

YH WIRE & CABLE

YHSPD cable

Micro Coaxial Cable (UL)

Factory Automation Cable

Military Wire & Cable (QPL)



YHSPD Cable



개요 (Overview)



해군에서 사용하고 있는 함정용 EPD 케이블은 전량 해외 도입품을 적용하고 있으며, 케이블의 가격, 납기, 개선요구 대응도, 기술력 축적 등을 고려하여 개발 필요성이 대두 되었다. 이에 군의 부품국산화 요구에의해 함정용 YHSPD 케이블을 연합정밀(주)에서 업체 자체개발 형태로 개발하게 되었음.

해군 함정에 사용되는 YHSPD 케이블을 연합정밀(주)에서 업체자체 기술로 개발 완료함에 따라, 다품종 소량에 따른 장기소요 구매기간의 단축 및 고가의 수입가격으로 인한 외화지출을 절감하고 안정적인 부품수급, 기술력축적, 제조기술 및 제품성능 향상 등을 기대할 수 있게 되었음.

함정용 YHSPD 케이블은 도체, 절연체, 폴리에스테르필름 테이프, 편조체, 자켓체로 구성되어 있고, 품목별로 코아 수, 구성체의 배열과 재질 등의 차이가 있음.

본 케이블은 함정 구성품간의 전기신호 및 전원 연결용 케이블로 사용됨.

The need for development of EPD cables for naval vessels emerged, in consideration of price, response to improvement request, and accumulation of technology, because previously all EPD Cables for naval vessels were being imported. In response to the demand for locally produced military parts, Yeonhab Precision has developed YHSPD cable for naval vessels.

As the YHSPD cables for naval vessels are manufactured by Yeonhab Precision with its own technology, purchasing time and the demand for foreign currency expenditure are expected to decrease. At the same time, stable part supply, technology accumulation, and improvement of product performance are anticipated. YHSPD cable for naval vessels are made up of conductor, insulator, Polyester film tape, braided shield, and jacket shield and there are different products depending on the number of core and the assembly arrangement and material.

This cable is used for electrical signalling and power supply between parts for naval vessels.

구조 및 형태 (Structure and design)



함정용 YHSPD 케이블은 도체, 절연체, 폴리에스테르필름 테이프, 편조체, 자켓체로 구성되어 있고, 품목별로 코아 수, 구성체의 배열과 재질 등의 차이가 있음.

- 자켓 케이블의 외부피복으로 내부 전선이 꼬여진 형상을 유지시키고, 외부의 화학적, 물리적 영향으로부터 전선을 보호하며, 화재 연소 시 인체 유해가스 발생이 억제되는 재질로 되어있음.
- 차폐 전선을 외부 물리적인 영향으로부터 보호하고, 전자기 차폐기능을 함.
- 연합 여러 가닥의 내부전선을 일정한 형태로 꼬는 것으로, 전기적 불균형의 개선, 송전의 손실 최소화, 유연성 등의 물리적 특성을 향상함.
- 와이어 전기신호 및 전원공급을 위한 전선으로, 전자기 차폐를 위한 대연 원형편조 전선과 편조를 하지 않은 대연 전선으로 되어있음.

YHSPD cable for naval vessels are made up of conductor, insulator, Polyester film tape, braided shield, and jacket shield and there are different products depending on the number of core and the assembly arrangement and material.

- * Jacket: Outer shield of the cable. It maintains the braided internal wires and protects the wires from external chemical and physical influences. It is made with the material that does not produce harmful gas when being burned by fire.
- * Shield: It protects the wires from external physical influences and functions as an electromagnetic shield.
- * Cabling: braiding of multiple internal wires. It improves the electrical imbalance, minimization of power during its transmission, and physical properties such as flexibility.
- * Wire: Wires for electrical signalling and power supply. It consists of round-braided double wires for electromagnetic shield and non-braided double wires.

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주요 제원 및 특성 (Core specification and characteristics)

Property	Specification and characteristics	Property	Specification and characteristics
Temperature range	-30 °C ~ 105 °C	Oxygen index	32% (Min.)
Maximum voltage	600 V	Chloride content	1.2% HCl (Max.)
Insulation resistance	40 MΩ Km at 20°C (Min.)	Smoke index	18 (Max.)
Withstanding voltage	1.5 KV / 1 min	Toxicity index	2.5/100g (Max.)
		Halogen content	not to be detected

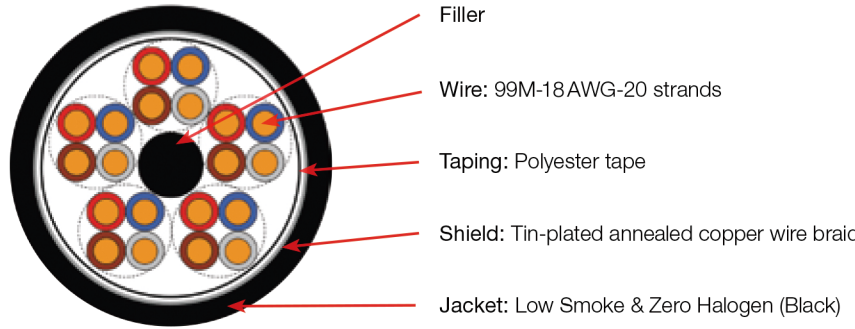
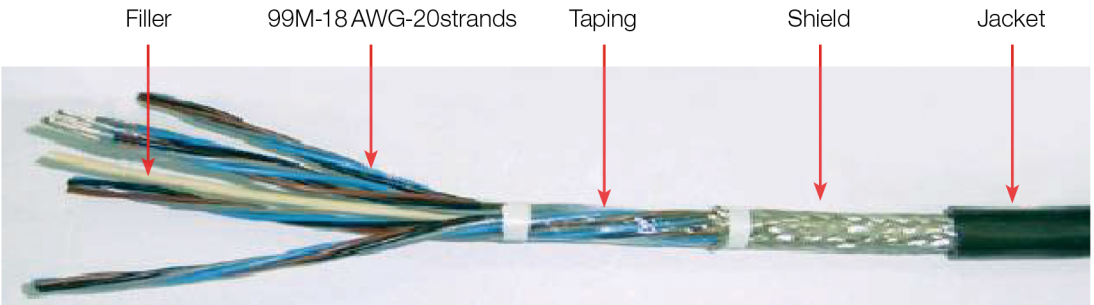
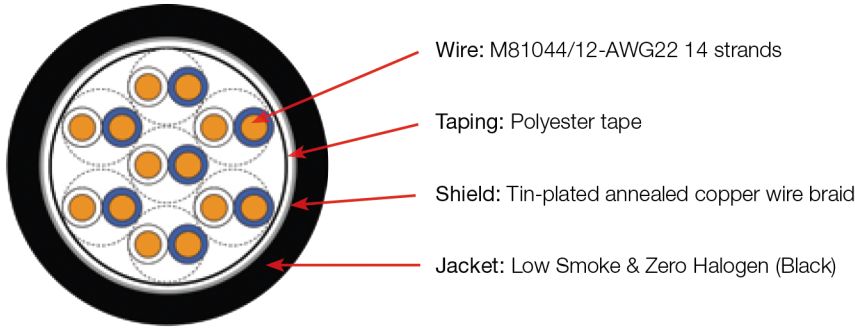
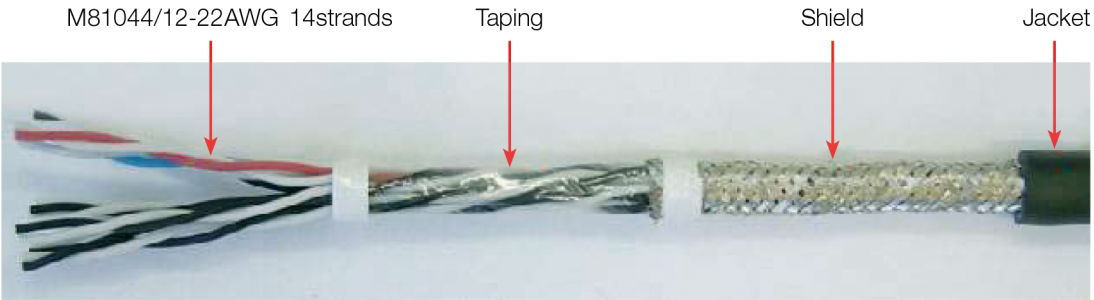
적용규격 (Applicable standards)

