Starwire® Radiating Coaxial Cables

EUROPEAN STAR ON CONNECTIVITY

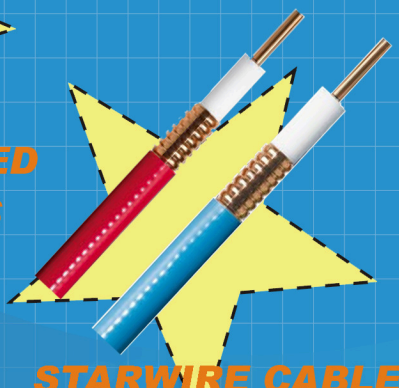
7/16 CONNECTORS

N-LC SERIES CONNECTOR

FLANGE SERIES 7/8" 1-5/8" 3-1/8"

STARWIRES ENGINEERING (SWE)

RF MOULDED JUMPERS



STARWIRE CABLES 7/8" TO 1-5/8"

Sponsored by CPE ITALIA SpA

Edition Gen.2011

Preliminary Remarks

Ministero delle Comunicazioni

Istituto Superiore delle Comunicazioni e delle Tecnologie dell'Informazione

CERTIFICAZIONE DI CONFORMITA'

Declaration of conformity

N° ISCTI/3/4/98/C005

In relazione alla richiesta della: C.P.E. Italia S.p.A.

With reference to the request of:

SI CERTIFICA CHE:

we certify that

Connettori coassiali

Coaxial connectors:

Modello 5/8 per cavi TRUNK

Model 5/8 for TRUNK cable

Caratteristiche tecniche: come da rapporto finale

Technical characteristics as reported in the final report

Prodotto dalla Società: C.P.E. Italia S.p.A.

Manufactured by:

A SEGUITO DEGLI ESAMI E DELLE PROVE EFFETTUATE,

on the basis of tests and measurements performed,

E' CONFORME

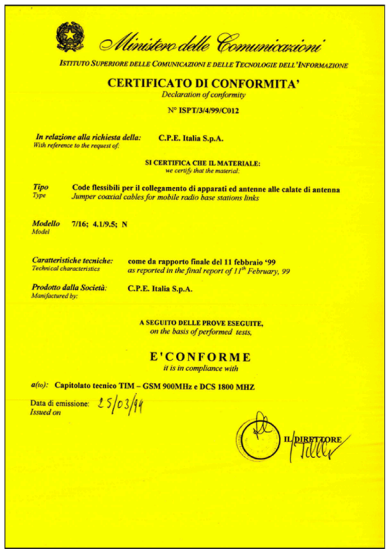
it is in compliance with

a(to): Capitolato tecnico TELECOM C.T. 1447 Rev.2 – Ed.Novembre '97

Data di emissione: 6/5/98

Issued on

IL DIRETTORE



Ministero delle Comunicazioni

ISTITUTO SUPERIORE DELLE COMUNICAZIONI E DELLE TECNOLOGIE DELL'INFORMAZIONE

CERTIFICATO DI CONFORMITA'

Declaration of conformity

N° ISPT/3/4/99/C012

In relazione alla richiesta della: C.P.E. Italia S.p.A.

With reference to the request of:

SI CERTIFICA CHE IL MATERIALE:

we certify that the material:

Tipo Code flessibili per il collegamento di apparati ed antenne alle calate di antenna

Type Jumper coaxial cables for mobile radio base stations links

Modello 7/16; 4.1/9.5; N

Model

Caratteristiche tecniche: come da rapporto finale del 11 febbraio '99

Technical characteristics as reported in the final report of 11th February, 99

Prodotto dalla Società: C.P.E. Italia S.p.A.

Manufactured by:

A SEGUITO DELLE PROVE ESEGUITE,

on the basis of performed tests,

E' CONFORME

it is in compliance with

a(to): Capitolato tecnico TIM – GSM 900MHz e DCS 1800 MHZ

Data di emissione: 25/03/99

Issued on

IL DIRETTORE

The present catalogue has been conceived in this format by CPE Italia SpA.

Aiming to show to Telecommunication Customers its flexibility, its potentiality, its involvement in the Customer successful solution, CPE Italia SpA has grouped in the following pages all products needed to implement an installation: cables, connectors to assemble the cables with an indeed very exhaustive range of configurations, accessories (grounding kits, cable clamps, tools, etc).

Throughout all shown products, Customer can just select what is more suitable to satisfy its requirements ... without worrying about quality: it is assured by CPE Italia SpA.

In fact, everything is supervised by CPE Italia SpA:

- Cables: For any reason, Customer may wish to use a specific brand already qualified and used within his organization and well accepted.
  CPE ITALIA SpA,
  because of its vast experience on the market can fulfil his specific request.
  In the same time, CPE ITALIA SpA, by means of
  STARWIRE ENGINEERING (SWE)
  made by a group of highly skilled specialists and consultants driving some cable manufacturers, can provide to Customers the necessary cable with any desired characteristics and an outstanding quality.
  Only the cables produced under the direct supervision of STARWIRE ENGINEERING Group constitute the Starwire® Product line.

- Connectors and adapters: no doubt about the competence of CPE Italia SpA on this domain: since 1998, its products received the "Declaration of Conformity" by the Communication Ministry. Definition of connector characteristics through its R&D office as well as the capability of production on its own is a fact started almost 15 years ago.

- Assembling: this is an other activity lasting since years. Also on this matter there is an award of the same Ministry but, in addition, there is the satisfaction of many Customers: the production average in the last 5 years is of 1.2 Million assembled cables/year.

- Grounding kit: an other design coming out from our R&D Group. Fully qualified by CESI (Italian Experimental Centre for Electricity), is produced by CPE Italia SpA at a volume of .5 Million pcs/year

- The same R&D Group, by gathering years and years of experience has defined the specifications and the production process definition of many other products: Clamps, Adapters, Connectors for elliptical wave guides, Assembled racks to interface different mobile phone operators, etc.

Conclusion: we strongly hope that the present catalogue will helpfully give to our Telecommunication Customer an exhaustive idea of its capabilities, its extensive experiences, its broad connection with extremely important Partners.
All this background, gathered in more than 30 years of presence on the market, is the key factor allowing CPE Italia SpA to offer to his Customers the best service, assistance and advises possible.

Connection Technology for Wireless Communication Systems

Due to its almost unique value added chain, CPE ITALIA SpA along with STARWIRE ENGINEERING Group is able to offer cable solutions both with copper and fiber optic elements, making up standard as well as special or hybrid cables according to our customer's requirements or whole cable systems for their optimal solutions.

Products are manufactured in selected plants scattered around the world. All these plants certified by STARWIRE ENGINEERING Group offer high-quality and environmentally compatible products (DIN EN ISO 9001 and DIN EN ISO 14001, DIN EN 9100).

CPE ITALIA SpA offers a comprehensive product range of cables, connectors and accessories for **Mobile Network Solutions,** such as GSM, CDMA, 3G, WiMAX and radio link systems.
Our **Starwire®** product line offer the whole of **Connection Technology for Wireless Communications Systems** and will be highlighted in this catalogue. Feel free to contact our sales team if you are looking for further information on a product or any other site solution to suit your special application. We are happy to provide you with the perfect cable or cable system solution!

Contents

	Page
Product Introduction	2
Order Code Rules	3 to 4
Radiating Coaxial Cables	
RMC 75 Series (75 Ohm)	5
RMC 50L Low Loss Series (from 75 up to 450 Mhz)	6
RMC 50LM Low Loss Series (from 75 up to 900 Mhz)	7
RMC 50 MH Low Loss Series (from 150 Mhz to 2.4 Ghz)	8
RMC 50 LMH Low Loss Series (from 75 Mhz to 2.6 Ghz)	9
RMC 50L (from 75 up to 450 Mhz)	10
RMC 50LM (from 75 up to 900 Mhz)	11
RMC 50 MH (from 150 Mhz to 2.4 Ghz)	12
RMC 50 LMH (from 75 Mhz to 2.6 Ghz)	13
CMC50 Series (from 150 Mhz to 2.4 Ghz)	14 to 17
CMC50D Low Loss Series	18 to 21
CMC50B Series	22
Connectors	23
Accessories	24 to 28
Quality and Certifications	29 to 30
Notes	
Sales Network	

Radiating Cable is a kind of coaxial cable whose outer conductor is incompletely sealed. During the signal transmission within radiating cable, part of the radio frequency signal can be coupled to outer space through the outer conductor slots. On the contrary, the radio frequency signal of the outer space can also be coupled into the inner part of the radiating cable through the outer conductor slots.
So radiating cable has the twofold purpose to work as a transmission line and as a transmitting-receiving antenna.
Radiating cables are generally used in a specific space where normal communication antenna has difficulty if not impossibility to play a role, especially in the telecommunication system where an individual antenna would not provide adeguate coverage. That means that radiating coaxial cable can adequately cover the weak or blind areas of mobile telecommunications.

CHARACTERISTICS

Through special structures designing and slot optimization grouping, the family of radiating coaxial cables shown on ths catalogue have outstanding transmitting performances such as:

- Low attenuation
- Stable transmitting performances
- Excellent field strength covering performances
- Non-Contaminating fire - retardant PE outer sheath without halogen

APPLICATIONS

After special designing, radiating coaxial cable is mainly applied in tunnels, mines, intelligent buildings and railways where radio signals can be hardly transmitted or they cannot be transmitted at all in wireless telecommunications and TETRA system. The concrete applications are:

- GSM-R telecommunication system along the railway
- Mobile telecommunication system in urban track traffic (such as light rail, metro, magnetically levitated train, etc.)
- Information transmission in the FM frequency and wireless alarm signal
- Mobile telecommunication in sealed or relatively sealed buildings such as intelligent buildings, large export area, underground parks, supermrkets, etc.
- Security alarm monitor system, such as airport caution areas, military target areas, airport security systems, etc.
- Government organizations or personal target protection area (i.e.banks)

- **Inner Conductor**: it is a wire made of copper-clad aluminium, smooth copper tube or corrugated copper tube according to the conductor size.
- **Insulation**: it has a cellular foaming polyethylene structure. It is manufactured by a unique process by using an ozone -friendly gas. The high foaming degree guarantees low longitudinal attenuation. The foaming insulation is bonded to the inner conductor by a pre-coating layer. This layer ensures good adhesion of the inner conductor to the insulation. It also allows an easy, complete removal of the dielectrict during connector installation.
- **Outer Conductor**: For radiation mode cable (RMC) an overlapping copper foil with punched slots is used. For coupling mode cabling (CMC) a corrugated copper tube with milled slots or braiding structure is used.
- **Taped covering** (optional): to overlap the copper foil outer conductor, an additional layer of tape is used to ensure the structural stability of the outer condctor during the process of production and application. Fire-retardant materials such as mica tape, can be used according to Customer demands.
- **Jacket**: The standard cable construction uses weather-resistant black polyethylene as the outer jacket. Cables are also available with a flame retardant and haloge-free outer jacket for applications requiring these features.

