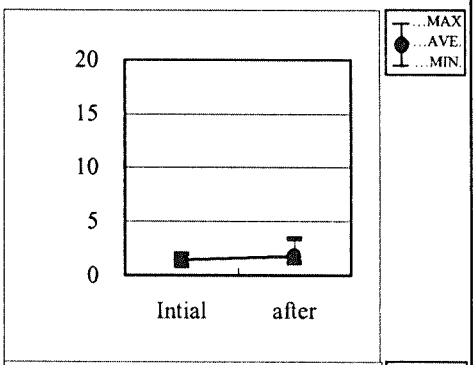
DOCUMENT CLASSIFICATION	TITLE	No.
Qualification Test Report テストレポート	MHF series micro coaxial connector	TR-1021

(4) Durability(耐久性)

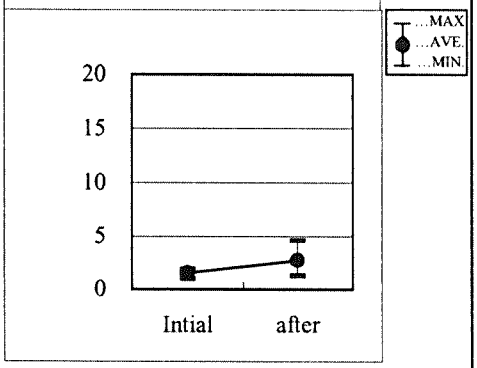
4-1 20278-001R-13 +AWG#32 (OD1.13) coaxial cable

Appearance(外観) : No abnormality(異常無し)

Contact resistance of inner contact (中心導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.42	1.80
MAX.	2.0	3.4
MIN.	0.9	1.2
S	0.36	0.68
Specification(規格)	20 MAX.	25 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



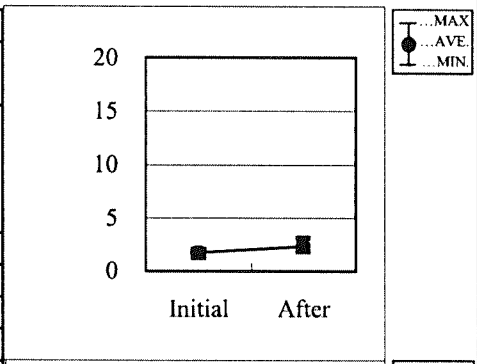
Contact resistance of ground contact (外部導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.54	2.74
MAX.	1.9	4.6
MIN.	1.0	1.3
S	0.31	1.07
Specification(規格)	10 MAX.	15 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



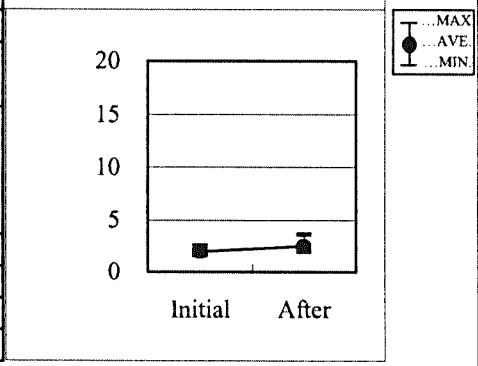
4-2 20278-001R-32 +AWG#32 (OD1.32) coaxial cable

Appearance(外観) : No abnormality(異常無し)

Contact resistance of inner contact (中心導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.71	2.32
MAX.	2.0	3.1
MIN.	1.2	1.8
S	0.24	0.43
Specification(規格)	20 MAX.	25 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



Contact resistance of ground contact (外部導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.96	2.48
MAX.	2.5	3.6
MIN.	1.6	2.0
S	0.32	0.55
Specification(規格)	10 MAX.	15 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



DOCUMENT CLASSIFICATION	TITLE	No.
Qualification Test Report テストレポート	MHF series micro coaxial connector	TR-1021

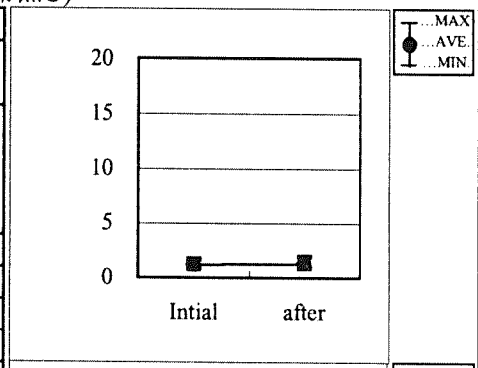
(5) Cable retention force(ケーブル保持力)

5-1 20278-001R-13 +AWG#32 (OD1.13) coaxial cable

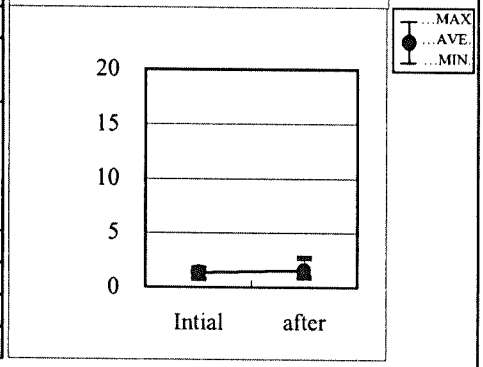
Appearance(外観) : No abnormality(異常無し)

Electrical discontinuity(電気瞬断) : No abnormality(異常無し)

Contact resistance of inner contact (中心導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.18	1.31
MAX.	1.7	2.0
MIN.	0.8	0.9
S	0.34	0.36
Specification(規格)	20 MAX.	25 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



Contact resistance of ground contact (外部導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.33	1.52
MAX.	1.7	2.7
MIN.	0.7	0.9
S	0.32	0.51
Specification(規格)	10 MAX.	15 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK

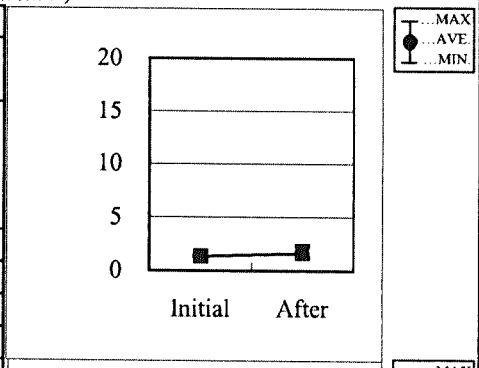


5-2 20278-001R-32 +AWG#32 (OD1.32) coaxial cable

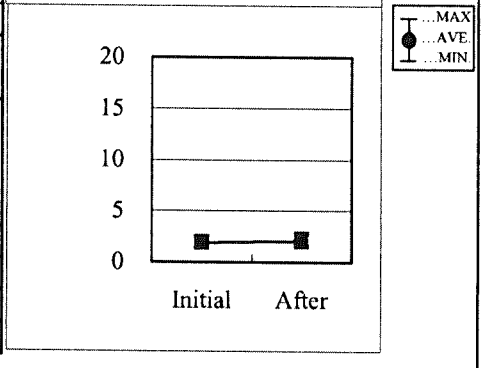
Appearance(外観) : No abnormality(異常無し)

Electrical discontinuity(電気瞬断) : No abnormality(異常無し)

Contact resistance of inner contact (中心導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.31	1.62
MAX.	1.8	2.3
MIN.	0.9	1.2
S	0.33	0.39
Specification(規格)	20 MAX.	25 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



Contact resistance of ground contact (外部導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.85	2.05
MAX.	2.4	2.7
MIN.	1.4	1.5
S	0.37	0.42
Specification(規格)	10 MAX.	15 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



DOCUMENT CLASSIFICATION	TITLE	No.
Qualification Test Report テストレポート	MHF series micro coaxial connector	TR-1021

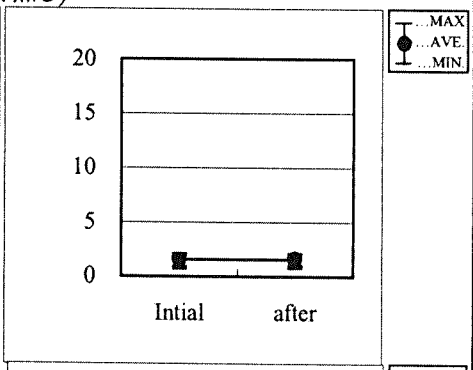
(6) Vibration(振動)

6-1 20278-001R-13 +AWG#32 (OD1.13) coaxial cable

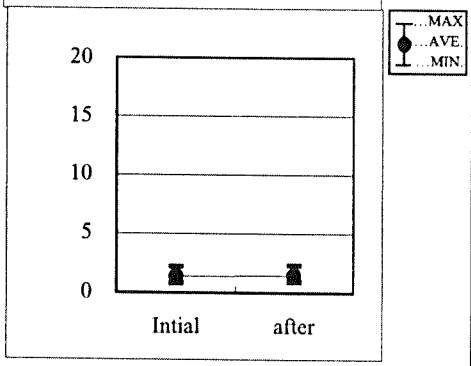
Appearance(外観) : No abnormality(異常無し)

Electrical discontinuity(電気瞬断) : No abnormality(異常無し)

Contact resistance of inner contact (中心導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.53	1.61
MAX.	2.0	2.0
MIN.	0.8	0.9
S	0.42	0.38
Specification(規格)	20 MAX.	25 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



Contact resistance of ground contact (外部導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.38	1.44
MAX.	2.2	2.3
MIN.	0.8	0.9
S	0.47	0.47
Specification(規格)	10 MAX.	15 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK

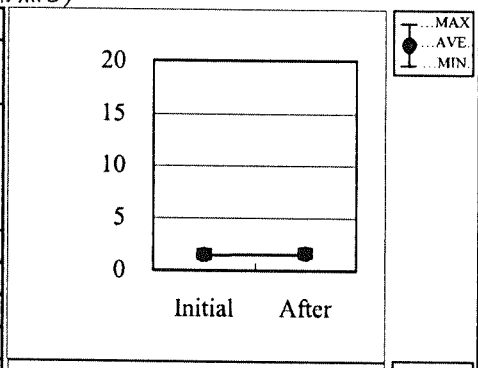


6-2 20278-001R-32 +AWG#32 (OD1.32) coaxial cable

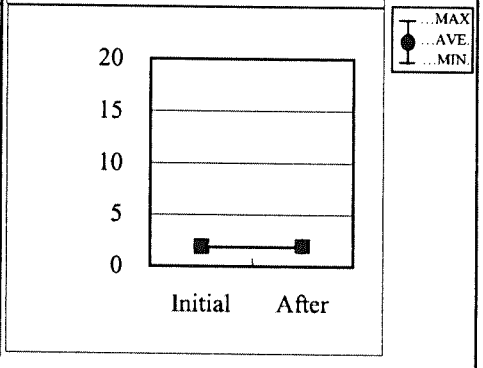
Appearance(外観) : No abnormality(異常無し)

Electrical discontinuity(電気瞬断) : No abnormality(異常無し)

Contact resistance of inner contact (中心導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.49	1.61
MAX.	1.9	2.0
MIN.	1.2	1.3
S	0.21	0.20
Specification(規格)	20 MAX.	25 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



Contact resistance of ground contact (外部導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.86	1.91
MAX.	2.4	2.4
MIN.	1.4	1.5
S	0.28	0.26
Specification(規格)	10 MAX.	15 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



DOCUMENT CLASSIFICATION	TITLE	No.
Qualification Test Report テストレポート	MHF series micro coaxial connector	TR-1021

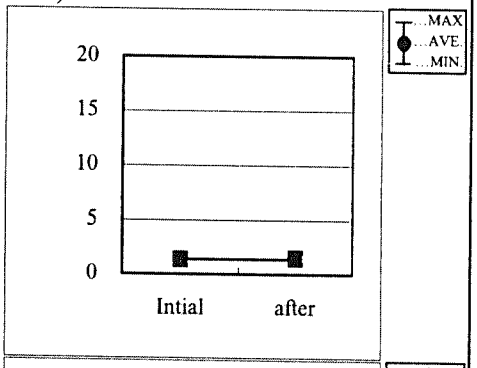
(7) Shock(衝撃)

