

# Qualtek

Electronics Corporation



## Heat Shrink Products Cable Ties & Accessories

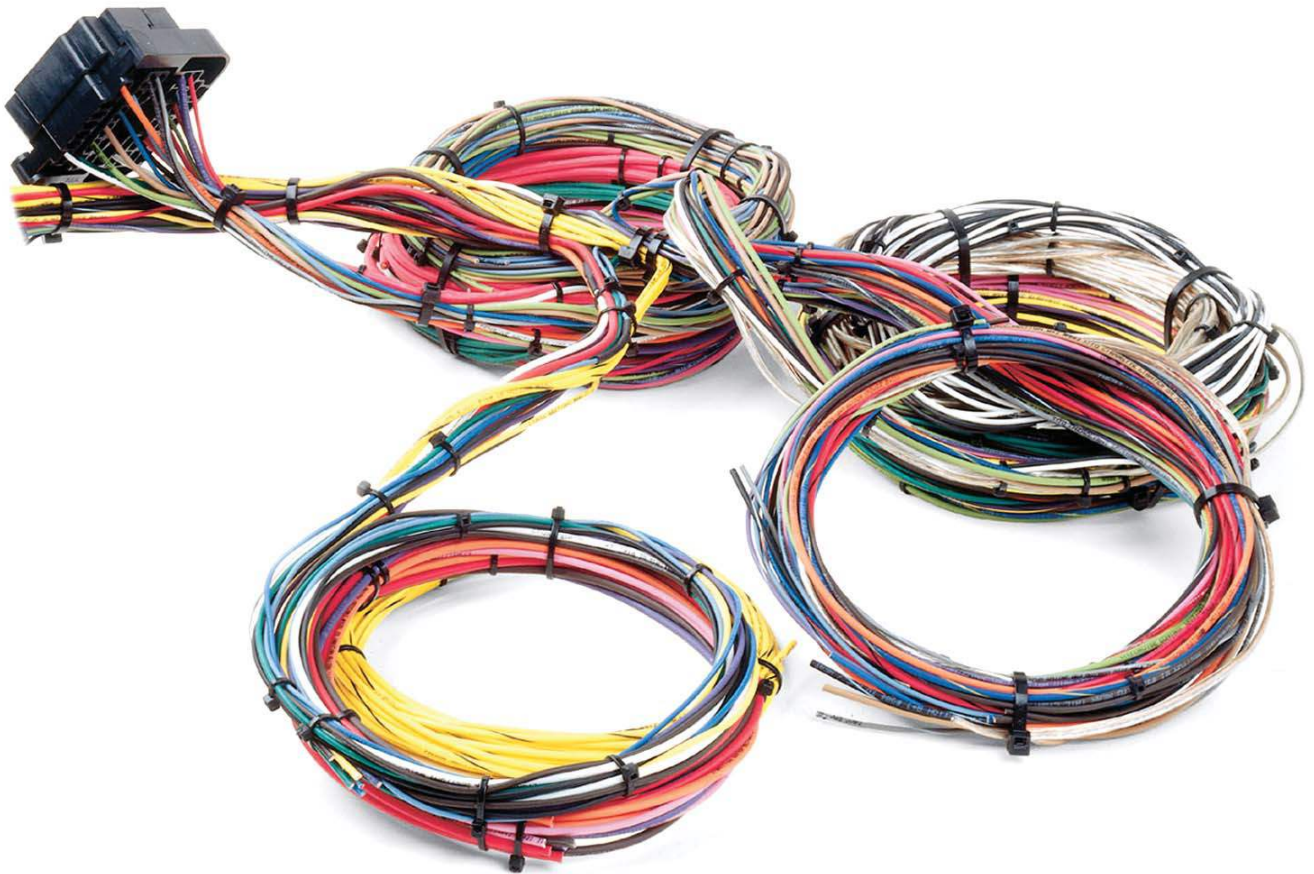


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## HEAT SHRINK THIN WALL TUBING

Part Number	Material	Product Type	Shrink Ratio	Operating Temp. & Voltage Rating	Min. Shrink Temp.	Full Recovery Temp.
Q2-CB	Polyolefin	Ultra Thin Wall	2:1	-55°C to +125°C, 300V	70°C	100°C
Q2-F	Polyolefin	Thin Wall	2:1	-55°C to +135°C, 600V	70°C	100°C
Q2-F3X	Polyolefin	Thin Wall	3:1	-55°C to +135°C, 600V	70°C	100°C
Q2-F4X	Polyolefin	Thin Wall	4:1	-55°C to +135°C, 600V	70°C	100°C
Q2-F2XYG Q2-F3XYG	Polyolefin	Thin Wall	2:1, 3:1	-55°C to +135°C, 600V	70°C	100°C
Q2-HF	Polyolefin	Thin Wall	2:1	-55°C to +105°C, 600V	70°C	100°C
Q2-LS	Polyolefin	Thin Wall	2:1	-55°C to +125°C, 600V	65°C	95°C
Q2-R	Polyolefin	Semi-Rigid Thin Wall	2:1	-55°C to +135°C, 600V	70°C	130°C
Q2-Z	Polyolefin	Thin Wall	2:1	-55°C to +125°C, 600V	70°C	100°C
Q2-3X	Polyolefin	Thin Wall	3:1	-55°C to +125°C, 600V	70°C	100°C
Q-150K	Modified PVDF	Flexible Thin Wall	2:1	-55°C to +150°C, 600V	135°C	150°C
Q-175K	PVDF	Semi-Rigid Thin Wall	2:1	-55°C to +175°C, 600V	-	175°C
Q-200E	Modified Fluoroelastomer Viton®	Very Flexible Thin Wall	2:1	-55°C to +200°C, 600V	150°C	175°C
QPTFE	Modified PTFE	Semi-Rigid Thin Wall	2:1	-65°C to +260°C, 600V	-	350°C

## HEAT SHRINK MEDIUM / HEAVY WALL TUBING - ADHESIVE LINED

Part Number	Material	Product Type	Shrink Ratio	Operating Temp. & Voltage Rating	Min. Shrink Temp.	Full Recovery Temp.
Q5-2X	Polyolefin	Dual Wall	2:1	-45°C to +125°C, 600V	100°C	125°C
Q5-3X	Polyolefin	Dual Wall	3:1	-55°C to +125°C, 600V	80°C	110°C
Q5-4X	Polyolefin	Dual Wall	4:1	-55°C to +125°C, 600V	80°C	110°C
Q5-F3X	Polyolefin	Dual Wall	3:1	-55°C to +125°C, 600V	70°C	110°C
Q5-F4X	Polyolefin	Dual Wall	4:1	-55°C to +125°C, 600V	70°C	110°C
Q5-4XR	Polyolefin	Semi-Rigid Dual Wall	4:1	-55°C to +125°C, 600V	110°C	135°C
Q5-3XM	Polyolefin	Heavy Dual Wall	3:1	-55°C to +125°C, 600V	80°C	110°C
QRA-6X	Polyolefin	Heavy Dual Wall	6:1	-55°C to +110°C, 600V	120°C	120°C
QBTM QBTH	Non-Halogen Polymer	Bus Bar	-	-55°C to +105°C, 24-36kV	120°C	-

## END CAPS

Part Number	Material	Product Type	Shrink Ratio	Operating Temp. & Voltage Rating	Min. Shrink Temp.	Full Recovery Temp.
QSEC	Polyolefin	Cable End Caps	-	-55°C to +110°C, 1000V	120°C	-

SHRINK TUBE KITS, REFILL BAGS, Q BOX & MINI SPOOLS

General Description	Agency Certification	Military Standard	Page
		SAE-AMS-DTL	
No PBB's, PBBE's, PBBO's, Low Cadmium and Lead, VW-1 mm Sizes: 1.0 to 10mm, Inch Sizes: 3/64" to 1/2"	E236137 242540	-	13
No PBB's, PBBE's, PBBO's, Very Flexible, Highly Flame-Retardant, VW-1 mm Sizes: 1.2 to 151mm, Inch Sizes: 3/64" to 6"	E236137 242540	23053/5 Class 1 & 3	14
No PBB's, PBBE's, PBBO's, Very Flexible, High Shrink Ratio, Highly Flame-Retardant, VW-1 mm Sizes: 1.5 to 39mm, Inch Sizes: 1/16" to 1 1/2"	E236137 242540	23053/5 Class 1 & 3	15
No PBB's, PBBE's, PBBO's, Very Flexible, High Shrink Ratio, Highly Flame-Retardant mm Sizes: 19.1 to 115mm, Inch Sizes: 3/4" to 4 1/2"	E236137 242540	23053/5 Class 1 & 3	16
Yellow-Green Striped, Flexible, Flame-Retardant Tubing, VW-1 2:1 - mm Sizes: 1.2 to 101.6mm, Inch Sizes: 3/64" to 4", 3:1 - mm Sizes: 1.6 to 39mm, Inch Sizes: 1/16" to 1 1/2"	E236137 242540	23053/5 Class 1 & 3	17
Halogen Free Polyolefin Tubing, Low Smoke mm Sizes: 1.0 to 150mm	242540	-	18
Very Flexible, Low Shrink Temperature, Halogen Free Polyolefin Tubing mm Sizes: 1.6 to 50.8mm, Inch Sizes: 1/16" to 2"	242540	-	19
Semi-Rigid, Flame-Retardant Tubing, Resistant to Common Chemicals and Solvents, Self-Extinguish in 30 Seconds mm Sizes: 1.2 to 25.4mm, Inch Sizes: 3/64" to 1"	E236137 242540	23053/6 Class 1 & 2	20
Environment Friendly, Flexible, Flame-Retardant, VW-1 mm Sizes: 1.0 to 150mm, Inch Sizes: 3/64" to 6"	E236137 242540	-	21
Flexible, High Shrink Ratio, Highly Flame-Retardant, VW-1 mm Sizes: 1.5 to 39mm, Inch Sizes: 1/16" to 1 1/2"	E236137 242540	-	22
Flexible, High Temperature, Chemical Resistant, Polyvinylidene Fluoride(PVDF) Kynar®, VW-1 mm Sizes: 1.2 to 38.1mm, Inch Sizes: 3/64" to 1 1/2"	VW-1 E245010	23053/18	23
Clear, High Temperature, Chemical Resistant, Polyvinylidene Fluoride (PVDF) Kynar®, VW-1 mm Sizes: 1.2 to 38.1mm, Inch Sizes: 3/64" to 1 1/2"	VW-1 E245010	23053/18	24
Flexible, Elastic, High Temperature, Solvent Resistant, Viton®, VW-1 mm Sizes: 3.2-50.8mm, Inch Sizes: 1/8" to 2"	VW-1 E245010	23053/13	25
Polytetrafluoroethylene Tubing, Self-Extinguish Sizes: AWG 30 to AWG 0	-	23053/12	26

General Description	Agency Certification	Military Standard	Page
		SAE-AMS-DTL	
Adhesive-Lined, Flexible, High Shrink Ratio, Flame-Retardant Tubing, Self-Extinguish in 30 Seconds mm Sizes: 3.2 to 38.1mm, Inch Sizes: 1/8" to 1 1/2"	E236137 242540	23053/4	27
Adhesive-Lined, Flexible, High Shrink Ratio, Flame-Retardant Tubing, Self-Extinguish in 30 Seconds mm Sizes: 3.0 to 50.0mm, Inch Sizes: 1/8" to 2"	E236137 242540	23053/4	28
Adhesive-Lined, Flexible, High Shrink Ratio, Flame-Retardant Tubing, Self-Extinguish in 30 Seconds mm Sizes: 4.0 to 52.0mm, Inch Sizes: 3/16" to 2"	E236137 242540	23053/4	29
Adhesive-Lined, Flexible, Polyolefin Tubing, Self-Extinguish in 30 Seconds mm Sizes: 3.0 to 40mm, Inch Sizes: 1/8" to 1 1/2"	E236137 242540	23053/4	30
High Shrink Ratio, Adhesive-Lined, Flexible, Flame-Retardant Tubing, Self-Extinguish in 30 Seconds mm Sizes: 4 to 52mm, Inch Sizes: 3/16" to 2"	E236137 242540	23053/4	31
High Shrink Ratio, Semi-Rigid, Adhesive-Lined, Flexible, Flame-Retardant Tubing, Self-Extinguish in 30 Seconds mm Sizes: 6.0 to 18.0mm, Inch Sizes: 0.236" to 0.708"	-	23053/4	32
Heavy Dual Wall, High Shrink Ratio, Adhesive-Lined, Flame-Retardant, Self-Extinguish in 30 Seconds mm Sizes: 19.0 to 100.0mm, Inch Sizes: 3/4" to 4"	-	-	33
Very High Shrink Ratio, Heavy Dual Wall, Hot-Melt, Adhesive-Lined mm Sizes: 19.0 to 235mm	-	-	34
Specially formulated radiation cross-linked halogen free compounds. High resistance to tracking and arcing. UV and weather resistant mm Sizes: 15.0 to 235mm	-	-	35

General Description	Page
Spiral Hot-Melt Adhesive Coated End Cap for Protecting Cable Ends from the Environmental Effects. mm Sizes: 12 to 200mm	36

# HEAT SHRINK PRODUCTS CROSS REFERENCE GUIDE



Qualtek PN	Page	Raychem	Sumitomo	Canusa	3M	Alpha	Insul Tab	LG
Q2-CB	13	VERSAFIT V4	F3(Z)	Deray ITW				GSHS-1625G
Q2-F	14	RNF-100, VERSAFIT	B2, B2(Z), F, F2, F2(Z)	CPX100, CPX-876	FP-301	FIT 221, FIT 221V	HS-101	GSHS-1635F
Q2-F3X	15	RNF-3000	B2(3X), F2(3X), A2(3X)	CPX300, Deray-I 3000	SFTW-203	FIT 321V	HS101 SR	GSHS-3635
Q2-F4X	16	RP-4800	W3B2(4X)			FIT 421		
Q2-F2XYG	17	DCPT 2:1	B2(Y/G)	Deray IGY, CPX-201	SFTW-202GYS	FIT 260		GSHS-1635Y/G
Q2-F3XYG	17	DCPT 3:1		Deray IGY, CPX-201			HS-101(3X)	
Q2-HF	18	ZHTM	SUMITUBE-NH	CZT-200				
Q2-LS	19	LSTT		Deray LSB				
Q2-R	20	CRN, RT-3	B8	CHM 140	SR350	FIT 295	HS-101-SR	
Q2-Z	21	VERSAFIT V2	F2(Z)	Deray H	CP-221			GSHS-1625G
Q2-3X	22	VERSAFIT 3X	F2(3X), B2(3X)				HS101SR	
Q-150K	23	RT 375, RNF-150	K2		THV-150 BLACK	FIT 221VC		GSHS-1650F
Q-175K	24	KYNAR, RW-175	K	CKN-175, Deray KY 175	KYNAR	FIT 350	HSK-600	GSHS-1675
Q-200E	25	VITON	FE3	Deray VT220	VITON	FIT 650	HSN-VTN	
Q-PTFE	26	TFE		Deray PTFE				
QDR	-	DR-25		Deray V25				
QDR-TW	-	DR-25-TW		Deray V25TW				
Q5-2X	27	TAT-125	02B2		EPS-200	FIT 750	HS-101-MV 2:1	GSHS-1625W
Q5-3X	28	DWP-125	W3B2	CPA 300	EPS-300	FIT 321	HS-101-MW 3:1	GSHS-3635W
Q5-4X	29	ATUM 4:1	W3B2		EPS-400		HS-101-MW 4:1	GSHS-4635W
Q5-F3X	30	ATUM 3:1	W3B2(4X)	Deray IAKT 3:1	EPS-300	FIT 321	HS-101-MW 3:1	GSHS-3635W
Q5-F4X	31	ATUM 4:1		Deray IAKT 4:1	EPS-400		HS-101-MW4:1	GSHS-4635W
Q5-4XR	32	ES-2000	SA2	Deray Splicemelt	EPS-400, SMS	FIT 421		GSHS-4635WS
Q5-3XM	33	SST			ITCSN, MDT	FIT 700		
Q5-2000	-	AP-2000	O2					GSHS-2690NW
QRA2	-	MWTM		CFM	IMCSN, MDT			LG-PMWT
QRA3	-	WCSM, SST		CFW		FIT 700		LG-PHWT
QFRA3	-	BSTSFR, SSTFR		FCFW	HDT, ITCSF			
QRA-6X	34			CFHR		FIT 321		
QBTM	35	BPTM		CBTM	BBI			
QBTH	35	BBIT		CBTH				
QRS	-			PLA				
QSTV	-	TCS2		CFTV	CCT		CTV	LG-CATV
QAT	-	HVTM		CNTT				
QBM	-	BBIT		CBTH	BBI			LG-BBVH
QBT	-	BPTM		CBTM	BBI			
QSCT	-			HSCT				
QSC-100	-		SCR-100	CSCR				
QSEC	36	SSC, ESC		CCAP, CEC	ICEC	FIT CAP		

Note: Qualtek products may not be a direct equivalent as listed; this cross reference is a guide only.

# CABLE TIES CROSS REFERENCE GUIDE



Qualtek PN	Page	Catamount T&B	Thomas & Betts	Panduit	Ideal Ind.	Hellermann Tyton	Avery Dennison	Richco	3M
11-M100B-C	40		TY551MX	PLM1M-C0		IT18R0C2			
11-M100N-C	40	L-4-18ID-9-C	TY551M	PL1M-C	IT1MID-C	IT18R9C2	08417	WIT-F1-18R-M	
11-M110B-C	40		TY553MX	PLF1M-C0		IT18FL0C2			
11-M110N-C	40		TY153M, TY553M	PLF1M-C		IT18FL9C2	10687	WIT-F2-18R-M	
11-M200B-C	40		TY5512MX	PLM2M-M0			10426		
11-M200N-C	40		TY5512M	PL2M-C			10427		
11-S190B-C	40		TY546MX	PLM2S-C0					
11-S190N-C	40	L-7-50ID-9-C	TY546M	PLM2S-C	IT2SID-C				
12-S200B-C	41					T50RDH0C2			
12-S200N-C	41		TB-50RLDH			T50RDH9C2			
12-S300B-C	41					T50IDH0C2	10432		
12-S300N-C	41		TB-12-50RLDH			T50IDH9C2	10430		
13-100B-C	42							BT-4-01-NT	
13-100N-C	42							BT-4-01-BK	
13-150B-C	42							BT-6-01-NT	
13-150N-C	42							BT-6-01-BK	
13-200B-C	42							BT-8-01-NT	
13-200N-C	42							BT-8-01-BK	
15-1919B-C	44	MPNY-750-0-C			IT750MP-C0			FTH-5A1-RT-UVB, FTH-5A1-01-UVB	CTB75X75BKA-C
15-1919N-C	44	MPNY-750-9-C	TC5344A	ABMM-A-C	IT750MP-C		10029	FTH-5A1-RT, FTH-5A1-01	CTB75X75NTA-C
15-2525B-C	44	MPNY-1000-0-C			IT1000MP-C0			FTH-7A1-RT-UVB, FTH-7A1-01-UVB	CTB1X1BKA-C
15-2525N-C	44	MPNY-1000-9-C	TC5345A	ABM2S-A-C, ABM112-A-C	IT1000MP-C		10030, 08463	FTH-7A1-RT, FTH-7A1-01	CTB1X1NTA-C
15-4040B-C	44							FTH-4040B-C	
15-4040N-C	44		TC150X150A-L	ABM3H-A-L				FTH-8-01	
16-1509B-C	45				IT1SMB-C0				
16-1509N-C	45		SMNY-000-9-D		IT1SMB-C		10044		
16-1712N-C	45						10045		
16-2216B-C	45				IT2SMB-C0				
16-2216N-C	45		SMNY-002-9-D		IT2SMB-C				
16-2516N-C	45						10046		
17-EHD1220B-L	47	L-48-175-0-L	TY54513MX	PLT13H-Q0	IT14H-L0	T150XL0X2			CT48BK175-L
17-EHD1220N-L	47	L-48-175-9-L	TY54513M	PLT13H-Q	IT14H-L	T150XL9X2			CT48NT175-L
17-EHD400B-L	47					T150R0X2			
17-EHD400N-C	47							WIT-175S-C	
17-EHD400N-L	47					T150R9X2			
17-EHD450B-L	47			PLT5H-L0					
17-EHD450N-L	47			PLT5H-L					
17-EHD550B-L	47			PLT6H-L0		T150M0X2			
17-EHD550N-L	47			PLT6H-L		T150M9X2			
17-EHD610B-L	47	L-24-175-0-L							CT24BK175-L
17-EHD610N-C	47							WIT-175R-C	
17-EHD610N-L	47	L-24-175-9-L							CT24NT175-L
17-EHD750B-L	47				IT7H-L0				
17-EHD750N-L	47				IT7H-L				
17-EHD780B-L	47			PLT8H-L0					
17-EHD780N-L	47			PLT8H-L					
17-EHD810B-L	47					T150L0X2			
17-EHD810N-C	47							WIT-175L-C	
17-EHD810N-L	47					T150L9X2			
17-EHD920B-L	47	L-36-175-0-L	TY53510MX			T150LL0X2			CT36BK175-L
17-EHD920N-L	47	L-36-175-9-L	TY53510M			T150LL9X2			CT36NT175-L
17-HD200B-C	46	L-8-120-0-C		PLT2H-L0					CT8BK120-L

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# CABLE TIES CROSS REFERENCE GUIDE



Qualtek PN	Page	Catamount T&B	Thomas & Betts	Panduit	Ideal Ind.	Hellermann Tyton	Avery Dennison	Richco	3M
17-HD200N-C	46	L-8-120-9-C		PLT2H-L					CT8NT120-L
17-HD220B-C	46		TY5272MX			T120S0K2			
17-HD220N-C	46		TY5272M			T120S9K2		WIT-120S-C	
17-HD250B-C	46			PLT2.5H-L0					
17-HD250N-C	46			PLT2.5H-L					
17-HD300B-C	46	L-100-120-0-C		PLT3H-L0		T120I0K2			
17-HD300N-C	46	L-100-120-9-C		PLT3H-L		T120I9K2			
17-HD350B-C	46		TY527MX						
17-HD350N-C	46		TY527M						
17-HD365B-C	46	L-14-120-0-C					10039		
17-HD365N-C	46	L-14-120-9-C					10038		
17-HD380B-C	46			PLT4H-L0	IT4LH-L0	T120R0K2			CT15BK120-C
17-HD380N-C	46			PLT4H-L	IT4LH-L	T120R9K2		WIT-120R-C	CT15NT120-C
17-HD450B-C	46		TY5275MX		IT5LH-L0				
17-HD450B-L	46	L-18-120-9-L							
17-HD450N-C	46		TY5275M		IT5LH-L				
17-HD450N-L	46	L-18-120-9-L							
17-HD540B-L	46						10608		
17-HD540N-C	46							WIT-120L-C	
17-HD540N-L	46						10606		
17-HD550B-L	46			PLT6LH-L0			10620		
17-HD550N-L	46			PLT6LH-L			10618		
17-HD750B-C	46		TY529MX, TY5277MX						
17-HD750B-L	46	L-28-120-0-L		PLT9LH-L0		T120L0K2			
17-HD750N-C	46		TY529M, TY5277M						
17-HD750N-L	46	L-28-120-9-L		PLT9LH-L		T120L9K2			
17-HSD1000N-L	47					T250XL9X2, T250XL0X2			
17-HSD530B-L	47					T250R0X2			
17-HSD530N-L	47					T250R9X2			
17-HSD650B-L	47				IT6EH-C0	T250M0X2			
17-HSD650N-L	47					T250M9X2			
17-I140B-C	46	L-5-30-0-C	TY524MX	PLT1.5I-C0					CT6BK40-C
17-I140B-M	46	L-5-30-0-M	TY24MX	PLT1.5I-M0					CT6BK40-M
17-I140N-C	46	L-5-30-9-C	TY524M	PLT1.5I-C					CT6NT40-C
17-I140N-M	46	L-5-30-9-M	TY24M	PLT1.5I-M					CT6NT40-M
17-I150B-C	46				IT1_5I-C0				
17-I150B-M	46				IT1_5I-M0				
17-I150N-C	46				IT1_5I-C			WIT-40R-C	
17-I150N-M	46				IT1_5I-M			WIT-40R-M	
17-I200B-C	46	L-8-40-0-C	TY5242MX	PLT21-C0		T40R0C2	08386		
17-I200B-M	46	L-8-40-0-M	TY242MX	PLT21-M0		T40R0M4	08380		
17-I200N-C	46	L-8-40-9-C	TY5242M	PLT21-C		T40R9C2	08385	WIT-40L-C, WIT-40XL-C	
17-I200N-M	46	L-8-40-9-M	TY242M	PLT21M		T40R9M4	08377	WIT-40L-M, WIT-40XL-M	
17-I250B-C	46			PLT2.5I-C0					CT8BK40-C
17-I250B-M	46			PLT2.5I-M0					CT8BK40-M
17-I250N-C	46			PLT2.5I-C					CT8NT40-C
17-I250N-M	46			PLT2.5I-M					CT8NT40-M
17-I280B-C	46		TY526MX					WIT-40VL-UVB-C	
17-I280B-M	46		TY26MX					WIT-40VL-UVB-M	
17-I280N-C	46		TY526M					WIT-40VL-C	
17-I280N-M	46		TY26M					WIT-40VL-M	
17-I300B-C	46	L-11-40-0-C		PLT31-C0	IT31-C0	T40I0C2			
17-I300B-M	46	L-11-40-0-M		PLT31-M0		T40I0M4			

