and humidity resistance without irradiation. (e.g.85℃,85%X1000Hr)
- ・ Will be applied for out-room automotive electronics unit and household electronic appliances which requires the high Temp.resistance.
- ・ Replacement of the "IRRAX SUMI-CARD" is possible.
- ・ Enable to Au-plating type and Tin plating type.

構 造 CONSTRUCTION

項 目 ITEM		構 成 DETAIL
製品区分略号 SYMBOL NAME		SML2CD
製品構造 PRODUCT TYPE		錫めっきタイプ Tin Plated Copper type
導 体 CONDUCTOR	標準 STANDARD	錫めっき軟銅箔 (めっき厚 1 μ m 以上) Tinned copper (Thickness of tin plating:Min.1 μ m)
	SNT2 ウィスカ対策品 ANTI-WHISKER	錫めっき軟銅箔 (めっき厚 0.4+0.2/-0.1 μ m (純錫厚 0.1 $\pm$ 0.1 μ m)) Tinned copper (Thickness of tin plating : 0.4+0.2/-0.1 μ m, pure tin plating : 0.1 $\pm$ 0.1 μ m)
絶縁体 INSULATION	絶縁層 INSULATION LAYER	ポリエステル Polyester
	接着層 ADHESIVE LAYER	架橋ポリオレフィン Cross-Linked Polyolefin
	色 COLOR	白 White
補強テープ SUPPORTING TAPE	材 質 MATERIAL	ポリエステル Polyester
	色 COLOR	青 Blue

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項 目 ITEM		構 成 DETAIL	
製品区分略号 SYMBOL NAME		SML2CD	
製品構造 PRODUCT TYPE		AUP タイプ AUP type	
導 体 CONDUCTOR	材 質 MATERIAL	軟銅箔 Annealed copper	
	めっき (全体) PLATING (whole)	ニッケルめっき Nickel Plating	
	厚み THICKNESS	AUP	AUPT
		0.3 μ m 以上 Min. 0.3 μ m	
	めっき (端末部) PLATING (Terminal)	金めっき Au Plating	
	厚み THICKNESS	AUP	AUPT
		0.05 μ m 以上 Min. 0.05 μ m	0.15 μ m 以上 Min. 0.15 μ m
絶縁体 INSULATION	絶縁層 INSULATION LAYER	ポリエステル Polyester	
	接着層 ADHESIVE LAYER	難燃ポリオレフィン Flame retardant polyolefin	
	色 COLOR	白 White	
補強テープ SUPPORTING TAPE	材 質 MATERIAL	ポリエステル Polyester	
	色 COLOR	青 Blue	

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性能 (例) PROPERTIES (EXAMPLES)

