

MICO®

KME

Mineral Insulated Cables

KME Italy S.p.A.
[I]
MICO®



*Member of the
KME Group*

WHAT IS KME

A major European industrial group which for more than a hundred years has been a leading force in the world of copper processing industry

World leader in semi-finished copper products

KME Group is the world's largest manufacturer of semi-finished copper and copper alloy products (excluding copper wire), with a share of 30% of the European market and 7% worldwide

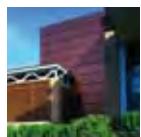
Major production sites

The Group boasts 14 production sites strategically located in the 5 European countries with the largest semi-finished products markets, as well as in China.

A hundred years of history

KME Group has deep roots in the history of European industry: it was founded and first quoted on the stock markets in the 19th century.

Our product range includes a complete assortment of semi-finished copper and copper alloy products designed for use in numerous applications. We keep an open dialogue with our customers, so that we can work together to develop resourceful, economical solutions for all kinds of copper applications, old and new.



Roofing systems

KME offers copper as a basic material for architecture and building: surfaces and systems for roofing and facade cladding and for the draining of rainwater.



Copper Industrial Tubes

A high level of quality characterizes our copper tubes; their characteristics have been studied to meet the needs of various industrial applications: air conditioning and refrigeration systems, construction of boilers, making of high-frequency coaxial cables, fittings and the solar heating industry.



Brass and copper rods

KME has the widest range of brass and copper rods on the market, in every size and shape, for all fields of application, from architecture to the electrical industry.



Special products

We are able to create highly technological products: piping systems for the marine industry, tube bundles, mineral insulated cables, special extruded and drawn products in every size and shape, and finished machined parts based on the customer's design.



Plumbing systems

High performance copper tubes, both bare and covered, which are ideal for any plumbing and heating application in the building sector as well as for the distribution of medical gases in the healthcare industry.



Industrial Rolled products

KME manufactures rolled products made of copper, brass, bronze and other copper-based alloys in every shape and size and with different surface treatments in order to meet the requests from many industrial sectors.



Engineered products

KME is a worldwide leader in the supply of copper and special alloy components for the continuous casting of steel and non-ferrous metals, just as it is a qualified and professional partner in the designing of these systems.

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Characteristics

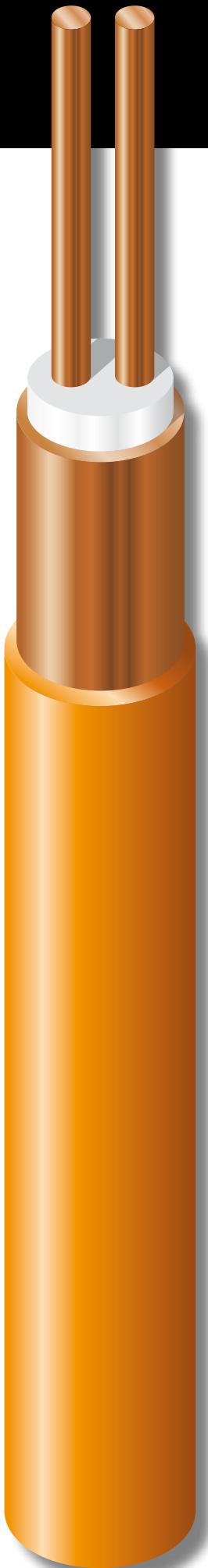
MICO® Mineral Insulated Cable is composed by:

- ETP solid (not stranded) copper cores, from 1 to 400 mm², melting point 1082°C
- Magnesium Oxide (MgO) as electrical insulation, due to its high performance at high temperature (melting point 2600°C)
- high quality DHP copper sheath, manufactured starting from tubes extruded and drawn only (not welded), melting point 1082°C
- LSF additional outer covering. Such flame retardant poliolephin is characterised by high performance in corrosion resistance and low smoke emission.

MICO® Cable range is divided into:

- Light duty cables (300/500 V) from 2 to 7 cores, from 1 to 4 mm² size
- Heavy Duty Cables (450/750 V) from 1 to 19 cores, 400 mm² maximum size for single core, 25 mm² maximum size up to 4 cores.

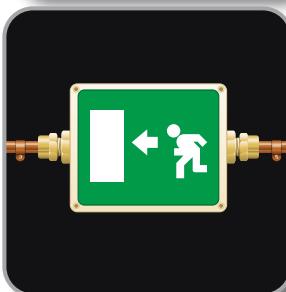
Production process held by KME foresee many steps of diameter reduction (both drawings and rollings) separated by high temperature annealing. Long lead time (average is 8 weeks) grants high quality cable at the end of the process: strong compression of MgO powder (density about 2 kg/cm³) allows very high values of insulation resistance (also if burned, 180° bended or flattened) and thermal conductivity. Therefore current ratings are higher than soft skin cables, especially at high temperature.



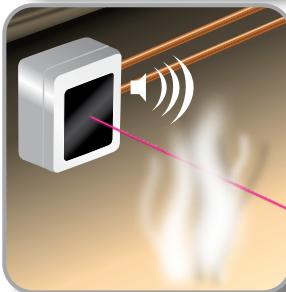
Applications and advantages



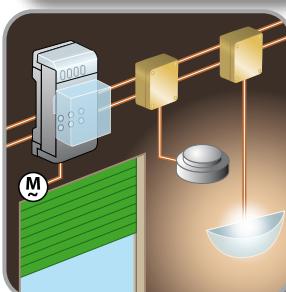
FIRE RESISTANCE – weaker situation is copper melting point (1082°C) MICO® is the safest cable, it can withstand to severe fire, water and mechanical tests as foreseen by British (LPCB), European and australian standards



EMERGENCY SYSTEMS – MICO® is the only cable to go on working also during a fire, so to supply (for at least 120 minutes, maximum time 3 hours) emergency lamps, acoustic alarms, sprinklers, automatic doors, elevators and so on



FIRE DETECTION – MICO® cables allow fire controller units to receive signals by fire detectors also during a fire. MICO® twisted cables (for signal transmission), in addition to MICO® light duty cables (for power supply), are able to match technical requirements by most popular fire detection systems



BUS SYSTEMS – world leaders like ABB or Schneider Electric already tested and approved MICO® as suitable cable for distribution in their bus systems, limiting MICO® specification in fire hazardous areas or in historical buildings, where standard bus cables need are not recommended



HISTORICAL BUILDINGS – standard electrical plant can deeply impact aesthetical aspect of old buildings: where integrity of original structure must be saved and hidden installation is not allowed (or its cost would be too much), MICO® is the perfect solution for an installation at sight. You can also trust on copper capacity of disappearing, day after day, if used on particular environment like stone, brick, wood.



TUNNELS – emergency lights and fan coils are required to go on working also during a fire, to allow people using emergency exits. In order to save their life, MICO® is really able to withstand high temperatures during a car fire.



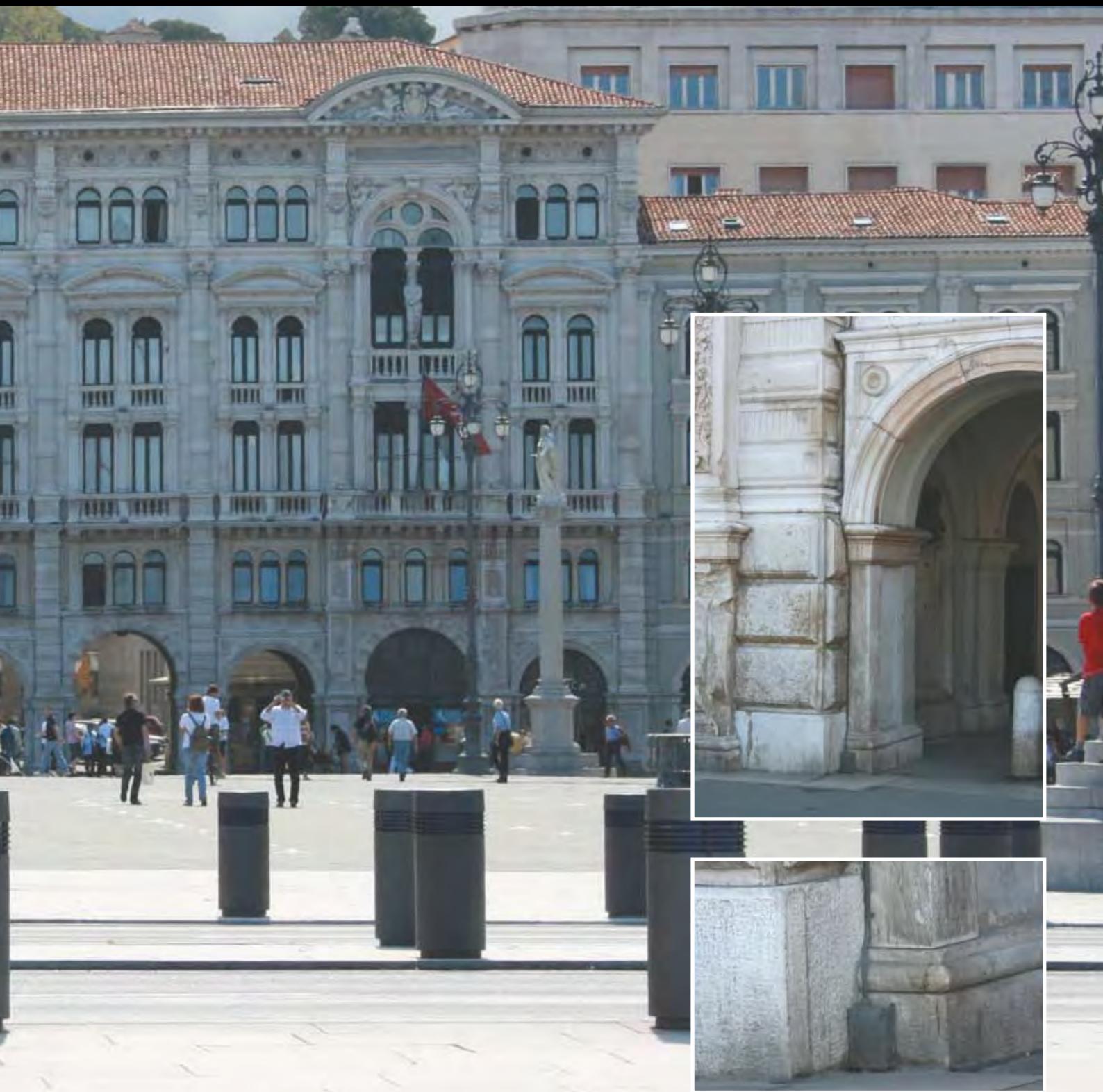
Mineral Insulated cables – Light duty cable (300/500 V) – is the best solution for electric circuits installed at sight, in historical or relevant buildings, both indoor and outdoor. Due to their small dimensions, they can be installed quickly and easily. Copper outer sheath, whose cross section is designed to be used as earth conductor, protects the cable from any mechanical stress like impacts, bending or flattening, giving at the same time a beautiful esthetical aspect to the cable. MICO® is not only a simple cable but, combining its use with the large range of copper and brass accessories, designed by KME, it can be considered as a complete wiring system.



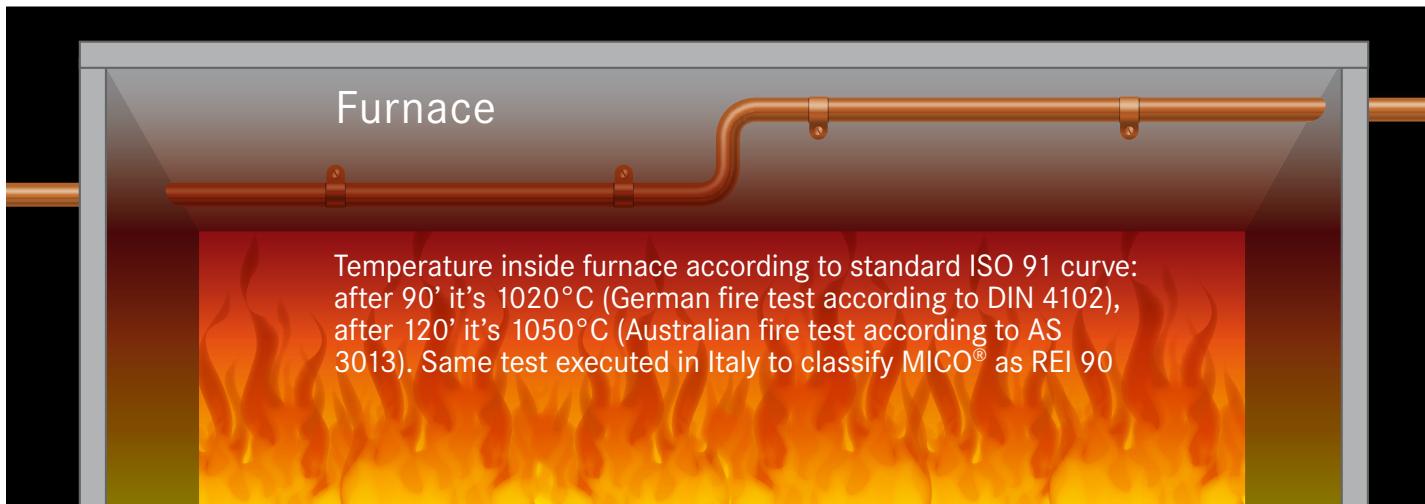


The increasing of nominal voltage (450/750 V), due to higher thickness of copper outer sheath and Magnesium Oxide insulation, allows KME Mineral Insulated heavy duty cables to be installed in every critical environment, due to high humidity degree, or wherever the installation is dangerous due to possible mechanical damages. Wide manufacturing range, similar to soft skin wiring cable range, allow heavy duty cables design whenever big power is required.