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# CABLE TIES CROSS REFERENCE GUIDE



Qualtek PN	Page	Catamount T&B	Thomas & Betts	Panduit	Ideal Ind.	Hellermann Tyton	Avery Dennison	Richco	3M
17-I300N-C	46	L-11-40-9-C		PLT31-C	IT31-C	T40I9C2			
17-I300N-M	46	L-11-40-9-M		PLT31-M		T40I9M4			
17-I370B-C	46	L-14-40-0-C	TY5244MX	PLT41-C0		T40L0C2			
17-I370B-M	46	L-14-40-0-M	TY244MX	PLT41-M0		M40L0M4			
17-I370N-C	46	L-14-40-9-C	TY5244M	PLT41-C		T40L9C2			
17-I370N-M	46	L-14-40-9-M	TY244M	PLT41-M		T40L9M4			
17-M100B-C	46	L-4-18-0-C	TY523MX	PLT1M-C0	IT1M-C0	T18R0C2	08435		CT4BK18-C
17-M100B-M	46	L-4-18-0-M	TY23MX	PLT1M-M0	IT1M-M0	T18R0M4	08433		CT4BK18-M
17-M100N-C	46	L-4-18-9-C	TY523M	PLT1M-C	IT1M-C	T18R9C2	08434		CT4NT18-C
17-M100N-M	46	L-4-18-9-M	TY23M	PLT1M-M	IT1M-M	T18R9M4	08432		CT4NT18-M
17-M120B-C	46							WIT-18R-UVB-C	
17-M120B-M	46							WIT-18R-UVB-M	
17-M120N-C	46							WIT-18R-C	
17-M120N-M	46							WIT-18R-M	
17-M150B-C	46			PLT1.5M-C0		T18I0C2		WIT-18L-UVB-C	CT6BK18-C
17-M150B-M	46			PLT1.5M-M0		T18I0M4		WIT-18L-UVB-M	
17-M150N-C	46			PLT1.5M-C		T18I9C2		WIT-18L-C	CT6NT18-C
17-M150N-M	46			PLT1.5M-M		T18I9M4		WIT-18L-M	
17-M160B-C	46	L-6-18-0-C							CT6NT18-M
17-M160B-M	46	L-6-18-0-M							
17-M160N-C	46	L-6-18-9-C							
17-M160N-M	46	L-6-18-9-M							
17-M200B-C	46	L-8-18-0-C	TY5232MX, TY52315MX	PLT2M-C0	IT2M-C0	T18L0C2		WIT-18V-UVB-C	CT8BK18-C
17-M200B-M	46	L-8-18-0-M	TY232MX, TYB2315MX	PLT2M-M0	IT2M-M0	T18L0M4		WIT-18V-UVB-M	CT8BK18-M
17-M200N-C	46	L-8-18-9-C	TY5232M, TY52315M	PLT2M-C	IT2M-C	T18L9C2		WIT-18V-C	CT8NT18-C
17-M200N-M	46	L-8-18-9-M	TY5232M, TYB2315M	PLT2M-M	IT2M-M	T18L9M4		WIT-18V-M	CT8NT18-M
17-M80B-C	46			PLT.7M-C0		T18S0C2		WIT-18SF-UVB-C	
17-M80B-M	46			PLT.7M-M0		T18S0M4		WIT-18SF-UVB-M	
17-M80N-C	46			PLT.7M-C		T18S9C2		WIT-18SF-C	
17-M80N-M	46			PLT.7M-M		T18S9M4		WIT-18SF-M	
17-S120B-C	46			PLT1S-C0					
17-S120B-M	46			PLT1S-M0					
17-S120N-C	46			PLT1S-C					
17-S120N-M	46			PLT1S-M					
17-S160B-C	46	L-5-50-0-C		PLT1.5S-C0		T50S0C2			
17-S160B-M	46	L-5-50-0-M		PLT1.5S-M0		T50S0M4			
17-S160N-C	46	L-5-50-9-C		PLT1.5S-C		T50S9C2		WIT-50S-C	
17-S160N-M	46	L-5-50-9-M		PLT1.5S-M		T50S9M4		WIT-50S-M	
17-S190B-C	46	L-7-50-0-C	TY525MX	PLT2S-C0	IT2S-C0		08437		CT8BK50-C
17-S190B-M	46	L-7-50-0-M	TY25MX	PLT2S-M0	IT2S-M0		08388		CT8BK50-M
17-S190N-C	46	L-7-50-9-C	TY525M	PLT2S-C	IT2S-C		08436		CT8NT50-C
17-S190N-M	46	L-7-50-9-M	TY25M	PLT2S-M	IT2S-M		08387		CT8NT50-M
17-S200B-C	46					T50R0C2			
17-S200B-M	46					T50R0M4			
17-S200N-C	46					T50R9C2		WIT-50R-C	
17-S200N-M	46					T50R9M4		WIT-50R-M	
17-S250B-C	46			PLT2.5S-C0					
17-S250B-M	46			PLT2.5S-M0					
17-S250N-C	46			PLT2.5S-C					
17-S250N-M	46			PLT2.5S-M					
17-S280B-C	46	L-11-50-0-C			IT3S-C0		08930		CT11BK50-C
17-S280B-M	46				IT3S-D0		08286		CT11BK50-D, CT11NT50-D

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# CABLE TIES CROSS REFERENCE GUIDE



Qualtek PN	Page	Catamount T&B	Thomas & Betts	Panduit	Ideal Ind.	Hellermann Tyton	Avery Dennison	Richco	3M
17-S280N-C	46	L-11-50-9-C			IT3S-C		08859		CT11NT50-C
17-S280N-M	46				IT3S-D		08600		
17-S300B-C	46		TY5253MX	PLT3S-C0		T50I0C2			
17-S300B-M	46		TY253MX	PLT3S-M0		T50I0M4			
17-S300N-C	46		TY5253M	PLT3S-C		T50I9C2			
17-S300N-M	46		TY253M	PLT3S-M		T510I9M4			
17-S360B-C	46	L-14-50-0-C							
17-S360N-C	46	L-14-50-9-C							
17-S370B-C	46		TY528MX	PLT4S-C0	IT4S-C0				CT15BK50-C
17-S370B-M	46		TY28MX	PLT4S-M0	IT4S-D0				CT15BK50-D
17-S370N-C	46		TY528M	PLT4S-C	IT4S-C				CT15NT50-C
17-S370N-M	46		TY28M	PLT4S-M	IT4S-D				CT-15NT50-D
17-S380B-C	46						08428		
17-S380B-M	46						10037		
17-S380N-C	46						08427		
17-S380N-M	46						10036		
17-S390B-C	46					T50L0C2			
17-S390B-M	46					T50L0M4			
17-S390N-C	46					T50L9C2		WIT-50L-C	
17-S390N-M	46					T50L9M4		WIT-50L-M	
17-S400B-C	46			PLT4.5S-C0					
17-S400B-M	46			PLT4.5S-M0					
17-S400N-C	46			PLT4.5S-C					
17-S400N-M	46			PLT4.5S-M					
17-S430B-C	46				IT5S-C0				
17-S430N-C	46				IT5S-C				
17-S450B-C	46			PLT5S-C0					
17-S450B-M	46			PLT5S-M0					
17-S450N-C	46			PLT5S-C					
17-S450N-M	46			PLT5S-M					
18-HD305B-C	48			PLC2H-S25-L0					
18-HD305N-C	48			PLC2H-S25-L					
18-HD400B-C	48	L-14-120MH-0-C	TY537MX	PLC4H-S25-L0		T120MR0K2	10040		
18-HD400N-C	48	L-14-120MH-9-C	TY537M	PLC4H-S25-L		T120MR9K2	08426		CT15NT120S-L
18-I150B-C	48	L-5-30MH-0-C	TY534MX	PLC1.5I-S8-C0		T30MR0C2			
18-I150N-C	48	L-5-30MH-9-C	TY534M	PLC1.5I-S8-C		T30MR9C2			
18-M110B-C	48		TY533MX	PLC1M-S4-C0		T18MR0C2			
18-M110N-C	48		TY533M	PLC1M-S4-C		T18MR9C2			
18-S200B-C	48	L-7-50MH-0-C	TY535MX	PLC2S-S10-C0	IT2SMH-C0		08318		CT8BK50S-C
18-S200N-C	48	L-7-50MH-9-C	TY535M	PLC2S-S10-C	IT2SMH-C		08484		CT8NT50S-C
18-S305B-C	48	L-11-50MH-0-C		PLC3S-S10-C0	IT3SMH-C0	T50MI0C2	10354		
18-S305N-C	48	L-11-50MH-9-C		PLC3S-S10-C	IT3SMH-C	T50MI9C2	10350		
18-S370B-C	48	L-14-50MH-0-C	TY5354MX	PLC4S-S10-C0	IT4SMH-C0				
18-S370N-C	48	L-14-50MH-9-C	TY5354M	PLC4S-S10-C	IT4SMH-C				
19-S160B-C	49			PRT1.5S-C0		RT50S0C2			
19-S160N-C	49			PRT1.5S-C		RT50S9C2		WIT-50SR-C	
19-S200B-C	49			PRT2S-C0			10366		
19-S200N-C	49			PRT2S-C			10364		
19-S305B-C	49			PRT3S-C0			10369		
19-S305N-C	49			PRT3S-C			10370		
19-S380B-C	49			PRT4S-C0		RT50LL0C2			
19-S380N-C	49			PRT4S-C		RT50LL9C2			
20-S150B-C	50	L-5-50R-0-C				REL50R0C2			
20-S150N-C	50	L-5-50R-9-C				REL50R9C2			
20-S200B-C	50	L-8-50R-0-C							

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# CABLE TIES CROSS REFERENCE GUIDE



Qualtek PN	Page	Catamount T&B	Thomas & Betts	Panduit	Ideal Ind.	Hellermann Tyton	Avery Dennison	Richco	3M
20-S200N-C	50	L-8-50R-9-C							
20-S250B-C	50					REL50L0C2			
20-S250N-C	50					REL50L9C2			
20-S300B-C	50	L-10-50R-0-C							
20-S300N-C	50	L-10-50R-9-C							
21A-M100B-C	51							WIT-18RA-UVB	
21A-M100N-C	51			PLWP1M-C		126-00041	10690	WIT-18RA-01	
21A-S130B-C	51			PLWP1S-C0				WIT-50SA-UVB	
21A-S130N-C	51			PLWP1S-C				WIT-50SA-01	
21A-S200B-C	51	L-7-50PM-0-C	TY538MX	PLWP2S-C0				WIT-50RA-UVB	
21A-S200N-C	51	L-7-50PM-9-C	TY538M	PLWP2S-C				WIT-50RA-01	
21A-S130N-C	51								
21B-I155B-C	51			PLP1.5I-M0		126-00045			
21B-I155N-C	51		TY554M	PLP1.5I-C		126-00043			
21B-S200B-C	51			PLP2S-M0		T50RSF0C2	08446	WIT-50RLA-3-UVB	
21B-S200N-C	51			PLP2S-C		T50RSF9C2	08439	WIT-50RLA-3	
22-H200A-C	52		LS-7.9-200A	MLT2LH-LP		MBT8H-S			
22-H200B-C	52		LS-7.9-200B	MLT2LH-LP316		MBT8H			
22-H200D-C	52		LS-7.9-200-C	MLTFC2H-LP316					
22-H360A-C	52		LS-7.9-360A	MLT4LH-LP		MBT14H-S			
22-H360B-C	52		LS-7.9-360B	MLT4LH-LP316		MBT14H			
22-H360D-C	52		LS-7.9-360-C	MLTFC4H-LP316					
22-H520A-C	52		LS-7.9-520A	MLT6LH-LP		MBT20H-S			
22-H520B-C	52		LS-7.9-520B	MLT6LH-LP316		MBT20H			
22-H520D-C	52		LS-7.9-520-C	MLTFC6H-LP316					
22-H680A-C	52		LS-7.9-680A	MLT8LH-LP		MBT27H-S			
22-H680B-C	52		LS-7.9-680B	MLT8LH-LP316		MBT27H			
22-H680D-C	52		LS-7.9-680-C	MLTFC8H-LP316					
22-H840A-C	52		LS-7.9-840A			MBT33H-S			
22-H840B-C	52		LS-7.9-840B			MBT33H			
22-H840D-C	52		LS-7.9-840-C						
22-S125A-C	52			MLT1S-CP		MBT5S-S			
22-S125B-C	52			MLT1S-CP316		MBT5S			
22-S200A-C	52		LS-4.6-200A	MLT2S-CP		MBT8S-S			
22-S200B-C	52		LS-4.6-200B	MLT2S-CP316		MBT8S			
22-S200D-C	52		LS-4.6-200-C						
22-S260A-C	52			MLT2.7S-CP					
22-S260B-C	52			MLT2.7S-CP316					
22-S360A-C	52		LS-4.6-360A			MBT14S-S			
22-S360B-C	52		LS-4.6-360B	MLT4S-CP		MBT14S			
22-S360D-C	52		LS-4.6-360-C	MLT4S-CP316					
22-S520A-C	52		LS-4.6-520A	MLT6S-CP		MBT20S-S			
22-S520B-C	52		LS-4.6-520B	MLT6S-CP316		MBT20S			
22-S520D-C	52		LS-4.6-520-C						
22-S680A-C	52		LS-4.6-680A	MLT8S-CP		MBT27S-S			
22-S680B-C	52		LS-4.6-680B	MLT8S-CP316		MBT27S			
22-S680D-C	52		LS-4.6-680-C						
22-S840A-C	52		LS-4.6-840A	MLT10S-CP		MBT33S-S			
22-S840B-C	52		LS-4.6-840B	MLT10S-CP316		MBT33S			
22-S840D-C	52		LS-4.6-840-C						

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# Qualtek

Electronics Corporation

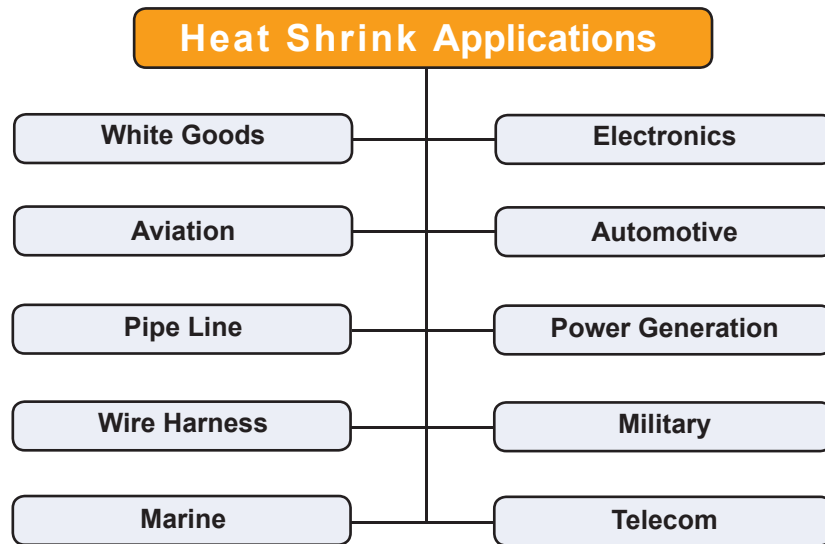


## HEAT SHRINK PRODUCTS

Qualtek Electronics offers a complete line of heat shrinkable products which include:

- Thin, medium and heavy wall heat shrink tubing
- Adhesive lined
- Medium and high voltage insulation
- Molded parts and end caps
- Cold shrink
- Shrink tubing kits, cables and wire identification tubing
- Specializing in custom cut lengths for all products





Qualtek heat shrinkable products include Polyolefin, Silicon, Teflon, Viton®, Kynar®, Halogen-Free, high temp, single wall, double wall and adhesive lined tubing with varying shrink ratio, colors and sizes. We also offer Military (MIL) specification shrink tubing with varying ratios, colors and sizes. Qualtek's heat shrink tubing products are produced by cross-linking extruded polymer compounds which produces a shape memory effect and when heated can be recovered to its original shape.

## Heat Shrink Technology

### ■ **Compound**

With a strong background in the research and development of modified polymer materials, we have developed a variety of chemical formulations for different types of heat shrinkable products.

### ■ **Extrusion**

Equipped with 20 advanced extrusion lines, we are able to produce stable and homogeneous dimensions. Our advanced co-extrusion technology makes it possible to manufacture polyolefin / hot melt adhesive dual wall and insulation / conductive multi-layer tubing.

### ■ **Irradiation**

There are three sets of specially designed electronic accelerators in-house to meet requirements of different sizes and shapes of shrinkable products that assures proper crosslinking of the product.

### ■ **Expansion**

This important process is required to obtain final forms and dimensions of heat shrink products. With our modern equipment and technology, we can accurately control the dimensions, longitudinal changes and eccentricity of the final product.

### ■ **Packaging**

After completion of the production cycle and quality control checks, the product is packaged to meet market demands such as standard product or is processed to customer designs from cut-to-length pieces to special packaging requirements.

## Tubing Features

- Wide range of sizes: micro  $\varnothing$  up to very large  $\varnothing$
- Large selection of colors
- Low shrink temperatures: down to 65°C
- High temperature rating: up to 260°C
- Abrasion, moisture and chemical / solvent resistant
- High shrink ratios: 2:1, 3:1, 4:1, & 6:1
- Halogen & PBB free with low lead & cadmium
- Flexible types: super flexible, flexible, semi rigid & rigid
- Single wall: ultra thin, very thin, thin, medium & heavy
- Dual wall adhesive lined: thin, medium & heavy
- Packaging: large & small spools, cut-to-length, kits & bags
- Special compound formulations available upon request

## Selection Parameters

- Size
- Shrink Ratio
- Operating Temperature
- Recovery Temperature
- Flammability Rating
- Electrical Rating
- Certifications & Specifications
- Resistance to Solvents & Chemicals
- Flexibility
- Mechanical Properties

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## Installation Instructions

- Place the heat shrink tubing over the product to be covered. Heat the tubing evenly until the tube shrinks around the object or the tube is shrunk completely (according to shrink ratio). Dual wall shrink tubing with adhesive may require additional heating to melt the adhesive for accurate installation.
- Constantly move the heat source or product during installation. Avoid concentrating the heat source in one location on the heat shrink tubing. Maintain heat source temperature to achieve appropriate shrink ratio and prevent charring or burning.
- Recommended heat sources include: Hot air gun, oven, infrared heat source, or soft flame. Use adequate ventilation during and following installation.
- Stop heating immediately if charring or burning of tubing occurs to prevent injury to operator or product. Charring or burning of ceratin tubing can create hazardous fumes that can potentially cause eye, skin, nose and throat irritation.
- For additional information, please contact your supplier or Qualtek.



## PART NUMBER EXAMPLE: Q2-F-3/64-01-QB48IN-25

### PART NUMBER EXAMPLE:

X - X - X - X X - X

- (6) QUANTITY - QB (Q BAG) ONLY
- (5) LENGTH - SEE LIST BELOW
- (4) STANDARD PACKAGING CODES - SEE LIST BELOW
- (3) COLOR - SEE LIST BELOW
- (2) SIZE - SEE TABLE BELOW
- (1) TYPE - SEE SPEC SHEET (Q1, Q2-F, Q-150K, etc....)

NOTE: Table below represents information on individual spec sheet

- ④ **STANDARD PACKAGING CODES:**  
**MS** - MINI SPOOL + LENGTH (FT or M)  
**QB** - Q BAG (Polybag contains quantity specified)  
**QX** - Q BOX + LENGTH (FT or M)  
**RK** - REFILL BAG  
**SS** - STANDARD SPOOL + LENGTH (FT or M)

- ③ **COLOR CODES:**  
**01** BLACK  
**02** CLEAR  
**03** WHITE  
**04** RED  
**05** BLUE  
**06** GREEN  
**07** YELLOW  
**08** YELLOW / GREEN  
**09** BROWN  
**10** ORANGE  
**11** ASSORTED COLORS  
**12** GRAY
- ⑤ **LENGTH:**  
**FT** = FEET  
**M** = METERS  
**IN** = INCH  
**MM** = MILLIMETERS

**HEAT SHRINK THIN WALL TUBING**

**Q2-F** Wall Compliance

**ENVIRONMENT FRIENDLY, FLEXIBLE, HIGHLY FLAME RETARDANT, HEAT SHRINKABLE TUBING**  
SHRINK RATIO 2:1

**Features/Applications:**  
 Provides both commercial and military applications electrical insulation and protects in-line components, disconnect terminals and splices with its high strength and excellent resistance. Bundles wires for very flexible high-duty harnesses, identifies or color-codes wires, cables, terminals and components.

- Operating temperature: -55°C to +150°C
- Minimum shrink temperature: 70°C
- Full recovery temperature: 100°C
- Approvals: **UL** File No. E236137, **CS** File No. 242540, 125°C, VW-1, 600V
- Meets: SAE-AMS-DTL-23053/5 Class 1 & 3, Sony-SS-00259
- Material: No PBB's, PBBD's, PBDE's, Free of Cadmium & Lead
- Standard colors: Black, red, blue, yellow, green, white, clear (class 2)
- RoHS Compliant

Technical Data		
Property	Test Method	Typical Data
Operating Temperature	IEC 216	55 to +150°C
Tensile Strength	ASTM D 2671	>14 MPa
Ultimate Elongation	ASTM D 2671	> 800%
Longitudinal Shrinkage	UL 224	< 2%
Exothermy	UL 224	< 30%
Heat Aging		
Tensile Strength	175°C, 168 hrs	> 11 MPa
Ultimate Elongation		> 35%
Flammability	UL 224	Pass
Dielectric Strength	ASTM D 150	>20KV / mm
Voltage Withstand	ASTM D 2671 / AC2500V, 1 min	No Breakdown
Volume Resistance	ASTM D 876	>10 <sup>12</sup> Ohm
Copper Stability	UL 224	Pass
Copper Corrosion	UL 224	No Corrosion

Product Dimensions									
Size	As Supplied (mm)		After Recovered (mm)		Standard Packaging				
	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)	Mini Spool (Feet)	Standard Spool (Feet)	Box Length (Feet)	Cut to Length Pcs. (Qty per bag)		
3/64	1.2	1.2	0.6	0.40	100	1000	50	40	25
1/16	1.6	1.6	0.8	0.40	100	1000	50	36	25
3/32	2.4	2.4	1.2	0.48	100	500	50	32	25
1/8	3.2	3.2	1.6	0.48	100	500	50	28	25
3/16	4.8	4.8	2.4	0.48	100	500	30	24	25
1/4	6.4	6.4	3.2	0.56	100	500	30	20	25
5/16	8.0	8.0	4.0	0.62	100	250	30	18	25
3/8	9.5	9.5	4.8	0.62	100	250	30	16	25
1/2	12.7	12.7	6.4	0.62	100	200	15	14	5
5/8	15.9	15.9	8.0	0.68	50	200	15	14	5
3/4	19.1	19.1	9.5	0.68	50	200	15	12	5
1	25.4	25.4	12.7	1.00	50	200	15	8	5
1 1/4	31.8	31.8	15.9	1.00	50	100	-	8	5
1 1/2	38.1	38.1	19.1	1.00	50	100	-	5	5
2	50.8	50.8	25.4	1.10	50	100	-	3	5
3	76.2	76.2	38.1	1.20	-	100	-	2	2
4	102.0	102.0	50.8	1.35	-	100	-	1	2
5	125.0	125.0	63.5	1.40	-	50	-	1	2
6	151.0	151.0	75.0	1.40	-	50	-	1	2

1. See page 7 - Part Number Guide for standard packaging codes.  
 2. Check Reference Guide located on page 3.  
 3. Special wire applications, sizes and cut pieces are available upon request.  
 4. Clear tubing is not flame retardant, UL or CSA approved.

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SAMPLE TABLE: Q2-F

②

Product Dimensions								
Size (inch)	As Supplied (mm)	After Recovered (mm)			Standard Packaging			
	Inside Diameter (max.)	Inside Diameter (max.)	Wall Thickness (min.)	Mini Spool *(MS) (Feet)	Standard Spool *(SS) (Feet)	Box Length *(QX) (Feet)	Cut to Length Pcs. *(QB) Qty per bag	
							6"	48"
3/64	1.2	0.6	0.40	100	1000	50	40	25
1/16	1.6	0.8	0.40	100	1000	50	36	25
3/32	2.4	1.2	0.48	100	500	50	32	25
1/8	3.2	1.6	0.48	100	500	50	28	25
3/16	4.8	2.4	0.48	100	500	30	24	25
1/4	6.4	3.2	0.56	100	500	30	20	25
5/16	8.0	4.0	0.62	100	250	30	18	25
3/8	9.5	4.8	0.62	100	250	30	16	25
1/2	12.7	6.4	0.62	100	200	15	14	5
5/8	15.9	8.0	0.68	50	200	15	14	5
3/4	19.1	9.5	0.68	50	200	15	12	5
1	25.4	12.7	0.87	50	200	15	8	5
1 1/4	31.8	15.9	1.00	50	100	-	8	5
1 1/2	38.1	19.1	1.00	50	100	-	5	5
2	50.8	25.4	1.10	50	100	-	3	5
3	76.2	38.1	1.20	-	100	-	2	2
4	102.0	50.8	1.35	-	100	-	1	2
5	125.0	63.5	1.40	-	50	-	1	2
6	151.0	75.0	1.40	-	50	-	1	2

⑥

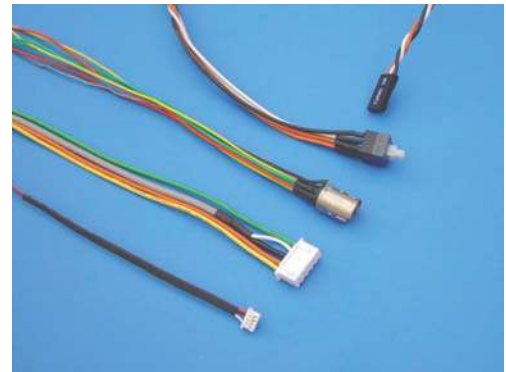
## Q2-CB RoHS Compliant

**ULTRA THIN WALL, FLEXIBLE, ENVIRONMENT FRIENDLY  
FLAME RETARDANT POLYOLEFIN TUBING  
SHRINK RATIO 2:1**

### Features/Applications

Typically used where rapid shrinking and space saving is important. Low shrink temperature further reduces installation time and risk of damage to temperature sensitive components. Low heavy metal content and flame retardant formulation make this a product that meets global environmental standards.