PRODUCT CODING RULES: *RADIATING MODE COAXIAL CABLES*

RMC 50 MH 158 1 Z

Type of leaky cable:
RMC - Radiating mode

Impedance:
50 Ohm
75 Ohm

Frequency range:
L = </= 500 MHz
M= from 500 MHz up to 1.000 MHz
H= from 1.700 MHz up to 2.600 MHz

Cable size:
78 = 7/8"
114 = 1 1/4"
158 = 1 5/8"
78L = 7/8" in low loss
114L = 1 1/4" in low loss
158L = 1 5/8" in low loss

Design Revision:
1 = first design issue

Jacket type:
Z = Fire retardant Halogen free PE

PRODUCT CODING RULES: COUPLING MODE COAXIAL CABLES
- Corrugated copper outer conductor

CMC 50 S 158 1 Z

Type of leaky cable:
CMC - Coupling Mode

Impedance:
50 Ohm

Type of outer conductor
S = Simple Slot
D = Double Slot

Cable size:
38 = 3/8"
12 = 1/2"
58 = 5/8"
78 = 7/8"
114 = 1 1/4"
158 = 1 5/8"
12L = 1/2" in low loss
78L = 7/8" in low loss
114L = 1 1/4" in low loss
158L = 1 5/8" in low loss

Design Revision:
1 = first design issue

Jacket type:
Z = Fire retardant
Halogen free PE

PRODUCT CODING RULES: COUPLING MODE COAXIAL CABLES
- Sparsely braided outer conductor

CMC 50 B 9

Type of leaky cable:
CMC - Coupling Mode

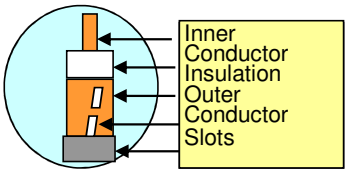
Impedance:
50 Ohm
75 Ohm

Type of outer conductor:
B = Braided

Equivalent insulation outer conductor

RADIATING COAXIAL CABLES

Construction and Specifications



Typical application:
High steady communication system in wireless dispatch of railway, especially in mountain areas, tunnels, subways, etc.

RMC 75L SERIES		RMC 75L-114-1	RMC 75L-114-2	RMC 75L-114-3
INNER CONDUCTOR	Material	Smooth copper tube	Smooth copper tube	Helically corrugated copper tube
	Diameter mm	7,80	7,80	7,80
INSULATOR	Material	Physically foamed PE	Physically foamed PE	Physically foamed PE
	Diameter mm	32,50	32,50	32,50
OUTER CONDUCTOR	Material	Overlapping copper foil	Overlapping copper foil	Overlapping copper foil
	Diameter mm	32,70	32,70	32,70
JACKET	Material	PE or fire retardant PE	PE or fire retardant PE	PE or fire retardant PE
	Diameter mm	37,00	37,00	37,00

MECHANICAL PROPERTIES				
Bending radius	mm	380	380	380
Pulling strengh	N	3000	3000	3000
Recommended Temperature	Store	-70°C +85°C	-70°C +85°C	-70°C +85°C
	Installation	-40°C +60°C	-40°C +60°C	-40°C +60°C
	Operation	-55°C +85°C	-55°C +85°C	-55°C +85°C

ELECTRICAL PROPERTIES			
Impedance Ohm	75+/-2	75+/-2	75+/-2
Capacitance pF/m	50	50	50
Propagation velocity %	88	88	88
Insulation Dielectric Strenght kV	10,0	10,0	10,0
Jacket spark test voltage kVAC	10,0	10,0	10,0
Insulation Resistance Mohm - Km	>5 x 10^3	>5 x 10^3	>5 x 10^3
VSWR	</= 1,3	</= 1,3	</= 1,3

ATTENUATION and COUPLING LOSS**			
Nominal Attenuation 20°C,dB/100m at 450 MHz	2,50	2,70	3,60
Coupling Loss*** (50%/95%) dB at 450 MHz	82	72	62

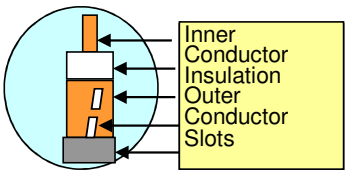
NOTES:

* Bending Test Method is according to IEC 61196.1

** Attenuation and CouplingLoss are measured by the free space method according to IEC 611960.4.

*** Coupling Loss values are given with a tolerance of +/- 5 dB.

Construction and Specifications



Typical application: Suitable for various types of analog, digital, wireless communication for which the operating frequency is less than 500 MHz, such as railways wireless dispatching on 450 MHz, public security and fire protection dispatching on 350MHz, communications in mine on 150MHzfrequency, etc.

RMC 50L LOW LOSS SERIES		RMC 50L-78L-1	RMC 50L-114L-1	RMC 50L-158L-1
INNER CONDUCTOR	Material	Smooth copper tube	Smooth copper tube	Helically corrugated copper tube
	Diameter mm	9,40	13,20	18,30
INSULATOR	Material	Physically foamed PE	Physically foamed PE	Physically foamed PE
	Diameter mm	23,00	33,10	43,50
OUTER CONDUCTOR	Material	Overlapping copper foil	Overlapping copper foil	Overlapping copper foil
	Diameter mm	23,30	33,40	43,80
JACKET	Material	PE or fire retardant PE	PE or fire retardant PE	PE or fire retardant PE
	Diameter mm	27,60	37,50	48,50

MECHANICAL PROPERTIES				
Bending radius	mm	280	381	508
Pulling strengh	N	2300	3000	1700
Recommended Temperature	Store	-70°C +85°C	-70°C +85°C	-70°C +85°C
	Installation	-40°C +60°C	-40°C +60°C	-40°C +60°C
	Operation	-55°C +85°C	-55°C +85°C	-55°C +85°C

ELECTRICAL PROPERTIES			
Impedance Ohm	50+/-1	50+/-1	50+/-1
Capacitance pF/m	76	76	76
Propagation velocity %	88	88	88
Insulation Dielectric Strenght kV	10,0	10,0	15,0
Jacket spark test voltage kVAC	8,0	10,0	10,0
Insulation Resistance Mohm - Km	>5 x 10^3	>5 x 10^3	>5 x 10^3
VSWR	</= 1,3	</= 1,3	</= 1,3

ATTENUATION and COUPLING LOSS**				
Nominal Attenuation 20°C,dB/100 m	75 MHz	1,00	0,64	0,50
	150 MHz	1,40	0,94	0,66
	350 MHz	2,60	1,60	1,20
	450 MHz	2,80	1,92	1,40
Coupling Loss*** (50%/95%) dB	75 MHz	56/60	58/68	67/72
	150 MHz	62/68	64/72	68/78
	350 MHz	53/56	56/61	65/70
	450 MHz	55/60	56/62	66/69

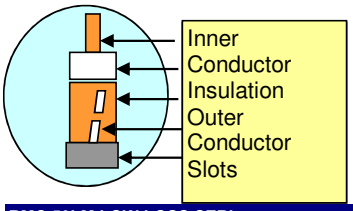
NOTES:

* Bending Test Method is according to IEC 61196.1

** Attenuation and CouplingLoss are measured by the free space method according to IEC 61196.4.

*** Coupling Loss values are given with a tolerance of +/- 5 dB,

Construction and Specifications



Typical application: Suitable for various types of analog, digital wireless communication for which the operating frequency is below 1000 MHz, such as the TETRA system, GSM-R railway wireless dispatching, the mobile telecommunication system, also suitable for the above systems that also have a coverage below 500 MHz in the same occasion.

RMC 50LM LOW LOSS SERI		RMC 50LM-78L-1	RMC 50LM-114L-1	RMC 50LM-158L-1
INNER CONDUCTOR	Material	Smooth copper tube	Smooth copper tube	Helically corrugated copper tube
	Diameter mm	9,40	13,20	18,30
INSULATOR	Material	Physically foamed PE	Physically foamed PE	Physically foamed PE
	Diameter mm	23,00	33,10	43,50
OUTER CONDUCTOR	Material	Overlapping copper foil	Overlapping copper foil	Overlapping copper foil
	Diameter mm	23,30	33,40	43,80
JACKET	Material	PE or fire retardant PE	PE or fire retardant PE	PE or fire retardant PE
	Diameter mm	27,60	37,50	48,50
MECHANICAL PROPERTIES				
Bending radius	mm	280	381	508
Pulling strengh	N	2300	3000	1700
Recommended Temperature	Store	-70°C +85°C	-70°C +85°C	-70°C +85°C
	Installation	-40°C +60°C	-40°C +60°C	-40°C +60°C
	Operation	-55°C +85°C	-55°C +85°C	-55°C +85°C
ELECTRICAL PROPERTIES				
Impedance	Ohm	50+/-1	50+/-1	50+/-1
Capacitance	pF/m	76	76	76
Propagation velocity	%	88	88	88
Insulation Dielectric Strenght	kVI	10,0	10,0	15,0
Jacket spark test voltage	kVAC	8,0	10,0	10,0
Insulation Resistance	Mohm - Kr	>5 x 10^3	>5 x 10^3	>5 x 10^3
VSWR		</= 1,3	</= 1,3	</= 1,3
ATTENUATION and COUPLING LOSS**				
Nominal Attenuation 20°C,dB/100 m	75 MHz	1,10	0,70	0,50
	150 MHz	1,50	1,00	0,66
	350 MHz	2,50	1,50	1,20
	450 MHz	2,70	1,80	1,40
	800 MHz	4,20	2,80	2,00
	900 MHz	4,50	3,50	2,20
Coupling Loss*** (50%/95%) dB	75 MHz	56/62	64/75	66/79
	150 MHz	62/72	71/81	68/79
	350 MHz	70/80	70/75	70/76
	450 MHz	67/77	66/70	66/69
	800 MHz	62/63	64/70	63/66
	900 MHz	62/72	62/68	62/64

NOTES:

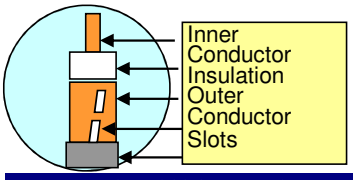
* Bending Test Method is according to IEC 61196.1

** Attenuation and CouplingLoss are measured by the free space method according to IEC 61196.4.

*** Coupling Loss values are given with a tolerance of +/- 5 dB.

RADIATING COAXIAL CABLES

Construction and Specifications



Typical application: Suitable for public mobile telecommunication systems. It also covers 3G communication band and 2,4 GHz open frequency band, such as frequency bands used by mobile telecommunication operators.