Korean Industrial Standards	U.S. Military Specifications and Standards	U.S. Federal Specification	American Society for Testing and Materials standards
KS C 3004	SAE AS 81044	FED. STD 228	ASTM B 3
KS C 3132	MIL-DTL-17H		ASTM B 8
			ASTM B 33
			ASTM B 2863
International Electrotechnical Commission	British Military Standards	British Standards	German National Standards
IEC 754-1	Defence Standard 61-12 Part0	BS ISO 4589-2	VG95214-16
IEC 754-2	Defence Standard 61-12 Part18	BS ISO 4589-3	
IEC 332-1	Defence Standard 61-12 Part31	BS 3G 230:2000	
IEC 332-2	NES 518	BS 2782 Part 1 Method 141	
IEC 332-3	NES 525		
	NES 711		
	NES 713		
	NES 714		
	NES 715		

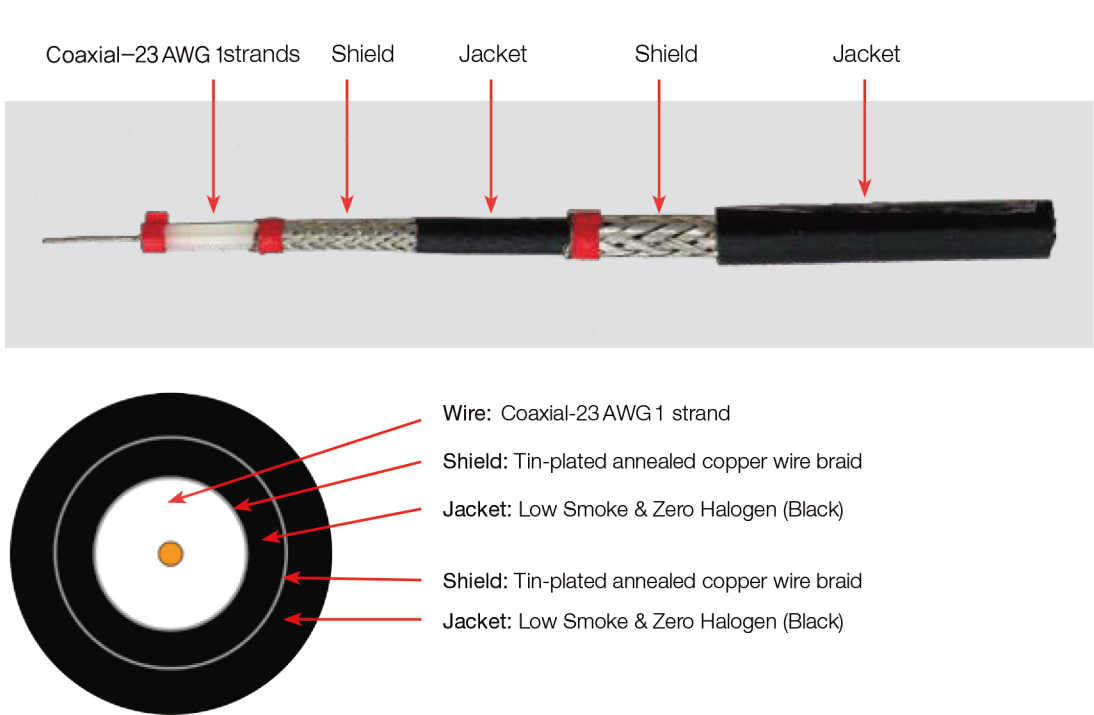


YHSPD Cable

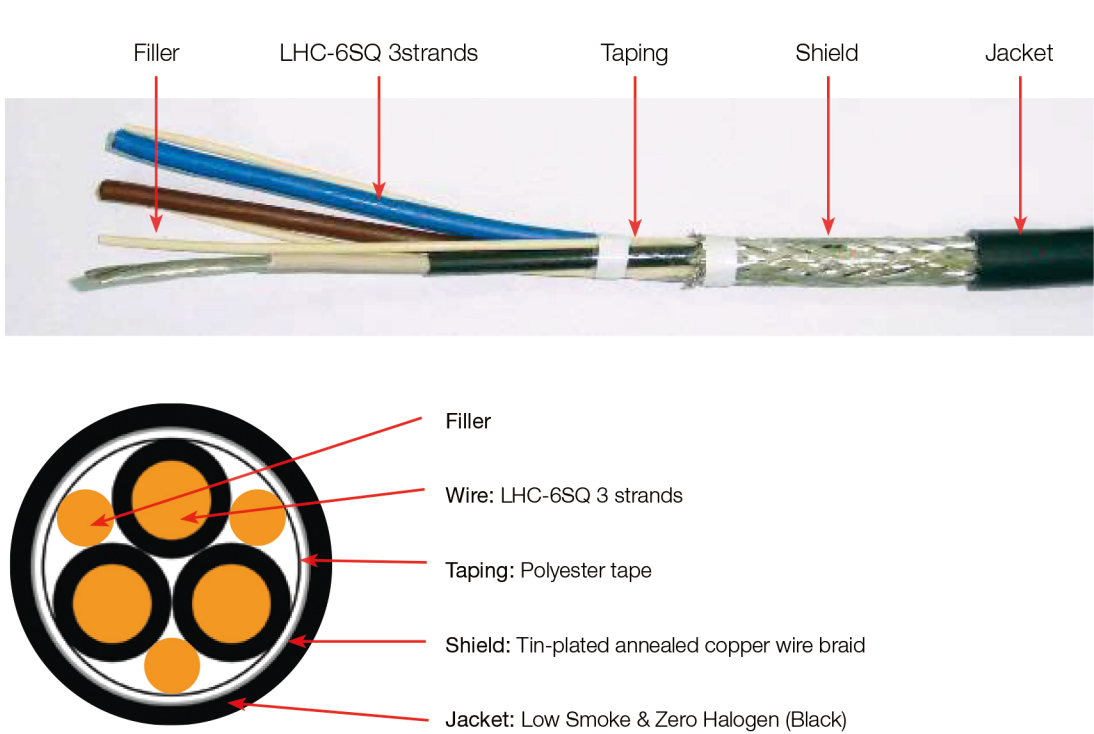
YHSPD Cable (44M Series) Cross-sectional view and composition



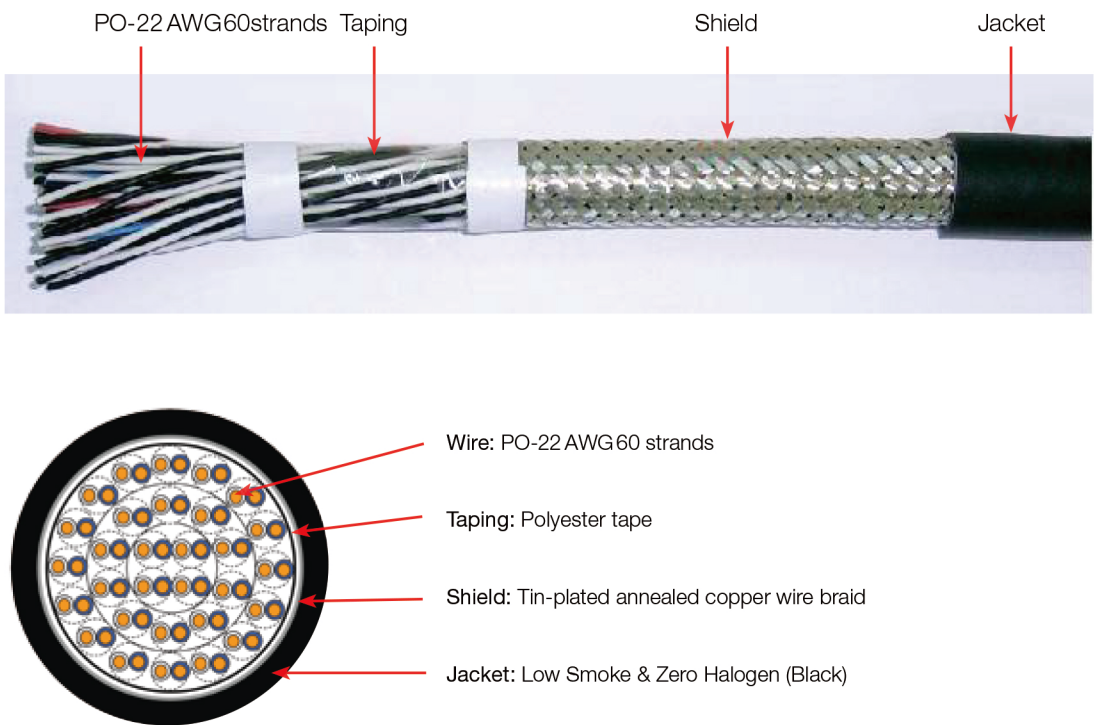
YHSPD Cable (Coaxial cable) Cross-sectional view and composition



YHSPD Cable (LHC Series) Cross-sectional view and composition



YHSPD Cable (PO Series) Cross-sectional view and composition



YHSPD Cable (TR Series) Cross-sectional view and composition



완제품 및 부품별 특성 (completed product and characteristics of parts)

Type	Production structure		Electrical characteristics		
	Conductor composition	Insulator	Common	Withstanding voltage	Insulation resistance
M81044	24 AWG(ϕ 0.62) (19/0.127)	PVdF	Cabling + Taping + Braid	2.5kV/5min	1524M Ω .km (min.)
99M	16 AWG(ϕ 1.40) (19/0.254)	XLPE		2.5kV/5min	1000M Ω .km (min.)
Coaxial	20 AWG(ϕ 0.98) (19/0.203)	Foam PE		1.0kV/1min	Characteristic Impedance 50 Ω , 75 Ω
LHC	6 SQ(ϕ 2.96) (84/0.30)	Rubber		1.5kV/1min	1M Ω .km (min.)
PO	22 AWG(ϕ 0.79) (19/0.160)	Rayolin		1.5kV/1min	100M Ω .km (min.)
TR	10 SQ(ϕ 4.55) (19/17/0.203)	Thermorad	Sheath	1.5kV/1min	20M Ω .km (min.)
Jacket		ZeroHal		1.5kV/1min	40M Ω .km (min.)