- Operating temperature: -55°C to +125°C
- Minimum shrink temperature: 70°C
- Full recovery temperature: 100°C
- Approvals<sup>4</sup>: File No. E236137, File No. 242540, 125°C, VW-1, 300V
- Meets: Sony-SS-00259
- Material: No PBB's, PBBO's, PBBE's
- Cadmium content: <5 ppm, Lead content: <30 ppm
- Standard color: Black
- Other colors are available upon request
- RoHS Compliant



Technical Data		
Property	Test Method	Typical Data
Operating Temperature	IEC 216	-55°C to +125°C
Tensile Strength	ASTM D 2671	> 14 MPa
Ultimate Elongation	ASTM D 2671	> 400%
Longitudinal Shrinkage	UL 224	0 ± 5%
Eccentricity	ASTM D 2671	< 30%
Heat Aging Tensile Strength Ultimate Elongation	158°C, 168 hrs.	> 350%
Flammability	VW-1	Pass
Dielectric Strength	IEC 243	> 20 kV / mm
Voltage Withstand	ASTM D 2671 / AC 2500V, 1 min.	No Breakdown
Volume Resistance	ASTM D 2671	> 10 <sup>14</sup> Ω.cm
Copper Stability	UL 224	Pass
Copper Corrosion	UL 224	No Corrosion

Product Dimensions							
Size (Inch)	As Supplied (mm)		After Recovered (mm)		Standard Packaging		
	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)	Mini Spool *(MS) (Feet)	Standard Spool *(SS) (Feet)	Cut to Length Pcs. *(QB) Qty per bag	
						6"	48"
3/64	1.2	0.60	0.20	100	1000	40	25
1/16	1.6	0.80	0.20	100	1000	36	25
3/32	2.4	1.20	0.25	100	500	32	25
1/8	3.2	1.60	0.25	100	500	28	25
3/16	4.8	2.40	0.25	100	500	24	25
1/4	6.4	3.20	0.28	100	500	20	25
3/8	9.5	4.80	0.28	100	250	16	25
1/2	12.7	6.40	0.28	100	200	14	5

- Notes:
- \* See page 12 - Part Number Guide for standard packaging codes.
  - Cross Reference Guide located on page 3.
  - Special sizes, packaging, colors and cut pieces are available upon request.
  - UL and CSA Approvals only for black color.

Product Dimensions				
Size (mm)	As Supplied (mm)	After Recovered (mm)		Standard Spool *(SS) (Meter)
	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)	
1.0	1.0	0.50	0.20	200
1.5	1.5	0.75	0.20	200
2.0	2.0	1.00	0.20	200
2.5	2.5	1.25	0.25	200
3.0	3.0	1.50	0.25	200
3.5	3.5	1.75	0.25	200
4.0	4.0	2.00	0.25	200
5.0	5.0	2.50	0.28	100
6.0	6.0	3.00	0.28	100
7.0	7.0	3.50	0.28	100
8.0	8.0	4.00	0.28	100
9.0	9.0	4.50	0.28	100
10.0	10.0	5.00	0.28	100



## Q2-F RoHS Compliant

**ENVIRONMENT FRIENDLY, FLEXIBLE,  
HIGHLY FLAME RETARDANT, HEAT SHRINKABLE TUBING  
SHRINK RATIO 2:1**

### Features/Applications

Provides both commercial and military applications electrical insulation and protects in-line components, disconnect terminals and splices with its high strength and excellent resilience. Bundles wires for very flexible light-duty harnesses. Identifies or color-codes wires, cables, terminals and components.

- Operating temperature: -55°C to +135°C
- Minimum shrink temperature: 70°C
- Full recovery temperature: 100°C
- Approvals<sup>4</sup>: File No. E236137, File No. 242540, 125°C, VW-1, 600V
- Meets: SAE-AMS-DTL-23053/5 Class 1 & 3, Sony-SS-00259
- Material: No PBB's, PBBO's, PBBE's, Free of Cadmium & Lead
- Standard colors: Black, red, blue, yellow, green, white, clear (class 2)
- RoHS Compliant



### Technical Data

Property	Test Method	Typical Data
Operating Temperature	IEC 216	-55°C to +135°C
Tensile Strength	ASTM D 2671	>14 MPa
Ultimate Elongation	ASTM D 2671	> 600%
Longitudinal Shrinkage	UL 224	0 ± 5%
Eccentricity	UL 224	< 30%
Heat Aging Tensile Strength Ultimate Elongation	175°C, 168 hrs.	> 11 MPa > 350 %
Flammability	VW-1	Pass
Dielectric Strength	ASTM D 150	>20kV / mm
Voltage Withstand	ASTM D 2671 / AC2500V. 1 min.	No Breakdown
Volume Resistance	ASTM D 876	>10 <sup>14</sup> Ω.cm
Copper Stability	UL 224	Pass
Copper Corrosion	UL 224	No Corrosion

### Product Dimensions

Size		As Supplied (mm)	After Recovered (mm)		Standard Packaging				
Inch	mm	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)	Mini Spool *(MS) (Feet)	Standard Spool *(SS) (Feet)	Box Length *(QX) (Feet)	Cut to Length Pcs. *(QB) Qty per bag	
								6"	48"
3/64	1.2	1.2	0.6	0.40	100	1000	50	40	25
1/16	1.6	1.6	0.8	0.40	100	1000	50	36	25
3/32	2.4	2.4	1.2	0.48	100	500	50	32	25
1/8	3.2	3.2	1.6	0.48	100	500	50	28	25
3/16	4.8	4.8	2.4	0.48	100	500	30	24	25
1/4	6.4	6.4	3.2	0.56	100	500	30	20	25
5/16	8.0	8.0	4.0	0.62	100	250	30	18	24
3/8	9.5	9.5	4.8	0.62	100	250	30	16	25
1/2	12.7	12.7	6.4	0.62	100	200	15	14	5
5/8	15.9	15.9	8.0	0.68	50	200	15	14	5
3/4	19.1	19.1	9.5	0.68	50	200	15	12	5
1	25.4	25.4	12.7	0.87	50	200	15	8	5
1 1/4	31.8	31.8	15.9	1.00	50	100	-	8	5
1 1/2	38.1	38.1	19.1	1.00	50	100	-	5	5
2	50.8	50.8	25.4	1.10	50	100	-	3	5
3	76.2	76.2	38.1	1.20	-	100	-	2	2
4	102.0	102.0	50.8	1.35	-	100	-	1	2
5	125.0	125.0	63.5	1.40	-	50	-	1	2
6	151.0	151.0	75.0	1.40	-	50	-	1	2

Notes:  
 1. \* See page 12 - Part Number Guide for standard packaging codes.  
 2. Cross Reference Guide located on page 3.  
 3. Special sizes, packaging, colors and cut pieces are available upon request  
 4. Clear tubing is not flame retardant, UL or CSA approved.

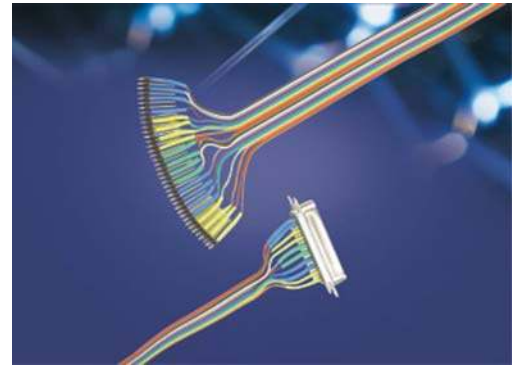
## Q2-F3X RoHS Compliant

**HIGHLY FLEXIBLE, FLAME RETARDANT POLYOLEFIN TUBING**  
SHRINK RATIO 3:1

### Features/Applications

Outstanding physical, chemical and electrical properties make it a good choice for electrical insulation, bundling and marking. It also prevents corrosion plus provides mechanical protection. It's 3:1 shrink ratio makes it suitable for applying to irregular and difficult shapes.

- Operating temperature: -55°C to +135°C
- Minimum shrink temperature: 70°C
- Full recovery temperature: 100°C
- Approvals<sup>4</sup>: File No. E236137, File No. 242540, 125°C, VW-1, 600V
- Meets: SAE-AMS-DTL-23053/5 Class 1 & 3, Sony-SS-00259,
- Standard color: Black
- Special Colors: Red, blue, yellow, green, clear (class 2)
- RoHS Compliant



Technical Data		
Property	Test Method	Typical Data
Operating Temperature	IEC 216	-55°C to +135°C
Tensile Strength	ASTM D 2671	>14 MPa
Ultimate Elongation	ASTM D 2671	> 600%
Longitudinal Shrinkage	UL 224	0 ± 5%
Eccentricity	ASTM D 2671	< 35%
Heat Aging Tensile Strength Ultimate Elongation	175°C, 168 hrs.	> 11 MPa > 350 %
Flammability	VW-1	Pass
Dielectric Strength	ASTM D 150	> 20kV / mm
Voltage Withstand	ASTM D 2671 / AC2500V. 1 min.	No Breakdown
Volume Resistance	ASTM D 2671	10 <sup>14</sup> Ω.cm
Copper Stability	UL 224	Pass
Copper Corrosion	UL 224	No Corrosion

Product Dimensions							
Size		As Supplied (mm)	After Recovered (mm)		Standard Packaging		
Inch	mm	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)	Standard Spool *(SS) (Feet)	Cut to Length Pcs. *(QB) Qty per bag	
						6"	48"
1/16	1.5/0.5	1.6	0.5	0.45	500	28	25
1/8	3.0/1.0	3.2	1.0	0.55	500	24	25
3/16	4.5/1.5	4.8	1.5	0.60	500	24	25
1/4	6.0/2.0	6.4	2.0	0.65	250	20	25
3/8	9.0/3.0	9.5	3.0	0.75	250	16	25
1/2	12.0/4.0	12.7	4.0	0.80	150	14	5
3/4	18.0/6.0	19.1	6.0	0.90	150	12	5
1	24.0/8.0	25.4	8.0	1.20	150	8	5
1 1/2	39.0/13.0	39.0	13.0	1.25	150	5	5

Notes:  
 1. \* See page 12 - Part Number Guide for standard packaging codes.  
 2. Cross Reference Guide located on page 3.  
 3. Special sizes, packaging, colors and cut pieces are available upon request.  
 4. Clear tubing is not flame retardant, UL or CSA approved.

## Q2-F4X



**HIGH SHRINK RATIO, HIGHLY FLEXIBLE  
FLAME RETARDANT POLYOLEFIN TUBING  
SHRINK RATIO 4:1**

### Features/Applications

Manufactured with specially developed formulation and technology, it can easily fit over a large diameter connector or transition and shrink down onto a smaller diameter jacket. Because of its outstanding physical, chemical and electrical properties it's widely used in some important fields such as military, aerospace and fine electronic instruments for insulating or repairing harnesses, cables and connectors.



- Operating temperature: -55°C to +135°C
- Minimum shrink temperature: 70°C
- Full recovery temperature: 100°C
- Approval: File No. E236137, File No. 242540, 125°C, VW-1, 600V
- Meets: SAE-AMS-DTL-23053/5 Class 1 & 3, Sony-SS-00259
- Standard color: Black
- Special colors: Red, blue, yellow, green
- UV Resistant
- RoHS Compliant

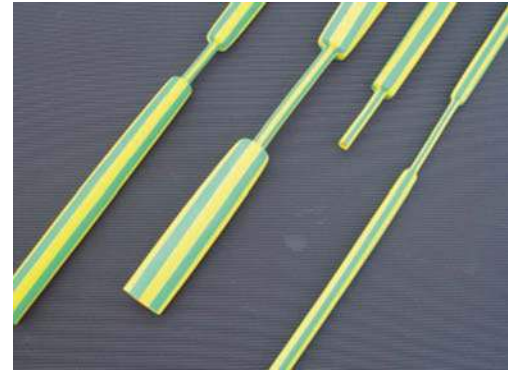
Technical Data		
Property	Test Method	Typical Data
Operating Temperature	IEC 216	-55°C to +135°C
Tensile Strength	ASTM D 2671	>14 MPa
Ultimate Elongation	ASTM D 2671	> 600%
Longitudinal Shrinkage	UL 224	0 ± 5%
Eccentricity	ASTM D 2671	< 35%
Heat Aging Tensile Strength Ultimate Elongation	175°C, 168 hrs.	> 11 MPa > 350 %
Flammability	VW-1	Pass
Dielectric Strength	ASTM D 150	> 20kV / mm
Voltage Withstand	ASTM D 2671 / AC2500V. 1 min.	No Breakdown
Volume Resistance	ASTM D 2671	> 10 <sup>14</sup> Ω.cm
Copper Stability	UL 224	Pass
Copper Corrosion	UL 224	No Corrosion

Product Dimensions						
Size		As Supplied (mm)	After Recovered (mm)		Standard Packaging	
Inch	mm	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)	Cut to Length Pcs. *(QB) Qty per bag	
					6"	48"
3/4	19.1/4.6	19.1	4.6	1.7	12	25
1	25.4/7.0	25.4	7.0	1.7	8	25
1 1/2	38.1/9.5	38.1	9.5	1.7	5	25
2	50.8/14.0	50.8	14.0	1.7	3	25
3	76.2/20.6	76.2	20.6	1.7	2	25
4	102.0/26.7	102.0	26.7	1.7	1	5
4 1/2	115.0/36.8	115.0	36.8	1.7	1	5

- Notes:
1. \* See page 12 - Part Number Guide for standard packaging codes.
  2. Cross Reference Guide located on page 3.
  3. Special sizes, packaging, colors and cut pieces are available upon request.

## Q2-F2X(YG), Q2-F3X(YG)

YELLOW & GREEN STRIPED, FLEXIBLE, FLAME RETARDANT, POLYOLEFIN TUBING  
SHRINK RATIO 2:1 & 3:1



### Features/Applications

Dual color yellow and green striped polyolefin tubing primarily used to identify "ground" wires. It is flexible and flame retardant with permanent color properties, making it easy to install and identify. Used for light duty harnessing and ground wire identification.

- Operating temperature: -55°C to +135°C
- Minimum shrink temperature: 70°C
- Full recovery temperature: 100°C
- Approvals: File No. E236137, File No. 242540, 125°C, VW-1, 600V
- Meets: SAE-AMS-DTL-23053/5 Class 1 & 3, Sony-SS-00259
- Standard color: Yellow & green striped
- RoHS Compliant

Technical Data		
Property	Test Method	Typical Data
Operating Temperature	IEC 216	-55°C to +135°C
Tensile Strength	ASTM D 2671	>14 MPa
Ultimate Elongation	ASTM D 2671	> 600%
Longitudinal Shrinkage	UL 224	0 ± 5%
Eccentricity	ASTM D 2671	< 35%
Heat Aging Tensile Strength Ultimate Elongation	175°C, 168 hrs.	> 11 MPa > 350 %
Flammability	VW-1	Pass
Dielectric Strength	ASTM D 150	> 20kV / mm
Voltage Withstand	ASTM D 2671 / AC2500V. 1 min.	No Breakdown
Volume Resistance	ASTM D 2671	>10 <sup>14</sup> Ω.cm
Copper Stability	UL 224	Pass
Copper Corrosion	UL 224	No Corrosion

Product Dimensions (2:1) Q2-F2X(YG)				
Size (Inch)	As Supplied (mm)	After Recovered (mm)		Standard Spool *(SS) (Meter)
	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)	
3/64	1.2	0.6	.33	200
1/16	1.6	0.8	.36	200
3/32	2.4	1.2	.44	200
1/8	3.2	1.6	.44	200
3/16	4.8	2.4	.56	100
1/4	6.4	3.2	.56	100
5/16	8.0	4.0	.56	100
3/8	9.5	4.8	.56	100
1/2	12.7	6.4	.65	50
5/8	16.0	8.0	.69	50
3/4	19.1	9.5	.80	50
1	25.4	12.7	.90	50
1 1/4	31.8	15.9	.90	50
2 1/2	38.1	19.1	1.02	50
2	50.8	25.4	1.02	50
3	76.2	38.1	1.20	30
4	101.6	50.8	1.30	30

Product Dimensions (3:1) Q2-F3X(YG)					
Size (Inch)	As Supplied (mm)		After Recovered (mm)		Standard Spool *(SS) (Meter)
	Inside Diameter (min.)	Inside Diameter (max.)	Inside Diameter (min.)	Wall Thickness (min.)	
1/16	1.6/0.5	1.6	0.5	0.51	200
3/32	2.4/0.8	2.4	0.8	0.51	200
1/8	3.2/1.0	3.2	1.0	0.55	200
3/16	4.8/1.5	4.8	1.5	0.60	100
1/4	6.4/2.0	6.4	2.0	0.65	100
3/8	9.5/3.0	9.5	3.0	0.75	100
1/2	12.7/4.0	12.7	4.0	0.75	50
3/4	19.1/6.0	19.1	6.0	0.85	50
1	25.4/8.0	25.4	8.0	1.00	50
1 1/2	39/13.0	39.0	13.0	1.15	50

- Notes:
1. \* See page 12 - Part Number Guide for standard packaging codes.
  2. Cross Reference Guide located on page 3.
  3. Special sizes, packaging, colors and cut pieces are available upon request.

## Q2-HF



**LOW SMOKE, HALOGEN FREE,  
FLAME RETARDANT, HEAT SHRINKABLE TUBING  
SHRINK RATIO 2:1**

### Features/Applications

As a kind of totally environmental friendly heat-shrinkable tube, it is made with specially designed halogen free polyolefin. It produces neither toxic smoke or harmful substance when burning, which meets the growing demand of environmental protection all over the world. In addition to the common fine physical and chemical specifications the tube also shows excellent flame-retardant, insulation, low temperature shrinking and flexible properties and thus is widely used in electronics, communication and the auto industry.

- Operating temperature: -55°C to +105°C
- Minimum shrink temperature: 70°C
- Full recovery temperature: 100°C
- Approvals: File No. 242540
- Standard colors: Black, white
- Other colors are available upon request.
- RoHS Compliant



Technical Data		
Property	Test Method	Typical Data
Operating Temperature	IEC 216	-55°C to +105°C
Tensile Strength	ASTM D 2671	>12 MPa
Ultimate Elongation	ASTM D 2671	> 400%
Longitudinal Shrinkage	UL 224	0 ± 5%
Eccentricity	ASTM D 2671	≤ 30%
Heat Aging Tensile Strength Ultimate Elongation	158°C, 168 hrs.	> 11 MPa > 200 %
Flammability	VW-1	Self extinguish in 30 sec.
Dielectric Strength	ASTM D 150	> 20kV / mm
Voltage Withstand	ASTM D 2671 / AC2500V. 1 min.	No Breakdown
Volume Resistance	ASTM D 2671	10 <sup>14</sup> Ω.cm
Copper Stability	UL 224	Pass
Copper Corrosion	UL 224	No Corrosion

Product Dimensions				
Size (mm)	As Supplied (mm)	After Recovered (mm)		Standard Spool *(SS) (Meter)
	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)	
1.0	1.0	0.50	.33	200
1.5	1.5	0.75	.36	200
2.0	2.0	1.00	.44	200
2.5	2.5	1.25	.44	200
3.0	3.0	1.50	.44	200
3.5	3.5	1.75	.44	200
4.0	4.0	2.00	.44	200
5.0	5.0	2.50	.56	100
6.0	6.0	3.00	.56	100
7.0	7.0	3.50	.56	100
8.0	8.0	4.00	.56	100
9.0	9.0	4.50	.56	100
10.0	10.0	5.00	.56	100
11.0	11.0	5.50	.56	100
12.0	12.0	6.00	.56	50
13.0	13.0	6.50	.65	50
14.0	14.0	7.00	.69	50

Product Dimensions				
Size (mm)	As Supplied (mm)	After Recovered (mm)		Standard Spool *(SS) (Meter)
	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)	
15.0	15.0	7.50	0.69	50
16.0	16.0	8.00	0.69	50
18.0	18.0	9.00	0.80	50
20.0	20.0	10.00	0.80	50
22.0	22.0	11.00	0.80	50
25.0	25.0	12.50	0.90	50
28.0	28.0	14.00	0.90	50
30.0	30.0	15.00	0.90	50
35.0	35.0	17.50	0.90	50
40.0	40.0	20.00	1.00	50
50.0	50.0	25.00	1.00	50
60.0	60.0	30.00	1.00	30
70.0	70.0	35.00	1.20	30
80.0	80.0	40.00	1.20	30
100.0	100.0	50.00	1.30	30
125.0	125.0	60.00	1.30	15
150.0	150.0	75.00	1.30	15

Notes:  
 1. \* See page 12 - Part Number Guide for standard packaging codes.  
 2. Cross Reference Guide located on page 3.  
 3. Special sizes, packaging, colors and cut pieces are available upon request.

## Q2-LS RoHS Compliant

**VERY LOW SHRINK TEMPERATURE, FLEXIBLE, HALOGEN FREE, POLYOLEFIN TUBING SHRINK RATIO 2:1**

### Features/Applications

Manufactured with modified radiation cross-linked polyolefin. This specially designed halogen free formulation makes the tubing very flexible and shrinks at low temperature. Suitable for applications where heat sensitive components are used and quick shrinkage is required. The flammability of the tubing meets the automotive flame propagation standard FMVSS 302. Although very flexible, it has good mechanical and electrical performance.

- Operating temperature: -55°C to +125°C
- Minimum shrink temperature: 65°C
- Full recovery temperature: 95°C
- Approvals: File No. 242540
- Meets: SONY-SS-00259
- Standard color: Black
- RoHS Compliant



Technical Data		
Property	Test Method	Typical Data
Operating Temperature	IEC 216	-55°C to +125°C
Tensile Strength	ASTM D 2671	>12 MPa
Ultimate Elongation	ASTM D 2671	> 400%
Longitudinal Shrinkage	UL 224	0 ± 5%
Eccentricity	ASTM D 2671	< 30%
Heat Aging Tensile Strength Ultimate Elongation	158°C, 168 hrs.	> 11 MPa > 200 %
Flammability	FMVSS 302	Pass
Dielectric Strength	ASTM D 150	> 20kV / mm
Voltage Withstand	ASTM D 2671 / AC2500V. 1 min.	No Breakdown
Volume Resistance	ASTM D 2671	10 <sup>14</sup> Ω.cm
Copper Stability	UL 224	Pass
Copper Corrosion	UL 224	No Corrosion

Product Dimensions							
Size (Inch)	As Supplied (mm)		After Recovered (mm)		Standard Packaging		
	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)	Mini Spool (MS)* (Feet)	Standard Spool (SS)* (Feet)	Cut to Length Pcs. (QB)* Qty per bag	
						6"	48"
1/16	1.6	0.8	0.5	100	1000	36	25
3/32	2.4	1.2	0.5	100	500	32	25
1/8	3.2	1.6	0.5	100	500	28	25
3/16	4.8	2.4	0.5	100	500	24	25
1/4	6.4	3.2	0.6	100	500	20	25
5/16	8.0	4.0	0.6	100	250	18	25
3/8	9.5	4.8	0.6	100	250	16	25
1/2	12.7	6.4	0.6	100	200	14	5
5/8	16.0	8.0	0.6	50	200	14	5
3/4	19.1	9.5	0.8	50	200	12	5
1	25.4	12.7	0.9	50	200	8	5
1 1/4	31.8	15.9	0.9	50	100	8	5
1 1/2	38.1	19.1	1.0	50	100	5	5
2	50.8	25.4	1.1	50	100	3	5

- Notes:
- \* See page 12 - Part Number Guide for standard packaging codes.
  - Cross Reference Guide located on page 3.
  - Special sizes, packaging, colors and cut pieces are available upon request.
  - To ensure dimensional stability, Q2-LS should be stored at temperature below 40°C/104°F

## Q2-R RoHS Compliant

**SEMI-RIGID, MULTI-PURPOSE,  
FLAME RETARDANT, POLYOLEFIN TUBING  
SHRINK RATIO 2:1**

### Features/Applications

Outstanding physical, chemical and electrical properties. Widely used for insulation of harnesses and connectors in such fields as military, aerospace and fine electronic instruments. Resistant to common fluids and solvents.

