WHA YU INDUSTRIAL CO., LTD. (HEAD OFFICE)
TAI HWA ELECTRONIC CO., LTD.(CHINA)
SHANGHAI HUA YU ELECTRONIC CO., LTD.(CHINA)
AEON TECH CO., LTD. (CHINA)

SPECIFICATION FOR APPROVAL

CUSTOMER: 合勤科技股份有限公司

PART NAME: *RF Antenna Assembly*

PART NO.: 65-031-355002G *REVISION:*

W. Y. P/NO.: *C034-510506-A* *REV.:* *X1*

	MANUFACTURER SIGNATURE	CUSTOMER SIGNATURE
APPROVED BY :		
DATE :	7/5.06	

WHA YU GROUP

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蘇州華廣電通有限公司
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Tel: + 86-512-63627980
Fax: + 86-512-63627981

RF Antenna Cable Assembly

Specification

1. Electrical Properties :

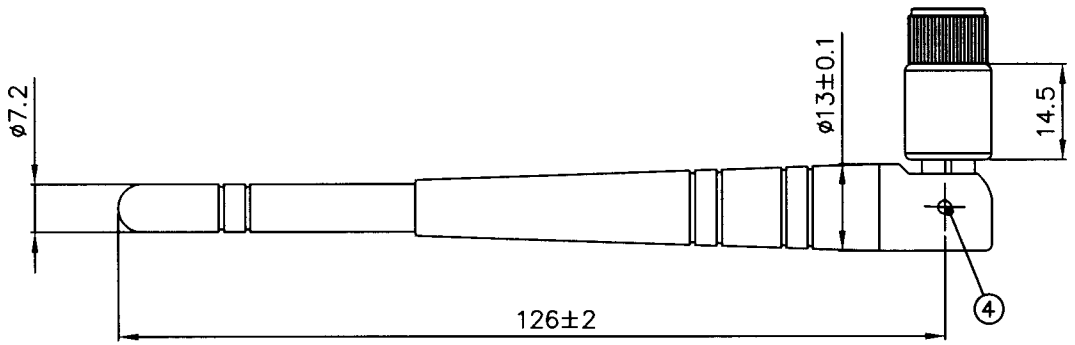
1.1 Frequency Rang…… 2.4GHz ~ 2.5GHz；4.9GHz ~ 5.825GHz
1.2 Impedance …… 50Ω Nominal
1.3 VSWR ……1.92 Max.
1.4 Return Loss…….-10 dB Maximum
1.5 Radiation ……Omni-directional
1.6 Antenna Gain…….… 2.04dBi@2.4GHz~2.5GHz
3dBi@ 4.9GHz~5.825GHz
1.7 Polarization……Linear Vertical
1.8 Admitted Power…… 1W

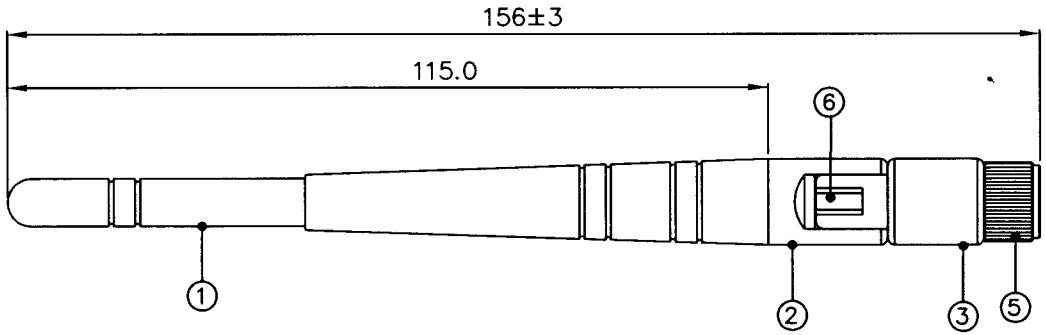
2. Physical Properties :

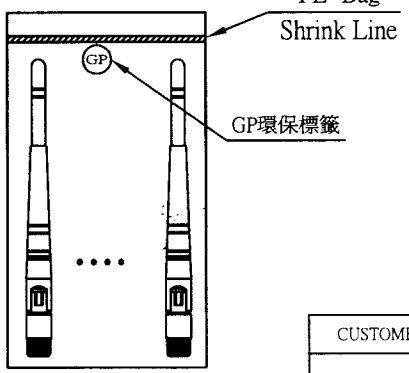
2.1 Cable……RG-178 Coaxial Cable
2.2 Antenna Cover……TPE
2.3 Antenna Base…… PC
2.4 Antenna Base…… PBT
2.5 Operating Temp. ……-20℃ ~ +65℃
2.6 Storage Temp. ……-30℃ ~ +75℃
2.7 Color ……Black
2.8 Connector…...…….SMA Plug Reverse

CG-

REV	DATE	DESCRIPTION
X1	2/15-2006	New Issue







Packing :10 pcs/bag

NO	DESCRIPTION		QTY	REMARK
6	Cable	RG-178 Cable	1	
5	Connector	SMA Plug Reverse	1	
4	Rivet	POM , Black	2	
3	Antenna Base	PBT ; Color : Black	1	
2	Antenna Base	PC ; Color : Black	1	
1	Antenna Body	TPE ; Color : Black	1	

CUSTOMER'S SINGATURE

XX.	±5
X.	±3.0
.X	±1.0
.XX	±0.5
.XXX	±0.1

APPROVED

CHECKED

DRAWING 程淑娟

CUSTOMER: 合勤科技股份有限公司

PART NO :