Micro Coaxial Cable



내용 (Contents)

- ▲ UL AWM 10005

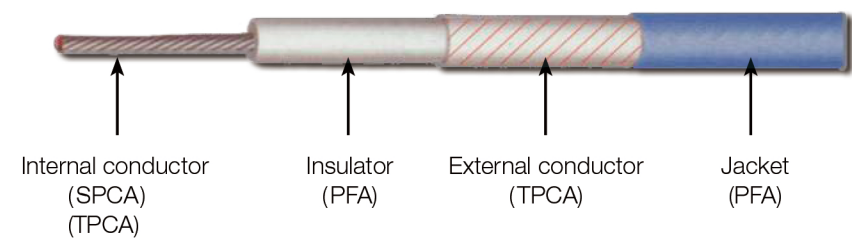
▲ UL AWM 11083

▲ UL AWM 11085
- 연합정밀(주)은 초극세선인 Micro Coaxial Cable을 개발하여 각종 개인용 휴대 정보통신장치의 소형화에 필요로 하는 저중량, 최소 부피, 유연성과 우수한 전기적 특성을 겸비한 제품을 실현하였음.

Mobile phone, LCD pannel, 의료장비 등에 사용 됨.
- Yeonhab Precision developed Micro Coaxial Cable with low weight, minimum volume, flexibility, and superior electrical characteristics needed for making various personal mobile information and communication devices smaller. It is used in mobile phone, LCD panel, and medical equipment.

Micro Coaxial Cable

UL AWM 10005
UL AWM 11083
UL AWM 11085

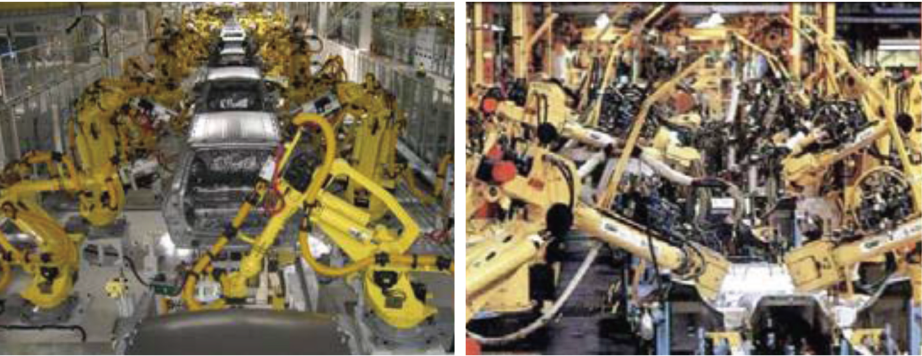


Feature

Internal conductor	Silver-plated copper alloy wire (SPCA : Silver plated copper alloy wire), Tin-plated copper alloy wire (TPCA: Tin plated copper alloy wire)
Insulator	PFA (Perfluoroalkoxy)
External conductor	Tin-plated copper alloy wire (TPCA : Tin plated copper alloy wire)
Jacket	PFA (Perfluoroalkoxy)
Voltage rating	30 V
Temperature rating	200 ℃

Internal conductor			Insulator	External conductor	Completed product
Standard (AWG)	structure (No. / mm)	Conductor resistance (Ω / km)	Outer diameter (mm)	Maximum diameter of wire (mm)	Outer diameter (mm)
40	7 / 0.030	5,033	0.250	0.031	0.370
42	7 / 0.025	7,220	0.178	0.029	0.290

Factory Automation Cable

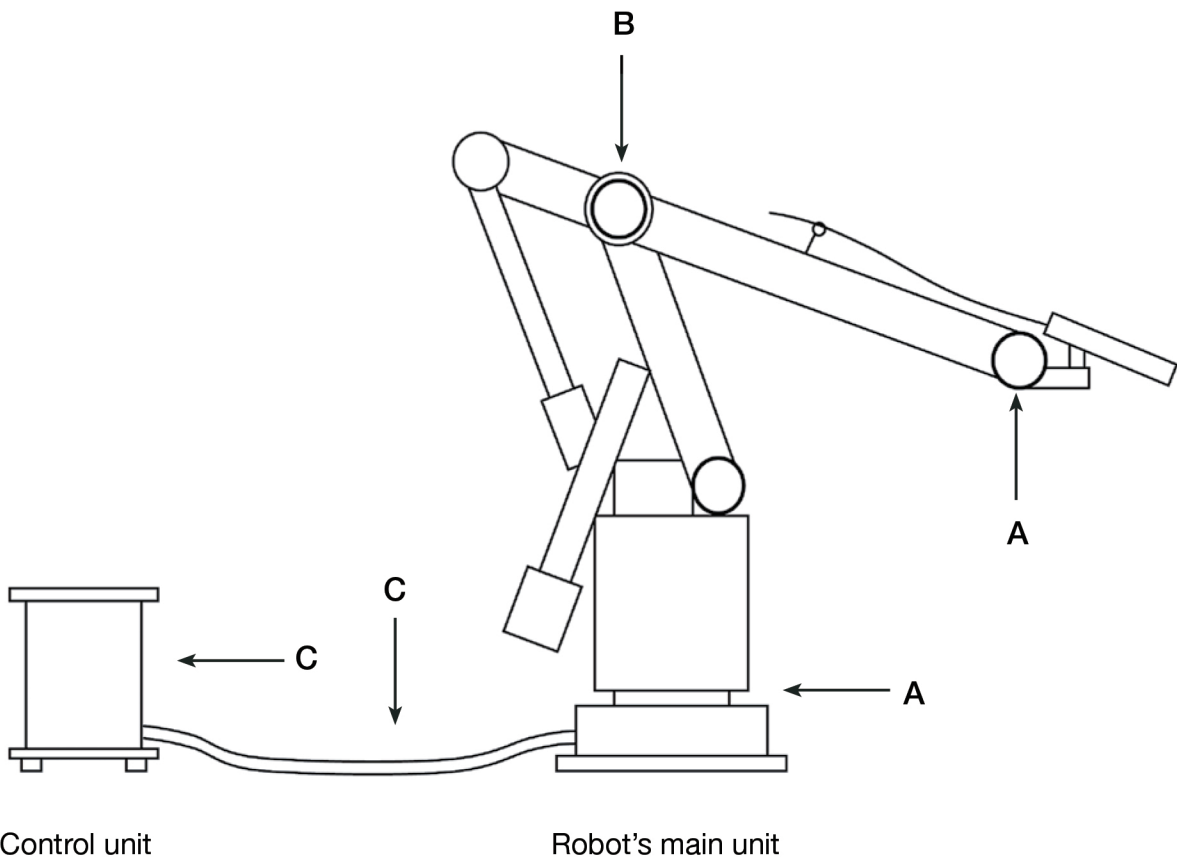


내용 (Contents)

