

# 物料承认书

制 造 商： 东莞市新盛电子有限公司

供 应 商： 东莞市新盛电子有限公司

物料名称： RF Antenna Cable Assembly

规格描述： 2.4G-5dbi Antenna+1.37Cable L=100mm

适用机型：

ERP料号： 800000000148

编 号：

拟制	审核	批准





東莞市新盛電子有限公司

Dongguan City Xinsheng Electronics Co.,Ltd

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東莞市新盛電子有限公司

**Dongguan City Xinsheng Electronics Co.,Ltd**

## **RF Antenna Cable Assembly**

### **Specification**

#### 1. Electrical Properties :

1.1 Frequency Range.....	2.4~2.5GHz
1.2 Impedance .....	50Ω Nominal
1.3 Return Loss.....	-10db
1.4 VSWR .....	1.92:1MAX
1.5 Gain(peak).....	5DBi
1.6 Cable .....	1.37Cable

#### 2. Physical Properties :

2.1 Antenna Body.....	TPEE
2.2 Antenna Base.....	PC+ ABS
2.3 Antenna Base.....	PC+ ABS
2.4 Operating Temp. ....	-10°C ~+60°C
2.5 Storage Temp. ....	-10°C ~+70°C
2.6 Color .....	White



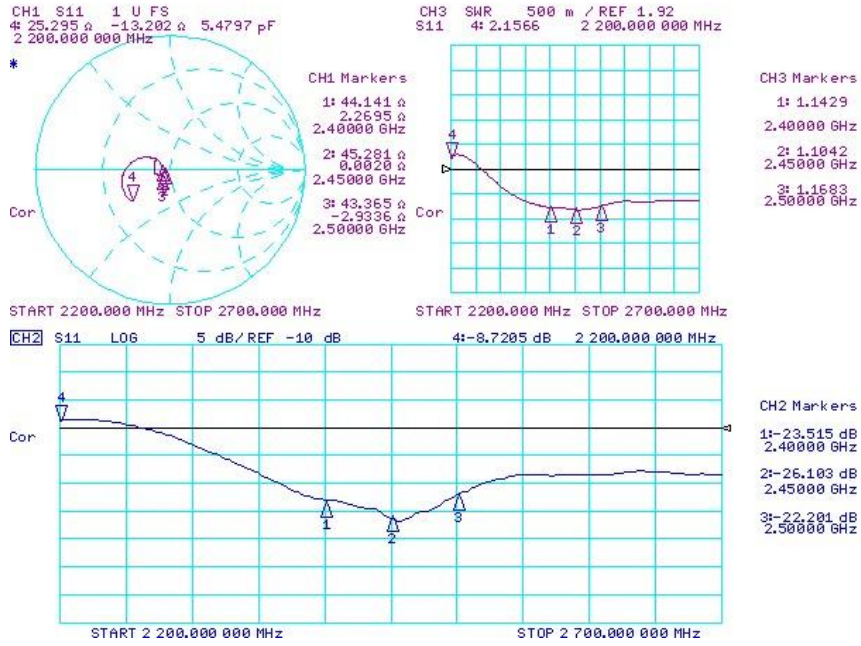
東莞市新盛電子有限公司

# Dongguan City Xinsheng Electronics Co.,Ltd

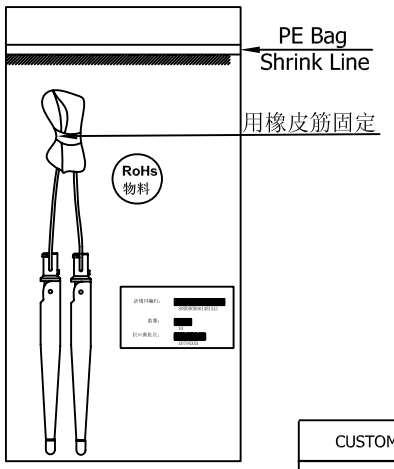
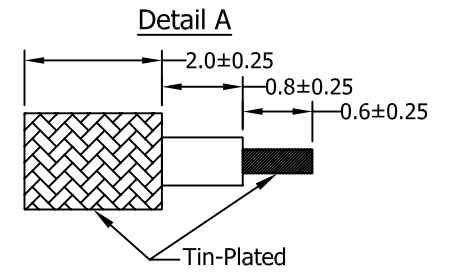
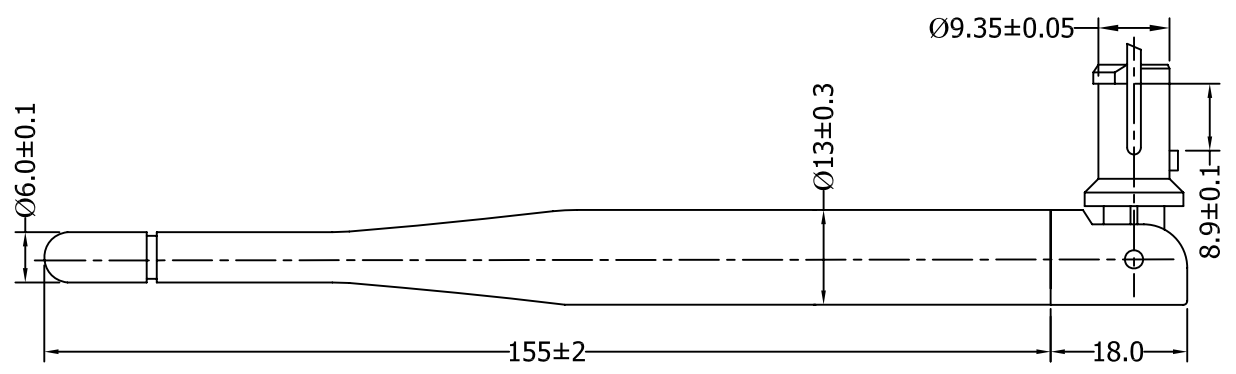
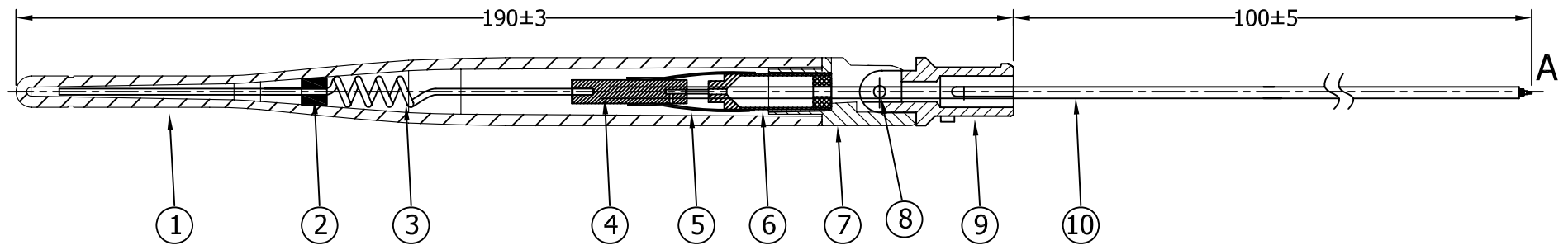
## S Parameter Test Date

RF Antenna Assembly

Spec: 2.4~2.5GHz



F		G	
REV	DATE	DESCRIPTION	
A	05/17-2012	NEW ISSUE	



Packing: 10pcs/bag

Specification:  
 Frequency Range: 2.4GHz~2.5GHz.  
 Return Loss: -10db or less  
 VSWR: 1.92 or less  
 Gain(peak): 5dBi

NO	DESCRIPTION	QTY	REMARK
10	Cable	Ø1.37 Cable, Gary, 50Ω	1
9	Antenna Base	PC+ABS, Color: White(XS-92)	1
8	Rivet	POM, Color: White(XS-92)	2
7	Antenna Base	PC+ABS, Color: White(XS-92)	1
6	Ground Tube	Zinc alloy Ø6.8*23.5	1
5	H.S Tube	Heat Shrink Tube	1
4	Signal Tube	Zinc alloy Ø4.5*22	1
3	Helix	Brass Ø5.0*102	1
2	泡棉	Φ6.0*(T)5.0mm Black	1
1	Antenna Body	TPE, Color: White(XS-92)	1