RMC 50MH LOW LOSS SERI		RMC 50MH-78L-1	RMC 50MH-114L-1	RMC 50MH-158L-1
INNER CONDUCTOR	Material	Smooth copper tube	Smooth copper tube	Helically corrugated copper tube
	Diameter mm	9,40	13,20	18,30
INSULATOR	Material	Physically foamed PE	Physically foamed PE	Physically foamed PE
	Diameter mm	23,00	33,10	43,50
OUTER CONDUCTOR	Material	Overlapping copper foil	Overlapping copper foil	Overlapping copper foil
	Diameter mm	23,30	33,40	43,80
JACKET	Material	PE or fire retardant PE	PE or fire retardant PE	PE or fire retardant PE
	Diameter mm	27,60	37,50	48,50
MECHANICAL PROPERTIES				
Bending radius	mm	280	381	508
Pulling strengh	N	2300	3000	1700
Recommended Temperature	Store	-70°C +85°C	-70°C +85°C	-70°C +85°C
	Installation	-40°C +60°C	-40°C +60°C	-40°C +60°C
	Operation	-55°C +85°C	-55°C +85°C	-55°C +85°C
ELECTRICAL PROPERTIES				
Impedance	Ohm	50+/-1	50+/-1	50+/-1
Capacitance	pF/m	76	76	76
Propagation velocity	%	88	88	88
Insulation Dielectric Strenght	kVI	10,0	10,0	15,0
Jacket spark test voltage	kVAC	8,0	10,0	10,0
Insulation Resistance	Mohm - Kr	>5 x 10^3	>5 x 10^3	>5 x 10^3
VSWR		</= 1,3	</= 1,3	</= 1,3
ATTENUATION and COUPLING LOSS**				
Nominal Attenuation 20°C,dB/100 m	150 MHz	1,50	1,10	0,70
	350 MHz	2,50	1,60	1,10
	450 MHz	2,70	1,90	1,30
	800 MHz	4,10	2,80	1,90
	900 MHz	4,50	3,00	2,20
	1.800 MHz	7,90	5,60	5,20
	2.200 MHz	10,26	6,20	4,60
	2.400 MHz	11,68	7,40	4,60
Coupling Loss*** (50%/95%) dB	150 MHz	65/77	82/92	77/86
	350 MHz	72/82	90/103	86/97
	450 MHz	77/89	90/103	88/100
	800 MHz	64/75	69/72	65/68
	900 MHz	62/72	68/71	61/63
	1.800 MHz	60/66	59/65	53/55
	2.200 MHz	59/67	62/72	60/64
	2.400 MHz	60/68	60/70	60/70

NOTES:

* Bending Test Method is according to IEC 61196.1

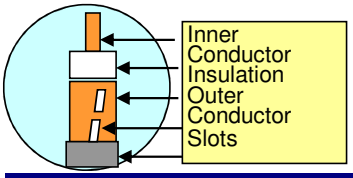
** Attenuation and CouplingLoss are measured by the free space method according to IEC 61196.4.

*** Coupling Loss values are given with a tolerance of +/- 5 dB.

Cables Connectors SWE Protections Accessories

RADIATING COAXIAL CABLES

Construction and Specifications



Typical application: Suitable for the coverage of multi-systems public network in the subway

RMC 50LMH LOW LOSS SEI		RMC 50LMH-78L-1	RMC 50LMH-114L-1	RMC 50LMH-158L-1
INNER CONDUCTOR	Material	Smooth copper tube	Smooth copper tube	Helically corrugated copper tube
	Diameter mm	9,40	13,20	18,30
INSULATOR	Material	Physically foamed PE	Physically foamed PE	Physically foamed PE
	Diameter mm	23,00	33,10	43,50
OUTER CONDUCTOR	Material	Overlapping copper foil	Overlapping copper foil	Overlapping copper foil
	Diameter mm	23,30	33,40	43,80
JACKET	Material	PE or fire retardant PE	PE or fire retardant PE	PE or fire retardant PE
	Diameter mm	27,60	37,50	48,50
MECHANICAL PROPERTIES				
Bending radius	mm	280	381	508
Pulling strengh	N	2300	3000	1700
Recommended Temperature	Store	-70°C +85°C	-70°C +85°C	-70°C +85°C
	Installation	-40°C +60°C	-40°C +60°C	-40°C +60°C
	Operation	-55°C +85°C	-55°C +85°C	-55°C +85°C
ELECTRICAL PROPERTIES				
Impedance	Ohm	50+/-1	50+/-1	50+/-1
Capacitance	pF/m	76	76	76
Propagation velocity	%	88	88	88
Insulation Dielectric Strenght	kVD	10,0	10,0	15,0
Jacket spark test voltage	kVAC	8,0	10,0	10,0
Insulation Resistance	Mohm - Km	>5 x 10^3	>5 x 10^3	>5 x 10^3
VSWR		</= 1,3	</= 1,3	</= 1,3
ATTENUATION and COUPLING LOSS**				
Nominal Attenuation 20°C,dB/100 m	75 MHz	1,10	0,70	0,50
	150 MHz	1,50	1,10	0,70
	450 MHz	2,70	1,90	1,30
	900 MHz	4,48	2,94	2,00
	1.800 MHz	7,70	5,46	3,30
	2.200 MHz	10,10	6,10	4,00
	2.400 MHz	11,68	7,40	4,60
	2.600 MHz	13,90	9,68	5,40
Coupling Loss*** (50%/95%) dB	75 MHz	60/66	75/84	74/89
	150 MHz	65/77	82/92	76/85
	450 MHz	72/84	83/93	75/78
	900 MHz	66/74	72/79	69/71
	1.800 MHz	62/70	68/74	64/68
	2.200 MHz	61/69	64/75	61/67
	2.400 MHz	60/68	59/70	60/69
	2.600 MHz	60/68	63/67	59/67

NOTES:

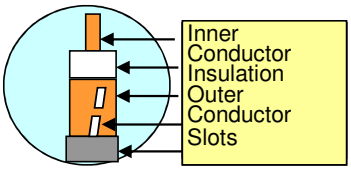
* Bending Test Method is according to IEC 61196.1

** Attenuation and CouplingLoss are measured by the free space method according to IEC 61196.4.

*** Coupling Loss values are given with a tolerance of +/- 5 dB.

RADIATING COAXIAL CABLES

Construction and Specifications



Typical application: Suitable for various types of analog, digital, wireless communication for which the operating frequency is less than 500 MHz, such as railways wireless dispatching on 450 MHz, public security and fire protection dispatching on 350MHz, communications in mine on 150MHzfrequency, etc.

RMC 50L SERIES		RMC 50L-78-1	RMC 50L-114-1	RMC 50L-158-1
INNER CONDUCTOR	Material	Smooth copper tube	Smooth copper tube	Helically corrugated copper tube
	Diameter mm	9,00	13,00	17,30
INSULATOR	Material	Physically foamed PE	Physically foamed PE	Physically foamed PE
	Diameter mm	22,50	32,80	43,50
OUTER CONDUCTOR	Material	Overlapping copper foil	Overlapping copper foil	Overlapping copper foil
	Diameter mm	22,80	33,10	43,80
JACKET	Material	PE or fire retardant PE	PE or fire retardant PE	PE or fire retardant PE
	Diameter mm	27,30	37,00	48,00

MECHANICAL PROPERTIES				
Bending radius	mm	280	380	485
Pulling strengh	N	2300	3000	1700
Recommended Temperature	Store	-70°C +85°C	-70°C +85°C	-70°C +85°C
	Installation	-40°C +60°C	-40°C +60°C	-40°C +60°C
	Operation	-55°C +85°C	-55°C +85°C	-55°C +85°C

ELECTRICAL PROPERTIES			
Impedance Ohm	50+/-1	50+/-1	50+/-1
Capacitance pF/m	76	76	76
Propagation velocity %	88	88	88
Insulation Dielectric Strenght kV	10,0	10,0	15,0
Jacket spark test voltage kVAC	8,0	10,0	10,0
Insulation Resistance Mohm - Kr	>5 x 10^3	>5 x 10^3	>5 x 10^3
VSWR	</= 1,3	</= 1,3	</= 1,3

ATTENUATION and COUPLING LOSS**				
Nominal Attenuation 20°C,dB/100 m	75 MHz	1,06	0,83	0,56
	150 MHz	1,76	1,24	0,82
	350 MHz	3,10	2,20	1,78
	450 MHz	3,40	2,30	1,90
Coupling Loss*** (50%/95%) dB	75 MHz	56/60	58/67	66/71
	150 MHz	61/67	63/71	68/76
	350 MHz	53/56	55/60	64/69
	450 MHz	54/59	57/62	64/68

NOTES:

* Bending Test Method is according to IEC 61196.1

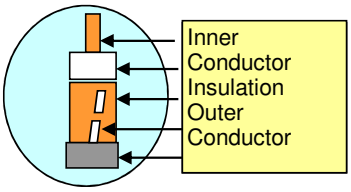
** Attenuation and CouplingLoss are measured by the free space method according to IEC 61196.4.

*** Coupling Loss values are given with a tolerance of +/- 5 dB.

Cables Connectors SWE Protections Accessories

RADIATING COAXIAL CABLES

Construction and Specifications



Typical application: Suitable for various types of analog, digital wireless communication for which the operating frequency is below 1000 MHz, such as the TETRA system, GSM-R railway wireless dispatching, the mobile telecommunication system, also suitable for the above systems that also have a coverage below 500 MHz in the same occasion.