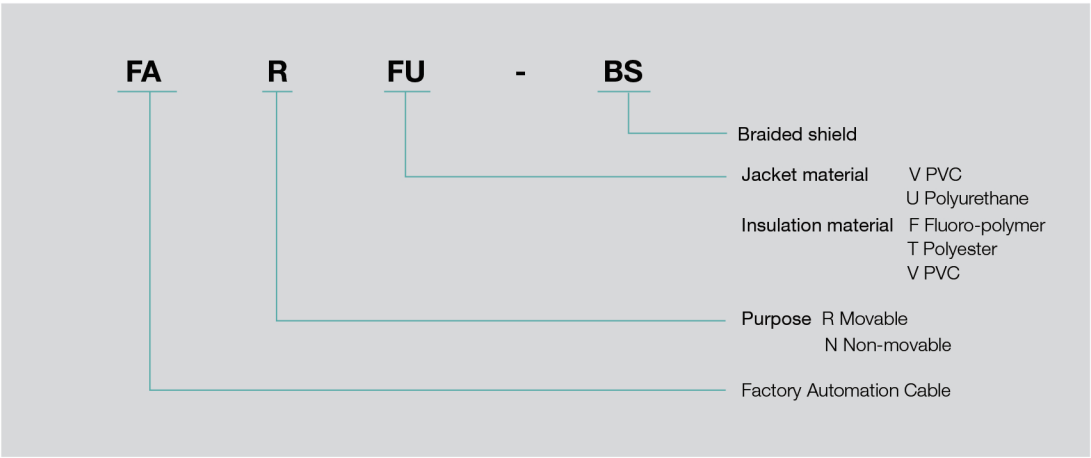
- ▲ FARFU, FARFU-BS
- ▲ FARTU, FARTU-BS
- ▲ FARVV, FARVV-BS
- ▲ FARVU, FARVU-BS
- ▲ FANVV, FANVV-BS

연합정밀(주)은 굴곡성과 유연성이 우수하고 전기적, 기계적 특성 및 EMI차폐효과가 뛰어나며 유연성, 내한성, 내유성, 내마모성이 우수한 가동설비용 케이블을 개발하였고 양산하고 있음.

Yeonhab Precision has developed and mass-produces factory automation cable with superior bendability, flexibility, electrical and mechanical characteristics, EMI shield effect, low temperature resistance, oil resistance, and abrasion resistance.

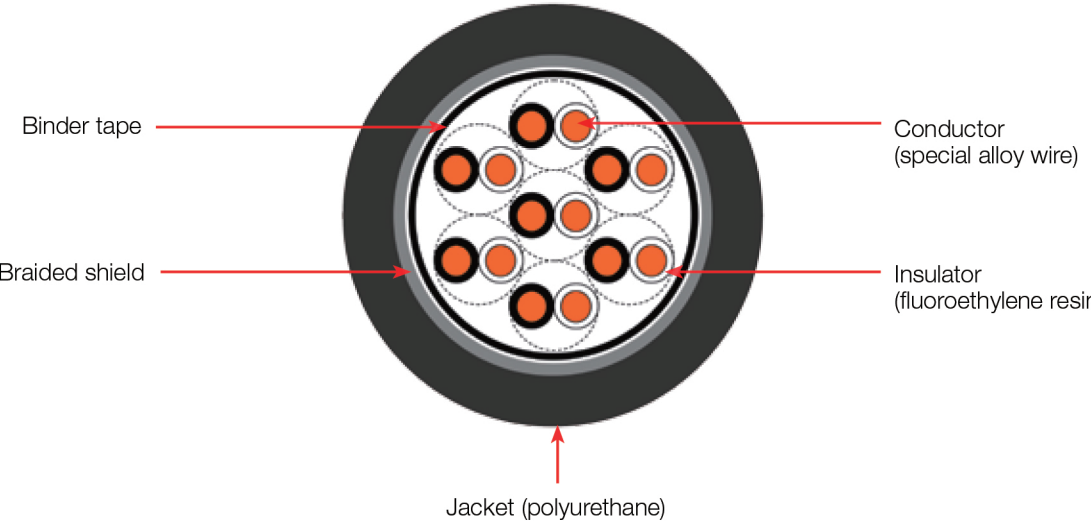


Application for cable

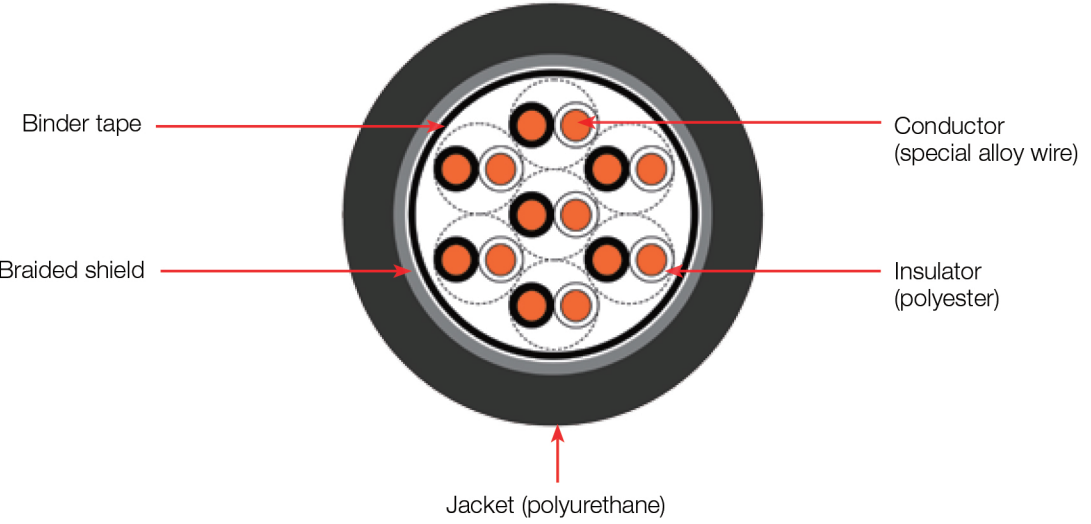


Position	Cable type	Remark
A	FARFU, FARFU-BS	Movable cable Flexible cable
B	FARTU, FARTU-BS	Movable cable Flexible cable
B	FARVV, FARVV-BS FARVU, FARVU-BS	Movable cable Non-movable cable
C	FANVV, FANVV-BS	Non-movable cable

Feature	Applications
1. Flexibility (Bendability)	1. Industrial robot
2. Abrasion resistance	2. Mechanical device
3. Jacket durability	3. Conveyor device
4. Weather resistance	4. Fixed track
5. Minimization of friction between insulators	5. Control Pannels
6. Solderability	
7. Fluoroethylene resin insulation, polyurethane sheath (with shield or without)	



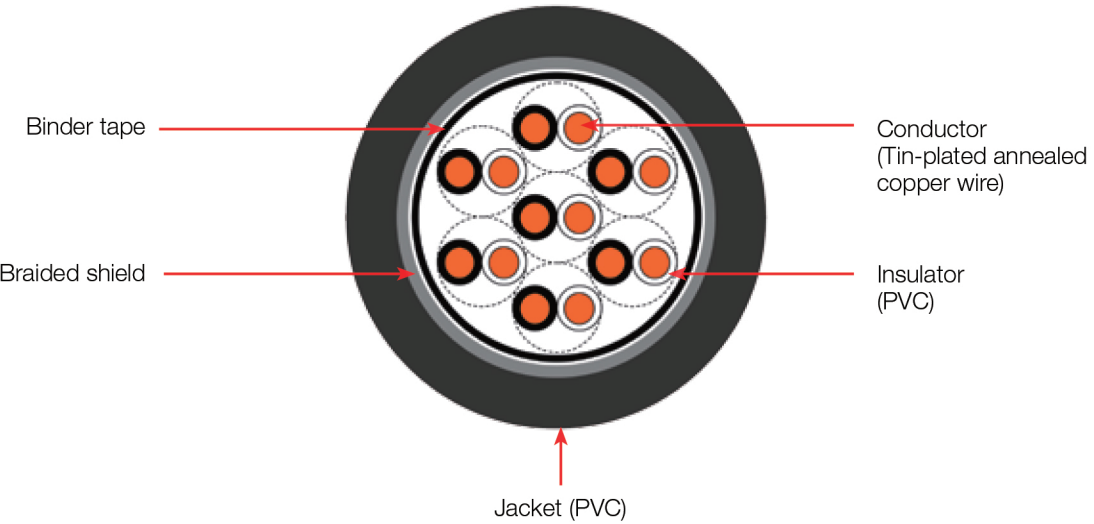
Feature	Applications
1. Flexibility (Bendability)	1. Industrial robot
2. Abrasion resistance	2. Mechanical device
3. Jacket durability	3. Conveyor device
4. Weather resistance	4. Fixed track
5. Minimization of friction between insulators	5. Control Pannels
6. Solderability	
7. Polyester insulation, polyurethane sheath (with shield or without)	



