

**矿物绝缘金属护套柔性防火电缆 —— 额定电压 1kV 及以下**
**Mineral insulated Metal sheathed Fire-resistant flexible cable —— Rated voltage 1kV Max.**
**适用范围 Application :**

该电缆可用于电缆回路易受着火蔓延影响或火灾直接影响的场所或其他场所。

The cable can be applied to where have the cable loop may be susceptible to fire spreading or directly affected by fire, or other sites.

**型号和名称 Model & Name :**

Model	Rated voltage	Name
RTTZ	450/750V	铜芯云母带矿物绝缘波纹铜护套控制电缆 Copper core, Mica-tape mineral insulated, Corrugated copper sheathed Control cable
RTTYZ		铜芯云母带矿物绝缘波纹铜护套聚烯烃外护套控制电缆 Copper core, Mica-tape mineral insulated, Corrugated copper sheathed, PE outer-sheathed Control cable
RTTVZ		铜芯云母带矿物绝缘波纹铜护套聚氯乙烯外护套控制电缆 Copper core, Mica-tape mineral insulated, Corrugated copper sheathed, PVC outer-sheathed Control cable
RTTZ	0.6/1kV	铜芯云母带矿物绝缘波纹铜护套电力电缆 Copper core, Mica-tape mineral insulated, Corrugated copper sheathed Power cable
RTTYZ		铜芯云母带矿物绝缘波纹铜护套聚烯烃外护套电力电缆 Copper core, Mica-tape mineral insulated, Corrugated copper sheathed, PE outer-sheathed Power cable
RTTVZ		铜芯云母带矿物绝缘波纹铜护套聚氯乙烯外护套电力电缆 Copper core, Mica-tape mineral insulated, Corrugated copper sheathed, PVC outer-sheathed Power cable

**产品规格 Specification:**

型号 Model	额定电压 Rated Voltage	芯数 Core Number	标称截面积(mm <sup>2</sup> ) Nominal cross-sectional area
RTTZ RTTYZ RTTVZ	450/750V	2	2.5~4
		3	1~2.5
		4	1~2.5
		7	1~2.5
		12	1~2.5
		19	1~1.5
RTTZ RTTYZ RTTVZ	0.6/1kV	1	1~630
		2	1~150
		3	1~150
		4	1~120
		5	1~25

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RTTZ RTTYZ RTTVZ	0.6/1kV	3+1	3*10+1*6, 3*16+1*10, 3*25+1*16, 3*35+1*16, 3*50+1*25, 3*70+1*35, 3*95+1*50, 3*120+1*70
		3+2	3*10+2*6, 3*16+2*10, 3*25+2*16, 3*35+2*16, 3*50+2*25, 3*70+2*35, 3*95+2*50
		4+1	4*10+1*6, 4*16+1*10, 4*25+1*16, 4*35+1*16, 4*50+1*25, 4*70+1*35, 4*95+1*50