RMC 50LM SERIES		RMC 50LM-78-2	RMC 50LM-114-2	RMC 50LM-158-2
INNER CONDUCTOR	Material	Smooth copper tube	Smooth copper tube	Helically corrugated copper tube
	Diameter mm	9,00	13,00	17,30
INSULATOR	Material	Physically foamed PE	Physically foamed PE	Physically foamed PE
	Diameter mm	22,50	32,80	43,50
OUTER CONDUCTOR	Material	Overlapping copper foil	Overlapping copper foil	Overlapping copper foil
	Diameter mm	22,80	33,10	43,80
JACKET	Material	PE or fire retardant PE	PE or fire retardant PE	PE or fire retardant PE
	Diameter mm	27,30	37,00	48,00
MECHANICAL PROPERTIES				
Bending radius*	mm	280	380	485
Pulling strengh	N	2300	3000	1700
Recommended Temperature	Store	-70°C +85°C	-70°C +85°C	-70°C +85°C
	Installation	-40°C +60°C	-40°C +60°C	-40°C +60°C
	Operation	-55°C +85°C	-55°C +85°C	-55°C +85°C
ELECTRICAL PROPERTIES				
Impedance	Ohm	50+/-1	50+/-1	50+/-1
Capacitance	pF/m	76	76	76
Propagation velocity	%	88	88	88
Insulation Dielectric Strenght	kVD	10,0	10,0	15,0
Jacket spark test voltage	kVAC	8,0	10,0	10,0
Insulation Resistance	Mohm - Km	>5 x 10^3	>5 x 10^3	>5 x 10^3
VSWR		</= 1,3	</= 1,3	</= 1,3
ATTENUATION and COUPLING LOSS**				
Nominal Attenuation 20°C,dB/100 m	75 MHz	1,10	0,90	0,60
	150 MHz	1,90	1,30	0,90
	350 MHz	2,90	2,10	1,70
	450 MHz	3,30	2,20	1,80
	800 MHz	4,90	3,90	2,40
	900 MHz	5,30	4,30	2,70
Coupling Loss*** (50%/95%) dB	75 MHz	64/76	62/71	67/78
	150 MHz	68/80	67/80	74/86
	350 MHz	72/80	72/78	72/79
	450 MHz	69/77	70/80	69/80
	800 MHz	63/71	62/68	63/67
	900 MHz	63/73	62/68	60/63

NOTES:

* Bending Test Method is according to IEC 61196.1

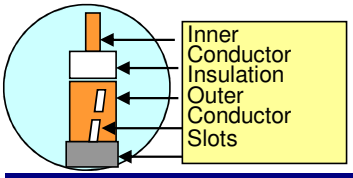
** Attenuation and CouplingLoss are measured by the free space method according to IEC 61196.4.

*** Coupling Loss values are given with a tolerance of +/- 5 dB.

Cables Connectors SWE Protections Accessories

RADIATING COAXIAL CABLES

Construction and Specifications



Typical application: Suitable for public mobile telecommunication systems. It also covers 3G communication band and 2,4 GHz open frequency band, such as frequency bands used by mobile telecommunication operators.

RMC 50MH SERIES		RMC 50MH-78-1	RMC 50MH-114-1	RMC 50MH-158-1
INNER CONDUCTOR	Material	Smooth copper tube	Smooth copper tube	Helically corrugated copper tube
	Diameter mm	9,00	13,00	17,30
INSULATOR	Material	Physically foamed PE	Physically foamed PE	Physically foamed PE
	Diameter mm	22,50	32,80	43,50
OUTER CONDUCTOR	Material	Overlapping copper foil	Overlapping copper foil	Overlapping copper foil
	Diameter mm	22,80	33,10	43,80
JACKET	Material	PE or fire retardant PE	PE or fire retardant PE	PE or fire retardant PE
	Diameter mm	27,30	37,00	48,00
MECHANICAL PROPERTIES				
Bending radius	mm	280	380	485
Pulling strengh	N	2300	3000	1700
Recommended Temperature	Store	-70°C +85°C	-70°C +85°C	-70°C +85°C
	Installation	-40°C +60°C	-40°C +60°C	-40°C +60°C
	Operation	-55°C +85°C	-55°C +85°C	-55°C +85°C
ELECTRICAL PROPERTIES				
Impedance	Ohm	50+/-1	50+/-1	50+/-1
Capacitance	pF/m	76	76	76
Propagation velocity	%	88	88	88
Insulation Dielectric Strenght	kVD	10,0	10,0	15,0
Jacket spark test voltage	kVAC	8,0	10,0	10,0
Insulation Resistance	Mohm - Km	>5 x 10^3	>5 x 10^3	>5 x 10^3
VSWR		</= 1,3	</= 1,3	</= 1,3
ATTENUATION and COUPLING LOSS**				
Nominal Attenuation 20°C,dB/100 m	150 MHz	1,51	1,11	0,83
	350 MHz	2,54	1,85	1,49
	450 MHz	2,78	1,97	1,58
	800 MHz	4,28	2,91	2,30
	900 MHz	4,54	3,22	2,50
	1.800 MHz	8,00	5,80	4,40
	2.200 MHz	10,30	7,00	5,70
	2.400 MHz	11,80	8,20	6,50
Coupling Loss*** (50%/95%) dB	150 MHz	65/77	74/82	77/84
	350 MHz	70/80	80/87	86/97
	450 MHz	72/84	80/87	88/92
	800 MHz	65/74	69/76	65/68
	900 MHz	66/75	68/76	61/68
	1.800 MHz	62/70	61/68	57/65
	2.200 MHz	61/69	65/69	62/69
	2.400 MHz	60/68	62/68	66/72

NOTES:

* Bending Test Method is according to IEC 61196.1

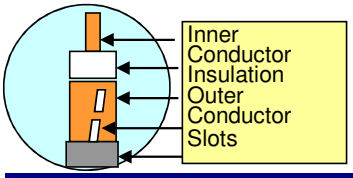
** Attenuation and CouplingLoss are measured by the free space method according to IEC 61196.4.

*** Coupling Loss values are given with a tolerance of +/- 5 dB.

Cables Connectors SWE Protections Accessories

RADIATING COAXIAL CABLES

Construction and Specifications



Typical application: Suitable for the coverage of multi-systems public network in the subway

RMC 50LMH SERIES		RMC 50LMH-78-1	RMC 50LMH-114-1	RMC 50LMH-158-1
INNER CONDUCTOR	Material	Smooth copper tube	Smooth copper tube	Helically corrugated copper tube
	Diameter mm	9,00	13,00	17,30
INSULATOR	Material	Physically foamed PE	Physically foamed PE	Physically foamed PE
	Diameter mm	22,50	32,80	43,50
OUTER CONDUCTOR	Material	Overlapping copper foil	Overlapping copper foil	Overlapping copper foil
	Diameter mm	22,80	33,10	43,80
JACKET	Material	PE or fire retardant PE	PE or fire retardant PE	PE or fire retardant PE
	Diameter mm	27,30	37,00	48,00
MECHANICAL PROPERTIES				
Bending radius	mm	280	380	485
Pulling strengh	N	2300	3000	1700
Recommended Temperature	Store	-70°C +85°C	-70°C +85°C	-70°C +85°C
	Installation	-40°C +60°C	-40°C +60°C	-40°C +60°C
	Operation	-55°C +85°C	-55°C +85°C	-55°C +85°C
ELECTRICAL PROPERTIES				
Impedance	Ohm	50+/-1	50+/-1	50+/-1
Capacitance	pF/m	76	76	76
Propagation velocity	%	88	88	88
Insulation Dielectric Strenght	kVD	10,0	10,0	15,0
Jacket spark test voltage	kVAC	8,0	10,0	10,0
Insulation Resistance	Mohm - Km	>5 x 10^3	>5 x 10^3	>5 x 10^3
VSWR		</= 1,3	</= 1,3	</= 1,3
ATTENUATION and COUPLING LOSS**				
Nominal Attenuation 20°C,dB/100 m	75 MHz	1,10	0,90	0,60
	150 MHz	1,51	1,11	0,85
	450 MHz	2,78	1,97	1,60
	900 MHz	4,50	2,94	2,48
	1.800 MHz	8,50	5,84	4,10
	2.200 MHz	10,80	8,08	5,30
	2.400 MHz	12,30	9,07	6,40
	2.600 MHz	14,00	10,27	7,30
Coupling Loss*** (50%/95%) dB	75 MHz	64/76	62/71	67/78
	150 MHz	65/77	77/83	79/86
	450 MHz	69/78	83/89	88/94
	900 MHz	69/75	68/79	64/72
	1.800 MHz	64/72	65/72	61/65
	2.200 MHz	61/67	67/70	65/70
	2.400 MHz	60/68	66/74	68/72
	2.600 MHz	60/66	63/67	62/69

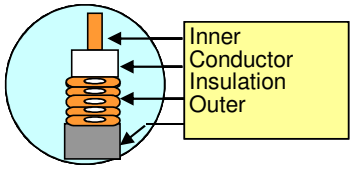
NOTES:

* Bending Test Method is according to IEC 61196.1

** Attenuation and CouplingLoss are measured by the free space method according to IEC 61196.4.

*** Coupling Loss values are given with a tolerance of +/- 5 dB.

Construction and Specifications



Typical application: As a wide leaky coaxial cable, wireless mobile telecommunication, wireless remote control, wireless dispatch, wireless alarming system and so on.

CMC 50S SERIES		CMC 50S-38-1	CMC 50S-12-1
INNER CONDUCTOR	Material	Copper clad aluminium wire	Copper clad aluminium wire
	Diameter mm	3,15	4,8
INSULATOR	Material	Physically foamed PE	Physically foamed PE
	Diameter mm	8,2	12,2
OUTER CONDUCTOR	Material	Corrugated copper tube with single row milled slots	Corrugated copper tube with single row mill
	Diameter mm	9,53	13,8
JACKET	Material	PE or fire retardant PE	PE or fire retardant PE
	Diameter mm	11,2	15,8

MECHANICAL PROPERTIES			
Bending radius	mm	30	80
Pulling strengh	N	1100	1130
Recommended Temperature	Store	-70°C +85°C	-70°C +85°C
	Installation	-40°C +60°C	-40°C +60°C
	Operation	-55°C +85°C	-55°C +85°C

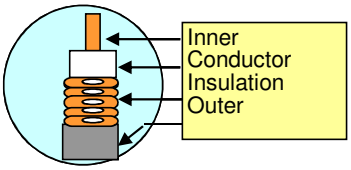
ELECTRICAL PROPERTIES			
Impedance	Ohm	50+/-1	50+/-1
Capacitance	pF/m	76	76
Propagation velocity	%	88	88
Insulation Dielectric Strenght	kV	2,5	6,0
Jacket spark test voltage	kVAC	5,0	8,0
Insulation Resistance	Mohm - Km	>5 x 10^3	>5 x 10^3
VSWR		</= 1,3	</= 1,3

ATTENUATION and COUPLING LOSS*			
Nominal Attenuation 20°C,dB/100 m	150 MHz	4,90	3,30
	450 MHz	8,50	6,60
	900 MHz	12,10	9,50
	1.800 MHz	17,40	13,10
	2.400 MHz	---	15,70
Coupling Loss** (50%/95%) dB	150 MHz	60/75	62/78
	450 MHz	68/78	70/80
	900 MHz	70/80	71/82
	1.800 MHz	74/86	77/88
	2.400 MHz	---	77/87

NOTES:

* Attenuation and Coupling Loss are measured by the free space method according to IEC 61196.4.