- Operating temperature: -55°C to +135°C
- Minimum shrink temperature: 70°C
- Full recovery temperature: 130°C
- Approvals<sup>4</sup>: File No. E236137, File No. 242540, 125°C, VW-1, 600V
- Meets: SAE-AMS-DTL-23053/6 Class 1 & 2, Sony SS-00259
- Standard colors: Black, clear (Non-flame retardant)
- RoHS Compliant



Technical Data		
Property	Test Method	Typical Data
Operating Temperature	IEC 216	-55°C to +135°C
Tensile Strength	ASTM D 2671	>16 MPa
Ultimate Elongation	ASTM D 2671	> 500%
Longitudinal Shrinkage	UL 224	0 ± 5%
Eccentricity	ASTM D 2671	< 30%
Heat Aging Tensile Strength Ultimate Elongation	175°C, 168 hrs.	> 12 MPa > 350 %
Flammability	VW-1	Pass
Dielectric Strength	ASTM D 150	> 20kV / mm
Voltage Withstand	ASTM D 2671 / AC2500V. 1 min.	No Breakdown
Volume Resistance	ASTM D 2671	10 <sup>14</sup> Ω.cm
Copper Stability	UL 224	Pass
Copper Corrosion	UL 224	No Corrosion

Product Dimensions							
Size (Inch)	As Supplied (mm)		After Recovered (mm)		Standard Packaging		
	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)	Mini Spool *(MS) (Feet)	Standard Spool *(SS) (Feet)	Cut to Length Pcs. *(QB)	
						6"	48"
3/64	1.2	0.6	0.4	100	500	40	25
1/16	1.6	0.8	0.4	100	500	36	25
3/32	2.4	1.2	0.5	100	500	32	25
1/8	3.2	1.6	0.5	100	500	28	25
3/16	4.8	2.4	0.5	100	250	24	25
1/4	6.4	3.2	0.6	100	250	20	25
3/8	9.5	4.8	0.6	100	250	16	25
1/2	12.7	6.4	0.6	100	150	14	5
5/8	16.0	8.0	0.7	50	150	14	5
3/4	19.1	9.5	0.7	50	150	12	5
1	25.4	12.7	0.9	50	150	8	5

- Notes:
- \* See page 12 - Part Number Guide for standard packaging codes.
  - Cross Reference Guide located on page 3.
  - Special sizes, packaging, colors and cut pieces are available upon request.
  - Clear tubing is not flame retardant, UL or CSA approved.

## Q2-Z RoHS Compliant

**ENVIRONMENT FRIENDLY, FLEXIBLE  
FLAME RETARDANT, HEAT SHRINKABLE TUBING  
SHRINK RATIO 2:1**

### Features/Applications

An environment friendly, flame retardant shrink tubing. Specially designed formulation to meet UL 224 and CSA 22.2 on the basis of no harmful substance such as PBB, PBBE, PBBO and toxic metal compounds. Widely used for insulation, strain relief, harnessing, bundling and color coding of wire with a low shrink temperature. Good flexibility and superior mechanical strength in such fields as electronics, communication and automobile.

- Operating temperature: -55°C to +125°C
- Minimum shrink temperature: 70°C
- Full recovery temperature: 100°C
- Approvals: File No. E236137, File No. 242540, 125°C, VW-1, 600V
- Meets: Sony SS-00259,
- Material: No PBB's, PBBO's, PBBE's
- Cadmium content <5 ppm, Lead content <10 ppm
- Standard colors: Black, red, blue, yellow, green, white
- Other colors are available upon request.
- RoHS Compliant



Technical Data		
Property	Test Method	Typical Data
Operating Temperature	UL 224	-55°C to +125°C
Tensile Strength	ASTM D 2671	> 14 MPa
Ultimate Elongation	ASTM D 2671	> 400%
Longitudinal Shrinkage	UL 224	0 ± 5%
Eccentricity	ASTM D 2671	< 30%
Heat Aging Tensile Strength Ultimate Elongation	158°C, 168 hrs.	> 12 MPa > 350%
Flammability	VW-1	Pass
Voltage Withstand	ASTM D 2671 / AC 2500, 1 min.	No Breakdown
Volume Resistance	IEC 93	> 10 <sup>14</sup> Ω.cm
Copper Stability	UL 224	Pass
Copper Corrosion	UL 224	No Corrosion

Product Dimensions				
Size (mm)	As Supplied (mm)	After Recovered (mm)		Standard Spool *(SS) (Meter)
	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)	
1.0	1.0	0.50	0.33	200
1.5	1.5	0.75	0.36	200
2.0	2.0	1.00	0.44	200
2.5	2.5	1.25	0.44	200
3.0	3.0	1.50	0.44	200
3.5	3.5	1.75	0.44	200
4.0	4.0	2.00	0.44	200
5.0	5.0	2.50	0.56	100
6.0	6.0	3.00	0.56	100
7.0	7.0	3.50	0.56	100
8.0	8.0	4.00	0.56	100
9.0	9.0	4.50	0.56	100
10.0	10.0	5.00	0.56	100
11.0	11.0	5.50	0.56	100
12.0	12.0	6.00	0.56	50
13.0	13.0	6.50	0.65	50
14.0	14.0	7.00	0.69	50
15.0	15.0	7.50	0.69	50
16.0	16.0	8.00	0.69	50
18.0	18.0	9.00	0.80	50
20.0	20.0	10.00	0.80	50
22.0	22.0	11.00	0.80	50
25.0	25.0	12.50	0.90	50
28.0	28.0	14.00	0.90	50
30.0	30.0	15.00	0.90	50
35.0	35.0	17.50	0.90	50
40.0	40.0	20.00	1.00	50
50.0	50.0	25.00	1.00	50
60.0	60.0	30.00	1.00	30
70.0	70.0	35.00	1.20	30
80.0	80.0	40.00	1.20	30
100.0	100.0	50.80	1.30	30
125.0	125.0	63.50	1.30	15
150.0	150.0	76.00	1.30	15

Product Dimensions								
Size (Inch)	As Supplied (mm)		After Recovered (mm)		Standard Packaging			
	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)	Mini Spool *(MS) (Feet)	Standard Spool *(SS) (Feet)	Box Length *(QX) (Feet)	Cut to Length Pcs. *(QB)	
							6"	48"
3/64	1.2	0.60	0.33	100	1000	50	40	25
1/16	1.6	0.80	0.36	100	1000	50	36	25
3/32	2.4	1.20	0.44	100	500	50	32	25
1/8	3.2	1.60	0.44	100	500	50	28	25
3/16	4.8	2.40	0.56	100	500	30	24	25
1/4	6.4	3.20	0.56	100	500	30	20	25
5/16	8.0	4.00	0.56	100	250	30	18	25
3/8	9.5	4.80	0.56	100	250	30	16	25
1/2	12.7	6.40	0.65	100	200	15	14	5
5/8	16.0	8.00	0.69	50	200	15	14	5
3/4	19.1	9.50	0.80	50	200	15	12	5
1	25.4	12.70	0.90	50	200	15	8	5
1 1/4	31.8	15.90	0.90	50	100	-	8	5
1 1/2	38.1	19.10	1.02	50	100	-	5	5
2	50.8	25.40	1.02	50	100	-	3	5
3	76.2	38.10	1.20	-	100	-	2	2
4	101.6	50.80	1.30	-	100	-	1	2
5	126.0	63.50	1.30	-	50	-	1	2
6	150.0	76.00	1.30	-	50	-	1	2

- Notes:
- \* See page 12 - Part Number Guide for standard packaging codes.
  - Cross Reference Guide located on page 3.
  - Special sizes, packaging, colors and cut pieces are available upon request.



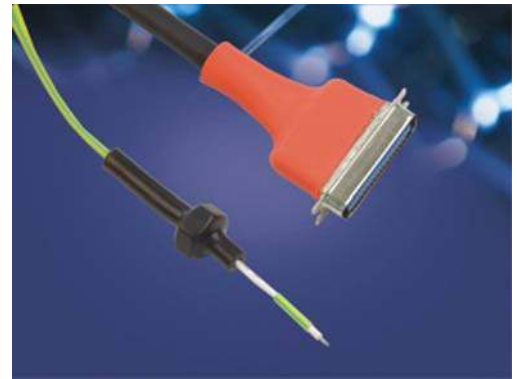
## Q2-3X RoHS Compliant

### FLEXIBLE, THIN WALL FLAME RETARDANT POLYOLEFIN TUBING SHRINK RATIO 3:1

#### Features/Applications

Widely used for electrical insulation. Protects in-line components, disconnect terminals and splices with its high strength and excellent resilience. Bundles wires for very flexible light-duty harnesses. Identifies or color-codes wires, cables, terminals and components. Free from environment harmful substances such as PBB's, PBBO's, PBBE's and toxic heavy metal compounds in its components.

- Operating temperature: -55°C to +125°C
- Minimum shrink temperature: 70°C
- Full recovery temperature: 100°C
- Approvals<sup>4</sup>: File No. E236137, File No. 242540, 125°C, VW-1, 600V
- Meets: Sony-SS-00259
- Standard colors: Black, red, blue, yellow, green, white, clear
- Other colors are available upon request.
- RoHS Compliant



Technical Data		
Property	Test Method	Typical Data
Operating Temperature	IEC 216	-55°C to +125°C
Tensile Strength	ASTM D 2671	>14 MPa
Ultimate Elongation	ASTM D 2671	> 400%
Longitudinal Shrinkage	UL 224	0 ± 5%
Eccentricity	ASTM D 2671	< 30%
Heat Aging Tensile Strength Ultimate Elongation	158°C, 168 hrs.	> 12 MPa > 350 %
Flammability	VW-1	Pass
Dielectric Strength	ASTM D 150	> 20kV / mm
Voltage Withstand	ASTM D 2671 / AC2500V. 1 min.	No Breakdown
Volume Resistance	ASTM D 2671	10 <sup>14</sup> Ω.cm
Copper Stability	UL 224	Pass
Copper Corrosion	UL 224	No Corrosion

Product Dimensions							
Size		As Supplied (mm)	After Recovered (mm)		Standard Spool *(SS) (Feet)	Standard Packaging	
Inch	mm	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)		Cut to Length Pcs. *(QB) Qty per bag	
						6"	48"
1/16	1.5/0.5	1.6	0.5	0.45	500	28	25
1/8	3.0/1.0	3.2	1.0	0.55	500	24	25
3/16	4.5/1.5	4.8	1.5	0.60	500	24	25
1/4	6.0/2.0	6.4	2.0	0.65	250	20	25
3/8	9.0/3.0	9.5	3.0	0.75	250	16	25
1/2	12.0/4.0	12.7	4.0	0.80	150	14	5
3/4	18.0/6.0	19.1	6.0	0.90	150	12	5
1	24.0/8.0	25.4	8.0	1.00	150	8	5
1 1/2	39.0/13.0	39.0	13.0	1.25	150	5	5

- Notes:
1. \* See page 12 - Part Number Guide for standard packaging codes.
  2. Cross Reference Guide located on page 3.
  3. Special sizes, packaging, colors and cut pieces are available upon request.
  4. Clear tubing is not flame retardant, UL or CSA approved.

## Q-150K

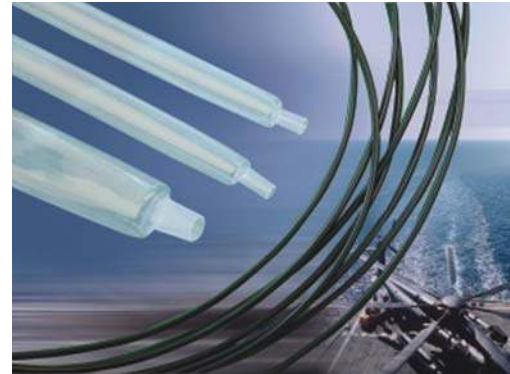


150°C , BLACK, MODIFIED THIN WALL FLEXIBLE PVDF TUBING  
SHRINK RATIO 2:1

### Features/Applications

Excellent flame-retardant, heat shrinkable polyvinylidene fluoride tubing for applications requiring high temperature performance, outstanding abrasion and cut-through resistance or superior chemical and solvent resistant properties. It reliably protects solder joints, terminals and connectors from most industrial fluids, solvents and chemicals.

- Operating temperature: -55°C to +150°C
- Minimum shrink temperature: 135°C
- Full recovery temperature: 150°C
- Approval: UL VW-1, File No. E245010
- Meets: SAE-AMS-DTL-23053/18
- Standard colors: Black, Clear
- RoHS Compliant



### Technical Data

Property	Test Method	Typical Data
Tensile Strength	ASTM D 2671	> 30 MPa
Ultimate Elongation	ASTM D 2671	> 150%
Flammability	VW-1	Pass
Volume Resistance	IEC 93	≥10 <sup>14</sup> Ω.cm
Copper Stability	180°C, 168 hrs.	Pass
Copper Corrosion	180°C, 168 hrs.	No Corrosion

### Product Dimensions

Size		As Supplied (mm)	After Recovered (mm)		Tubing Shape	Standard Packaging		
Inch	mm	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)		Standard Spool *(SS) (Meter)	Cut to Length Pcs. *(QB) Qty per bag	
							6"	48"
3/64	1.2	1.2	0.6	0.26	Round	200	32	25
1/16	1.6	1.6	0.8	0.26	Round	200	28	25
3/32	2.4	2.4	1.2	0.26	Round	200	24	25
1/8	3.2	3.2	1.6	0.26	Round	100	20	25
3/16	4.8	4.8	2.4	0.26	Round	100	16	25
1/4	6.4	6.4	3.2	0.26	Round	100	12	25
3/8	9.5	9.5	4.8	0.30	Flat	50	8	25
1/2	12.7	12.7	6.4	0.30	Flat	50	4	5
3/4	19.1	19.1	9.5	0.41	Flat	50	2	5
1	25.4	25.4	12.7	0.41	Flat	50	1	5
1 1/2	38.1	38.1	19.0	0.51	Flat	50	1	5

Notes:

1. \* See page 12 - Part Number Guide for standard packaging codes.
2. Cross Reference Guide located on page 3.
3. Special sizes, packaging, colors and cut pieces are available upon request.

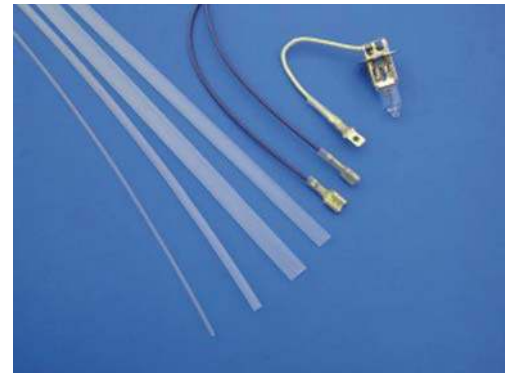
## Q-175K



**175°C , CLEAR, SEMI-RIGID, HIGH TEMPERATURE,  
CHEMICAL RESISTANT PVDF TUBING  
SHRINK RATIO 2:1**

### Features/Applications

Semi-rigid flame retardant heat shrinkable polyvinylidene fluoride tubing for applications requiring high temperature performance, outstanding abrasion and cut-through resistance or superior chemical and solvent resistant properties. It reliably protects wires, solder joints, terminals, connectors and components from most industrial fluids, solvents and chemicals.



- Operating temperature: -55°C to +175°C
- Full recovery temperature: 175°C
- Approval: UL VW-1, File No. E245010
- Meets: SAE-AMS-DTL-23053/18
- Standard color: Clear
- RoHS Compliant

Technical Data		
Property	Test Method	Typical Data
Operating Temperature	IEC 216	-55°C to +175°C
Tensile Strength	ASTM D 2671	≥ 34.5 MPa
Ultimate Elongation	ASTM D 2671	≥ 150%
Ultimate Elongation After Aging	250°C, 168 hrs.	≥ 100%
Heat Shock	300°C, 1 hr.	No cracking
Cold Bend	-55°C, 1 hr.	No cracking
Dielectric Strength	ASTM D 2671	≥ 30 kV / mm
Volume Resistance	IEC 93	≥ 10 <sup>13</sup> Ω.cm
Flammability	VW-1	Pass

Product Dimensions								
Size		As Supplied (mm)	After Recovered (mm)		Standard Spool *(SS) (Meter)	Standard Packaging		
Inch	mm	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)		Cut to Length Pcs. *(QB) Qty per bag		
						6"	48"	
3/64	1.2	1.2	0.6	0.20	200	32	25	
1/16	1.6	1.6	0.8	0.20	200	28	25	
3/32	2.4	2.4	1.2	0.23	200	24	25	
1/8	3.2	3.2	1.6	0.23	200	20	25	
3/16	4.8	4.8	2.4	0.23	100	16	25	
1/4	6.4	6.4	3.2	0.28	100	12	25	
3/8	9.5	9.5	4.8	0.28	-	8	25	
1/2	12.7	12.7	6.4	0.28	-	4	5	
3/4	19.1	19.1	9.5	0.36	-	2	5	
1	25.4	25.4	12.7	0.41	-	1	5	
1 1/2	38.1	38.1	19.0	0.51	-	1	5	

Notes:

- \* See page 12 - Part Number Guide for standard packaging codes.
- Cross Reference Guide located on page 3.
- Special sizes, packaging, colors and cut pieces are available upon request.

## Q-200E

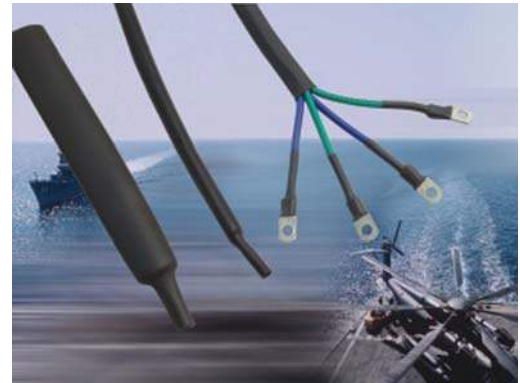


**200°C, VERY FLEXIBLE  
MODIFIED FLUOROELASTOMER TUBING (Viton®)  
SHRINK RATIO 2:1**

### Features/Applications

Q-200E is made from modified fluoroelastomer with superior impact, abrasion and cut-through resistance. Used for applications requiring high resistance to corrosive fluids, fuels, lubricants, acids and solvents at elevated temperatures. Very flexible at high and low temperatures without cracking.

- Operating temperature: -55°C to +200°C
- Minimum shrink temperature: 150°C
- Full recovery temperature: 175°C
- Approval: UL VW-1, File No. E245010
- Meets: SAE-AMS-DTL-23053/13
- Standard Color: Black
- RoHS Compliant



Technical Data		
Property	Test Method	Typical Data
Operating Temperature	IEC 216	-55°C to +200°C
Tensile Strength	ASTM D 2671	≥ 8.5 MPa
Elongation at Break	ASTM D 2671	≥ 250%
Elongation at Break After Aging	250°C, 168 hrs.	> 8MPa > 200%
Heat Shock	300°C, 4 hrs.	No cracking or dropping
Flexibility	ASTM D 412	≤ 13.8 MPa
Dielectric Strength	ASTM D 2671	≥ 7.9kV / mm
Volume Resistance	ASTM D 876	≥ 10 <sup>14</sup> Ω.cm
Copper Corrosion	UL 224	No corrosion
Flammability	ASTM D 2671	Self-extinguish in 15 sec.

Product Dimensions								
Size		As Supplied (mm)	After Recovered (mm)		Tubing Shape	Standard Packaging		
Inch	mm	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)		Standard Spool *(SS) (Meter)	Cut to Length Pcs. *(QB) Qty per bag	
							6"	48"
1/8	3.2	3.2	1.6	0.76	Round	50	20	25
3/16	4.8	4.8	2.4	0.90	Round	50	16	25
1/4	6.4	6.4	3.2	0.90	Round	50	12	25
3/8	9.5	9.5	4.8	0.90	Round	50	8	25
1/2	12.7	12.7	6.4	1.10	Round	30	4	5
3/4	19.1	19.1	9.5	1.30	Round	30	2	5
1	25.4	25.4	12.7	1.65	Flat	30	1	5
1 1/2	38.1	38.1	19.1	1.90	Flat	15	1	5
2	50.8	50.8	25.4	2.80	Flat	15	1	5

- Notes:
- \* See page 12 - Part Number Guide for standard packaging codes.
  - Cross Reference Guide located on page 3.
  - Special sizes, packaging, colors and cut pieces are available upon request.
  - Viton® is a registered trademark of E.I. Du Pont de Nemours and Co. Inc.

## Q-PTFE



### PTFE HEAT SHRINKABLE TUBING

#### Features/Applications

Q-PTFE heat shrinkable tubing is manufactured with polytetrafluoroethylene (PTFE). It is specially designed for applications where high temperature and chemical resistance is required. This tubing works great as an electrical insulator and where highly flame retardant properties are required, such as in the automotive, military and aerospace fields.

- Operating temperature: -65°C to +260°C
- Full recovery temperature: 350°C
- Meets: SAE-AMS-DTL-23053/12
- Standard color: Clear
- RoHS Compliant



Technical Data		
Property	Test Method	Typical Data
Tensile Strength	ASTM D 2671	≥ 17.3 MPa
Ultimate Elongation	ASTM D 2671	≥ 200%
Specific Gravity	ASTM D 792	2.30
Heat Shock (400°C, 4hrs.)	ASTM D 2671	No cracking or dropping
Cold Bend Test (-65°C, 4hrs.)	ASTM D 2671	No cracking
Volume Resistance	ASTM D 2671	≥ 10 <sup>18</sup> Ω.cm
Dielectric Strength	ASTM D 2671	≥ 34kV/mm
Copper Corrosion	UL 224	Pass
Flammability	ASTM D 2671	Self-extinguish
Fluid Resistance	SAE-AMS-DTL-23053/12	Excellent
Water Absorption	ASTM D 570	≤ 0.1

Product Dimensions				
Size (AWG)	As Supplied (mm)	After Recovered (mm)		Standard Packaging Cut to Length Pcs. *(QB) Qty per bag (48" pcs.)
	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)	
20	1.52	0.97	0.30	25
18	1.93	1.17	0.30	25
16	2.36	1.45	0.30	25
14	3.05	1.82	0.30	25
12	3.81	2.26	0.30	25
10	4.85	2.80	0.30	25
8	6.10	3.55	0.38	5
6	7.67	4.40	0.38	5
4	9.40	5.45	0.38	5
2	10.92	6.90	0.38	5
0	11.94	8.56	0.38	5

Notes:

1. \* See page 12 - Part Number Guide for standard packaging codes.
2. Cross Reference Guide located on page 3.
3. Special sizes, packaging, colors and cut pieces are available upon request.



# Q5-2X

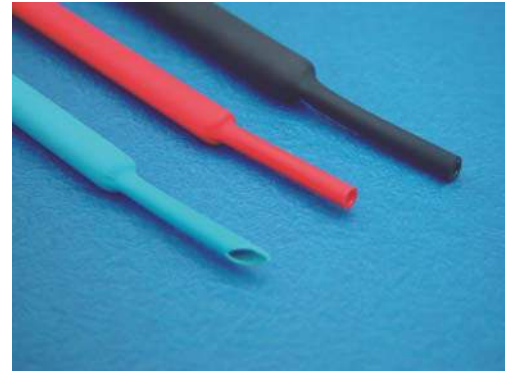


## DUAL WALL, ADHESIVE LINED, FLEXIBLE POLYOLEFIN TUBING SHRINK RATIO 2:1

### Features/Applications

Heat shrinkable dual wall adhesive lined tubing is manufactured by co-extrusion of polyolefin and hot-melt adhesive. Designed to provide both insulation and sealing for protection against water and moisture of auto wires, shipping cables, metal tubes and bundled wires.

- Operating temperature: -45°C to +125°C
- Minimum shrink temperature: 100°C
- Full recovery temperature: 125°C
- Approvals<sup>4</sup>:  File No. E236137,  File No. 242540, 125°C, VW-1, 600V
- Meets: Sony-SS-00259, SAE-AMS-DTL-23053/4
- Standard color: Black
- Special colors: Red, blue, white, yellow, clear(non-flame retardant jacket)
- RoHS Compliant



### Technical Data

Property	Test Method	Typical Data
Tensile Strength	ASTM D 2671	10.4 MPa (min.)
Tensile Strength After Aging	ASTM D 2671	158°C, 168 hrs., remains 70%
Elongation at Break	ASTM D 2671	200% (min.)
Elongation at Break After Aging (158°C, 168 hrs.)	ASTM D 2671	100% (min.)
Longitudinal Shrinkage	UL 224	0 ± 10%
Heat Shock	250°C, 4 hrs.	No cracking, no dropping
Cold Bend (-30°C, 1 hr.)	ASTM D 2671	No cracking
Voltage Withstand (AC 2500V, 60 seconds)	ASTM D 2671	No breakdown
Break Down Voltage	ASTM D 2671	AC 2500V (min.)
Volume Resistance	ASTM D 876	Min. 10 <sup>14</sup> Ω.cm (min.)
Flammability	SAE-AMS-DTL-23053/4	Self extinguish in 30 seconds
Copper Corrosion (158°C, 168 hrs.)	UL 224	Pass
Water Absorption	ASTM D 570	< 0.5%

### Product Dimensions

Size		As Supplied (mm)	After Recovered (mm)			Standard Packaging		
Inch	mm	Inside Diameter (min.)	Inside Diameter (max.)	Total Wall Thickness (min.)	Adhesive Thickness (nom.)	Standard Spool *(SS) (Meter)	Cut to Length Pcs. *(QB) Qty per bag	
							6"	48"
1/8	3.2/1.6	3.20	1.6	0.70	0.20	200	28	25
3/16	4.8/2.4	4.80	2.4	0.70	0.20	100	24	25
1/4	6.4/3.2	6.40	3.2	0.75	0.20	100	20	25
3/8	9.5/4.8	9.50	4.8	0.75	0.20	50	16	25
1/2	12.7/6.4	12.70	6.4	0.75	0.20	25	14	5
3/4	19.1/9.6	19.10	9.5	0.90	0.20	25	12	5
1	25.4/12.7	25.40	12.7	1.10	0.20	25	8	5
1 1/2	38.1/19.0	38.10	19.0	1.10	0.20	25	5	5

#### Notes:

- \* See page 12 - Part Number Guide for standard packaging codes.
- Cross Reference Guide located on page 3.
- Special sizes, packaging, colors and cut pieces are available upon request.
- Clear and color tubing other than black are not flame retardant, UL or CSA approved.

