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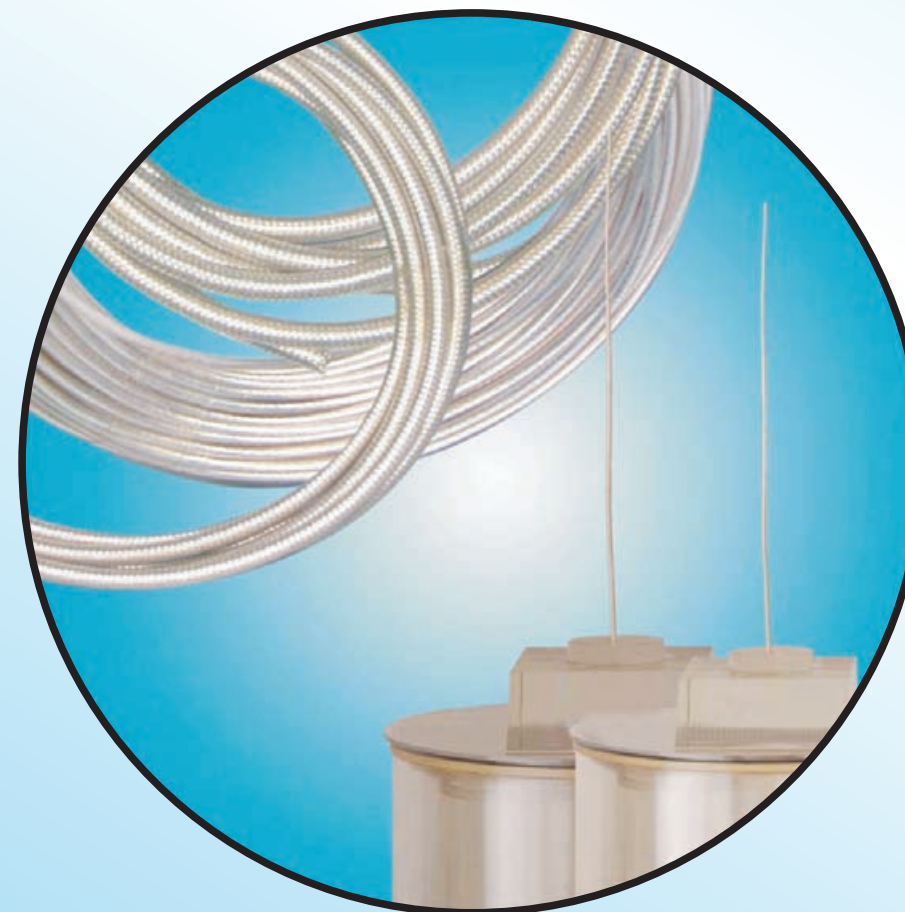
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# 航空、航天用电缆 Cables for Aerospace Industry

航空航天用电缆产品采用镀锡铜线作导体，提高了导体的抗氧化能力，采用聚全氟乙丙烯材料绝缘，产品绝缘电阻高，工作范围广，适用于航空、航天设备和相关仪器仪表的内部连接线。

The cables designed for aerospace industry are made up of, inoxidizable tinned copper wires conductor and FED insulation. This design endows them with very high insulation resistance. They have found a very wide scope of application, especially internal wiring of aerospace industrial apparatuses meters and instruments.



# 航空、航天用电缆

## Cables for Aerospace Industry

### 航空航天用镀锡铜芯聚全氟乙丙烯绝缘电线

#### Tinned Copper Conductor Fluorinated Ethylene Propylene Insulated Electric Wire for Aerospace

#### 执行标准 Executive Standard

产品执行GJB773A/11A-2000标准。

The product is manufactured as per GJB773A/11A-2000 standard.

#### 适用范围 Applicable Scope

本产品采用镀锡铜线作导体，提高了导体的抗氧化能力，采用聚全氟乙丙烯材料绝缘，产品绝缘电阻高，工作范围广，适用于航空、航天设备和相关仪器仪表的内部连接线。

Tinned copper wire is used as conductor for the product to improve performance of anti-oxidation and fluorinated ethylene propylene insulating material is used to have higher insulation resistance. It has wide operating scopes as in the internal connection of the space and aeronautic equipment as well as the related apparatus and instruments.

