WREXHAM MINERAL CABLES

MICC Product Brochure

THE **ONLY** TRUE FIRE **SURVIVAL** CABLE

IECEx

Ex

SAUDI MADE

50 YEAR WARRANTY

The only TRUE Fire Survival Cable

Mineral Insulated Copper Cable (MICC Cable) is the only true fire survival cable and exceeds over three hours testing in temperatures above 950°C. MICC Cables utilise two key elements: Copper and Magnesium oxide. Neither release toxins; neither will burn.

[Cu, MgO] +  = **NO SMOKE**
NO TOXINS
NO BURNING
ZERO FLAME SPREAD

Wrexham Mineral Cables KSA, a brand under National Targets Company for Cables (NTCC) and in partnership with Wrexham Mineral Cables UK, is the first and only manufacturer of MICC cables in Saudi Arabia and the GCC.

Back in 1989 Wrexham Mineral Cables UK developed a totally unique process for the manufacturing of MICC cables. This method allows 100% continuous monitoring of the manufacturing process and ensures a 100% conforming product. In over 30 years of manufacturing, Wrexham Mineral Cables UK have had zero in-field failures.

Our cables are installed in some of the world's largest and most important buildings, and are recognised throughout the electrical industry as the best choice for fire survival.

The quality and reliability of our MICC cables meets and exceeds British, European and Australian standards, and maintains certifications from BRE-LPCB, Warrington Fire Research Centre, and London Underground with our termination glands approved by SIRA-for ATEX and IECEx certification.

Wrexham Mineral Cable is proven to safely carry a load for over 3 hours at 950°C and survive direct impact and exposure to water similar to a full fire hose, all on one cable sample.

INORGANIC CONSTRUCTION **NOTHING TO BURN**	> >	Nothing to Burn Zero toxic emissions or smoke
INORGANIC MATERIALS **HOLISTIC FIRE SURVIVAL**	> >	Last a lifetime Zero combustion or heat release
NATURALLY ARMOURED **SELF MONITORING**	> >	No risk of rodent damage No False alarms
FURNACE TESTED	>	Passes the only true lifelike fire test

CERTIFIED
ISO 9001
ISO 14001
ISO 45001

CERTIFIED TO BS 60702-1:2002
REFERENCE NO: 333a/01*
*UNDER PROCESS

SAUDI MADE

50 YEAR WARRANTY

IECEx™

Warranty details available on our website: www.wrexhamcablesksa.com

Safe EVACUATION takes?

10 minutes?

IN CASE OF EMERGENCY

1] Sound the alarm:
But if the cable is burnt and not connected how can you?

2] Dial local emergency number:
Inform reception/security
Impossible if the communication cables are burnt.

3] Attack the fire with extinguishers:
But how can you if the lights are not working and you can't find them?

4] Follow exit signs:
You can't because plastic sheathing around the emergency systems' cabling is emitting toxic smoke and you cannot see or breathe.

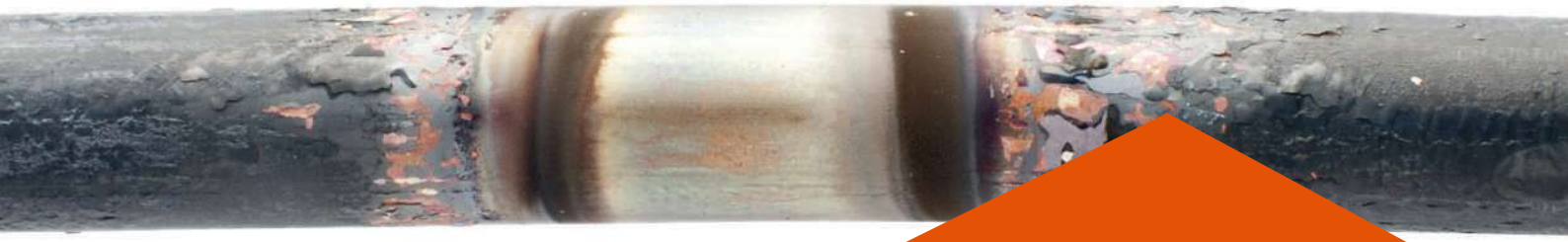
5] Contain the fire:
Close windows and doors - A bit difficult if you have NO lights and you cannot see because of smoke.

6] Use the exit stairwells:
Fine, but you can't find them because emergency lights have failed and smoke extraction fans have stopped due to cables burnt.

The image above is a polymeric 'fire resistant' cable after just 10 minutes when exposed to temperatures of 850˚C. (This is the testing temperature of BS EN 50200 pH120 Enhanced) which requires 2 hours fire resistance. In independent testing several leading brands of polymeric cables failed at 950˚C (The test temperature of BS 6387)

Competitor cable after just 10 minutes at 850˚C

or 3 hours?



MICC Cable easily withstands temperatures exceeding 950˚C for over 3 hours right up to the melting point of copper (1083˚C) and its composition means there is NOTHING to burn!

Our cable after 3 hours at 950˚C

Why Mineral Cable is the TRUE FIRE SURVIVAL CABLE

MICC cables are designed to meet some of the most stringent tests around the world. Wrexham Mineral Cables KSA approvals include:

- British fire performance standards BS EN 50200 PH120 Enhanced to BS 8434-2 which demands 2 hours fire resistance at 850°C.
- BS 5839-1
- BS EN 60702-1
- BS 6387 category C, W & Z demands that cables perform safely for 3 hours at 950°C.
- BS 8519 CAT 3 POWER (HD Cables only)
- AS/NZS 3013

Our MICC Cables are totally inorganic and silicone free. They consist of multiple copper conductors (cores), highly compressed magnesium oxide (insulation) and an outer copper sheath, meaning just 2 elements. This unique composition has an outer melting point of 1083°C (the melting point of copper) and ultimately 2800°C for the insulation (magnesium oxide). Note that the internal load carrying cores (conductors) are protected inside the magnesium oxide insulation.

This ensures MICC cable can safely carry a load in temperatures in excess of 1000°C making it the only TRUE fire survival cable. MICC cable is water and oil resistant, can carry greater current ratings, require no conduit for mechanical or vermin protection, is UV and radiation resistant and can last in excess of 50 years.

Soft Skin, Fire Resistant Polymeric Cables

In order to give some soft skinned polymer cables flame retardant properties, halogens are added to the outer sheath such as: chlorine, bromine, and fluorine. When exposed to a fire, these halogenated polymers will release halides which are extremely toxic. The outer and inner sheaths of soft skin polymer cables burn and contribute to a fire, releasing toxic smoke which can itself ignite, often explosively. Most fire resistant cables are limited to a maximum continuous operating temperature around 80°C. A bare Mineral Cable can work continuously up to 250°C

CABLE PROPERTY	COPPER MICC CABLE	LSF FP/ FR SOFT SKIN
Continuous 250°C operating temp	**YES**	**NO**
Exposure to 1040°C	**YES**	**NO**
BS6387 CWZ	**YES**	**YES**
BS6387 CWZ Enhanced	**YES**	**NO**
Flame retardant / Fire resistant	**YES**	**?**
Waterproof, submersible	**YES**	**NO**
No self ignition	**YES**	**NO**
Mechanical shock & pressure resistant	**YES**	**NO**
Zero toxic emissions	**YES**	**NO**
Self monitoring	**YES**	**NO**
Non-aging, corrosion resistant	**YES**	**NO**
Suitable for confined space / tunnel	**YES**	**NO**
100% recyclable	**YES**	**NO**
No conduit required	**YES**	**NO**
High overload resistance	**YES**	**NO**
ZERO smoke on overload	**YES**	**NO**
Gas bio/chemical proof	**YES**	**NO**
Rodent proof	**YES**	**NO**

Explosive Environments

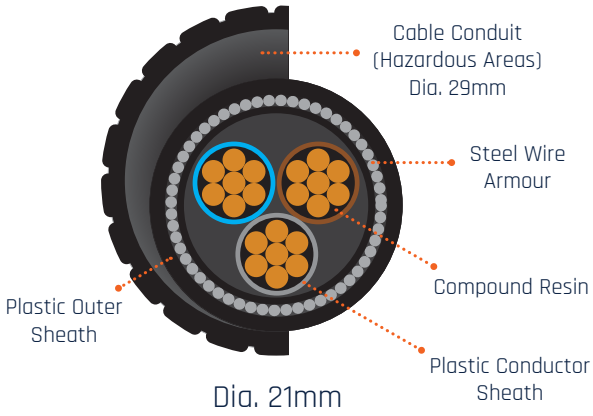
Unlike any other type of hazardous area cable system, MICC Cables do not require conduits, curing resins, expensive fittings, or complicated terminating processes for use in Ex environments. Our cable systems are approved to the latest EExd ATEX & IECEx standards for use in explosive atmospheres, and one simple twist of our cable gland locking nut produces a total seal to Zone 1 and 2 hazardous area applications within 5 minutes. This greatly reduces the installation risk, and the cost and installation space required. Our cable system also comes with a 50 years system warranty. The risk free, cost effective Ex cable solution from the KSA's only manufacturer of MICC fire survival cables.