# Q5-3X



**DUAL WALL, ADHESIVE LINED, FLEXIBLE POLYOLEFIN TUBING  
SHRINK RATIO 3:1**

**Features/Applications**

Heat shrinkable dual wall adhesive lined tubing is manufactured by co-extrusion of polyolefin and hot-melt adhesive. It is designed to provide both insulation and sealing for protection against water and moisture of auto wires, shipping cables, metal tubes and bundled wires.



- Operating temperature: -55°C to +125°C
- Minimum shrink temperature: 80°C
- Full recovery temperature: 110°C
- Approvals<sup>4</sup>: File No. E236137, File No. 242540, 125°C, VW-1, 600V
- Meets: Sony-SS-00259, SAE-AMS-DTL-23053/4
- Standard color: Black
- Special colors: Red, blue, white, yellow, clear(non-flame retardant jacket)
- RoHS Compliant

Technical Data		
Property	Test Method	Typical Data
Operating Temperature	IEC 216	-55°C to +125°C
Tensile Strength	ASTM D 2671	>12 MPa
Ultimate Elongation	ASTM D 2671	> 400%
Longitudinal Shrinkage	UL 224	0 ± 10%
Eccentricity	ASTM D 2671	< 40%
Heat Aging Tensile Strength Ultimate Elongation	158°C, 168 hrs.	> 11 MPa > 350 %
Flammability	VW-1	Pass
Voltage Withstand	ASTM D 2671 / AC2500V. 1 min.	No Breakdown
Volume Resistance	ASTM D 2671	>10 <sup>14</sup> Ω.cm
Copper Stability	UL 224	Pass
Copper Corrosion	UL 224	No Corrosion
Property of adhesive		
Ring-Ball Soft Point	ASTM E28	95°C ± 5°C

Product Dimensions								
Size		As Supplied (mm)	After Recovered (mm)			Standard Packaging		
Inch	mm	Inside Diameter (min.)	Inside Diameter (max.)	Total Wall Thickness (min.)	Adhesive Thickness (nom.)	Standard Spool *(SS) (Meter)	Cut to Length Pcs. *(QB)	
							Qty per bag	
							6"	48"
1/8	3.0/1.0	3.0	1.0	1.00	0.5	200	28	25
3/16	4.8/1.5	4.8	1.5	1.00	0.5	100	24	25
1/4	6.0/2.0	6.0	2.0	1.00	0.5	100	20	25
3/8	9.0/3.0	9.0	3.0	1.40	0.6	50	16	25
1/2	12.0/4.0	12.0	4.0	1.60	0.8	25	14	5
3/4	19.0/6.0	19.0	6.0	2.15	0.8	25	12	5
1	24.0/8.0	24.0	8.0	2.40	1.0	25	8	5
1 1/4	30.0/10.0	30.0	10.0	2.40	1.0	25	5	5
1 1/2	40.0/13.0	40.0	13.0	2.40	1.0	25	5	5
2	50.0/19.0	50.0	19.0	2.40	1.0	25	3	5

Notes:  
 1. \* See page 12 - Part Number Guide for standard packaging codes.  
 2. Cross Reference Guide located on page 3.  
 3. Special sizes, packaging, colors and cut pieces are available upon request.  
 4. Clear tubing and color tubing other than black are not flame retardant, UL or CSA approved.

## Q5-4X RoHS Compliant

**DUAL WALL, ADHESIVE LINED, FLEXIBLE POLYOLEFIN TUBING**  
**SHRINK RATIO 4:1**

### Features/Applications

Heat shrinkable dual wall adhesive lined tubing is manufactured by co-extrusion of polyolefin and hot-melt adhesive. Designed to provide both insulation and sealing for protection against water and moisture of auto wires, shipping cables, metal tubes and bundled wires.

- Operating temperature: -55°C to +125°C
- Minimum shrink temperature: 80°C
- Full recovery temperature: 110°C
- Approvals<sup>4</sup>: File No. E236137, File No. 242540, 125°C, VW-1, 600V
- Meets: Sony-SS-00259, SAE-AMS-DTL-23053/4
- Standard color: Black
- Special colors: Red, blue, white, yellow, clear
- RoHS Compliant



Technical Data		
Property	Test Method	Typical Data
Operating Temperature	IEC 216	-55°C to +125°C
Tensile Strength	ASTM D 2671	>12 MPa
Ultimate Elongation	ASTM D 2671	> 400%
Longitudinal Shrinkage	UL 224	0 ± 10%
Eccentricity	ASTM D 2671	< 40%
Heat Aging Tensile Strength Ultimate Elongation	158°C, 168 hrs.	> 11 MPa > 350 %
Flammability	VW-1	Pass
Voltage Withstand	ASTM D 2671 / AC2500V. 1 min.	No Breakdown
Volume Resistance	ASTM D 2671	>10 <sup>14</sup> Ω.cm
Copper Stability	UL 224	Pass
Copper Corrosion	UL 224	No Corrosion
Property of adhesive		
Ring-Ball Soft Point	ASTM E28	95°C ± 5°C

Product Dimensions									
Size		As Supplied (mm)	After Recovered (mm)			Standard Packaging			
Inch	mm	Inside Diameter (min.)	Inside Diameter (max.)	Total Wall Thickness (min.)	Adhesive Thickness (nom.)	Standard Spool *(SS) (Meter)	Cut to Length Pcs. *(QB) Qty per bag		
							6"	48"	
3/16	4/1	4.0	1.0	1.00	0.5	100	24	25	
1/4	6/1.5	6.0	1.5	1.00	0.5	100	20	25	
5/16	8/2	8.0	2.0	1.00	0.5	50	18	25	
1/2	12/3	12.0	3.0	1.40	0.6	25	14	5	
5/8	16/4	16.0	4.0	1.60	0.8	25	14	5	
1	24/6	24.0	6.0	2.15	0.8	25	12	5	
1 1/4	32/8	32.0	8.0	2.40	1.0	25	8	5	
2	52/13	52.0	13.0	2.40	1.0	-	5	5	

- Notes:
- \* See page 12 - Part Number Guide for standard packaging codes.
  - Cross Reference Guide located on page 3.
  - Special sizes, packaging, colors and cut pieces are available upon request.
  - Clear tubing and color tubing other than black are not flame retardant, UL or CSA approved.



## Q5-F3X



**DUAL WALL, ADHESIVE LINED, FLEXIBLE POLYOLEFIN TUBING  
SHRINK RATIO 3:1**

### Features/Applications

Q5-F3X is manufactured by co-extrusion of polyolefin and meltable adhesive. It is designed to provide insulation and create a tight seal for protected articles. Typical applications are environmental sealing of electrical components such as wire splices and harnesses in the automotive and communication industry.

- Operating temperature: -55°C to +125°C
- Minimum shrink temperature: 70°C
- Full recovery temperature: 110°C
- Approvals<sup>4</sup>: File No. E236137, File No. 242540, 125°C, VW-1, 600V
- Meets: SAE-AMS-DTL-23053/4, Sony-SS-00259
- Standard color: Black
- RoHS Compliant



Technical Data		
Property	Test Method	Typical Data
Operating Temperature	IEC 216	-55°C to +125°C
Tensile Strength	ASTM D 2671	>13 MPa
Ultimate Elongation	ASTM D 2671	> 400%
Longitudinal Shrinkage	UL 224	0 ± 10%
Eccentricity	ASTM D 2671	< 40%
Heat Aging Tensile Strength Ultimate Elongation	158°C, 168 hrs.	> 11 MPa > 300 %
Flammability	VW-1	Pass
Voltage Withstand	ASTM D 2671 / AC2500V. 1 min.	No Breakdown
Volume Resistance	ASTM D 2671	> 10 <sup>14</sup> Ω.cm
Copper Stability	UL 224	Pass
Copper Corrosion	UL 224	No Corrosion
Property of adhesive		
Ring-Ball Soft Point	ASTM E28	95°C ± 5°C

Product Dimensions									
Size		As Supplied (mm)	After Recovered (mm)			Standard Packaging			
Inch	mm	Inside Diameter (min.)	Inside Diameter (max.)	Total Wall Thickness (min.)	Adhesive Thickness (nom.)	Standard Spool *(SS) (Meter)	Cut to Length Pcs. *(QB) Qty per bag		
							6"	48"	
1/8	3/1	3.0	1.0	1.00	0.5	200	28	25	
3/16	4.8/1.5	4.8	1.5	1.00	0.5	100	24	25	
1/4	6/2	6.0	2.0	1.00	0.5	100	20	25	
3/8	9/3	9.0	3.0	1.40	0.6	50	16	25	
1/2	12/4	12.0	4.0	1.60	0.8	25	14	5	
3/4	19/6	19.0	6.0	2.15	0.8	25	12	5	
1	24/8	24.0	8.0	2.40	1.0	25	8	5	
1 1/2	40/13	40.0	13.0	2.40	1.0	25	5	5	

- Notes:
1. \* See page 12 - Part Number Guide for standard packaging codes.
  2. Cross Reference Guide located on page 3.
  3. Special sizes, packaging, colors and cut pieces are available upon request.
  4. Clear tubing and color tubing other than black are not flame retardant, UL or CSA approved.

# Q5-F4X

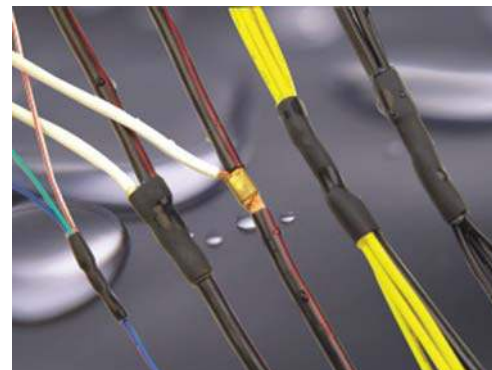


DUAL WALL, ADHESIVE LINED, FLEXIBLE POLYOLEFIN TUBING  
SHRINK RATIO 4:1

## Features/Applications

Q5-F4X is manufactured by co-extrusion of polyolefin and meltable adhesive. It is designed to provide insulation and a tight seal for protected articles. Typical applications are environmental sealing of electrical components such as wire splices and harnesses in the automotive and communication industry.

- Operating temperature: -55°C to +125°C
- Minimum shrink temperature: 70°C
- Full recovery temperature: 110°C
- Approvals<sup>4</sup>: File No. E236137, File No. 242540, 125°C, VW-1, 600V
- Meets: SAE-AMS-DTL-23053/4, Sony-SS-00259
- Standard color: Black
- RoHS Compliant



## Technical Data

Property	Test Method	Typical Data
Operating Temperature	IEC 216	-55°C to +125°C
Tensile Strength	ASTM D 2671	>13 MPa
Ultimate Elongation	ASTM D 2671	> 400%
Longitudinal Shrinkage	UL 224	0 ± 10%
Eccentricity	ASTM D 2671	< 40%
Heat Aging Tensile Strength Ultimate Elongation	158°C, 168 hrs.	> 11 MPa > 300 %
Flammability	VW-1	Pass
Voltage Withstand	ASTM D 2671 / AC2500V. 1 min.	No Breakdown
Volume Resistance	ASTM D 2671	> 10 <sup>14</sup> Ω.cm
Copper Stability	UL 224	Pass
Copper Corrosion	UL 224	No Corrosion
<b>Property of adhesive</b>		
Ring-Ball Soft Point	ASTM E28	95°C ± 5°C

## Product Dimensions

Size		As Supplied (mm)	After Recovered (mm)			Standard Packaging		
Inch	mm	Inside Diameter (min.)	Inside Diameter (max.)	Total Wall Thickness (min.)	Adhesive Thickness (nom.)	Standard Spool *(SS) (Meter)	Cut to Length Pcs. *(QB) Qty per bag	
							6"	48"
3/16	4/1	4.0	1.0	1.00	0.5	100	24	25
5/16	8/2	8.0	2.0	1.00	0.5	50	18	25
1/2	12/3	12.0	3.0	1.40	0.6	25	14	5
5/8	16/4	16.0	4.0	1.60	0.8	25	14	5
1	24/6	24.0	6.0	2.15	0.8	25	8	5
1 1/4	32/8	32.0	8.0	2.40	1.0	25	5	5
1 1/2	38.1/9.5	38.1	9.5	2.40	1.0	25	5	5
2	52/13	52.0	13.0	2.40	1.0	-	3	5

### Notes:

- \* See page 12 - Part Number Guide for standard packaging codes.
- Cross Reference Guide located on page 3.
- Special sizes, packaging, colors and cut pieces are available upon request.
- Clear tubing and color tubing other than black are not flame retardant, UL or CSA approved.

# Q5-4XR

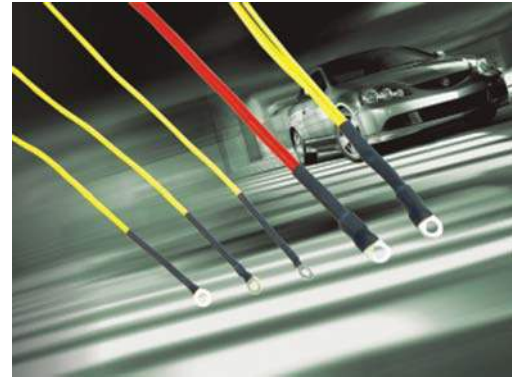


**SEMI-RIGID, ADHESIVE LINED HEAT SHRINKABLE TUBING**  
**SHRINK RATIO 4:1 QBK/HBK SERIES**

**Features/Applications**

Specially designed for the protection of wires, terminals and other components against environmental damage. The semi-rigid composition makes it more abrasion resistant compared with most common tubing and the 4:1 shrink ratio fits a wide range of component diameters. With its thicker liner, it forms an effective barrier against fluids and moisture.

- Operating temperature: -55°C to +125°C
- Minimum shrink temperature: 110°C
- Full recovery temperature: 135°C
- Meets: SAE-AMS-DTL-23053/4, Ford ESB-M99D56-A2, 600V
- Standard colors: Black and Clear
- RoHS Compliant



Technical Data		
Property	Test Method	Test Requirements
Tensile Strength	ASTM D 2671	>10 MPa
Elongation at Break	ASTM D 2671	>200%
Elongation at Break After Aging (158°C, 168 hrs.)	ASTM D 2671	>100%
Longitudinal Shrinkage	UL 224	-10~0%
Heat Shock	250°C, 4 hrs.	No cracking, no dropping
Cold Bend ( -30°C, 4 hr.)	ASTM D 2671	No cracking
Dielectric Strength	ASTM D 2671	15kV (min.)
Minimum Volume Resistance	ASTM D 2671	>10 <sup>14</sup> Ω.cm
Flammability	-	Self extinguish in 30 seconds
Copper Corrosion (158°C, 168 hrs.)U	L 224	Pass
Property of adhesive		
Ring-Ball Soft Point	ASTM E 28	135°C ± 5°C

Product Dimensions						
Size (mm)	As Supplied (mm)	After Recovered (mm)			Standard Packaging	
	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)	Adhesive Thickness (nom.)	Cut to Length Pcs. (QB)* Qty per bag	
					6"	48"
6/1.27	6	1.27	1.30	0.56	20	5
8/1.65	8	1.65	1.52	0.76	16	5
12/2.41	12	2.41	1.91	1.02	14	5
18/4.45	18	4.45	2.41	1.37	12	5

- Notes:
1. \* See page 12 - Part Number Guide for standard packaging codes.
  2. Cross Reference Guide located on page 3.
  3. Special sizes, packaging, colors and cut pieces are available upon request.
  4. Halogen free heat-shrinkable adhesive-lined tubing is available upon request.

# Q5-3XM



HEAVY DUAL WALL, ADHESIVE LINED, FLEXIBLE POLYOLEFIN TUBING  
SHRINK RATIO 3:1

## Features/Applications

Manufactured using a specially designed coating technology. Designed to provide both insulation and create a tight seal for protected articles. Suitable for joints and terminations, it can also be used to protect auto wires, shipping cables, bundled wires and metal tubes against water and moisture especially in ship building.

- Operating temperature: -55°C to +125°C
- Minimum shrink temperature: 80°C
- Full recovery Temperature: 110°C
- Standard color: Black
- RoHS Compliant



## Technical Data

Property	Test Method	Typical Data
Tensile Strength	ASTM D 2671	>14 MPa
Ultimate Elongation	ASTM D 2671	> 400%
Longitudinal Shrinkage	UL 224	-10%
Eccentricity	ASTM D 2671	< 30%
Heat Aging Tensile Strength Ultimate Elongation	250°C, 168 hrs.	> 12 MPa > 350 %
Heat Shock	300°C, 4 hrs.	No Cracking
Flammability	VW-1	Pass
Dielectric Strength	IEC 93	> 20 kV / mm
Voltage Withstand	ASTM D 2671 / AC2500V. 1 min.	No Breakdown
Volume Resistance	ASTM D 2671	>10 <sup>14</sup> Ω.cm
Copper Stability	UL 224	Pass
Copper Corrosion	UL 224	No Corrosion
<b>Property of adhesive</b>		
Ring-Ball Soft Point	ASTM E28	85°C ± 5°C

## Product Dimensions

Size		As Supplied (mm)	After Recovered (mm)			Standard Packaging	
Inch	mm	Inside Diameter (min.)	Inside Diameter (max.)	Total Wall Thickness (min.)	Adhesive Thickness (nom.)	Cut to Length Pcs. *(QB) Qty per bag	
						6"	48"
3/4	19/6	19	6	3.0	1.35	14	5
1	25/8	25	8	3.0	1.35	12	5
1 1/4	33/8	33	8	3.0	1.35	5	5
1 1/2	40/12	40	12	3.0	1.35	5	5
2	55/16	55	16	3.0	1.35	3	5
2 1/2	65/19	65	19	3.0	1.35	2	5
3	75/22	75	22	3.0	1.35	2	5
3 3/8	85/25	85	25	3.0	1.35	1	5
4	100/30	100	30	3.0	1.35	1	5

### Notes:

- \* See page 12 - Part Number Guide for standard packaging codes.
- Cross Reference Guide located on page 3.
- Special sizes, packaging, colors and cut pieces are available upon request.
- Halogen free heat-shrinkable adhesive-lined tubing is available upon request.

# QRA-6X



**VERY HIGH SHRINK RATIO, HEAVY DUAL WALL TUBING ,  
HOT MELT ADHESIVE-LINED  
SHRINK RATIO 6:1**

**Features/Applications**

Ideal for applications of extremely different diameter between cables, connectors and components. The high shrink ratio provides close fit to a wide variety of irregular shapes, connectors and figurations. Provides excellent mechanical protection to cable joints and terminations, complete environmental protection and is resistant to impact and abrasion.



- Operating temperature: -55°C to +110°C
- Minimum shrink temperature: 120°C
- Full recovery temperature: 120°C
- Standard color: Black
- RoHS Compliant
- Very high shrink ratio
- Resistant to UV radiation
- High electrical insulation
- Superior mechanical property

Technical Data		
Property	Test Method	Typical Data
Tensile Strength	ASTM D 2671	≥14 MPa
Tensile Strength After Aging (158°C, 168 hrs.)	ASTM D 2671	≥ 12 MPa
Longitudinal Shrinkage	UL 224	0 ± 10%
Elongation at Break	ASTM D 2671	≥ 400%
Elongation at Break After Aging (50°C, 168 hrs.)	ASTM D 2671	≥ 300%
Dielectric Strength	IEC 243	≥ 18kV / mm
Volume Resistance	IEC 93	≥13 <sup>14</sup> Ω.cm
Copper Stability	ASTM D 2671	Non-corrosive
Heat Shock (225°C, 4hrs.)	ASTM D 2671	No cracking or flowing

Property	Test Method	Typical Data
Water Absorption	ISO 62	< 0.2%
Softening Point	ASTM D E28	85°C ± 5°C
Peel Strength (PE)	DIN 30672	4N / cm
Resistance to Fungus and Decay	ISO 846	Pass

Product Dimensions						
Size (mm)	As Supplied (mm)	After Recovered (mm)		Tubing Shape	Standard Packaging	
	Inside Diameter (min.)	Inside Diameter (max.)	Wall Thickness (min.)		Cut to Length Pcs. *(QB)	Qty per bag (48" pcs.)
19/3.2	19.0	3.2	3.2	Round		20
33/5.5	33.0	5.5	3.4	Round		20
44.4/7.4	44.4	7.4	3.6	Round		15
50.8/8.3	50.8	8.3	4.3	Round		15
69.8/11.7	69.8	11.7	4.8	Round		15
88.9/17.1	88.9	17.1	4.8	Round		15
119.4/22.9	119.4	22.9	4.8	Round		10
235/40	235.0	40.0	4.8	Round		10

Notes:  
 1. \* See page 12 - Part Number Guide for standard packaging codes.  
 2. Cross Reference Guide located on page 3.  
 3. Special sizes, packaging, colors and cut pieces are available upon request.

## QBTM, QBTH RoHS Compliant

HALOGEN FREE, HEAT SHRINKABLE, 24-36kV  
BUS BAR INSULATION PROTECTION TUBING

### Features/Applications

Made from specially formulated radiation cross-linked halogen-free compounds. The carefully produced product can provide high resistance to tracking and arcing. Used to enhance the insulation properties of bus bar in switchgear and substations. The continuous length of supplied products makes it more convenient and economical.

- Operating temperature: -55°C to +105°C
- Minimum shrink temperature: 120°C
- RoHS Compliant
- Halogen free
- UV and weather resistant



### Technical Data

Property	Test Method	Typical Data
Tensile Strength	ASTM D 2671	> 14 MPa
Ultimate Elongation	ASTM D 2671	> 800%
Longitudinal Shrinkage	ASTM D 2671	0 to -10%
Heat Aging Tensile Strength (120 °C, 168 hrs.)	ASTM D 2671	> 10MPa
Ultimate Elongation		> 200%
Dielectric Strength	IEC 243	> 19kV/mm
Dielectric Constant	IEC 250	< 3.5
Volume Resistance	IEC 93	> 10 <sup>14</sup> Ω .cm
Flammability (Oxygen Index)	ISO 4589	> 25
Copper Corrosion	UL 224	No corrosion
Cold Bend	ASTM D 2671 (-40°C, 4 hrs.)	No cracking
Water Absorption	ISO 62 (23°C, 14 days)	< 0.5%

### Product Dimensions QBTM-Medium Wall Bus Bar Tubing 24kV

Size (mm)	As Supplied (mm)		After Recovered (mm)		Tubing Shape	Standard Spool *(SS) (Meter)
	Inside Diameter (min)	Inside Diameter (max)	Inside Diameter (max)	Wall Thickness (min)		
<b>Continuous Length Tubing</b>						
15/6	15	6		2.0	Flat	30
30/12	30	12		2.3	Flat	30
40/16	40	16		2.5	Flat	30
50/20	50	20		2.5	Flat	15
65/25	65	25		2.5	Flat	15
75/30	75	30		2.6	Flat	15
100/40	100	40		2.8	Flat	15
120/50	120	50		2.8	Flat	15
<b>Cut Length Tubing</b>						Standard Packaging *(QB) (mm)
150/60	150	60		3.3	Round	1000
180/60	180	60		3.3	Round	1000
205/75	205	75		3.8	Round	1000
235/75	235	75		3.8	Round	1000

### Product Dimensions QBTH-Heavy Wall Bus Bar Tubing 36kV

Size (mm)	As Supplied (mm)		After Recovered (mm)		Tubing Shape	Standard Spool *(SS) (Meter)
	Inside Diameter (min)	Inside Diameter (max)	Inside Diameter (max)	Wall Thickness (min)		
25/10	25	10		4.0	Flat	15
40/16	40	16		4.0	Flat	15
<b>Cut Length Tubing</b>						Standard Packaging *(QB) (mm)
65/25	65	25		4.0	Round	1000
75/25	75	25		4.0	Round	1000
95/30	95	30		4.0	Round	1000
120/40	120	40		4.2	Round	1000
180/58	180	58		4.2	Round	1000

Notes:  
 1. \* See page 12 - Part Number Guide for standard packaging codes.  
 2. Special sizes, packaging, and cut pieces are available upon request.

# QSEC

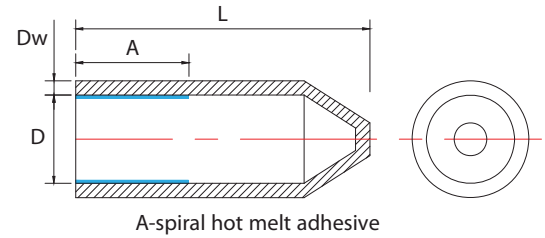


## HEAT SHRINKABLE CABLE END CAPS, 1000V WITH SPIRAL ADHESIVE COATING

### Features/Applications

QSEC offers an economical means of sealing the ends of power and control cables to ensure a watertight seal. The internal surface of the end caps has a layer of spiral coated hot melt adhesive, which retains its flexible properties after recovery. Recommended for use both in open air and on underground power distribution cables with PVC, lead or XLPE sheaths. Protects against oxidation, ozone, UV radiation, etc.