#### 使用特性 Operating Features

1、电缆额定电压：交流600V

Rated Voltage: 600V

2、额定温度：150℃

Rated temp: 150℃

3、最低环境使用温度：-65℃

Min. ambient operating temp: -65℃

#### 电缆的型号、名称和使用环境 Type, Description and Service Environment

型号 Type	名称 Description
FF <sub>46</sub> -1	镀锡铜芯，FEP绝缘电线电缆 Tinned copper conductor, FEP insulated, electric wire and cable
FF <sub>46</sub> P11-1	镀锡铜芯，FEP绝缘镀锡圆铜线编织屏蔽电线电缆 Tinned copper conductor, FEP insulated, tinned copper wire braided and shielded electric wire and cable
FF <sub>46</sub> H3-1	镀锡铜芯，FEP绝缘，FEP护套电线电缆 Tinned copper conductor, FEP insulated and sheathed, electric wire and cable
FF <sub>46</sub> P11H3-1	镀锡铜芯，FEP绝缘镀锡圆铜线编织屏蔽，FEP护套电线电缆 Tinned copper conductor, FEP insulated, tinned copper wire braided and shielded, FEP sheathed electric wire and cable
FF <sub>46</sub> H10-1	镀锡铜芯，FEP绝缘，ETFE护套电线电缆 Tinned copper conductor, FEP insulated, ETFE sheathed, electric wire and cable
FF <sub>46</sub> P11H10-1	镀锡铜芯，FEP绝缘镀锡圆铜线编织屏蔽，ETFE护套电线电缆 Tinned copper conductor, FEP insulated, tinned copper wire braided and shielded, ETFE sheathed, electric wire and cable

#### 生产范围 Production Scope

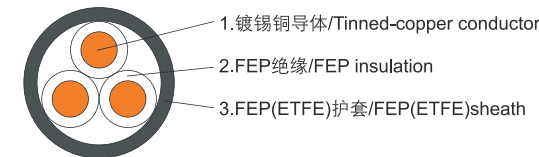
芯数 No. of cores	导体标称截面积 Nom. cross section of conductor		
	FF <sub>46</sub> -1	FF46H3-1、FF46H10-1	FF46P11-1、FF46P11H3-1、FF46P11H10-1
1	0.14~8	—	0.14~6
2	—	0.14~2	0.14~2
3	—	0.14~2	0.14~2
4	—	0.14~2	0.14~2

#### 电缆结构图 Cable Drawings

##### 1、FF46-1型 type



##### 2、FF46H3-1、FF46H10-1型 type



##### 3、FF46P11-1型 type



##### 4、FF46P11H3-1、FF46P11H10-1型 type



# 航空、航天用电缆 Cables for Aerospace Industry

## 主要试验项目及指标 Main Test Items and Index

### 1、20℃时导线芯最大直流电阻及FF46-1型结构参数

Max. D.C Resistance of Conductor at 20℃ and parameters of FF46-1 type

导体标称截面 Nom. cross section of conductor mm <sup>2</sup>	导体结构 根数/直径 No / Dia of conductor	FF46-1型成品电线外径 O.D of completed wire mm	导体直流电阻最大值 Max. DC resistance of conductor Ω/km	FF46-1型成品电线 重量最大值 Max. weight of completed wire kg/km
0.14	19/0.10	1.02±0.05	136	3.01
0.2	19/0.12	1.14±0.05	90.4	4.22
0.4/0.3	19/0.16	1.32±0.05	53.1	5.87
0.6/0.5	19/0.20	1.52±0.05	32.4	8.43
(0.75)	19/0.23	1.70±0.05	24.6	10.5
1	19/0.26	1.80±0.05	20.4	12.5
1.2	19/0.28	2.06±0.08	16.6	16.1
(1.5)	19/0.32	2.25±0.08	12.7	19.5
2	19/0.36	2.41±0.08	10.0	24.5
(2.5)	37/0.30	2.78±0.10	7.43	32.3
3	37/0.32	2.90±0.10	6.63	37.3
(4)	37/0.37	3.38±0.10	4.88	46.9
5	37/0.40	3.53±0.10	4.13	56.5
(6)	37/0.45	4.08±0.10	3.30	68.2
8	133/0.29	5.03±0.10	2.30	97.0

注：未加括号的规格为优先选用的规格。

Note: The specifications without bracket mark are those of preferred selection.