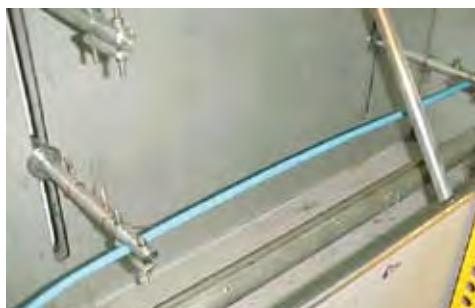
Mineral cables are more efficient than standard wiring cables, in terms of resistance to thermal effects: this means that core cross sections (and cable outer diameters as well) can be reduced, under the same conditions of current ratings.



Fire resistance



CWZ



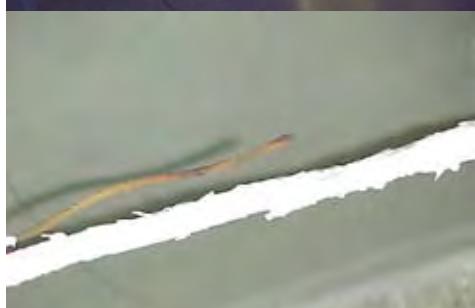
Standard soft skin fire resistant cable before fire test



Standard cable failure after few minutes of fire test



Soft skin cable insulation cracks and falls down after some mechanical hits



This is how soft skin fire resistant cable remains after few minutes of fire: would you trust on it ?

MICO® cable during fire test (950°C for 180 minutes)



MICO® cable during water test (650°C for 15 minutes, then water crush trough sprinklers)

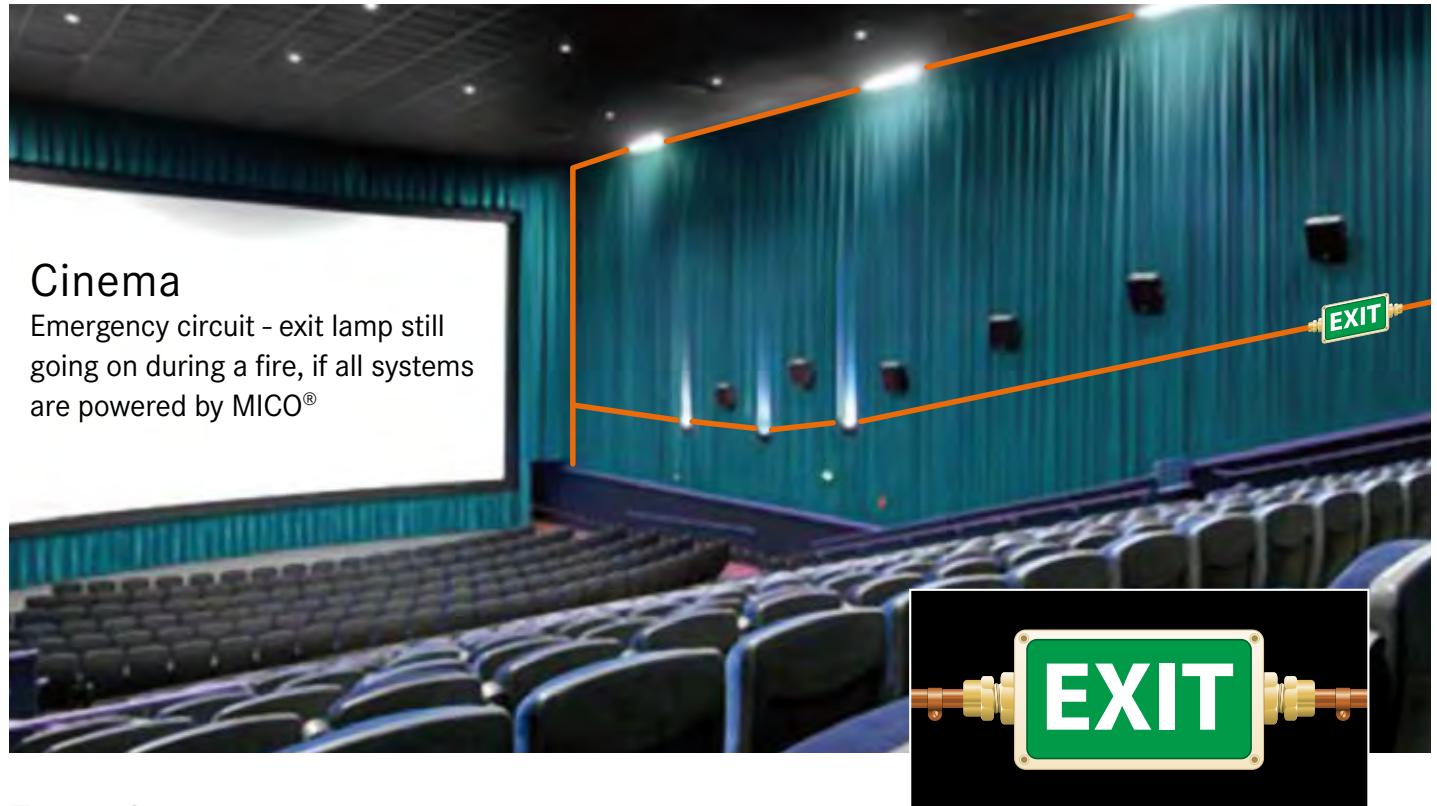


MICO® cable during mechanical test (950°C again for 15 minutes then mechanical impact directly on the cable)



MICO® cables after all test: power supply is still granted





Tunnels

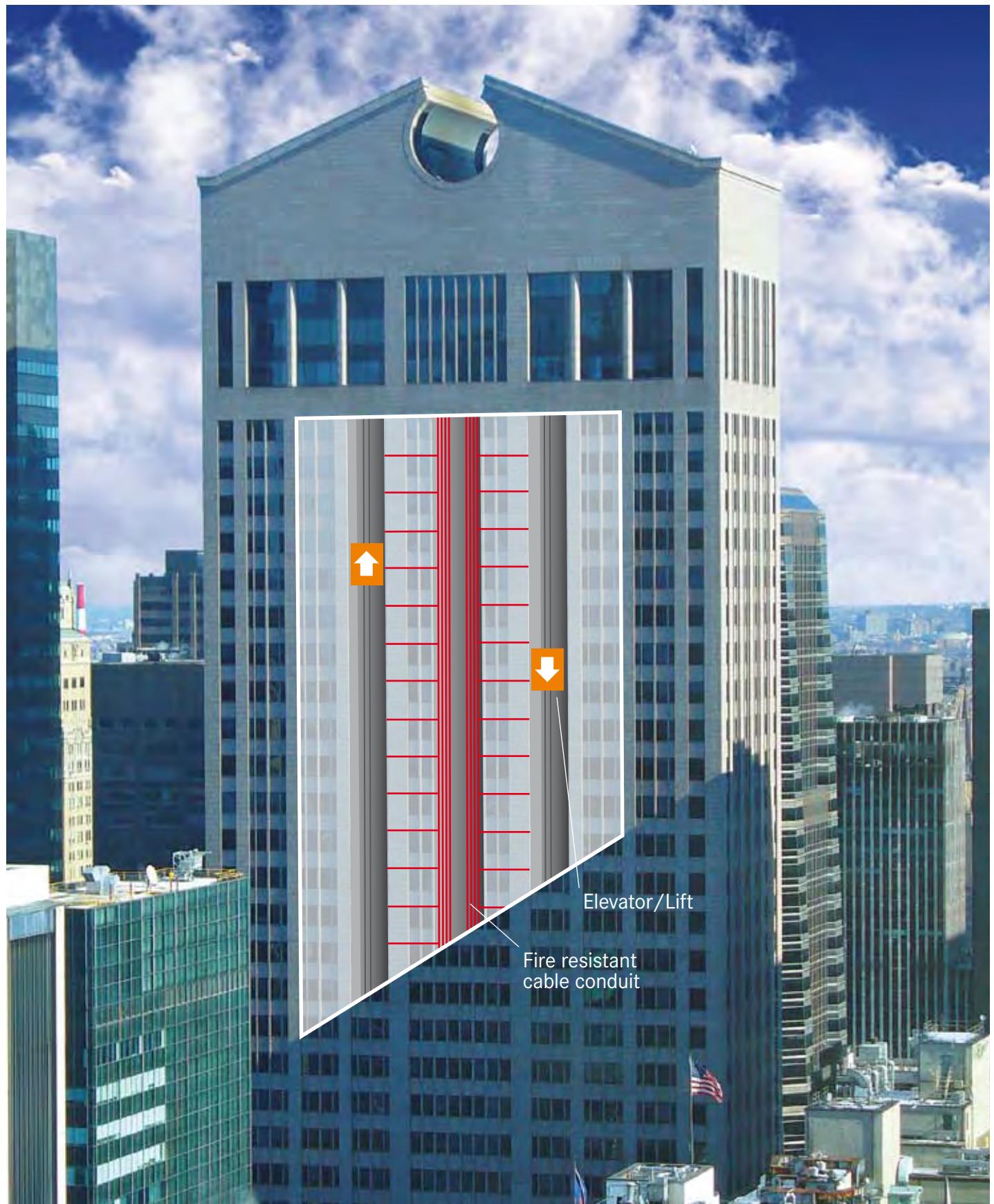
Fan coils, exit LED lights, emergency and standard lighting can continue to work if powered by MICO®



Fire resistance

Building applications

Emergency circuit - single core cables on fire proof cable conduit, to supply each level of building Elevator power supply