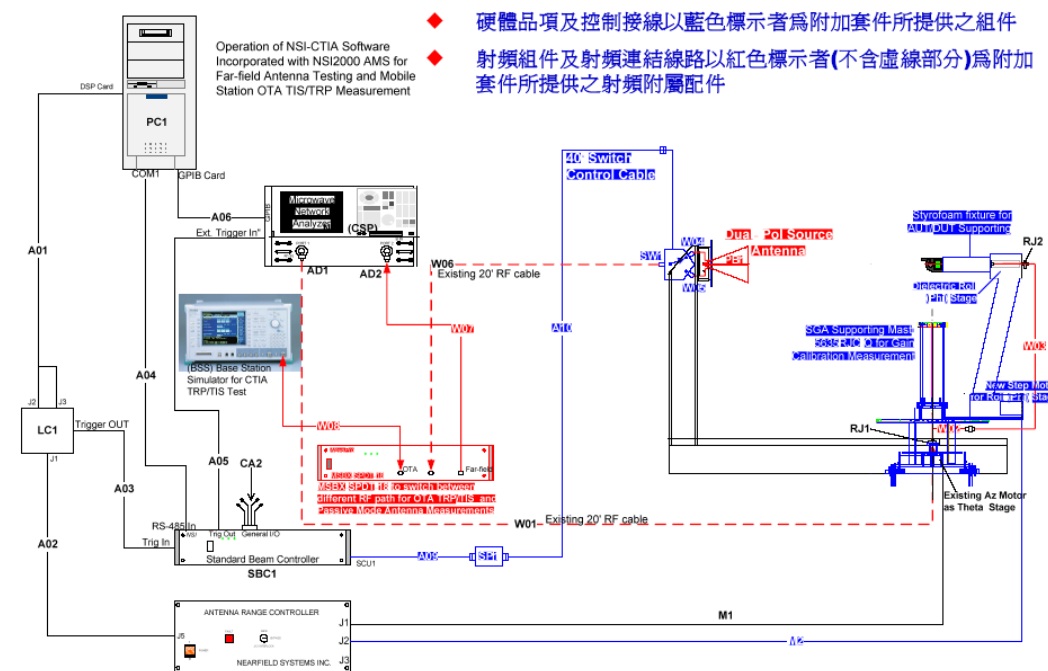
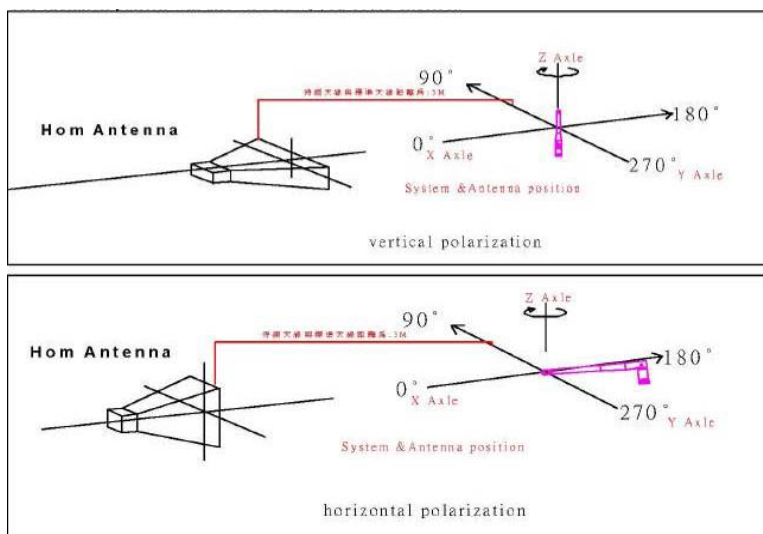
CUSTOMER'S SIGNATURE	XX. ±5	APPROVED	CUSTOMER: 同维/共进		
	X. ±3.0	CHECKED	PART NO : 800000000148		
	.X ±1.0		PART NAME: RF Antenna Cable Assembly		
	.XX ±0.5	DRAWING	X.S P/NO :		
	.XXX ±0.1		REV	UNIT	FILE : SSR-1106031
		A	m/m	SHEET : 1/1	

**东莞新盛  
电子有限公司**



# 東莞市新盛電子有限公司

The antenna efficiency and radiation pattern were measured using a NST-800F 3D anechoic chamber. The configuration of the chamber are shown below, The chamber coordinate system definition can be found. The placement of the tested fixture is shown below.



Configuration of NSI-800F 3D-chamber



# 東莞市新盛電子有限公司

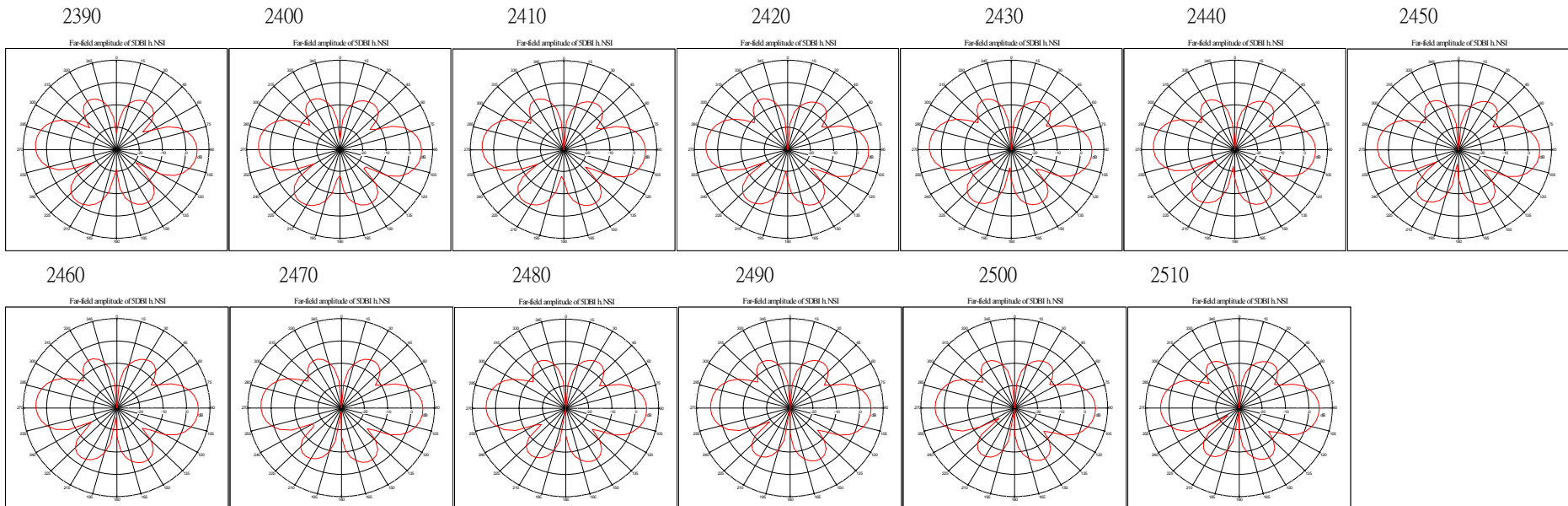
## 天線增益測試報告

客戶：同維/共進

產品名稱：2.4~2.5GHz 5DBi Antenna+1.37cable L=100mm

### E-Plane/horizontal polaztion

Freq.(MHz)	2390	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500	2510
Peak gain(dBi)	4.83	5.01	5.42	5.12	5.19	4.98	4.75	4.80	4.81	4.73	4.77	4.74	4.89
Peak degree	90	89	260	272	85	92	80	83	272	85	91	90	95
Avg gain(dBi)	-3.31	-2.98	-2.95	-3.06	-3.12	-3.26	-3.38	-3.43	-3.55	-3.82	-3.95	-3.99	-4.34







# 東莞市新盛電子有限公司

## 天線增益測試報告

客戶：同維/共進

產品名稱：2.4~2.5GHz 5DBi Antenna+1.37cable L=100mm

### H-Plane/vertical polaztion

Freq.(MHz)	2390	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500	2510
Peak gain(dBi)	4.96	5.43	5.38	5.42	4.70	5.28	4.97	5.17	4.98	4.75	4.80	4.95	4.77
Peak degree	250	263	50	283	270	277	278	288	90	241	252	90	273
Avg gain(dBi)	3.90	4.34	4.96	4.40	3.57	4.27	3.99	4.22	4.09	3.99	3.98	4.11	3.92