PARTNAME: RF Antenna Assembly

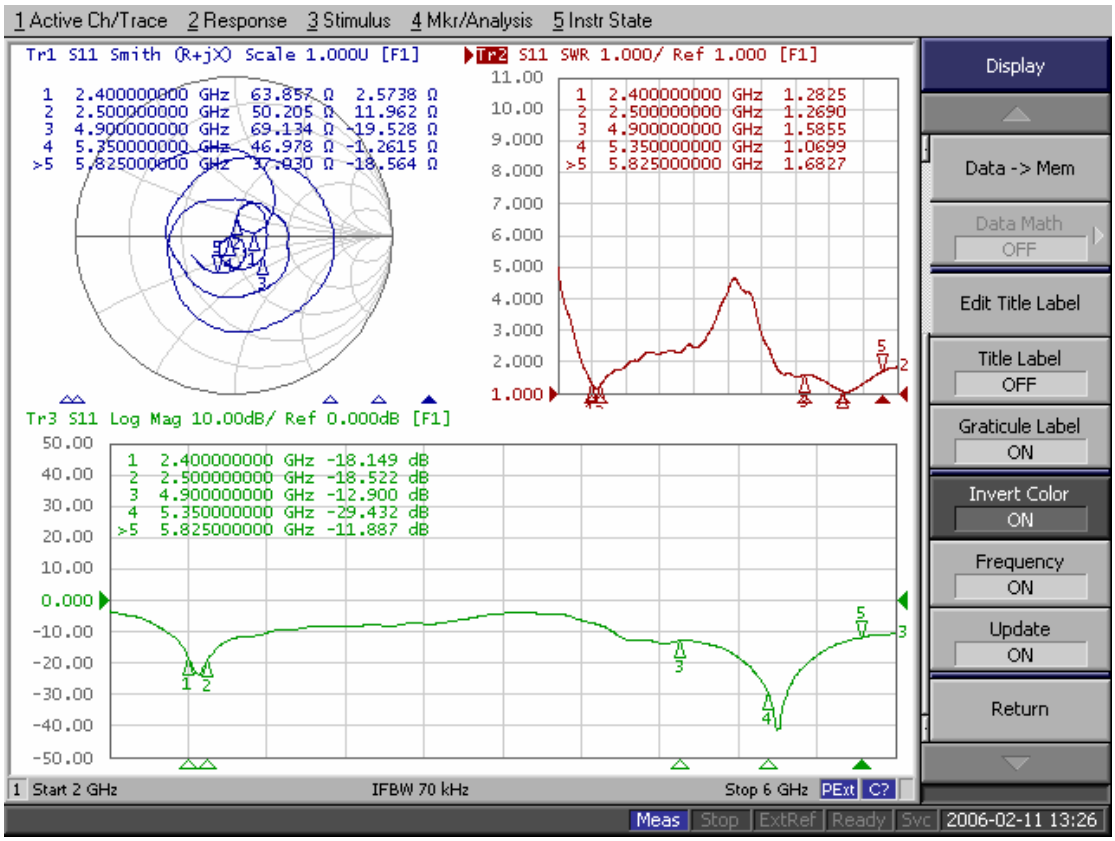
W.Y P/NO : C034-510506-A

REV	UNIT	FILE :
X1	m/m	SHEET : 1/1

Wha Yu
INDUSTRIAL CO.,LTD.
謙裕實業股份有限公司

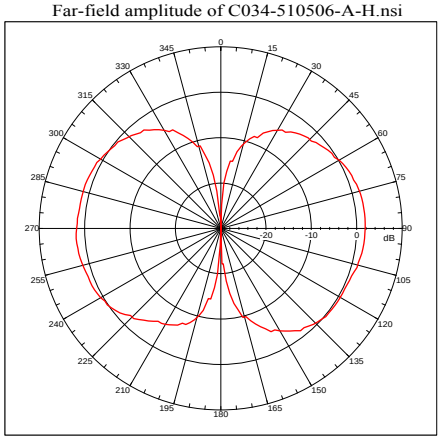
RF Antenna Assembly

P/NO :C034 -510506 -A SPEC : Dual Band



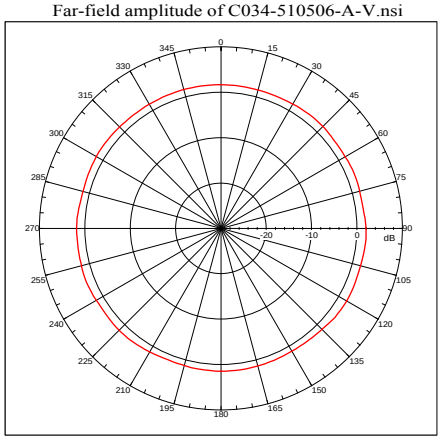
2/14/2006

Far-field amplitude of C034-510506-A-H.nsi



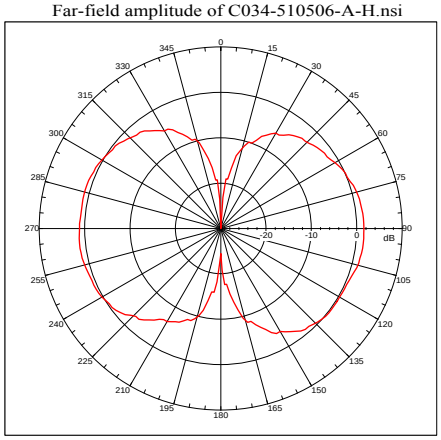
2.4GHz Gain =1.89572 dBi

Far-field amplitude of C034-510506-A-V.nsi



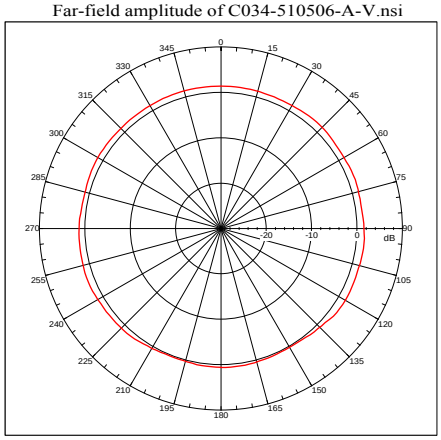
2.4GHz Gain =2.01771 dBi

Far-field amplitude of C034-510506-A-H.nsi



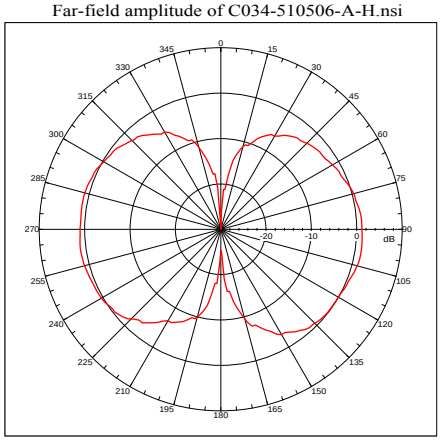
2.45GHz Gain = 1.59217 dBi

Far-field amplitude of C034-510506-A-V.nsi



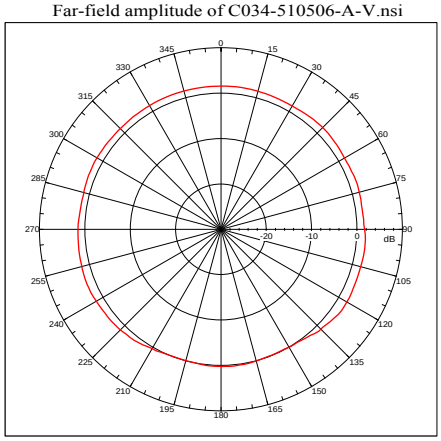
2.45GHz Gain = 1.69496 dBi

Far-field amplitude of C034-510506-A-H.nsi



2.5GHz Gain = 1.30516 dBi

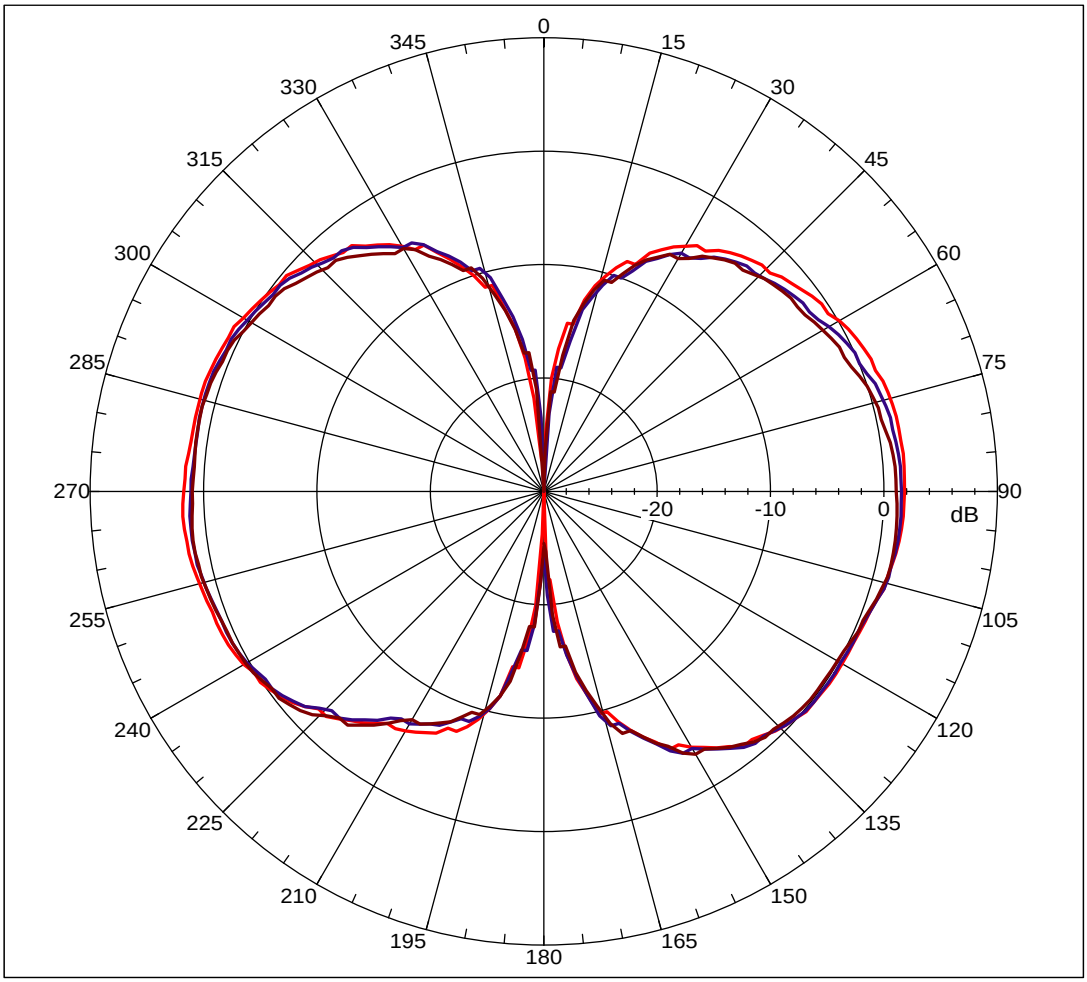
Far-field amplitude of C034-510506-A-V.nsi



2.5GHz Gain = 2.0476 dBi

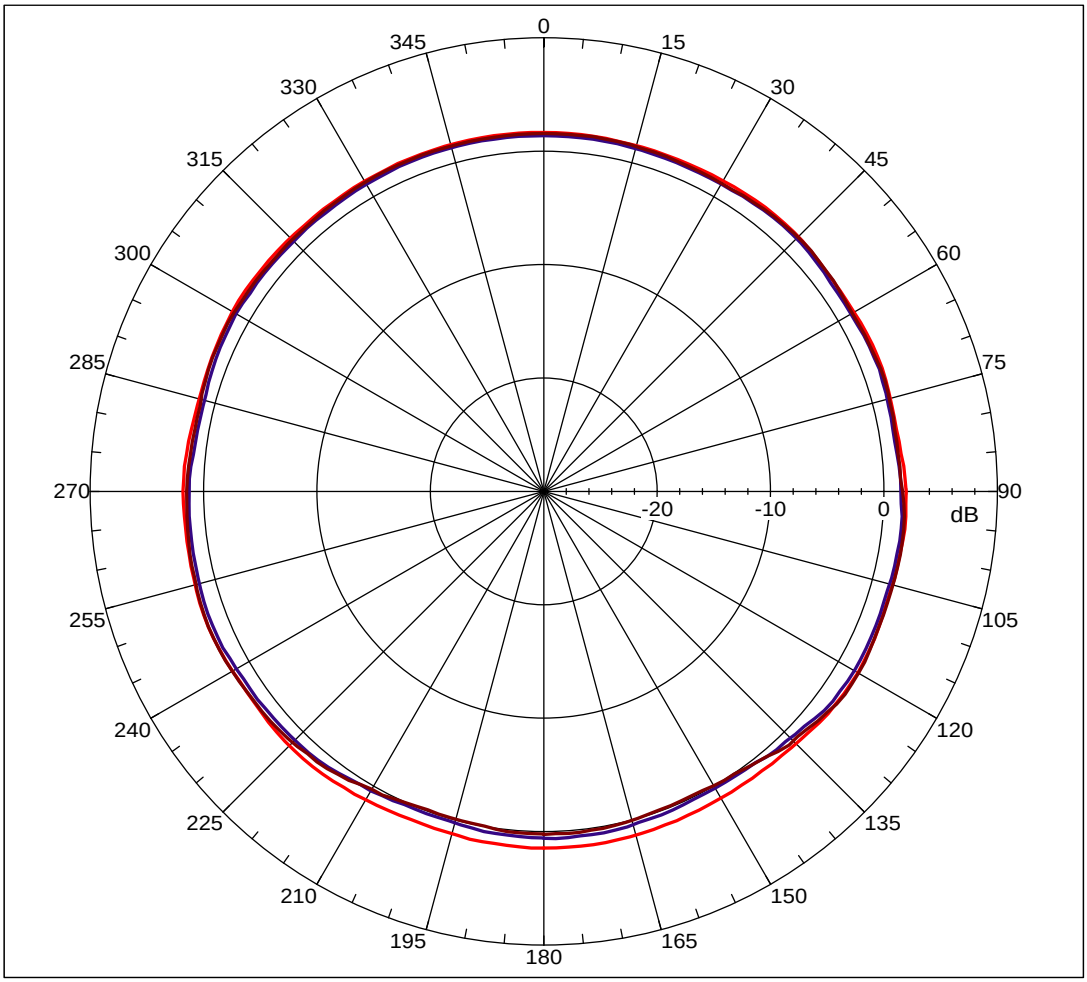
Far-field amplitude of C034-510506-A-H.nsi