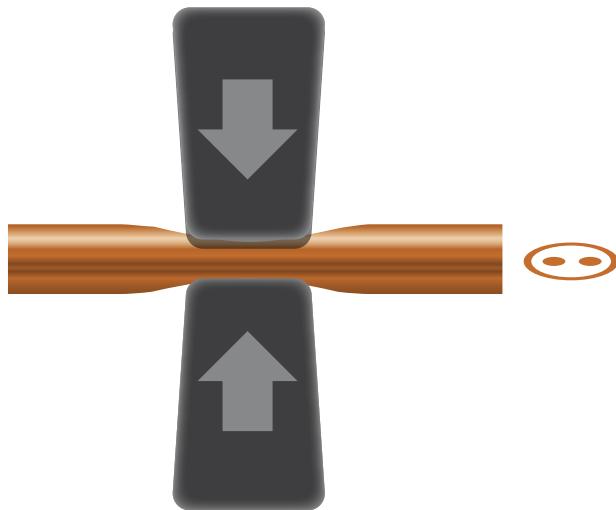


Industrial applications

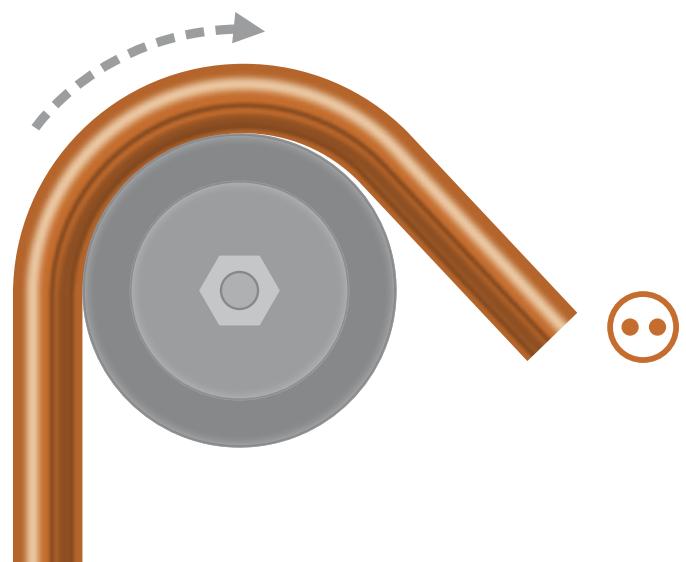


Mechanical performance

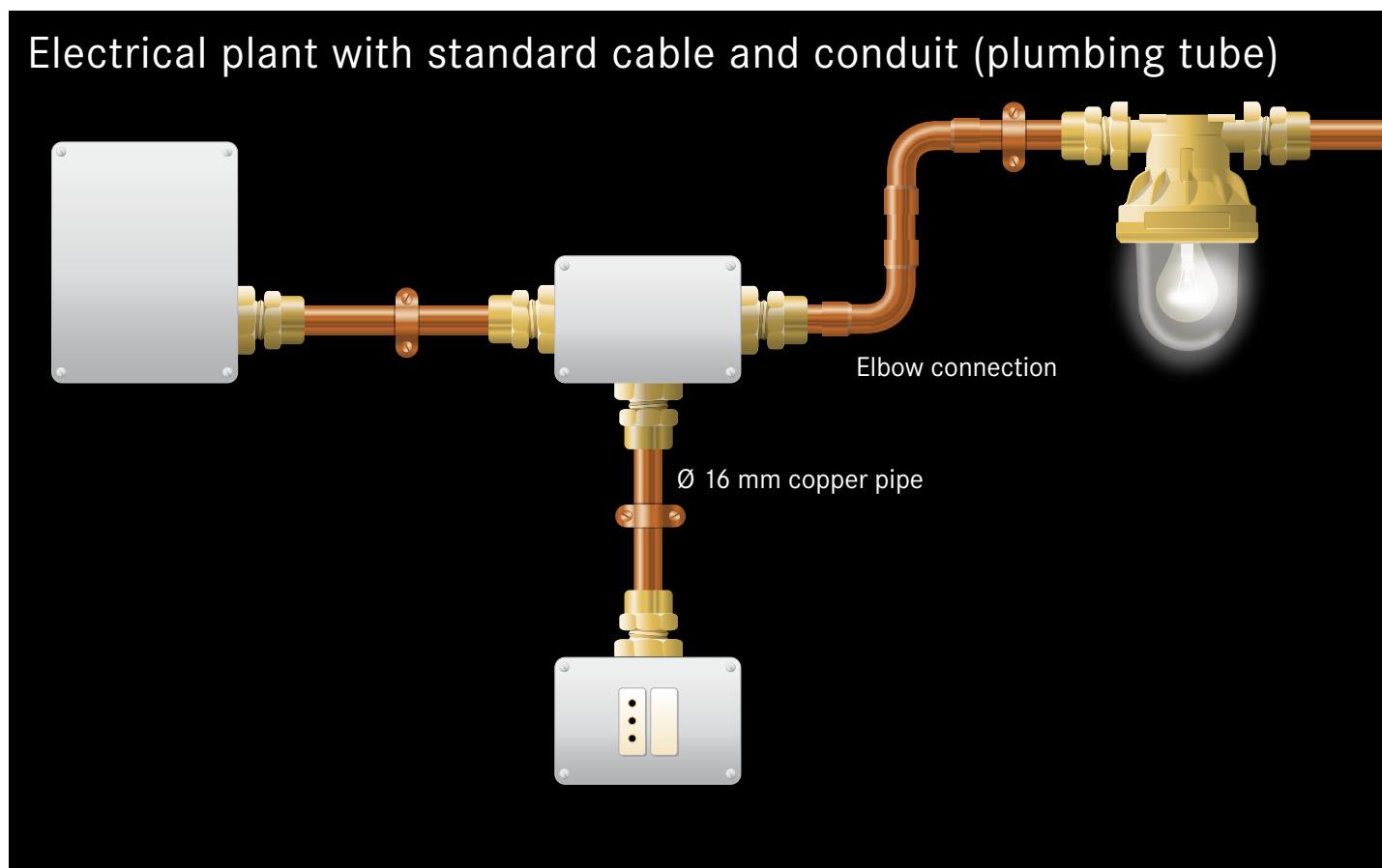
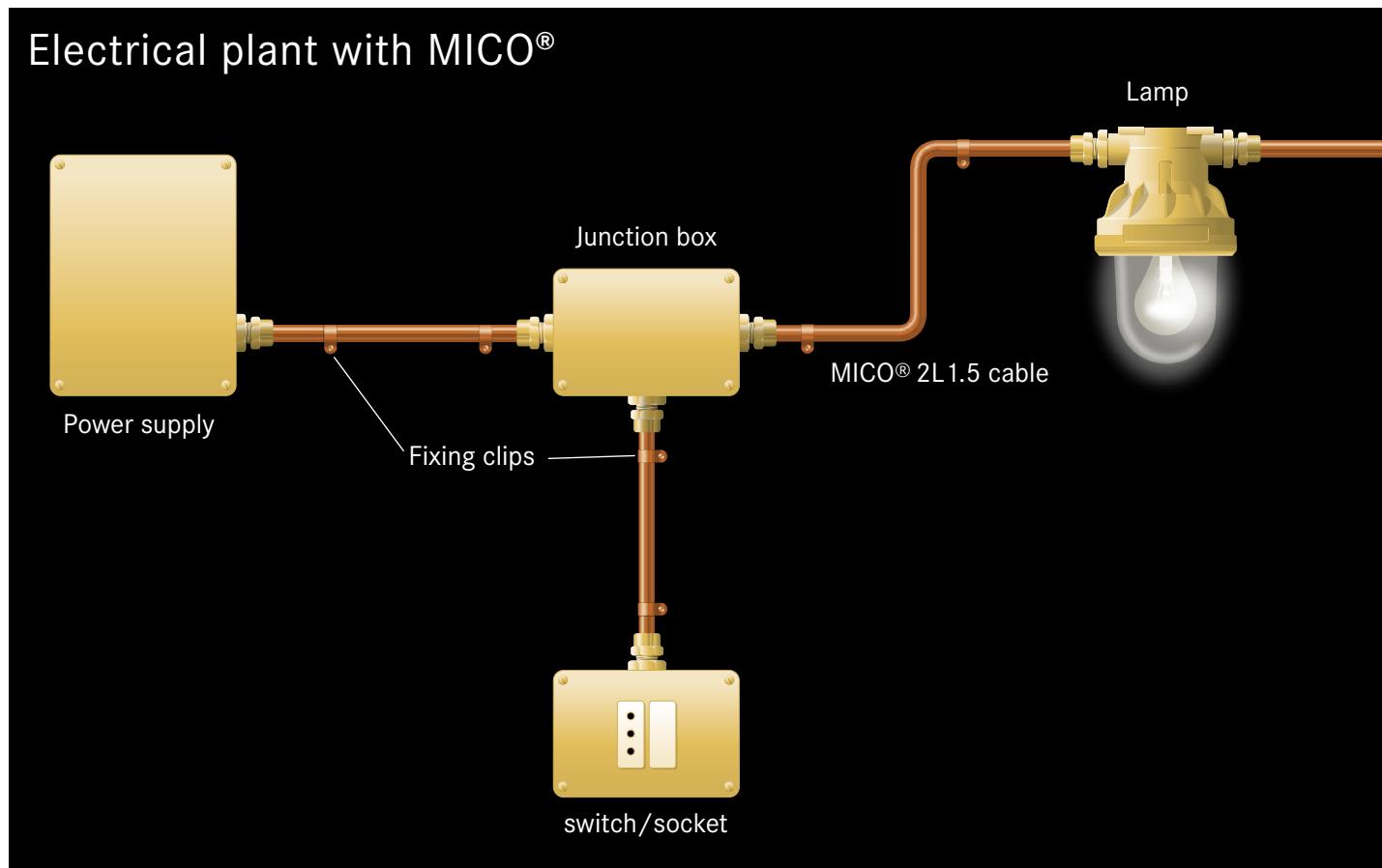
Flattening test: cable cross section reduced by 50%, connected to power - no breakdown

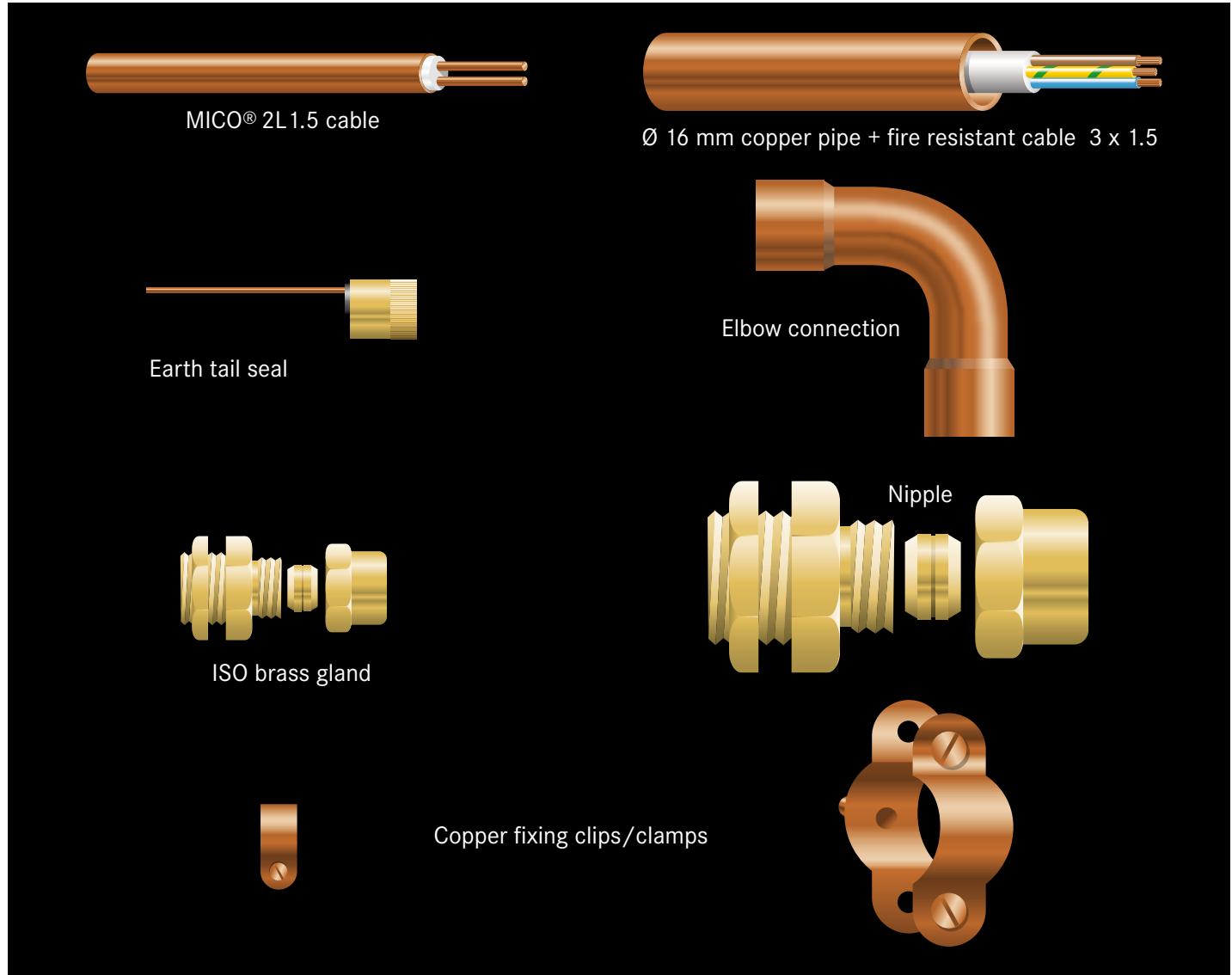


Bending test: 180° bending on one side (bending radius = 6 times cable diameter), 180° bending on opposite side, then connected to power - no breakdown



MICO® plumbing tube comparison





MICO®

5 m assembled piece

2L1.5 MICO® CABLE	26.55 €	5 m	5.31 €/m
seals GFT 2L1.5	9.14 €	2 pcs	45.7 €/pack
ISO glands 2L1.5	11.94 €	2 pcs	59.7 €/pack
locknuts C1	2.1 €	2 pcs	10.5 €/pack
copper clips 1N01	6.16 €	10 pcs	30.8 €/pack
55.89 €			

4L1.5 MICO® CABLE	38.85 €	5 m	7.77 €/m
seals GFT 4L1.5	9.14 €	2 pcs	45.7 €/pack
ISO glands 4L1.5	11.94 €	2 pcs	59.7 €/pack
locknuts C1	2.1 €	2 pcs	10.5 €/pack
copper clips 1N02	6.56 €	10 pcs	32.8 €/pack
68.59 €			

COPPER TUBE

5 m assembled piece

COPPER TUBE diam. 16 mm	28.35 €	5 m	5.67 €/m
standard cable 2 x 1.5 + G	8.61 €	2 pcs	1.27 €/m
2 elbows x 16	3.7 €	1 pack	3.7 €/each
2 nipples x 16	6.8 €	1 pack	6.8 €/each
copper clamps	12.5 €	10 pcs	1.25 €/each
59.96 €			

COPPER TUBE diam. 22 mm	39.69 €	5 m	7.938 €/m
standard cable 4 x 1.5 + G	12.715 €	5 pcs	2.543 €/m
2 elbows x 22	5.2 €	1 pack	5.2 €/each
2 nipples x 22	9.5 €	1 pack	9.5 €/each
copper clamps	22 €	10 pcs	2.2 €/each
89.105 €			