2390

2400

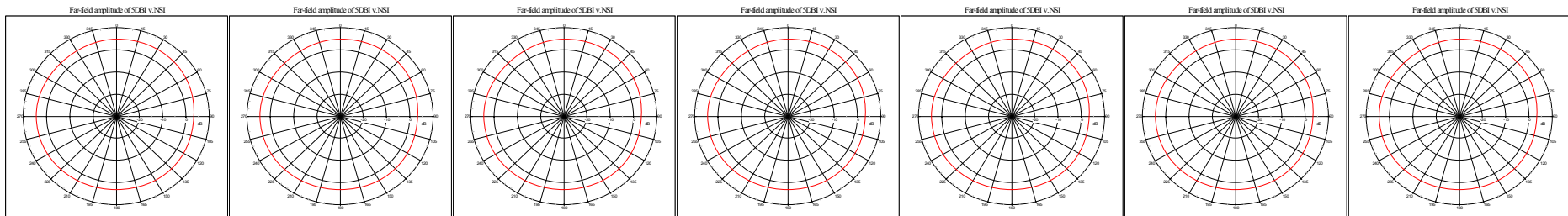
2410

2420

2430

2440

2450



2460

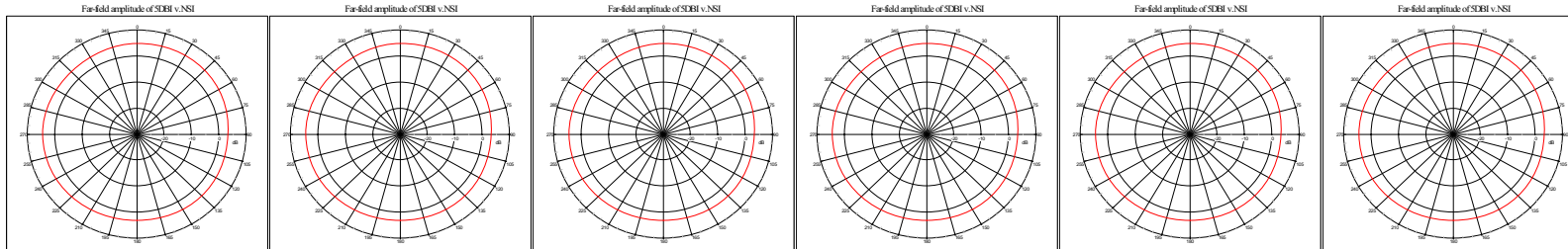
2470

2480

2490

2500

2510





樣品檢驗記錄表

編號:

新盛料號/ 專案代號		SSR-1106031		品名/規格		2.4G-5dbi Antenna+1.37 Cable L =100MM		數量		10pcs		日期		2012.05.17	
檢驗 項目	Item		公差	樣品編號										量測 工具	判定
				1	2	3	4	5	6	7	8	9	10		
尺寸	1	100mm	±5	99.7	99.6	100.4	100.1	99.3	101.3	102.6	99.9	99.8	100.5	a	<input checked="" type="checkbox"/> OK <input type="checkbox"/> NG
	2	2mm	±0.25	1.98	2.08	1.85	2.09	2.13	1.92	2.06	2.07	2.12	2.07	a	<input checked="" type="checkbox"/> OK <input type="checkbox"/> NG
	3	0.8mm	±0.25	0.92	0.82	0.75	0.76	0.95	0.84	0.76	0.88	0.92	0.89	a	<input checked="" type="checkbox"/> OK <input type="checkbox"/> NG
	4	0.6mm	±0.25	0.54	0.66	0.63	0.56	0.75	0.73	0.59	0.53	0.72	0.68	a	<input checked="" type="checkbox"/> OK <input type="checkbox"/> NG
	5														<input type="checkbox"/> OK <input type="checkbox"/> NG
	6														<input type="checkbox"/> OK <input type="checkbox"/> NG
	7														<input type="checkbox"/> OK <input type="checkbox"/> NG
	8														<input type="checkbox"/> OK <input type="checkbox"/> NG
外觀	1	咬花	樣品或規格	无刮伤, 脏污										目視	<input checked="" type="checkbox"/> OK <input type="checkbox"/> NG
	2	配色	樣品或規格	无明显色差										目視	<input checked="" type="checkbox"/> OK <input type="checkbox"/> NG
	3	印刷	樣品或規格											目視	<input type="checkbox"/> OK <input type="checkbox"/> NG
	4	亮霧度	樣品或規格											目視	<input type="checkbox"/> OK <input type="checkbox"/> NG
電氣 特性	1	VSWR		1.92:1MaX										NA	<input checked="" type="checkbox"/> OK <input type="checkbox"/> NG
	2	S11 / S22												NA	<input type="checkbox"/> OK <input type="checkbox"/> NG
	3	Gain												chamber	<input type="checkbox"/> OK <input type="checkbox"/> NG
零件組 配性	各零件組配 性狀況	樣品或規格												<input type="checkbox"/> OK <input type="checkbox"/> NG	
材料選 用確認	是否依照成 品圖之材料													<input type="checkbox"/> OK <input type="checkbox"/> NG	
備注:															

※量測工具: a游標卡尺 b塞規 c深度規 d工具顯微鏡 e厚薄規 f分厘卡 g扭力計 h拉拔測試機 i組配

尺寸檢驗:標注在附圖Mark表示

核 準 : \_\_\_\_\_

審 核 : \_\_\_\_\_

制表: 崔园园 \_\_\_\_\_

无锡源达电工材料有限公司

WUXI YUANDA ELECTRICAL MATERIAL CO., LTD.

中国江苏省江阴市青阳镇南陈村 邮编 214401

Nachen, Qingyang Town, Jiangyin City 214400, Jiangsu, China

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客户/ Customer: \_\_\_\_\_

客户料号/ Customer P/N: \_\_\_\_\_

# 规格书

## Specification

50  $\Omega$  (FEP) 绝缘射频电缆

50  $\Omega$  FEP Insulated Coaxial Cable

YD137 系列

YD137 SERIES

编制/ Signed by: cool Lai

编制日期/ Date: 2010-07-12

# 无锡源达电工材料有限公司

WUXI YUANDA ELECTRICAL MATERIAL CO., LTD.

中国江苏省江阴市青阳镇南陈村 邮编 214401

Nachen, Qingyang Town, Jiangyin City 214400, Jiangsu, China

## 1. 适用范围:

Scope

本规格书制定了 50 Ω FEP 绝缘射频电缆 YD137 系列的结构和电气特性。

This specification covers the construction and the electrical properties of YD137 series of 50 Ω FEP Insulation Coaxial Cable.

## 2. 结构/Construction:

单位/Unit:mm

	项目/Item	详细资料/Details
导体/Conductor	材料/Material	镀银铜线/Silver-coated Copper Wire
	构成(根/mm) Composition(No. /mm)	7/0.102
	标称直径/Nom. O. D(mm)	0.306±0.01
绝缘层 /Insulation	材料/Material	聚全氟乙丙烯(自然色) /FEP(Natural)
	标称绝缘厚度/Nom. Thick(mm)	0.295
	标称外径/Nom. O. D(mm)	0.90±0.03
屏蔽层/Shield	材料/Material	镀锡铜线/Tinned annealed copper wire
	构成/Composition	0.05 单线编织/Single Braid of 0.05
	标称外径/Nom. O. D(mm)	1.13±0.05
护套/Jacket	材料/Material	聚全氟乙丙烯(*颜色)/FEP(*color)
	标称护套厚度/Nom. Thick(mm)	0.12
	标称外径/Nom. O. D(mm)	1.37±0.05
	颜色/Color	按与客户确认的颜色/According to corresponding have approved by the suppliers and customers

## 3. 电气特性(20℃时)/Electrical Properties(at 20℃)

项目/Item	单位/Unit	详细资料/Details
导体电阻/Conductor Resistance	Ω/km	Max. 371
绝缘电阻/Insulation Resistance	MΩ.km	Min. 500
耐压强度/Dielectric Strength	V(AC)/min	500
静电容/Capacitance	pF/m	105(1kHz)

# 无锡源达电工材料有限公司

WUXI YUANDA ELECTRICAL MATERIAL CO., LTD.

中国江苏省江阴市青阳镇南陈村 邮编 214401

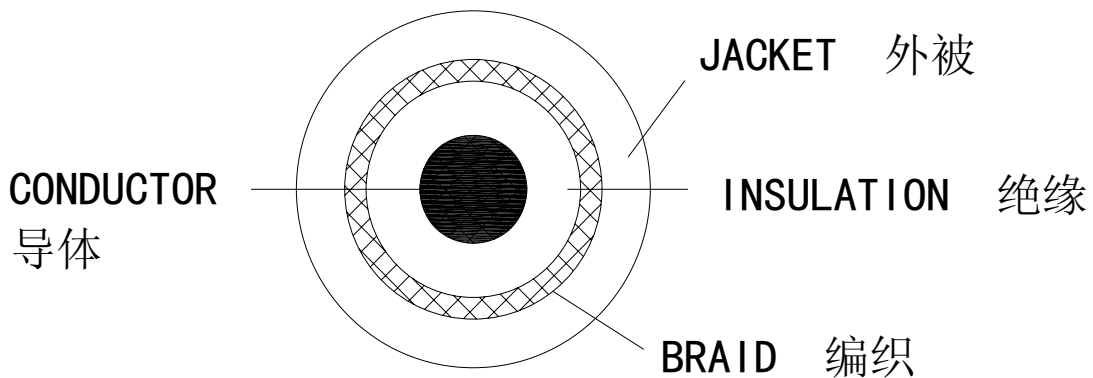
Nachen, Qingyang Town, Jiangyin City 214400, Jiangsu, China

特性阻抗 /Characteristic Impedance	$\Omega$	50±2.0	
衰减/Attenuation	dB/m	1GHz	1.70
		2GHz	2.40
		3GHz	2.90
		4GHz	3.40
		5GHz	4.00
		6GHz	4.20
驻波比/Standing wave (0-6GHz)	/	≤1.30	

#### 4. 包装 Packing

标准单位包装长度为 700 米/盘, 每盘最多允许 3 个接头, 接头最短长度 20 米, 在搬运过程中不能损坏包装.