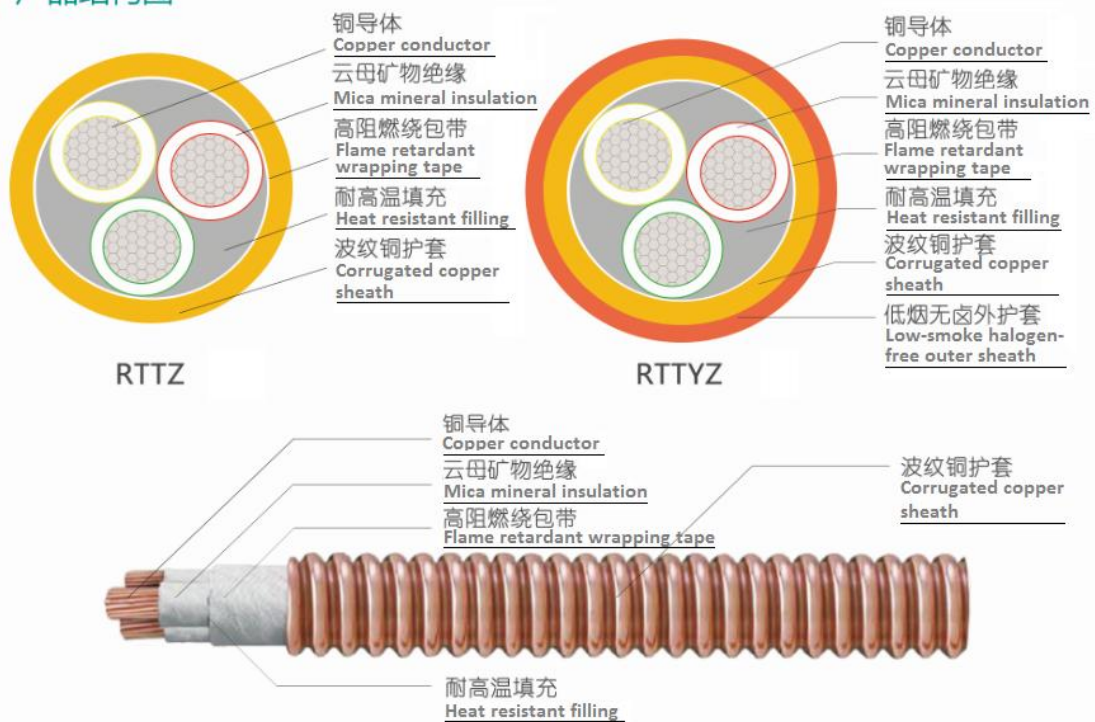
**产品结构 Product Structure:**
**产品结构图**

**电缆参考外径 Cable reference diameter:**

 表1 额定电压450/750V控制电缆参考外径  
 Table 1: Control cable - Rated voltage 450/750V

导体标称截面积 mm <sup>2</sup> Nominal cross-sectional area of Conductor	电缆参考外径 mm Cable's reference diameter					
	2 core	3 core	4 core	7 core	12 core	19 core
1	-	7.2	7.9	9.4	12.3	14.4
1.5	-	7.8	8.5	10.1	13.3	15.7
2.5	8.1	8.6	9.5	11.3	15.0	-
4	9.1	-	-	-	-	-

表2 额定电压0.6/1kV电力电缆参考外径  
 Table 2: Powe cable - Rated voltage 0.6/1kV

导体标称截面积 mm <sup>2</sup> Nominal cross-sectional area of conductor	电缆参考外径 mm Cable's reference diameter							
	1 core	2 core	3 core	4 core	5 core	3+1	3+2	4+1
1	7.0	8.2	8.5	9.1	9.7	-	-	-
1.5	7.2	8.6	9.0	9.6	10.2	-	-	-
2.5	7.6	9.4	9.8	10.7	11.5	-	-	-
4	8.1	10.8	11.1	11.9	12.8	-	-	-
6	8.6	11.8	12.4	13.4	14.4	-	-	-
10	10.0	13.8	15.0	16.4	17.7	15.8	16.6	17.2
16	10.9	16.2	16.9	18.8	20.3	18.4	19.6	20.0
25	12.2	18.6	19.7	21.8	23.7	21.0	22.5	23.1
35	13.7	19.4	22.7	24.7	-	23.3	24.5	26.5
50	15.8	21.4	24.8	26.0	-	26.7	29.8	30.4
70	17.4	21.8	27.7	29.5	-	30.2	33.4	34.0
95	19.0	24.2	30.7	32.8	-	33.4	37.0	37.8
120	20.8	26.2	33.6	33.4	-	37.0	-	-
150	22.6	29.4	37.2	-	-	-	-	-
185	24.1	-	-	-	-	-	-	-
240	27.1	-	-	-	-	-	-	-
300	29.9	-	-	-	-	-	-	-
400	33.2	-	-	-	-	-	-	-
500	36.8	-	-	-	-	-	-	-
630	40.3	-	-	-	-	-	-	-

注：表中导体标称截面积 50mm<sup>2</sup> 及以上多芯电缆外径为主线芯采用半圆形、扇形或瓦形。

Remark: The main cores will be half semicircle, sector or tile shape for multi-core cables with conductor nominal cross-sectional area above 50mm<sup>2</sup>.