Benefits of MICC Cable

- **NO** conduit required
- **NO** curing time for resin
- **NO** additional glanding system
- **NO** risk of poor Ex insulation techniques

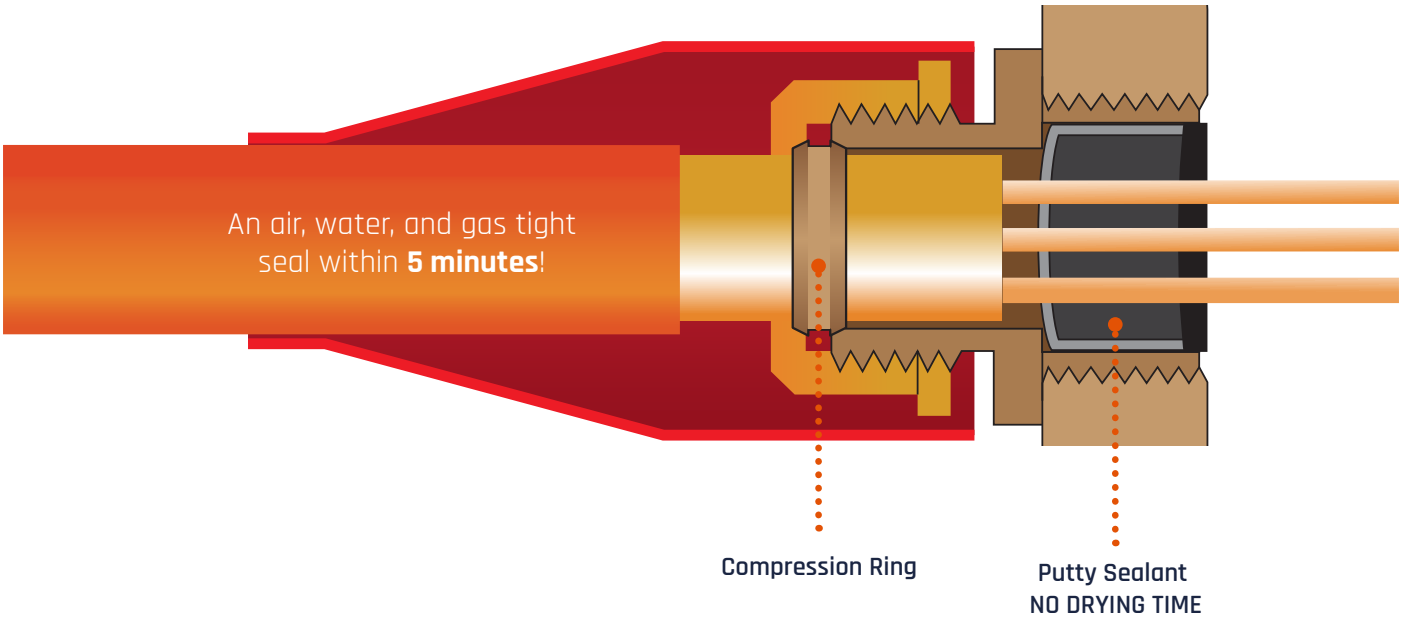
3 Core MICC Cable

3 Core SWA Cable



The Wrexham Mineral Cables KSA Ex Cable system

The cost effective Ex cable solution from WMC KSA can also greatly reduce the installation space. In most cases the MICC cable system can be over ONE THIRD smaller than other Ex cable options.



Applications and Industries

MICC Cables have been designed specifically for critical and lifesaving systems where continuity is required in the event of a fire.

Critical and Life Saving Systems:

EMERGENCY SHUTDOWN SYSTEMS	Stop/Start Controls	**EMERGENCY LIGHTING**	Fire Alarm Systems
FIRE PUMPS	Fume & Smoke Extraction	**FIRE DETECTION & PROTECTION SYSTEMS**	Theatre/Life Support Systems
SPRINKLER SYSTEMS	Instrument/Monitoring Systems	**COMMUNICATION SYSTEMS**	Lifts
RECESS & HANDRAIL ILLUMINATION	Public Address Systems	**MAINS DISTRIBUTION**	Motor Operated Valves

Industries

Multi-Storey Car Parks

Travelators/Escalators

Airports

Hospitals

Shopping Centres

Rail Networks/Metrolinks

Industrial/Manufacturing

Mining/Tunnels

Hotels/Catering

Skyscrapers/Tower Blocks

Gas/Oil Refineries

Nuclear/Power Stations

Training and Support:

Scan the QR code and follow our YouTube channel for training / installation videos.

For the very latest on Wrexham Mineral Cables KSA including events and training follow us on linkedIn.

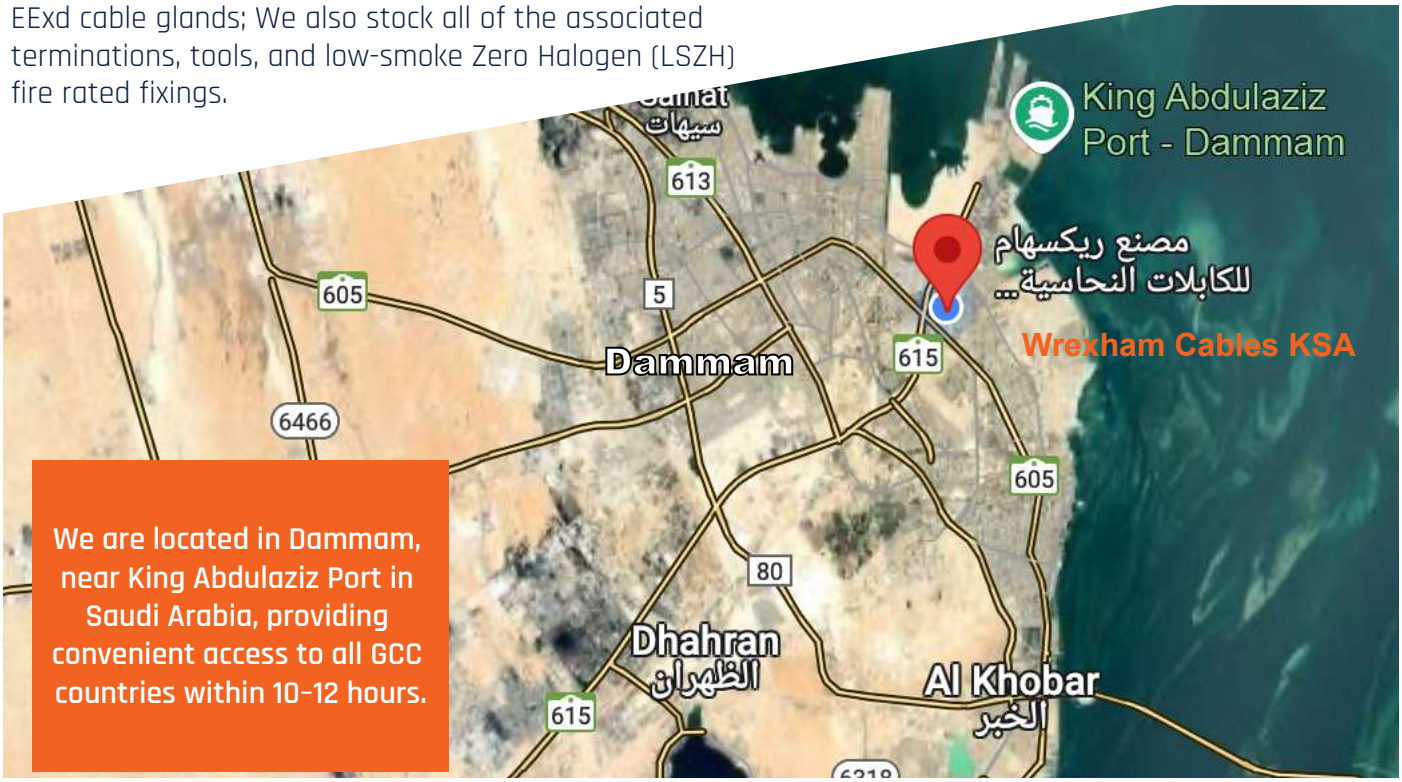
SCAN ME

YouTube

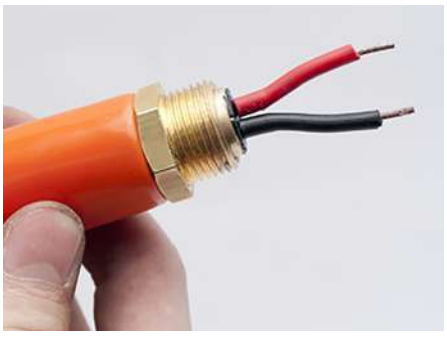
LinkedIn

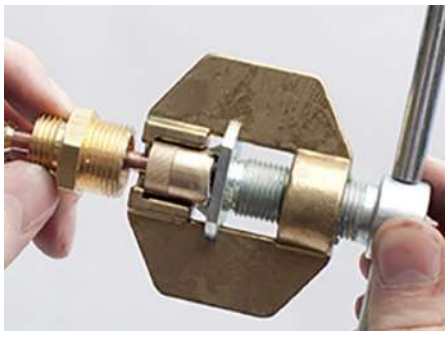
Glands, Terminations and Tools

WMC KSA stock a full range of ATEX and IECEx approved EExd cable glands; We also stock all of the associated terminations, tools, and low-smoke Zero Halogen (LSZH) fire rated fixings.