- Operating temperature: -55°C to +110°C, 1000V
- Minimum shrink temperature: 120°C
- RoHS Compliant
- Protection against oxidation, ozone & UV radiation
- Easy to fit on cable end
- Ensures seal



Technical Data		
Property	Test Method	Typical Data
Operating Temperature	IEC 216	-55°C to +110°C
Tensile Strength	ASTM D 638	> 14 MPa
Elongation at Break	ASTM D 638	> 400%
Density	ASTM D 792	1.05
Elongation at Break After Aging	150°C, 168 hrs.	> 300%
Dielectric Strength	IEC 243	> 15kV/ mm
Volume Resistance	IEC 93	> 10 <sup>14</sup> Ω.cm

Product Dimensions							
Part Number	As Supplied (mm)	Recovered (mm)				For Cable Diameter (mm)	Standard Packaging *(QB) (Qty)
	D (min)	D (max)	A (± 10%)	L (± 10%)	Dw (± 5%)		

Standard Length End Cap							
QSEC105-12/4-QB200	12	4	15	40	2.6	4-10	200
QSEC110-14/5-QB200	14	5	18	45	2.2	5-12	200
QSEC115-20/6-QB150	20	6	25	55	2.8	6-16	150
QSEC120-25/8.5-QB150	25	8.5	30	68	2.8	10-20	150
QSEC130-35/16-QB100	35	16	35	83	3.3	17-30	100
QSEC135-40/15-QB100	40	15	40	83	3.3	18-32	100
QSEC140-55/26-QB50	55	26	50	103	3.5	28-48	50
QSEC150-75/36-QB40	75	36	55	120	4.0	45-68	40
QSEC160-100/52-QB30	100	52	70	140	4.0	55-90	30
QSEC170-120/60-QB15	120	60	70	150	4.0	65-110	15
QSEC180-145/60-QB15	145	60	70	150	4.0	70-130	15
QSEC190-160/82-QB10	160	82	70	150	4.0	90-150	10
QSEC200-200/90-QB10	200	90	70	160	4.2	100-180	10

Extended Length End Cap							
QSEC110L-14/5-QB200	14	5	30	55	2.2	5-12	200
QSEC130L-42/15-QB100	42	15	40	110	3.3	18-34	100
QSEC140L-55/23-QB50	55	23	70	140	3.8	25-48	50
QSEC145L-62/23-QB50	62	23	70	140	3.8	25-55	50
QSEC150L-75/32-QB40	75	32	70	150	4.0	40-68	40
QSEC150XL-75/36-QB40	75	36	70	170	4.2	45-68	40
QSEC160L-105/45-QB30	105	45	65	150	4.0	50-90	30

- Notes:
1. End cap with valve stem is available upon request.
  2. \* See page 12 - Part Number Guide for standard packaging codes.
  3. Cross Reference Guide located on page 3.



# QKITS, REFILL BAGS, Q BOX & MINI SPOOLS

**Q2-F TYPE TUBING KIT, 6" LENGTH PCS.**  
**ASSORTED SIZES / KITS 1 & 2 BLACK, KIT 4 ASSORTED COLORS**  
**THIN WALL, ENVIRONMENT FRIENDLY, HIGHLY FLAME RETARDANT, POLYOLEFIN TUBING**  
**SHRINK RATIO 2:1, OPERATING TEMPERATURE: -55°C to +135°C, MILITARY STANDARD: 23053/5**



**SMALL SIZES**



Q2-F KIT 1  
180 PCS.

P/N Q2-F-QK1-01-6IN-180  
 Q2-F Kit 1 consists of 180 pcs.

Size		QTY	Color
Inch	mm		
3/64	1.6	40 pcs.	Black
1/16	2.0	36 pcs.	Black
3/32	3.1	32 pcs.	Black
1/8	3.7	28 pcs.	Black
3/16	5.2	24 pcs.	Black
1/4	6.8	20 pcs.	Black

**REFILL BAGS**



6" LENGTH

Q2-F, Kit 1 Refill Bags  
 Consist of 6" length pcs.

Part Number	QTY	Color
Q2-F-RK1-3/64-01-6IN-40	40 pcs.	Black
Q2-F-RK1-1/16-01-6IN-36	36 pcs.	Black
Q2-F-RK1-3/32-01-6IN-32	32 pcs.	Black
Q2-F-RK1-1/8-01-6IN-28	28 pcs.	Black
Q2-F-RK1-3/16-01-6IN-24	24 pcs.	Black
Q2-F-RK1-1/4-01-6IN-20	20 pcs.	Black

**LARGE SIZES**



Q2-F KIT 2  
82 PCS.

P/N Q2-F-QK2-01-6IN-82  
 Q2-F Kit 2 consists of 82 pcs.

Size		QTY	Color
Inch	mm		
5/16	8.8	18 pcs.	Black
3/8	10.7	16 pcs.	Black
1/2	13.7	14 pcs.	Black
5/8	16.7	14 pcs.	Black
3/4	20.5	12 pcs.	Black
1	25.4	8 pcs.	Black

**REFILL BAGS**



6" LENGTH

Q2-F, Kit 2 Refill Bags  
 Consist of 6" length pcs.

Part Number	QTY	Color
Q2-F-RK2-5/16-01-6IN-18	18 pcs.	Black
Q2-F-RK2-3/8-01-6IN-16	16 pcs.	Black
Q2-F-RK2-1/2-01-6IN-14	14 pcs.	Black
Q2-F-RK2-5/8-01-6IN-14	14 pcs.	Black
Q2-F-RK2-3/4-01-6IN-12	12 pcs.	Black
Q2-F-RK2-1-01-6IN-8	8 pcs.	Black

**ASSORTED COLORS**



Q2-F KIT 4  
141 PCS.

P/N Q2-F-QK4-11-6IN-141  
 Q2-F Kit 4 consists of 141 pcs.

Size		QTY	Color
Inch	mm		
1/16	2.0	39 pcs.	Assorted
1/8	3.7	31 pcs.	Assorted
1/4	6.8	23 pcs.	Assorted
3/8	10.7	19 pcs.	Assorted
1/2	13.7	19 pcs.	Assorted
1	25.4	10 pcs.	Assorted

**REFILL BAGS**



6" LENGTH

Q2-F, Kit 4 Refill Bags  
 Consist of 6" length pcs.

Part Number	QTY	Color
Q2-F-RK4-1/16-11-6IN-39	39 pcs.	Assorted
Q2-F-RK4-1/8-11-6IN-31	31 pcs.	Assorted
Q2-F-RK4-1/4-11-6IN-23	23 pcs.	Assorted
Q2-F-RK4-3/8-11-6IN-19	19 pcs.	Assorted
Q2-F-RK4-1/2-11-6IN-19	19 pcs.	Assorted
Q2-F-RK4-1-11-6IN-10	10 pcs.	Assorted

## Q BOX

**Q BOX**



VARIOUS LENGTHS  
PER SIZE

Part Number	Size (Inch)	Box Length (Feet)
Q2-F-3/64-01-QX50FT	3/64	50
Q2-F-1/16-01-QX50FT	1/16	50
Q2-F-3/32-01-QX50FT	3/32	50
Q2-F-1/8-01-QX50FT	1/8	50
Q2-F-3/16-01-QX30FT	3/16	30
Q2-F-1/4-01-QX30FT	1/4	30
Q2-F-5/16-01-QX30FT	5/16	30
Q2-F-3/8-01-QX30FT	3/8	30
Q2-F-1/2-01-QX15FT	1/2	15
Q2-F-5/8-01-QX15FT	5/8	15
Q2-F-3/4-01-QX15FT	3/4	15



## MINI SPOOLS

Part Number	Size (Inch)	Spool Length (Feet)
Q2-F-3/64-01-MS100FT	3/64	100
Q2-F-1/16-01-MS100FT	1/16	100
Q2-F-3/32-01-MS100FT	3/32	100
Q2-F-1/8-01-MS100FT	1/8	100
Q2-F-3/16-01-MS100FT	3/16	100
Q2-F-1/4-01-MS100FT	1/4	100
Q2-F-5/16-01-MS100FT	5/16	100
Q2-F-3/8-01-MS100FT	3/8	100
Q2-F-1/2-01-MS100FT	1/2	100
Q2-F-5/8-01-MS50FT	5/8	50
Q2-F-3/4-01-MS50FT	3/4	50
Q2-F-1-01-MS50FT	1	50
Q2-F-1 1/2-01-MS50FT	1 1/2	50
Q2-F-2-01-MS50FT	2	50

**Q2-F3X TYPE TUBING KIT, 6" LENGTH PCS.**  
**ASSORTED SIZES / BLACK**  
**THIN WALL, HIGHLY FLEXIBLE, FLAME RETARDANT POLYOLEFIN TUBING**  
**SHRINK RATIO 3:1, OPERATING TEMPERATURE: -55°C to +135°C, MILITARY STANDARD: 23053/5**



**ASSORTED SIZES**



Q2-F3X KIT 1  
106 PCS.

P/N Q2-F3X-QK1-01-6IN-106  
 Q2-F3X Kit 1 consists of 106 pcs.

Size		QTY	Color
Inch	mm		
1/16	2.0	28 pcs.	Black
1/8	3.7	24 pcs.	Black
1/4	6.8	20 pcs.	Black
1/2	10.7	14 pcs.	Black
3/4	13.7	12 pcs.	Black
1	25.4	8 pcs.	Black

**REFILL BAGS**



6" LENGTH

Q2-F3X, Kit 1 Refill Bags  
 Consist of 6" length pcs.

Part Number	QTY	Color
Q2-F3X-RK1-1/16-01-6IN-28	28 pcs.	Black
Q2-F3X-RK1-1/8-01-6IN-24	24 pcs.	Black
Q2-F3X-RK1-1/4-01-6IN-20	20 pcs.	Black
Q2-F3X-RK1-1/2-01-6IN-14	14 pcs.	Black
Q2-F3X-RK1-3/4-01-6IN-12	12 pcs.	Black
Q2-F3X-RK1-1-01-6IN-8	8 pcs.	Black



# QKITS & REFILL BAGS

**Q2-Z TYPE TUBING KIT, 6" LENGTH PCS.**  
**ASSORTED SIZES / BLACK**  
**THIN WALL, GENERAL PURPOSE, FLAME RETARDANT, POLYOLEFIN TUBING**  
**SHRINK RATIO 2:1, OPERATING TEMPERATURE: -55°C to +125°C**



SMALL SIZES

P/N Q2-Z-QK1-01-6IN-180  
 Q2-Z Kit 1 consists of 180 pcs.

REFILL BAGS

Q2-Z, Kit 1 Refill Bags  
 Consist of 6" length pcs.



Q2-Z KIT 1  
 180 PCS.

Size		QTY	Color
Inch	mm		
3/64	1.6	40 pcs.	Black
1/16	2.0	36 pcs.	Black
3/32	3.1	32 pcs.	Black
1/8	3.7	28 pcs.	Black
3/16	5.2	24 pcs.	Black
1/4	6.8	20 pcs.	Black



6" LENGTH

Part Number	QTY	Color
Q2-Z-RK1-3/64-01-6IN-40	40 pcs.	Black
Q2-Z-RK1-1/16-01-6IN-36	36 pcs.	Black
Q2-Z-RK1-3/32-01-6IN-32	32 pcs.	Black
Q2-Z-RK1-1/8-01-6IN-28	28 pcs.	Black
Q2-Z-RK1-3/16-01-6IN-24	24 pcs.	Black
Q2-Z-RK1-1/4-01-6IN-20	20 pcs.	Black

LARGE SIZES

P/N Q2-Z-QK2-01-6IN-82  
 Q2-Z Kit 2 consists of 82 pcs.

REFILL BAGS

Q2-Z, Kit 2 Refill Bags  
 Consist of 6" length pcs.



Q2-Z KIT 2  
 82 PCS.

Size		QTY	Color
Inch	mm		
5/16	8.8	18 pcs.	Black
3/8	10.7	16 pcs.	Black
1/2	13.7	14 pcs.	Black
5/8	16.7	14 pcs.	Black
3/4	20.5	12 pcs.	Black
1	25.4	8 pcs.	Black



6" LENGTH

Part Number	QTY	Color
Q2-Z-RK2-5/16-01-6IN-18	18 pcs.	Black
Q2-Z-RK2-3/8-01-6IN-16	16 pcs.	Black
Q2-Z-RK2-1/2-01-6IN-14	14 pcs.	Black
Q2-Z-RK2-5/8-01-6IN-14	14 pcs.	Black
Q2-Z-RK2-3/4-01-6IN-12	12 pcs.	Black
Q2-Z-RK2-1-01-6IN-8	8 pcs.	Black

**Q5-2X TYPE TUBING KIT, 6" LENGTH PCS.**  
**ASSORTED SIZES / BLACK**  
**DUAL WALL, ADHESIVE-LINED, FLEXIBLE POLYOLEFIN TUBING**  
**SHRINK RATIO 2:1, OPERATING TEMPERATURE: -55°C to +125°C, MILITARY STANDARD: 23053/4**



ASSORTED SIZES

P/N Q5-2X-QK1-01-6IN-114  
 Q5-2X Kit 1 consists of 114 pcs.

REFILL BAGS

Q5-2X, Kit 1 Refill Bags  
 Consist of 6" length pcs.



Q5-2X KIT 1  
 114 PCS.

Size		QTY	Color
Inch	mm		
1/8	3.7	28 pcs.	Black
3/16	5.2	24 pcs.	Black
1/4	6.8	20 pcs.	Black
3/8	10.7	16 pcs.	Black
1/2	13.7	14 pcs.	Black
3/4	20.5	12 pcs.	Black



6" LENGTH

Part Number	QTY	Color
Q5-2X-RK1-1/8-01-6IN-28	28 pcs.	Black
Q5-2X-RK1-3/16-01-6IN-24	24 pcs.	Black
Q5-2X-RK1-1/4-01-6IN-20	20 pcs.	Black
Q5-2X-RK1-3/8-01-6IN-16	16 pcs.	Black
Q5-2X-RK1-1/2-01-6IN-14	14 pcs.	Black
Q5-2X-RK1-3/4-01-6IN-12	12 pcs.	Black

**Q5-3X TYPE TUBING KIT, 6" LENGTH PCS.**  
**ASSORTED SIZES / BLACK**  
**DUAL WALL, ADHESIVE-LINED, FLEXIBLE POLYOLEFIN TUBING**  
**SHRINK RATIO 3:1, OPERATING TEMPERATURE: -55°C to +125°C, MILITARY STANDARD: 23053/4**



ASSORTED SIZES

P/N Q5-3X-QK1-01-6IN-114  
 Q5-3X Kit 1 consists of 114 pcs.

REFILL BAGS

Q5-3X, Kit 1 Refill Bags  
 Consist of 6" length pcs.



Q5-3X KIT 1  
 114 PCS.

Size		QTY	Color
Inch	mm		
1/8	3.7	28 pcs.	Black
3/16	5.2	24 pcs.	Black
1/4	6.8	20 pcs.	Black
3/8	10.7	16 pcs.	Black
1/2	13.7	14 pcs.	Black
3/4	20.5	12 pcs.	Black



6" LENGTH

Part Number	QTY	Color
Q5-3X-RK1-1/8-01-6IN-28	28 pcs.	Black
Q5-3X-RK1-3/16-01-6IN-24	24 pcs.	Black
Q5-3X-RK1-1/4-01-6IN-20	20 pcs.	Black
Q5-3X-RK1-3/8-01-6IN-16	16 pcs.	Black
Q5-3X-RK1-1/2-01-6IN-14	14 pcs.	Black
Q5-3X-RK1-3/4-01-6IN-12	12 pcs.	Black

**Q5-F3X TYPE TUBING KIT, 6" LENGTH PCS.**  
**ASSORTED SIZES / BLACK**  
**DUAL WALL, ADHESIVE-LINED, FLEXIBLE POLYOLEFIN TUBING**  
**SHRINK RATIO 3:1, OPERATING TEMPERATURE: -55°C to +125°C, MILITARY STANDARD: 23053/4**



ASSORTED SIZES

P/N Q5-F3X-QK1-01-6IN-114  
 Q5-F3X Kit 1 consists of 114 pcs.

REFILL BAGS

Q5-F3X, Kit 1 Refill Bags  
 Consist of 6" length pcs.



Q5-F3X KIT 1  
 114 PCS.

Size		QTY	Color
Inch	mm		
1/8	3.7	28 pcs.	Black
3/16	5.2	24 pcs.	Black
1/4	6.8	20 pcs.	Black
3/8	10.7	16 pcs.	Black
1/2	13.7	14 pcs.	Black
3/4	20.5	12 pcs.	Black



6" LENGTH

Part Number	QTY	Color
Q5-F3X-RK1-1/8-01-6IN-28	28 pcs.	Black
Q5-F3X-RK1-3/16-01-6IN-24	24 pcs.	Black
Q5-F3X-RK1-1/4-01-6IN-20	20 pcs.	Black
Q5-F3X-RK1-3/8-01-6IN-16	16 pcs.	Black
Q5-F3X-RK1-1/2-01-6IN-14	14 pcs.	Black
Q5-F3X-RK1-3/4-01-6IN-12	12 pcs.	Black



# CABLE TIES

Qualtek offers a complete line of cable ties and accessories which include:

- Miniature, intermediate, standard, and heavy duty cable ties
- Releasable
- Stainless Steel
- Screw and push mount
- Marker ties
- Double loop
- Beaded
- Cable tie mounts



## 11 Series

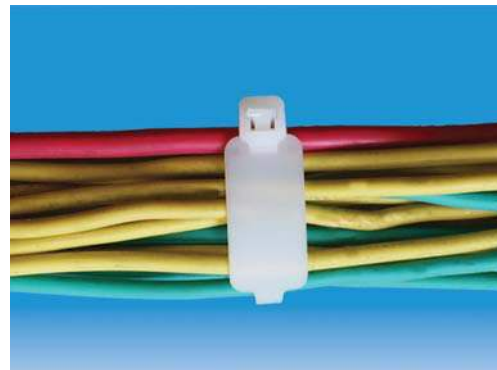


NYLON 6.6

GENERAL PURPOSE

APPLICATION OPERATING TEMPERATURE: -40°C to +85°C

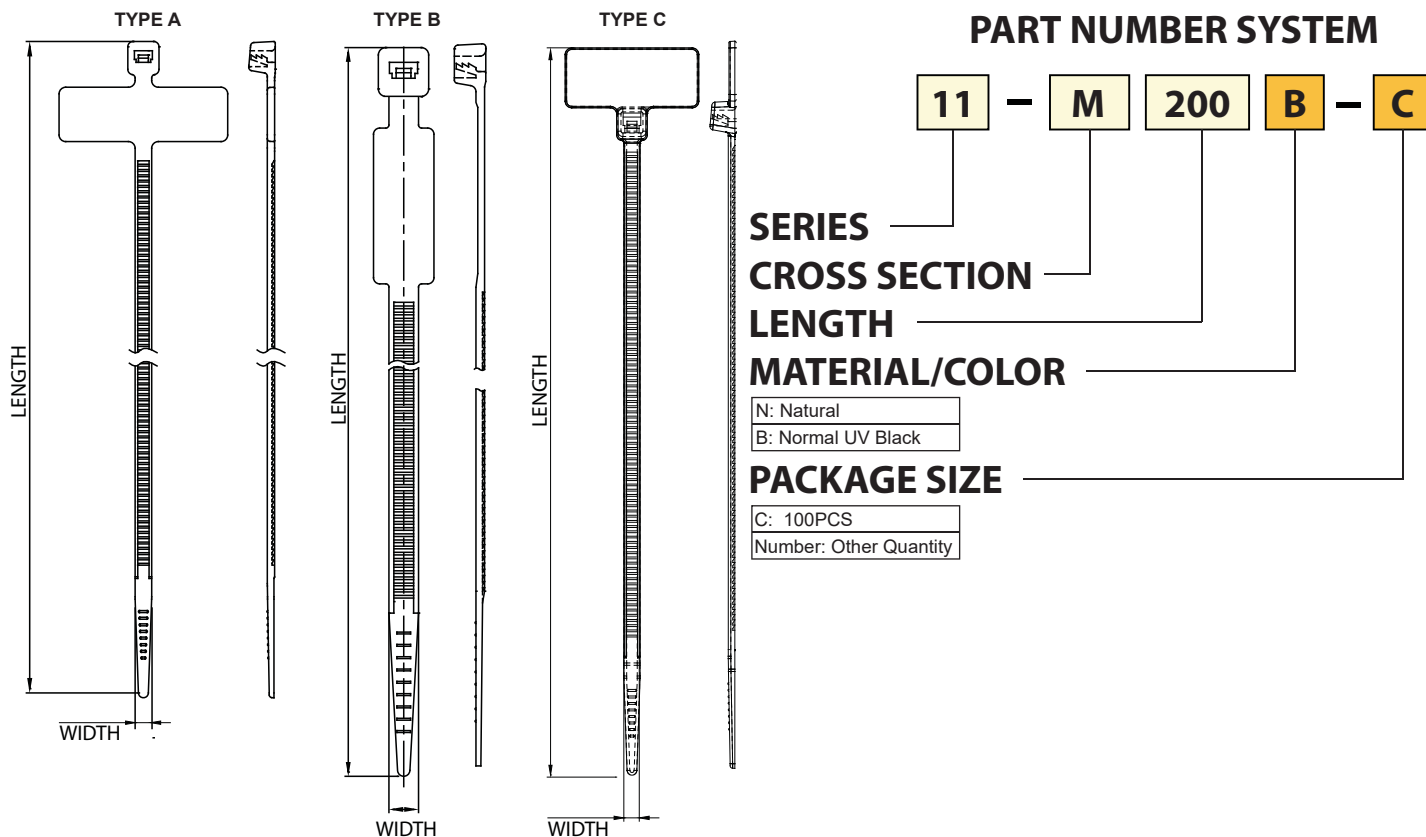
APPROVALS<sup>1</sup>



Part Number	Width mm [Inch]	Length mm [Inch]	Max Bundle Diameter mm [Inch]	Min Loop Tensile Kg [lb]	Write Area mm [Inch]
<b>M - 18lb TYPE A</b>					
11-M100	2.5 [.098]	100 [4.0]	22.0 [0.86]	8 [18]	7.75x24.5 [0.30x0.95]
11-M200	2.5 [.098]	200 [8.0]	53.9 [2.12]	8 [18]	7.75x24.5 [0.30x0.95]
<b>M - 18lb TYPE C</b>					
11-M110	2.5 [.098]	110 [4.3]	22.6 [0.89]	8 [18]	9.0x20 [0.35x0.78]
<b>S - 50lb TYPE B</b>					
11-S190	4.8 [.189]	190 [7.0]	50.9 [2.00]	22 [50]	12.9x27 [0.50x1.05]

Note:

1. 11-M110 and 11-M200 are not UL approved  
Cross Reference Guide located on pages 4-8.



# 12 Series



NYLON 6.6

GENERAL PURPOSE

MATERIAL OPERATING TEMPERATURE: -40°C to +85°C

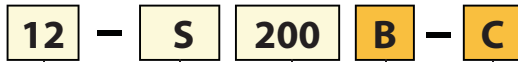
APPLICATION OPERATING TEMPERATURE: -10°C to +85°C



Part Number	Width mm [Inch]	Length mm [Inch]	Max Bundle Diameter mm [Inch]	Min Loop Tensile Kg [lb]
<b>S - 50lb</b>				
12-S200	4.8 [.189]	200 [7.9]	57.1 [2.15]	22 [50]
12-S300	4.8 [.189]	300 [11.8]	85.3 [3.36]	22 [50]

Note: Cross Reference Guide located on pages 4-8.

## PART NUMBER SYSTEM



**SERIES**

**CROSS SECTION**

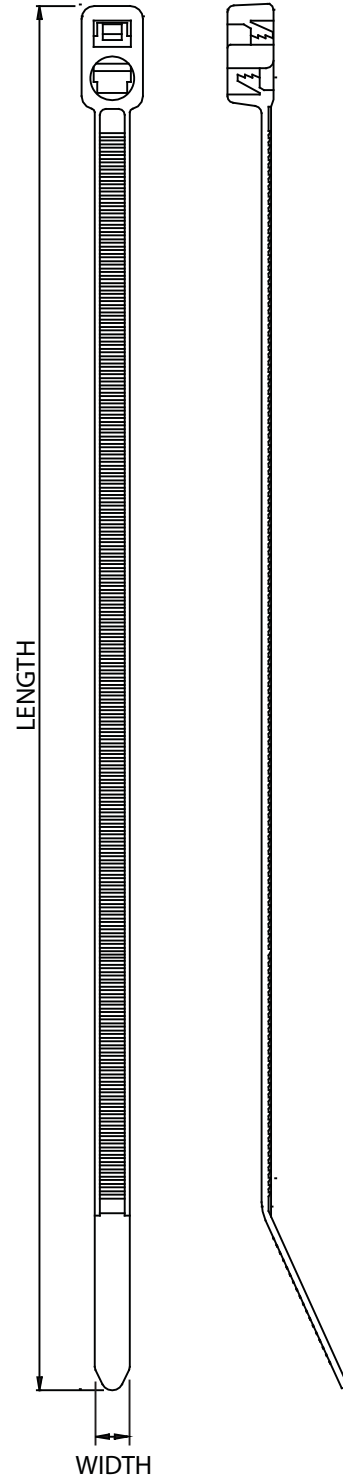
**LENGTH**

**MATERIAL/COLOR**

- N: Natural
- B: Normal UV Black

**PACKAGE SIZE**

- C: 100PCS
- Number: Other Quantity



# 13 Series

RoHS  
Compliant

NYLON 6.6

GENERAL PURPOSE

MATERIAL OPERATING TEMPERATURE: -40°C to +85°C

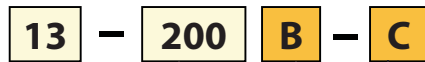
APPLICATION OPERATING TEMPERATURE: -10°C to +85°C



Part Number	Ball Diameter mm [Inch]	Length mm [Inch]	Max Bundle Diameter mm [Inch]
<b>HEAD TYPE A</b>			
13-100	2.5 [.095]	100 [4.0]	25.0 [0.98]
<b>HEAD TYPE B</b>			
13-150	2.5 [.095]	150 [6.0]	36.0 [1.41]
13-200	2.5 [.095]	200 [8.0]	51.9 [2.04]

Note: Cross Reference Guide located on pages 4-8.