7-1 20278-001R-13 +AWG#32 (OD1.13) coaxial cable

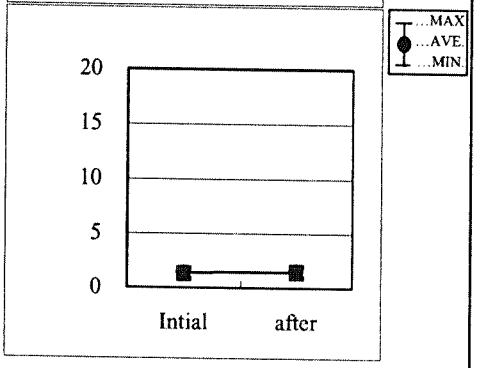
Appearance(外観) : No abnormality(異常無し)

Electrical discontinuity(電気瞬断) : No abnormality(異常無し)

Contact resistance of inner contact (中心導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.38	1.42
MAX.	1.9	2.0
MIN.	0.8	0.9
S	0.35	0.38
Specification(規格)	20 MAX.	25 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



Contact resistance of ground contact (外部導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.40	1.51
MAX.	1.8	2.0
MIN.	0.8	0.9
S	0.32	0.34
Specification(規格)	10 MAX.	15 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK

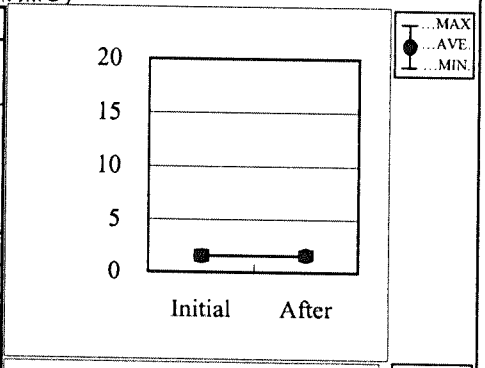


7-2 20278-001R-32 +AWG#32 (OD1.32) coaxial cable

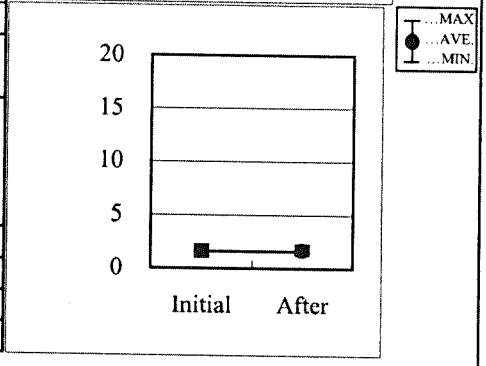
Appearance(外観) : No abnormality(異常無し)

Electrical discontinuity(電気瞬断) : No abnormality(異常無し)

Contact resistance of inner contact (中心導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.53	1.58
MAX.	1.9	1.9
MIN.	1.2	1.3
S	0.23	0.20
Specification(規格)	20 MAX.	25 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



Contact resistance of ground contact (外部導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.61	1.70
MAX.	2.1	2.1
MIN.	1.2	1.4
S	0.28	0.25
Specification(規格)	10 MAX.	15 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



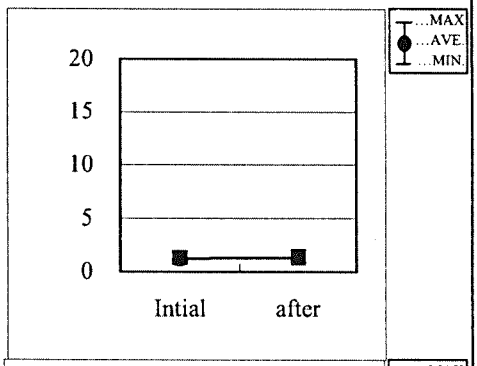
DOCUMENT CLASSIFICATION	TITLE	No.
Qualification Test Report テストレポート	MHF series micro coaxial connector	TR-1021

(8) Thermal shock(熱衝撃)

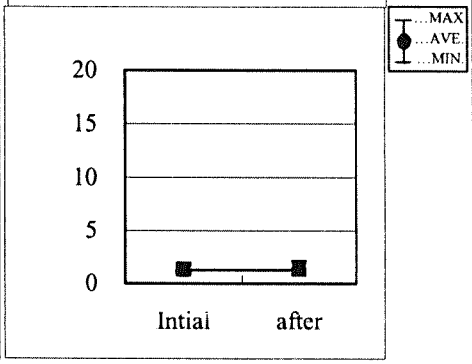
8-1 20278-001R-13 +AWG#32 (OD1.13) coaxial cable

Appearance(外観) : No abnormality(異常無し)

Contact resistance of inner contact (中心導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.20	1.32
MAX.	1.8	1.9
MIN.	0.9	0.9
S	0.28	0.32
Specification(規格)	20 MAX.	25 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



Contact resistance of ground contact (外部導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.22	1.29
MAX.	1.8	2.0
MIN.	0.9	0.9
S	0.35	0.37
Specification(規格)	10 MAX.	15 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK

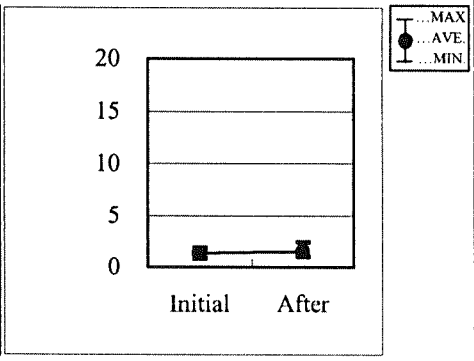


Insulation resistance (絶縁抵抗)	Initial (初期)	After testing (試験後)
Results(結果) MIN. value	10,000	10,000
Specification(規格)	500 MIN.	100 MIN.
Units(単位)	mega-ohm	mega-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK

8-2 20278-001R-32 +AWG#32 (OD1.32) coaxial cable

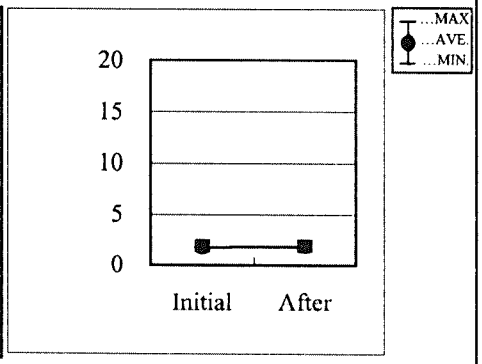
Appearance(外観) : No abnormality(異常無し)