#### 电缆使用特性 Cable using features:

1. 电缆安装时的环境温度 Ambient temperature when installing :  
 RTTZ 暂时没有限制条件 , RTTVZ、RTTYZ 安装时环境温度应不低于 0°C ;  
 No limit for RTTZ, but ambient temperature should not be less than 0°C for RTTVZ & RTTYZ;
2. 额定工作温度 Rated running temperature :  
 电缆正常运行时导体最高温度为 90°C , 短路时 ( 最长持续 5S ) 导体最高温度为 250°C ;  
 Max temperature of conductor is 90°C when normal running, and Max temperature is 250°C when short circuit (5s Max);
3. 电缆安装时的最小弯曲半径 Min bending radius for installation :

电缆外径 mm Cable diameter	电缆最小弯曲半径 Cable Min bending radius	靠近连接盒或终端的电缆最小弯曲半径 Min bending radius for cable near connection box or terminal
D ≤ 12	6D	4D
12 < D ≤ 20	12D	8D
20 < D ≤ 40	15D	13D
D > 40	20D	18D

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注： 1. D 为电缆的实际外径；  
 2. 弯曲时应小心控制，如采用成型导板等。  
 Remark: 1. D – Actual diameter of cable;  
 2. Be careful when bending, for example, with molding guide, etc.

### 电缆性能参数 Performance parameter of Cable :

#### 1. 电缆的绝缘电阻 Insulation resistance of Cable

导体标称截面积 mm <sup>2</sup> Nominal cross-sectional area of Conductor	环境温度下最小绝缘电阻 MΩ·km Min insulation resistance under ambient temperature	工作温度下最小绝缘电阻 MΩ·km Min insulation resistance under working temperature
1	100	16
1.5	100	14
2.5	100	13
4	100	12
6	100	11
10	100	10
16	100	8
25	100	8
35	100	7
50	100	7
70	100	6
95	100	6
120	100	5
150	100	5
185	100	5
240	100	4
300	100	4
400	100	4
500	100	3
630	100	3

#### 2. 气密性试验 Air impermeability test

波纹铜护套充入 0.25~0.35MPa 干燥空气或氮气后保持 2 小时，压力表示值不下降。

With 0.25~0.35MPa dry air or nitrogen filled in the corrugated copper sheath and hold for 2 hours, the pressure value will not go down.

#### 3. 耐电压试验 Voltage resistance test

成品电缆应能通过交流电压试验：控制电缆为 3000V/5min，电力电缆为 3500V/5min。

The finished cable should be able to pass AC test: 3000V/5min for Control cable, 3500V/5min for power cable.

#### 4. 耐火试验 Fire-resistance test

试验时选用火焰温度为 950~1000℃，燃烧时间为 180min，试验要求见下表：

Flame temperature for test is 950~1000℃, and the burning time is 180min. The test requirements are as below:

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电缆实测外径(mm) Cable actual diameter	试验要求 Test requirement
D ≤ 20	按照 BS6387:2013 规定的 C、W、Z 试验方法进行试验，线路保持完整 Test according to the test method of C, W, Z required by BS6387:2013, and keep the circuit perfectly.
D > 20	按照 BS8491:2008 规定进行试验，线路保持完整 Test according to BS8491:2008, and keep the circuit perfectly.

- 酸性气体的释放 The Release of acid gas  
RTTYZ 成品电缆的低烟无卤护套 PH 值不小于 4.3，电导率不大于 10μS/mm。  
For RTTYZ finished cable, the PH value of its low-smoke halogen-free sheath should not be less than 4.3, and the conductivity should not be larger than 10μS/mm.
- 烟密度 Smoke density  
RTTYZ 成品电缆的低烟无卤护套能通过在特性条件下的燃烧试验，透光率不小于 60%。  
For RTTYZ finished cable, its low-smoke halogen-free sheath can pass the burning test under certain conditions, and the light transmittance is not less than 60%.