Standard unit length of finished cable shall be 700m on reel, frequency of joint max.3/reel, the mini length is 20m. The finished cable shall be packed not be damaged during transportation



\*\*\*\*\*  
 本产品有时不适合车载用途的情况也有,所以使用前请先和本公司业务部门进行商谈.  
 This product is not suitable for automobile application in some cases.Please contact with our sales department before you use this product.  
 \*\*\*\*\*

规格书完  
 End of specification



CHEIL INDUSTRIES

材質證明

PCABS

Properties	Unit	GE PC/ABS			MITSUBISHI	TEIJIN	BAYER	SAMSUNG		
		C2800	C6200	C6600	MB1800	TN-7000	FR2000 BBS052	NH-1015L	NH-1015S	NH-1017H
<i>Mechanical Properties</i>										
Tensile Strength	kgf/cm <sup>2</sup>	580	660	630	600	630	600	600	620	600
Flexural Modulus	kgf/cm <sup>2</sup>	27,000	27,000	27,000	28,000	2,600	?	27,000	26,000	24,000
Izod Impact Strength	kgf-cm/cm	42	53	58	40	30	45	40	52	52
<i>Thermal Properties</i>										
HDT (18.6kgf)	°C	73	87	90	81	84	78	90	92	89
VCT	°C	90	-	100	-	-	91	100	102	99
<i>Physical Properties</i>										
MFI @220°C/10kgf	g/10 min	25	22	30	25(?)			34	40	33
Density	-	1.17	1.18	1.19	1.18	1.18	1.18	1.18	1.18	1.18
Mold Shrinkage	%	0.4~0.6	0.4~0.6	0.4~0.6	0.3~0.5	0.4~0.6	0.5~0.7	0.4~0.6	0.4~0.6	0.4~0.6
Flammability (UL94)	V-2	0.9mm	-	0.75mm	-	1.2mm	-	-	-	-
	V-1	-	1.2mm	-	-	-	-	-	-	-
	V-0	1.5mm	1.5mm	1.5mm	1.2mm	1.5mm	1.5mm	1.5mm	1.5mm	2.0mm
	5VB	2.3mm	2.0mm	2.0mm	2.0mm	2.0mm	2.0mm	2.0mm	2.0mm	2.0mm
	5VA	3.0mm	3.4mm	3.0mm	-	-	-	3.0mm	3.0mm	-

Search  TOP > Product Introduction > Product Lines > Brand Name List >

**GO** ▶ POM(TEPCON) Grade Line-Up(ISO)

HOME

WHAT'S NEW

Product Introduction

Technical Support

Corporation

FAQ

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Site Map

Online support

User Name Password 


▶ About WEB@TSC

▶ Register

▶ Forgot Password

Date Sheets

MSDS

Product Safety Information

Hazardous substances/Regulations FAQ's

Polyplastics Taiwan Co., Ltd. 台灣寶

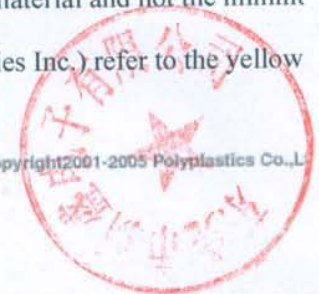
Item	Unit	Testing Method	Standard				
			M25 High Viscosity	M90 General	M130 High Fluidity	M270 High Fluidity-High Cycle	M320 High Fluidity-H Cycle
Density	g/cm <sup>3</sup>	ISO 1183	1.41	1.41	1.41	1.41	1.41
Stress at yield	MPa	ISO 527-1, 2	59	62	62	63	63
Strain at break	%	ISO 527-1, 2	40*	35*	33*	30*	28*
Tensile modulus	MPa	ISO 527-1, 2	2,500	2,700	2,700	2,800	2,800
Flexural strength	MPa	ISO 178	81	87	87	88	88
Flexural modulus	MPa	ISO 178	2,350	2,500	2,500	2,550	2,550
Charpy notched impact strength	kJ/m <sup>2</sup>	ISO 179/1eA	8.0	6.0	5.5	5.3	5.1
Temperature of deflection under load (1.80MPa)	°C	ISO 75-1, 2	90	95	100	100	100
Coefficient of linear thermal expansion (23-55° C) Parallel	×10 <sup>-5</sup> /°C	ISO 11359-2	13	12	11	11	11
Coefficient of linear thermal expansion (23-55° C) transverse	×10 <sup>-5</sup> /°C	ISO 11359-2	12	12	11	11	11
Electric strength	kV/mm	IEC 60243-1	19	19	19	19	19
Volume resistivity	Ohm·cm	IEC 60093	1×10 <sup>14</sup>	1×10 <sup>14</sup>	1×10 <sup>14</sup>	1×10 <sup>14</sup>	1×10 <sup>14</sup>
Surface resistivity	Ohm	IEC 60093	1×10 <sup>16</sup>	1×10 <sup>16</sup>	1×10 <sup>16</sup>	1×10 <sup>16</sup>	1×10 <sup>16</sup>
Comparative tracking index	CTI	IEC 60112	600+	600+	600+	600+	600+
Arc resistance (UL)	s	—	—	—	—	—	—
Flammability	—	UL94	HB	HB	HB	HB	HB

\* Nominal strain at break

- All figures in the table are the typical values of the material and not the minimum values of the material specifications.

- For qualified values of UL (Underwriters Laboratories Inc.) refer to the yellow No.E146187) issued by UL

1)Please note that these...



# DSM Engineering Plastics - Property Data

## Arnitel® EL550

TPE-unfilled

55 Shore D, Injection Grade

Properties	Typical Data	Unit	Test Method
<b>RHEOLOGICAL PROPERTIES</b>			
Melt volume-flow rate	31	cm <sup>3</sup> /10min	ISO 1133
Temperature	230	°C	ISO 1133
Load	2.16	kg	ISO 1133
<b>MECHANICAL PROPERTIES</b>			
Shore D Hardness (3s)	53	-	ISO 868
Tensile modulus	200	MPa	ISO 527-1/-2
Stress at break	30	MPa	ISO 527-1/-2
Stress at 5% strain	8.8	MPa	ISO 527-1/-2
Stress at 10% strain	11.8	MPa	ISO 527-1/-2
Stress at 50% strain	13.8	MPa	ISO 527-1/-2
Stress at 100% strain	12	MPa	ISO 527-1/-2
Charpy notched impact strength (+23°C)	N	kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength (-30°C)	25	kJ/m <sup>2</sup>	ISO 179/1eA
Izod notched impact strength (23°C)	N	kJ/m <sup>2</sup>	ISO 180/1A
Tear strength Graves (without nick)	115	kN/m	ISO 34
<b>THERMAL PROPERTIES</b>			
Melting temperature (10°C/min)	207	°C	ISO 11357-1/-3
Temp. of deflection under load (0.45 MPa)	110	°C	ISO 75-1/-2
Vicat softening temperature (50°C/h 50N)	90	°C	ISO 306
Vicat softening temperature (50°C/h 10N)	190	°C	ISO 306
Coeff. of linear therm. expansion (parallel)	1.5	E-4/°C	ISO 11359-1/-2
Coeff. of linear therm. expansion (normal)	1.5	E-4/°C	ISO 11359-1/-2
Burning Behav. at 1.6 mm nom. thickn.	HB	class	IEC 60695-11-10
Thickness tested	1.6	mm	IEC 60695-11-10
<b>ELECTRICAL PROPERTIES</b>			
Relative permittivity (1 MHz)	4	-	IEC 60250
Dissipation factor (1 MHz)	400	E-4	IEC 60250
Volume resistivity	>1E13	Ohm*m	IEC 60093
Electric strength	20	kV/mm	IEC 60243-1
Comparative tracking index	600	-	IEC 60112
<b>OTHER PROPERTIES</b>			
Density	1210	kg/m <sup>3</sup>	ISO 1183
Water absorption	0.65	%	Sim. to ISO 62
Humidity absorption	0.2	%	Sim. to ISO 62

28.10.2004

DSM Product

All information supplied by or on behalf of DSM in relation to its products, whether in the nature of data, recommendations or otherwise, is supported by research and, in good faith, believed reliable, but DSM assumes no liability and makes no warranties of any kind, express or implied, including, but not limited to, those of title, merchantability, fitness for a particular purpose or non-infringement or any warranty arising from a course of dealing, usage, or trade practice whatsoever in respect of application, processing or use made of the aforementioned information or product. The user assumes all responsibility for the use of all information provided and shall verify quality and other properties or any consequences from the use of all such information.