** Coupling Loss values are given with a tolerance of +/- 10 dB.



Typical application: As a wide leaky coaxial cable, wireless mobile telecommunication, wireless remote control, wireless dispatch, wireless alarming system and so on.

CMC 50S SERIES		CMC 50S-58-1	CMC 50S-78-1
INNER CONDUCTOR	Material	Smooth copper tube	Smooth copper tube
	Diameter mm	7,05	9,00
INSULATOR	Material	Physically foamed PE	Physically foamed PE
	Diameter mm	18,00	22,50
OUTER CONDUCTOR	Material	Corrugated copper tube with single row milled slots	Corrugated copper tube with single row mill
	Diameter mm	19,80	24,90
JACKET	Material	PE or fire retardant PE	PE or fire retardant PE
	Diameter mm	22,20	27,30

MECHANICAL PROPERTIES			
Bending radius	mm	100	140
Pulling strengh	N	1150	1500
Recommended Temperature	Store	-70°C +85°C	-70°C +85°C
	Installation	-40°C +60°C	-40°C +60°C
	Operation	-55°C +85°C	-55°C +85°C

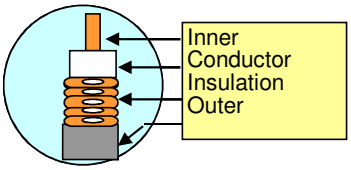
ELECTRICAL PROPERTIES			
Impedance	Ohm	50+/-1	50+/-1
Capacitance	pF/m	76	76
Propagation velocity	%	88	88
Insulation Dielectric Strenght	kV	6,0	10,0
Jacket spark test voltage	kVAC	8,0	8,0
Insulation Resistance	Mohm - Km	>5 x 10^3	>5 x 10^3
VSWR		</= 1,3	</= 1,3

ATTENUATION and COUPLING LOSS*			
Nominal Attenuation 20°C,dB/100 m	150 MHz	2,40	1,80
	450 MHz	4,30	3,60
	900 MHz	6,40	5,10
	1.800 MHz	9,60	7,60
	2.400 MHz	11,40	9,00
Coupling Loss** (50%/95%) dB	150 MHz	70/80	66/76
	450 MHz	74/83	72/80
	900 MHz	72/83	74/85
	1.800 MHz	68/79	80/87
	2.400 MHz	73/82	78/88

NOTES:

* Attenuation and CouplingLoss are measured by the free space method according to IEC 61196.4.

** Coupling Loss values are given with a tolerance of +/- 10 dB.



Typical application: As a wide leaky coaxial cable, wireless mobile telecommunication, wireless remote control, wireless dispatch, wireless alarming system and so on.

CMC 50S SERIES		CMC 50S-78L-1	CMC 50S-114-1
INNER CONDUCTOR	Material	Smooth copper tube	Smooth copper tube
	Diameter mm	9,40	13,00
INSULATOR	Material	Physically foamed PE	Physically foamed PE
	Diameter mm	23,00	32,80
OUTER CONDUCTOR	Material	Corrugated copper tube with single row milled slots	Corrugated copper tube with single row mill
	Diameter mm	25,40	35,80
JACKET	Material	PE or fire retardant PE	PE or fire retardant PE
	Diameter mm	28,00	38,80

MECHANICAL PROPERTIES			
Bending radius	mm	150	200
Pulling strengh	N	1700	2500
Recommended Temperature	Store	-70°C +85°C	-70°C +85°C
	Installation	-40°C +60°C	-40°C +60°C
	Operation	-55°C +85°C	-55°C +85°C

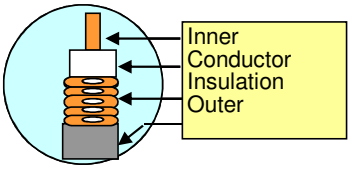
ELECTRICAL PROPERTIES			
Impedance	Ohm	50+/-1	50+/-1
Capacitance	pF/m	76	76
Propagation velocity	%	88	88
Insulation Dielectric Strenght	kV	10,0	10,0
Jacket spark test voltage	kVAC	8,0	10,0
Insulation Resistance	Mohm - Km	>5 x 10^3	>5 x 10^3
VSWR		</= 1,3	</= 1,3

ATTENUATION and COUPLING LOSS*			
Nominal Attenuation 20°C,dB/100 m	150 MHz	1,70	1,30
	450 MHz	3,40	3,00
	900 MHz	5,10	4,00
	1.800 MHz	7,40	5,60
	2.400 MHz	8,80	6,90
Coupling Loss** (50%/95%) dB	150 MHz	66/75	70/80
	450 MHz	72/80	75/85
	900 MHz	72/82	77/86
	1.800 MHz	70/81	77/88
	2.400 MHz	69/80	78/88

NOTES:

* Attenuation and CouplingLoss are measured by the free space method according to IEC 61196.4.

** Coupling Loss values are given with a tolerance of +/- 10 dB.



Typical application: As a wide leaky coaxial cable, wireless mobile telecommunication, wireless remote control, wireless dispatch, wireless alarming system and so on.

CMC 50S SERIES		CMC 50S-158-1	
INNER CONDUCTOR	Material	Helically corrugated copper tube	
	Diameter mm	17,30	
INSULATOR	Material	Physically foamed PE	
	Diameter mm	43,50	
OUTER CONDUCTOR	Material	Corrugated copper tube with single row milled slots	
	Diameter mm	46,50	
JACKET	Material	PE or fire retardant PE	
	Diameter mm	49,50	

MECHANICAL PROPERTIES			
Bending radius	mm	280	
Pulling strengh	N	3000	
Recommended Temperature	Store	-70°C +85°C	
	Installation	-40°C +60°C	
	Operation	-55°C +85°C	

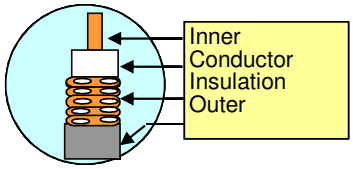
ELECTRICAL PROPERTIES		
Impedance	Ohm	50+/-1
Capacitance	pF/m	76
Propagation velocity	%	88
Insulation Dielectric Strenght	kVI	15,0
Jacket spark test voltage	kVAC	10,0
Insulation Resistance	Mohm - Kr	>5 x 10^3
VSWR		</= 1,3

ATTENUATION and COUPLING LOSS*			
Nominal Attenuation 20°C,dB/100 m	150 MHz	0,80	
	450 MHz	2,00	
	900 MHz	2,70	
	1.800 MHz	4,40	
	2.400 MHz	5,60	
Coupling Loss** (50%/95%) dB	150 MHz	72/84	
	450 MHz	79/85	
	900 MHz	79/85	
	1.800 MHz	80/86	
	2.400 MHz	82/88	

NOTES:

* Attenuation and CouplingLoss are measured by the free space method according to IEC 61196.4.

** Coupling Loss values are given with a tolerance of +/- 10 dB.



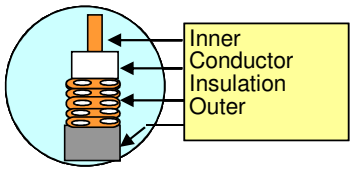
Typical application: As a wide leaky coaxial cable, wireless mobile telecommunication, wireless remote control, wireless dispatch, wireless alarming system and so on.

CMC 50D LOW LOSS SERIE		CMC 50D-12L-1	CMC 50D-78L-1
INNER CONDUCTOR	Material	Copper clad aluminium wire	Smooth copper tube
	Diameter mm	4,80	9,40
INSULATOR	Material	Physically foamed PE	Physically foamed PE
	Diameter mm	12,20	23,00
OUTER CONDUCTOR	Material	Corrugated copper tube with double row milled slots	Corrugated copper tube with double row mi
	Diameter mm	13,80	25,40
JACKET	Material	PE or fire retardant PE	PE or fire retardant PE
	Diameter mm	15,80	28,00
MECHANICAL PROPERTIES			
Bending radius	mm	80	140
Pulling strengh	N	1130	1500
Recommended Temperature	Store	-70°C +85°C	-70°C +85°C
	Installation	-40°C +60°C	-40°C +60°C
	Operation	-55°C +85°C	-55°C +85°C
ELECTRICAL PROPERTIES			
Impedance Ohm		50+/-1	50+/-1
Capacitance pF/m		76	76
Propagation velocity %		88	88
Insulation Dielectric Strenght kVI		6,0	10,0
Jacket spark test voltage kVAC		8,0	8,0
Insulation Resistance Mohm - Kr		>5 x 10^3	>5 x 10^3
VSWR		</= 1,3	</= 1,3
ATTENUATION and COUPLING LOSS*			
Nominal Attenuation 20°C,dB/100 m	150 MHz	3,15	1,75
	450 MHz	5,70	3,05
	900 MHz	8,40	4,40
	1.800 MHz	13,10	6,80
	1.900 MHz	13,60	7,00
	2.200 MHz	14,70	7,80
	2.400 MHz	15,30	8,30
Coupling Loss** (50%/95%) dB	150 MHz	59/71	66/75
	450 MHz	67/79	75/86
	900 MHz	66/78	73/83
	1.800 MHz	68/80	70/81
	1.900 MHz	69/81	70/81
	2.200 MHz	70/82	70/81
	2.400 MHz	70/82	68/80

NOTES:

* Attenuation and CouplingLoss are measured by the free space method according to IEC 61196.4.

** Coupling Loss values are given with a tolerance of +/- 10 dB.



Typical application: As a wide leaky coaxial cable, wireless mobile telecommunication, wireless remote control, wireless dispatch, wireless alarming system and so on.