Factory Automation Cable

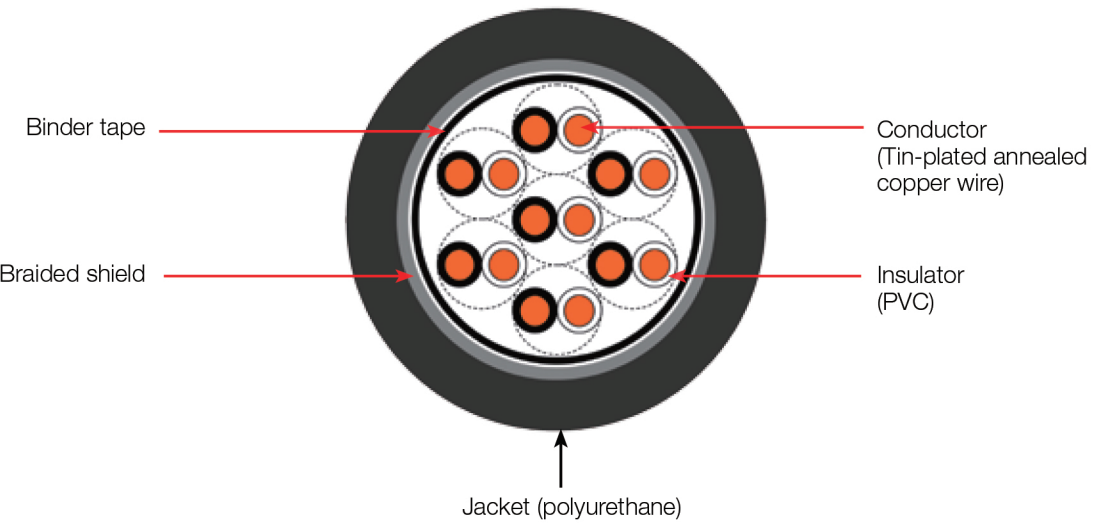
FARVV, FARVV-BS

Feature	Applications
1. Flexibility (Bendability)	1. Industrial robot
2. Abrasion resistance	2. Mechanical device
3. Jacket durability	3. Conveyor device
4. Weather resistance	4. Fixed track
5. Solderability	5. Control Pannels
6. PVC Insulation, PVC Sheath (with shield or without)	



FARVU, FARVU-BS

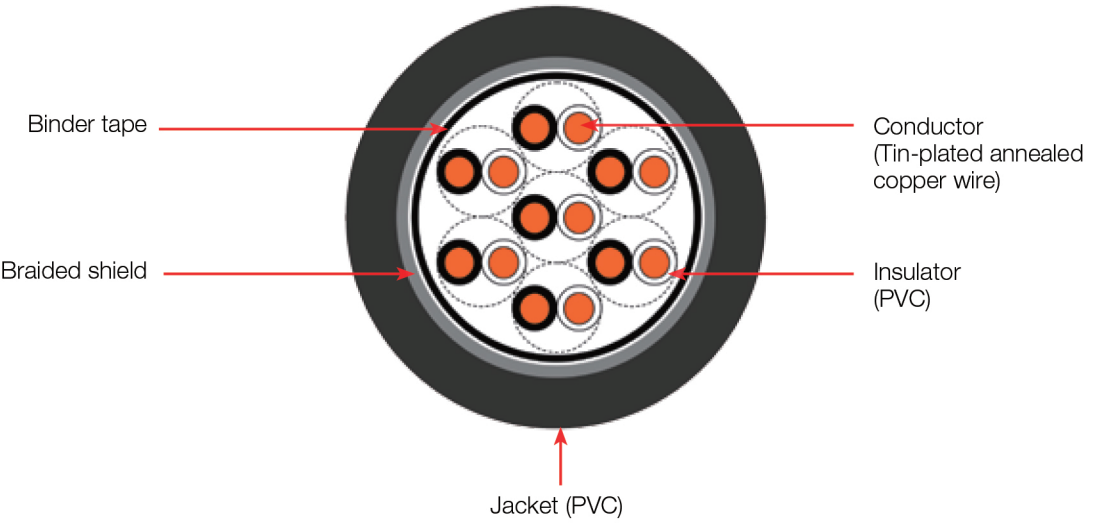
Feature	Applications
1. Flexibility (Bendability)	1. Industrial robot
2. Abrasion resistance	2. Mechanical device
3. Jacket durability	3. Conveyor device
4. Weather resistance	4. Fixed track
5. Solderability	5. Control Pannels
6. PVC Insulation, Polyurethane Sheath (with shield or without)	



Factory Automation Cable

FANVV, FANVV-BS

Feature	Applications
1. Flexibility (Bendability)	1. Industrial robot
2. Abrasion resistance	2. Mechanical device
3. Jacket durability	3. Conveyor device
4. Weather resistance	4. Fixed track
5. Solderability	5. Control Pannels
6. PVC Insulation, PVC Sheath (with shield or without)	6. Fixed device



M81044/9 (SAE AS 81044/9)QPL

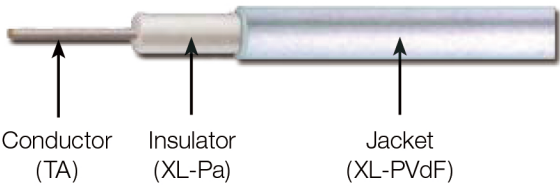


내용 (Contents)

- ▲ M81044/9 (QPL)
- ▲ M81044/12 (QPL)
- ▲ YH22759/16
- ▲ YH22759/18
- ▲ M22759/32 (QPL)
- ▲ M22759/34 (QPL)
- ▲ M22759/41 (QPL)
- ▲ M22759/43 (QPL)
- ▲ M22759/44 (QPL)
- ▲ YH16878/11
- ▲ M27500 (QPL)
- ▲ VG 95218-25 style

연합정밀(주)은 MIL 규격에서 규정한 극한 환경에서 사용 가능한 최고의 특성을 요구하는 케이블 및 와이어를 생산, 공급하고 있음.
MIL 규격에 부합하는 최적의 케이블을 생산하기 위해서 환경 시험과 품질 보증을 실행하고 있음.

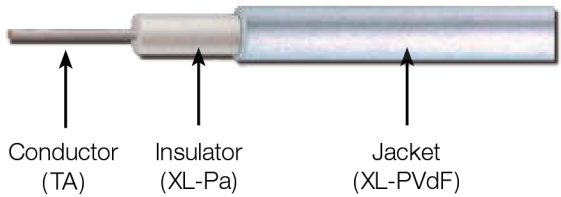
Yeonhab Precision manufactures and supplies cables and wires of superior quality which can be used in extreme environment specified by the MIL standards. The Company carries out environmental testing and quality assurance in order to produce the most appropriate cables which meet the MIL standards.



Feature		
Conductor	TA : Tin coated annealed copper wire	
Insulator	XL-Pa (Crosslinked Polyalkene)	
Jacket	XL-PVdF (Crosslinked Polyvinylidene Fluoride)	
Voltage rating	600 V	
Temperature rating	-65 ℃ ~ 150 ℃	
Mechanical characteristics	Tensile strength	Min. 2,500 psi (1.76 kgf/㎟) for sizes 24 through 12 Min. 2,000 psi (1.41 kgf/㎟) for sizes 10 through 0
	Elongation	Min. 150 %
Environmental characteristics	Accelerated aging	300 ± 2 ℃ / 6 h
	Heat shrinking	Max. 3.175 mm (300 ± 2 ℃ / 6h) for sizes 24 through 12 Max. 6.35 mm (300 ± 2 ℃ / 6h) for sizes 10 through 0
	Fluid immersion	Oils, Fules, Solvents
Electrical characteristics	Insulation resistance	Min. 1,524 Mohm-km
	Withstanding voltage	2,500 V / 5 min

Conductor standard (AWG)	Composition (No. / mm)	Conductor outer diameter (mm)		Conductor resistance (Q / km)	Completed product outer diameter (mm)
		Min.	Max.		
0	1045 / 0.254	10.29	10.80	0.38	12.45 ± 0.41
2	665 / 0.254	8.13	8.64	0.60	10.16 ± 0.30
4	133 / 0.455	6.35	6.96	0.92	8.13 ± 0.20
6	133 / 0.361	5.03	5.51	1.46	6.71 ± 0.18
8	133 / 0.287	4.01	4.39	2.30	5.44 ± 0.15
10	37 / 0.404	2.69	2.90	4.13	3.94 ± 0.13
12	37 / 0.320	2.13	2.29	6.63	3.20 ± 0.10
14	19 / 0.360	1.65	1.85	10.0	2.74 ± 0.10
16	19 / 0.287	1.32	1.47	15.8	2.26 ± 0.10
18	19 / 0.254	1.17	1.30	20.4	2.03 ± 0.08
20	19 / 0.203	0.94	1.04	32.4	1.78 ± 0.08
22	19 / 0.160	0.74	0.84	53.1	1.57 ± 0.08
24	19 / 0.127	0.58	0.66	86.0	1.37 ± 0.05