We are located in Dammam, near King Abdulaziz Port in Saudi Arabia, providing convenient access to all GCC countries within 10-12 hours.





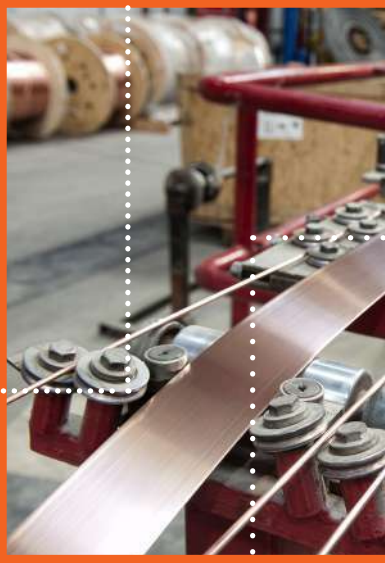
Manufacturing Process

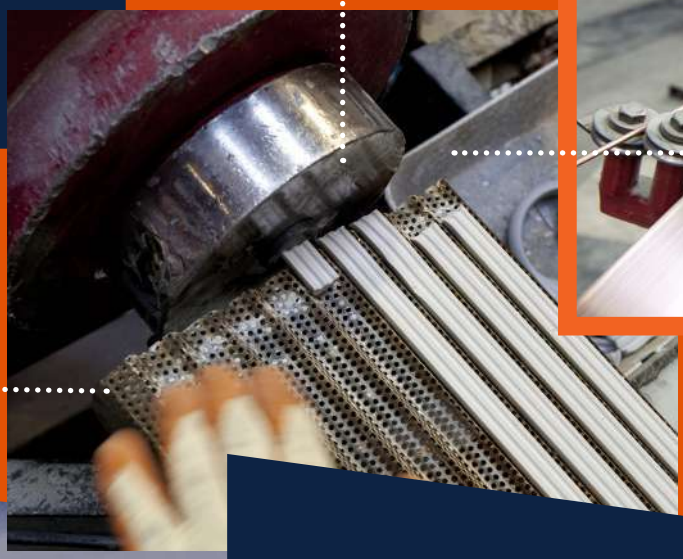
Highly compressed magnesium oxide blocks are manufactured on site and used as insulation. Wrexham Mineral Cables select only the highest grade MgO for the manufacturing process.
Wrexham Mineral Cables manufacturing process is environmentally friendly and operates a full recycling process on its materials including MgO.

Why Magnesium Oxide?

MgO is a refractory material, a solid that is physically and chemically stable at high temperatures. Its two main attributes are high thermal conductivity and low electrical conductivity making it an ideal insulator for our cables

The highly compressed magnesium blocks are fired up to 1400˚C in our purpose built kilns. Any impurities burn away leaving a pure inorganic mineral block





At this stage the copper conductors, magnesium block and outer copper sheath are combined together in one efficient process.

Continuous manufacture

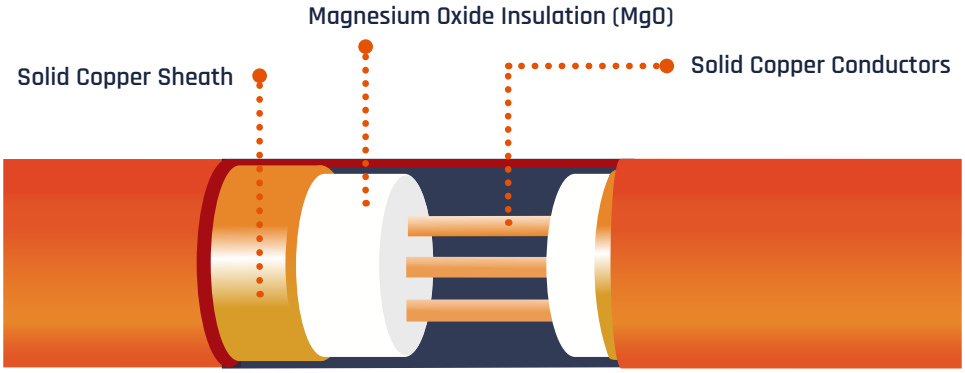
The unique process of hand feeding the highly compressed magnesium blockallows continuous monitoring of the MgO compaction and conductor geometry, crucial to achieving high voltage breakdowns with high levels of insulation and a consistent level of quality.

Competitive lead time

The pre-formed cable is then seam fused using a Tig process before entering our rolling mills.
During this process the cable is gradually reduced in diameter to the desired specification while passing through our high frequency induction annealer.

Fire Resistant Cable and Accessories

Available in 2 voltage ranges, commonly known as Light (L) and Heavy Duty (H) cables. Exceeds 3 hours at 930°C survival time. This impressive performance can add vital time to escape a fire, and makes it ideal for use in large developments such as hospitals, shopping centres, airports, schools, underground rail systems, factories and high rise buildings which house large numbers of people.



500V Light Duty Cable

TECHNICAL													ACCESSORIES							
CORE	CABLE SIZE	CONDUCTORS		CURRENT RATINGS		VOLT DROP	SHEATH CROSS SECTION AREA (EFFECTIVE mm²)	EARTH FAULT LOOP IMPEDANCE @ 70°C (R1+R2) Ohms / km	MAXIMUM CONDUCTOR RESISTANCE Ohms PER 1000 METRES 20°C	CABLE DIAMETER		APPROX WEIGHT PER 1000 METRES		GLAND SIZE REF: WRGM		CABLE FIXINGS			
				CABLES EXPOSED TO TOUCH												ONE HOLE CLIPS		TWO WAY SADDLES	
		NO X SQ mm		BARE (AMPS)	COVERED (AMPS)	PER AMP/ PER METRE mV				BARE (mm)	LSZH COVERED (mm)	BARE (kg)	LSZH COVERED (kg)	PLAIN SEAL (mm) REF: WRPS	EARTH TAIL SEAL (mm) REF: WRPSL	BARE COPPER REF: WRC	LSZH COATED REF: WRCHL	BARE COPPER REF: WRS	LSZH COATED REF: WRSFL
	2L 1.0	2	1.0	16.5	18.5	42	5.4	26.590	18.1	5.1	6.6	105	124	20	20	20	26	202	272
	2L 1.5	2	1.5	20.5	23	28	6.3	18.627	12.1	5.7	7.2	132	156	20	20	22	28	222	302
	2L 2.5	2	2.5	28	31	17	8.2	11.980	7.41	6.6	8.1	184	207	20	20	26	32	272	342
	2L 4.0	2	4.0	36	40	10	10.7	7.915	4.61	7.7	9.4	253	290	20	20	30	37	302	382
	3L 1.0	3	1.0	13.5	15	36	6.7	25.637	18.1	5.8	7.3	132	159	20	20	22	28	242	302
	3L 1.5	3	1.5	17	19	24	7.8	17.823	12.1	6.4	7.9	172	199	20	20	24	30	272	342
	3L 2.5	3	2.5	23.5	26	14	9.5	11.621	7.41	7.3	9.0	234	270	20	20	28	34	302	342
	4L 1.0	4	1.0	13.5	15	36	7.7	25.111	18.1	6.3	7.8	164	191	20	20	24	30	272	342
	4L 1.5	4	1.5	17.5	19.5	24	9.1	17.416	12.1	7.0	8.5	209	243	20	20	28	34	302	342
	4L 2.5	4	2.5	23.5	26	14	11.3	11.166	7.41	8.1	9.8	288	333	20	20	32	37	342	422
	7L 1.0	7	1.0	9	10	42	10.2	24.333	18.1	7.6	9.3	237	271	25	25	30	37	302	382
	7L 1.5	7	1.5	11.5	13	28	11.8	16.758	12.1	8.4	10.1	310	351	25	25	32	40	342	422
	7L 2.5	7	2.5	15.5	17.5	17	15.4	10.580	7.41	9.7	11.4	433	475	25	25	37	43	382	462