CMC 50D LOW LOSS SERIE		CMC 50D-114L-1	CMC 50D-158L-1
INNER CONDUCTOR	Material	Smooth copper tube	Helically corrugated copper tube
	Diameter mm	13,20	18,30
INSULATOR	Material	Physically foamed PE	Physically foamed PE
	Diameter mm	33,10	43,50
OUTER CONDUCTOR	Material	Corrugated copper tube with double row milled slots	Corrugated copper tube with double row mi
	Diameter mm	35,80	46,50
JACKET	Material	PE or fire retardant PE	PE or fire retardant PE
	Diameter mm	39,40	50,30
MECHANICAL PROPERTIES			
Bending radius	mm	200	280
Pulling strengh	N	2500	3000
Recommended Temperature	Store	-70°C +85°C	-70°C +85°C
	Installation	-40°C +60°C	-40°C +60°C
	Operation	-55°C +85°C	-55°C +85°C
ELECTRICAL PROPERTIES			
Impedance	Ohm	50+/-1	50+/-1
Capacitance	pF/m	76	76
Propagation velocity	%	88	88
Insulation Dielectric Strenght	kVI	10,0	15,0
Jacket spark test voltage	kVAC	10,0	10,0
Insulation Resistance	Mohm - Kr	>5 x 10^3	>5 x 10^3
VSWR		</= 1,3	</= 1,3
ATTENUATION and COUPLING LOSS*			
Nominal Attenuation 20°C,dB/100 m	150 MHz	1,22	0,86
	450 MHz	2,22	1,60
	900 MHz	3,31	2,42
	1.800 MHz	5,18	3,80
	1.900 MHz	5,35	3,94
	2.200 MHz	5,92	4,36
	2.400 MHz	6,19	4,65
Coupling Loss** (50%/95%) dB	150 MHz	70/80	70/80
	450 MHz	81/93	83/93
	900 MHz	80/92	82/92
	1.800 MHz	77/88	81/91
	1.900 MHz	76/88	80/90
	2.200 MHz	77/88	80/90
	2.400 MHz	79/90	80/90

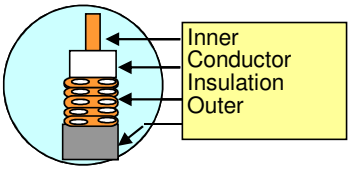
NOTES:

* Attenuation and CouplingLoss are measured by the free space method according to IEC 61196.4.

** Coupling Loss values are given with a tolerance of +/- 10 dB.

RADIATING COAXIAL CABLES

Construction and Specifications



Typical application: As a wide leaky coaxial cable, wireless mobile telecommunication, wireless remote control, wireless dispatch, wireless alarming system and so on.

CMC 50D SERIES		CMC 50D-12-1	CMC 50D-78-1
INNER CONDUCTOR	Material	Copper clad aluminium wire	Smooth copper tube
	Diameter mm	4,80	9,00
INSULATOR	Material	Physically foamed PE	Physically foamed PE
	Diameter mm	12,20	22,50
OUTER CONDUCTOR	Material	Corrugated copper tube with double row milled slots	Corrugated copper tube with double row mi
	Diameter mm	13,80	24,90
JACKET	Material	PE or fire retardant PE	PE or fire retardant PE
	Diameter mm	15,80	27,30
MECHANICAL PROPERTIES			
Bending radius	mm	80	140
Pulling strengh	N	1130	1500
Recommended Temperature	Store	-70°C +85°C	-70°C +85°C
	Installation	-40°C +60°C	-40°C +60°C
	Operation	-55°C +85°C	-55°C +85°C
ELECTRICAL PROPERTIES			
Impedance	Ohm	50+/-1	50+/-1
Capacitance	pF/m	76	76
Propagation velocity	%	88	88
Insulation Dielectric Strenght	kVI	6,0	10,0
Jacket spark test voltage	kVAC	8,0	8,0
Insulation Resistance	Mohm - Kr	>5 x 10^3	>5 x 10^3
VSWR		</= 1,3	</= 1,3
ATTENUATION and COUPLING LOSS*			
Nominal Attenuation 20°C,dB/100 m	150 MHz	3,21	1,80
	450 MHz	5,80	3,30
	900 MHz	8,60	5,00
	1.800 MHz	13,50	8,70
	1.900 MHz	13,90	9,00
	2.200 MHz	14,70	9,70
	2.400 MHz	15,50	10,10
Coupling Loss** (50%/95%) dB	150 MHz	57/69	65/77
	450 MHz	66/78	72/84
	900 MHz	66/78	72/84
	1.800 MHz	67/79	68/80
	1.900 MHz	70/82	68/80
	2.200 MHz	78/90	69/81
	2.400 MHz	83/95	68/80

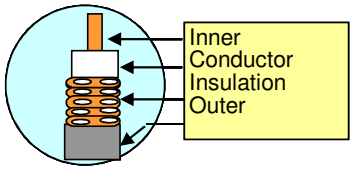
NOTES:

* Attenuation and CouplingLoss are measured by the free space method according to IEC 61196.4.

** Coupling Loss values are given with a tolerance of +/- 10 dB.

RADIATING COAXIAL CABLES

Construction and Specifications



Typical application: As a wide leaky coaxial cable, wireless mobile telecommunication, wireless remote control, wireless dispatch, wireless alarming system and so on.

CMC 50D SERIES		CMC 50D-114-1	CMC 50D-158-1
INNER CONDUCTOR	Material	Smooth copper tube	Helically corrugated copper tube
	Diameter mm	13,00	17,30
INSULATOR	Material	Physically foamed PE	Physically foamed PE
	Diameter mm	32,80	43,50
OUTER CONDUCTOR	Material	Corrugated copper tube with double row milled slots	Corrugated copper tube with double row mi
	Diameter mm	35,80	46,50
JACKET	Material	PE or fire retardant PE	PE or fire retardant PE
	Diameter mm	39,40	49,50
MECHANICAL PROPERTIES			
Bending radius	mm	200	280
Pulling strengh	N	2500	3000
Recommended Temperature	Store	-70°C +85°C	-70°C +85°C
	Installation	-40°C +60°C	-40°C +60°C
	Operation	-55°C +85°C	-55°C +85°C
ELECTRICAL PROPERTIES			
Impedance	Ohm	50+/-1	50+/-1
Capacitance	pF/m	76	76
Propagation velocity	%	88	88
Insulation Dielectric Strenght	kV	10,0	15,0
Jacket spark test voltage	kVAC	10,0	10,0
Insulation Resistance	Mohm - Km	>5 x 10^3	>5 x 10^3
VSWR		</= 1,3	</= 1,3
ATTENUATION and COUPLING LOSS*			
Nominal Attenuation 20°C,dB/100 m	150 MHz	1,35	1,03
	450 MHz	2,51	1,97
	900 MHz	3,81	3,00
	1.800 MHz	6,20	4,80
	1.900 MHz	6,40	4,93
	2.200 MHz	7,20	5,40
	2.400 MHz	7,40	5,80
Coupling Loss** (50%/95%) dB	150 MHz	70/82	74/86
	450 MHz	77/89	80/92
	900 MHz	66/87	79/91
	1.800 MHz	72/84	74/86
	1.900 MHz	74/86	76/88
	2.200 MHz	77/89	83/95
	2.400 MHz	79/91	85/97

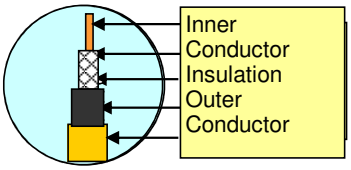
NOTES:

* Attenuation and CouplingLoss are measured by the free space method according to IEC 61196.4.

** Coupling Loss values are given with a tolerance of +/- 10 dB.

RADIATING COAXIAL CABLES

Construction and Specifications



Typical application: Suitable for voice communication and data collection and so on inside the coal mine.

CMC 50B SERIES		CMC 50B-9	CMC 75B-9
INNER CONDUCTOR	Material	Copper clad aluminium wire	Copper clad aluminium wire
	Diameter mm	3,50	2,00
INSULATOR	Material	Physically foamed PE	Physically foamed PE
	Diameter mm	8,80	8,80
OUTER CONDUCTOR	Material	Sparsely braided copper wire	Sparsely braided copper wire
	Braiding Coverag	40%-50%	40%-50%
FIRST JACKET	Material	Black LPDE	Black LPDE
	Diameter mm	11,70	11,70
SECOND JACKET	Material	Yellow fire retardant PVC	Yellow fire retardant PVC
	Diameter mm	15,80	13,70

MECHANICAL PROPERTIES			
Bending radius	mm	125	125
Recommended Temperature	Store	-20°C +80°C	-20°C +80°C
	Installation	0°C +60°C	0°C +60°C
	Operation	-20°C +80°C	-20°C +80°C

ELECTRICAL PROPERTIES			
Impedance	Ohm	50+/-1	75+/-2
Capacitance	pF/m	76	50
Propagation velocity	%	86	86
Insulation Dielectric Strenght	kVD	1,0	1,0
Jacket spark test voltage	kVAC	3,0	3,0
Insulation Resistance	Mohm - Km	>5 x 10^3	>5 x 10^3
VSWR		</= 1,3	</= 1,3

ATTENUATION and COUPLING LOSS*			
Nominal Attenuation 20°C,dB/100 m	60 MHz	3,70	3,70
	150 MHz	5,70	5,20
	900 MHz	9,70	9,70
Coupling Loss** (50%/95%) dB	60 MHz	80	75
	150 MHz	70	75
	900 MHz	70	70

NOTES:

* Attenuation and CouplingLoss are measured by the free space method according to IEC 61196.4.

** Coupling Loss values are given with a tolerance of +/- 10 dB.

		DIMENSIONI CAVI RADIANTI			
		1/2"	7/8"	1 1/4"	1 5/8"
CONNECTOR TYPES	N Male	SWR12NM0	03SWR78NM0001	03SWR114NM001	03SWR158NM001
	N Female	SWR12NF0	03SWR78NF0001	03SWR114NF001	03SWR158NF001
	7/16 Male	SWR12M71	03SWR78M71601	03SWR114M7161	03SWR158M7161
	7/16 Female	SWR12F716	03SWR78F71601	03SWR114F7161	03SWR158F7161

PRODUCT DESCRIPTION

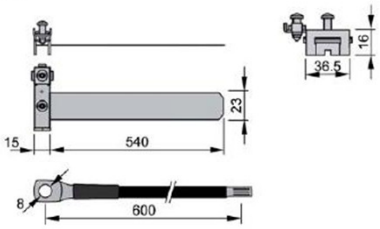
- All-purpose earthing clip with 16 mm² grounding conductor for all connector sizes from 1/2" to 1-5/8".