製品区分略号 SYMBOL NAME		構 成 DETAIL	
UL スタイル No. UL STYLE No.		5465	5462
導体 CONDUCTOR	サイズ NOMINAL DIMENSION	0.035 × 0.3 mm	0.05 × 0.7 mm
	ピッチ PITCH	0.5 mm	1.0 mm
難燃性 FLAME TEST		VW - 1 合格 VW - 1 PASS	
導体抵抗 CONDUCTOR RESISTANCE		2,200 Ω /km 以下 Max. 2,200 Ω /km	600 Ω /km 以下 Max. 600 Ω /km
絶縁抵抗 INSULATION RESISTANCE		1,000M Ω -m 以上 Min. 1,000 M Ω -m	
耐電圧 (隣接導体間) DIELECTRIC STRENGTH (Between Adjacent Conductors)		AC500V-1 分絶縁破壊無し AC500V-1min No Dielectric Breakdown	
耐熱性 (110℃ × 1000Hr) HEAT RESISTANCE (110℃ × 1000Hr)		絶縁抵抗 1000M Ω -m 以上 Insulation Resistance Min. 1,000 M Ω -m	
		耐電圧 (隣接導体間) AC500V-1 分絶縁破壊無し DIELECTRIC STRENGTH (Between Conductors) AC500V-1min No Dielectric Breakdown	
耐湿性 (85℃ 85%RH × 1000Hr) HIGH HUMIDITY RESISTANCE (85℃ 85%RH × 1000Hr)		絶縁抵抗 1000M Ω -m 以上 Insulation Resistance Min. 1,000 M Ω -m	
		耐電圧 (隣接導体間) AC500V-1 分絶縁破壊無し DIELECTRIC STRENGTH (Between Conductors) AC500V-1min No Dielectric Breakdown	
耐寒性 (-40℃ × 1000Hr) COLD RESISTANCE (-40℃ × 1000Hr)		絶縁抵抗 1000M Ω -m 以上 Insulation Resistance Min. 1,000 M Ω -m	
		耐電圧 (隣接導体間) AC500V-1 分絶縁破壊無し DIELECTRIC STRENGTH (Between Conductors) AC500V-1min No Dielectric Breakdown	
ヒートショック HEAT SHOCK (110℃ × 0.5Hr ⇄ -40℃ × 0.5Hr) × 1000Cycles		絶縁抵抗 1000M Ω -m 以上 Insulation Resistance Min. 1,000 M Ω -m	
		耐電圧 (隣接導体間) AC500V-1 分絶縁破壊無し DIELECTRIC STRENGTH (Between Conductors) AC500V-1min No Dielectric Breakdown	
屈曲性 FLEXIBILITY	往復摺動 SLIDING	15mmR, 1,000 回 / 分, 25mm 1,000 万回以上 15mmR, 1,000 cycles/min, 25mm Min. 10M cycles	
	180° 折り重ね屈曲 FOLDING TEST	30 回以上 Min. 30 cycles	100 回以上 Min. 100 cycles
摩耗強度 φ 0.5mm, 600g, 60 回 / 分 ABRASION TEST φ 0.5mm, 600g, 60cycles/min		10,000 回以上 Min. 10,000 cycles	

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UL スタイルと適用品種 UL STYLE No. AND PRODUCTS

製品区分略号 SYMBOL NAME	製品構造 PRODUCT TYPE	UL スタイルNo. UL STYLE No.	UL 定格 UL Rating	導体厚 CONDUCTOR THICKNESS (B) (mm)	CABLE THICKNESS (T) (mm)	導体間ピッチ Pitch (mm)		
						1.25	1.0	0.5
SML2CD	錫めっきタイプ Tin Plated Type	5462	105°C 300V	0.035	0.18	○	○	×
				0.05	0.20	○	○	×
		5465	105°C 90V	0.035	0.18	×	×	○
				0.05	0.20	×	×	○
	SNT2 タイプ ANTI WHISKER Type	5462	105°C 300V	0.035	0.18	○	○	×
				0.05	0.20	△	△	×
		5465	105°C 90V	0.035	0.18	×	×	○
				0.05	0.20	×	×	△
	AUP タイプ AUP Type	5462	105°C 300V	0.035	0.18	×	×	×
				0.05	0.20	×	×	×
		5465	105°C 90V	0.035	0.18	×	×	○
				0.05	0.20	×	×	×

○：標準品

△：特殊仕様

×

○：Sumitomo Standard

△：Special Specification

×

公称寸法 NOMINAL DIMENSION

錫めっき、SNT 2 タイプ (TIN PLATED, SNT2 TYPE)

単位 Unit : mm

項 目 ITEM	寸 法 DEMENSION			
導体間ピッチ PITCH (P)	1.25	1.0		0.5
導体幅 CONDUCTOR WIDTH (A)	0.80	0.70	0.60	0.30
マージン幅 MARGIN WIDTH (M)	0.85	0.65	0.70	0.35
トータルピッチ TOTAL PITCH (TP)	$P \times (n + 1)$ n= 導体数 n=number of conductors			
仕上幅 CABLE WIDTH (W)	$P \times (n + 1)$ n= 導体数 n=number of conductors			
絶縁長 INSULATION LENGTH (I)	$P \times (n + 1)$			
全 長 CABLE LENGTH (L)	20 以上任意 (P1.25,P1.0 の AD タイプは 30 以上) Min. 20(P1.25,P1.0 AD type:Min30)			
端末厚 TERMINAL THICKNESS (TT)	0.30			
剥離長 STRIP LENGTH (S)	4,5,6,			
補強テープ長 SUPPORTING TAPE LENGTH (H)	6,8,10,15,20			