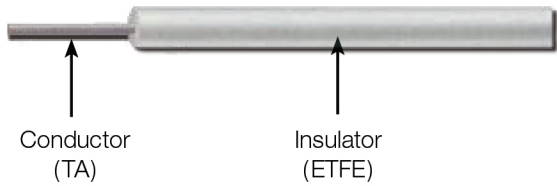
M81044/12 (SAE AS 81044/12) QPL



Feature		
Conductor	TA : Tin coated annealed copper wire	
Insulator	XL-Pa (Crosslinked Polyalkene)	
Jacket	XL-PVdF (Crosslinked Polyvinylidene Fluoride)	
Voltage rating	600 V	
Temperature rating	-65 ℃ ~ 150 ℃	
Mechanical characteristics	Tensile strength	Min. 2,500 psi (1.76 kgf/mm²)
	Elongation	Min. 150 %
Environmental characteristics	Accelerated aging	300 ± 2 ℃ / 6 h
	Heat shrinking	Max. 3.175 mm (300 ± 2 ℃ / 6h)
	Fluid immersion	Oils, Fules, Solvents
Electrical characteristics	Insulation resistance	Min. 1,524 Mohm-km
	Withstanding voltage	2,500 V / 5 min

Conductor standard (AWG)	Composition (No. / mm)	Conductor outer diameter (mm)		Conductor resistance (Ω / km)	Completed product outer diameter (mm)
		Min.	Max.		
12	37 / 0.320	2.13	2.29	6.63	2.74 ± 0.10
14	19 / 0.361	1.65	1.85	10.04	2.26 ± 0.10
16	19 / 0.287	1.32	1.47	15.78	1.83 ± 0.08
18	19 / 0.254	1.17	1.30	20.43	1.65 ± 0.05
20	19 / 0.203	0.94	1.04	32.41	1.40 ± 0.05
22	19 / 0.160	0.74	0.84	53.14	1.19 ± 0.05
24	19 / 0.127	0.58	0.66	85.95	1.02 ± 0.05
26	19 / 0.102	0.46	0.53	135.49	0.86 ± 0.05
28	7 / 0.127	0.36	0.41	225.06	0.76 ± 0.05
30	7 / 0.102	0.28	0.33	355.64	0.69 ± 0.05

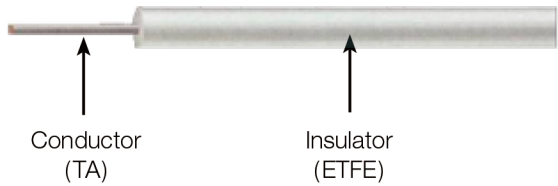
YH22759/16 (SAE AS 22759/16)



Feature		
Conductor	TA : Tin coated annealed copper wire	
Insulator	ETFE (Ethylene tetra Fluoroethylene)	
Voltage rating	600 V	
Temperature rating	-65 ℃ ~ 150 ℃	
Mechanical characteristics	Accelerated aging	230 ± 2 ℃ / 7 h
	Heat shrinking	Max. 3.175 mm (200 ± 2 ℃ / 6 h)
	Fluid immersion	Oils, Fules, Solvents
Electrical characteristics	Insulation resistance	Min. 1,524 Mohm-km for sizes 26 through 20 Min. 915 Mohm-km for sizes 18 through 14 Min. 610 Mohm-km for sizes 12 through 10
	Withstanding voltage	2,200 V / 1 min

Conductor standard (AWG)	Composition (No. / mm)	Conductor outer diameter (mm)		Conductor resistance (Ω / km)	Completed product outer diameter (mm)
		Min.	Max.		
00	1330 / 0.254	11.18	12.07	0.29	13.87 ± 0.18
0	1045 / 0.254	10.03	10.80	0.38	12.17 ± 0.15
1	817 / 0.254	9.14	9.65	0.48	10.95 ± 0.13
2	665 / 0.254	8.13	8.64	0.60	9.86 ± 0.10
4	133 / 0.455	6.35	6.81	0.91	7.93 ± 0.10
6	133 / 0.361	5.03	5.38	1.45	6.35 ± 0.08
8	133 / 0.287	4.01	4.29	2.29	5.06 ± 0.08
10	37 / 0.404	2.69	2.84	4.13	3.53 ± 0.08
12	37 / 0.320	2.13	2.26	6.62	2.90 ± 0.08
14	19 / 0.361	1.65	1.75	10.03	2.36 ± 0.05
16	19 / 0.287	1.32	1.40	15.78	2.01 ± 0.05
18	19 / 0.254	1.17	1.24	20.43	1.80 ± 0.05
20	19 / 0.203	0.94	0.99	32.41	1.52 ± 0.05
22	19 / 0.160	0.74	0.79	53.14	1.32 ± 0.05
24	19 / 0.127	0.58	0.61	85.95	1.14 ± 0.05

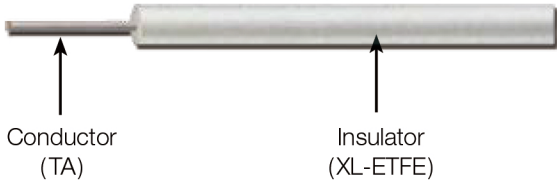
YH 22759/18 (SAE AS 22759/18)



Feature		
Conductor	TA : Tin coated annealed copper wire	
Insulator	ETFE (Ethylene tetra Fluoroethylene)	
Voltage rating	600 V	
Temperature rating	-65 ℃ ~ 150 ℃	
Environmental characteristics	Accelerated aging	230 ± 2 ℃ / 7 h
	Heat shrinking	Max. 3.175 mm (200 ± 2 ℃ / 6 h)
	Fluid immersion	Oils, Fules, Solvents
Electrical characteristics	Insulation resistance	Min. 1,524 Mohm-km for sizes 26 through 20 Min. 915 Mohm-km for sizes 18 through 14 Min. 610 Mohm-km for sizes 12 through 10
	Withstanding voltage	2,200 V / 1 min

Conductor standard (AWG)	Composition (No. / mm)	Conductor outer diameter (mm)		Conductor resistance (Ω / km)	Completed product outer diameter (mm)
		Min.	Max.		
10	37 / 0.404	2.70	2.84	4.13	3.4 ± 0.08
12	37 / 0.320	2.13	2.26	6.62	2.72 ± 0.08
14	19 / 0.361	1.65	1.75	10.03	2.16 ± 0.05
16	19 / 0.287	1.32	1.40	15.78	1.78 ± 0.05
18	19 / 0.254	1.17	1.24	20.43	1.55 ± 0.05
20	19 / 0.203	0.94	0.99	32.41	1.30 ± 0.05
22	19 / 0.160	0.74	0.79	53.14	1.09 ± 0.05
24	19 / 0.127	0.58	0.61	85.95	0.91 ± 0.05
26	19 / 0.102	0.46	0.51	135.49	0.81± 0.05

M22759/32 (SAE AS 22759/32) QPL

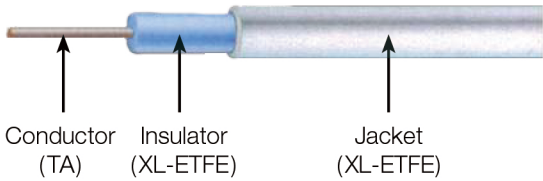


Feature		
Conductor	TA : Tin coated annealed copper wire	
Insulator	XL-ETFE (Crosslinked Ethylene tetra Fluoroethylene)	
Rated voltage	600 V	
Usage temperature	-65 ℃ ~ 150 ℃	
Mechanical characteristics	Tensile strength	Min. 5,000 psi (3.5 kgf/mm²)
	Elongation	Min. 75 %
Environmental characteristics	Accelerated aging	300 ± 3 ℃ / 7 h
	Heat shrinking	Max. 3.175 mm (200 ± 3 ℃ / 6 h)
	Fluid immersion	Oils, Fules, Solvents
Electrical characteristics	Insulation resistance	Min. 1,524 Mohm-km for sizes 26 through 20 Min. 915 Mohm-km for sizes 18 through 14 Min. 610 Mohm-km for sizes 12 through 10
	Withstanding voltage	2,500 V / 1 min

Conductor standard (AWG)	Composition (No. / mm)	Conductor outer diameter (mm)		Conductor resistance (Ω / km)	Completed product outer diameter (mm)
		Min.	Max.		
12	37 / 0.320	2.13	2.26	6.62	2.62 ± 0.08
14	19 / 0.361	1.65	1.75	10.03	2.16 ± 0.08
16	19 / 0.287	1.32	1.40	15.78	1.73 ± 0.05
18	19 / 0.254	1.17	1.24	20.43	1.52 ± 0.05
20	19 / 0.203	0.94	0.99	32.41	1.27 ± 0.05
22	19 / 0.160	0.74	0.79	53.14	1.09 ± 0.05
24	19 / 0.127	0.58	0.64	85.95	0.94 ± 0.05
26	19 / 0.102	0.46	0.51	135.49	0.81 ± 0.05
28	7 / 0.127	0.36	0.41	225.06	0.69 ± 0.05
30	7 / 0.102	0.28	0.33	355.64	0.61 ± 0.05