2.400000 GHz 2.450000 GHz 2.500000 GHz

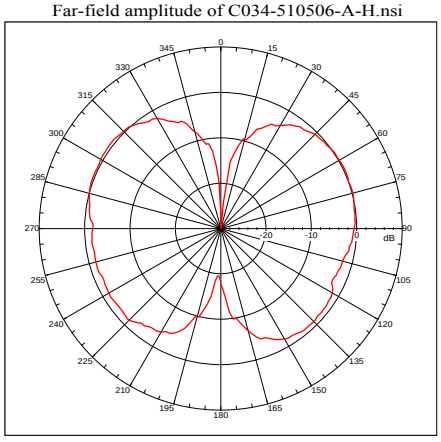


Far-field amplitude of C034-510506-A-V.nsi

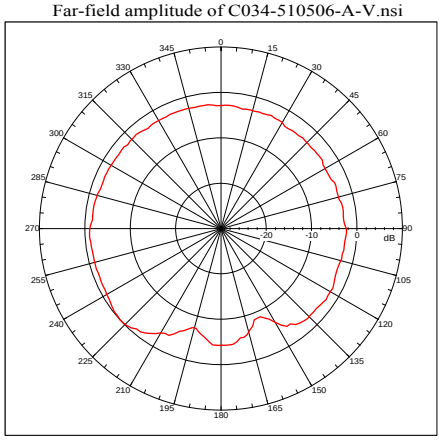
2.400000 GHz 2.450000 GHz 2.500000 GHz



Far-field amplitude of C034-510506-A-H.nsi

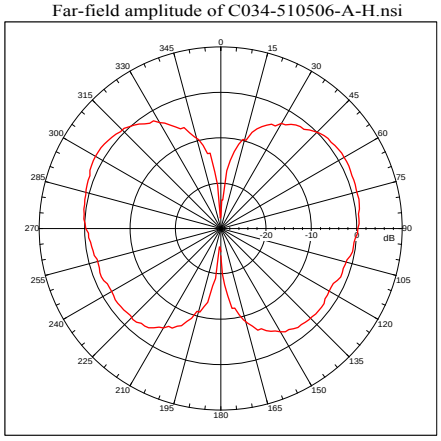


Far-field amplitude of C034-510506-A-V.nsi

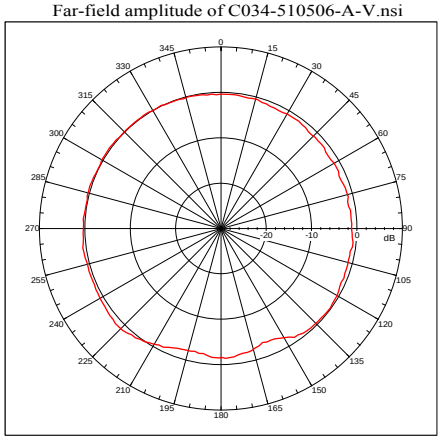


4.9GHz Gain = 0.64077 dBi 4.9GHz Gain = -0.02841 dBi

Far-field amplitude of C034-510506-A-H.nsi

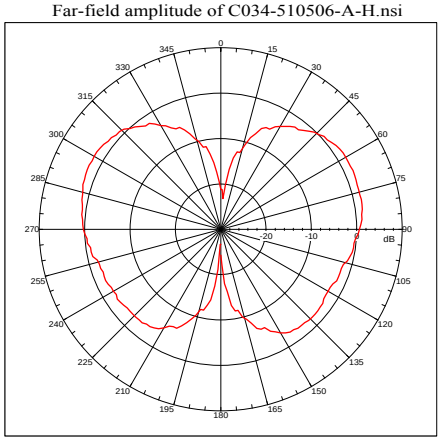


Far-field amplitude of C034-510506-A-V.nsi

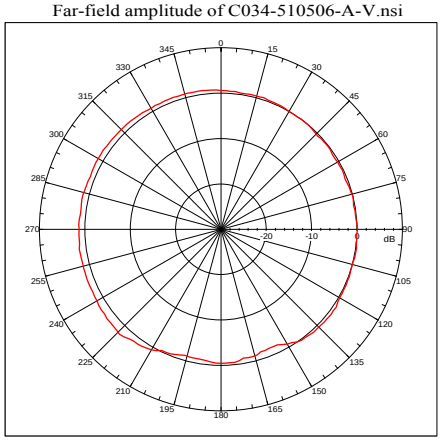


5.15GHz Gain = 1.84243 dBi 5.15GHz Gain = 1.29234 dBi

Far-field amplitude of C034-510506-A-H.nsi

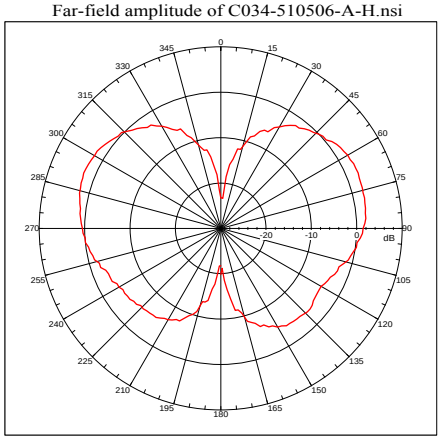


Far-field amplitude of C034-510506-A-V.nsi



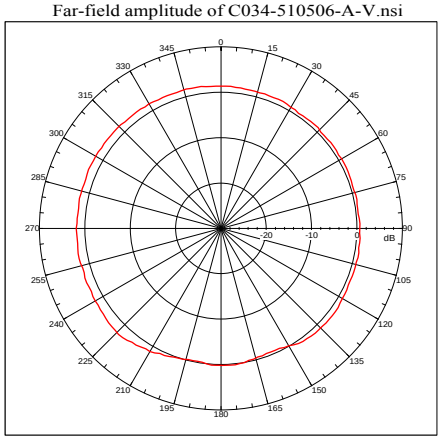
5.25GHz Gain = 2.24997 dBi 5.25GHz Gain = 2.16254 dBi

Far-field amplitude of C034-510506-A-H.nsi



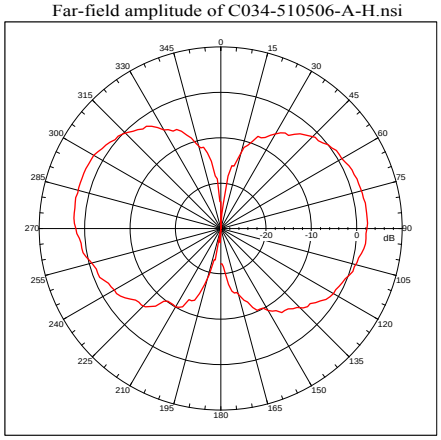
5.35GHz Gain = 2.63689 dBi

Far-field amplitude of C034-510506-A-V.nsi



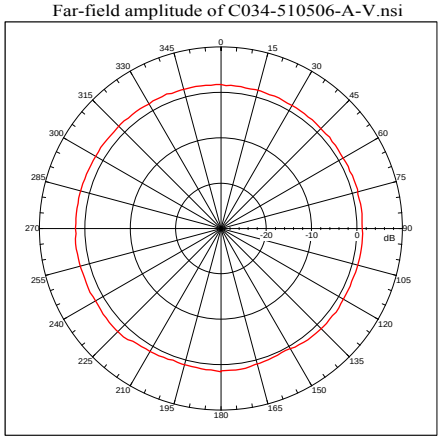
5.35GHz Gain = 2.47178 dBi

Far-field amplitude of C034-510506-A-H.nsi



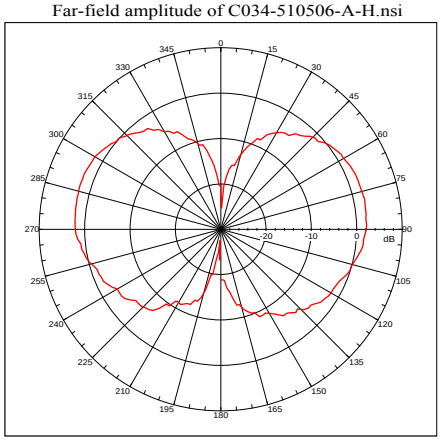
5.725GHz Gain = 2.65108 dBi

Far-field amplitude of C034-510506-A-V.nsi



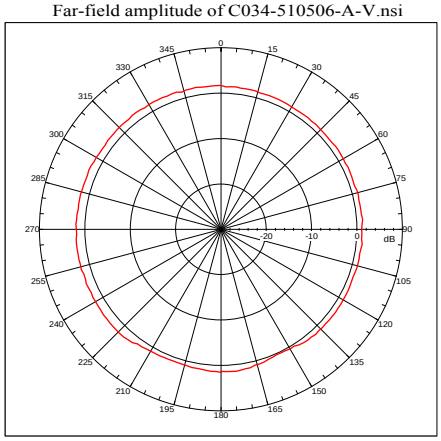
5.725GHz Gain = 2.20194 dBi

Far-field amplitude of C034-510506-A-H.nsi



5.825GHz Gain = 2.45406 dBi

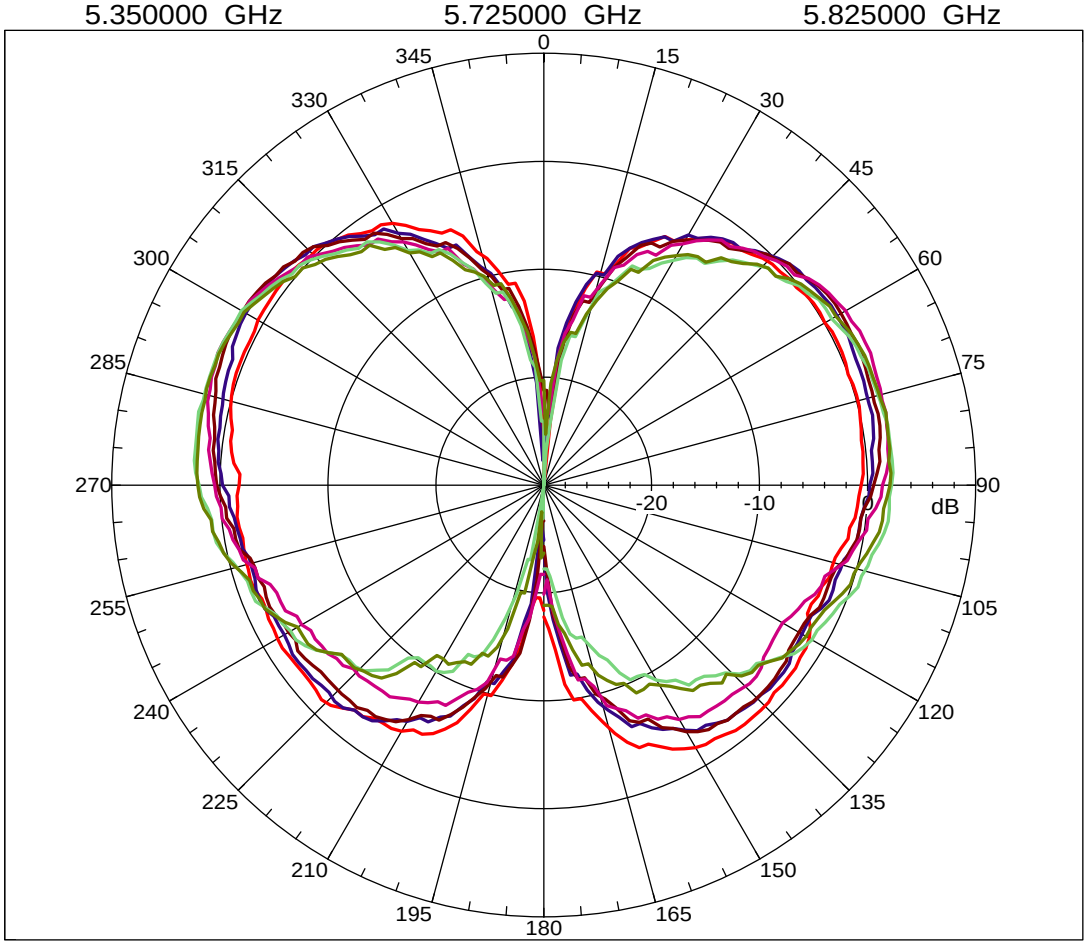
Far-field amplitude of C034-510506-A-V.nsi



5.825GHz Gain = 2.03634 dBi

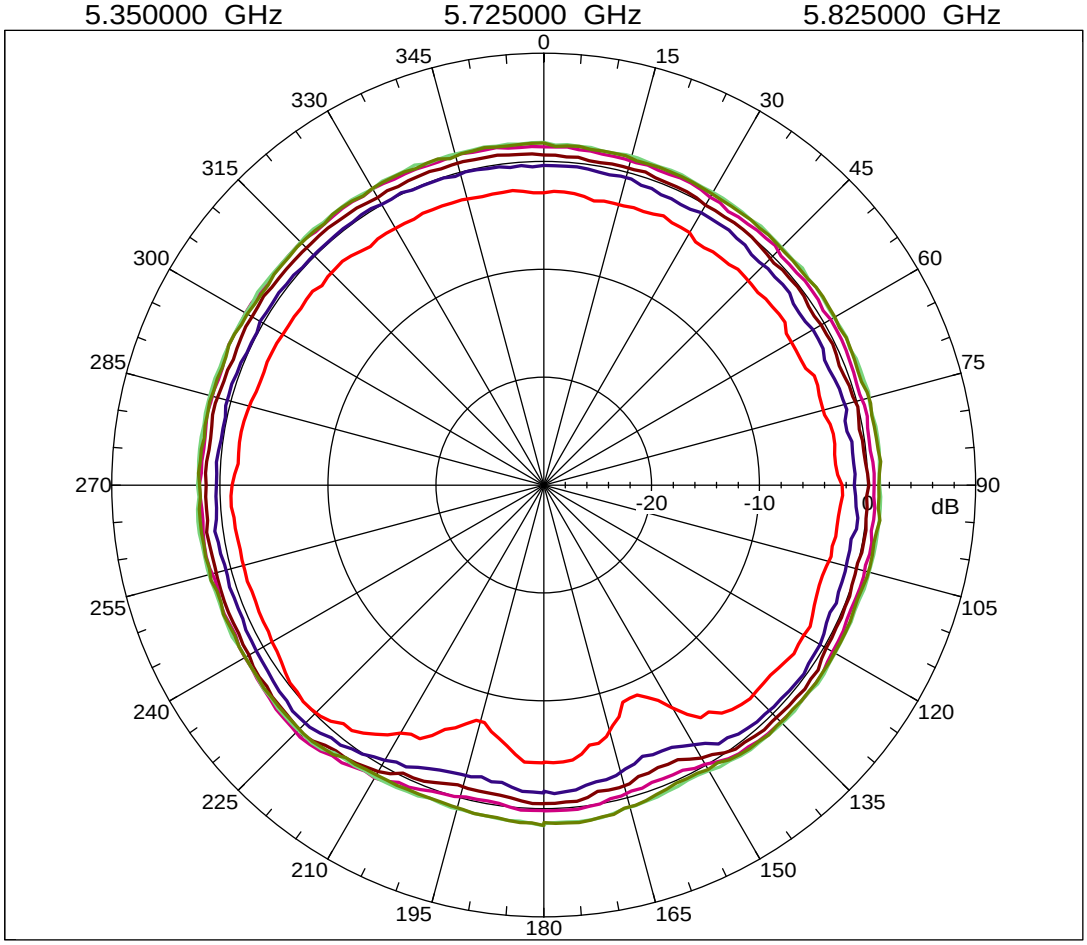
Far-field amplitude of C034-510506-A-H.nsi

4.900000 GHz
5.150000 GHz
5.250000 GHz
5.350000 GHz
5.725000 GHz
5.825000 GHz



Far-field amplitude of C034-510506-A-V.nsi

4.900000 GHz
5.150000 GHz
5.250000 GHz
5.350000 GHz
5.725000 GHz
5.825000 GHz



PRODUCT SPECIFICATION	ISSUED DATE	July.12, 2000	PAGE	1/2
	REVISION		REVISION NO.	