copper price ref: 5 €/kg - VAT not included

CABLE TECHNICAL DATA

PLAIN S

CABLE TYPE	CORE N° x CORE SIZE (mm ²)	BARE CABLE DIAMETER (mm)	LSF CABLE DIAMETER (mm)	CORE DIAMETER (mm)	CORE RESISTANCE (Ohm/km)	COPPER SHEATH SECTION (mm ²)	COPPER SHEATH RESISTANCE (Ohm/km)	NOMINAL LENGTH (m) TOLERANCE %	COIL DIAMETER (mm)	BARE CABLE WEIGHT (kg/m)	LSF CABLE WEIGHT (kg/m)	PLAIN SEALS KIT	PCS PER PACK	ISO EEx d IP67 BRASS GLANDS	
LIGHT DUTY CABLES (300/500 V) - Multi core L cables															
2L1	2 x 1	5.10	6.40	1.13	17.24	6.04	2.85	100	1900	1200	0.103	0.124	XG 2L1	10	RAD 2L1
2L1.5	2 x 1.5	5.70	7.00	1.38	11.49	7.12	2.42	100	1500	1200	0.132	0.155	XG 2L1.5	10	RAD 2L1.5
2L2.5	2 x 2.5	6.60	7.90	1.78	6.90	9.41	1.83	100	1100	1200	0.180	0.206	XG 2L2.5	10	RAD 2L2.5
2L4	2 x 4	7.70	9.20	2.26	4.31	12.15	1.42	100	800	1200	0.249	0.280	XG 2L4	10	RAD 2L4
3L1	3 x 1	5.80	7.10	1.13	17.24	7.56	2.28	100	1500	1200	0.131	0.154	XG 3L1	10	RAD 3L1
3L1.5	3 x 1.5	6.40	7.70	1.38	11.49	8.93	1.93	100	1200	1200	0.166	0.192	XG 3L1.5	10	RAD 3L1.5
3L2.5	3 x 2.5	7.30	8.80	1.78	6.90	10.68	1.61	100	900	1200	0.225	0.258	XG 3L2.5	10	RAD 3L2.5
4L1	4 x 1	6.30	7.60	1.13	17.24	8.78	1.96	100	1300	1200	0.160	0.185	XG 4L1	10	RAD 4L1
4L1.5	4 x 1.5	7.00	8.30	1.38	11.49	10.21	1.69	100	1000	1200	0.204	0.232	XG 4L1.5	10	RAD 4L1.5
4L2.5	4 x 2.5	8.10	9.60	1.78	6.90	12.83	1.34	100	700	1200	0.272	0.308	XG 4L2.5	10	RAD 4L2.5
7L1	7 x 1	7.60	9.10	1.13	17.24	11.57	1.49	800	1200	0.223	0.258	XJ 7L1	2	RAD 7L1	
7L1.5	7 x 1.5	8.40	9.90	1.38	11.49	13.33	1.29	600	1200	0.289	0.326	XJ 7L1.5	2	RAD 7L1.5	
7L2.5	7 x 2.5	9.70	11.20	1.78	6.90	17.42	0.99	500	1200	0.417	0.459	XJ 7L2.5	2	RAD 7L2.5	
2T1	2 x 1	5.10	6.40	1.13	17.24	6.04	2.85	100	1900	1200	0.103	0.124	XG 2L1	10	RAD 2L1
2T1.5	2 x 1.5	5.70	7.00	1.38	11.49	7.12	2.42	100	1500	1200	0.132	0.155	XG 2L1.5	10	RAD 2L1.5
2T2.5	2 x 2.5	6.60	7.90	1.78	6.90	9.41	1.83	100	1100	1200	0.180	0.206	XG 2L2.5	10	RAD 2L2.5
HEAVY DUTY CABLES (450/750 V) - Single core H cables															
1H1.5	1 x 1.5	4.90	6.20	1.38	11.49	5.78	2.98	2030	1200	0.090	0.107	XG 1H1.5	10	RAD 1H1.5	
1H2.5	1 x 2.5	5.30	6.60	1.78	6.90	6.44	2.68	1740	1200	0.111	0.128	XG 1H2.5	10	RAD 1H2.5	
1H4	1 x 4	5.90	7.20	2.26	4.31	7.70	2.24	1420	1200	0.143	0.166	XG 1H4	10	RAD 1H4	
1H6	1 x 6	6.40	7.70	2.76	2.87	8.93	1.93	1200	1200	0.176	0.202	XG 1H6	10	RAD 1H6	
1H10	1 x 10	7.30	8.80	3.57	1.72	10.68	1.61	950	1200	0.235	0.268	XG 1H10	10	RAD 1H10	
1H16	1 x 16	8.30	9.80	4.51	1.08	13.16	1.31	730	1200	0.319	0.356	XG 1H16	10	RAD 1H16	
1H25	1 x 25	9.60	11.10	5.64	0.69	16.96	1.02	540	1200	0.443	0.485	XG 1H25	10	RAD 1H25	
1H35	1 x 35	10.70	12.20	6.68	0.49	20.23	0.85	440	1600	0.581	0.627	XG 1H35	10	RAD 1H35	
1H50	1 x 50	12.10	13.60	7.98	0.34	24.73	0.70	350	1600	0.764	0.816	XJ 1H50	2	RAD 1H50	
1H70	1 x 70	13.70	15.20	9.44	0.25	30.90	0.56	275	1600	0.986	1.044	XJ 1H75	2	RAD 1H70	
1H95	1 x 95	15.40	17.40	11.00	0.18	36.69	0.47	215	1600	1.279	1.367	XJ 1H95	2	RAD 1H95	
1H120	1 x 120	16.80	18.80	12.36	0.14	42.59	0.40	185	1600	1.560	1.658	XK 1H120	2	RAD 1H120	
1H150	1 x 150	18.40	20.40	13.82	0.11	49.48	0.35	155	1600	1.867	1.974	XK 1H150	2	RAD 1H150	
1H185	1 x 185	20.40	22.90	15.35	0.09	57.47	0.30	125	1600	2.315	2.460	XK 1H185	2	RAD 1H185	
1H240	1 x 240	23.30	25.80	17.48	0.07	69.39	0.25	98	1600	3.020	3.186	XM 1H240	2	RAD 1H240	
1H300	1 x 300	26.00	28.50	19.54	0.06	84.55	0.20	80	1800	3.810	3.986	T 1H300	2	RAD 1H300	
1H400	1 x 400	30.00	32.50	22.57	0.04	105.97	0.16	80	1800	5.006	5.199	T 1H400	2	RAD 1H400	
HEAVY DUTY CABLES (450/750 V) - Multi core H cables															
2H1.5	2 x 1.5	7.9	9.4	1.38	11.49	12.49	1.38	750	1200	0.225	0.256	XG 2H1.5	10	RAD 2H1.5	
2H2.5	2 x 2.5	8.7	10.2	1.78	6.90	14.56	1.18	610	1200	0.268	0.306	XG 2H2.5	10	RAD 2H2.5	
2H4	2 x 4	9.8	11.3	2.26	4.31	17.61	0.98	480	1200	0.345	0.388	XG 2H4	10	RAD 2H4	
2H6	2 x 6	10.9	12.4	2.76	2.87	20.93	0.82	370	1600	0.431	0.478	XG 2H6	10	RAD 2H6	
2H10	2 x 10	12.7	14.2	3.57	1.72	26.74	0.64	280	1600	0.608	0.662	XJ 2H10	2	RAD 2H10	
2H16	2 x 16	14.7	16.2	4.51	1.08	34.11	0.51	205	1600	0.845	0.907	XJ 2H16	2	RAD 2H16	
2H25	2 x 25	17.1	19.1	5.64	0.69	43.39	0.40	150	1600	1.138	1.238	XK 2H25	2	RAD 2H25	
3H1.5	3 x 1.5	8.3	9.8	1.38	11.49	13.62	1.27	670	1200	0.242	0.274	XG 3H1.5	10	RAD 3H1.5	
3H2.5	3 x 2.5	9.3	10.8	1.78	6.90	16.14	1.07	520	1200	0.313	0.354	XG 3H2.5	10	RAD 3H2.5	
3H4	3 x 4	10.4	11.9	2.26	4.31	19.34	0.89	420	1600	0.405	0.450	XG 3H4	10	RAD 3H4	
3H6	3 x 6	11.5	13.0	2.76	2.87	23.11	0.75	350	1600	0.516	0.565	XJ 3H6	2	RAD 3H6	
3H10	3 x 10	13.6	15.1	3.57	1.72	30.28	0.57	245	1600	0.733	0.791	XJ 3H10	2	RAD 3H10	
3H16	3 x 16	15.6	17.6	4.51	1.08	38.07	0.45	180	1600	1.011	1.100	XJ 3H16	2	RAD 3H16	
3H25	3 x 25	18.2	20.2	5.64	0.69	47.37	0.36	135	1600	1.381	1.487	XM 3H25	2	RAD 3H25	
4H1.5	4 x 1.5	9.1	10.6	1.38	11.49	15.77	1.09	560	1200	0.298	0.333	XG 4H1.5	10	RAD 4H1.5	
4H2.5	4 x 2.5	10.1	11.6	1.78	6.90	18.47	0.93	445	1600	0.374	0.418	XG 4H2.5	10	RAD 4H2.5	
4H4	4 x 4	11.4	12.9	2.26	4.31	22.90	0.75	350	1600	0.496	0.545	XJ 4H4	2	RAD 4H4	
4H6	4 x 6	12.7	14.2	2.76	2.87	26.74	0.64	270	1600	0.623	0.677	XJ 4H6	2	RAD 4H6	
4H10	4 x 10	14.8	16.3	3.57	1.72	34.36	0.50	205	1600	0.884	0.946	XJ 4H10	2	RAD 4H10	
4H16	4 x 16	17.3	19.3	4.51	1.08	44.42	0.39	145	1600	1.236	1.337	XK 4H16	2	RAD 4H16	
4H25	4 x 25	20.1	22.6	5.64	0.69	56.01	0.31	110	1600	1.752	1.895	XM 4H25	2	RAD 4H25	
7H1.5	7 x 1.5	10.8	12.3	1.38	11.49	20.73	0.83	385	1600	0.431	0.477	XJ 7H1.5	2	RAD 7H1.5	
7H2.5	7 x 2.5	12.1	13.6	1.78	6.90	24.73	0.70	310	1600	0.557	0.609	XJ 7H2.5	2	RAD 7H2.5	
12H1.5	12 x 1.5	14.1	15.6	1.38	11.49	31.85	0.54	210	1600	0.685	0.746	XJ 12H1.5	2	RAD 12H1.5	
12H2.5	12 x 2.5	15.6	17.6	1.78	6.90	37.64	0.46	175	1600	0.878	0.970	XK 12H2.5	2	RAD 12H2.5	
19H1.5	19 x 1.5	16.6	18.6	1.38	11.49	41.59	0.41	155	1600	0.928	1.044	XM 19H1.5	2	RAD 19H1.5	

SEALS		EARTH TAIL SEALS					CLIPS AND SADDLES				
ISO THREAD DIMENSION	PCS PER PACK	EARTH TAIL SEALS KIT	PCS PER PACK	ISO EEx d IP67 BRASS GLANDS	ISO THREAD DIMENSION	PCS PER PACK	SINGLE CLIPS (50 pcs/pack)	BARE SADDLES (50 PCS/PACK)	LSF SINGLE CLIPS (50 PCS/PACK)	LSF SADDLES (50 PCS/PACK)	EARTH BONDING CLAMPS (10 PCS/PACK)
M20	10	XGFT 2L1	10	RAD 2L1	M20	10	1N01	2N01	1P01	2P01	T01M
M20	10	XGFT 2L1.5	10	RAD 2L1.5	M20	10	1N01	2N02	1P01	2P02	T02M
M20	10	XGFT 2L2.5	10	RAD 2L2.5	M20	10	1N01	2N04	1P01	2P03	T03M
M20	10	XGFT 2L4	10	RAD 2L4	M20	10	1N03	2N05	1P03	2P04	T05M
M20	10	XGFT 3L1	10	RAD 3L1	M20	10	1N01	2N03	1P01	2P02	T02M
M20	10	XGFT 3L1.5	10	RAD 3L1.5	M20	10	1N01	2N04	1P01	2P03	T03M
M20	10	XGFT 3L2.5	10	RAD 3L2.5	M20	10	1N02	2N05	1P02	2P04	T04M
M20	10	XGFT 4L1	10	RAD 4L1	M20	10	1N01	2N04	1P01	2P03	T03M
M20	10	XGFT 4L1.5	10	RAD 4L1.5	M20	10	1N02	2N05	1P02	2P03	T04M
M20	10	XGFT 4L2.5	10	RAD 4L2.5	M20	10	1N03	2N06	1P04	2P05	T05M
M25	2	XJFT 7L1	2	RAD 7L1	M25	2	1N03	2N05	1P03	2P04	T05M
M25	2	XJFT 7L1.5	2	RAD 7L1.5	M25	2	1N03	2N06	1P04	2P05	T05M
M25	2	XJFT 7L2.5	2	RAD 7L2.5	M25	2	1N05	2N07	1P05	2P06	T08M
M20	10	XGFT 2L1	10	RAD 2L1	M20	10	1N01	2N01	1P01	2P01	T01M
M20	10	XGFT 2L1.5	10	RAD 2L1.5	M20	10	1N01	2N02	1P01	2P02	T02M
M20	10	XGFT 2L2.5	10	RAD 2L2.5	M20	10	1N01	2N04	1P01	2P03	T03M
M20	10	XGFT 1H1.5	10	RAD 1H1.5	M20	10	1N01	2N01	1P01	2P01	T01M
M20	10	XGFT 1H2.5	10	RAD 1H2.5	M20	10	1N01	2N01	1P01	2P01	T01M
M20	10	XGFT 1H4	10	RAD 1H4	M20	10	1N01	2N01	1P01	2P01	T02M
M20	10	XGFT 1H6	10	RAD 1H6	M20	10	1N01	2N04	1P01	2P03	T01U
M20	10	XJFT 1H10	2	RADT 1H10	M25	2	1N02	2N05	1P02	2P04	T02U
M20	10	XJFT 1H16	2	RADT 1H16	M25	2	1N03	2N06	1P04	2P05	T03U
M20	10	XKFT 1H25	2	RADT 1H25	M32	2	1N05	2N07	1P05	2P06	T04U
M20	10	XKFT 1H35	2	RADT 1H35	M32	2	1N06	2N08	1P06	2P07	T05U
M25	2	XMFT 1H50	2	RADT 1H50	M40	2	1N08	2N10	1P07	2P08	T06U
M25	2						1N09	2N11	1P09	2P10	T07U
M25	2						1N10	2N13	1P11	2P11	T08U
M32	2						1N11	2N14	1P12	2P12	T09U
M32	2						1N13	2N15	1P13	2P13	T10U
M32	2						1N14	2N16	1P14	2P14	T11U
M40	2						1N15	2N17	1P15	2P15	T12U
M40	2										T13U
M40	2										T14U
M20	10	XGFT 2H1.5	10	RAD 2H1.5	M20	10	1N03	2N06	1P03	2P04	T05M
M20	10	XGFT 2H2.5	10	RAD 2H2.5	M20	10	1N05	2N06	1P04	2P05	T06M
M20	10	XJFT 2H4	2	RADT 2H4	M25	2	1N05	2N08	1P05	2P06	T08M
M20	10	XJFT 2H6	2	RADT 2H6	M25	2	1N07	2N09	1P07	2P07	T10M
M25	2	XKFT 2H10	2	RADT 2H10	M32	2	1N08	2N10	1P08	2P09	T12M
M25	2	XMFT 2H16	2	RADT 2H16	M40	2	1N09	2N12	1P10	2P11	T14M
M32	2	XMFT 2H25	2	RADT 2H25	M40	2	1N12	2N14	1P12	2P13	T17M
M20	10	XGFT 3H1.5	10	RAD 3H1.5	M20	10	1N03	2N06	1P04	2P05	T06M
M20	10	XJFT 3H2.5	2	RADT 3H2.5	M25	2	1N05	2N07	1P05	2P06	T07M
M20	10	XJFT 3H4	2	RADT 3H4	M25	2	1N06	2N08	1P06	2P07	T09M
M25	2	XJFT 3H6	2	RAD 3H6	M25	2	1N07	2N09	1P07	2P08	T11M
M25	2	XKFT 3H10	2	RADT 3H10	M32	2	1N09	2N11	1P09	2P10	T13M
M25	2	XMFT 3H16	2	RADT 3H16	M40	2	1N10	2N13	1P11	2P12	T15M
M40	2	XMFT 3H25	2	RAD 3H25	M40	2	1N13	2N15	1P13	2P13	T18M
M20	10	XGFT 4H1.5	10	RAD 4H1.5	M20	10	1N05	2N07	1P05	2P06	T07M
M20	10	XJFT 4H2.5	2	RADT 4H2.5	M25	2	1N06	2N08	1P06	2P06	T09M
M25	2	XJFT 4H4	2	RAD 4H4	M25	2	1N07	2N09	1P07	2P08	T11M
M25	2	XKFT 4H6	2	RADT 4H6	M32	2	1N08	2N10	1P08	2P09	T12M
M25	2	XXFT 4H10	2	RADT 4H10	M32	2	1N09	2N12	1P10	2P11	T14M
M32	2	XMFT 4H16	2	RADT 4H16	M40	2	1N12	2N14	1P12	2P13	T17M
M40	2	XMFT 4H25	2	RAD 4H25	M40	2	1N14	2N16	1P14	2P14	T19M
M25	2	XJFT 7H1.5	2	RAD 7H1.5	M32	2	1N07	2N09	1P06	2P07	T10M
M25	2	XJFT 7H2.5	2	RAD 7H2.5	M32	2	1N08	2N10	1P07	2P08	T12M
M25	2						1N09	2N12	1P09	2P11	T14M
M40	2						1N10	2N13	1P11	2P12	T15M
M40	2						1N11	2N14	1P12	2P12	T16M