Military Wire & Cable

M22759/34 (SAE AS 22759/34) QPL

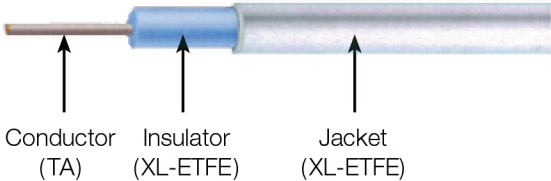


Feature		
Conductor	TA : Tin coated annealed copper wire	
Insulator	XL-ETFE (Crosslinked Ethylene tetra Fluoroethylene)	
Jacket	XL-ETFE (Crosslinked Ethylene tetra Fluoroethylene)	
Voltage rating	600 V	
Operating temperature	−65 ℃ ~ 150 ℃	
Mechanical characteristics	Tensile strength	Min. 5,000 psi (3.5 kgf/mm ²)
	Elongation	Min. 75 %
Environmental characteristics	Accelerated aging	300 ± 2 ℃ / 7 h
	Heat shrinking	Max. 3.175 mm (200 ± 3 ℃/ 6 h)
	Fluid immersion	Oils, Fules, Solvents
Electrical characteristics	Insulation resistance	Min.1,524 Mohm-km for sizes 24 through 10 Min.9,15 Mohm-km for sizes 8 through 00
	Withstanding voltage	2,500 V / 1 min

Conductor standard (AWG)	Composition (No. / mm)	Conductor outer diameter (mm)		Conductor resistance (Ω / km)	Completed product outer diameter (mm)
		Min.	Max.		
00	1330 / 0.254	11.18	12.06	0.29	13.84 ± 0.41
0	1045 / 0.254	10.03	10.80	0.38	12.32 ± 0.41
1	817 / 0.254	9.14	9.65	0.48	11.30 ± 0.41
2	655 / 0.254	8.13	8.64	0.60	10.29 ± 0.41
4	133 / 0.455	6.35	6.96	0.91	7.87 ± 0.25
6	133 / 0.361	5.03	5.51	1.45	6.12 ± 0.25
8	133 / 0.287	4.01	4.40	2.29	4.95 ± 0.2
10	37 / 0.404	2.70	2.87	4.13	3.40 ± 0.1
12	37 / 0.320	2.13	2.26	6.62	2.82 ± 0.08
14	19 / 0.361	1.65	1.75	10.03	2.39 ± 0.08
16	19 / 0.287	1.32	1.40	15.78	1.96 ± 0.08
18	19 / 0.254	1.17	1.24	20.43	1.78 ± 0.08
20	19 / 0.203	0.94	0.99	32.41	1.47 ± 0.05
22	19 / 0.160	0.74	0.79	53.14	1.27 ± 0.05
24	19 / 0.127	0.58	0.64	85.95	1.14 ± 0.05

Military Wire & Cable

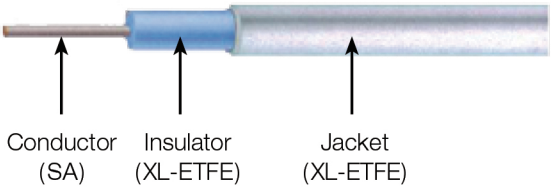
M22759/41 (SAE AS 22759/41) QPL



Feature		
Conductor	NA : Nickel coated annealed copper wire	
Insulator	XL-ETFE (Crosslinked Ethylene tetra Fluoroethylene)	
Jacket	XL-ETFE (Crosslinked Ethylene tetra Fluoroethylene)	
Voltage rating	600 V	
Operating temperature	−65 ℃ ~ 200 ℃	
Mechanical characteristics	Tensile strength	Min. 5,000 psi (3.5 kgf/mm ²)
	Elongation	Min. 75 %
Environmental characteristics	Accelerated aging	300 ± 2 ℃ / 7 h
	Heat shrinking	Max. 3.175 mm (230 ± 3 ℃/ 6 h)
	Fluid immersion	Oils, Fules, Solvents
Electrical characteristics	Insulation resistance	Min.1,524 Mohm-km for sizes 26 through 10 Min.9,15 Mohm-km for sizes 8 through 00
	Withstanding voltage	2,500 V / 1 min

Conductor standard (AWG)	Composition (No. / mm)	Conductor outer diameter (mm)		Conductor resistance (Ω / km)	Completed product outer diameter (mm)
		Min.	Max.		
00	1330 / 0.254	11.18	12.07	0.29	13.84 ± 0.41
0	1045 / 0.254	10.03	10.80	0.37	12.32 ± 0.41
1	817 / 0.254	9.14	9.65	0.47	11.30 ± 0.41
2	655 / 0.254	8.13	8.64	0.58	10.29 ± 0.41
4	133 / 0.455	6.35	6.96	0.90	7.87 ± 0.25
6	133 / 0.361	5.03	5.51	1.43	6.12 ± 0.25
8	133 / 0.287	4.01	4.40	2.27	4.95 ± 0.2
10	37 / 0.404	2.70	2.87	4.06	3.40 ± 0.1
12	37 / 0.320	2.13	2.26	6.49	2.82 ± 0.08
14	19 / 0.361	1.65	1.75	9.84	2.39 ± 0.08
16	19 / 0.287	1.32	1.40	15.61	1.96 ± 0.08
18	19 / 0.254	1.17	1.24	20.01	1.78 ± 0.08
20	19 / 0.203	0.94	0.99	32.05	1.47 ± 0.05
22	19 / 0.160	0.74	0.79	52.49	1.27 ± 0.05
24	19 / 0.127	0.58	0.64	84.97	1.14 ± 0.05
26	19 / 0.102	0.46	0.51	138.44	1.02 ± 0.05

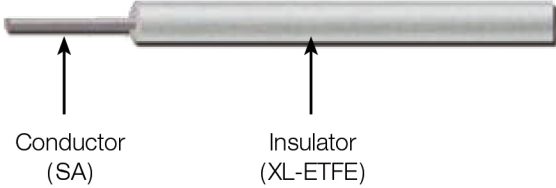
M22759/43 (SAE AS 22759/43) QPL



Feature		
Conductor	SA : Silver coated annealed copper wire	
Insulator	XL-ETFE (Crosslinked Ethylene tetra Fluoroethylene)	
Jacket	XL-ETFE (Crosslinked Ethylene tetra Fluoroethylene)	
Voltage rating	600 V	
Operating temperature	−65 ℃ ~ 200 ℃	
Mechanical characteristics	Tensile strength	Min. 5,000 psi (3.5 kgf/mm²)
	Elongation	Min. 75 %
Environmental characteristics	Accelerated aging	300 ± 2 ℃ / 7 h
	Heat shrinking	Max. 3.175 mm (230 ± 3 ℃/ 6 h)
	Fluid immersion	Oils, Fules, Solvents
Electrical characteristics	Insulation resistance	Min.1,524 Mohm-km for sizes 26 through 10 Min.9,15 Mohm-km for sizes 8 through 00
	Withstanding voltage	2,500 V / 1 min

Conductor standard (AWG)	Composition (No. / mm)	Conductor outer diameter (mm)		Conductor resistance (Ω / km)	Completed product outer diameter (mm)
		Min.	Max.		
00	1330 / 0.254	11.18	12.06	0.28	13.84 ± 0.41
0	1045 / 0.254	10.03	10.80	0.35	12.32 ± 0.41
1	817 / 0.254	9.14	9.65	0.46	11.30 ± 0.41
2	665 / 0.254	8.13	8.64	0.56	10.29 ± 0.41
4	133 / 0.455	6.35	6.81	0.87	7.87 ± 0.25
6	133 / 0.361	5.03	5.41	1.37	6.12 ± 0.25
8	133 / 0.287	4.01	4.29	2.16	4.95 ± 0.2
10	37 / 0.404	2.70	2.84	3.90	3.40 ± 0.1
12	37 / 0.320	2.13	2.21	6.23	2.82 ± 0.08
14	19 / 0.361	1.65	1.73	9.44	2.39 ± 0.08
16	19 / 0.287	1.32	1.37	14.82	1.96 ± 0.08
18	19 / 0.254	1.17	1.22	18.98	1.78 ± 0.08
20	19 / 0.203	0.94	0.99	30.13	1.47 ± 0.05
22	19 / 0.160	0.74	0.79	49.51	1.27 ± 0.05
24	19 / 0.127	0.58	0.63	79.67	1.14 ± 0.05
26	19 / 0.102	0.46	0.48	125.90	1.02 ± 0.05