#### 产品优势 Advantage:

- 防火性能优异，耐火等级不仅满足国标 GB12666.6 A 类 950°C, 90min，还能满足英国 BS6387-1994 中规定的 A 级 650°C/3h, B 级 750°C/3h, C 级 90°C/3h 要求；同时在燃烧中还能耐受水喷与机械撞击。  
Excellent fire-resistance. Fire resistance rating can not only reach GB12666.6 Grade A (950°C, 90min), but also reach BS6387-1994 standard requirement; During the burning, the cable can still bear water spray and mechanical impact.
- 连续长度长，不管是单芯还是多芯电缆，其长度都能满足供电长度需要，极限长度可达 2000 米。  
Long continuous length. No matter single core or multi cores, the length can satisfy the demand of power supply, and the limiting length can reach 2000 meters.
- 截面大，单芯电缆截面可达 1000mm<sup>2</sup>，多芯可达 240mm<sup>2</sup>。  
Large section. Section area of single core cable can reach 1000 mm<sup>2</sup>, and 240mm<sup>2</sup> for multi cores.
- 具有柔性，电缆可盘在电缆盘上，弯曲半径 ≥ 20D。（D 为电缆外径）  
The cable is flexible, and can be in coil packed, and the bending radius is more than 20D.
- 燃烧时无烟无毒，绝缘采用无机材料（不燃烧体），燃烧时不会产生任何有害气体，更无二次污染。  
No-smoke and no toxic when burning. The insulation is inorganic material, which will not generate any harmful gas when burning.
- 过载能力大，电缆不仅载流量大，更具有较大的过载能力。根据布线要求，通常电缆表面温度 ≤ 70°C，若布线不可触摸，也不与可燃烧建筑材料接触时，电缆护套温度可达 105°C。过载时允许工作温度可达 250°C。  
Large overload capacity. The cable not only have large carrying capacity, but also have large overload capacity. According to wire arrangement requirement, normal surface temperature of cable is not more than 70°C. If the ware arrangement can not be touched, and no touch with the combustible building materials, the cable sheath temperature can reach 105°C. The allowed working temperature can reach 250°C when overloaded.
- 耐腐蚀，有机绝缘耐火电缆有时需穿塑料管或铁管，塑料易老化变脆，铁管易锈蚀。防火电缆是铜护套不需穿管，且铜护套耐腐蚀性好。

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Copper sheath has good anti-corrosion, that no need to wear additional tube.

8. 无电磁干扰，防火电缆与信号、控制等电线电缆在同一竖井中敷设时，防火电缆在铜护套的屏蔽下，不会对信号、控制电线电缆的传输信息产生干扰。

No electromagnetic interference. Under the shielding of the copper sheath, the cable will not disturb the signal and transmit information of control cable.

9. 安全性好，防火电缆除了在火焰上正常供电，启动灭火设备，减少火灾损失外，对保障人身安全也具有可靠性，其铜护套是良导体，是最好的接地线，且连续覆盖电缆全长，大大提高了接地保护灵敏度和可靠性。

Good safety. The cable can ensure the normal power supply in fire, and the fire-fighting equipment can not only reduce fire damage, but also ensure personal safety. The copper sheath is good conductor, which is best ground lead, and cover cable overall length.

10. 使用寿命长，无机绝缘材料耐高温，不易老化，寿命比有机绝缘电缆高很多倍，在正常工作状态下，其寿命可与建筑物等同。

Long service life. Inorganic insulation material is high temperature resistance and not easy to aging, so the service life is much longer than organic insulation cable, and almost can reach same life as buildings.

11. 运输和安装包括安装配件近似于普通电缆，较简单。

Transportation and installation are easy, similar to normal cables.

12. 经济性高，由于制作工艺先进，安装简单，在同等条件下其综合费用较矿物绝缘电缆明显降低。

High economy. Due to advanced production process and easily installation, the comprehensive costs is much lower.