PRODUCT NAME : Coaxial Cable
RATING : -55℃~200℃
ITEM : RG 178 B/U

誠-漢

No.	Revised Date	Revised Details	Page	Report

REPORTED BY :

Q.C Engineer HOON LEE

APPROVED BY :

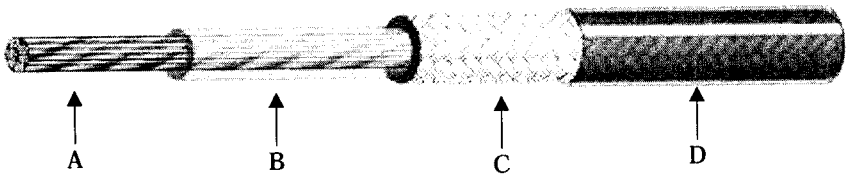
Q.C Manager SOON-MOK SHIN

PRODUCT SPECIFICATION	ISSUED DATE	July.12, 2000	PAGE	2/2
	REVISION		REVISION NO.	

1. APPLICATIONS

This specification is applies to Coaxial Cable manufactured by the YOUNG CHANG SILICONE CO.,LTD

2. STRUCTURE



A. Conductor: SCCS
B. Insulation : PFA
C. Shield : Silver-Plated Copper
D. Jacket : FEP

3. DIMENSION

Conductor (SCCS)			Insulation		Shield		Jacket	
Structure Q'ty/㎜ϕ	Cross sectional area ㎟(SQ)	Diameter ㎜ϕ	Material	Diameter ㎜ϕ	Material	Diameter ㎜ϕ	Material	Diameter ㎜ϕ
7/0.102	0.06	0.30	PFA	0.84±0.05	SPC	1.25	FEP	1.80±0.10

4. ELECTRIC PROPERTIES

Impedance	Capacitance	Maximum Attenuation (dB/100ft)				Dielectric Sterngth
ohms	pF/ft(Max)	100Mhz	400Mhz	1Ghz	3Ghz	V/1min
50 ± 2	32	16.0	33.0	52.0	94.0	2000

Arnitel **天線桿套材質特性表**

polyether esters
polyetherester
esters de polyether

Units Einheiten Unites	EM400	EM460	EL550	EL630	EL740	PL380
	1.12	1.16	1.20	1.23	1.27	1.18
℃	195	185	202	212	221	197
μm/m.k	220	160	180	140	110	150
℃	\	\	110	115	120	\
℃	130	150	180	200	200	145
℃	\	50	85	115	150	\
%	0.30	0.30	0.20	0.20	0.15	0.40
%	0.75	0.70	0.55	0.60	0.90	7.0
*	HB	HB	HB	HB	HB	HB
Mpa	55	110	220	375	900	60
Mpa	4.0	7.1	13.2	20.2	26.9	3.5
Mpa	5.4	9.0	15.7	23	22.6	5.2
Mpa	8.4	11.4	16.6	22.0	26.3	8.5
Mpa	17	21	32	40	45	16
%	700	800	600	600	360	450
kj/㎡	NB	NB	NB	NB	NB	NB
kj/㎡	NB	NB	NB	NB	200	NB
kj/㎡	NB	NB	NB	NB	9	NB
kj/㎡	NB	NB	20	4	4	NB
	38	45	55	63	74	38
MV/m	\	\	\	\	\	\
Ω.cm	$5*10^{14}$	10^{14}	10^{14}	10^{14}	10^{12}	10^{12}
Ω	$>10^{13}$	$>10^{14}$	$>10^{14}$	$>10^{14}$	$>10^{10}$	$>10^{13}$
\	4.1	\	\	3.8	\	4.7
\	4.0	4.4	4.0	3.4	3.3	4.4
$x10^{14}$	10	\	\	3.8	\	310
$x10^{14}$	170	350	400	350	300	350
\	800	800	600	600	600	800
\	600	600	600	800	800	600

2.2 Product coding

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

U M 55 1 - V

Thermoplastic elastomer type:
E = polyether ester; polyether = PTHF
P = polyether ester; polyether = PEO/PPO
U = polyester ester; (with extra urethane linkages)

Indication of viscosity range or processing technique
L, M = injection moulding and extrusion
B = blow moulding grade

Indication of hardness (Shore D)

Serial number

Indication of additives, perfomance
H = heat-stabilized
L = light/UV stabilized
V = flame-retardant (not V-0)
S = flame-retardant (V-0)

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**
Arnitel E		EM400	EM460	EL550 EM550	EL630 EM630	EL740 EM740
Arnitel P	PL380		PL460	PL580 PM581		
Arnitel U				UM551 UM551-V UM552 UM552-V	UM622	

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.

	A'tel E	**A'tel P**	**A'tel U**
Automotive			
• CVJ boots	EB460 EB463 EB464		
• Boyplugs		PL380-M0	
Extrusion			
• Roofing foil	EM402-L		

Table 2.3: *Examples of specialty grades*

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 stucture of Arnitel EL630/EM630 is shown below.

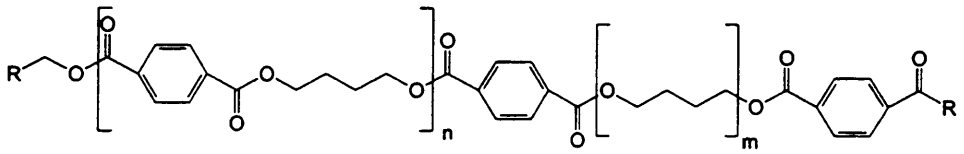


Figure 2.9: *Chemical structure of Arnitel EL630/EM630.*

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

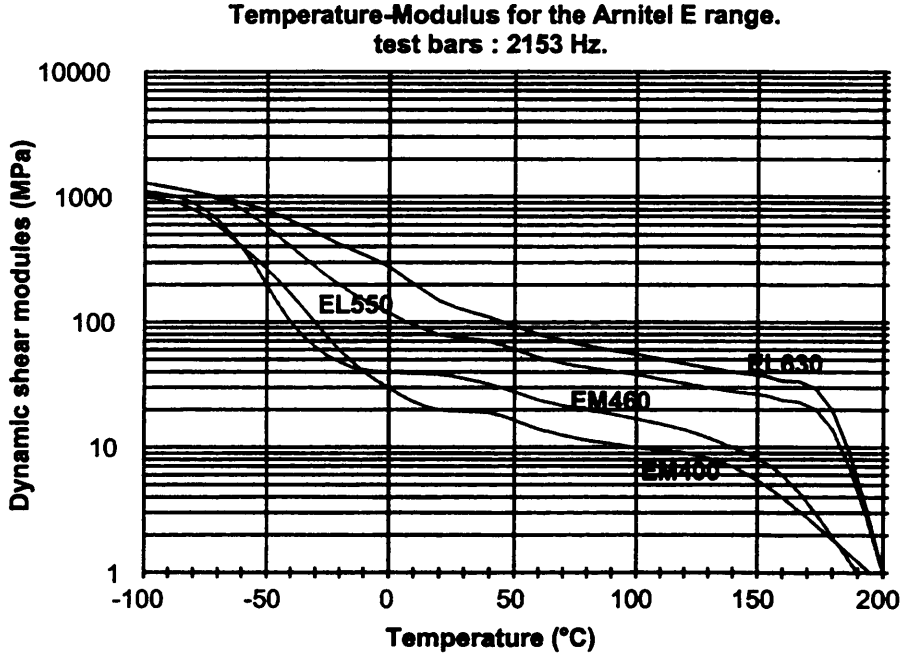
Figure 2.10: *Simplified structure of Arnitel EL630/EM630 .*

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.*

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.

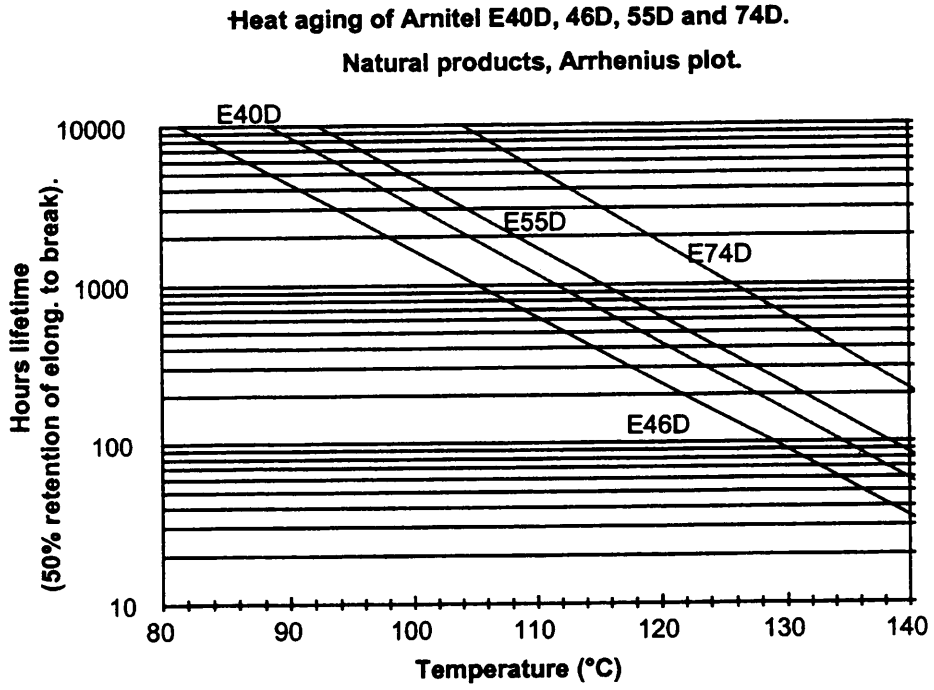
analysis	SI unit	typical data	test method
Vicat A	(°C)	200	ISO 306/A
Vicat B	(°C)	125	ISO 306/B
HDT-B	(°C)	115	ISO 75-1

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 $140*10^{-4}$ µm/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.



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 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.

- **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

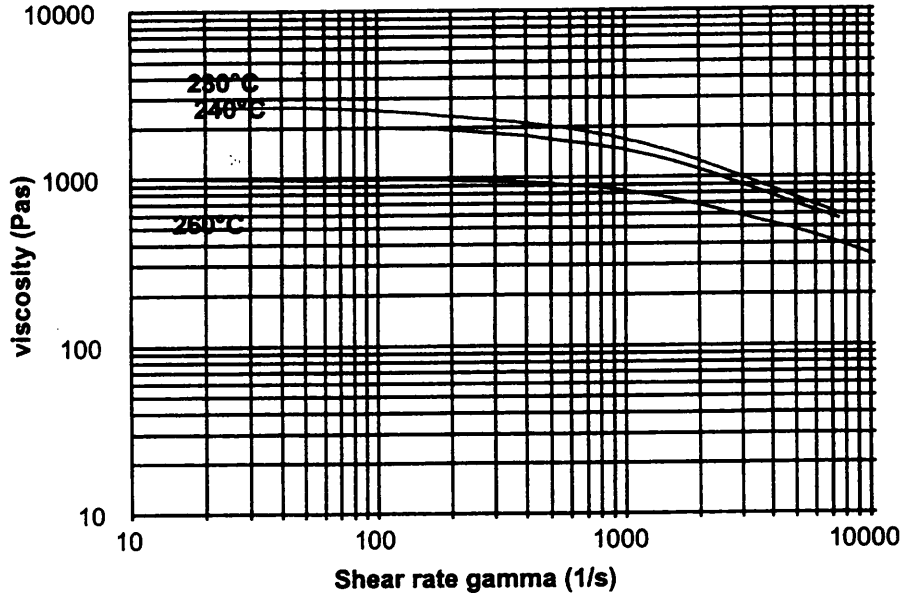
All temperatures are in °C.