Contact resistance of inner contact (中心導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.33	1.50
MAX.	1.8	2.4
MIN.	0.5	1.0
S	0.38	0.44
Specification(規格)	20 MAX.	25 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



DOCUMENT CLASSIFICATION	TITLE	No.
Qualification Test Report テストレポート	MHF series micro coaxial connector	TR-1021

Contact resistance of ground contact (外部導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.76	1.85
MAX.	2.3	2.3
MIN.	1.5	1.5
S	0.26	0.27
Specification(規格)	10 MAX.	15 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



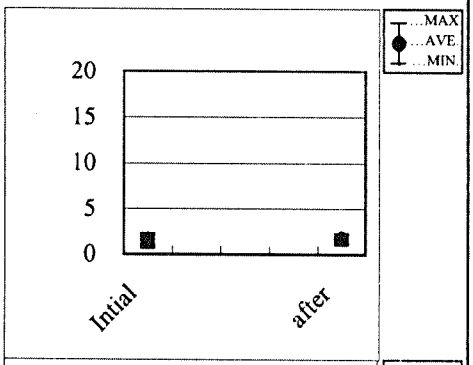
Insulation resistance (絶縁抵抗)	Initial (初期)	After testing (試験後)
Results(結果) MIN. value	10,000	10,000
Specification(規格)	500 MIN.	100 MIN.
Units(単位)	mega-ohm	mega-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK

(9) Humidity(湿度)

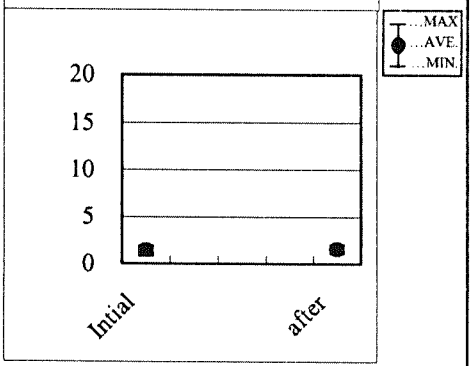
9-1 20278-001R-13 +AWG#32 (OD1.13) coaxial cable

Appearance(外観) : No abnormality(異常無し)

Contact resistance of inner contact (中心導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.51	1.66
MAX.	2.1	2.1
MIN.	0.8	1.1
S	0.41	0.34
Specification(規格)	20 MAX.	25 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



Contact resistance of ground contact (外部導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.44	1.55
MAX.	1.8	1.9
MIN.	1.0	1.2
S	0.25	0.25
Specification(規格)	10 MAX.	10 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



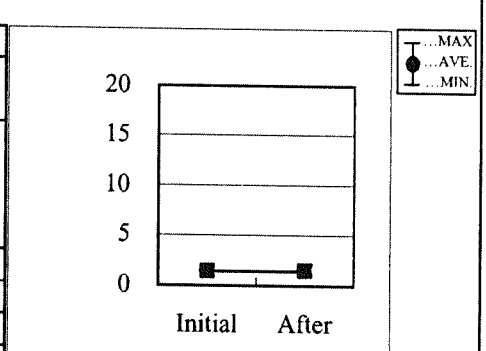
DOCUMENT CLASSIFICATION	TITLE	No.
Qualification Test Report テストレポート	MHF series micro coaxial connector	TR-1021

Insulation resistance (絶縁抵抗)	Initial (初期)	After testing (試験後)
Results(結果) MIN. value	10,000	10,000
Specification(規格)	500 MIN.	100 MIN.
Units(単位)	mega-ohm	mega-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK

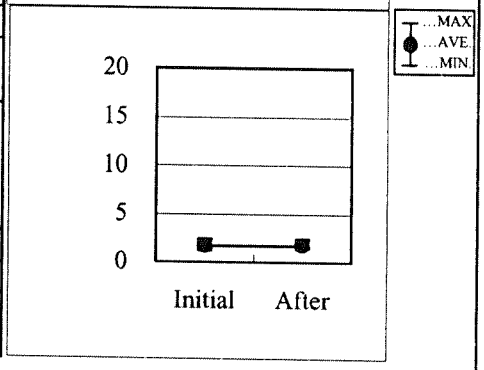
9-2 20278-001R-32 +AWG#32 (OD1.32) coaxial cable

Appearance(外観) : No abnormality(異常無し)

Contact resistance of inner contact (中心導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.42	1.46
MAX.	1.6	2.0
MIN.	0.9	1.0
S	0.31	0.32
Specification(規格)	20 MAX.	25 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



Contact resistance of ground contact (外部導体接触抵抗)	Initial (初期)	After testing (試験後)
AVE.	1.70	1.77
MAX.	2.3	2.3
MIN.	1.3	1.5
S	0.33	0.30
Specification(規格)	10 MAX.	15 MAX.
Units(単位)	mille-ohm	mille-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK



Insulation resistance (絶縁抵抗)	Initial (初期)	After testing (試験後)
Results(結果) MIN. value	10,000	10,000
Specification(規格)	500 MIN.	100 MIN.
Units(単位)	mega-ohm	mega-ohm
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK

(10) Salt water spray (塩水噴霧)

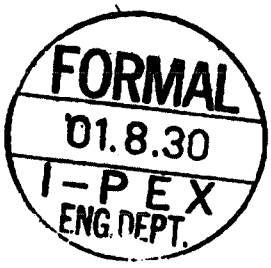
	Initial(初期)	After testing(試験後)
Results(結果)	No abnormality(異常無し)	No abnormality(異常無し)
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK

(11) Solderability , reflow solderimg resistance(半田付け性 , 半田耐熱性)

	Solderability(半田付け性)	Reflow solderimg resistance(半田耐熱性)
Results(結果)	No abnormality(異常無し)	No abnormality(異常無し)
Sample quantity(試料数)	10pcs.	10pcs.
Judge(判定)	OK	OK

Patent of MHF series micro coaxial connector

No. IER-001-00572



REV.	ECN	BY	DATE	APP.
1	R1111	K.O	AUG/30/01	
0	R1063	K.O	JUL/05/01	

REVISION RECORD

Prepared by	Reviewed by	Approved by
K.Ohbayashi JUL / 05 / 01	E.Kawabe JUL / 06 / 01	K.Katabuchi JUL / 09 / 01

DOCUMENT CLASSIFICATION	TITLE	No.
Technical Report	Patent of MHF series micro coaxial connector	IER－001－00572

1. Name, part No. :MHF series micro coaxial connector , 20278-001R-**,20279-001E-01

2. Contents

Our MHF series micro coaxial connector does not conflict with Hirose's patent under our research of patent issues at this moment.