**ARNITEL® TPE**  
dedication makes the difference





**Arnitel**

**2.2 Product coding**

The structure of the Arnitel productcodes is illustrated with the following example:

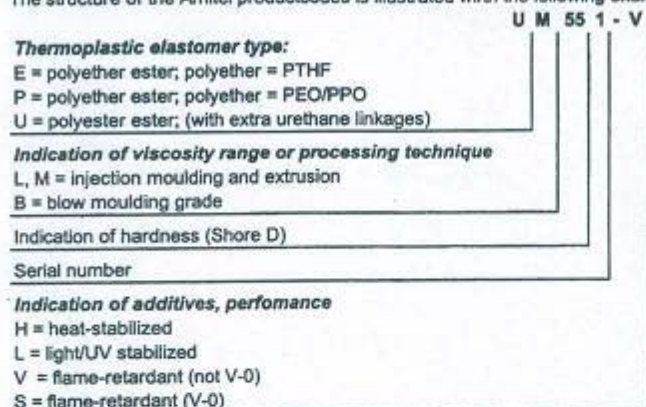


Figure 2.2: Arnitel product coding

**2.3 Product portfolio**

The Arnitel productrange is available with a hardness from 38 to 74 Shore D. The general Arnitel grades are shown in table 2.2. In order to enhance the flexibility of the portfolio a set of masterbatches (a.o. for heat, UV, etc) are on offer (refer to § 2.4).

Because of the development of these masterbatches heat stabilised Arnitel P is suggested for application areas where thermo-oxidative stability is an issue. For applications where colour and UV stability is required, the Arnitel E range is advised.

	Shore D					
	38	40	46	55	63	74
<b>Arnitel E</b>		EM400	EM460	EL550	EL630	EL740
				EM550	EM630	EM740
<b>Arnitel P</b>	PL380		PL460	PL580		
				PM581		
<b>Arnitel U</b>				UM551	UM622	
				UM551-V		
				UM552		
				UM552-V		

Table 2.2: Arnitel productrange for general purpose

Besides these multi-purpose grades, specialty grades can be offered for specific purposes and/or application areas. These grades are not intended for regular sales and are therefore restricted. Permission from marketing is needed before sampling is initiated.

	Arnitel E	Arnitel P	Arnitel U
<b>Automotive</b>			
• CVJ boots	EB460 EB463 EB464		
• Boyplugs		PL380-M0	
<b>Extrusion</b>			
• Roofing foil	EM402-L		

Table 2.3: Examples of specialty grades



**Arnitel® EL630/EM630**

**2.8.31 General:**

Arnitel is the brand name of a series polyester based thermoplastic elastomers. These polymers combine excellent processability with good elastomeric properties between -40 and 200°C. Arnitel EL630 and EM630 are excellent materials for injection moulding and extrusion applications respectively. The chemical structure of Arnitel EL630/EM630 is shown below.

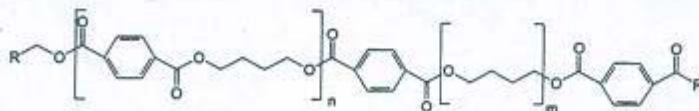


Figure 2.9: Chemical structure of Arnitel EL630/EM630.

Another way of writing the structure of Arnitels is shown below in Figure 2.



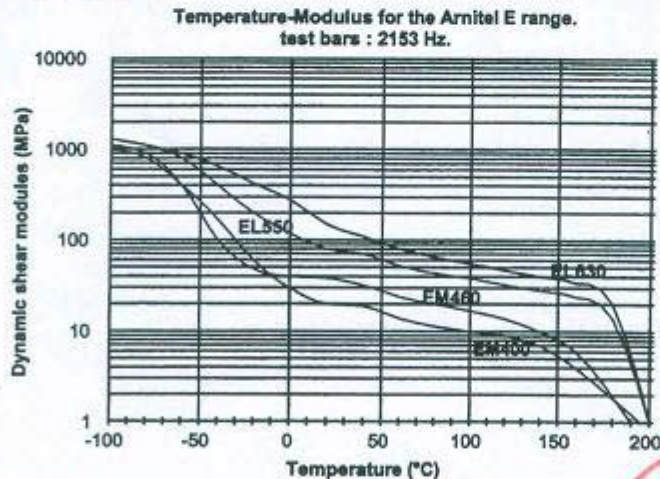
Figure 2.10: Simplified structure of Arnitel EL630/EM630.

Arnitel EL630/EM630 is TOSCA registered (including DSL-Canada) under CAS 37282-12-5

**2.8.32 Thermal properties:**

• **Modulus-temperature behaviour:**

The materials have a glass transition at circa -40°C and a typical melting point at 213°C. The modulus-temperature behaviour is shown in graph 2.76, for comparison, accompanied by other Arnitel E types.



Graph 2.76: Modulus-temperature behaviour of Arnitel EL630/EM630.



**Arnitel® EL630/EM630**

Although information on performance at higher temperatures may be extracted from the above shown graph, a Vicat or HDT are shown in table 2.29.

analysis	SI unit	typical data	test method
Vicat A	(°C)	200	ISO 306/A
Vicat B	(°C)	125	ISO 306/B
HDT-B	(°C)	115	ISO 75-1

Table 2.29: Vicat and HDT data on Arnitel® EL630 and EM630

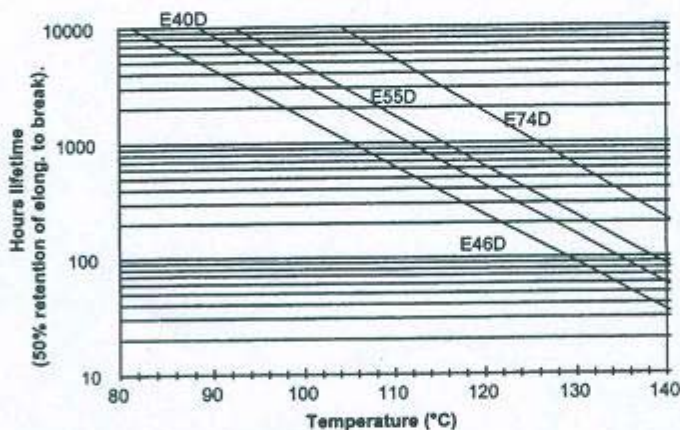
Arnitel EL630 and EM630 have a melting point of 213°C as found in the second heating curve of a DSC. The polymer will crystallize at 155°C using a 20°C/min cooling rate. The thermal expansion coefficient of Arnitel EL630/EM630 and is  $140 \cdot 10^{-4} \mu\text{m/m.K}$ .

• **Heat aging:**

Arnitel EL630/EM630 shows an optimum between heat resistance and colour stability. Heat aging for EL630/EM630 is under test at this moment, however the data will be between EL550 and EL740. Arrhenius curves of thermo-oxidative heat aging are shown in graph 2.77. Criterium chosen is retention of 50% original elongation at break.

**Heat aging of Arnitel E40D, 46D, 55D and 74D.**

**Natural products, Arrhenius plot.**



Graph 2.77: Heat stability for Arnitel E-range.

Heat ageing can be improve using a stabilisation masterbatch, however for heat stabilisation the P-range is preferred for it's excellence in performance. These data can be found in the Arnitel properties summary or an Arnitel P datasheet.

**2.8.33 Processing and Handling:**

Arnitel EL630/EM630 is a polyester with a density of  $1.12 \text{ g/cm}^3$  according ISO 1183. Due to the polyester nature of these materials it is of major importance to store the material dry prior to processing. Materials packaged in sealed packaging should have a moisture content lower then 500 ppm. The polymer will contain 0.12% moisture in 50% RH and 0.58% water after saturation in water. Both numbers are in equilibrium. If samples have become wet during storage a drying step of 24 hours 120°C (or 6 hours 140°C) prior to use will prevent degradation of the material during processing combined with an eventual loss of properties. The air or nitrogen will have to have a dew point of at least -30°C.

**Arnitel® EL630/EM630**

• **Processing:**

Arnitel EL630/EM630 shows a single melting point at 195°C in DSC. Processing conditions are shown in the table below.

polymer	zone 1	zone 2	zone 3	additional	melt	mold
EL630	225	230	235	235	225-235	20-50
EM630	225	230	235	235	235	50

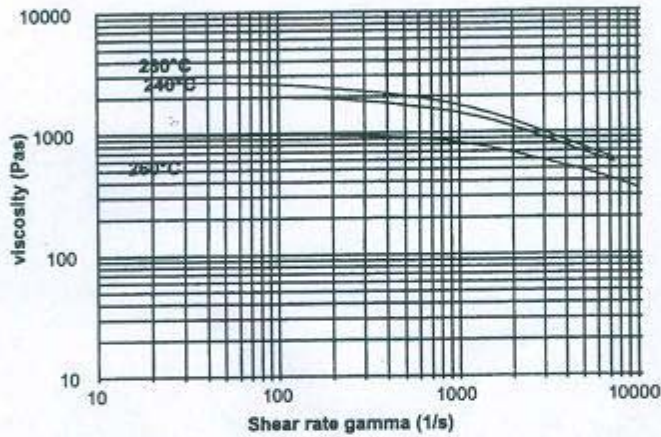
All temperatures are in °C.