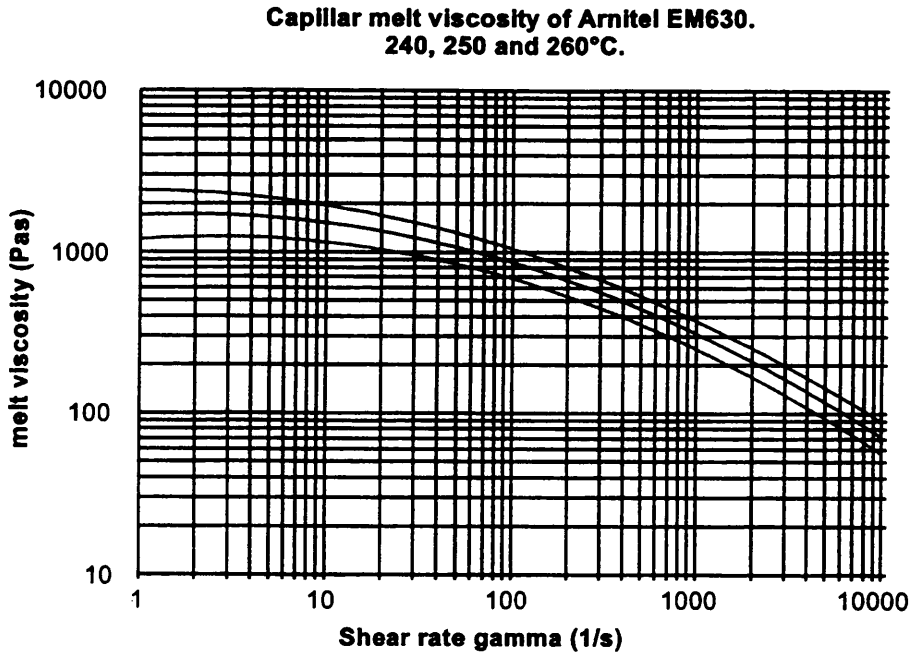
Table 2.30: *Processing conditions for Arnitel EL630 and Arnitel EM630.*

- **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.





Graph 2.80 and 2.81: *Temperature dependancy 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	typica 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^2	NB	NB	ISO 180/1A
Izod notched -30°C (-22°F)	KJ/m^2	4	4	ISO 180/1A
Charpy notched 23°C (73°F)	KJ/m^2	NB	NB	ISO 179/1eA
Charpy notched -30°C (-22°F)	KJ/m^2	12	12	ISO 179/1eA

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

Table 2.32: *mechanical properties of Arnitel® EL630.*

- **Abrasion:**

Arnitels show good abrasion resistance in both Taber and DIN 53516 abrasion tests. Data are shoen in the Arnitel general property overview (also included in the EPIC)

2.8.35 Flame retardancy:

Arnitel 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:

Arnitel EL630/EM630 can be used for cable jacketting 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	typica data*		test method
		EL630	EM630	
Dielectric strength	KV/mm	22	22	IEC 243-1
Relative permittivity (ε_r) at 1 kHz	-	4.4	4.4	IEC 250
Dissipation factor (tan δ) at 1kHz	-	0.019	0.019	IEC 250
Comparative tracking index	-	600	600	IEC 112
Volume resistivity	$10^{14}\Omega$.cm	1	1	IEC 93
Surface resistivity	$10^{14}\Omega$	1	1	IEC 93

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

2.8.37 Chemical resistance:

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

- **Hydrolysis**

Like all polyesters Arnitel are sensitive to moisture, however Arnitels are more stable to water then e.g. PET and PBT. graph 2.84 shows the hydrolytic stability of Arnitel 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.

台灣省台南縣仁德鄉三甲村 59-1 號 Tel: 886-6-266-3000, Fax: 886-6-266-7983/4

WONDERLITE® PC-110 代表物性：

June 9, 2004,v2.0

特性		試驗法	單位	試驗條件	PC-110
流動係數 Melt Flow Index		ASTM D1238	g/10min	300℃, 1.2 kg	10
比重 Specific Gravity		ASTM D792	-	23/23℃	1.20
吸水率 Water Absorption (immersion)		ASTM D570	%	24hr at 23℃	0.20
全光穿透率 Light Transmission		ASTM D1003	%	3 mm thick	89
濁度 Haze		ASTM D1003	%	3.2 mm thick	< 0.8
折射率 Refractive Index		ASTM D542	-	-	1.585
引張強度，降伏點 Tensile Strength at Yield		ASTM D638	Kg/cm^2	23℃	630
延伸率 Tensile Elongation	降伏點 Yield	ASTM D638	%	23℃	6
	破斷點 Break			23℃	110
彎曲強度 Flexural Strength		ASTM D790	Kg/cm^2	23℃	920
彎曲模數 Flexural Modulus		ASTM D790	Kg/cm^2	23℃	24000
Izod 缺口衝擊強度 Izod Impact Strength (Notched)		ASTM D256	Kg. cm/cm	1/4”	14.3
				1/8”	87
洛式硬度 Rockwell Hardness		ASTM D785	M Scale	-	M-77
壓縮強度 Compressive Strength		ASTM D695	Kg/cm^2	-	780
熱變形溫度，未退火 Heat Distortion Temperature (unannealed)		ASTM D648	℃	4.6 Kg/cm^2, 120℃/hr	136
				18.6 Kg/cm^2, 120℃/hr	125
軟化點 Vicat Softening Temperature		ASTM D1525	℃	1 Kg, 50℃/hr	153
線膨脹係數 Coefficient of Linear Expansion		ASTM D696	$x10^{-5}$ cm/cm/℃	40~100℃	6~8
熱傳導率 Thermal Conductivity		ASTM C177	W/m℃	-	0.2
成型收縮率 Mold Shrinkage		ASTM D955	%	流動方向 parallel	0.5-0.7
				垂直方向 across	0.5-0.7
燃燒率 Flammability		UL 94	1/16”	-	V-2
體積電阻率 Volume Resistivity		ASTM D257	$x10^{16}\Omega$・cm	-	3
介電常數 Dielectric Constant		ASTM D150	-	60 Hz	2.95
				10^6 Hz	2.9
介電損失 Dielectric Dissipation Factor (tan δ)		ASTM D150	-	60 Hz	0.0004
				10^6 Hz	0.009
絕緣破壞強度 Dielectric Breakdown Strength		ASTM D149	kV/mm	1.6mm	30
耐電弧性 Arc Resistance (Tungsten electrode)		ASTM D495	sec	-	110
產品特性 / 主要應用 Characteristics/Principal Applications					**中黏度 Medium Viscosity**

請注意：上表數據僅供參考用。

VALOX® 310SE0 Americas: COMMERCIAL

Unreinforced. UL94V-0/5VA rated. For electrical industry; bobbins, keyboard switches and switch components, and appliance housings.

Property

TYPICAL PROPERTIES (1)			
MECHANICAL	Value	Unit	Method
Tensile Stress, yld, Type I, 50 mm/min	59	MPa	ASTM D 638
Tensile Stress, brk, Type I, 50 mm/min	59	MPa	ASTM D 638
Tensile Strain, brk, Type I, 50 mm/min	80	%	ASTM D 638
Flexural Stress, yld, 1.3 mm/min, 50 mm span	101	MPa	ASTM D 790
Flexural Stress, brk, 1.3 mm/min, 50 mm span	101	MPa	ASTM D 790
Flexural Modulus, 1.3 mm/min, 50 mm span	2620	MPa	ASTM D 790
Hardness, Rockwell R	120	-	ASTM D 785
IMPACT	Value	Unit	Method
Izod Impact, unnotched, 23 ℃	1602	J/m	ASTM D 4812
Izod Impact, notched, 23 ℃	37	J/m	ASTM D 256
Gardner, 23 ℃	34	J	ASTM D 3029
Modified Gardner, 23 ℃	34	J	ASTM D 3029
THERMAL	Value	Unit	Method
HDT, 0.45 MPa, 6.4 mm, unannealed	163	℃	ASTM D 648
HDT, 1.82 MPa, 6.4 mm, unannealed	71	℃	ASTM D 648
CTE, -40 ℃ to 40 ℃, flow	7.92E-05	1/ ℃	ASTM E 831
CTE, 60 ℃ to 138 ℃, flow	1.31E-04	1/ ℃	ASTM E 831
Relative Temp Index, Elec	120	℃	UL 746B
Relative Temp Index, Mech w/impact	120	℃	UL 746B
Relative Temp Index, Mech w/o impact	140	℃	UL 746B
PHYSICAL	Value	Unit	Method
Specific Gravity	1.39	-	ASTM D 792
Specific Volume	0.72	cm^3/g	ASTM D 792
Water Absorption, 24 hours	0.08	%	ASTM D 570
Mold Shrinkage, flow, 0.75-2.3 mm	0.9 - 1.6	%	GE Method
Mold Shrinkage, flow, 2.3-4.6 mm	1.5 - 2.3	%	GE Method
Mold Shrinkage, xflow, 0.75-2.3 mm	1 - 1.7	%	GE Method
Mold Shrinkage, xflow, 2.3-4.6 mm	1.6 - 2.4	%	GE Method
ELECTRICAL	Value	Unit	Method
Volume Resistivity	>1.6E+16	Ohm-cm	ASTM D 257
Dielectric Strength, in air, 3.2 mm	18.4	kV/mm	ASTM D 149

Dielectric Strength, in oil, 1.6 mm	22	kV/mm	ASTM D 149
Relative Permittivity, 100 Hz	3.1	-	ASTM D 150
Relative Permittivity, 1 MHz	3.1	-	ASTM D 150
Dissipation Factor, 100 Hz	0.002	-	ASTM D 150
Dissipation Factor, 1 MHz	0.02	-	ASTM D 150
Arc Resistance, Tungsten {PLC}	6	PLC Code	ASTM D 495
Hot Wire Ignition {PLC)	2	PLC Code	UL 746A
High Voltage Arc Track Rate {PLC}	4	PLC Code	UL 746A
High Ampere Arc Ign, surface {PLC}	0	PLC Code	UL 746A
Comparative Tracking Index (UL) {PLC}	3	PLC Code	UL 746A
FLAME CHARACTERISTICS	Value	Unit	Method
UL Recognized, 94V-0 Flame Class Rating (3)	0.7	mm	UL 94
UL Recognized, 94-5VA Rating (3)	3	mm	UL 94
CSA (See File for complete listing)	LS88480	File No.	CSA LISTED

Source GMD, last updated:04/14/2003

Processing

Parameter		
Injection Molding	Value	Unit
Drying Temperature	120	℃
Drying Time	3 - 4	hrs
Drying Time (Cumulative)	12	hrs
Maximum Moisture Content	0.02	%
Melt Temperature	245 - 260	℃
Nozzle Temperature	240 - 255	℃
Front - Zone 3 Temperature	245 - 260	℃
Middle - Zone 2 Temperature	240 - 255	℃
Rear - Zone 1 Temperature	230 - 250	℃
Mold Temperature	50 - 75	℃
Back Pressure	0.3 - 0.7	MPa
Screw Speed	50 - 100	rpm
Shot to Cylinder Size	40 - 80	%
Vent Depth	0.013 - 0.025	mm

Source GMD, last updated:04/14/2003

THESE PROPERTY VALUES ARE NOT INTENDED FOR SPECIFICATION PURPOSES.