弊社ＭＨＦシリーズ超小型同軸コネクタは、弊社調査結果においてはヒロセ電機の特許に抵触していない事を報告します。

SUMITOMO ELECTRIC INDUSTRIES, LTD.

Sheet No. 1

3-3, Satsuki-cho, Kanuma, Tochigi, 322-8585 JAPAN
Tel.(028978)-0324 Fax.(028976)-2789

Head Office : Osaka
International Div: Tokyo

Messrs. High Tek

Date Oct. 9, 2002
Spec. No. IE28-01026B

SPECIFICATION

FOR

LVCX Series
50Ω SUMIFRON® Insulation Coaxial Cable

0.7DS-PBE (COLOR)

SIGNED BY

K. Yokoi

Manager of Data Transmission
Engineering Section
Data Transmission Cable
Component Department
Electronic Wire Division

SUMITOMO ELECTRIC INDUSTRIES, LTD.

Sheet No. 2
IEE8-010268

1. Scope
This specification covers the construction and the electrical properties of 50Ω SUMIFRON® Insulation Coaxial Cable.

[0.7DS-PBE (COLOR)]

2. Construction

Unit: mm

Item		Details
Conductor	Material	Silver-coated copper wire
	Composition	7/0.079
	Nom. O.D.	0.237 (±0.03) 代替
Insulation	Material	SUMIFLON® P (Natural)
	Nom. thick.	0.22
	Nom. O.D.	0.67 (±0.03) 代替
Shield	Material	Silver-coated copper wire
	Composition	Single braid of 0.05
Jacket	Material	SUMIFLON® E (Color) **
	Nom. thick.	0.11
	Nom. O.D.	1.13 (±0.05) 代替

3. Electrical Properties (at 20℃)

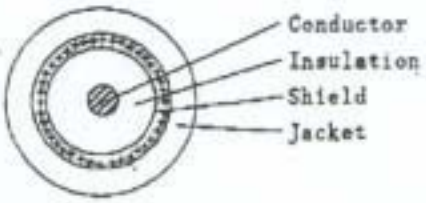
Item	Unit	Details		
Conductor Resistance	Ω/km	Max.	567	
Insulation Resistance	MΩ-km	Min.	305	
Dielectric strength	ACV/1min.		500	
Capacitance	pF/m		97	(1kHz)
Characteristic Impedance	Ω		50 ± 2	(TDR)
Attenuation*	dB/m	Nom.	1.82	(0.9GHz)
		Nom.	2.37	(1.5GHz)
		Nom.	2.70	(1.9GHz)
		Nom.	3.05	(2.4GHz)
		Nom.	3.43	(3.0GHz)
		Nom.	3.94	(4.0GHz)
		Nom.	4.45	(5.0GHz)
		Nom.	4.89	(5.8GHz)
		Nom.	5.16	(6.0GHz)

* Maximum Value = Nom. Value × 1.15
** White, Black, Blue, Gray

SUMITOMO ELECTRIC INDUSTRIES, LTD.

Sheet No. 9
IEE8-01026B

4. Packing
Standard unit length of finished cable shall be 500m on reel and shall be packed not to be damaged during transportation.



業電文
發行章
92.1.10
RF事業部

계 약 번 호
CONTRACT NO : KTP1C2RBK

주 문 번 호
ORDER NO : ST3-99001KD

품 명
COMMODITY : ELECTROLYTIC TINPLATE COIL

제 품 규 격
SPECIFICATION : JISG3303 SPTE-MRT3

검 사 증 명 서
MILL TEST CERTIFICATE

포항종합제철주식회사
POHANG IRON & STEEL CO., LTD
(POHANG WORKS)

수 요 가
CUSTOMER : RENDE TRADING CO.,LTD

주 문 자
SUPPLIER : SSANGYONG CORPORATION

증 명 서 번 호
CERTIFICATE NO : 990818-CSE-005-001

발 행 일 자
DATE OF ISSUE : AUG. 18. 1999

제품치수 DIMENSIONS	수량 QUANTITY	중량 WEIGHT (KG)	제강번호 CHARGE NO	제품번호 PRODUCT NO	인장시험 TENSILE TEST YP	TS	EL %	코팅중량 COATING WEIGHT g/m² OUTER-SIDE SN	INNER-SIDE SN	경도 HARD-NESS R30T	화학성분 CHEMICAL COMPOSITION (%) C	Si	Mn	P	S	CEQ	비고 REMARKS
0.50X855XC	1	3,370	X60535	3TPG0504				3.82	3.85	56.1	400	5	23	10	9		F2
"	1	3,270	"	3TPG0505				"	"	"	"	"	"	"	"		F2
"	1	4,170	"	3TPG0506				"	"	"	"	"	"	"	"		F2
*** SUB TOTAL (060) ***	3			10,810(KG)													
*** LOT TOTAL ***	3			10,810(KG)							* LOT NO ==> NCL1E2RBK 06033						
*** GRADE TOTAL ***	3			10,810(KG)													
*** GRAND TOTAL ***	3			10,810(KG)													

== LAST ITEM ==

O X100 : 2
N X1000 : 3
I. X10000 : 4
T. X100000 : 5

R : MAXIMUM ROUGHNESS, A : AVERAGE ROUGHNESS, S : ROOT MEAN SQUARE, P : PEAK PER INCH, B : BI

[redacted] : LADLE ANALYSIS, [redacted] : PRODUCT ANALYSIS

SIGNATURE

SUBVISTOR NO :

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN MADE BY THE BASIC OXYGEN PROCESS AND TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND ALSO WITH THE REQUIREMENTS CALLED FOR BY THE ABOVE ORDER.