Table 2.30: Processing conditions for Arnitel EL630 and Arnitel EM630.

• **Rheology:**

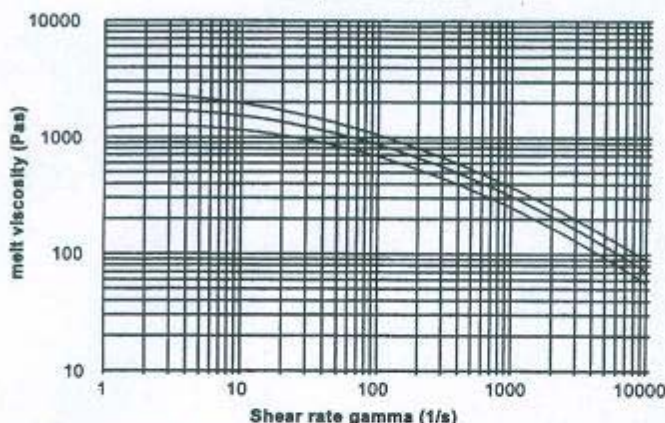
The temperature depending melt viscosity of Arnitel EL630/EM630 and are shown below in graph 2.80 and 2.81 respectively.

Shear rate dependent of the melt viscosity of Arnitel EL630.  
Effect of melt temperature.



Arnitel® EL630/EM630

Capillar melt viscosity of Arnitel EM630.  
240, 250 and 260°C.



Graph 2.80 and 2.81: Temperature dependency of the melt viscosity for Arnitel EL630 and EM630.

The MFI values are shown in table 2.31.

		EL630	EM630	
MFI 230°C	g/10 min		7	ISO 1133
MFI 240°C	g/10 min	30		ISO 1133

Table 2.31: MFI for Arnitel EL630/EM630.

• Use of regrind:

Arnitel can readily be recycled. If the MFI of the regrind is up or down to four points higher, 20% can be recycled. A difference of 2 MFI points allows up to 50% of regrind. Obviously the regrind should be dried properly before use.

2.8.34 Mechanical properties:

If Arnitel EL630 or Arnitel EM630 are processed properly the materials will have mechanical properties as shown in table 2.32.

Mechanical property	SI Unit	typical data*		test method
		EL630	EM630	
Hardness	Shore D	63	63	ISO 868
Tensile modulus (1 mm/min)	MPa	330	330	ISO 527
Tensile strength (50 mm/min)	MPa	30	30	ISO 527
Strain at break	%	350	350	ISO 527
Tensile stress at 5% strain	Mpa	11.5	11.5	
Tensile stress at 10% strain	Mpa	15.9	15.9	
Tensile stress at 50% strain	Mpa	17.3	17.3	
Tear strength Graves	KN/m	145	145	DIN53515
Izod notched 23°C (73°F)	KJ/m <sup>2</sup>	NB	NB	ISO 180/1A
Izod notched -30°C (-22°F)	KJ/m <sup>2</sup>	4	4	ISO 180/1A
Charpy notched 23°C (73°F)	KJ/m <sup>2</sup>	NB	NB	ISO 179/1eA
Charpy notched -30°C (-22°F)	KJ/m <sup>2</sup>	12	12	ISO 179/1eA

\* Data for dry natural materials.  
NB: No Break

Table 2.32: mechanical properties of Arnitel® EL630.



**Amitel® EL630/EM630**• **Abrasion:**

Amitels show good abrasion resistance in both Taber and DIN 53516 abrasion tests. Data are shown in the Amitel general property overview (also included in the EPIC)

**2.8.35 Flame retardancy:**

Amitel EL630 and EM630 show in an ISO1210/A flammability test a burning rate leading to a classification FH-1. Flame retardancy can be improved using a halogenated or halogen free FR masterbatch.

**2.8.36 Electrical properties:**

Amitel EL630/EM630 can be used for cable jacketing applications. If the material is in permanent contact with copper a copper stabilisation package should be added. If the copper wires are coated with a tin layer, no stabilisation is necessary. The electrical properties are shown in table 33.

Electrical property	SI Unit	typical data*		test method
		EL630	EM630	
Dielectric strength	KV/mm	22	22	IEC 243-1
Relative permittivity ( $\epsilon_r$ ) at 1 kHz	-	4.4	4.4	IEC 250
Dissipation factor ( $\tan \delta$ ) at 1kHz	-	0.019	0.019	IEC 250
Comparative tracking index	-	600	600	IEC 112
Volume resistivity	$10^{14} \Omega \cdot \text{cm}$	1	1	IEC 93
Surface resistivity	$10^{14} \Omega$	1	1	IEC 93

Table 2.33: Typical electrical properties of Amitel® EL630 and EM630.

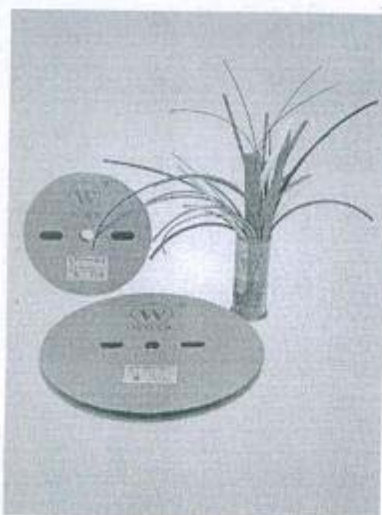
**2.8.37 Chemical resistance:**

Amitel EL630 and EM630 are sensitive to strong bases and strong acids, especially at elevated temperatures. In some halogenated hydrocarbons (like tetrachloroethane), the materials (partially) dissolve. For a full review on chemical resistance of Amitel EL630 and EM630 request the chemical resistance brochure.

• **Hydrolysis**

Like all polyesters Amitel are sensitive to moisture, however Amitels are more stable to water than e.g. PET and PBT. graph 2.84 shows the hydrolytic stability of Amitel EL630 at 100°C and in steam (120°C). For improved hydrolysis stability, using a polycarbodiimid containing masterbatch like Stabaxol® in an option. To maintain all other properties use a masterbatch based on polyester. Data on the Stabaxol stabilised grade are shown in graph 2.85.





安装标准: UL224 VW-1  
C-UL CSA C 22.2 OFT

**WOLFRASHTH 222** H无卤环保阻燃热缩套管采用优质高聚物, 经科学配方、机械共混成高聚合物合金, 产品成型后经电子加速器辐照交联、连续扩张而成。产品具有环保、柔软、阻燃、收缩快、性能稳定等优点。广泛应用于电线连接、焊点保护、电线端部、线缆及电子元器件的防护和绝缘处理; 健身器材零部件和钢结构表面防护; 相关产品的防锈、防腐处理; 电线和其它产品的标识等。

特点:

- ①八大有害元素, 卤素元素通过SGS检测;
  - ②不含有机锡化合物(三丁基锡类/三苯基锡类)、石棉(Asbestos)、阻燃剂(AzoCompounds)及限制其释放的物质-甲醛;
  - ③适用范围: -55°C~125°C;
  - ④起始收缩温度70°C, 超薄型完全收缩温度110°C, 普通型完全收缩温度120°C, 轴向收缩率≤5%;
  - ⑤柔软、阻燃;
  - ⑥规格齐全, φ0.6~φ180, 并可定制特殊规格;
  - ⑦使用方便, 用烘箱和热风枪加热即可收缩;
  - ⑧环保性能符合Sony与欧盟RoHS等环保标准。
- 标准颜色: 见标准颜色表, 其中“+”表示比色卡颜色偏深, “-”表示比色卡颜色偏浅。黑、白、红、黄、绿、蓝色为基本颜色, 常备库存, 其它颜色不备库存, 需定做。

H管标准颜色

标准颜色	黑色	白色	红色	黄色	绿色	蓝色	紫色	灰色	棕色	银灰
产品颜色标识			186U	114U	3288U	646U	2735U	427U	483U	484U
H管彩色颜色色标										