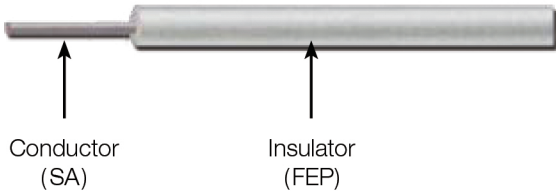
M22759/44 (SAE AS 22759/44) QPL



Feature		
Conductor	SA : Silver coated annealed copper wire	
Insulator	XL-ETFE (Crosslinked Ethylene tetra Fluoroethylene)	
Voltage rating	600 V	
Operating temperature	−65 ℃ ~ 200 ℃	
Mechanical characteristics	Tensile strength	Min. 5,000 psi (3.5 kgf/mm²)
	Elongation	Min. 75 %
Environmental characteristics	Accelerated aging	300 ± 3 ℃ / 7 h
	Heat shrinking	Max. 3.175 mm (230 ± 3 ℃/ 6 h)
	Solvent resistance testing	Oils, Fules, Solvents
Electrical characteristics	Insulation resistance	Min. 1,524 Mohm-km
	Withstanding voltage	2,500 V / 1 min

Conductor standard (AWG)	Composition (No. / mm)	Conductor outer diameter (mm)		Conductor resistance (Ω / km)	Completed product outer diameter (mm)
		Min.	Max.		
12	37 / 0.320	2.13	2.21	6.23	2.62 ± 0.08
14	19 / 0.361	1.65	1.73	9.44	2.16 ± 0.08
16	19 / 0.287	1.32	1.37	14.82	1.73 ± 0.05
18	19 / 0.254	1.17	1.22	18.99	1.52 ± 0.05
20	19 / 0.203	0.94	0.99	30.15	1.27 ± 0.05
22	19 / 0.160	0.74	0.76	49.54	1.09 ± 0.05
24	19 / 0.127	0.58	0.64	79.72	0.94 ± 0.05
26	19 / 0.102	0.46	0.48	125.98	0.81 ± 0.05
28	7 / 0.127	0.36	0.38	209.31	0.69 ± 0.05

YH16878/11 (ANSI-NEMA HP 4)



Feature		
Conductor	은도금 연동선 (SA : Silver coated annealed copper wire)	
Insulator	FEP (Fluorinated Ethylene Propylene)	
Voltage rating	600 V	
Operating temperature	−65 ℃ ~ 200 ℃	
Mechanical characteristics	Tensile strength	Min.2,500 psi (1.76 kgf/㎟)
	Elongation	Min. 200 %
Environmental characteristics	Accelerated aging	230 ± 2 ℃ / 96 h
	Heat shrinking	Max. 3.175 mm (230 ± 3 ℃/ 6 h
Electrical characteristics	Insulation resistance	Min. 1,524 Mohm-km
	Withstanding voltage	2,000 V / 1 min

Conductor standard(AWG)	Composition (No. / mm)	Conductor outer diameter (mm)		Conductor resistance (Ω / km)	Completed product outer diameter (mm)
		Min.	Max.		
8	133 / 0.287	4.013	4.394	2.30	4.88 ± 0.18
10	37 / 0.404	2.692	2.921	4.13	3.40 ± 0.18
12	19 / 0.455	2.083	2.362	6.30	2.91 ± 0.18
14	19 / 0.361	1.651	1.854	10.04	2.41± 0.18
16	19 / 0.287	1.321	1.499	15.78	2.03 ± 0.18
18	19 / 0.254	1.168	1.321	20.44	1.75 ± 0.13
20	19 / 0.203	0.940	1.041	32.41	1.47 ± 0.10
22	19 / 0.160	0.737	0.838	53.15	1.27 ± 0.10
24	19 / 0.127	0.584	0.686	85.96	1.12 ± 0.10
26	19 / 0.102	0.457	0.559	135.50	0.99 ± 0.10
28	7 / 0.127	0.356	0.406	225.06	0.89 ± 0.10
30	7 / 0.102	0.279	0.330	374.34	0.81 ± 0.10
32	7 / 0.079	0.224	0.279	620.07	0.76 ± 0.10

M27500 (ANSI-NEMA WC 27500) Product Name Code

M27500	A	22	ML	2	T	08
Standards number	Braid density classification and insulator core identification classification	Conductor standards (AWG)	Basic wire specitication	Number of insulator cores	Shield type	Jacket type

M27500 (ANSI-NEMA WC 27500) Basic Wire Specification

Specification sequence	
M81044/9 type (QPL)	MH
M81044/12 type (QPL)	ML
YH22759/16 type	TE
YH22759/18 type	TG
M22759/32 type (QPL)	SB
M22759/34 type (QPL)	SD
M22759/41 type (QPL)	SM
M22759/43 type (QPL)	SP
M22759/44 type (QPL)	SR

M27500 (ANSI-NEMA WC 27500) Insulator core identification method

Insulator core identification method	Braid density		Order of color arrangement			
	M27500	85%	95%			
Insulator color classification	A	D	1st	white	6th	black
			2nd	blue	7th	yellow
			3rd	orange	8th	violet
			4th	green	9th	gray
			5th	red	10th	brown

M27500 (ANSI-NEMA WC 27500) Shield type

Shield material	Single shield original symbol	Double shield original symbol
No Jacket	U	
Tin-coated annealed copper wire	T	V
Silver-coated annealed copper wire	S	W
Nickel-coated annealed copper wire	N	Y
Stainless	F	Z
Silver-coated alloy wire	M	K
Nickel-coated alloy wire	P	L

M27500 (ANSI-NEMA WC 27500) Jacket type

Jacket material	Single Jacket	Double Jacket
No Jacket	00	-
Crosslinked, white, extruded, PVdF ^{1/}	08	58
Extruded, white, ETFE ^{2/}	14	64
Crosslinked, white, extruded, XL-ETFE ^{3/}	23	73

1/ PVdF : Polyvinylidene fluoride
2/ ETFE : Ethylene-tetrafluoroethylene copolymer
3/ XL-ETFE : Crosslinked Ethylene-tetrafluoroethylene copolymer

Military Wire & Cable

M27500 (ANSI-MENA WC 27500)

No shield, No jacket
Number of cores : 2 ~ 10

ex) M27500A22ML2U00
M27500A20SM2U00



M27500 (ANSI-MENA WC 27500)

No shield, Jacket
Number of cores : 1 ~ 10

ex) M27500A22ML2U08
M27500A20SM2U23



M27500 (ANSI-MENA WC 27500)

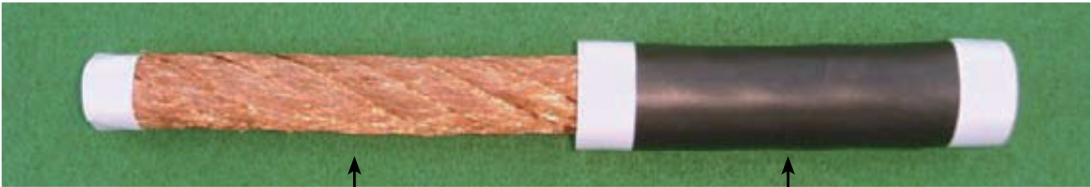
Shield, Jacket
Number of cores : 1 ~ 10

ex) M27500A22ML2T08
M27500A20SM2N23



Military Wire & Cable

VG 95218-25 style



Conductor
(A)

Jacket
(Polyester elastomer)

Feature		
Conductor	A : annealed copper wire	
Insulator	Polyester elastomer	
Rated voltage	600 V	
Usage temperature	150 ℃	
Mechanical characteristics	Tensile strength	Min. 1,800 psi (1.27 kgf/mm ²)
	Elongation	Min. 200 %
Environmental characteristics	low temperature impact	No crack allowed. (-40℃ / 4 h, 300mm / 750g)
	Fluid immersion	Oils, Fules, Solvents
Electrical characteristics	Insulation resistance	Min. 1 Mohm-km
	Withstanding voltage	2,500 V / 1 min

Conductor standard (SQmm)	Conductor outer diameter (mm)		Conductor resistance (Ω / km)	Completed product outer diameter (mm)	
	Min.	Max.		Min.	Max.
10	4.0	5.0	1.900	6.6	7.2
25	7.0	8.0	0.745	10.0	10.8
35	8.5	9.5	0.535	13.1	14.1
50	10.5	11.5	0.375	15.4	16.4
70	12.5	13.5	0.275	17.7	18.9
95	15.5	16.5	0.205	21.1	22.3
120	17.0	19.0	0.160	23.1	25.1
150	19.5	21.5	0.128	25.3	27.3