SIGNATURE

CHIEF OF PRODUCTS INSPECTION SECTION

マイクロセル

PORON

ROGERS INOAC CORPORATION
TECHNICAL DEPT.

2/8

PORON HH-48C PHYSICAL PROPERTY

PROPERTY	UNIT	DATUM	TEST METHOD
Thickness	mm	±10%	Thickness gauge
Density	g/cm³	0.48	JIS-K-6401
Tensile strength	kg/cm²	≧7.0	JIS-K-6301
Tear strength	kg/cm	7.6	〃
Elongation	%	140	〃
25%CLD	kg/cm²	4.0	〃
Compression set	%	4.7	JIS-K-6401

(The Figure indicates all mean value.)

TEL:29036327
FAX:29036082

20.Dec. 2002 11:49 No.4486 P.1

特　性

一般物性

PORONは、各々のタイプにより硬さ、強度等が異なり、各種用途への展開が容易になっています。物性の規格としては、JIS K-6301に準拠していますが、主な項目は右表のようになっています。

項目 / タイプ	密度 (g/cm³)	引張強度 (kg/cm²)	伸び (%)	引裂強度 (kg/cm)	25%圧縮応力 (kg/cm²)
L-24	0.24	5.5	115	1.8	0.4
L-32	0.32	7.0	150	2.4	0.8
H-32	0.32	14.7	155	3.4	1.4
H-48	0.48	17.4	105	4.1	2.2
U-32	0.32	4.0	115	1.5	0.5
LE-32	0.32	7.6	300	1.4	0.3
HH-48	0.48	27.0	140	7.5	3.0
#4000	0.27	10.2	120	2.5	0.9
CRスポンジ	0.19	5.0	150	2.2	0.6
PEフォーム	0.04	3.2	180	2.1	0.4
試験方法		ダンベル1号	ダンベル1号	ダンベルB型	形状：φ29×12.5 圧縮速度：1mm/min

（値はすべて代表値を示しています

圧縮残留歪

PORONの最大の特徴である、いつまでもシール性及びクッション性が維持できるということは、右表に示した圧縮残留歪によって理解できます。

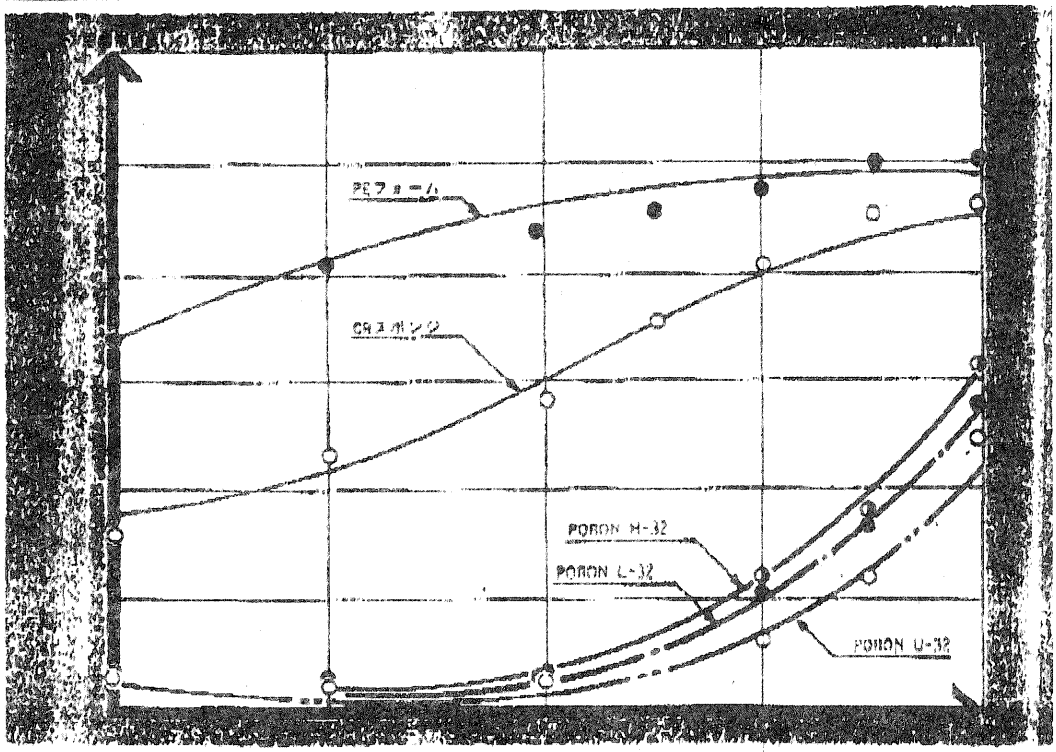
条件：JIS-K6401に準じ、50%圧縮時70℃×22時間放置、その後開放30分後の厚み変化を求める。

	PORON					CRスポンジ	PEフォーム
	L-24	L-32	H-32	H-48	U-32		
圧縮残留歪(%)	2.7	3.1	3.1	3.9	4.6	35	45

（値はすべて代表値を示してい

圧縮残留歪の温度依存性について

PORONは他素材に比べて、温度変化に対して、圧縮残留歪の変化が少ない。



20.Dec. 2002 11:50　　No.4466　P.2

Underwriters Laboratories Inc.®

ROGERS INOAC CORP
C/O CHEMITOX INC
MS K ITO, DIRECTOR
14-18 KAMIIKEDAI 1-CHOME
OHTA-KU
TOKYO 145-0064 JAPAN

RE: Project Number(s) - 99SC51089

Your most recent listing is shown below. Please review this information and report any inaccuracies to the UL Engineering staff member who handled your project.

For information on placing an order for UL Listing Cards in a 3 x 5 inch format, please refer to the enclosed ordering information.