性能特性

性能	测试方法		性能指标
	测试方法	性能指标	
物理特性	拉伸强度 (MPa)	GB/T1040	≥10.4
	断裂伸长率 (%)	GB/T1040	≥200
	热老化后拉伸强度 (MPa)	UL 224 158°C x 168hr	≥7.3
	热老化后断裂伸长率 (%)	UL 224 158°C x 168hr	≥100
	耐热冲击	UL 224 250°C x 4hr	不受损 不龟裂
	抗冷弯曲	UL 224 -30°C x 4hr	不龟裂
电气特性	击穿强度 (kv/mm)	GB/T1408	≥15
	耐压	150V	UL 224 1500V不击穿
		600V	UL 224 2500V不击穿
体积电阻率 (Ω·cm)	GB/T1410	≥1 × 10 <sup>11</sup>	
化学特性	抗腐蚀性	UL 224 158°C x 168hr	PASS
	铜安定性	UL 224 158°C x 168hr	PASS
	阻燃性	UL 224	VW-1

环保特性

有害元素名称	测试方法	指标(mg/kg)	有害元素名称	测试方法	指标(mg/kg)
镉 (Cd)	EN1122:2001 Method B	≤5	硒 (Se)	EPA 3062	≤25
铅 (Pb)	EPA 3060 B	≤90	氟 (F)	EN 14582 Method B	≤200
镍 (Ni)	EPA 3060 B	≤60	氯 (Cl)	EN 14582 Method B	≤900
钡 (Ba)	EPA 3060 B	≤1000	溴 (Br)	EN 14582 Method B	≤900
铬 (Cr)	EPA 3060 B	≤5	碘 (I)	EN 14582 Method B	≤200
汞 (Hg)	EPA 3062	≤5	其中多溴联苯 (PBB)	EPA3540C或3550C	禁用
砷 (As)	EPA 3062	≤50	多溴联苯醚 (PBDE)	EPA3540C或3550C	禁用



H管(无卤环保阻燃热缩套管)产品规格

规格 (mm)	收缩前尺寸 (mm)		收缩后尺寸 (mm)		标准包装			适用范围 (mm)
	内径	壁厚	内径	壁厚	米/盘	盘/箱	包装箱规格(cm)	
φ0.6	0.9±0.2	0.15±0.05	≤0.40	0.22±0.10	200	23	31×31×44.5	0.5-0.7
φ0.8	1.1±0.2	0.15±0.05	≤0.50	0.22±0.10	200	23	31×31×44.5	0.6-0.8
φ1.0	1.5±0.2	0.15±0.05	≤0.65	0.28±0.10	200	16	31×31×44.5	0.75-0.9
φ1.5	2.0±0.2	0.18±0.05	≤0.85	0.32±0.10	200	12	31×31×44.5	0.95-1.4
φ2.0	2.5±0.2	0.18±0.05	≤1.00	0.35±0.10	200	15	46×46×44.5	1.1-1.8
φ2.5	3.0±0.2	0.18±0.05	≤1.30	0.39±0.10	200	13	46×46×44.5	1.4-2.3
φ3.0	3.5±0.2	0.18±0.05	≤1.50	0.40±0.10	200	11	46×46×44.5	1.6-2.7
φ3.5	4.0±0.2	0.22±0.05	≤1.80	0.42±0.10	200	9	46×46×44.5	1.9-3.2
φ4.0	4.5±0.2	0.25±0.05	≤2.00	0.45±0.10	200	7	46×46×44.5	2.1-3.6
φ4.5	5.0±0.2	0.25±0.05	≤2.30	0.50±0.10	100	10	46×46×44.5	2.4-4.0
φ5.0	5.5±0.2	0.25±0.05	≤2.5	0.55±0.10	100	9	46×46×44.5	2.6-4.5
φ5.5	6.0±0.2	0.25±0.05	≤2.75	0.55±0.10	100	6	46×46×44.5	2.85-5.0
φ6.0	6.5±0.2	0.28±0.05	≤3.0	0.65±0.10	100	7	46×46×44.5	3.1-5.4
φ7.0	7.5±0.3	0.28±0.05	≤3.5	0.65±0.10	100	14	46×46×31	3.7-6.3
φ8.0	8.5±0.3	0.28±0.05	≤4.0	0.60±0.10	100	13	46×46×31	4.2-7.2
φ9.0	9.5±0.3	0.30±0.05	≤4.5	0.60±0.10	100	12	46×46×31	4.7-8.0
φ10	10.5±0.3	0.30±0.05	≤5.0	0.60±0.10	100	11	46×46×31	5.2-9.0
φ11	11.5±0.3	0.30±0.05	≤5.5	0.60±0.10	100	11	46×46×31	5.7-10
φ12	12.5±0.3	0.30±0.05	≤6.0	0.60±0.10	100	10	46×46×31	6.2-11
φ13	13.5±0.3	0.35±0.10	≤6.5	0.65±0.10	100	9	46×46×29.5	6.7-12
φ14	14.5±0.3	0.35±0.10	≤7.0	0.65±0.10	100	9	46×46×31	7.3-13
φ15	15.5±0.4	0.40±0.12	≤7.5	0.70±0.10	100	8	46×46×29.5	7.8-14
φ16	16.5±0.4	0.40±0.12	≤8.0	0.70±0.10	100	8	46×46×31	8.3-15
φ17	17.5±0.4	0.40±0.12	≤8.5	0.70±0.10	100	7	46×46×29.5	8.8-15
φ18	19.0±0.5	0.40±0.15	≤9.0	0.80±0.15	100	7	46×46×29.5	9.3-17
φ20	21.0±0.5	0.40±0.15	≤10.0	0.80±0.15	100	6	46×46×29.5	10.4-19
φ22	23.0±0.5	0.40±0.15	≤11.0	0.80±0.15	100	6	46×46×31	11.4-21
φ25	26.0±0.5	0.50±0.15	≤12.5	0.90±0.15	50	6	46×46×31	12.9-24
φ28	29.0±0.5	0.50±0.15	≤14.0	0.90±0.15	50	5	46×46×29.5	14.4-27
φ30	31.5±1.0	0.50±0.15	≤15.0	0.95±0.15	50	5	46×46×31	16-29
φ35	36.5±1.0	0.50±0.15	≤17.5	1.00±0.15	50	4	46×46×29.5	18-34
φ40	41.5±1.0	0.55±0.15	≤20.0	1.00±0.15	50	4	46×46×31	21-39
φ45	46.5±1.0	0.55±0.15	≤22.5	1.00±0.15	25	5	31×31×40.5	23.5-44
φ50	≥50	0.55±0.15	≤25.0	1.00±0.15	25	5	31×31×44.5	26-49
φ60	≥60	0.60±0.15	≤31.0	1.30±0.20	25	4	31×31×42	35-55
φ70	≥70	0.65±0.15	≤36.0	1.30±0.20	25	3	31×31×37	40-65
φ80	≥80	0.65±0.15	≤41.0	1.46±0.20	25	3	31×31×42	45-75
φ90	≥90	0.65±0.15	≤46.0	1.46±0.20	25	2	31×31×32	50-85
φ100	≥100	0.65±0.20	≤51.0	1.46±0.20	25	2	31×31×34.5	55-95
φ120	≥120	0.65±0.20	≤61.0	1.56±0.20	15	2	31×31×40.5	65-115
φ150	≥150	0.65±0.20	≤74.0	1.56±0.20	15	2	31×31×49.5	80-145
φ180	≥180	0.65±0.30	≤91.0	1.56±0.20	15	1	31×31×31	95-175

H管(无卤环保阻燃热缩套管)产品规格(英制)

英寸 Inch	规格 (mm)	收缩前尺寸 (mm)		收缩后尺寸 (mm)		标准包装			适用范围 (mm)
		内径	壁厚	内径	壁厚	米/盘	盘/箱	包装箱规格(cm)	
3/64	φ0.6	1.1±0.2	0.15±0.05	≤0.50	0.22±0.10	200	23	31×31×44.5	0.6-0.8
1/16	φ1.0	1.5±0.2	0.15±0.05	≤0.65	0.28±0.10	200	16	31×31×44.5	0.75-0.9
3/32	φ2.0	2.5±0.2	0.18±0.05	≤1.00	0.35±0.10	200	15	46×46×44.5	1.1-1.8
1/8	φ3.0	3.5±0.2	0.18±0.05	≤1.50	0.40±0.10	200	11	46×46×44.5	1.6-2.7
3/16	φ4.5	5.0±0.2	0.25±0.05	≤2.30	0.50±0.10	100	10	46×46×44.5	2.4-4.0
1/4	φ6.0	6.5±0.2	0.28±0.05	≤3.0	0.55±0.10	100	7	46×46×44.5	3.1-5.4
3/8	φ9.0	9.5±0.3	0.30±0.05	≤4.5	0.60±0.10	100	12	46×46×31	4.7-8.0
1/2	φ12	12.5±0.3	0.30±0.05	≤6.0	0.60±0.10	100	10	46×46×31	6.2-11
3/4	φ18	19.0±0.5	0.40±0.15	≤9.0	0.80±0.15	100	7	46×46×29.5	9.3-17
1	φ25	26.0±0.5	0.50±0.15	≤12.5	0.90±0.15	50	6	46×46×31	12.9-24
1-1/4	φ28	29.0±0.5	0.50±0.15	≤14.0	0.90±0.15	50	5	46×46×29.5	14.4-27
1-1/2	φ40	41.5±1.0	0.55±0.15	≤20.0	1.00±0.15	50	4	46×46×31	21-39
2	φ50	≥50	0.55±0.15	≤25.0	1.00±0.15	25	5	46×46×44.5	26-49
3	φ80	≥80	0.65±0.15	≤41.0	1.46±0.20	25	3	31×31×42	45-75
4	φ100	≥100	0.65±0.20	≤51.0	1.46±0.20	25	2	31×31×34.5	55-95
5	φ120	≥120	0.65±0.20	≤61.0	1.56±0.20	15	2	31×31×40.5	65-115