PLEASE CHECK WITH YOUR (LOCAL SALES OFFICE) FOR AVAILABILITY IN YOUR REGION

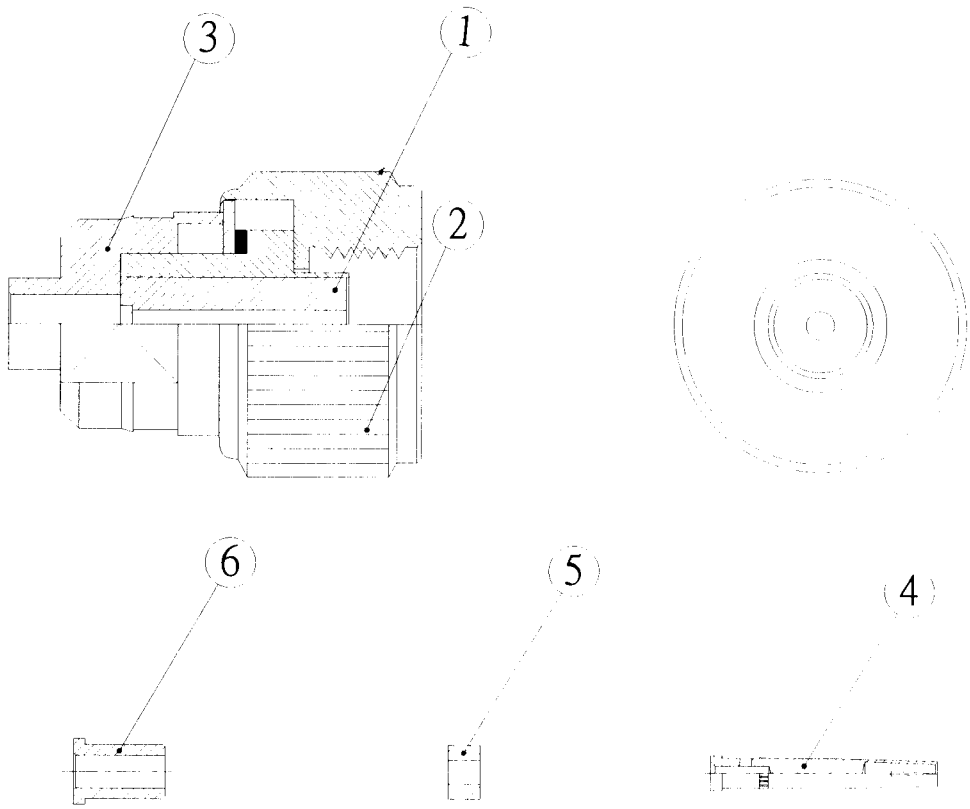
(1) Typical values only. Variations within normal tolerances are possible for various colors. All values are measured after at least 48 hours storage at 23 ℃/50% relative humidity. All properties, except the melt volume and melt flow rates, are measured on injection molded samples. All samples tested under ISO test standards are prepared according to ISO 294.
(2) Only typical data for selection purposes. Not to be used for part or tool design.

(3) This rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.
(4) Internal measurements according to UL standards.

譁裕實業股份有限公司
WHA YU INDUSTRIAL CO., LTD
Connector 材質證明書

譁裕料號 Whayu P/N	100-2001069-AZ	產品名稱 Product Name	Big SMA Plug Reverse Straight For RG-178

結構圖面



材質成份									表面處理
1	絕緣	Teflon	PTFE						N/A
2	外殼	Brass	Cu	Pb	Fe	Fe+Sn	Zn		電著
3	本體	Brass	Cu	Pb	Fe	Fe+Sn	Zn		鍍金(Gold Flash)
4	中心針	Phosphor Bronze	Cu	Sn	P	Zn	Pb		鍍金(5u")
5	絕緣	Teflon	PTFE						N/A
6	尾管	Brass	Cu	Pb	Fe	Fe+Sn	Zn		鍍鎳(80u")

Remark：

請蓋公司章

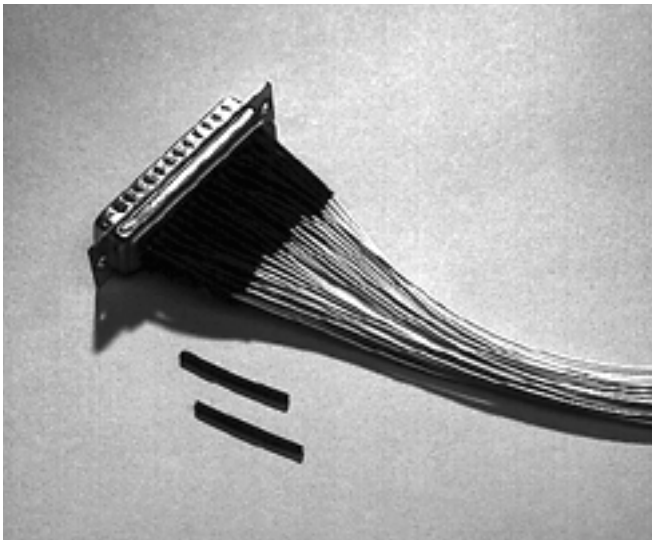
Fax-on-Demand: (800) 260-9099
(650) 361-6523

Before ordering check with factory for most current data.

FAX ID	Description
2240	Data sheet
2590	RW-3010

Versafit V4

Very-thin-wall, very flexible, highly flame-retardant polyolefin tubing



Applications

Typically used where space saving is important. Offers the ability to pack components more closely than is possible with standard tubings. Cost-effective choice for many commercial applications; electrically insulates and protects in-line components, disconnect terminals, and splices. Used for strain relief on high-density connectors.

Operating Temperature Range

–55°C to 125°C

Features/Benefits

- 2:1 shrink ratio.
- Very thin wall provides space savings and rapid shrinking.
- Low shrink temperature further reduces installation time and risk of damage to temperature-sensitive components.
- Very flexible; doesn't easily wrinkle when bent.
- Free of polybrominated biphenyls (PBBs) and polybrominated biphenyl oxides and ethers (PBBOs and PBBEs), which are classified as environmentally hazardous substances.

Installation

Minimum shrink temperature: 70°C
Minimum full recovery temperature: 90°C

Specifications/Approvals

Series	UL	CSA	Raychem
Versafit V4	E35586 VW-1 300 V, 125°C	LR31929 OFT 150 V, 125°C	RW-3010

Product Dimensions

	As supplied		After shrinkage	
Metric sizes	Inside Diameter	Wall thickness (nominal)	Inside diameter (max.)	Wall thickness* (min.)
1.0/0.5	1.4 ±0.25	0.1	0.5	0.25
1.5/0.75	1.9 ±0.25	0.1	0.75	0.25
2.0/1.0	2.3 ±0.25	0.1	1.0	0.25
2.5/1.25	2.8 ±0.25	0.15	1.25	0.25
3.0/1.5	3.3 ±0.25	0.15	1.5	0.25
3.5/1.75	3.8 ±0.25	0.15	1.75	0.25
4.0/2.0	4.4 ±0.25	0.15	2.0	0.25
Inch sizes (mm/*in*)				
3/64	1.2 *(.046)*	0.6 *(.023)*	.30 ±.05 *(.012 ±.002)*	
1/16	1.6 *(.063)*	0.8 *(.031)*	.30 ±.05 *(.012 ±.002)*	
3/32	2.4 *(.093)*	1.2 *(.046)*	.30 ±.05 *(.012 ±.002)*	
1/8	3.2 *(.125)*	1.6 *(.062)*	.33 ±.05 *(.013 ±.002)*	
3/16	4.8 *(.187)*	2.4 *(.093)*	.33 ±.05 *(.013 ±.002)*	

	As supplied		After shrinkage	
Size	Inside diameter	Wall thickness	Inside diameter (max.)	Wall thickness* (min.)
5.0/2.5	5.5 ±0.25	0.15	2.5	0.25
6.0/3.0	6.5 ±0.4	0.15	3.0	0.28
7.0/3.5	7.5 ±0.4	0.15	3.5	0.28
8.0/4.0	8.5 ±0.4	0.15	4.0	0.28
9.0/4.5	9.5 ±0.4	0.15	4.5	0.28
10.0/5.0	10.5 ±0.5	0.15	5.0	0.28
1/4	6.4 *(.250)*	3.2 *(.125)*	.36 ±.05 *(.014 ±.002)*	
3/8	9.5 *(.375)*	4.8 *(.187)*	.36 ±.05 *(.014 ±.002)*	
1/2	12.7 *(.500)*	6.4 *(.250)*	.36 ±.05 *(.014 ±.002)*	
3/4	19.1 *(.750)*	9.5 *(.375)*	.46 ±.08 *(.017 ±.003)*	
1	25.4 *(1.000)*	12.7 *(.500)*	.51 ±.08 *(.020 ±.003)*	

*Wall thickness will be less if tubing recovery is restricted during shrinkage.

Ordering Information

Color	Standard	Black (-0)
	Nonstandard	Other colors available upon request.
Size selection	Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request.	
Standard packaging	On spools.	
Marking	Marked with UL/CSA/-F- legends.	
Ordering description	Specify product name, size, and color (for example, Versafit V4-1.0-0).	

SGS Test Report

Product：RF Antenna

Contents

No	Description		Report No.	Page
1	Cable	RG-178 Cable	F690501/LF-CTS500034 F690501/LF-CTS500035 F690501/LF-CTSGP06-0418 F690501/LF-CTSGP05-5552	P.27~36
2	Antenna Body	TPE EL-630	CE/2005/B4713	P.37~41
3	Antenna Base	PC-110	KE/2005/41718	P.42
4	Antenna Base	PBT	GZSCR050533447/LP	P.43
5	Rivet	POM ; Black	CE/2005/50700	P.44~47
6	Connector	SMA Plug Reverse	SH517723/CHEM GZML05115712 GZSCR050421403/LP SZTYR050410520/LP SZTYR050410518/LP	P.48~60
7	H.S Tube	Heat Shrink Tube	SH519043-1/CHEM	P.61~70
8	Ground Tube	Tin Plated + POM	CE/2005/96122 CE/2005/96121 CE/2005/96111	P.71~78

Result for RoHS：PASS

SGS

Test Report No. F690501/LF-CTS500034

Date: September 22, 2005 Page 1 of 2

To: **DO SOL CO., LTD**
1256-7
Jungwang-dong
Shiheung-city,
KYUNGGI-DO 429-450
Korea

The following merchandise was submitted and identified by the client as :

Commodity	:	Please refer to the next page.
SGS File No.	:	GP05-0026
Received Date	:	September 14, 2005
Test Performing Date	:	September 15, 2005
Test Performed	:	SGS Testing Korea tested the sample(s) selected by applicant with following results
Test Results	:	For further details, please refer to following page(s)

SGS Testing Korea Co. Ltd.

Jeff Jang / Technical Mgr

Jason Han / Lab Director

SGS

Test Report No. F690501/LF-CTS500034

Date: September 22, 2005 Page 2 of 2

Sample No. : GP05-0026.003
Sample Description : AgCu Wire
Style/Item No. :
Comments : Materials: METAL

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium(Cd)	mg/kg	USEPA 3050B, ICP-AES	0.5	N.D.
Lead (Pb)	mg/kg	USEPA 3050B, ICP-AES	5	N.D.
Mecury (Hg)	mg/kg	USEPA 3502, ICP-AES	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	USEPA 3060 , UV-vis	1	N.D.