## PART NUMBER SYSTEM



**SERIES**

**LENGTH**

**MATERIAL/COLOR**

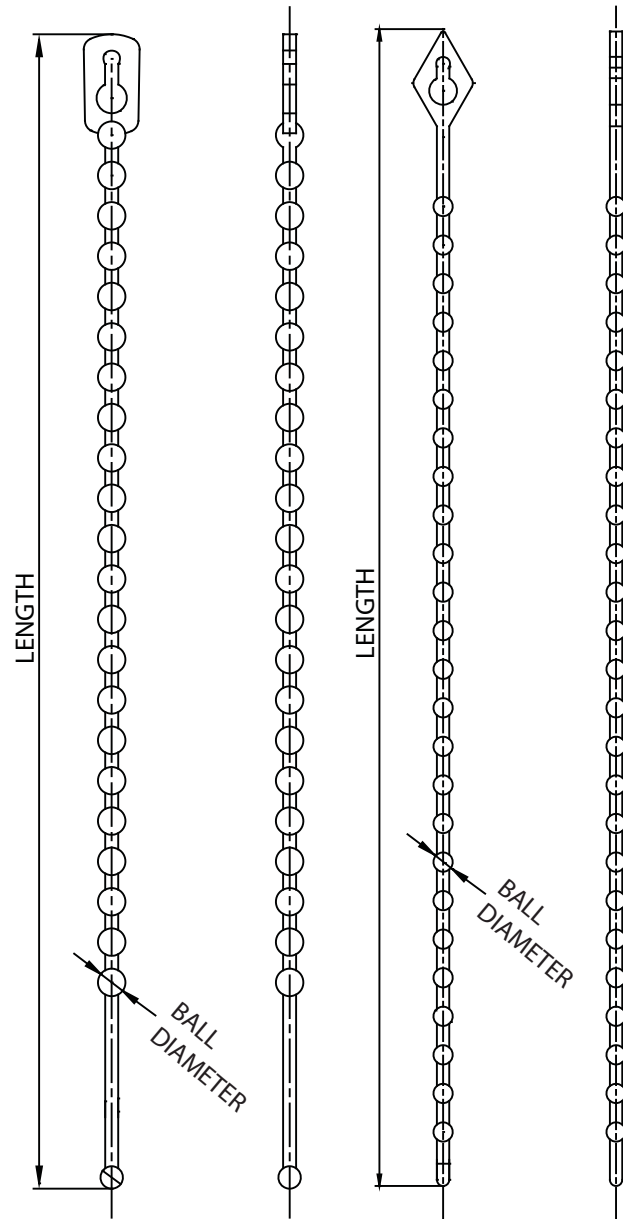
- N: Natural
- B: Normal UV Black

**PACKAGE SIZE**

- C: 100PCS
- Number: Other Quantity

HEAD TYPE A

HEAD TYPE B



# 14 Series

RoHS  
Compliant

NYLON 6.6

GENERAL PURPOSE

MATERIAL OPERATING TEMPERATURE: -40°C to +85°C

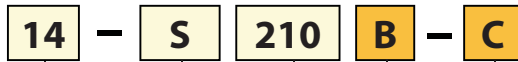
APPLICATION OPERATING TEMPERATURE: -10°C to +85°C



Part Number	Ball Diameter mm [Inch]	Length mm [Inch]	Max Bundle Diameter mm [Inch]	Min Loop Tensile Kg [lb]
<b>S - 50lb</b>				
14-S210	4.5 [.177]	210 [8.0]	53.5 [2.10]	22 [50]
14-S310	4.5 [.177]	310 [12.0]	83.8 [3.30]	22 [50]
<b>HD - 120lb</b>				
14-HD460	6.5 [.255]	460 [18.0]	129.5 [5.10]	55 [120]
14-HD610	6.5 [.255]	610 [24.0]	175.2 [6.90]	55 [120]

Note: Cross Reference Guide located on pages 4-8.

## PART NUMBER SYSTEM



**SERIES**

**CROSS SECTION**

**LENGTH**

**MATERIAL/COLOR**

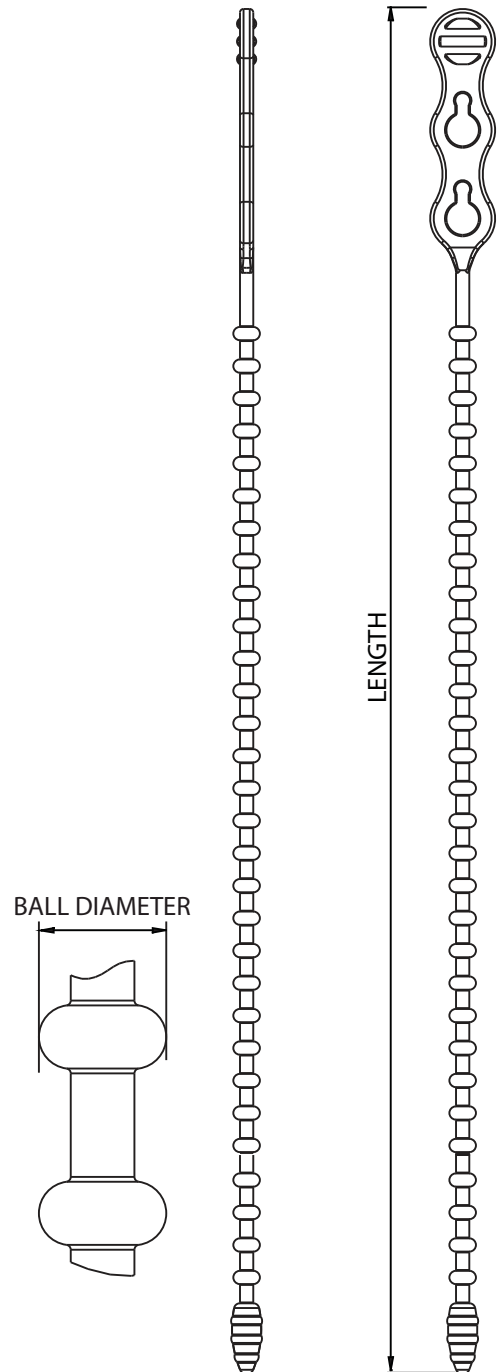
N: Natural

B: Normal UV Black

**PACKAGE SIZE**

C: 100PCS

Number: Other Quantity



# 15 Series



NYLON 6.6

GENERAL PURPOSE

APPLICATION OPERATING TEMPERATURE: -40°C to +85°C

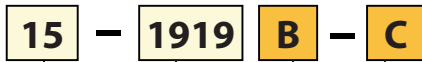
APPROVALS<sup>1</sup>



Part Number	Length mm [Inch]	Width mm [Inch]	Screw Size	Cable Ties Width up to mm [Inch]
15-1919	19.0 [.750]	19.0 [.750]	M5 [#10]	3.6 [.140]
15-2525	28.0 [1.10]	28.0 [1.10]	M5 [#10]	4.8 [.189]
15-4040	40.0 [1.50]	40.0 [1.50]	M5 [#10]	9.0 [.354]

Note:  
 1. 15-4040 is not UL approved  
 Cross Reference Guide located on pages 4-8.

## PART NUMBER SYSTEM



**SERIES**

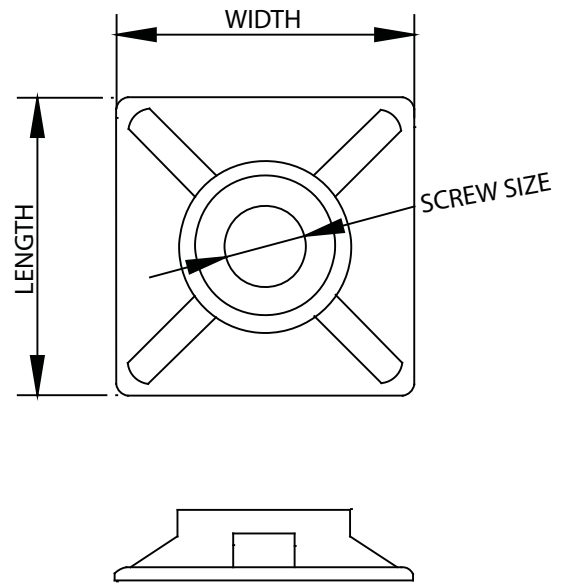
**SIZE**

**MATERIAL/COLOR**

- N: Natural
- B: Normal UV Black

**PACKAGE SIZE**

- C: 100PCS
- Number: Other Quantity



# 16 Series



NYLON 6.6

GENERAL PURPOSE

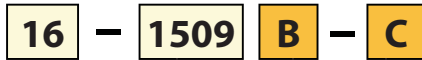
APPLICATION OPERATING TEMPERATURE: -40°C to +85°C



Part Number	Length mm [Inch]	Width mm [Inch]	Height mm [Inch]	Diameter mm [Inch]	Cable Ties Width up to mm [Inch]
16-1509	15.2 [.600]	9.4 [.370]	6.80 [.267]	3.30 [.130]	4.8 [.189]
16-1712	17.8 [.700]	12.7 [.500]	8.20 [.320]	4.31 [.170]	4.8 [.189]
16-2216	22.0 [.870]	16.2 [.640]	9.60 [.385]	5.20 [.205]	7.6 [.300]
16-2516	25.4 [1.00]	16.2 [.640]	10.80 [.425]	5.20 [.205]	9.0 [.354]

Note: Cross Reference Guide located on pages 4-8.

## PART NUMBER SYSTEM



**SERIES**

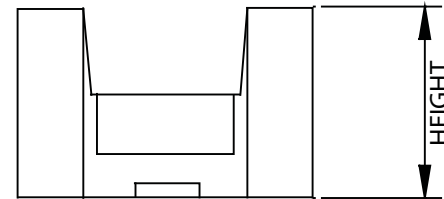
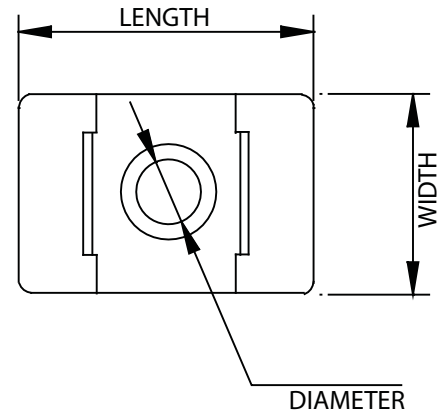
**SIZE**

**MATERIAL/COLOR**

- N: Natural
- B: Normal UV Black

**PACKAGE SIZE**

- C: 100PCS
- Number: Other Quantity





# 17 Series



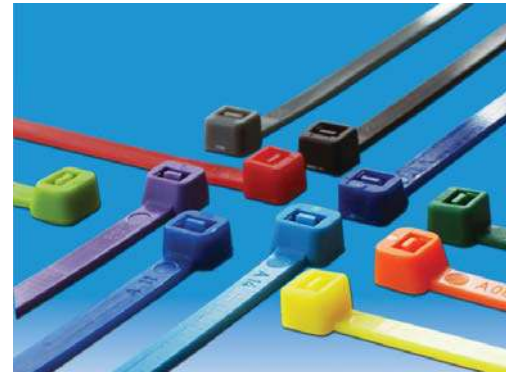
NYLON 6.6

GENERAL PURPOSE

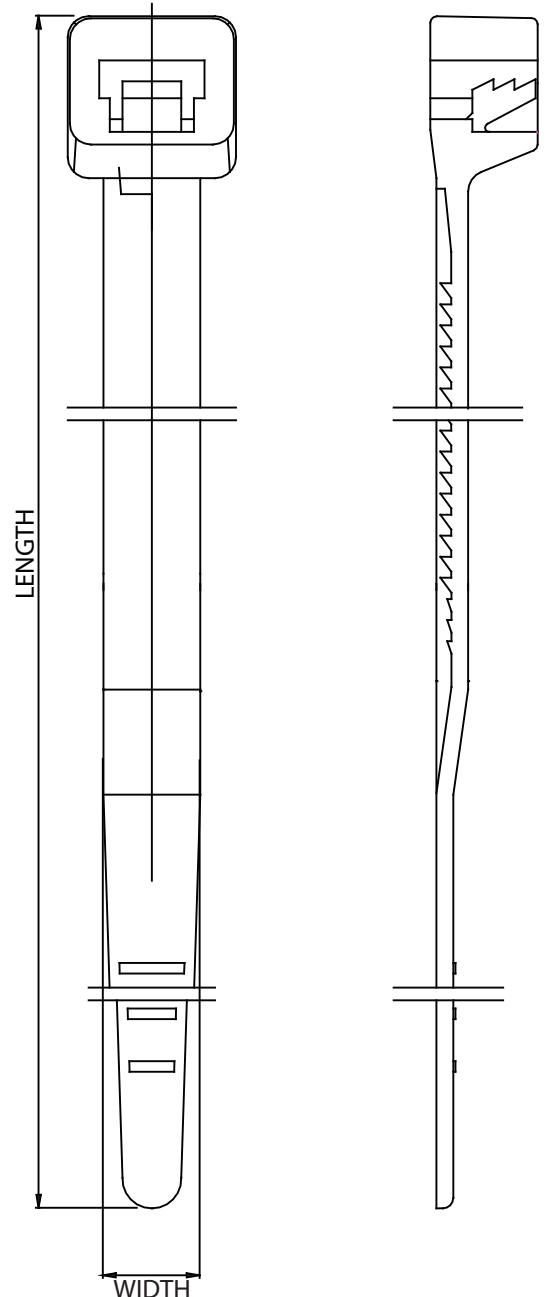
MATERIAL OPERATING TEMPERATURE: -40°C to +85°C

APPLICATION OPERATING TEMPERATURE: -10°C to +85°C

APPROVALS<sup>1</sup>:



Part Number	Width mm [Inch]	Length mm [Inch]	Max Bundle Diameter mm [Inch]	Min Loop Tensile Kg [lb]
<b>M - 18lb</b>				
17-M80	2.5 [.098]	80 [3.2]	14.0 [0.55]	8 [18]
17-M100	2.5 [.098]	100 [4.0]	20.5 [0.80]	8 [18]
17-M120	2.5 [.098]	120 [4.7]	27.0 [1.06]	8 [18]
17-M130	2.5 [.098]	130 [5.0]	30.0 [1.18]	8 [18]
17-M150	2.5 [.098]	150 [6.0]	36.5 [1.43]	8 [18]
17-M160	2.5 [.098]	160 [6.3]	39.8 [1.56]	8 [18]
17-M200	2.5 [.098]	200 [8.0]	52.5 [2.06]	8 [18]
17-M260	2.5 [.098]	260 [10.2]	71.6 [2.81]	8 [18]
<b>I - 40lb</b>				
17-I140	3.6 [.14]	140 [5.5]	33.0 [1.30]	18 [40]
17-I150	3.6 [.14]	150 [6.0]	36.0 [1.41]	18 [40]
17-I180	3.6 [.14]	180 [7.0]	46.0 [1.81]	18 [40]
17-I200	3.6 [.14]	200 [8.0]	52.5 [2.06]	18 [40]
17-I250	3.6 [.14]	250 [10.0]	68.0 [2.67]	18 [40]
17-I280	3.6 [.14]	280 [11.0]	78.0 [3.07]	18 [40]
17-I300	3.6 [.14]	300 [11.8]	84.0 [3.30]	18 [40]
17-I370	3.6 [.14]	370 [14.5]	106.0 [4.17]	18 [40]
<b>S - 50lb</b>				
17-S120	4.6 [.181]	120 [4.7]	23.8 [0.93]	22 [50]
17-S160	4.6 [.181]	160 [6.3]	36.6 [1.32]	22 [50]
17-S180	4.8 [.189]	180 [7.0]	43.0 [1.68]	22 [50]
17-S190	4.8 [.189]	190 [7.5]	46.0 [1.81]	22 [50]
17-S200	4.8 [.189]	200 [8.0]	49.5 [1.94]	22 [50]
17-S250	4.8 [.189]	250 [10.0]	65.0 [2.55]	22 [50]
17-S280	4.8 [.189]	280 [11.0]	74.8 [2.94]	22 [50]
17-S300	4.8 [.189]	300 [11.8]	81.0 [3.18]	22 [50]
17-S350	4.8 [.189]	350 [13.7]	97.0 [3.81]	22 [50]
17-S360	4.8 [.189]	360 [14.0]	100.0 [3.93]	22 [50]
17-S370	4.8 [.189]	370 [14.5]	103.5 [4.07]	22 [50]
17-S380	4.8 [.189]	380 [15.0]	106.7 [4.20]	22 [50]
17-S390	4.8 [.189]	390 [15.3]	110.0 [4.33]	22 [50]
17-S400	4.8 [.189]	400 [15.7]	113.1 [4.45]	22 [50]
17-S430	4.8 [.189]	430 [17.0]	122.5 [4.82]	22 [50]
17-S450	4.8 [.189]	450 [17.7]	129.0 [5.07]	22 [50]
17-S500	4.8 [.189]	500 [19.7]	145.0 [5.70]	22 [50]
17-S550	4.8 [.189]	550 [21.6]	160.9 [6.33]	22 [50]
<b>HD - 120lb</b>				
17-HD150	7.6 [.300]	150 [6.0]	35.0 [1.37]	55 [120]
17-HD200	7.6 [.300]	200 [8.0]	50.9 [2.00]	55 [120]
17-HD220	7.6 [.300]	220 [8.6]	57.2 [2.25]	55 [120]
17-HD250	7.6 [.300]	250 [10.0]	66.8 [2.62]	55 [120]
17-HD300	7.6 [.300]	300 [11.8]	82.8 [3.25]	55 [120]
17-HD350	7.6 [.300]	350 [13.7]	98.5 [3.87]	55 [120]
17-HD365	7.6 [.300]	365 [14.0]	103.5 [4.07]	55 [120]
17-HD380	7.6 [.300]	380 [15.0]	108.0 [4.25]	55 [120]
17-HD400	7.6 [.300]	400 [15.7]	114.5 [4.50]	55 [120]
17-HD450	7.6 [.300]	450 [17.0]	130.5 [5.13]	55 [120]
17-HD540	7.6 [.300]	540 [21.0]	159.0 [6.25]	55 [120]
17-HD550	7.6 [.300]	550 [21.6]	162.5 [6.39]	55 [120]
17-HD750	7.6 [.300]	750 [29.5]	226.1 [8.90]	55 [120]



Note:  
 1. 17-EHD750, 17-M260HSN, 17-M260HSB, 17-S550HSN, 17-S550HSB, 17-HD750HSN, 17-HD750HSB, 17-M260HT, 17-S550HT, 17-HD750HT, 17-EHD400HT, 17-EHD450HT, 17-EHD500HT, 17-EHD550HT, 17-EHD610HT, 17-EHD760HT, 17-EHD780HT, 17-EHD810HT, 17-EHD920HT, 17-EHD1220HT, 17-EHD750UVB, are not UL approved  
 Material/Color LT and V0 are not UL approved  
 Cross Reference Guide located on pages 4-8.

Continued on next page

# 17 Series



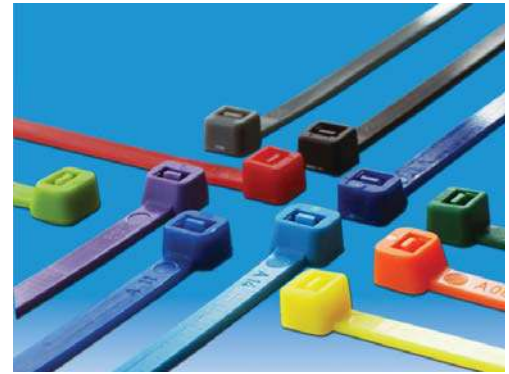
NYLON 6.6

GENERAL PURPOSE

MATERIAL OPERATING TEMPERATURE: -40°C to +85°C

APPLICATION OPERATING TEMPERATURE: -10°C to +85°C

APPROVALS<sup>1</sup>: US

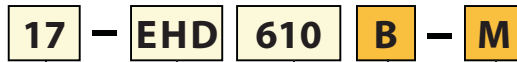


Part Number	Width mm [Inch]	Length mm [Inch]	Max Bundle Diameter mm [Inch]	Min Loop Tensile Kg [lb]
<b>EHD - 175lb</b>				
17-EHD400	8.8 [.345]	400 [15.7]	115.0 [4.52]	80 [175]
17-EHD450	8.8 [.345]	450 [18.0]	130.5 [5.13]	80 [175]
17-EHD500	8.8 [.345]	500 [19.7]	146.5 [5.76]	80 [175]
17-EHD550	8.8 [.345]	550 [21.6]	163.5 [6.43]	80 [175]
17-EHD610	8.8 [.345]	610 [24.0]	181.5 [7.14]	80 [175]
17-EHD750	8.8 [.345]	750 [29.5]	226.5 [8.91]	80 [175]
17-EHD760	8.8 [.345]	760 [30.0]	229.5 [9.03]	80 [175]
17-EHD780	8.8 [.345]	780 [30.5]	235.5 [9.27]	80 [175]
17-EHD810	9.0 [.350]	810 [32.0]	245.0 [9.64]	80 [175]
17-EHD920	9.0 [.350]	920 [36.0]	280.0 [11.0]	80 [175]
17-EHD1220	9.0 [.350]	1220 [48.0]	375.5 [14.7]	80 [175]
<b>HSD - 250lb</b>				
17-HSD530	12.4 [.490]	530 [21.0]	156.0 [5.90]	110 [250]
17-HSD650	12.4 [.490]	650 [25.5]	195.0 [7.60]	110 [250]
17-HSD1000	12.4 [.490]	1000 [40.0]	305.0 [12.0]	110 [250]
17-HSD1030	12.4 [.490]	1030 [40.5]	315.0 [12.4]	110 [250]

Note: Cross Reference Guide located on pages 4-8.

1. 17-EHD750, 17-M260HSN, 17-M260HSB, 17-S550HSN, 17-S550HSB, 17-HD750HSN, 17-HD750HSB, 17-M260HT, 17-S550HT, 17-HD750HT, 17-EHD400HT, 17-EHD450HT, 17-EHD500HT, 17-EHD550HT, 17-EHD610HT, 17-EHD760HT, 17-EHD780HT, 17-EHD810HT, 17-EHD920HT, 17-EHD1220HT, 17-EHD750UVB, are not UL approved  
Material/Color LT and V0 are not UL approved  
Cross Reference Guide located on pages 4-8.