H-CB管(无卤环保阻燃超薄型热缩套管)产品规格

规格 (mm)	收缩前尺寸 (mm)		收缩后尺寸 (mm)		标准包装			适用范围 (mm)
	内径	平均壁厚	最大内径	平均壁厚	米/盘	盘/箱	包装箱规格(cm)	
Φ1.0CB	1.40±0.2	0.13±0.05	≤0.65	0.20±0.10	200	19	31×31×44.5	0.7~1.0
Φ1.5CB	1.90±0.2	0.13±0.05	≤0.85	0.20±0.10	200	13	31×31×44.5	0.9~1.4
Φ2.0CB	2.40±0.2	0.13±0.05	≤1.00	0.22±0.10	200	18	46×46×44.5	1.1~1.8
Φ2.9CB	2.90±0.2	0.13±0.05	≤1.30	0.25±0.10	200	15	46×46×44.5	1.4~2.3
Φ3.0CB	3.40±0.2	0.13±0.05	≤1.50	0.28±0.10	200	13	46×46×44.5	1.6~2.7
Φ3.5CB	3.90±0.2	0.13±0.05	≤1.80	0.28±0.10	200	10	46×46×44.5	1.9~3.2
Φ4.0CB	4.40±0.2	0.15±0.05	≤2.00	0.30±0.10	200	8	46×46×44.5	2.1~3.6
Φ4.5CB	4.90±0.2	0.15±0.05	≤2.30	0.30±0.10	100	10	46×46×44.5	2.4~4.0
Φ5.0CB	5.90±0.2	0.15±0.05	≤2.5	0.32±0.10	100	10	46×46×44.5	2.6~4.5
Φ6.0CB	6.50±0.2	0.15±0.05	≤3.0	0.32±0.10	100	8	46×46×44.5	3.1~5.4
Φ7.0CB	7.5±0.3	0.15±0.05	≤3.5	0.32±0.10	100	20	31×31×44.5	3.7~6.3
Φ8.0CB	8.5±0.3	0.15±0.05	≤4.0	0.32±0.10	100	18	31×31×44.5	4.2~7.2
Φ9.0CB	9.5±0.3	0.15±0.05	≤4.5	0.35±0.10	100	18	31×31×44.5	4.7~8.0
Φ10CB	10.5±0.3	0.15±0.05	≤5.0	0.35±0.10	100	16	31×31×44.5	5.2~9.0
Φ11CB	11.5±0.3	0.18±0.05	≤5.5	0.40±0.10	100	15	31×31×44.5	5.7~10.0
Φ12CB	12.5±0.3	0.20±0.05	≤6.0	0.40±0.10	100	10	46×46×31	6.2~11.0
Φ13CB	13.5±0.3	0.20±0.05	≤6.5	0.40±0.10	100	9	46×46×29.5	6.7~12.0
Φ14CB	14.5±0.3	0.20±0.05	≤7.0	0.40±0.10	100	9	46×46×29.5	7.3~13.0
Φ15CB	15.5±0.4	0.20±0.05	≤7.5	0.40±0.10	100	8	46×46×29.5	7.8~14.0
Φ16CB	16.5±0.4	0.22±0.05	≤8.0	0.40±0.10	100	8	46×46×31	8.3~15.0
Φ17CB	17.5±0.4	0.22±0.05	≤8.5	0.40±0.10	100	8	46×46×29.5	8.8~16.0
Φ18CB	18.5±0.4	0.22±0.05	≤9.0	0.42±0.10	100	7	46×46×29.5	9.3~17.0
Φ20CB	20.5±0.5	0.25±0.05	≤10.0	0.45±0.10	100	6	46×46×29.5	10.5~19.0
Φ22CB	22.5±0.5	0.25±0.05	≤11.0	0.45±0.10	100	6	46×46×29.5	11.5~20.5
Φ25CB	25.5±0.5	0.25±0.05	≤12.5	0.45±0.10	50	6	46×46×31	13.0~24.0

H-CB管(无卤环保阻燃超薄型热缩套管)产品规格(英制)

英寸 Inch	规格 (mm)	收缩前尺寸 (mm)		收缩后尺寸 (mm)		标准包装			适用范围 (mm)
		内径	平均壁厚	内径	平均壁厚	米/盘	盘/箱	包装箱规格(cm)	
1/16	Φ1.0CB	1.40±0.20	0.13±0.05	≤0.65	0.20±0.10	200	19	31×31×44.5	0.7~1.0
3/32	Φ2.0CB	2.40±0.20	0.13±0.05	≤1.00	0.22±0.10	200	18	46×46×44.5	1.1~1.8
1/8	Φ3.0CB	3.40±0.20	0.13±0.05	≤1.50	0.28±0.10	200	13	46×46×44.5	1.6~2.7
3/16	Φ4.5CB	4.90±0.20	0.15±0.05	≤2.30	0.30±0.10	100	10	46×46×44.5	2.4~4.0
1/4	Φ6.0CB	6.50±0.20	0.15±0.05	≤3.0	0.32±0.10	100	8	46×46×44.5	3.1~5.4
3/8	Φ9.0CB	9.50±0.30	0.15±0.05	≤4.5	0.35±0.10	100	18	31×31×44.5	4.7~8.0
1/2	Φ12.0CB	12.5±0.30	0.20±0.05	≤6.0	0.40±0.10	100	10	46×46×31	6.2~11.0
3/4	Φ18.0CB	18.5±0.40	0.22±0.05	≤9.0	0.42±0.10	100	7	46×46×29.5	9.3~17.0
1	Φ25.0CB	25.5±0.50	0.25±0.05	≤12.5	0.45±0.10	50	6	46×46×31	13.0~25.5



SHIYANG (ZHONG SHAN) METAL PRODUCTS CO.,LTD

世扬金属制品有限公司

TEST CERTIFICATE

材质证明书

CLIENT 客户	海睿兴							certificate NO. 证明书号	090413-06	
name article 品名	Brass									
LOT NO.	SIZE(MM) STANDARD	OUTWGT (KG)	DESIGNATION	Cu(%)	Pb(%)	Fe(%)	Fe+Sn(%)	Cd(%)	Zn(%)	REMARK
2520	10.75 φ	200	JISC3604	57~61	1.8~3.7	≤0.5	≤1.2	≤0.0075	REM	
			JISC3604	57.8	3.028	0.341	0.826	0.0017	REM	

兹证明本表所列产品,均依材料规格制造及试验,并符合规格之要求。  
 WE HEREBY CERTIFY THAT MATERIAL DESCRIBED JERE IN MAS BEEN MANUFACTURED AND TESTED WITH SATISFACTORY RESULTS IN ACCORDANCE WITH THE REQUIREMENT OF THE ABOVE MATERIAL SPECIFICATION.

核准:

审核: 李玉奎

THE THREE INDUSTRIAL AREA NAN LANG TOWN ZHONG SHAN CITY  
 中国广东省中山市南朗镇第三工业区

日期: 2009/04/13

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E-Mail:bs01@shiyangmetal.net

# 豁免自我申明

兹证明我公司 东莞新盛电子有限公司

(公司名称) 关于 RF 天线 (成品名称) 成品验证申请  
提供的 铜管 (样品名称) 对应的 RoHS 测试报告编号为  
CANEC1102385201 (测试报告编号), 其中 Pb  
(可豁免项目) 的含量为 26586ppm, 此样品的  
原材料组成成分为 铜, 其中的 Pb (可豁免项目)  
来源于 铜管, 根据欧盟 RoHS 指令豁免  
条款第 11 条: 4(1)6. 钢合金元素中的铅含量达 0.35%。铝含  
量达 0.4%。铜合金中的铅含量达 4%

(条款引用), 此样品中的 Pb 含量可获豁免。

特此证明! 如有不实, 本公司愿承担一切责任。

东莞新盛电子有限公司



证明公司名称: 日期