750V Heavy Duty Cable

TECHNICAL												ACCESSORIES							
Core	Cable Size	CONDUCTORS		CURRENT RATINGS		VOLT DROP	SHEATH CROSS SECTION AREA (EFFECTIVE mm²)	EARTH FAULT LOOP IMPEDANCE @ 70°C (R1+R2) Ohms / km	MAXIMUM CONDUCTOR RESISTANCE Ohms PER 1000 METRES 20°C	CABLE DIAMETER		APPROX WEIGHT PER 1000 METRES		GLAND SIZE REF: WRGM		CABLE FIXINGS			
		NO X SQ mm		CABLES EXPOSED TO TOUCH												ONE HOLE CLIPS		TWO WAY SADDLES	
				BARE (AMPS)	COVERED (AMPS)	PER AMP/ PER METRE mV				BARE (mm)	LSZH COVERED (mm)	BARE (kg)	LSZH COVERED (kg)	PLAIN SEAL (mm) REF: WRPS	EARTH TAIL SEAL (mm) REF: WRPSL	BARE COPPER REF: WRC	LSZH COATED REF: WRCHL	BARE COPPER REF: WRS	LSZH COATED REF: WRSFL
	1H2.5	1	2.5	39	43	13.5	6.44	3.71	7.41	5.3	6.6	111	128	20	20	20	26	202	272
	1H4	1	4	51	56	8.3	7.7	3.09	4.61	5.9	7.2	143	166	20	20	22	28	222	272
	1H6	1	6	47	52	6	8	5.318	3.08	6.4	7.9	173	213	20	20	24	30	272	342
	1H10	1	10	63	70	3.6	9	3.545	1.83	7.3	9.0	241	274	20	25	28	34	302	342
	1H16	1	16	83	92	2.3	12	2.471	1.15	8.3	10.0	327	364	20	25	32	37	342	422
	1H25	1	25	108	120	1.45	15	1.715	0.727	9.6	11.3	458	500	20	32	37	43	382	462
	1H35	1	35	132	147	1.05	18	1.329	0.524	10.7	12.4	600	650	20	32	40	47	422	502
	1H50	1	50	163	181	0.79	22	1.040	0.387	12.1	13.8	760	812	25	40	47	54	502	542
	1H70	1	70	199	221	0.55	27	0.781	0.268	13.7	15.4	1019	1080	25	-	54	59	542	632
	1H95	1	95	237.5	265	0.41	32	0.619	0.193	15.4	17.7	1326	1416	25	-	59	67	632	702
	1H120	1	120	272.5	303	0.33	37	0.516	0.153	16.8	19.1	1615	1713	32	-	63	75	702	752
	1H150	1	150	311	346	0.29	44	0.435	0.124	18.4	20.7	1952	2059	32	-	71	79	752	812
	1H185	1	185	353	392	0.25	54	0.368	0.101	20.4	23.2	2425	2570	32	-	79	88	812	932
	1H240	1	240	411	457	0.21	70	0.297	0.0775	23.3	26.1	3146	3312	40	-	88	101	932	1042
	1H300	1	300	795	883	0.31	84.6	0.28	0.0775	26	28.8	3791	3972	-	-	101	USE WRSHL 18 OR WRSZL 18 AS REQUIRED		
	1H400	1	400	948	1053	0.28	105	0.22	0.044	30	32.8	5004	5211	-	-	-			
	2H1.5	2	1.5	22.5	25	28	11	16.902	12.1	7.9	9.6	247	284	20	20	30	37	342	382
	2H2.5	2	2.5	30.5	34	17	13	10.903	7.41	8.7	10.4	280	335	20	20	34	40	342	422
	2H4	2	4	40.5	45	10	16	7.185	4.16	9.8	11.5	365	415	20	25	37	43	422	462
	2H6	2	6	51	57	7	18	5.073	3.08	10.9	12.6	463	510	20	25	43	47	462	502
	2H10	2	10	69	77	4.2	24	3.272	1.83	12.7	14.4	635	725	25	32	47	54	502	592
	2H16	2	16	92	102	2.6	30	2.220	1.15	14.7	16.4	855	918	25	40	54	63	592	702
	2H25	2	25	119.5	135	1.65	38	1.537	0.727	17.1	19.4	1185	1285	32	40	67	75	702	752
	3H1.5	3	1.5	19	21	24	12	16.722	12.1	8.3	10.0	265	310	20	20	32	37	342	422
	3H2.5	3	2.5	25	28	14	14	10.711	7.41	9.3	11.0	345	390	20	25	37	43	382	462
	3H4	3	4	33	37	9.1	17	7.041	4.61	10.4	12.1	452	495	20	25	40	47	422	502
	3H6	3	6	43	48	6	20	4.953	3.08	11.5	13.2	562	602	25	25	43	51	462	542
	3H10	3	10	58.5	65	3.6	27	3.147	1.83	13.6	15.3	758	817	25	32	54	59	542	632
	3H16	3	16	77	86	2.3	34	2.133	1.15	15.6	17.9	1039	1130	25	40	59	71	632	752
	3H25	3	25	101	112	1.45	42	1.476	0.727	18.2	20.5	1451	1557	40	40	71	79	752	812
	4H1.5	4	1.5	19	21	24	14	16.435	12.1	9.1	10.8	330	370	20	20	37	43	382	462
	4H2.5	4	2.5	25	28	14	16	10.496	7.41	10.1	11.8	412	445	20	25	40	47	422	462
	4H4	4	4	33	37	9.1	20	6.814	4.61	11.4	13.1	530	608	25	25	43	51	462	542
	4H6	4	6	43	48	6	24	4.782	3.08	12.7	14.4	740	790	25	32	47	54	502	592
	4H10	4	10	58.5	65	3.6	30	3.036	1.83	14.8	16.5	916	979	25	32	54	63	592	702
	4H16	4	16	77	86	2.3	39	2.026	1.15	17.3	19.6	1292	1393	32	40	67	75	702	752
	4H25	4	25	101	112	1.45	49	1.384	0.727	20.1	22.9	1813	1956	40	40	79	88	812	932
	7H1.5	7	1.5	13	14.5	28	18	16.004	12.1	10.8	12.5	435	482	25	25	43	47	472	502
	7H2.5	7	2.5	17.5	19.5	17	22	10.100	7.41	12.1	13.8	563	616	25	25	47	54	502	542
	12H1.5	12	1.5	10.5	12	28	29	15.519	12.1	14.1	15.8	710	770	32	-	54	59	592	632
	12H2.5	12	2.5	14.5	16	17	34	9.706	7.41	15.6	17.9	910	1001	32	-	59	71	632	752
	19H1.5	19	1.5	9	10	28	37	15.310	12.1	16.6	18.9	989	1086	40	-	63	71	702	752

Voltage Drop

Conductor operating temperature 70°C.

CONDUCTOR CROSS-SECTIONAL AREA	1 TWO-CORE CABLE						THREE-PHASE AC											
	2 SINGLE-CORE CABLES TOUCHING			1 TWO-CORE CABLE			1 THREE OR FOUR CORE CABLE			3 SINGLE-CORE CABLES IN TREFOIL FORMATION			3 SINGLE-CORE CABLES FLAT and TOUCHING			CABLES FLAT and SPACED BY ONE CABLE DIAMETER*		
(mm²)	(mV/A/m)			(mV/A/m)			(mV/A/m)			(mV/A/m)			(mV/A/m)			(mV/A/m)		
2.5	17			17			14			14			14			14		
4	10			10			9.1			9.1			9.1			9.1		
6	7			7			6.0			6.0			6.0			6.0		
10	4.2			4.2			3.6			3.6			3.6			3.6		
16	2.6			2.6			2.3			2.3			2.3			2.3		
	R	X	Z	R	X	Z	R	X	Z	R	X	Z	R	X	Z	R	X	Z
25	1.65	0.200	1.65	1.65	0.145	1.65	1.45	0.125	1.45	1.45	0.170	1.45	1.45	0.25	1.45	1.45	0.32	1.50
35	1.20	0.195	1.20	-	-	-	-	-	-	1.05	0.165	1.05	1.05	0.24	1.10	1.05	0.31	1.10
50	0.89	0.185	0.91	-	-	-	-	-	-	0.78	0.160	0.80	0.79	0.24	0.83	0.82	0.31	0.87
70	0.62	0.180	0.64	-	-	-	-	-	-	0.54	0.155	0.56	0.55	0.23	0.60	0.58	0.30	0.65
95	0.46	0.175	0.49	-	-	-	-	-	-	0.40	0.150	0.43	0.41	0.22	0.47	0.44	0.29	0.53
120	0.37	0.170	0.41	-	-	-	-	-	-	0.32	0.150	0.36	0.33	0.22	0.40	0.36	0.28	0.46
150	0.30	0.170	0.34	-	-	-	-	-	-	0.26	0.145	0.30	0.29	0.21	0.36	0.32	0.27	0.42
185	0.25	0.165	0.29	-	-	-	-	-	-	0.21	0.140	0.26	0.25	0.21	0.32	0.28	0.26	0.39
240	0.190	0.160	0.25	-	-	-	-	-	-	0.165	0.140	0.22	0.21	0.20	0.29	0.26	0.25	0.36