QMFZ2 November 9, 1999
Plastics - Component

ROGERS INOAC CORP E96146
INOAC BLDG 2-4-14 GINZA CHUO-KU, TOKYO 104-0061 JAPAN

Mtl Dsg	Col	Density pcf (g/cc)	Min Thk in.	Min Thk (mm)	UL94 Flame Class
Polyurethane Foam furnished in the form of sheets.					
MO-48	BK	28.5-31.5(0.46-0.51)	0.059	(1.5)	94HBF
	BK	28.5-31.5(0.46-0.51)	0.16	(4.0)	94HBF
U-91	NC (YL)	17.5-22.5(0.28-0.36)	0.053	(1.30)	94HBF
	BK	17.5-22.5(0.28-0.36)	0.053	(1.30)	94HBF
	BK	17.5-22.5(0.28-0.36)	0.27	(6.8)	94HBF
MH-32	BK	17.5-18.4(0.28-0.30)	0.059	(1.5)	94HBF
	BK	17.5-18.4(0.28-0.30)	0.12	(3.0)	94HBF
ML-32	BK	18.0-19.8(0.29-0.32)	0.059	(1.5)	94HBF
	BK	18.0-19.8(0.29-0.32)	0.12	(3.0)	94HBF
MS-32	BK	18.0-19.8(0.29-0.32)	0.059	(1.5)	94HBF
	BK	18.0-19.8(0.29-0.32)	0.12	(3.0)	94HBF

Marking: Company name or trademark PORON and material designation on container or wrapper.

See General Information Preceding These Recognitions.
ULH small-scale test data does not pertain to building materials, furnishings and related articles. ULH small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by ULI.

Sony Chemicals

TECHNICAL REPORT

Industrial Adhesive Tape
T4000

Industrial Adhesive Tape T4000

Doudle-Faced Adhesive Tape

T4000 is a double-faced adhesive tape developed for the requirement of strong and permanent bonding. It is a highly selected doudle-faced adhesive tape with outstanding reliability, having high low-temperature adhesion.

SPECIFICATIONS

Coating amounts (g/m^2)	140–170
Coating thickness (mm)	approx. 0.15
Thickness of release paper (mm)	approx. 0.14

FEATURES

- Excellent in thermal holding strength
- Excellent in low-temperature adhesion
- High bonding strength in the widest temperature range
- No smell
- Outstanding reliability and durability

APPLICATION

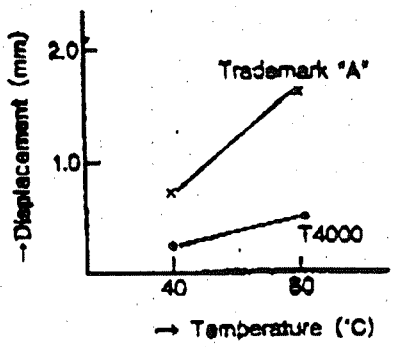
T4000 is most suitable for the adhesion to surface decorative sheet, rating plate and escutcheon, etc. made of metal and plastic material for the automobiles and household electric appliances.
T4000 is also recommendable for use as a double-faced permanent adhesive tape for various substrates.

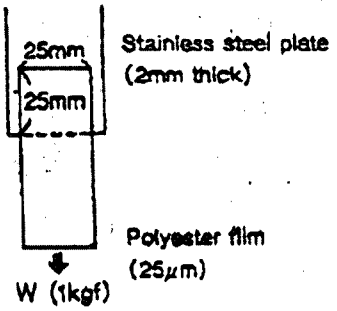
Industrial Adhesive Tape T4000

SPECIFICATIONS

1. Holding strength at elevated tefnperatures

T4000 demonstrates an excellent holding strength even under severe conditions.

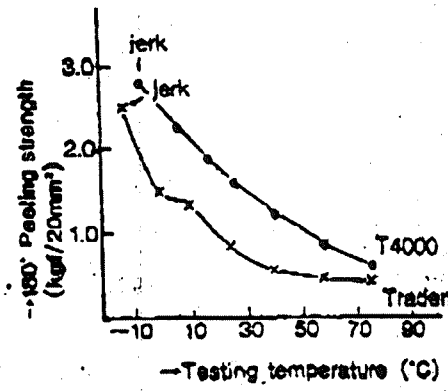




Conditions for preparing test pieces
Temperature : 20°C
Pressure : 2kgf/cm² (one stroke)
Conditions for test peeling
60minutes : 1kgf of loading

2. Temperature change of 180° peeling strength

T4000 provides a high bonding strength at various temperatures



Substrate :
Polyester film (25μm)
/stainless steel plate (2mm thick)
Conditions for preparing test pieces
Temperature : 20°C
Pressure : 2kgf/cm² (one stroke)
Peeling speed : 300mm/min.

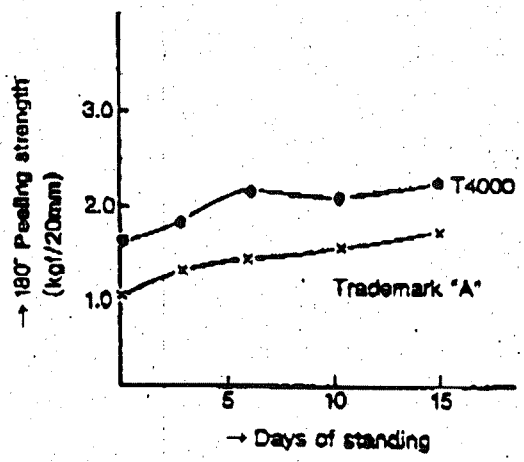
3. Peeling strength after aging

T4000 has excellent thermal aging resistance, and high resistances to moisture, water, oil and weather.