Grounding conductor

Strip earthing clip

FEATURES and BENEFITS

- Fast, easy and reliable installation
- Corrosion resistant
- Multiple use for connector sizes from 1/2" to 1-5/8"



TECHNICAL FEATURES

Strip earthing clip		
• Tightening block and screws material		Nickel-plated brass
• Tightening strap material		Stainless steel
• Clamping diameter range	mm	10 ... 150
• Connection options	mm²	max. 2 conductors 2.5 - 25
Grounding conductor		
• Insulation		PVC (free of lead)
• Color		black
• Cross section	mm²	16 (copper)
• Length	mm	600
• Cable lug	mm	16 x 8
• Screw: Stainless steel, hex socket cap screw	mm	M6 x 20

PRODUCT OVERVIEW

Product reference	*Contents*
• 11.700.000-371	• 1 strip earthing clip
	• 1 earth lead (60 cm) with attached lug + M6 + washer + nut

PRODUCT DESCRIPTION

Clic clamps are used for installing radiating cables in galleries and tunnels with or without spacers. The installation is very simple and quick.

FEATURES and BENEFITS

- Lock with 1 or 2 locking positions
- Automatic locking by pushing cable into clamp, reusable
- Unlocks with screwdriver
- Pivoted hangers allow installation down to -25°C
- Slot design allows installation correction of up to 4.5 mm
- Slot for insertion of flange for rod and stud mounting

TECHNICAL FEATURES

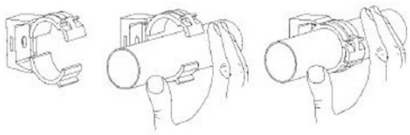
Clic type		Clic Clamp
• Material		Pure Polyamide, halogen free, fire class UL94HB, UV-resistant
• Environmental		
Operating Temperature	°C	-40 to +110
Installation Temperature	°C	-25 to +60
• Color		standard: black grey (RAL 7035) by request

Clic type		for 1/2"	for 5/8"	for 7/8"	for 1-1/4"	for 1-5/8"
• Clamping range	mm	14.3 - 16.8	19.5 - 22.0	24.6 - 27.8	35.5 - 39.5	46.5 - 50.5
• Max. load	N	600	700	850	1100	1300
• Part reference		03SWRCLIC012	03SWRCLIC058	03SWRCLIC078	03SWRCLIC114	03SWRCLIC158

SPACERS and ACCESSORIES

Reference	Description	Use with	Picture
Spacers			
• 03SWR80SRB	Round base spacer 80 mm	03SWR125WS , 03SWRM6HSH	
• 03SWR45SRB	Rectangular base spacer 45 mm	03SWR085WS	
• 03SWR85SRB	Rectangular base spacer 85 mm	03SWR125WS	
• 03SWR75SSP	Stainless steel spacer 75 mm	03SWRM8SSP , 03SWRM6SSN	
Flat nuts			
• 03SWRM6SSN	Flat nut M6, stainless steel	All clic clamps	
Wood screws, stainless steel			
• 03SWR040WS	Wood screw 4.5 x 40 Clic Clamp without spacer		
• 03SWR085WS	Wood screw 4.5 x 85	03SWR45SRB	
• 03SWR125WS	Wood screw 4.5 x 125	03SWR85SRB or 03SWR80SRB	
Bolt with metric thread, stainless steel			
• 03SWRM6HSH	M6 x 90, hex socket head	03SWR80SRB , 03SWRM6SSP	
Plugs			
• 03SWR45PWS	Nylon plug for wood screw diameter 4.5 mm	Wood screws	
• 03SWRM6SSP	Stainless steel plug M6	Bolt 03SWRM6HSH	
• 03SWRM8SSP	Stainless steel plug M8	Spacer 03SWR75SSP	
• 03SWRHSSSP	Stainless steel hammer set plug	03SWRM6SSN , 03SWR85SRB	
• 03SWRHSPDR	Drill for installation of the hammer set plugs	03SWRHSSSP	
• 03SWRHSPTO	Setting tool of the hammer set plugs	03SWRHSSSP	

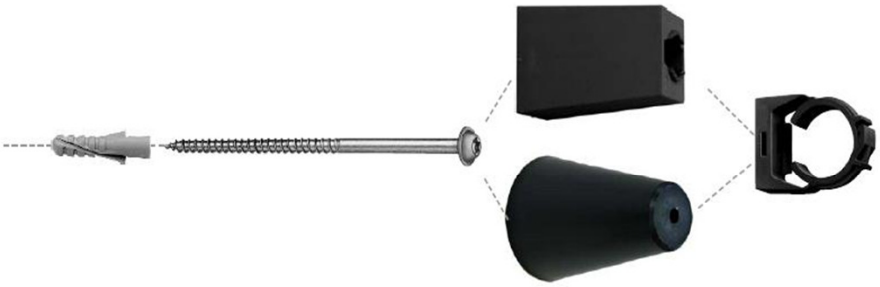
INSTALLATION EXAMPLES



Single-hand installation – a matter of course with CLIC, place the cable, apply slight pressure and the clamp locks itself with a sharp clic.

1. Installation with wood screw and Nylon plug

2. Installation with Spacers, buttonhead wood screw pressed-on washer and Nylon plug



3. Installation with Hammer Set Plug (with or without spacer)

4. Installation with M8/M6 stainless steel spacer, FN6 and flush metal anchor

PRODUCT DESCRIPTION

Stainless Stell Cable Clamps are used to provide Fire Resistant installations of Radiating Cables in galleries or tunnels with or without spacers. The installation is very simple and quick. To limit the interference that could be caused by Metal Objects on the RF Field generated by a Radiating Cable, only every 10th fixing should be metallic.

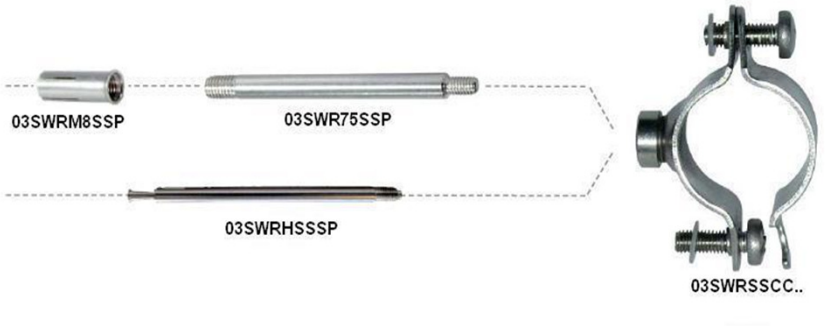
Stainless Steel Cable Clamp

Cable type	Clamp type	Use with
• 1/2"	03SWRSSCC20	Hammer set plug
• 5/8"	03SWRSSCC25	03SWRHSSSP
• 7/8"	03SWRSSCC32	or
• 1-1/4"	03SWRSSCC46	Stainless Steel spacer
• 1-5/8"	03SWRSSCC50	03SWR75SSP

TECHNICAL FEATURES

Clamp Type	Ø min. mm	Max. Load (N)
• 03SWRSSCC20	13	450
• 03SWRSSCC25	18	380
• 03SWRSSCC32	24	300
• 03SWRSSCC46	39	230
• 03SWRSSCC50	51	180

Installation with M8/M6 spacer and stainless steel clamp



Starwire®

Quality Certifications (obtained & maintained so far)

DNV

DET NORSKE VERITAS

QUALITY MANAGEMENT SYSTEM CERTIFICATE

Certificato No. / Certificate No. **CERT-01876-97-AQ-MIL-SINCERT**

Si attesta che / This certifies that

Il sistema di gestione per la qualità di / the quality management system of

CPE Italia S.p.A.

Via Dante Chiasserini, 15 - 20157 Milano (MI) - Italy
SS. Appia Km. 195,000 - 81047 Vitulazio (CE) - Italy

È conforme ai requisiti della norma per i sistemi di gestione per la qualità
Conforms to the quality management systems standard

UNI EN ISO 9001:2008 (ISO 9001:2008)

Questa certificazione è valida per il seguente campo applicativo:
This certificate is valid for the following products or services:

(Ulteriori chiarimenti riguardanti lo scopo e l'applicabilità dei requisiti della normativa si possono ottenere consultando l'organizzazione certificata)
(Further clarifications regarding the scope and the applicability of the requirements of the standard(s) may be obtained by consulting the certified organization)

Progettazione, assemblaggio e commercializzazione di componenti coassiali passivi per telecomunicazioni e componenti passivi per trasmissione dati

Design, assembly and trade of coaxial passive components for the telecommunication and passive components for data transmission

Data Prima Emissione *First Issue Date*	*Data di scadenza* *Expiry Date*
1997-06-18	**2013-09-28**

Luogo e data *Place and date*: **Agrate Brianza, (MI) 2010-09-28**

Settore EA : 19

SINCERT
ACCREDITAMENTO ORGANISMI DI CERTIFICAZIONE E ISPEZIONE
SGQ Registrazione N. 003A
SGA Registrazione N. 003D
PRD Registrazione N. 003B
Membro degli Accordi di Mutuo Riconoscimento EA e IAF
Signatory of EA and IAF Mutual Recognition Agreements

per l'Organismo di Certificazione *for the Accredited Unit*: **DET NORSKE VERITAS ITALIA S.R.L.**

Pasquale Talucci
Lead Auditor

Vittore Marangon
Management Representative

La validità del presente certificato è subordinata a sorveglianza periodica (ogni 6, 9 o 12 mesi) e al riesame completo del sistema con periodicità triennale
The validity of this certificate is subject to periodical audits (every 6, 9 or 12 months) and the complete re-assessment of the system every three years
Le aziende in possesso di un certificato valido sono presenti nella banca dati sul sito www.dnv.it e sul sito Sincert (www.sincert.it) - All the companies with a valid certificate are online at the following addresses: www.dnv.it and www.sincert.it

DNV

DET NORSKE VERITAS

QUALITY MANAGEMENT SYSTEM CERTIFICATE

Certificato No. / Certificate No. 11044-2007-AQ-ITA-SINCERT

Si attesta che / This certifies that

il sistema di gestione per la qualità di / the quality management system of

CPE Italia S.p.A.