Notes:

- Ambient temperature: 30°C
- Sheath operating temperature: 70°C
- For single-core cables, the sheaths of the circuit are assumed to be connected together at both ends.
- For bare cables exposed to touch, the tabulated values should be multiplied by 0.9

Current-Carrying Capacity

LSZH Covered or bare and exposed to touch (Copper conductors and sheath).

REFERENCE METHOD C				REFERENCE METHODS E, F, AND G				
CONDUCTOR CROSS-SECTIONAL AREA	SINGLE PHASE AC OR DC	THREE-PHASE AC		SINGLE PHASE AC OR DC	THREE-PHASE AC			
	2 SINGLE-CORE CABLES TOUCHING OR 1 TWO-CORE CABLE	3 SINGLE-CORE CABLES IN TREFOIL OR 1 THREE-CORE OR FOUR-CORE CABLE	3 SINGLE-CORE CABLES FLAT AND TOUCHING, HORIZONTAL OR VERTICAL	2 SINGLE-CORE CABLES TOUCHING OR 1 TWO-CORE CABLE	3 SINGLE-CORE CABLES IN TREFOIL OR 1 THREE-CORE OR FOUR-CORE CABLE	3 SINGLE-CORE CABLES FLAT AND TOUCHING	3 SINGLE-CORE CABLES FLAT & SPACED BY ONE CABLE DIAMETER	
							VERTICAL	HORIZONTAL
(mm^2)	(AMPS)	(AMPS)	(AMPS)	(AMPS)	(AMPS)	(AMPS)	(AMPS)	(AMPS)
LIGHT DUTY CABLE (500 volts)								
1	18.5	15	17	19.5	16.5	18	20	23
1.5	23	19	21	25	21	23	26	29
2.5	31	26	29	33	28	31	34	39
4	40	35	38	44	37	41	45	51
HEAVY DUTY CABLE (750 volts)								
1.5	25	21	23	26	22	26	28	32
2.5	34	28	31	36	30	34	37	43
4	45	37	41	47	40	45	49	56
6	57	48	52	60	51	57	62	71
10	77	65	70	82	69	77	84	95
16	102	86	92	109	92	102	110	125
25	133	112	120	142	120	132	142	162
35	163	137	147	174	147	161	173	197
50	202	169	181	215	182	198	213	242
70	247	207	221	264	223	241	259	294
95	296	249	264	317	267	289	309	351
120	340	286	303	364	308	331	353	402
150	388	327	346	416	352	377	400	454
185	440	371	392	472	399	426	446	507
240	514	434	457	552	466	496	497	565

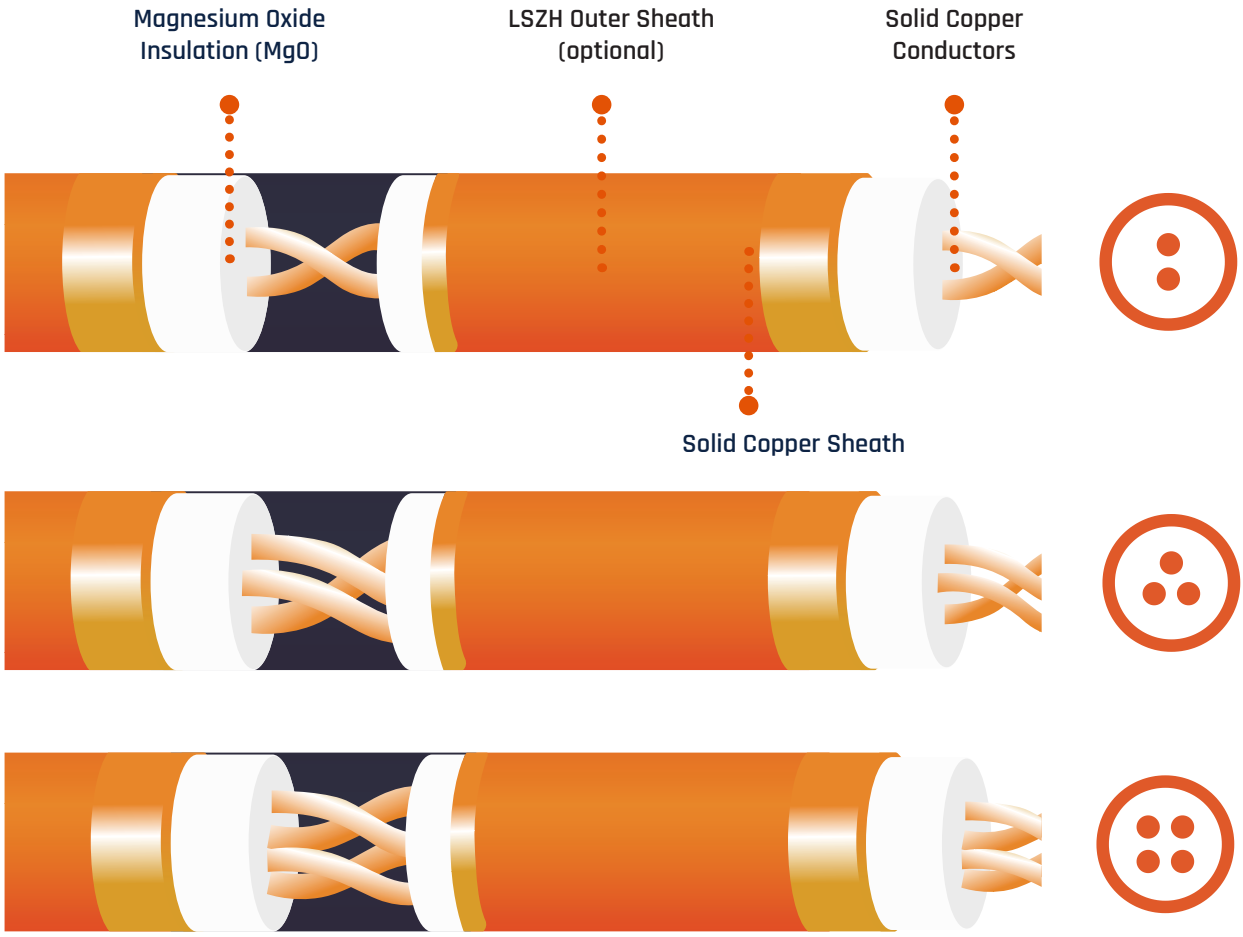
Notes:

- Ambient temperature: 30°C
- Sheath operating temperature: 70°C
- For single-core cables, the sheaths of the circuit are assumed to be connected together at both ends
- For bare cables exposed to touch, the tabulated values should be multiplied by 0.9

Twisted Conductor Cable

Our Twisted Conductor Cables are designed for use where enhanced fire survival is required such as fire alarm and detection systems. Other applications include fire telephone systems, CCTV, and public address systems. Our Twisted Conductor Cables have reduced electromagnetic interference and signal corruption, reducing system malfunction and improved electrostatic screening.