### 2、绝缘电阻：不小于1.5×10<sup>3</sup> MΩ·km

Insulation resistance is not less than 1.5×10<sup>3</sup> MΩ·km

### 3、绝缘表面电阻：不小于1.3×10<sup>4</sup> MΩ·mm

Insulation surface resistance is not less than 1.3×10<sup>4</sup> MΩ·mm

### 4、耐工频火花电压试验：Withstand power frequency spark voltage test

导体对屏蔽：工频电压，1.5kV，15~30s不击穿

Conductor to shield, 1.5kV power frequency voltage, 15~30s, no breakdown

芯线对芯线：工频电压，1.5kV，15~30s不击穿

Core to core, 1.5kV power frequency voltage, 15~30s, no breakdown

屏蔽护套：工频火花电压，1.5kV不击穿

Shield to sheath, power frequency spark voltage, 1.5kV, no breakdown

FF46型多芯电缆：脉冲电压，6.0kV不击穿

FF46 type multi-core cable, impulse voltage, 6.0kV, no breakdown

## 航空航天用镀银铜芯聚全氟乙丙烯绝缘电线 Silver-coated Copper Conductor Fluorinated Ethylene Propylene Insulated Electric Wire for Aerospace

### 执行标准 Executive Standard

产品执行GJB773A/8A-2000标准。

The product is manufactured as per GJB773A/8A-2000 standard.

### 适用范围 Applicable Scope

本产品采用镀银铜线作导体，提高了导体的工作温度及交流工况下的电缆载流量，采用聚全氟乙丙烯材料绝缘，产品绝缘电阻高，工作温度范围广，适用于航空、航天设备和相关仪器仪表的内部连线。

Silver-coated copper wire is used as conductor for the product to improve operating temp of conductor and current rating at A.C condition and fluorinated ethylene propylene insulating material is used to have higher insulation resistance. It has wide operating scopes as in the internal connection of the space and aeronautic equipment as well as the related apparatus and instruments.

### 使用特性 Operating Features

1、电缆额定电压：交流600V Rated Voltage: 600V

2、额定温度：200℃ Rated temp: 200℃

3、最低环境使用温度：-65℃ Min. operating ambient temp: -65℃.

### 电缆的型号、名称和使用环境 Type, Description and Service Environment

型号 Type	名称 Description
FF <sub>46</sub> -2	镀银铜芯，FEP绝缘电线电缆 Silver-coated copper conductor, FEP insulated, electric wire and cable
FF <sub>46</sub> P21-2	镀银铜芯，FEP绝缘，镀银圆铜线编织屏蔽电线电缆 Silver-coated copper conductor, FEP insulated, tinned copper wire braided and shielded, electric wire and cable
FF <sub>46</sub> H3-2	镀银铜芯，FEP绝缘，FEP护套电线电缆 Silver-coated copper conductor, FEP insulated and sheathed, electric wire and cable
FF <sub>46</sub> P21H3-2	镀银铜芯，FEP绝缘，镀银圆铜线编织屏蔽，FEP护套电线电缆 Silver-coated copper conductor, FEP insulated, tinned copper wire braided and shielded, FEP sheathed, electric wire and cable