*** End ***

NOTE: N.D. = Not detected.(<MDL)
ppm = mg/kg
MDL = Method Detection Limit
"-" = No Regulation
** = Qualitative analysis (No Unit)
Negatvie = Undetectable / Positive = Detectable

SGS Testing Korea Co., Ltd
18-34, Sanbon-dong, Gunpo, Gyeonggi-do, Korea 435-040 t +82 (0)31 428 5777 f +82 (0)31 427 2374 www.sgslab.co.kr
1002-2, Hwasan-ri, Onsan-eub, Ulju-gun, Ulsan, Korea 689-890 t +82 (0)52 239 0906~10 f +82 (0)52 239 0913
Member of SGS Group (Société Générale de Surveillance)

SGS

Test Report No. F690501/LF-CTS500035

Date: September 22, 2005 Page 1 of 2

To: **DO SOL CO., LTD**
1256-7
Jungwang-dong
Shiheung-city,
KYUNGGI-DO 429-450
Korea

The following merchandise was submitted and identified by the client as :

Commodity	:	Please refer to the next page.
SGS File No.	:	GP05-0026
Received Date	:	September 14, 2005
Test Performing Date	:	September 15, 2005
Test Performed	:	SGS Testing Korea tested the sample(s) selected by applicant with following results
Test Results	:	For further details, please refer to following page(s)

SGS Testing Korea Co. Ltd.

Jeff Jang / Technical Mgr

Jason Han / Lab Director

SGS

Test Report No. F690501/LF-CTS500035

Date: September 22, 2005 Page 2 of 2

Sample No. : GP05-0026.004
Sample Description : AgCp40% Wire
Style/Item No. :
Comments : Materials: METAL

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium(Cd)	mg/kg	USEPA 3050B, ICP-AES	0.5	N.D.
Lead (Pb)	mg/kg	USEPA 3050B, ICP-AES	5	N.D.
Mecury (Hg)	mg/kg	USEPA 3502, ICP-AES	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	USEPA 3060 , UV-vis	1	N.D.

*** End ***

NOTE: N.D. = Not detected.(<MDL)
ppm = mg/kg
MDL = Method Detection Limit
"-" = No Regulation
** = Qualitative analysis (No Unit)
Negatvie = Undetectable / Positive = Detectable

18-34, Sanbon-dong, Gunpo, Gyeonggi-do, Korea 435-040 t +82 (0)31 428 5777 f +82 (0)31 427 2374 www.sgslab.co.kr
1002-2, Hwasan-ri, Onsan-eub, Ulju-gun, Ulsan, Korea 689-890 t +82 (0)52 239 6908-10 f +82 (0)52 239 6913

Test Report No. F690501/LF-CTSGP06-0418

Date: January 11, 2006

To: **BOGO CHEMICAL CORPORATION**
123-4
Samsung-dong
Gangnam-gu
SEOUL
Korea

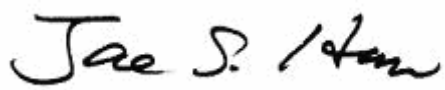
The following merchandise was submitted and identified by the client as :

Commodity	:	AP-210 (DAIKIN)
SGS File No.	:	GP06-0418
Received Date	:	January 06, 2006
Test Performing Date	:	January 09, 2006
Test Performed	:	SGS Testing Korea tested the sample(s) selected by applicant with following results
Test Results	:	For further details, please refer to following page(s)

SGS Testing Korea Co. Ltd.

Brendan Lee
Monet Jeong
Jully Oh
Jerry Jung
/Testing Person

Jeff Jang / Technical Mgr



Jason Han / Lab Director

Sample No. : GP06-0418.001

Sample Description : AP-210 (DAIKIN)

Style/Item No. : N/A

Comments : Material is PFA RESIN

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium(Cd)	mg/kg	US EPA 3050B(1996), US EPA 6010B(1996)	0.5	N.D.
Lead (Pb)	mg/kg	US EPA 3050B(1996), US EPA 6010B(1996)	5	N.D.
Mercury (Hg)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996)	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	US EPA 3060A(1996), US EPA 7196A(1992)	1	N.D.

Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Dibromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tribromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tetrabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Heptabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Hexabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Pentabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Octabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Nonabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Decabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Monobromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Dibromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tribromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tetrabromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Heptabromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Hexabromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Pentabromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Octabromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Nonabromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Decabromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	6.10

NOTE: N.D. = Not detected.(<MDL)
ppm = mg/kg
MDL = Method Detection Limit
"-" = No Regulation
** = Qualitative analysis (No Unit)
Negative = Undetectable / Positive = Detectable

Picture of Sample as Received:

*** End ***

NOTE: N.D. = Not detected.(<MDL)
ppm = mg/kg
MDL = Method Detection Limit
"-" = No Regulation
** = Qualitative analysis (No Unit)
Negative = Undetectable / Positive = Detectable

Test Report No. F690501/LF-CTSGP05-5552

Date: January 04, 2006

To: **BOGO CHEMICAL CORPORATION**
123-4
Samsung-dong
Gangnam-gu
SEOUL
Korea

The following merchandise was submitted and identified by the client as :

Commodity	:	NP-21 (DAIKIN)
SGS File No.	:	GP05-5552
Received Date	:	January 02, 2006
Test Performing Date	:	January 03, 2006
Test Performed	:	SGS Testing Korea tested the sample(s) selected by applicant with following results
Test Results	:	For further details, please refer to following page(s)

SGS Testing Korea Co. Ltd.

Jeff Jang / Technical Mgr

Jason Han / Lab Director

Sample No. : GP05-5552.001

Sample Description : NP-21 (DAIKIN)

Style/Item No. : N/A

Comments : Material is FEP Resin.

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium(Cd)	mg/kg	EN 1122(2001), US EPA 6010B(1996)	0.5	N.D.
Lead (Pb)	mg/kg	US EPA 3050B(1996), US EPA 6010B(1996)	5	N.D.
Mercury (Hg)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996)	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	US EPA 3060A(1996), US EPA 7196A(1992)	1	N.D.

Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Dibromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tribromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tetrabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Heptabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Hexabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Pentabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Octabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Nonabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Decabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Monobromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Dibromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tribromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tetrabromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Heptabromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Hexabromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Pentabromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Octabromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Nonabromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Decabromobiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.

NOTE: N.D. = Not detected.(<MDL)
ppm = mg/kg
MDL = Method Detection Limit
"-" = No Regulation
** = Qualitative analysis (No Unit)
Negative = Undetectable / Positive = Detectable

Picture of Sample as Received:

*** End ***

NOTE: N.D. = Not detected.(<MDL)
ppm = mg/kg
MDL = Method Detection Limit
"-" = No Regulation
** = Qualitative analysis (No Unit)
Negative = Undetectable / Positive = Detectable

Test Report

DSM ENGINEERING PLASTICS

Report No. : CE/2005/B4713
Date : 2005/11/28

The following merchandise was (were) submitted and identified by the client as :

Type of Product	:	ARNITEL TPE-E EL630 NATURAL
Buyer/Order No	:	SONY
Sample Received	:	2005/11/21
Testing Date	:	2005/11/21 TO 2005/11/28

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Test Result : - Please see the next page -

Daniel Yeh, M.R. / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.

Test Report

DSM ENGINEERING PLASTICS

Report No. : CE/2005/B4713
Date : 2005/11/28

Test Result

PART NAME NO.1 : WHITE PLASTIC PELLETS

Test Item (s):	Unit	Method	MDL	Result No.1
Monobromobiphenyl	%	With reference to USEPA3540C or USEPA3550C. Analysis was performed by HPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS), 83/264/EEC, and 76/769/EEC)	0.0005	N.D.
Dibromobiphenyl	%		0.0005	N.D.
Tribromobiphenyl	%		0.0005	N.D.
Tetrabromobiphenyl	%		0.0005	N.D.
Pentabromobiphenyl	%		0.0005	N.D.
Hexabromobiphenyl	%		0.0005	N.D.
Heptabromobiphenyl	%		0.0005	N.D.
Octabromobiphenyl	%		0.0005	N.D.
Nonabromobiphenyl	%		0.0005	N.D.
Decabromobiphenyl	%		0.0005	N.D.
Total PBBs (Polybrominated biphenyls)/Sum of above	%		-	N.D.
Monobromobiphenyl ether	%	With reference to USEPA3540C or USEPA3550C. Analysis was performed by HPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS), 83/264/EEC, and 76/769/EEC)	0.0005	N.D.
Dibromobiphenyl ether	%		0.0005	N.D.
Tribromobiphenyl ether	%		0.0005	N.D.
Tetrabromobiphenyl ether	%		0.0005	N.D.
Pentabromobiphenyl ether	%		0.0005	N.D.
Hexabromobiphenyl ether	%		0.0005	N.D.
Heptabromobiphenyl ether	%		0.0005	N.D.
Octabromobiphenyl ether	%		0.0005	N.D.
Nonabromobiphenyl ether	%		0.0005	N.D.
Decabromobiphenyl ether	%		0.0005	N.D.
Total PBBEs(PBDEs) (Polybrominated biphenyl ethers)/Sum of above	%		-	N.D.
Total of Mono to Nona-brominated biphenyl ether. (Note 4)	%		-	N.D.

Test Report

DSM ENGINEERING PLASTICS

Report No. : CE/2005/B4713
Date : 2005/11/28

Test Item (s):	Unit	Method	MDL	Result
				No.1
Chromium VI (Cr+6)	ppm	UV-VIS after reference to US EPA 3060A.	2	N.D.
Cadmium (Cd)	ppm	ICP-AES after reference to US EPA 3052 or other acid digestion.	2	N.D.
Mercury (Hg)	ppm	ICP-AES after reference to US EPA 3052 or other acid digestion.	2	N.D.
Lead (Pb)	ppm	ICP-AES after reference to US EPA 3052 or other acid digestion.	2	N.D.

NOTE: (1) N.D. = Not detected (<MDL)
(2) ppm = mg/kg
(3) MDL = Method Detection Limit
(4) Decabromodiphenyl ether (DecaBDE) in polymeric applications is exempted by Commission Decision of 13 Oct 2005 amending Directive 2002/95/EC notified under document 2005/717/EC.
(5) PBBEs=PBDEs=Polybrominated Diphenyl Ethers=PBDOs=PBBOs.
(6) " - " = Not Regulation

Test Report

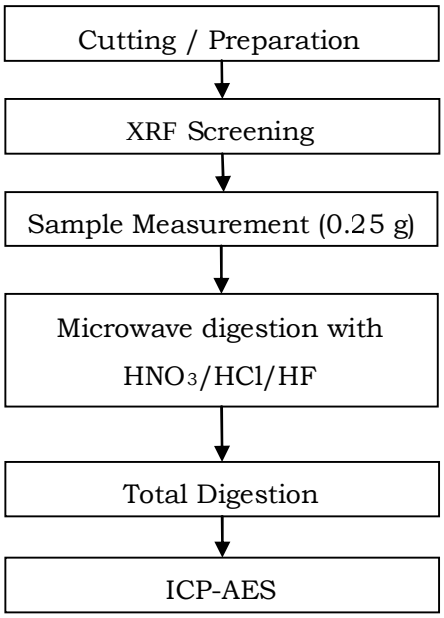
DSM ENGINEERING PLASTICS

Report No. : CE/2005/B4713
Date : 2005/11/28

Per requirements of SONY QAR-05-002:

1) These samples were dissolved totally by pre-conditioning method according to below flow chart.
2) Name of the person who made measurement: Anren Lee
3) Name of the person in charge of measurement: Daniel Yeh

Flow Chart of Digestion for Plastic –EPA3052 for Pb、Cd (without residue)



Test Report

DSM ENGINEERING PLASTICS

Report No. : CE/2005/B4713
Date : 2005/11/28

SGS

Chemical Laboratory - Kao.,SGS Taiwan Ltd.

TEST REPORT

REPORT NO.KE/2005/41718
DATE: 2005/4/29
PAGE: 1 OF 1

THE FOLLOWING MERCHANDISE WAS(WERE) SUBMITTED AND IDENTIFIED BY THE CLIENT AS :

CLIENT	:	CHI MEI CORPORATION..
PRODUCT DESCRIPTION	:	POLYCARBONATE(AS ATTACHED SAMPLE CARD).
COLOR	:	NATURAL.
STYLE/ITEM NO.	:	WONDERLITE® PC-110.
TESTING DATE	:	2005/04/25 TO 2005/4/29
SAMPLE RECEIVED	:	2005/04/25.