CABLE SIZE REFERENCE	CONDUCTORS	CONDUCTOR RESISTANCE	MAX SHEATH RESISTANCE @20°c Ohm/ km	CAP-C/C @10k-Hz	CAP-C/SH @10kHz	IND-LOOP @10kHz	CHARACTER IMP	DIAMETER OVER SHEATH	DIAMETER OVER LSZH	COND AREA	FREQUENCY OF TWIST (PER METRE)
2T1.5	2	12.1 ohms/Km	3.35	164 pF/m	243 pF/m	436 uH/Km	52 ohms	5.7mm	7.2mm	1.5mm^2	20
2T2.5	2	7.4 ohms/Km	2.53	170 pF/m	270 pF/m	410 uH/Km	49 ohms	6.6mm	8.1mm	2.5mm^2	20
3T1.5	3	12.1 ohms/Km	2.67	160 pF/m	260 pF/m	450 uH/Km	50 ohms	6.4mm	7.9mm	1.5mm^2	20
4T1.5	4	12.1 ohms/Km	2.33	180-216 pF/m	290 pF/m	520 uH/Km	48 ohms	7.0mm	8.5mm	1.5mm^2	20



Approvals and Standards:

CABLES MANUFACTURED AND TESTED UNDER LPCB LICENCE 333A/01*	To BS EN 60702 -1: 2002+A1:2015
ISO 9001 APPROVED MANUFACTURING FACILITY	BV cert DU005007-005

*Under Process

EX PRODUCTION QUALITY ASSURANCE NOTIFICATION	No. SIRA 02 ATEX M170
ATEX EU-TYPE EXAMINATION CERTIFICATE	No. SIRA 02 ATEX 1305X Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU
IECEX CERTIFICATE OF CONFORMITY	No. SIRA IECEx 19.0051X

CERTIFIED
ISO 9001
ISO 14001
ISO 45001

CERTIFIED TO BS 60702-1:2002
REFERENCE NO: 333a/01*

*UNDER PROCESS

VISIT OUR WEBSITE FOR A FULL LIST OF STANDARDS AND APPROVALS.

SCAN ME

WMC KSA are also compliant with:

LPCB Cable standards

LPCB	BS 5839-1:2013 ENHANCED to clause 26.2	Fire detection and fire alarm systems for buildings. Code of practice for system design, installation, commissioning and maintenance
LPCB	BS EN 50200 Class Ph120	Resistance to fire of unprotected small cables for use in emergency circuit
LPCB	BS 8434-2:2003+A2:2009	Test for unprotected small cables for use in emergency circuits. BS EN 50200 with a 930° flame and with water spray
LPCB	C, W & Z of BS 6387: 2013	Requirements for cables to maintain circuit integrity under fire conditions.
LPCB	BS 8491	Method for assessment of fire integrity of large diameter power cables
LPCB	BS 8519 CAT 3 POWER	Selection and installation of fire-resistant power and control cable systems for life safety, fire-fighting and other critical application

SIRA Hazardous area cable gland system approvals

ENCLOSURE TYPES	Brass Compression Ring Type Glands hold ATEX & IECEx approval for use with suitable Certified Apparatus in Zone Classification 1 and 2 in potentially explosive atmospheres.
EN / IEC 60079-1	Explosive atmospheres – Part 1: Equipment protection by flameproof enclosure "d"
EN / IEC 60079-31	Explosive atmospheres – Part 31. Equipment dust ignition protection by enclosure "t"

Other approvals

LONDON UNDERGROUND (LUL)	LU standard 1-085	Product Registration Certificate number 1567 The cable is compliant with LU standard 1-085, and suitable for installations in surface and sub-surface locations

High-rise Buildings

Golden Bay Tower

Park Plaza

Harrods

A high-rise building undergoes many risk assessments. Their aim is to not only reduce the probability of a fire occurring, but also how the core of the building will function when it's needed to save lives during evacuation.

The critical circuits need to function for extended periods due to evacuation time for large buildings. The areas of consideration include the fire alarm, sprinkler, smoke extraction and P.A. systems. Within these systems, emergency scenarios can be made worse when they fail to work. These include:

- Fire alarm cable stops working after several minutes.
- The sprinkler system did not activate which allowed the spread of fire rapidly.
- Communication systems fail to reach all levels, leaving residents uninformed on what actions to take.
- Extraction fans fail to work, meaning stairwells fill quickly with smoke.
- Emergency lights fail to work, meaning escape routes are not found.

MICC copper sheath has its own built-in conduit and does not require any additional mechanical protection. MICC cables can reduce inspection times saving further annual costs.

Fire resistant cables supply critical circuits to high rise buildings during a fire, or incident, where circuit integrity is essential for extended periods. It is the unique properties of MICC which make it the only cable option for all buildings where fire safety is paramount.

Lusail Stadium, Qatar

Education

In buildings such as Schools, Colleges or Universities the risk of highly populated evacuations that will require additional time means the choice of cables to power these circuits is crucial. These cables must continue to carry power to vital equipment for hours, to continue to warn of the fire, suppress the flames, extract the toxic fumes, and provide visual access for a route to exit, in what is likely to be a densely filled classroom or corridor.

The risk of damage and tamper-proofing of these cables is also considered, as the environment poses a risk to such activities.

National Heritage

Windsor Castle

Houses of Parliament

Buckingham Palace

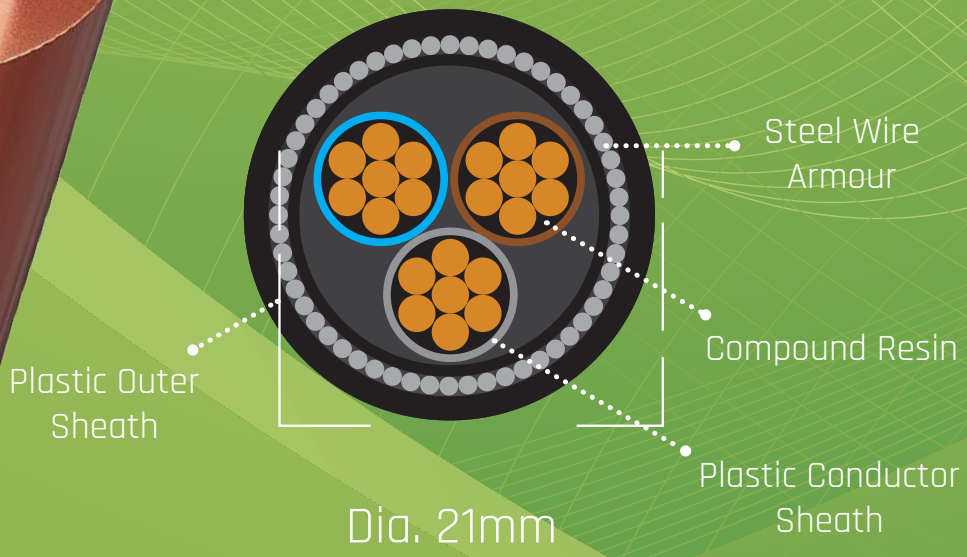
The use of MICC Cables is the natural choice when protecting our history and irreplaceable National heritage. The fact that MICC Cables withstand considerable abuse such as bending, flattening and twisting, without electrical failure and are able to power all emergency circuits before, during and after a fire is a key decision maker. MICC Cable is also ideal for use in buildings which have not been designed for electrical installations.

Its small, overall size and pliability enables it to provide the most sympathetic solution when aesthetic considerations require cable to blend in suitably with stonework, bare timber, lead, copper or other 'natural' surfaces. Popular in both bare (where environmentally possible) and even colour matched using our optional LSZH outer covering.
The added complication is that many historic buildings are now managed as commercial operations and so electrical installations and maintenance must be minimised to ensure that revenues from admissions are not adversely affected.

TWO ELEMENTS.
ZERO WASTE.

3 Core MICC Cable

3 Core SWA Cable



3 hours survival time

SAUDI MADE

50 YEAR WARRANTY

The **ONLY** ENVIRONMENTALLY FRIENDLY, PLASTIC-FREE CABLE

MICC Cables offer designers, engineers and installers the chance to reduce the overall environmental impact of any project. Due to its unique structure the MICC sheath can be used as an earth with our earth tail seal kits. This could save a core of cable when choosing MICC. Not only reducing the overall diameter but also the cost.
Although recycling efforts are changing, any electric cable choices on the market will require plastics or polymers to protect the conductors; all except one...

MICC cable is a NON-AGEING product, and does not need plastics, polymers, resins or tapes to aid fire performance. The copper used in our cables is 100% recyclable and zero products are sent to landfill from our bare MICC Cables.

SWA 4 Core 4mm sq

CONTAINS **270g** OF PLASTIC PER 1m LENGTH

= **54** PLASTIC BAGS*

WMC 4H4 Bare

CONTAINS **0g** OF PLASTIC PER 1m LENGTH

= **0** PLASTIC BAGS*

*Average plastic bag = 5g

[Cu, MgO] + = **NO SMOKE**
NO TOXINS
NO BURNING
ZERO FLAME SPREAD

Are you installing a **sustainable and environmentally** friendly cable?