## PART NUMBER SYSTEM



SERIES

CROSS SECTION

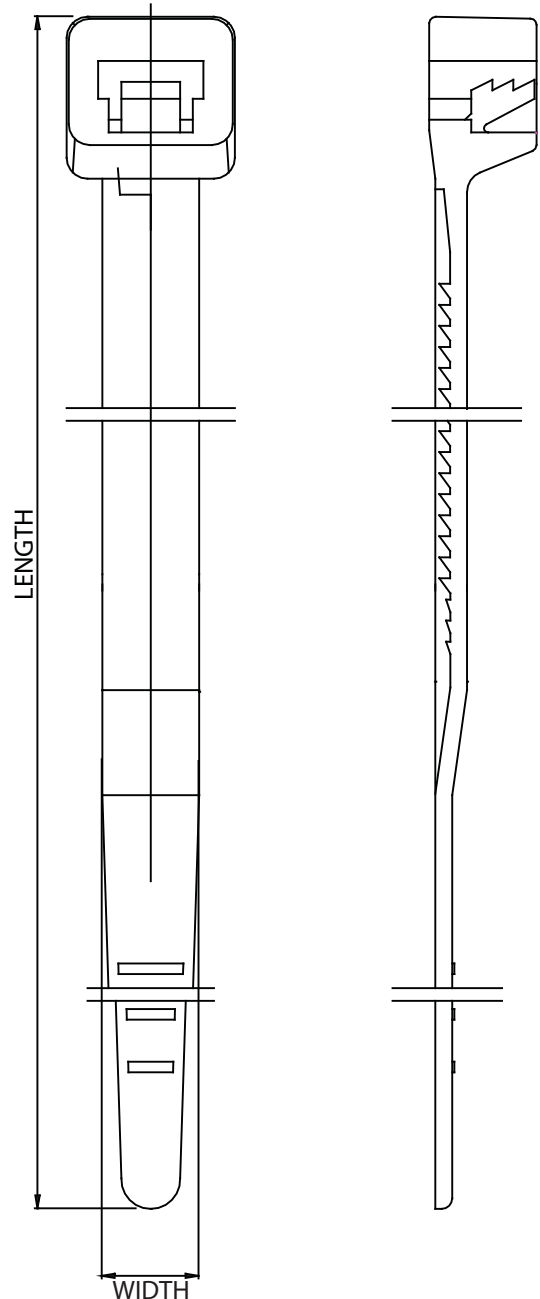
LENGTH

MATERIAL/COLOR

N: Natural	Y: Yellow
WH: White	R: Red
B: Normal UV Black	P: Purple
UVB: Weather Resistant Black	BR: Brown
HSB: Heat Stabilized Black	GR: Gray
HSN: Heat Stabilized Natural	O: Orange
HT: High Heat Resistant Natural	FG: Fluorescent Green
LT: Low Temperature Resistant Natural	FY: Fluorescent Yellow
V0: Flame Retardant Natural	FB: Fluorescent Blue
G: Green	FO: Fluorescent Orange
BL: Blue	S: Silver

## PACKAGE SIZE

L: 50PCS
C: 100PCS
D: 500PCS
M: 1000PCS
Number: Other Quantity



# 18 Series

RoHS Compliant

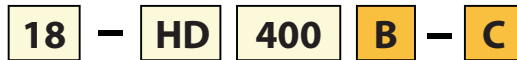
NYLON 6.6  
 GENERAL PURPOSE  
 MATERIAL OPERATING TEMPERATURE: -40°C to +85°C  
 APPLICATION OPERATING TEMPERATURE: -10°C to +85°C  
 APPROVALS<sup>1</sup> :



Part Number	Width mm [Inch]	Length mm [Inch]	Max Bundle Diameter mm [Inch]	Min Loop Tensile Kg [lb]	Fastener
<b>M - 18lb</b>					
18-M110	2.5 [.098]	110 [4.3]	19.0 [0.75]	8 [18]	M2.5 [#4]
<b>I - 40lb</b>					
18-I150	3.6 [.14]	150 [6.0]	35.5 [1.40]	18 [40]	M4 [#8]
<b>S - 50lb</b>					
18-S160	4.8 [.189]	160 [6.3]	36.8 [1.45]	22 [50]	M5 [#10]
18-S200	4.8 [.189]	200 [8.0]	49.8 [1.96]	22 [50]	M5 [#10]
18-S305	4.8 [.189]	305 [12.0]	82.8 [3.26]	22 [50]	M5 [#10]
18-S370	4.8 [.189]	370 [14.5]	103.8 [4.09]	22 [50]	M5 [#10]
<b>HD - 120lb</b>					
18-HD305	7.6 [.300]	305 [12.0]	78.7 [3.10]	55 [120]	M6 [#1/4]
18-HD400	7.6 [.300]	400 [15.7]	109.2 [4.30]	55 [120]	M6 [#1/4]

Note:  
 1. 18-M110, is not UL approved  
 Cross Reference Guide located on pages 4-8.

## PART NUMBER SYSTEM



**SERIES**

**CROSS SECTION**

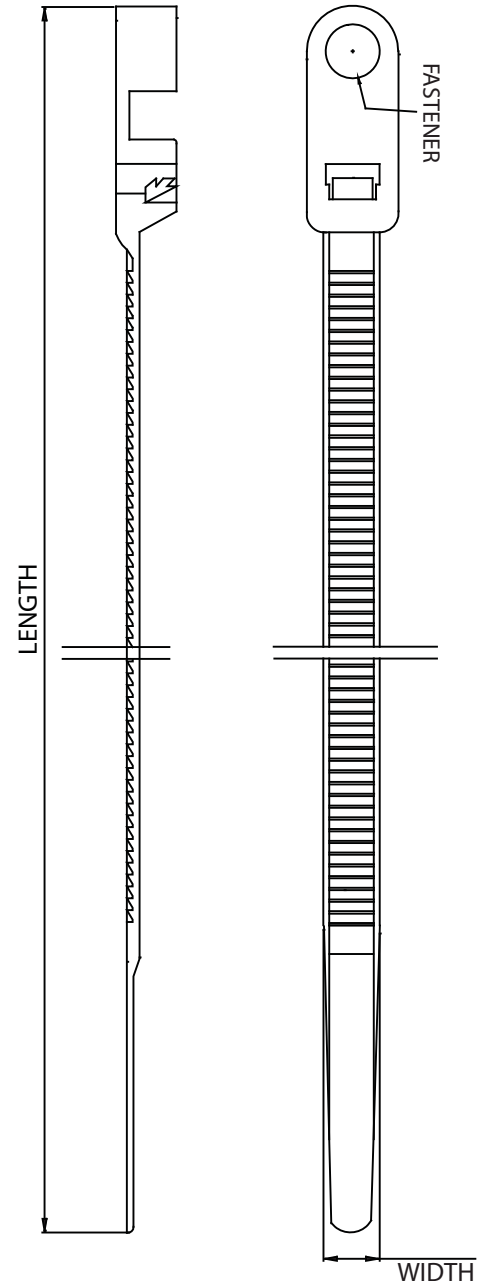
**LENGTH**

**MATERIAL/COLOR**

- N: Natural
- B: Normal UV Black

**PACKAGE SIZE**

- C: 100PCS
- Number: Other Quantity



# 19 Series

RoHS  
Compliant

NYLON 6.6

GENERAL PURPOSE

MATERIAL OPERATING TEMPERATURE: -40°C to +85°C

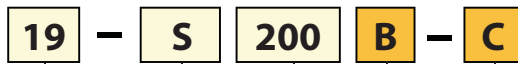
APPLICATION OPERATING TEMPERATURE: -10°C to +85°C



Part Number	Width mm [Inch]	Length mm [Inch]	Max Bundle Diameter mm [Inch]	Min Loop Tensile Kg [lb]
<b>I - 40lb</b>				
19-I100	3.6 [.14]	100 [4.0]	22.6 [0.89]	18 [40]
<b>S - 50lb</b>				
19-S160	4.8 [.189]	160 [6.3]	41.9 [1.65]	22 [50]
19-S200	4.8 [.189]	200 [8.0]	54.8 [2.16]	22 [50]
19-S305	4.8 [.189]	305 [12.0]	88.1 [3.47]	22 [50]
19-S380	4.8 [.189]	380 [15.0]	111.0 [4.39]	22 [50]

Note: Cross Reference Guide located on pages 4-8.

## PART NUMBER SYSTEM



**SERIES**

**CROSS SECTION**

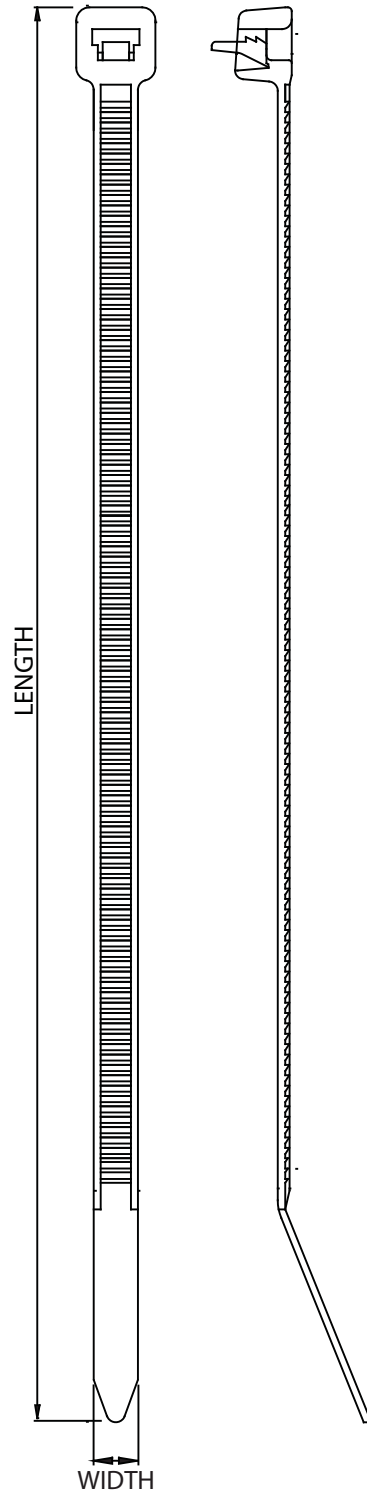
**LENGTH**

**MATERIAL/COLOR**

- N: Natural
- B: Normal UV Black

**PACKAGE SIZE**

- C: 100PCS
- Number: Other Quantity



# 20 Series



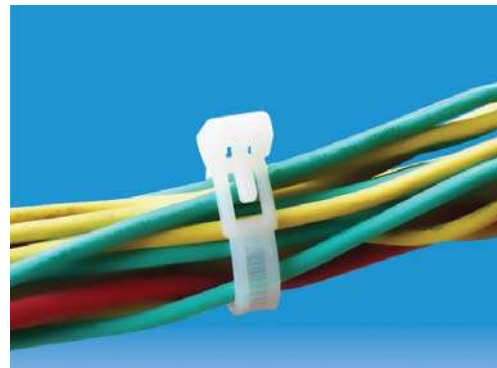
NYLON 6.6

GENERAL PURPOSE

MATERIAL OPERATING TEMPERATURE: -40°C to +85°C

APPLICATION OPERATING TEMPERATURE: -10°C to +85°C

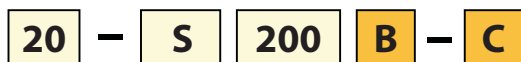
APPROVALS:



Part Number	Width mm [Inch]	Length mm [Inch]	Max Bundle Diameter mm [Inch]	Min Loop Tensile Kg [lb]
<b>S - 50lb</b>				
20-S150	7.6 [.300]	150 [6.0]	40.3 [1.59]	22 [50]
20-S200	7.6 [.300]	200 [8.0]	55.6 [2.19]	22 [50]
20-S250	7.6 [.300]	250 [10.0]	71.8 [2.83]	22 [50]
20-S300	7.6 [.300]	300 [11.8]	88.1 [3.47]	22 [50]
20-S370	7.6 [.300]	370 [14.5]	109.9 [4.33]	22 [50]

Note: Cross Reference Guide located on pages 4-8.

## PART NUMBER SYSTEM



**SERIES**

**CROSS SECTION**

**LENGTH**

**MATERIAL/COLOR**

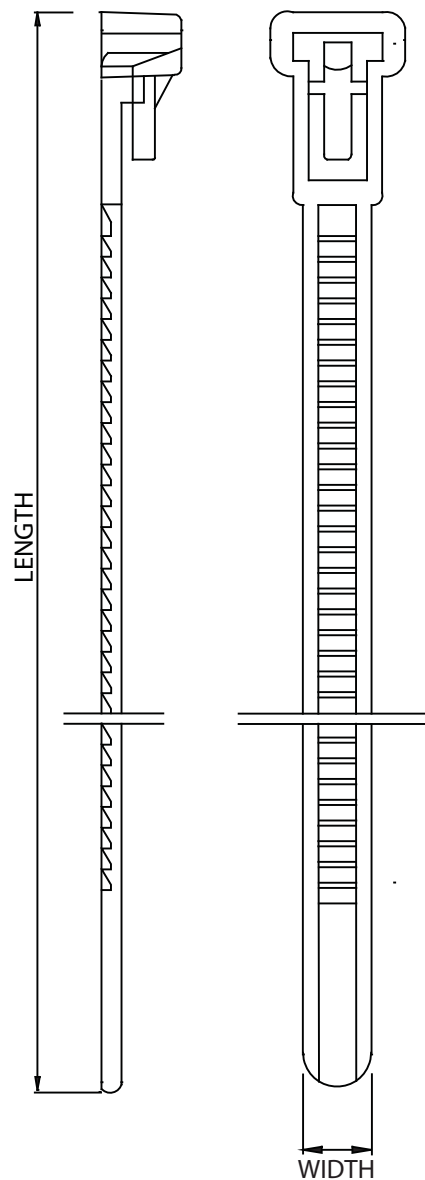
N: Natural

B: Normal UV Black

**PACKAGE SIZE**

C: 100PCS

Number: Other Quantity



# 21 Series



NYLON 6.6

GENERAL PURPOSE

MATERIAL OPERATING TEMPERATURE: -40°C to +85°C

APPLICATION OPERATING TEMPERATURE: -10°C to +85°C

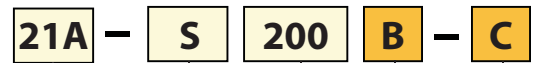
APPROVALS<sup>1</sup>:



Part Number	Width mm [Inch]	Length mm [Inch]	Max Bundle Diameter mm [Inch]	Min Loop Tensile Kg [lb]
<b>M - 18lb</b>				
21A-M100	2.5 [.098]	100 [4.0]	21.6 [0.85]	8 [18]
<b>I - 40lb</b>				
21B-I155	3.6 [.140]	155 [6.0]	37.9 [1.49]	18 [40]
<b>S - 50lb</b>				
21A-S100	4.8 [.189]	100 [4.0]	21.6 [0.85]	22 [50]
21A-S130	4.8 [.189]	130 [5.1]	30.7 [1.21]	22 [50]
21A-S200	4.8 [.189]	200 [8.0]	50.0 [1.97]	22 [50]
21B-S200	4.8 [.189]	200 [8.0]	50.8 [2.00]	22 [50]

Note:  
1. 21B-I155 is not UL approved  
Cross Reference Guide located on pages 4-8.

## PART NUMBER SYSTEM



**SERIES**

**CROSS SECTION**

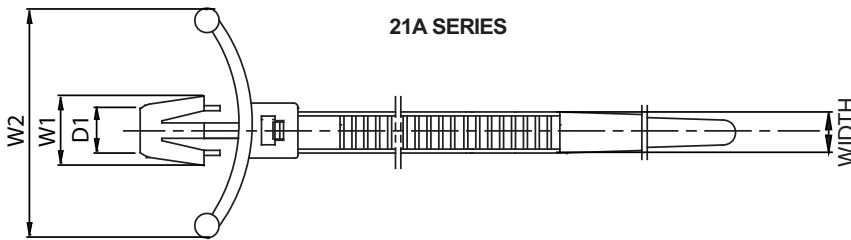
**LENGTH**

**MATERIAL/COLOR**

- N: Natural
- B: Normal UV Black

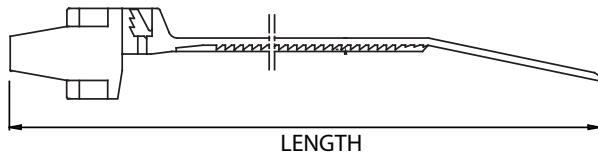
**PACKAGE SIZE**

- C: 100PCS
- Number: Other Quantity



21A SERIES

Part Number	W1 mm [Inch]	W2 mm [Inch]	D1 mm [Inch]
21A-M100	5.58 [.220]	18.4 [.725]	3.55 [.140]
21A-S100	8.38 [.330]	18.9 [.745]	4.60 [.181]
21A-S130	8.38 [.330]	18.9 [.745]	4.60 [.181]
21A-S200	7.62 [.300]	17.1 [.675]	4.60 [.181]



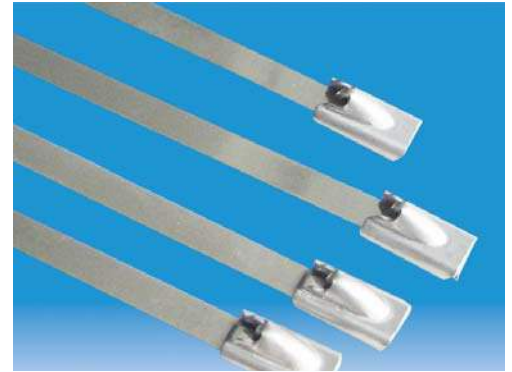
21B SERIES

Part Number	W1 mm [Inch]	D1 mm [Inch]
21B-I155	5.97 [.235]	3.55 [.140]
21B-S200	7.60 [.300]	4.44 [.175]

# 22 Series RoHS Compliant

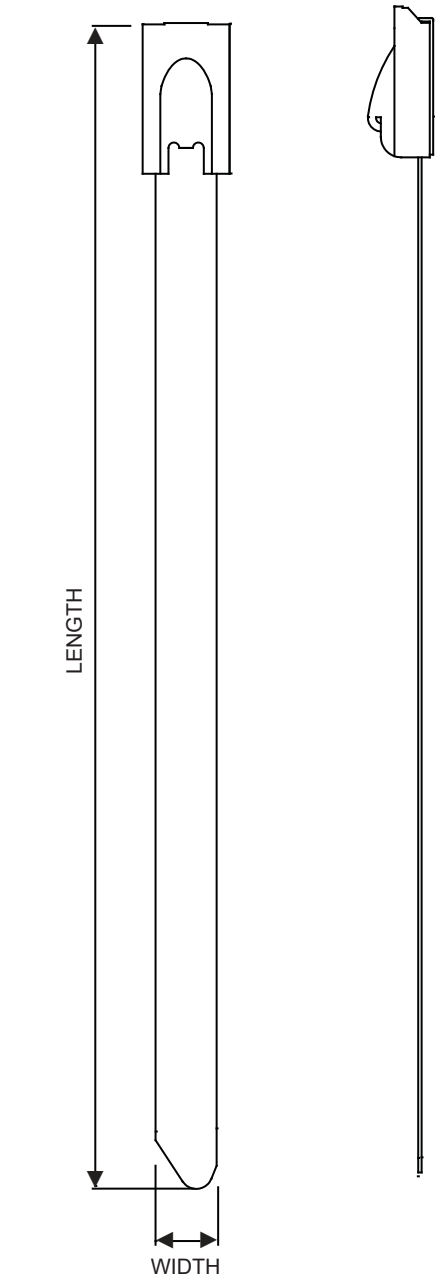
**SELF-LOCKING BALL LOCK HEAD DESIGN PROVIDES A STRONG, DURABLE METHOD OF CABLE BUNDLING CAN BE USED IN A WIDE RANGE OF INDOOR, OUTDOOR AND UNDERGROUND APPLICATIONS**

**304 STAINLESS STEEL FOR GENERAL PURPOSE APPLICATIONS  
316 STAINLESS STEEL FOR CORROSIVE ENVIRONMENTS  
OPERATING TEMPERATURE: -80°C to +538°C  
APPROVALS<sup>1</sup>:**

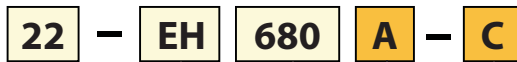


Part Number	Width mm [Inch]	Length mm [Inch]	Max Bundle Diameter mm [Inch]	Min Loop Tensile Kg [lb]
<b>S - 200lb</b>				
22-S125	4.6 [.180]	125 [5.0]	38.0 [1.49]	90 [200]
22-S150	4.6 [.180]	150 [6.0]	46.0 [1.81]	90 [200]
22-S200	4.6 [.180]	200 [8.0]	61.9 [2.43]	90 [200]
22-S260	4.6 [.180]	260 [10.0]	81.0 [3.19]	90 [200]
22-S290	4.6 [.180]	290 [11.5]	90.6 [3.56]	90 [200]
22-S360	4.6 [.180]	360 [14.0]	112.8 [4.44]	90 [200]
22-S520	4.6 [.180]	520 [20.5]	163.8 [6.45]	90 [200]
22-S680	4.6 [.180]	680 [27.0]	214.8 [8.45]	90 [200]
22-S840	4.6 [.180]	840 [33.0]	265.7 [10.46]	90 [200]
<b>H - 350lb</b>				
22-H200	7.9 [.310]	200 [8.0]	61.9 [2.43]	160 [350]
22-H260	7.9 [.310]	260 [10.0]	81.0 [3.19]	160 [350]
22-H290	7.9 [.310]	290 [11.5]	90.6 [3.56]	160 [350]
22-H360	7.9 [.310]	360 [14.0]	112.8 [4.44]	160 [350]
22-H520	7.9 [.310]	520 [20.5]	163.8 [6.45]	160 [350]
22-H680	7.9 [.310]	680 [27.0]	214.8 [8.45]	160 [350]
22-H840	7.9 [.310]	840 [33.0]	265.7 [10.46]	160 [350]
<b>EH - 500lb</b>				
22-EH290	12 [.485]	290 [11.5]	90.6 [3.56]	235 [500]
22-EH360	12 [.485]	360 [14.0]	112.8 [4.44]	235 [500]
22-EH520	12 [.485]	520 [20.5]	163.8 [6.45]	235 [500]
22-EH680	12 [.485]	680 [27.0]	214.8 [8.45]	235 [500]
22-EH840	12 [.485]	840 [33.0]	265.7 [10.46]	235 [500]

Note:  
1. 22-H260, 22-EH290C, 22-EH360C, 22-EH520C, 22-EH680C, 22-EH840C, 22-EH290D, 22-EH360D, 22-EH520D, 22-EH680D, 22-EH840D are not UL approved  
Cross Reference Guide located on pages 4-8.



## PART NUMBER SYSTEM



**SERIES** — 22  
**CROSS SECTION** — EH  
**LENGTH** — 680  
**MATERIAL/COLOR** — A - C

A: 304 Stainless Steel	C: 304 Epoxy Coated Stainless Steel
B: 316 Stainless Steel	D: 316 Epoxy Coated Stainless Steel

## PACKAGE SIZE

C: 100PCS
Number: Other Quantity

# PRODUCT PROFILE



## FAN-S DIVISION

### AC & DC Fans and Accessories

Low cost, high tech AC & DC axial fans with sizes ranging from 25mm - 280 mm, DC voltages from 3.3VDC - 60VDC and AC voltages from 115VAC - 230VAC and many special features such as IP55, IP56M, and IP67 rated, GR487 salt fog rated, speed sensors, alarm functions and much more upon request. Each fan is offered with a variety of bearing types : 2-ball, 1-ball 1-sleeve, sleeve only, and our newly developed hydro dynamic bearing with better performance than sleeve and lower cost than 2 ball bearings. Every fan is available with a wide range of speeds from ultra low to super high speed.

Our fan accessories are famous worldwide and consist of wire form and plastic guards, plastic air filters, aluminum and stainless steel air filters, fan cords, and our patented noise reduction vibration sleeves.



## PRIMARY POWER COMPONENTS DIVISION

### AC Receptacles

A complete line of inlets, outlets, multifunction modules with major international approval marks thus assuring high safety standards and help customers comply with international regulations. Modern production methods enable us to manufacture cost-effective and reliable components. A full range of products are maintained in inventory for quick on-time deliveries. Custom designs are available upon request.

### Circuit Breakers

QLB and QMB series are compact and cost effective thermal circuit breakers with a wide range of amp ratings from 3A - 40A and offered in single pole and push-to-reset with safety agency certifications. We offer a large variety of bushing types, terminals, name plates, button colors and printing with custom configurations available.

### EMI Filters

EMI/RFI power line filters are designed to meet most international safety agency requirements. These filters help customers meet FCC and VDE emission standards. Our line consists of many standard configurations such as block type, filter with power line connector, and various filters with multifunctional modules. Custom designs are available upon request.

### Power Cords

A large selection of North American and International Power Cords that have been designed to comply with North American and international safety agency regulations to insure safe and reliable products. Offered in a wide selection of plugs and connectors available in various cable insulations, voltage ratings, colors, lengths, shielding and a full range of hospital grade certified power cords. Custom configurations and strain reliefs are available upon request.

### Power Supplies

A full range of low cost, high reliability and energy saving switch mode AC/DC power supplies consisting of enclosed, open frame, din rail, wall mount, desktop, medical approved, and waterproof LED drivers; our enclosed versions are rated from 15W - 800W, open frame from 20W - 200W, desktop and wall mount from 5W - 200W, and LED drivers with constant current 25W - 200W and constant voltage 25W - 300W. All models have universal voltage input and a variety of output voltages ranging from 3.3V - 48V and some models include power factor correction to increase efficiency and reduce power losses. All of our power supplies meet or exceed the RoHS EU and the Chinese directives and are certified with worldwide safety agencies to ensure a safe and reliable product.



## WIRE MANAGEMENT, CABLE ASSEMBLIES & INTERCONNECT DIVISION

### Cable Assemblies

We offer a wide selection of standard and custom cable assemblies, specializing in DVI, HDMI, USB and Fiber Optic and also producing flat ribbon cables, monitor cables, networking cables and an extensive offering of custom cable assemblies and wire harnesses.

### Cable Ties & Accessories

Our low cost, high reliability cable nylon ties are available in a variety of styles including miniature, intermediate, standard and heavy duty. Specialty cable ties include releasable pawl type, stainless steel ball lock, head mount, push mount, marker ties, double loop, beaded and 4-way cable tie mounts. Cable ties are available in various material types including ultraviolet, heat stabilized, fire retardant and also are available in a range of colors. Custom designs and colors available upon request.

### Heat Shrink Products

Heat shrinkable products include thin wall, medium and heavy wall, adhesive lined, medium and high voltage insulation, molded parts and end caps, cold shrink, wide range of shrink tubing kits and heat shrinkable cable and wire identification tubing.



## INTERNATIONAL PROCUREMENT SERVICES DIVISION

### Procurement Services

With over 30 years of global business experience, Qualtek's IPS division provides a complete range of services from component sourcing to complete turnkey projects. With our extensive knowledge of the major global manufacturing regions, this enables us to have access to the newest technology, highest quality, and the most cost effective production methods.

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