Light duty multi-core cables (500 V): resistance, reactance & impedance

Cable type	Resistance R (Ω/km)			Reactance X (Ω/km)	Impedance Z (Ω/km)		
	30 °C	70 °C	105 °C		30 °C	70 °C	105 °C
2L1	18.811	21.656	24.145	0.088	18.811	21.656	24.145
2L1.5	12.575	14.477	16.141	0.083	12.576	14.477	16.141
2L2.5	7.701	8.866	9.885	0.079	7.702	8.866	9.885
2L4	4.479	5.157	5.749	0.075	4.480	5.157	5.749
3L1	18.811	21.656	24.145	0.091	18.811	21.656	24.145
3L1.5	12.575	14.477	16.141	0.086	12.576	14.477	16.141
3L2.5	7.701	8.866	9.885	0.079	7.702	8.866	9.885

Above indicated values are valid also for multi-core cables with 4 & 7 conductors

Heavy duty two-core cables (750 V): resistance, reactance & impedance

Cable type	Resistance R (Ω/km)			Reactance X (Ω/km)	Impedance Z (Ω/km)		
	30 °C	70 °C	105 °C		30 °C	70 °C	105 °C
2H1.5	12.575	14.477	16.141	0.101	12.576	14.478	16.142
2H2.5	7.701	8.866	9.885	0.094	7.702	8.866	9.885
2H4	4.791	5.516	6.150	0.088	4.792	5.516	6.150
2H6	3.200	3.685	4.109	0.083	3.201	3.686	4.110
2H10	1.902	2.190	2.441	0.079	1.904	2.191	2.442
2H16	1.195	1.376	1.534	0.075	1.198	1.378	1.536
2H25	0.756	0.870	0.970	0.073	0.759	0.873	0.973

Above indicated values are valid also for all the other types of multi-core cables (with 3, 4 ,7, 12 & 19 conductors).



Single-core triplet cables: resistance, reactance & impedance

Cable type	Resistance R (Ω/km)			Reactance X (Ω/km)	Impedance Z (Ω/km)		
	30 °C	70 °C	105 °C		30 °C	70 °C	105 °C
1H1.5	12.576	14.478	16.142	0.139	12.577	14.478	16.142
1H2.5	7.702	8.866	9.885	0.128	7.703	8.867	9.886
1H4	4.792	5.516	6.15	0.120	4.793	5.518	6.650
1H6	3.202	3.686	4.109	0.112	3.204	3.687	4.111
1H10	1.903	2.190	2.442	0.104	1.906	2.193	2.444
1H16	1.196	1.377	1.535	0.098	1.200	1.380	1.538
1H25	0.757	0.871	0.971	0.093	0.763	0.876	0.975
1H35	0.546	0.628	0.700	0.089	0.554	0.635	0.706
1H50	0.404	0.465	0.518	0.085	0.413	0.473	0.525
1H70	0.281	0.323	0.360	0.083	0.293	0.333	0.369
1H95	0.204	0.234	0.260	0.080	0.219	0.247	0.272
1H120	0.163	0.186	0.207	0.078	0.180	0.202	0.221
1H150	0.133	0.152	0.169	0.077	0.154	0.170	0.185
1H185	0.109	0.123	0.137	0.076	0.133	0.145	0.157
1H240	0.086	0.096	0.106	0.076	0.115	0.123	0.131
1H300	0.076	0.084	0.092	0.075	0.107	0.113	0.119
1H400	0.075	0.063	0.069	0.075	0.095	0.099	0.103

Single-core cables laid side by side: resistance, reactance & impedance



Cable type	Resistance R (Ω/km)								
	30 °C			70 °C			105 °C		
	R	S	T	R	S	T	R	S	T
1H1.5	12.61	12.57	12.53	14.51	14.47	14.44	16.18	16.14	16.10
1H2.5	7.740	7.702	7.665	8.905	8.866	8.829	9.924	9.885	9.848
1H4	4.831	4.792	4.755	5.555	5.516	5.480	6.189	6.150	6.113
1H6	3.241	3.202	3.166	3.725	3.686	3.649	4.148	4.109	4.073
1H10	1.942	1.903	1.867	2.229	2.190	2.154	2.481	2.442	2.406
1H16	1.236	1.196	1.161	1.416	1.377	1.341	1.574	1.535	1.499
1H25	0.797	0.757	0.722	0.911	0.871	0.836	1.011	0.971	0.935
1H35	0.587	0.546	0.512	0.669	0.628	0.594	0.74	0.700	0.665
1H50	0.446	0.404	0.371	0.506	0.464	0.431	0.558	0.517	0.483
1H70	0.323	0.280	0.249	0.364	0.322	0.290	0.401	0.359	0.326
1H95	0.246	0.203	0.172	0.276	0.233	0.201	0.302	0.259	0.227
1H120	0.206	0.161	0.132	0.229	0.185	0.155	0.249	0.206	0.175
1H150	0.177	0.132	0.104	0.195	0.151	0.122	0.212	0.168	0.138
1H185	0.154	0.107	0.083	0.168	0.122	0.096	0.181	0.135	0.108
1H240	0.132	0.083	0.063	0.142	0.095	0.072	0.152	0.104	0.081
1H300	0.122	0.073	0.056	0.130	0.082	0.062	0.137	0.090	0.068
1H400	0.104	0.054	0.038	0.110	0.061	0.042	0.115	0.067	0.046

Cable type	Reactance X (Ω/km)			Impedance Z (Ω/km)								
				30 °C			70 °C			105 °C		
	R	S	T	R	S	T	R	S	T	R	S	T
1H1.5	0.160	0.139	0.161	12.61	12.57	12.54	14.52	14.48	14.44	16.18	16.14	16.10
1H2.5	0.149	0.128	0.150	7.742	7.703	7.667	8.906	8.867	8.831	9.925	9.886	9.850
1H4	0.140	0.120	0.142	4.833	4.793	4.757	5.557	5.517	5.482	6.190	6.151	6.115
1H6	0.132	0.112	0.135	3.244	3.204	3.168	3.727	3.687	3.652	4.150	4.111	4.075
1H10	0.124	0.104	0.127	1.946	1.905	1.871	2.233	2.193	2.158	2.484	2.444	2.409
1H16	0.117	0.098	0.121	1.242	1.200	1.167	1.421	1.380	1.347	1.579	1.538	1.504
1H25	0.112	0.093	0.117	0.805	0.762	0.731	0.918	0.876	0.844	1.017	0.975	0.943
1H35	0.107	0.089	0.113	0.597	0.553	0.524	0.677	0.634	0.604	0.748	0.706	0.675
1H50	0.103	0.085	0.110	0.457	0.413	0.387	0.516	0.472	0.445	0.568	0.524	0.496
1H70	0.099	0.083	0.108	0.338	0.292	0.271	0.378	0.333	0.309	0.413	0.368	0.343
1H95	0.096	0.080	0.106	0.264	0.218	0.202	0.292	0.246	0.227	0.317	0.271	0.250
1H120	0.093	0.078	0.105	0.226	0.179	0.169	0.248	0.201	0.187	0.267	0.220	0.203
1H150	0.090	0.077	0.104	0.199	0.153	0.147	0.216	0.169	0.160	0.231	0.185	0.172
1H185	0.086	0.077	0.104	0.177	0.132	0.133	0.190	0.144	0.141	0.202	0.156	0.150
1H240	0.082	0.077	0.104	0.155	0.113	0.122	0.166	0.122	0.127	0.175	0.130	0.132
1H300	0.078	0.076	0.103	0.145	0.105	0.117	0.153	0.112	0.121	0.161	0.118	0.124
1H400	0.077	0.076	0.103	0.129	0.094	0.110	0.136	0.098	0.112	0.142	0.102	0.114

Single-core cables laid at the distance of a diameter: resistance, reactance & impedance



Cable type	Resistance R (Ω/km)								
	30 °C			70 °C			105 °C		
	R	S	T	R	S	T	R	S	T
1H1.5	12.61	12.57	12.54	14.52	14.48	14.44	16.18	16.14	16.10
1H2.5	7.743	7.703	7.767	8.907	8.867	8.831	9.925	9.886	9.850
1H4	4.833	4.793	4.728	5.557	5.518	5.482	6.191	6.151	6.115
1H6	3.244	3.203	3.169	3.727	3.687	3.652	4.150	4.111	4.075
1H10	1.946	1.905	1.870	2.232	2.192	2.157	2.484	2.443	2.408
1H16	1.24	1.199	1.165	1.420	1.379	1.345	1.578	1.537	1.502
1H25	0.803	0.760	0.728	0.916	0.874	0.841	1.015	0.973	0.940
1H35	0.593	0.550	0.519	0.674	0.632	0.600	0.745	0.703	0.671
1H50	0.453	0.409	0.379	0.512	0.469	0.438	0.564	0.521	0.490
1H70	0.332	0.287	0.259	0.372	0.328	0.299	0.408	0.364	0.334
1H95	0.257	0.210	0.185	0.285	0.239	0.212	0.310	0.265	0.237
1H120	0.217	0.170	0.147	0.239	0.193	0.168	0.259	0.213	0.186
1H150	0.190	0.142	0.121	0.207	0.160	0.137	0.222	0.176	0.151
1H185	0.169	0.120	0.105	0.182	0.134	0.116	0.194	0.146	0.126
1H240	0.148	0.100	0.141	0.158	0.110	0.097	0.167	0.118	0.103
1H300	0.139	0.093	0.085	0.147	0.099	0.088	0.154	0.105	0.092
1H400	0.120	0.075	0.069	0.126	0.079	0.071	0.131	0.083	0.073

Cable type	Reactance X (Ω/km)			Impedance Z (Ω/km)								
				30 °C			70 °C			105 °C		
	R	S	T	R	S	T	R	S	T	R	S	T
1H1.5	0.203	0.182	0.205	12.61	12.57	12.54	14.52	14.48	14.44	16.18	16.14	16.10
1H2.5	0.192	0.171	0.194	7.745	7.705	7.670	8.907	8.867	8.831	9.927	9.888	9.852
1H4	0.183	0.163	0.186	4.837	4.796	4.762	5.560	5.520	5.485	6.194	6.154	6.118
1H6	0.175	0.156	0.179	3.248	3.207	3.174	3.731	3.691	3.656	4.154	4.114	4.079
1H10	0.167	0.148	0.171	1.953	1.911	1.878	2.239	2.197	2.164	2.489	2.448	2.414
1H16	0.160	0.141	0.165	1.250	1.207	1.177	1.429	1.386	1.355	1.586	1.543	1.511
1H25	0.154	0.136	0.161	0.817	0.772	0.746	0.928	0.884	0.856	1.026	0.983	0.954
1H35	0.150	0.132	0.157	0.611	0.566	0.543	0.690	0.645	0.620	0.760	0.716	0.689
1H50	0.145	0.129	0.154	0.475	0.429	0.410	0.532	0.486	0.465	0.583	0.537	0.514
1H70	0.140	0.126	0.152	0.360	0.313	0.301	0.398	0.351	0.336	0.431	0.385	0.367
1H95	0.136	0.123	0.150	0.289	0.244	0.239	0.315	0.269	0.260	0.339	0.292	0.281
1H120	0.133	0.121	0.149	0.253	0.209	0.209	0.273	0.228	0.224	0.291	0.245	0.238
1H150	0.129	0.120	0.147	0.227	0.185	0.190	0.243	0.199	0.201	0.257	0.213	0.211
1H185	0.123	0.199	0.147	0.205	0.168	0.179	0.218	0.178	0.187	0.194	0.146	0.126
1H240	0.116	0.117	0.145	0.183	0.153	0.168	0.194	0.160	0.173	0.203	0.166	0.178
1H300	0.112	0.115	0.143	0.172	0.146	0.162	0.182	0.151	0.166	0.190	0.156	0.170
1H400	0.108	0.115	0.142	0.155	0.135	0.152	0.163	0.139	0.160	0.170	0.142	0.159

Voltage drop in single-core triplet cables

cable type	Voltage drop (mV/Am)					
	$\cos \varphi = 1$			$\cos \varphi = 0.8$		
	30 °C	70 °C	105 °C	30 °C	70 °C	105 °C
1H1.5	21.780	25.080	27.960	17.570	20.210	22.510
1H2.5	13.340	15.360	17.120	10.800	12.420	13.830
1H4	8.300	9.550	10.650	6.760	7.770	8.650
1H6	5.550	6.380	7.120	4.550	5.220	5.810
1H10	3.300	3.790	4.230	2.740	3.140	3.490
1H16	2.070	2.380	2.660	1.760	2.010	2.230
1H25	1.310	1.510	1.680	1.150	1.300	1.440
1H35	0.950	1.090	1.210	0.850	0.960	1.060
1H50	0.700	0.810	0.900	0.650	0.730	0.810
1H70	0.490	0.560	0.620	0.480	0.530	0.580
1H95	0.350	0.400	0.450	0.370	0.410	0.440
1H120	0.280	0.320	0.360	0.310	0.340	0.370
1H150	0.230	0.260	0.290	0.260	0.280	0.310
1H185	0.190	0.210	0.240	0.230	0.250	0.270
1H240	0.150	0.210	0.180	0.200	0.250	0.230
1H300	0.130	0.150	0.160	0.180	0.190	0.210
1H400	0.099	0.110	0.120	0.160	0.170	0.170