For more information visit **www.wrexhamcablesksa.com**

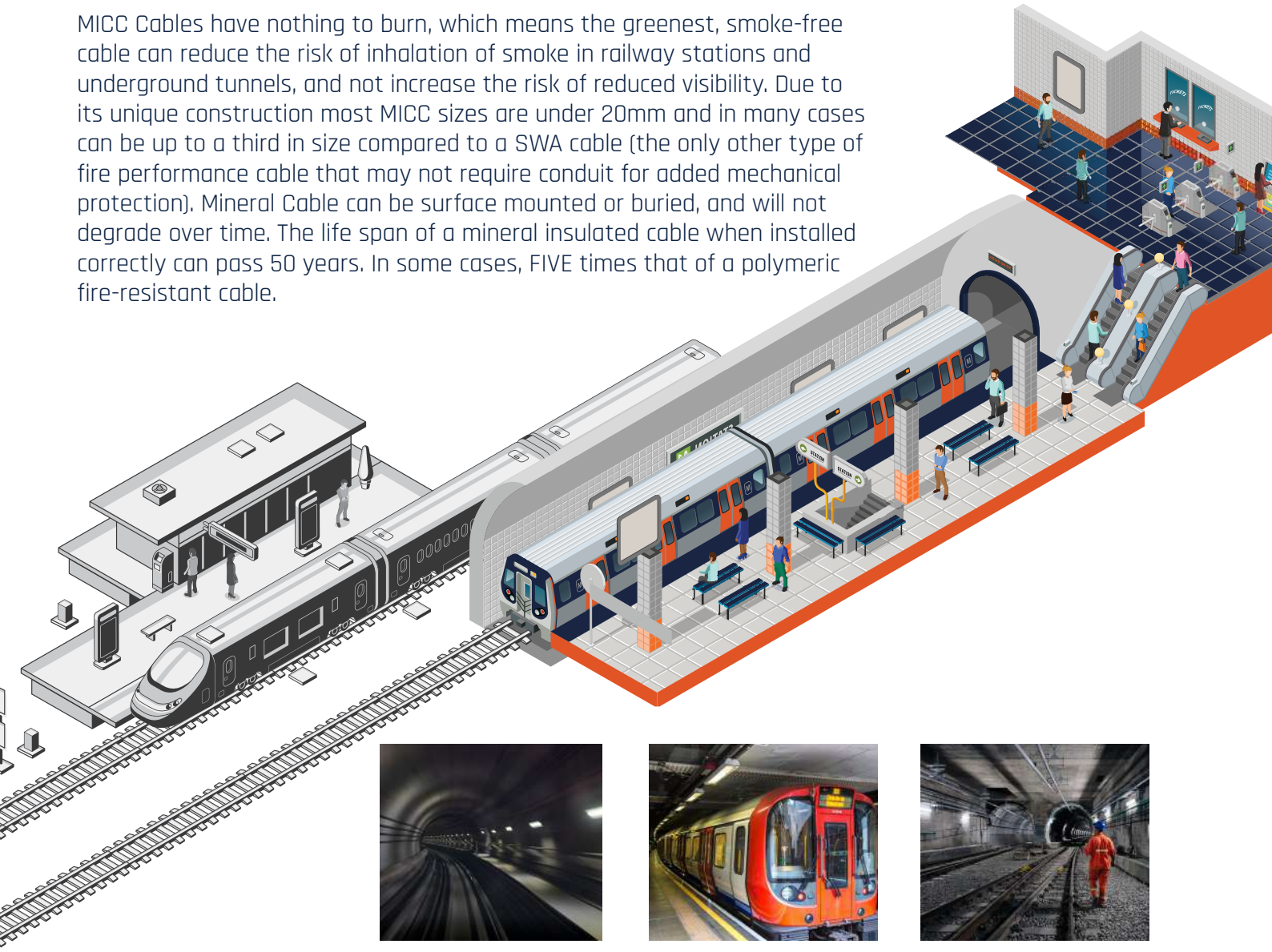
Rail and Underground Tunnel Networks

Most underground cable installations are found in tunnels which are usually either roadways or railways. These tunnels carry significant cable services, where the highest standard of safety is demanded.

It is essential that the cables specified for critical applications have 'fire survival' capability. That is, the ability to survive in an emergency situation, to provide the power to the vital services such as alarms, emergency lighting and smoke extraction, to name but some.

The cable must also reduce the risk of flame spread. MICC cables are the ONLY type of FP cable that does not require any plastics or polymers to aid fire protection. Stations and underground tunnels are specially designed to include firewalls that should eliminate the risk of flame spread. Polymeric cables aid flame spread, and conduits spread flammable gases through the fire walls, increasing the risk of inhalation. Extraction within these systems may also be poor, meaning the FP cable must not produce dense toxic smoke, which increases the risk of inhalation and reduces visibility for escape.

MICC Cables have nothing to burn, which means the greenest, smoke-free cable can reduce the risk of inhalation of smoke in railway stations and underground tunnels, and not increase the risk of reduced visibility. Due to its unique construction most MICC sizes are under 20mm and in many cases can be up to a third in size compared to a SWA cable (the only other type of fire performance cable that may not require conduit for added mechanical protection). Mineral Cable can be surface mounted or buried, and will not degrade over time. The life span of a mineral insulated cable when installed correctly can pass 50 years. In some cases, FIVE times that of a polymeric fire-resistant cable.



Delhi Metro Rail

London Underground

Manchester Victoria

Testing of Fire Survival Cables

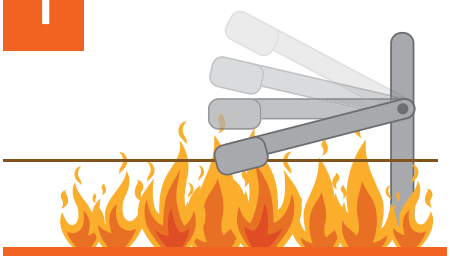
When testing to comply with the BS 6387:2013 fire, water and mechanical shock requirements, assessors will select a new sample of cable to be used for each category of testing, instead of the same cable for each one.

For any cable to be classed as Fire Survival it should undergo TRUE fire scenario testing involving fire, water and DIRECT impact on one single sample of cable. Our MICC did just that...

London Underground Limited Test For Fire Survival Cables.

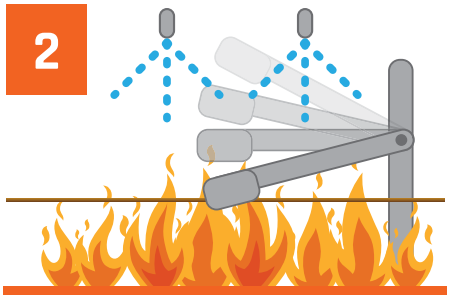
In order to satisfy one of the most globally recognised standards, London Underground devised a test for fire survival cables. The aim of the test was to extend the conditions of BS 6387 to effectively recreate a more realistic fire scenario, demonstrating what the cables may be subjected to in the event of a fire. This involved thermal shock and DIRECT impact on the cable sample. In a true fire scenario, cables have to survive not only the extremes of high temperature, but also the impact from falling debris together with water and foam exposure. In the resulting aftermath of a fire, a cable may be required to withstand bending, impact and water immersion whilst remaining operational. The London Underground Limited Test for Fire Survival Cables involved the following:

1



Cable was to be struck at the centre of the burner directly with a steel bar every 5 minutes during a 3 hours test at 950˚C.

2

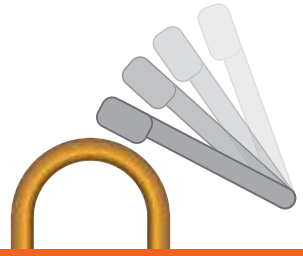


The cable would then be sprayed with water for 15 minutes whilst still being struck by the bar.

3

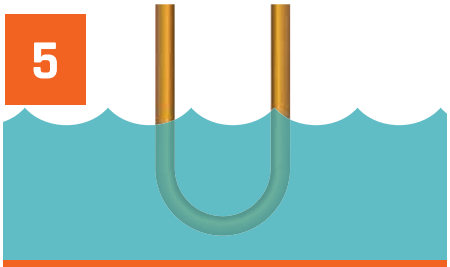
The cable would then be bent at point of impact around a mandrel through 180˚. The bend radius would be equal to mineral cables' minimum bend radius which is six times the diameter of the bare cable.

4

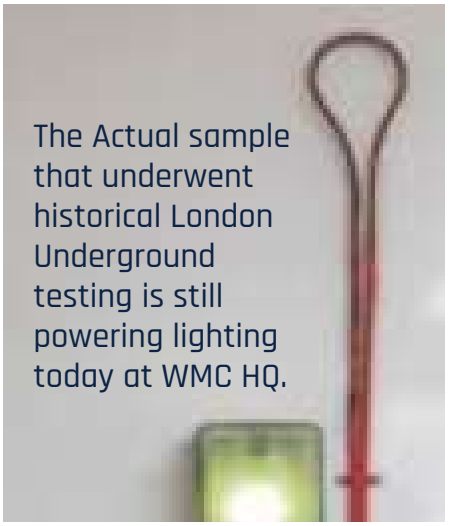


The cable was then struck repeatedly and directly on the bend radius. The instrument used to strike the cable sample was a hammer.