Via Dante Chiasserini, 15 - 20157 Milano (MI) - Italy
SS. Appia Km. 195,000 - 81047 Vitulazio (CE) - Italy

È conforme ai requisiti della norma per i sistemi di gestione per la qualità
Conforms to the quality management system standard

UNI EN ISO 9001:2008 (ISO 9001:2008)

e / and

UNI EN 9100:2005 (EN 9100:2003)

Certificazione rilasciata in conformità al Regolamento Tecnico SINCERT RT – 18
Certification has been granted in conformity with the SINCERT Technical Regulation RT - 18

La Verifica è stata condotta in accordo ai requisiti della Norma EN 9104. DNV è accreditato da SINCERT sotto il controllo dello Schema Europeo Aerospaziale
The assessment was performed in accordance with the requirements of the Norm EN 9104. DNV is accredited by SINCERT under the control of the Aerospace European Scheme

Questa certificazione è valida per il seguente campo applicativo
This certificate is valid for the following products or services:

(Ulteriori chiarimenti riguardanti lo scopo e l'applicabilità dei requisiti della normativa si possono ottenere consultando l'organizzazione certificata)
(Further clarifications regarding the scope and the applicability of the requirements of the standard(s) may be obtained by consulting the certified organisation)

Assemblaggio e commercializzazione di componenti coassiali passivi per telecomunicazioni e componenti passivi per trasmissione dati

Assembly and trade of coaxial passive components for the telecommunication and passive components for data transmission

Data Prima Emissione *First Issue Date*	*Data di scadenza* *Expiry Date*
2007-10-26	**2013-09-28**

Luogo e data *Place and date*: **Agrate Brianza, (MI) 2010-09-28**

Settore EA : 19

IAQ SCSA Schema di Certificazione Settore Aerospaziale

SINCERT
ACCREDITAMENTO ORGANISMI DI CERTIFICAZIONE E ISPEZIONE
SGQ Registrazione N. 003A
SGA Registrazione N. 003D
PRD Registrazione N. 003B
Membro degli Accordi di Mutuo Riconoscimento EA e IAF
Signatory of EA and IAF Mutual Recognition Agreements

per l'Organismo di Certificazione *for the Accredited Unit*: **DET NORSKE VERITAS ITALIA S.R.L.**

Pasquale Talucci
Lead Auditor

Vittore Marangon
Management Representative

La validità del presente certificato è subordinata a sorveglianza periodica (ogni 6, 9 o 12 mesi) e al riesame completo del sistema con periodicità triennale
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DNV

DET NORSKE VERITAS

ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFICATE

Certificato No. / Certificate No. **74833-2010-AE-ITA-SINCERT**

Si attesta che / This certifies that

il sistema gestione ambientale di / the environmental management system of

CPE ITALIA S.p.A.

Via Dante Chiasserini, 15 - 20157 Milano (MI) - Italy

È conforme ai requisiti della normativa
Conforms to the environmental management system standard

UNI EN ISO 14001:2004 (ISO 14001:2004)

Certificazione rilasciata in conformità al Regolamento Tecnico SINCERT RT - 09
Certification has been granted in conformity with the SINCERT Technical Regulation RT - 09

Questa certificazione è valida per il seguente campo applicativo:
This certificate is valid for the following products or services:

Progettazione e assemblaggio mediante la fasi di taglio, saldatura e moldatura di componenti coassiali passivi per telecomunicazioni e componenti passivi per trasmissione dati

Design and assembling through thefollowing processes: cuting, sodering, molding of coaxial passive components for both telecommunication and for data transmission

Data di scadenza *Expiry Date*
2013-03-09

Luogo e data *Place and date*: **Agrate Brianza, (MI) 2010-03-09**

Settore EA : 19

SINCERT
ACCREDITAMENTO ORGANISMI DI CERTIFICAZIONE E ISPEZIONE
SGQ Registrazione N. 003A
SGA Registrazione N. 003D
PRD Registrazione N. 003B
Membro degli Accordi di Mutuo Riconoscimento EA e IAF
Signatory of EA and IAF Mutual Recognition Agreements

per l'Organismo di Certificazione *for the Accredited Unit*: **DET NORSKE VERITAS ITALIA S.R.L.**

Mara Zaccari
Lead Auditor

Vittore Marangon
Management Representative

La validità del presente certificato è subordinata a sorveglianza periodica (ogni 6, 9 o 12 mesi) e al riesame completo del sistema con periodicità triennale
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Le aziende in possesso di un certificato valido sono presenti nella banca dati sul sito www.dnv.it e sul sito sincert (www.sincert.it) - All the companies with a valid certificate are online at the following addresses: www.dnv.it and www.sincert.it

WIRING HARNESS

UL ONLINE CERTIFICATIONS DIRECTORY

UL Online Certifications Directory

ZPFW2.E327870
Wiring Harnesses - Component

CPE ITALIA SPA E327870
VIA D.CHIASSERINI 15
20157 MILANO, MI ITALY

Underwriters Laboratories Inc.®"

An independent organization working for a safer world with integrity, precision and knowledge.

CQC

QUALITY MANAGEMENT SYSTEM CERTIFICATE

Certificate No.: 00109Q211723R0S/3200

We hereby certify that
Wuxi CPE Electronics Co., Ltd.

Registration Address: Taihu Town (Xuelang, Banqiao), Binhu District, Wuxi City, Jiangsu Province, P.R.China
Production Address: No.503, Datong Road, Economy Development Zone, Wuxi City, Jiangsu Province, P.R.China

by reason of its
Quality Management System
has been awarded this certificate for compliance with the standard
ISO9001: 2008
GB/T 19001-2008
The Quality Management System Applies in the following area:
Production of Communication Cable Assembly

Certified since: Sep. 15, 2006 **Valid from: Aug. 24, 2010** **Valid until: Sep. 21, 2012**

After a surveillance cycle, the certificate is valid only when used together with an Acceptance Notice of Surveillance Audit issued by CQC.
Please access www.cqc.com.cn for checking validity of the certificate.

CNAS MANAGEMENT SYSTEM CNAS C001-Q · IAF · IQNet · CHINA QUALITY CERTIFICATION CENTRE

Signed by: Wang Kejiao

CHINA QUALITY CERTIFICATION CENTRE
Section 9, No.188, Nansihuan(the South Fourth Ring Road) Xilu(West Road), Beijing 100070,China
http://www.cqc.com.cn

NGV

The Authentication Certificate Of Environmental Management System

Wuxi CPE Electronics Co., Ltd.
Banqiao, Xuelang, Taihu Town, Binhu District, Jiangsu Province P.R.China P.C.: 214125

According to your organization's application, our center carried out audit and certification in accordance with the requirements with guidance for use of *Environmental Management System* (GB/T24001-2004/ISO14001:2004), it accords with the requirements through assessment.

The scope of the certified EMS is:

The environmental management activities of the relevant departments.
Regional office in cable assembly products and services.

Registered No.: 05307E10055R0S
Date of Registration: 8-5-2008
Date of Validity: 8-5-2008~7-5-2011

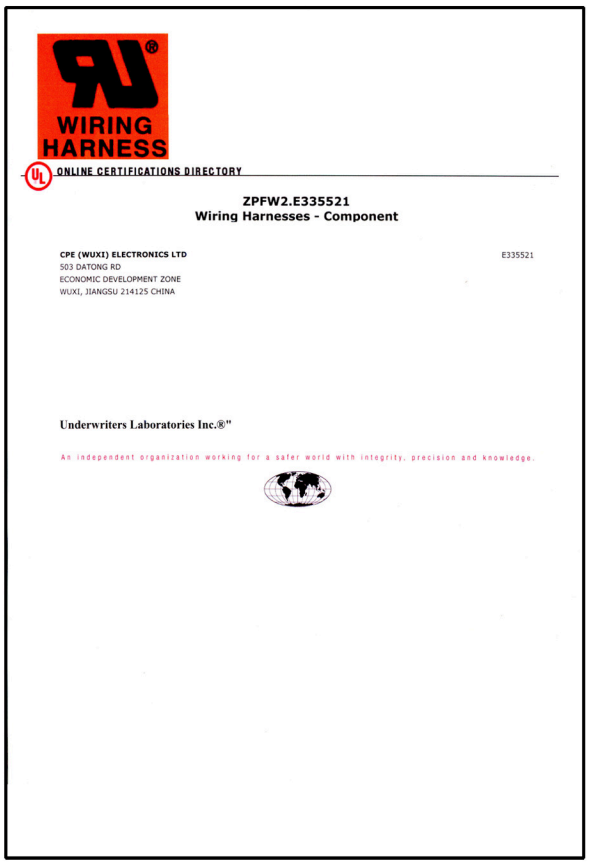
If not stick the laser surveillance mark after the date of surveillance expires, this certificate is invalid.

The first surveillance	Mark stick here	The second surveillance	Mark stick here	The third surveillance	Mark stick here

CNAS MANAGEMENT SYSTEM CNAS C053-Q · IAF MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT

Beijing NGV Certification Center Director: *Chenshiming*

Address of Certification Authority:52/F,Block A Tianchuangshiyuan, No.310 Huizhongbeili, Yayuncun, Chaoyang District,Beijing.
Tel: 010-64802303 P.C.: 100012 Http://www.ngv.org.cn



WIRING HARNESS

UL ONLINE CERTIFICATIONS DIRECTORY

ZPFW2.E335521
Wiring Harnesses - Component

CPE (WUXI) ELECTRONICS LTD E335521
503 DATONG RD
ECONOMIC DEVELOPMENT ZONE
WUXI, JIANGSU 214125 CHINA

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SGS

Certificado BR10/5600

O sistema de gestão de

CPE do Brasil Componentes Profissionais para Eletrônica Indústria e Comércio Ltda.

Rua Inajá, 670/698 - Vila Emiliano Perneta
Pinhais - PR - 83324-050 - BR

Foi auditado e certificado encontrando-se em conformidade com os requisitos da norma:

ISO 9001:2008

Para as seguintes atividades:

"Fabricação e venda de chicotes elétricos, cabos montados e subconjuntos, comercialização de componentes coaxiais passivos para telecomunicações e componentes passivos para transmissão de dados."

Informações adicionais a respeito do escopo e da aplicação dos requisitos da norma ISO 9001:2008 podem ser obtidos consultando a organização.

Este certificado é válido de 07/08/2010 até 06/08/2013
e mantém-se válido sujeito a auditorias de acompanhamento satisfatórias.
Revisão 1. Certificado desde Maio/2007

Aprovado por

Rosemary Vianna
Diretora

SGS ICS Certificadora Ltda.
Avenida das Nações Unidas, 11633 – 4º A CJ 41B
Brooklin - 04578-000 - São Paulo - SP - Brasil
Fone: 11-5501-4809 / Fax: 11-5501-4830
www.br.sgs.com

Gestão da Qualidade NBR ISO 9001 · OCS 0009

Accredited by Member of the International Accreditation Forum Multilateral Recognition Arrangement for Quality Management Systems

Página 1 de 1

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Notes

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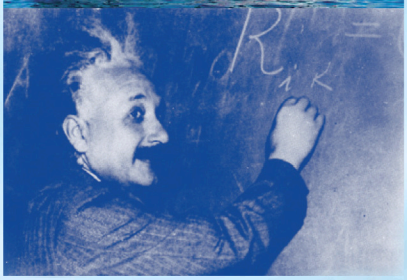

cpe italia

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