Voltage drop in single-core cables laid side by side

cable type	Voltage drop (mV/Am)					
	$\cos \varphi = 1$			$\cos \varphi = 0.8$		
	30 °C	70 °C	105 °C	30 °C	70 °C	105 °C
1H1.5	21.780	25.080	27.960	17.570	20.210	22.510
1H2.5	13.340	15.360	17.120	10.800	12.420	13.830
1H4	8.300	9.550	10.650	6.760	7.770	8.650
1H6	5.550	6.380	7.120	4.550	5.220	5.810
1H10	3.300	3.790	4.230	2.740	3.140	3.490
1H16	2.070	2.380	2.660	1.760	2.010	2.230
1H25	1.310	1.510	1.680	1.150	1.300	1.440
1H35	0.950	1.090	1.210	0.850	0.960	1.060
1H50	0.700	0.810	0.900	0.650	0.730	0.810
1H70	0.490	0.560	0.620	0.480	0.530	0.580
1H95	0.350	0.400	0.450	0.370	0.410	0.440
1H120	0.280	0.320	0.360	0.310	0.340	0.370
1H150	0.230	0.260	0.290	0.260	0.280	0.310
1H185	0.190	0.210	0.240	0.230	0.250	0.270
1H240	0.150	0.210	0.180	0.200	0.250	0.230
1H300	0.130	0.150	0.160	0.180	0.190	0.210
1H400	0.099	0.110	0.120	0.160	0.170	0.170

Voltage drop in single-core cables laid at the distance of a diameter

cable type	Voltage drop (mV/Am)					
	cos φ = 1			cos φ = 0.8		
	30 °C	70 °C	105 °C	30 °C	70 °C	105 °C
1H1.5	21.790	25.080	27.960	17.630	20.270	22.570
1H2.5	13.340	15.360	17.130	10.870	12.480	13.890
1H4	8.300	9.560	10.660	6.830	7.830	8.710
1H6	5.550	6.390	7.120	4.620	5.290	5.870
1H10	3.300	3.800	4.240	2.810	3.210	3.560
1H16	2.060	2.390	2.670	1.830	2.080	2.290
1H25	1.320	1.520	1.690	1.210	1.370	1.510
1H35	0.960	1.100	1.220	0.920	1.030	1.130
1H50	0.720	0.820	0.910	0.720	0.800	0.880
1H70	0.510	0.580	0.640	0.550	0.610	0.660
1H95	0.380	0.430	0.470	0.440	0.480	0.520
1H120	0.310	0.350	0.380	0.380	0.420	0.440
1H150	0.260	0.290	0.320	0.340	0.370	0.390
1H185	0.230	0.250	0.270	0.310	0.330	0.350
1H240	0.200	0.210	0.220	0.280	0.300	0.310
1H300	0.180	0.190	0.200	0.270	0.280	0.290
1H400	0.150	0.160	0.170	0.240	0.250	0.260

Voltage drop in Light duty multi-core cables (500 V)

cable type	Voltage drop (mV/Am)					
	cos φ = 1			cos φ = 0.8		
	30 °C	70 °C	105 °C	30 °C	70 °C	105 °C
2L1	37.620	43.310	48.290	30.200	34.760	38.740
2L1.5	25.150	28.950	32.280	20.220	23.260	25.930
2L2.5	15.400	17.730	19.770	12.420	14.280	15.910
2L4	8.960	10.310	11.500	7.260	8.340	9.290
3L1	32.580	37.51	41.820	26.160	30.100	33.550
3L1.5	21.780	25.080	27.960	17.510	20.150	22.460
3L2.5	13.340	15.360	17.120	10.750	12.370	13.780

Above indicated values are valid also for multi-core cables with 4 & 7 conductors.

Voltage drop in Light duty multi-core cables (750 V)

cable type	Voltage drop (mV/Am)					
	cos φ = 1			cos φ = 0.8		
	30 °C	70 °C	105 °C	30 °C	70 °C	105 °C
2H1.5	25.150	28.950	32.280	20.240	23.280	25.950
2H2.5	15.400	17.730	19.770	12.430	14.300	15.930
2H4	9.580	11.030	12.300	7.770	8.930	9.940
2H6	6.401	7.370	8.220	5.220	6.000	6.670
2H10	3.800	4.380	4.880	3.140	3.600	4.000
2H16	2.390	2.750	3.070	2.000	2.290	2.540
2H25	1.510	1.740	1.940	1.300	1.480	1.640

Above indicated values are valid also for all the other types of multi-core cables (with 3, 4 ,7, 12 & 19 conductors).

Table I/1

single-core H (750 V) M.I.C. bare, exposed to touch or covered with thermoplastic material (metal sheath maximum temperature 70°C). For bare cables we must multiply by 0.9. Cables sheaths are connected to the ends.

cable type	triplet cables in air	laid side by side cables in air		horizontal spaced cables in air		vertical spaced cables in air		laid cables in air, fixed on wall or ceiling		triplet cables in air, fixed on wall or ceiling
	13-14 15-16 *	13-14 15-16 *		14 15-16 *		14 15-16 *		11 11A *		11 11A *
	3 cables	2 cables	3 cables	2 cables	3 cables	2 cables	3 cables	2 cables	3 cables	3 cables
1H1.5	(A) 22	(A) 26	(A) 26	(A) 26	(A) 32	(A) 26	(A) 28	(A) 25	(A) 23	(A) 21
1H2.5	30	36	34	36	43	36	37	34	31	28
1H4	40	47	45	47	56	47	49	45	41	37
1H6	51	60	57	60	71	60	62	57	52	48
1H10	69	82	77	82	95	82	84	77	70	65
1H16	92	109	102	109	125	109	110	102	92	86
1H25	120	142	132	142	162	142	142	133	120	112
1H35	147	174	161	174	197	174	173	163	147	137
1H50	182	215	198	215	242	215	213	202	181	169
1H70	223	264	241	264	294	264	259	247	221	207
1H95	267	317	289	317	351	317	309	296	264	249
1H120	308	364	331	364	402	364	353	340	303	286
1H150	352	416	377	416	454	416	400	388	346	327
1H185	399	472	426	472	507	472	446	440	392	371
1H240	466	552	496	552	565	552	497	514	457	434

Table II/1

multi-core H (750 V) e L (500 V) M.I.C. bare, exposed to touch or covered with thermoplastic material (metal sheath maximum temperature 70°C). For bare cables we must multiply by 0.9.

nominal conductor cross section mm ²	cable in air, spaced from wall or ceiling or on platform		cable in air, fixed on wall or ceiling	
	3-14-15-16 *		11-11A *	
	2 cables	3 cables	2 cables	3 cables
serie	(A)	(A)	(A)	(A)
500 V				
1.5	25	21	23	19
2.5	33	28	31	26
4	44	37	40	35
750 V				
1.5	26	22	25	21
2.5	37	30	34	28
4	47	40	45	37
6	60	51	57	48
10	82	69	77	65
16	109	92	102	86
25	142	120	133	112

* Installation methods taken from 3rd edition of CEI 64-8/5 norm, table 52 C

Table I/2

single-core H (450/750 V) M.I.C. bare, not exposed to touch (metal sheath maximum temperature 105°C). - Correction factor for bundle is not required.										
cable type	triplet cables in air	laid side by side cables in air		horizontal spaced cables in air		vertical spaced cables in air		laid cables in air, fixed on wall or ceiling		triplet cables in air, fixed on wall or ceiling
	13-14 15-16 *	13-14 15-16 *		14 15-16 *		14 15-16 *		11 11A *		11 11A *
	3 cables	2 cables	3 cables	2 cables	3 cables	2 cables	3 cables	2 cables	3 cables	3 cables
1H1.5	(A) 28	(A) 33	(A) 32	(A) 33	(A) 40	(A) 33	(A) 35	(A) 31	(A) 30	(A) 26
1H2.5	38	45	43	45	54	45	47	42	41	35
1H4	50	60	56	60	70	60	61	55	53	47
1H6	64	76	71	76	89	76	78	70	67	59
1H10	87	104	96	104	120	104	105	96	91	81
1H16	115	137	127	137	157	137	137	127	119	107
1H25	150	179	164	179	204	179	178	166	154	140
1H35	184	220	200	220	248	220	216	203	187	171
1H50	228	272	247	272	304	272	266	251	230	212
1H70	279	333	300	333	370	333	323	307	280	260
1H95	335	400	359	400	441	400	385	369	334	312
1H120	385	460	411	460	505	460	441	424	383	359
1H150	441	526	469	526	565	526	498	485	435	410
1H185	500	596	530	596	629	596	557	550	492	465
1H240	584	697	617	697	704	697	624	643	572	544

Table II/2

multi-core H (750 V) e L (500 V) M.I.C. bare, not exposed to touch (metal sheath maximum temperature 105°C). Correction factor for bundle is not required					
nominal conductor cross section mm ²	cable in air, spaced from wall or ceiling or on platform			cable in air, fixed on wall or ceiling	
	3-14-15-16 *			11-11A *	
	2 cables	3 cables		2 cables	3 cables
serie	(A)	(A)		(A)	(A)
500 V					
1.5	31	26		28	24
2.5	41	35		38	33
4	54	46		51	44
750 V					
1.5	33	26		32	26
2.5	45	35		42	35
4	60	47		55	47
6	76	59		70	59
10	104	81		96	81
16	137	107		127	107
25	179	140		166	140

* Installation methods taken from 3rd edition of CEI 64-8/5 norm, table 52 C

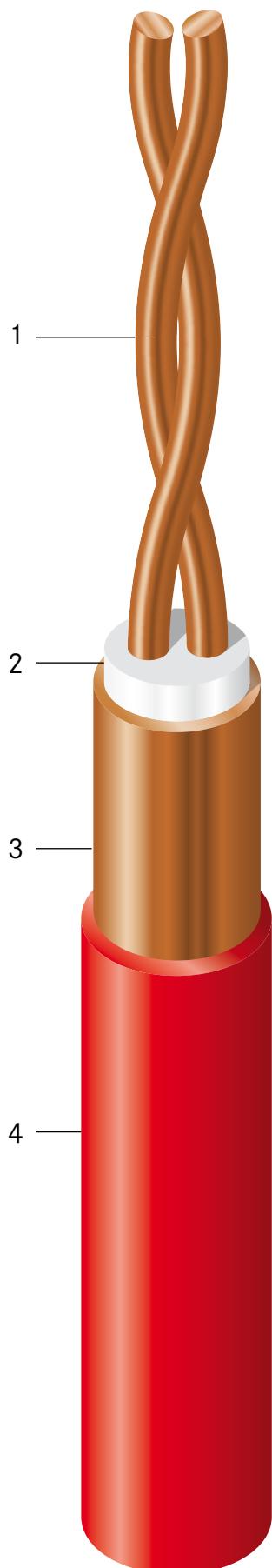
Table III Correction factor k_1 for room temperature different from 30° C

room temperature	bare cable or covered by thermoplastic material exposed to touch	bare cable not exposed to touch
°C	70 °C	105 °C
10	1.26	1.14
15	1.20	1.11
20	1.14	1.07
25	1.07	1.04
35	0.93	0.96
40	0.85	0.92
45	0.76	0.88
50	0.67	0.84
55	0.57	0.80
60	0.45	0.75
65	-	0.70
70	-	0.65
75	-	0.60
80	-	0.54
85	-	0.47
90	-	0.40
95	-	0.32

Nominal copper sheath resistance

Rated Voltage	Cross-Section mm ²	Nominal copper sheath resistance (Ω/km)						
		1 cond	2 cond	3 cond	4 cond	7 cond	12 cond	19 cond
500 V	1		2.855	2.279	1.964	1.491		
	1.5		2.422	1.931	1.689	1.293		
	2.5		1.833	1.614	1.344	0.990		
	4		1.419					
750 V	1.5	2.981	1.381	1.266	1.093	0.832	0.541	0.414
	2.5	2.677	1.184	1.068	0.934	0.697	0.458	
	4	2.238	0.979	0.892	0.753			
	6	1.931	0.824	0.746	0.645			
	10	1.614	0.645	0.569	0.502			
	16	1.310	0.505	0.453	0.388			
	25	1.016	0.397	0.364	0.308			
	35	0.852						
	50	0.697						
	70	0.558						
	95	0.470						
	120	0.405						
	150	0.348						
	185	0.300						
	240	0.248						
	300	0.204						
	400	0.163						

Mineral insulated cable TWISTED - code:2T1.5



- **Building management systems**
- **Fire detection systems**
- **Closed circuit television**
- **Fire telephone systems**
- **Data networks**

Dimensional characteristics

Manufactured following the requirements of BS 6207	
1	Numbers of conductors 2 x 1.5 mm ²
2	Insulation (MgO)
3	Diameter over copper sheath (5.7 mm)
4	Red LSF additional sheath (7.2 mm)
In 100 mtrs coils	