==========

WE HAVE TESTED THE SAMPLE(S) SUBMITTED AS REQUESTED AND THE FOLLOWING RESULTS WERE OBTAINED.

TEST ITEM(S)	UNIT	METHOD	DET.LMT	RESULT
CADMIUM	ppm	ANALYSIS BY ICP-AES WITH ADVANCE TREATMENT EN1122, METHOD B:2001	2	n.d.
CHROMIUM VI	ppm	ANALYSIS BY US EPA 7196A WITH ADVANCE TREATMENT US EPA 3060A	2	n.d.
MERCURY	ppm	ANALYSIS BY ICP-AES WITH ADVANCE TREATMENT US EPA 3052	2	n.d.
LEAD	ppm	ANALYSIS BY ICP-AES WITH ADVANCE TREATMENT US EPA 3050B	2	n.d.
PBBs	%	WITH REFERENCE TO 83/264/EEC. ANALYSIS WAS PERFORMED BY GC/ECD/MS OR HPLC/DAD/MS	0.0005	n.d.
PBDEs	%	WITH REFERENCE TO 83/264/EEC. ANALYSIS WAS PERFORMED BY GC/ECD/MS OR HPLC/DAD/MS	0.0005	n.d.

NOTE : n.d. = not detected.

<END>

品翔電子公司 開發部 2005 6. 30. 東莞廠 發行 PIN SHINE CO., LIMITED

George Huang / Supervisor
Sign for and on behalf of
SGS Taiwan Limited

SGS Taiwan Limited | No. 208, Chung Hwa 2nd Road, San Ming District, Kaohsiung, Taiwan
t (886-7) 323-0920 f (886-7) 315-7484 www.sgs.com.tw
Member of the SGS Group (Société Générale de Surveillance)

SGS

Test Report

No.: GZSCR050533447/LP Date: JUN 03, 2005

TAIHWA ELECTRONIC FACTORY
PAKHO DISTRICT,
HOU STREET TOWN, DONGGUAN CITY

Report on the submitted sample said to be TNC 下固定座 (BLACK PBT 310-SEO 5/25 05 进料)

SGS Ref No.	: SZ050509298EC-10.3
Buyer	: SONY
Manufacturer / Supplier	: 品翔
Item / Style / Ref. No.	: 100-3001372-AZ
Sample Receiving Date	: MAY 27, 2005
Testing Period	: MAY 27, 2005 TO JUN 02, 2005

Test Requested : As specified by client, to determine the Lead & Cadmium content in the submitted sample.

Test method : Cadmium content : With reference to BS EN 1122:2001 Method B see flowchart (1).
Lead content : Ashing after wet decomposition see flowchart (2).
Analysis was performed by Atomic Absorption Spectrometer.

Results :

	Black plastic part
Lead Content (Pb)(ppm)	27
Cadmium Content (Cd)	N.D.

Note : - N.D. = Not Detected (< 2 ppm)
- ppm = mg/kg

*** End of Report ***

Signed for and on behalf of
SGS-CSTC Ltd.

He Xiaoyan, Jane
Tech. Manager

GZCM 268837

SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch-Chemical Laboratory.
4/F.,Block 8,Yu Jing Industrial Park,Ling Shan Road,Zhu Cun Dong Pu Area,Tianhe District,Guangzhou China 510660 t(86-20)82169300 f(86-20)82169558 www.sgscstc.com
中国·广州·天河区东圃珠村灵山路裕景工业园八栋四楼 邮编:510660 t(86-20)82169300 f(86-20)82169558 e sgs-china@sgs.com

Test Report

REN-YUH ENTERPEISE CO., LTD.
NO. 3, LANE 36, DONG-SHUN ST., SHE-LIN, TAIPEI,
TAIWAN, R. O. C.

Report No. : CE/2005/50700
Date : 2005/05/12
Page : 1 of 4

The following merchandise was (were) submitted and identified by the client as :

Type of Product	:	BLACK POM
Sample Received	:	2005/5/5
Testing Date	:	2005/5/5 TO 2005/05/12

==========

Test Result : - Please see the next page -

Daniel Yeh, M.R. / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.

Test Report

REN-YUH ENTERPEISE CO., LTD.
NO. 3, LANE 36, DONG-SHUN ST., SHE-LIN, TAIPEI, TAIWAN, R. O. C.

Report No. : CE/2005/50700
Date : 2005/05/12

Test Result

PART NAME NO.1 : BLACK PLASTIC PELLETS (PLEASE REFER TO THE PHOTO ATTACHED)

Test Item (s):	Unit	Method	MDL	Result
				No.1
Monobromobiphenyl	%	With reference to USEPA3540C or USEPA3550C. Analysis was performed by HPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS), 83/264/EEC, and 76/769/EEC)	0.0005	N.D.
Dibromobiphenyl	%		0.0005	N.D.
Tribromobiphenyl	%		0.0005	N.D.
Tetrabromobiphenyl	%		0.0005	N.D.
Pentabromobiphenyl	%		0.0005	N.D.
Hexabromobiphenyl	%		0.0005	N.D.
Heptabromobiphenyl	%		0.0005	N.D.
Octabromobiphenyl	%		0.0005	N.D.
Nonabromobiphenyl	%		0.0005	N.D.
Decabromobiphenyl	%		0.0005	N.D.
Total PBBs (Polybrominated biphenyls)/Sum of above	%		-	N.D.
Monobromobiphenyl ether	%	With reference to USEPA3540C or USEPA3550C. Analysis was performed by HPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS), 83/264/EEC, and 76/769/EEC)	0.0005	N.D.
Dibromobiphenyl ether	%		0.0005	N.D.
Tribromobiphenyl ether	%		0.0005	N.D.
Tetrabromobiphenyl ether	%		0.0005	N.D.
Pentabromobiphenyl ether	%		0.0005	N.D.
Hexabromobiphenyl ether	%		0.0005	N.D.
Heptabromobiphenyl ether	%		0.0005	N.D.
Octabromobiphenyl ether	%		0.0005	N.D.
Nonabromobiphenyl ether	%		0.0005	N.D.
Decabromobiphenyl ether	%		0.0005	N.D.
Total PBBEs (PBDEs)(Polybrominated biphenyl ethers)/Sum of above	%		-	N.D.

Test Report

REN-YUH ENTERPEISE CO., LTD.
NO. 3, LANE 36, DONG-SHUN ST., SHE-LIN, TAIPEI, TAIWAN, R. O. C.

Report No. : CE/2005/50700
Date : 2005/05/12

Test Item (s):	Unit	Method	MDL	Result
				No.1
Chromium VI (Cr+6)	ppm	UV-VIS after reference to US EPA 3060A.	2	N.D.
Cadmium (Cd)	ppm	ICP-AES after reference to EN 1122, method B:2001 or other acid digestion.	2	N.D.
Mercury (Hg)	ppm	ICP-AES after reference to US EPA 3052 or other acid digestion.	2	N.D.
Lead (Pb)	ppm	ICP-AES after reference to US EPA 3050B or other acid digestion.	2	N.D.

NOTE : (1) N.D. = Not detected (<MDL)
(2) ppm = mg/kg
(3) MDL = Method Detection Limit
(4) " - " = No Regulation

Test Report

REN-YUH ENTERPEISE CO., LTD.
NO. 3, LANE 36, DONG-SHUN ST., SHE-LIN, TAIPEI, TAIWAN, R. O. C.

Report No. : CE/2005/50700
Date : 2005/05/12

Test Report

No. SH517723/CHEM Date: 4.14.2005

FLUOTECH INDUSTRIES CO., LTD.
NO.26, DIN HU 2ST, KNEI-SHAN, TAO YUAN, TAIWAN

The following sample(s) was/were submitted and identified on behalf of the applicant as.

Sample Name	: PTFE ROD
SGS Ref No.	: SHEC0050305667
Model	: 10mm STICK
Material	: PTFE
Sample Receiving Date	: March 31, 2005
Testing Period	: March 31 to April 14, 2005

Test Requested : 1) *To determine the Cadmium Content of the submitted sample.
2) *To determine the Lead content of the submitted sample.
3) *To determine Mercury Content of the submitted sample.
4) *To determine Hexavalent Chromium content of the submitted sample.
5) *To determine the PBBs(Polybrominated biphenyls) PBBEs(PBDEs) (Polybrominated biphenyl ethers) Content of the submitted sample.
6) *To determine the PCBs(Polychlorinated Biphenyls) Content of the submitted sample.
7) *To determine the Mirex(CAS NO:002385-85-5) Content of the submitted sample.
8) ***As specified by client, to detection and determination of certain listed aromatic amines derived from Azo Colorants (EN14362-2:2003).

Test method/Test Results: Please refer to next page

Conclusion : 8) *** According to the analysis as carried out, azo colorants which can release one or more of certain listed amines by cleavage of their azo group/s were not detected in the commodity submitted.

Signed for and on behalf of
SGS-CSTC Chemical Laboratory

Ella Zhang
Supervisor

SHCH 245801

SGS-CSTC Standards Technical Services Co., Ltd. Shanghai Branch Testing Center Chemical Laboratory
1/F, 7/F, 9/F & 10/F, the 3rd Building, No. 889, Yishan Road, Xuhui District, Shanghai, China 200233 t +86 21 6495 1616*2822 f +86 21 5450 0314
中国·上海·徐汇区宜山路889号3号楼1楼, 7楼, 9楼, 10楼 邮编: 200233 t +86 21 6495 1616*2822 f +86 21 5450 0314 www.cn.sgs.com
Member of the SGS Group (Société Générale de Surveillance)

Test method : 1) * ICP-AES after reference to EN 1122, method B:2001 or other acid digestion.
2) *ICP-AES after reference to US EPA 3050B or other acid digestion.
3) *ICP-AES after reference to US EPA 3052 or other acid digestion.
4) *UV-VIS after reference to US EPA 3060A.
5) *With reference to USEPA3540C or USEPA3550C. Analysis was performed by HPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS), 83/264/EEC, and 76/769/EEC)
6) *With reference to US EPA 8082, Analysis was performed by GC/MS.
7) *Analysis was performed by GC/MS.
8) *** Extraction test on coloured textile - Detection of the use of certain azo colorants in fibres with extractable dyes with the use of Gas Chromatographic Mass Spectrometry (GC-MS) / Thin Layer Chromatography (TLC) Technique.

Tesf Results

No.	Test Item(s):	Unit	MDL	Result
				A
1	Cadmium (Cd) *	ppm	2	N.D.
2	Lead (Pb) *	ppm	2	N.D.
3	Mercury (Hg) *	ppm	2	N.D.
4	Hexavalent Chromium (Cr VI)*	ppm	2	N.D.

5) *PBBs(Polybrominated biphenyls) PBBEs(PBDEs) (Polybrominated biphenyl ethers) Content

Test Item(s):	Unit	MDL	Result
			A
Monobromobiphenyl	%	0.0005	
Dibromobiphenyl	%	0.0005	N.D.
Tribromobiphenyl	%	0.0005	N.D.
Tetrabromobiphenyl	%	0.0005	N.D.
Pentabromobiphenyl	%	0.0005	N.D.
Hexabromobiphenyl	%	0.0005	N.D.
Heptabromobiphenyl	%	0.0005	N.D.
Octabromobiphenyl	%	0.0005	N.D.
Nonabromobiphenyl	%	0.0005	N.D.
Decabromobiphenyl	%	0.0005	N.D.
Total PBBs (Polybrominated biphenyls)/Sum of above	%	-	N.D.
Monobromobiphenyl ether	%	0.0005	N.D.
Dibromobiphenyl ether	%	0.0005	N.D.
Tribromobiphenyl ether	%	0.0005	N.D.
Tetrabromobiphenyl ether	%	0.0005	N.D.

SGS CSTC Standards Technical Services Co., Ltd. Shanghai Branch, Testing Center
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