※本カタログの仕様・構成等は性能改善の為、お断り無く変更する場合がございます。

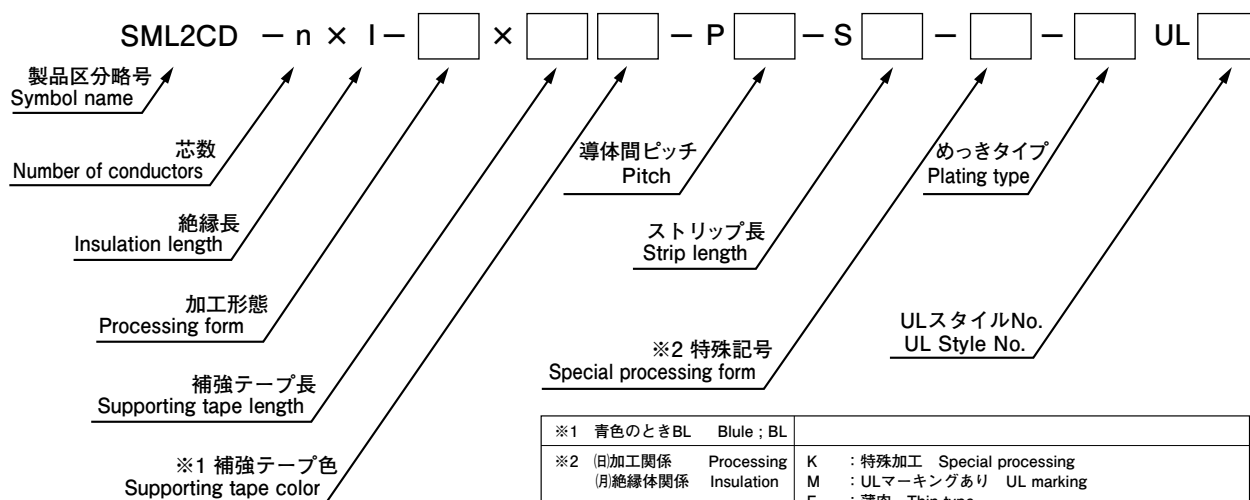
※ This specification is subject to change without a prior announcement.

AUP タイプ (AUP TYPE)

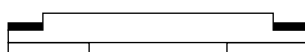
単位 Unit : mm

項 目 ITEM	仕 様 DEMENSION	
導体間ピッチ PITCH (P)	0.5	1.0
導体幅 CONDUCTOR WIDTH (A)	0.30	0.70
マージン幅 MARGIN WIDTH (M)	0.35	0.65
トータルピッチ TOTAL PITCH (TP)	$P \times (n + 1)$ n= 導体数 n=number of conductors	
仕上幅 CABLE WIDTH (W)	$P \times (n + 1)$ n= 導体数 n=number of conductors	
絶縁長 INSULATION LENGTH (I)	20 以上任意 Min. 20	30 以上任意 Min. 30
全 長 CABLE LENGTH (L)	650mm 以下 /650mm 超は要相談 MAX. 650mm/Negotirble over 650mm	
端末厚 TERMINAL THICKNESS (TT)	0.30 ± 0.05	
剥離長 STRIP LENGTH (S)	4,5,6,	
補強テープ長 SUPPORTING TAPE LENGTH (H)	6,8,10	

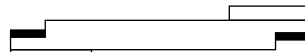
品名呼称 NOMENCLATURE



加工タイプ PROCESSING FORM



両端末同じ方向に補強テープ
Supporting tapes at both ends
are on the same side



両端末逆方向に補強テープ
Supporting tapes at both ends
are on the opposite side

※本製品は車載用途に適さない場合がございますので、御使用前に弊社営業にご相談下さい。

※ This product is not suitable for automobile application in some cases. Please contact our sales office before you use this product.

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※ This specification is subject to change without a prior announcement.