5



The cable was then immersed in water and successfully energised at its rated voltage.



The Actual sample that underwent historical London Underground testing is still powering lighting today at WMC HQ.

Accessories

Our cable fixings are fire rated and meet the requirements of BS 7671 fire resistant cable fixings in escape routes.

To complement the cable, Wrexham Mineral Cables have developed a range of accessories and tools, and can therefore supply a complete wiring system to suit the requirements of a wide variety of installations and applications where only MICC cables are suitable.

Fixing Clips & Saddles

A full range of clips and saddles are available in Bare Copper, Red, Orange, Black, & White. Other colours available on request.

PRODUCT CODE: WRCHL (clips)
PRODUCT CODE: WRSFL (saddles)

Brass Glands

ATEX and IECEx certified brass compression glands for EExd and general applications. Sizes: 20mm, 25mm, 32mm, 40mm.

PRODUCT CODE:
WRGM + cable size in mm

Earth Tail Kit

Termination seals with built in earth tail for easy use. Kit comprises of E/T pots, WRMX sealing compound, Stub caps, Conductor and earth sleeving. Sizes: 20, 25, 32, 40mm

PRODUCT CODE: WRPSL

Seal Kit

Termination seals without built in earth tail. Kit comprises Seal pots, WRMX sealing compound, Stub caps, Conductor sleeving. Sizes: 20mm, 25mm, 32mm, 40mm.

PRODUCT CODE: WRPS

Pre punched Copper fixing strap

For use when making your own special size cable groupings. All colours available. Size: 12mm, 18mm. Sold as 5 metres Roll.

PRODUCT CODE: WRSH - WRSHL (covered)
PRODUCT CODE: WRSZ - WRSH (bare strap)

Gland Shrouds

LSZH / PVC* shroud available in all standard colours, with special colours available on request. Sizes: 20mm, 25mm, 32mm, 40mm.

PRODUCT CODE: WRHGMM - (LSZH), WRHG - (PVC) *Available in 20mm & 25mm only

Brass Locknuts

For use with the WRGM glands to secure the gland to the power supply box. Sizes: 20mm, 25mm, 32mm, 40mm.

PRODUCT CODE: WRLM

Serrated Washers

For use with the installation of the gland. Sizes: 20mm, 25mm, 32mm, 40mm.

PRODUCT CODE: WRLWS

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Tools

For further information on our tools and components please call our sales team on +966 (55) 920 7575

Plate Type Crimper

Uses a 3 point crimping plate to lock the stub cap into the pot.

PRODUCT CODE: WZDD + 20mm, 25mm, 32mm, 40mm

Bending Lever

To assist in the dressing of cables, or when using the larger cables. The bending lever will help save time.

PRODUCT CODE: WZBLA (cables 10-16mm)
WZBLB (cables 16-27mm)

Rotary Stripper

Strips cables' sheaths

PRODUCT CODE: WZSUS (<8mm dia. cable)
WZSU (>8mm dia. cable)
SPARE BLADES: WZSUSB (pack of 5)
WZSUB (pack of 5)

Joistripper

Easy to set tool for fast and efficient stripping of: 2L1, 2L1.5, 2L2.5, 3L1, 3L1.5, 4L1, 4L1.5

PRODUCT CODE: WZSJ
SPARE BLADES: WZSJB (sold individually)

Ringing Tool

Used to score a light groove around the cable sheath to neatly stop the stripping action.

PRODUCT CODE: WZR

20mm Pot Wrench

Quick and easy ratchet tool for screwing on 20mm brass pots to the cable.

PRODUCT CODE: WZRP

T Bar Hand Crimper

A quick and easy tool for crimping the stub caps into the pots. The 'T' bar avoids the need for spanner and is available in 20mm & 25mm.

PRODUCT CODE: WZDC

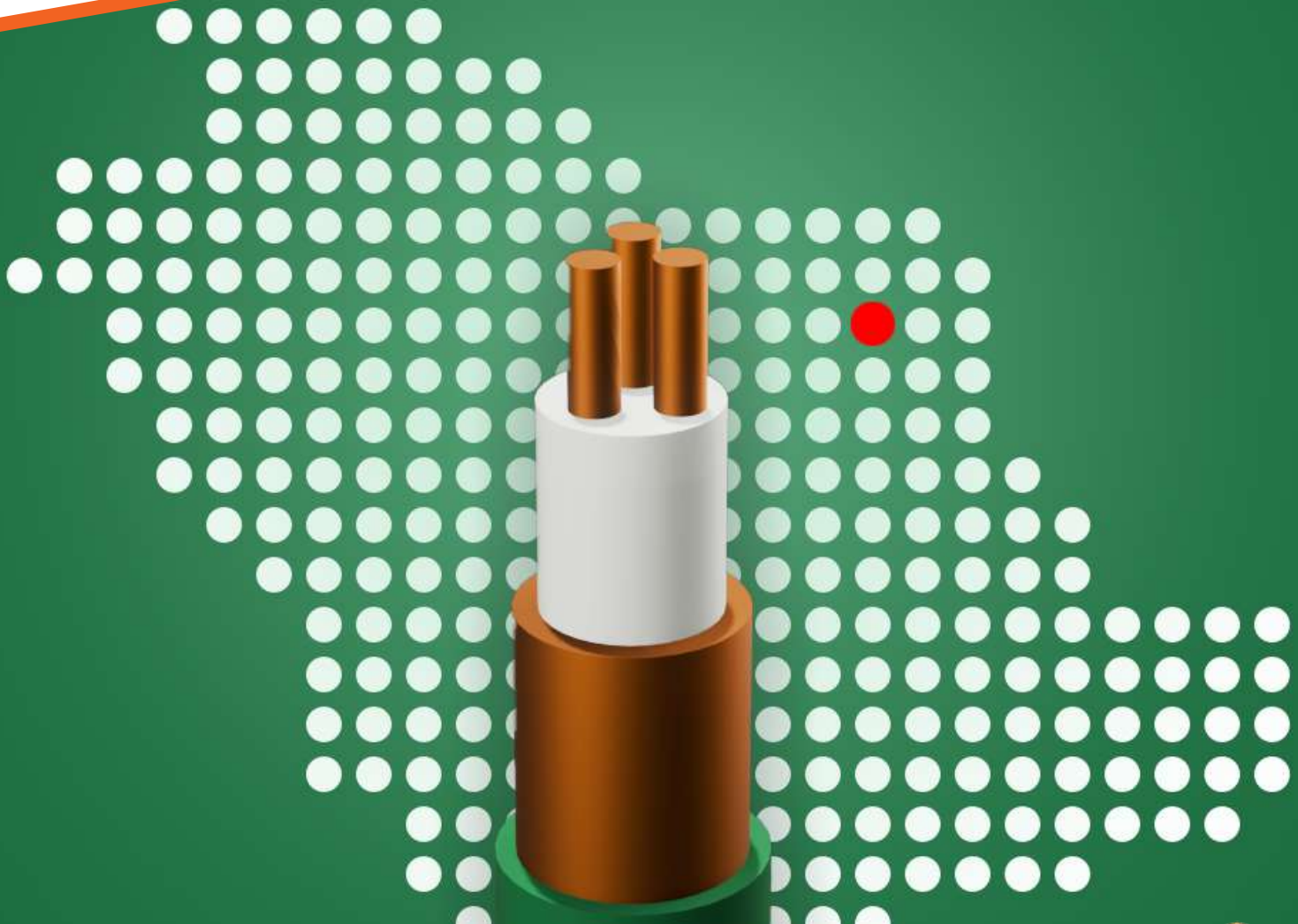
Pot Wrench

Tool ensures quick and accurate screwing on of the brass pot. Sizes: 20mm, 25mm, 32mm, 40mm.

PRODUCT CODE: WZPM + Pot Size in mm

WREXHAM MINERAL CABLES

Mineral cables helps save lives



CERTIFIED
ISO 9001
ISO 14001
ISO 45001
BUREAU VERITAS

LPCB LOSS PREVENTION CERTIFICATION BOARD
UKAS PRODUCT CERTIFICATION 0007
CERTIFIED TO BS 60702-1.2002
REFERENCE NO: 333a/01*
*UNDER PROCESS

SAUDI MADE

IECEx

50 YEAR WARRANTY

NATIONAL TARGETS COMPABY for CABLES
3458 Salim Ibn Abdul Malik
7663 Al Khalidiyah Al Janubiyah
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Issue C
ISSUE A