### 生产范围 Production Scope

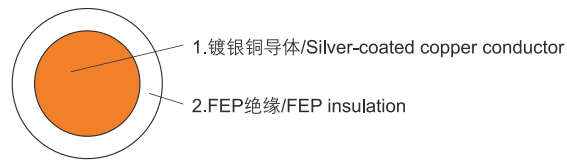
芯数 No. of cores	导体标称截面积 Nom. cross section of conductor			
	FF <sub>46</sub> -2	FF46H3-2	FF46P21-2	FF46P21H3-2
1	0.14~8	—	0.14~6	0.14~6
2	—	0.14~2	0.14~2	0.14~2
3	—	0.14~2	0.14~2	0.14~2
4	—	0.14~2	0.14~2	0.14~2



# 航空、航天用电缆 Cables for Aerospace Industry

## 电缆结构图 Cable Drawings

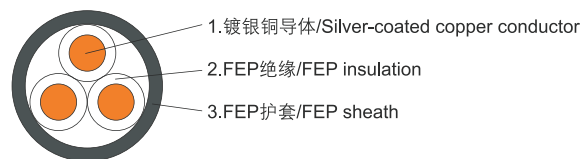
### 1、FF46-2型 type



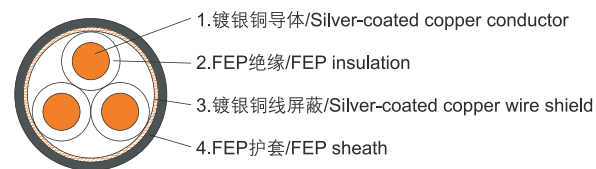
### 2、FF46P21-2型 type



### 3、FF46H3-2型 type



### 4、FF46P21H3-2型 type



## 主要试验项目及指标 Main Test Items and Index

### 1、20℃时导电线芯最大直流电阻及FF46-2型结构参数

Max. D.C Resistance of Conductor at 20℃ and parameters of FF46-2type

导体标称截面 Nom. cross section of conductor mm <sup>2</sup>	导体结构 根数/直径 No / Dia of conductor	FF46-2型成品电线外径 O.D of completed wire mm	导体直流电阻最大值 Max. DC resistance of conductor Ω/km	FF46-2型成品电线 重量最大值 Max. weight of completed wire kg/km
0.14	19/0.10	1.02±0.05	126	3.01
0.2	19/0.12	1.14±0.05	83.5	4.22
0.4/0.3	19/0.16	1.32±0.05	49.5	5.87
0.6/0.5	19/0.20	1.52±0.05	30.2	8.43
(0.75)	19/0.23	1.70±0.05	22.7	10.5
1	19/0.26	1.80±0.05	19.0	12.5
1.2	19/0.28	2.06±0.08	15.3	16.1
(1.5)	19/0.32	2.25±0.08	11.7	19.5
2	19/0.36	2.41±0.08	9.45	24.5
(2.5)	37/0.30	2.78±0.10	6.86	32.3
3	37/0.32	2.90±0.10	6.23	37.3
(4)	37/0.37	3.38±0.10	4.51	46.9
5	37/0.40	3.53±0.10	3.90	56.5
(6)	37/0.45	4.08±0.10	3.05	68.2
8	133/0.29	5.03±0.10	2.16	97.0

注：未加括号的规格为优先选用的规格。

Note: The specifications without bracket mark are those of recommendation to select.

### 2、绝缘电阻：不小于1.5×10<sup>3</sup> MΩ·km

Insulation resistance is not less than 1.5×10<sup>3</sup> MΩ·km

### 3、绝缘表面电阻：不小于1.3×10<sup>4</sup> MΩ·mm

Insulation surface resistance is not less than 1.3×10<sup>4</sup> MΩ·mm

### 4、耐工频火花电压试验：Withstand power frequency spark voltage test

导体对屏蔽：工频电压，1.5kV，15~30s不击穿

Conductor to shield, 1.5kV power frequency voltage, 15~30s, no breakdown

芯线对芯线：工频电压，1.5kV，15~30s不击穿

Core to core, 1.5kV power frequency voltage, 15~30s, no breakdown

屏蔽护套：工频火花电压，1.5kV不击穿

Shield to sheath, power frequency spark voltage, 1.5kV, no breakdown

FF46型多芯电缆：脉冲电压，6.0kV不击穿

FF46 type multi-core cable, impulse voltage, 6.0kV, no breakdown