Electric characteristics

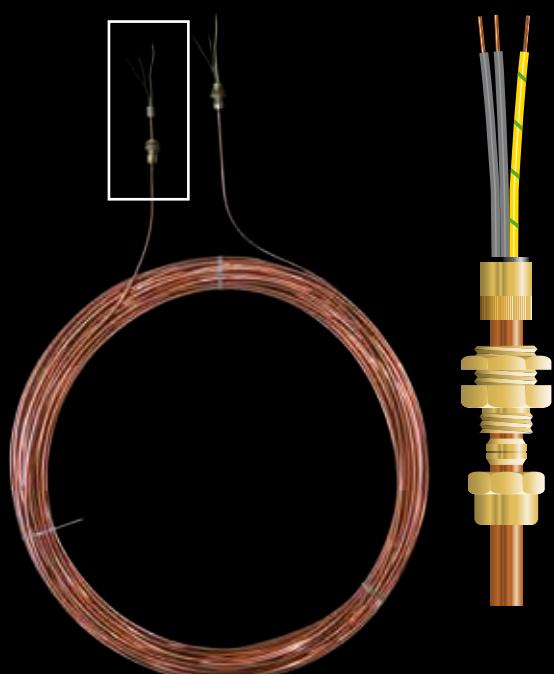
Voltage rating	500 V
Conductors resistance (max.)	12.1 ohm/km
Nominal sheath resistance (screen)	2.7 ohm/km
Nominal capacitance conductor to conductor	164.5 pF/m
Nominal capacitance one conductor to sheath at 1 kHz	243.5 pF/m
Nominal capacitance between conductors and copper sheath at 1 kHz	384.4 pF/m
Nominal inductance (loop) at 10 MHz	436.0 µH/m
Attenuation at 1 MHz	- 19.0 dB/km
Attenuation at 10 MHz	- 52.0 dB/km
Nominal characteristic impedance	50 ohm

On request KME is able to produce twisted cables 2T1 and 2T2.5 and also shielded MI cables with double insulation

MICO® assembled and tested in factory - complete pieces

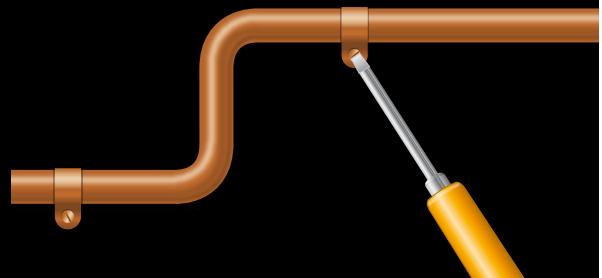
CONTROL

Step 1: Customer receives complete pieces, only to be controlled (500 V, $R_{iso} > 500 \text{ MOhm}$)



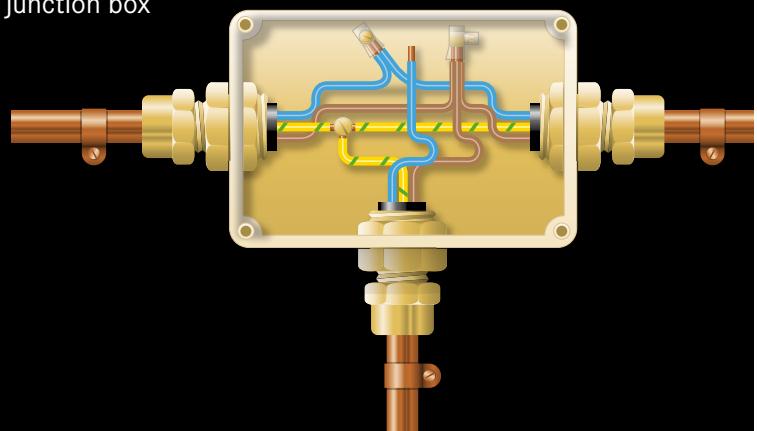
FIXING

Step 2: Customer fixes cable on the wall



CONNECTION

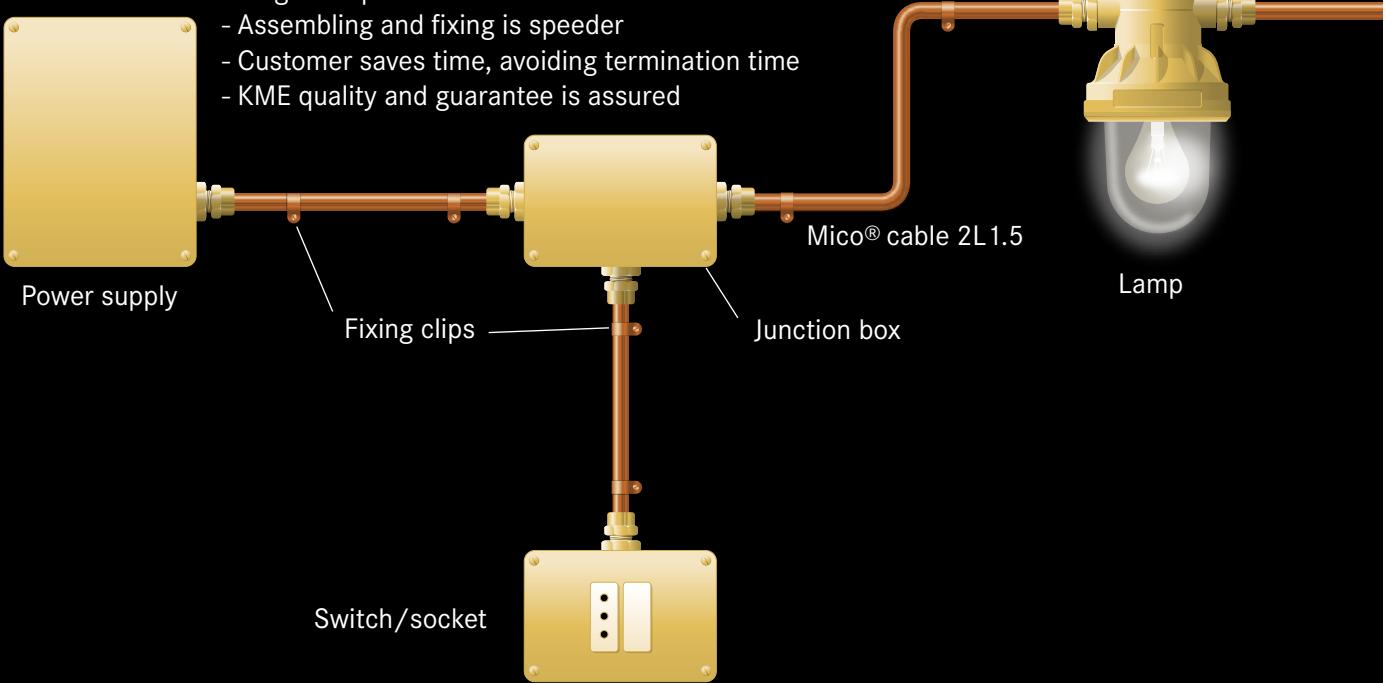
Step 3: Customer joints conductors inside the junction box



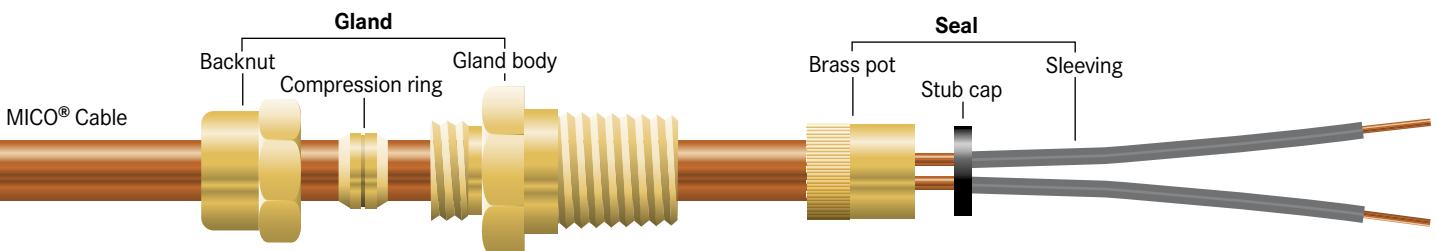
Complete Installation

Using this option:

- Assembling and fixing is speeder
- Customer saves time, avoiding termination time
- KME quality and guarantee is assured



PLAIN SEALS



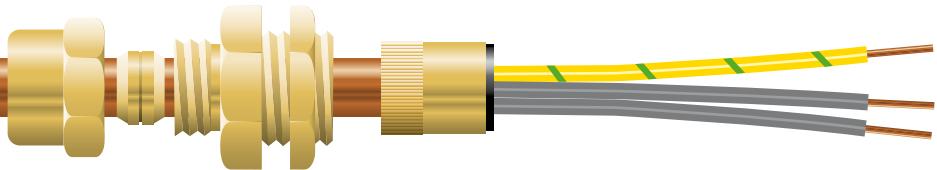
It's original MICO® termination type, characterised by minimum volume and minimum cost and execution time. Since it doesn't foresee the connection of outer copper sheath, inside the junction box, to the earth system, it's frequently used in public lighting to connect to double insulated lights and, for industrial applications in explosion-proof installation, within EEx d brass RAD ISO glands.

EARTH TAIL SEALS

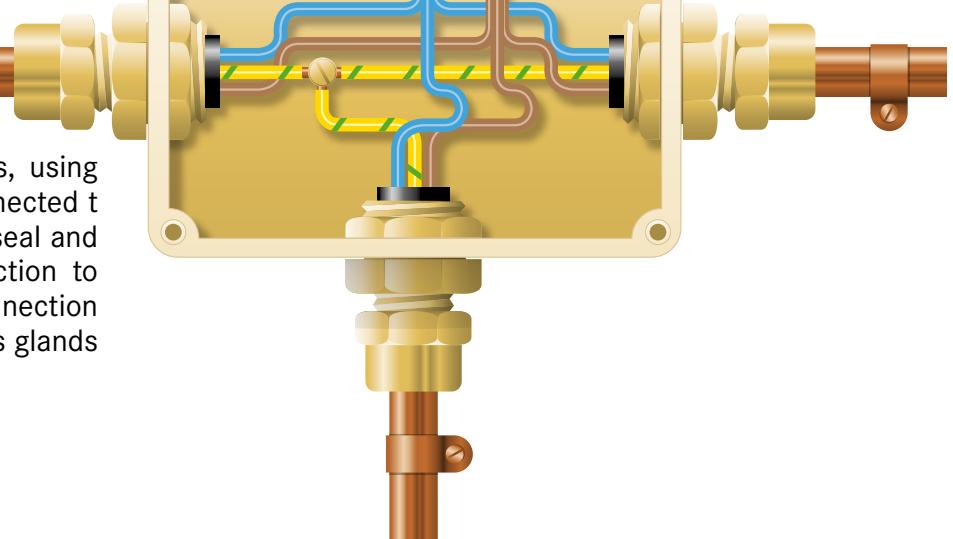
Copper outer sheath can be directly connected to earth system inside junction box by an annealed wire, already welded on brass pot.

Also metallic junction box is connected as well by mechanical connection to outer sheath by brass glands, tightened through a locknut. Earth tail seals can so avoid an unpleasant outer earth connection.

A correct execution of earth connection is extremely important for MICO® system, more than all other standard cables, since MICO® is the only cable to be installed at sight, exposed directly to touch also under 2.5 m of height, due to its structural mechanical resistance.

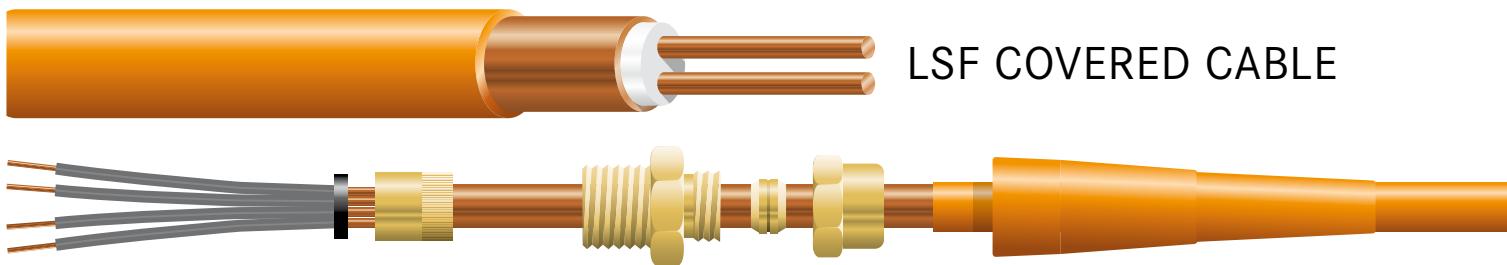
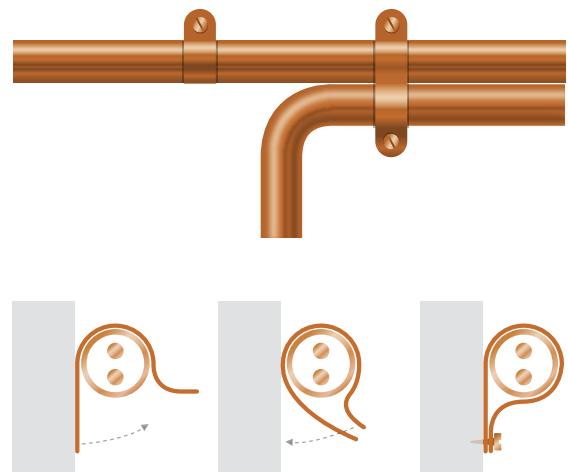


TIPICAL CONNECTION



Inside Junction boxes or enclosures, using standard hubs, MICO system is connected to standard wiring system. Earth tail seal and brass gland (by mechanical connection to metal enclosures) assure perfect connection to earth/ground system. MICO brass glands are IP67 waterproof approved.

FIXING SYSTEMS



Polyolefin extruded protection on the cable, available in red, orange, white and black colour, is required when:

- There are aggressive substances and therefore there's danger for corrosion. Typical LSF cables usage is in chemical, pharmaceuticals and oil industries.
- Specific colour must identify the circuit type, like, for instance, LSF red to identify all cables part of fire detection systems
- Specific LSF colour is considered as the best solution for cable camouflage.



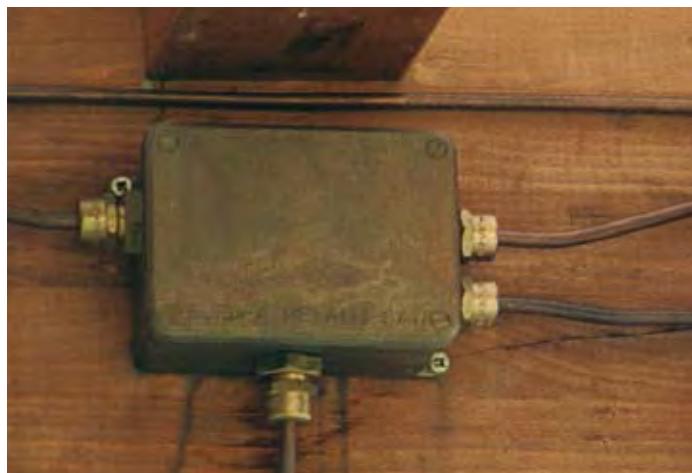
JUNCTION BOXES

In order to complete MICO® system range, KME produces also 2 ranges of valuable metal junction boxes: in sandblasted brass and in copper. The first one is manufactured after melting, the second through assembly and welding of semi-finished products coming from KME divisions standard production.

Production dimensions for junction boxes are:

83 x 117 x 63 mm (small type) in our stock both for brass and copper; **132 x 191 x 72 mm (large type)** in stock only for brass. Copper junction boxes can be manufactured according to any desired dimension by the Customer. All junction boxes can be supplied with a holed panel, so to install behind it all series of mounting frames and relative switches and sockets.

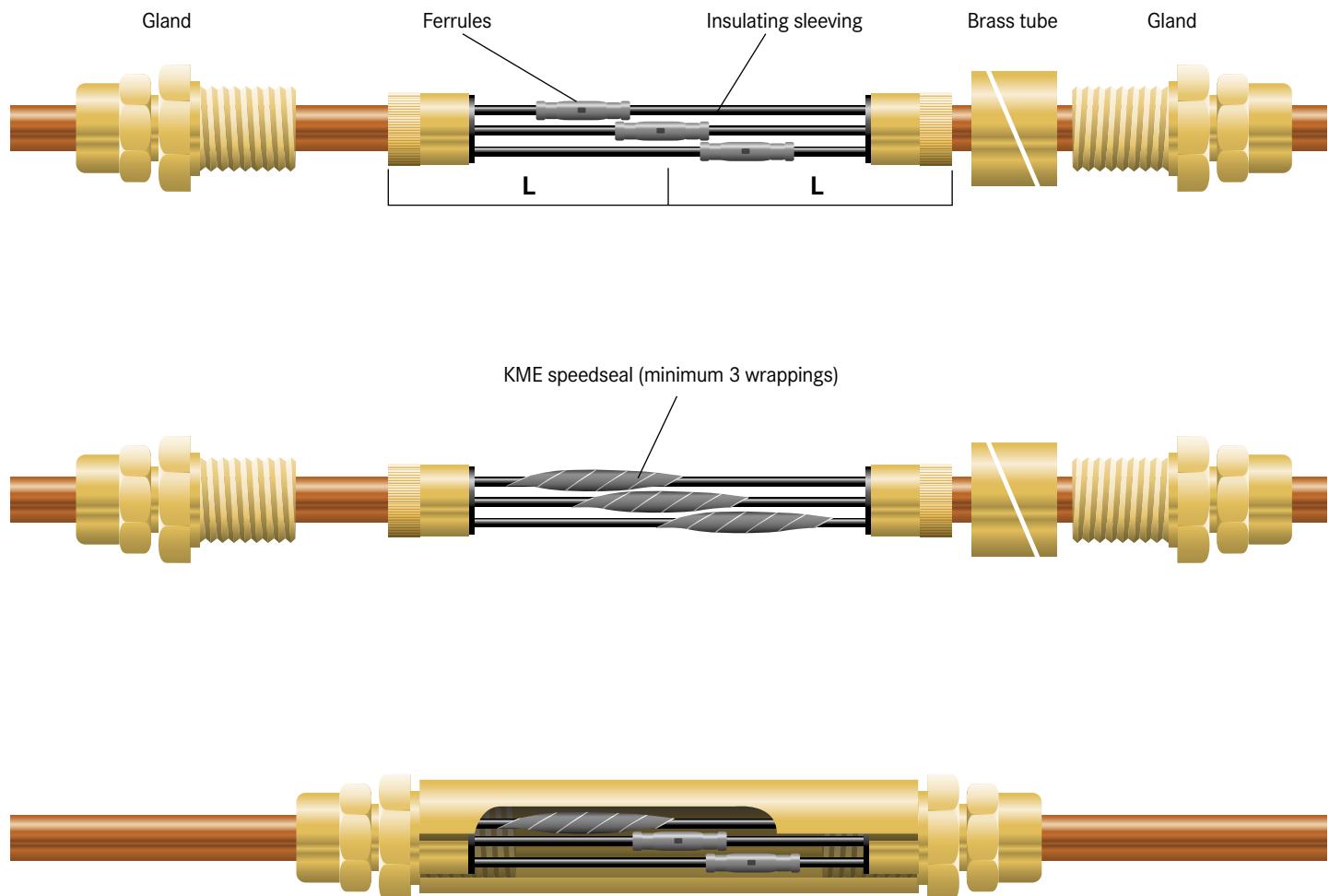
BRASS line



COPPER line



WATERPROOF STRAIGHT THROUGH JOINT



cable type	L	cable type	L	cable type	L
2L1	50	2H1.5	50	3H25	100
2L1.5	50	2H2.5	50	4H1.5	50
2L2.5	50	2H4	50	4H2.5	50
2L4	50	2H6	50	4H4	70
3L1	50	2H10	70	4H6	70
3L1.5	50	2H16	70	4H10	70
3L2.5	50	2H25	80	4H16	80
4L1	50	3H1.5	50	4H25	100
4L1.5	50	3H2.5	50	7H1.5	70
4L2.5	50	3H4	50	7H2.5	70
7L1	70	3H6	70	12H1.5	70
7L1.5	70	3H10	70	12H2.5	80
7L2.5	70	3H16	70	19H1.5	100

REFERENCE LIST

HISTORICAL AREAS

Indoor lighting

VISCONTI CASTLE – PAVIA (14th century)

Designer: Arch. Stefano Vassallo

Clerk of works: Arch. Vittorio Prina

Public buildings office – town of Pavia

Main contractor: IGET – Palestrina (Rome)



ROCCA MAGGIORE & MINORE- ASSISI (12th century)

Designer: Arch. Barabani

Clerk of works: Ing. Cristiano

Technical office Manager – town of Assisi

Main contractor: VEBE of Belli Gianluca (PG)



Outdoor lighting



CATHEDRAL SQUARE, POPE PALACE AND FARNESE FAMILY PALACE (12th 13th and century)

Clerk of works: C.E.V. Spa di Viterbo

Main contractor: Morelli Giorgio – Viterbo

CATHEDRAL AREA OF SIENA 12th century
TOWN WALLS CATHEDRAL MUSEUM

Designer: Leonardo P.I. Gozzi

Main contractor: Cesare Mazzini



CISTERCENSE ABBEY OF SAN GALGANO (SI)
Main contractor: Mannelli SpA - Florence



Public lighting of town streets

HISTORICAL CENTRE OF TAORMINA (ME)

Designer and Clerk of works: Ing. Carmelo De Caro

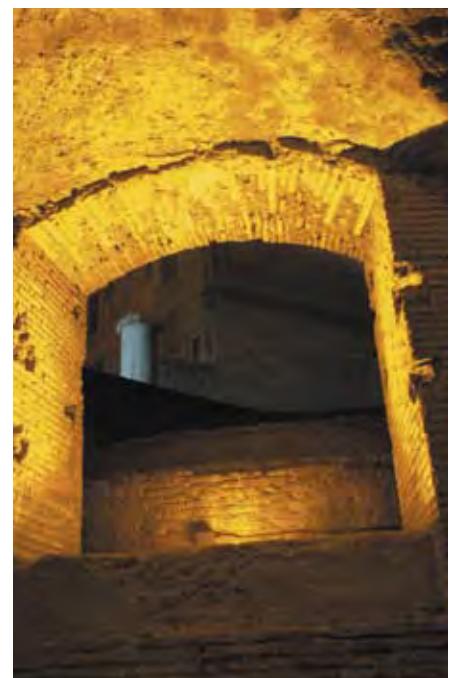
main contractor: COGIP Srl (CT) - installation made by: Savoca and Scollo Company



Archaeological Areas

TRAIANO FORUM (Rome) - 2nd century AC

Designer and Clerk of works: ACEA SpA (Rome) - Ing. Stefano Santia - Main contractor: Prudenzi Mario



INDUSTRIAL AREA Emergency and safety circuits

RICCO' CARLO & FRATELLI (s.p.a.) Rhesins and paintings factory - Correggio (RE) - *Designer: Studio EMMECI consultants by Marzi Enrico*



APPROVALS

KME

IMO

Product | Product
Cavi ad isolamento minerale
Mineral insulated cables

Compatibile | Compatible Model
IEMMEQU < HAR >

Motivo | Motivation
Controllo di fabbricazione

Rapporto | Test Report

Caratteristiche tecniche | Technical characteristics
Tutte le specifiche tecniche dei cavi sono indicate nel documento "Terminazioni per cavi ad isolamento minerale"

Artefici (con stampa) / Artifacts (with print)

Informazioni aggiuntive | Additional Information

Certificato | Certificate

CA01.00228

IMO

Product | Product
Cavi ad isolamento minerale
Mineral insulated cables

Compatibile | Compatible Model
IEMMEQU < HAR >

Motivo | Motivation
Controllo di fabbricazione

Rapporto | Test Report

Caratteristiche tecniche | Technical characteristics
Tutte le specifiche tecniche dei cavi sono indicate nel documento "Terminazioni per cavi ad isolamento minerale"

Artefici (con stampa) / Artifacts (with print)

Informazioni aggiuntive | Additional Information

Certificato | Certificate

CA01.00229

IMO

Product | Product
Terminazioni per cavi ad isolamento minerale
Terminations for mineral insulated cables

Compatibile | Compatible Model
IEMMEQU < HAR >

Motivo | Motivation
Controllo di fabbricazione

Rapporto | Test Report

Caratteristiche tecniche | Technical characteristics
Tutte le specifiche tecniche dei cavi sono indicate nel documento "Terminazioni per cavi ad isolamento minerale"

Artefici (con stampa) / Artifacts (with print)

Informazioni aggiuntive | Additional Information

Certificato | Certificate

CA01.00229

IMO

Product | Product
Terminazioni per cavi ad isolamento minerale
Terminations for mineral insulated cables

Compatibile | Compatible Model
IEMMEQU < HAR >

Motivo | Motivation
Controllo di fabbricazione

Rapporto | Test Report

Caratteristiche tecniche | Technical characteristics
Tutte le specifiche tecniche dei cavi sono indicate nel documento "Terminazioni per cavi ad isolamento minerale"

Artefici (con stampa) / Artifacts (with print)

Informazioni aggiuntive | Additional Information

Certificato | Certificate

CA01.00229



MICO® fire resistant cable is approved according:
IEC 60331 - 3 hours - 750°C
LPCB 6387 - 3 hours 950°C +
mechanical and water test
AS/NZS 3113 - 2 hours up to
1050°C + mrechanical tests

LSF outer sheath approvals:
low smoke emission,
flame retardant

KME accessories are ATEX
approved for Ex d protection

REFERENCE LIST-ASIA

Using KME Italy MICC Cable in Hong Kong, China & Macau

Projects in Hong Kong

Hospital:

- QUEEN ELIZABETH HOSPITAL - A.O. B.D.D.
- REDEVELOPMENT OF RUTTONJEE SANATORIUM HOSPITAL - J.R.P.
- PAMELA YOODE HOSPITAL - A.C.E.

Industrial Plant/Factory

- TUEN MUN COLD STORAGE - Richard Chan & Associate
- SWIRE DURO FACTORY - Tomas & Anderson
- SAI KUNG CHINA PAINTING FACTORY - David Wu & Consolidate Consultan Engineers
- ON LOK TELEPHONE EXCHANGE BUILDING - J.R.P.
- H.K. STANDARD NEWSPAPER INDUSTRIAL FACTORY - Eric Leung Architect & Engineering Associate
- SWIRE MAGNETIC FACTORY - Thomas & Anderson
- M.C. PACKAGING FCTORY - Lu & Associates
- TAI PO PRINTING FACTORY - P&T
- ORIENTA DAILY NEWS BUILDING - A. Thomas
- YAM O DOCKYARD
- CLP CASTLE PEAK POWER STATION
- TIN SHUI WAI LOT 7
- DORSET HOUSE

Projects in Hong Kong-Cont'd

Office Buildings/School

- CHAI WAN TECHNICAL INSTITUTE - J.R.P
- SEAMEN TRAINING CENTRE - Kennedy & Donkin
- CITY POLYTECHNIC PHASE I - A.C.E.
- HARBIUR ROAD LOT 19 GOVERNMENT OFFICE BUILDING - A.O. B.D.D.
- PACIFICPLACE PHASE I & II - Wong& Ouyang
- TSIMSHATSUI CULTURAL COMPLE - A.O. B.D.D.
- HOUSING HEADQUARTERS - J.R.P.
- LDC PROJECT H6
- LEE GARDEN REDEVELOPMENT

Tunnels/Depots

- MONGKOK RAILWAY STATION - A.O B.D.D.
- ROYAL HONG KONG JOCKEY CLUB GRAND STAND - O.A.P.
- LRT-TUEN MUN DEPOT - P.B.A.
- EASTERN HARBOUR CROSSING TUNNEL - Freeman Fox

Residential Buildings/Public Entertainment Centres

- WHAMPOA SITE 5 - A.C.E.
- WHAMPOA SITE 5 & 6 - Wong & Ouyang

Airport Projects

- HACTL SUPERTERMINAL1

Projects in China

- SILVER BAY II IN PRC JOHN - Cornell
- GUILIN CHINA HOTEL IN PRC - P.B.A.
- XIAN XIDU HOTEL IN PRC - P.B.A.
- SKY CENTRAL PLAZA - P.B.A.

Projects in Macau

- CEM BUIDING - P.B.A.
- NAM YUEN BUIDING - Nam Kwong