Substrate : Polyester film (25μm)/stainless steel plate (2mm thick)
Conditions for preparing test pieces :
Temperature : 20°C
Pressure : 2kgf/cm² (one stroke)
Test peeling speed : 300m/m

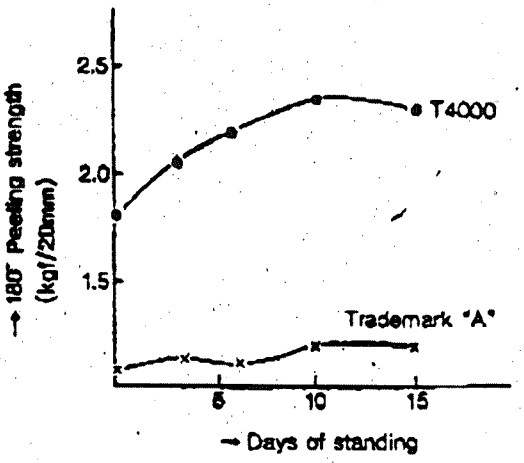
● THERMAL AGING

Standing test in the atmosphere



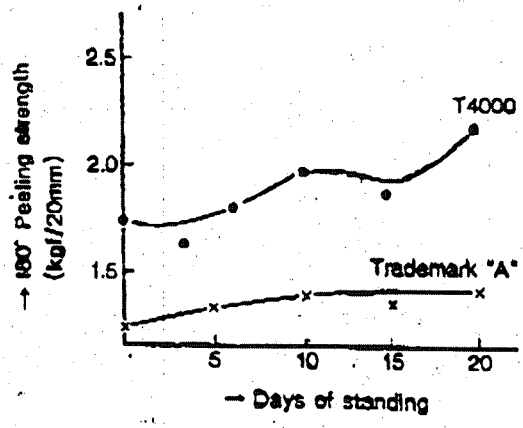
● MOISTURE RESISTANCE

Standing test in the atmosphere of 50°C and relative humidity of 90 %



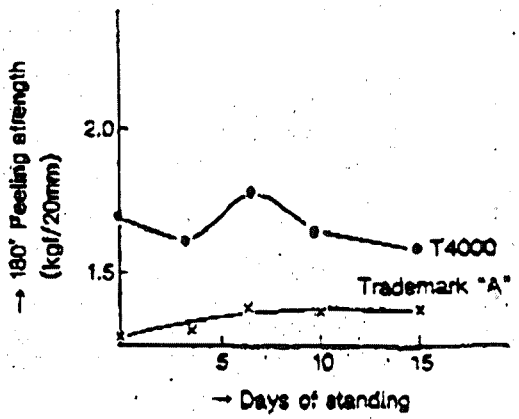
● WATER RESISTANCE

standing test in water at 40°C

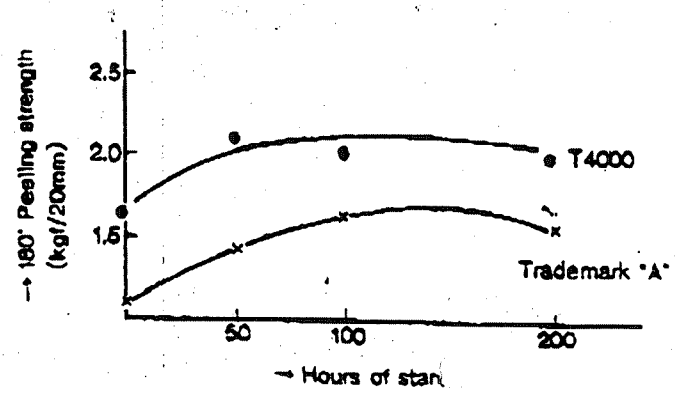


● OIL RESISTANCE

Standing test in machine oil at 40°C



● WEATHERING

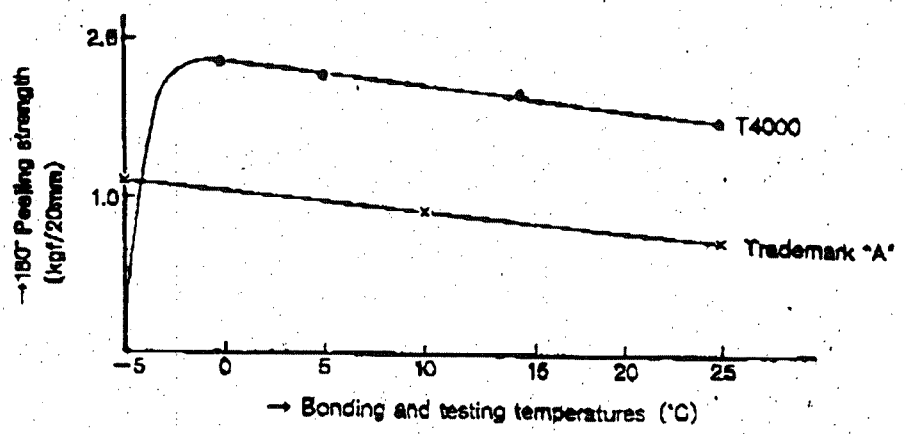


Industrial Adhesive Tape T4000

WORKABILITY

Low-temperature adhesion

T4000 provides high adhesion even in the bonding work at low temperatures.



CAUTION: While this report is based on our company's reliable testing, this does not imply that the effects noted herein are guaranteed. The user is requested to use this product at his own risk after thorough study of the purposes for which the product is designed and the conditions under which it is used.

Sony Chemicals Corporation
6-3 Nihonbashi-muromachi-1chome, Chuo-ku, Tokyo Telephone:(03)3279-0447 Fax:(03)3246-1784
Sony Chemicals Singapore Pte Ltd.
Block 1022 Tai Seng Avenue Tai Seng Industrial Estate #02-3530 Singapore 1953 Telephone:382-1500 Fax:382-1750
Sony Chemicals Corporation of America
100 Technology Drive Mount Pleasant, Pennsylvania 15666 Telephone:(412)696-7500 Fax:(412)696-7599
Sony Chemicals Europe B.V.
Diamantlaan 27 2132 WV Hoofddorp, The Netherlands Telephone:31(0)23-565 06 06

Printed 1997.3

SONY CHEMICALS CORP

MH15431 (M)

(B–cont. from A card)

T3500, T3500S, T3500SW, T3500W. For bonding aluminum (thickness .007 to 0.020 in), polycarbonate (thickness .018 to .079 in) and acrylic (thickness .019 to .079 in) to acrylonitrile butadiene styrene (ABS) plastic, maximum surface temperature 80 C (176 F), minimum temperature -40 C (-40 F). Suitable where exposed indoors to high humidity and occasional exposure to water.

T4000, T4000W. For bonding aluminum (thickness .007 to 0.020 in), polycarbonate (thickness .019 to .079 in) and acrylic (thickness .019 to .079 in) to acrylonitrile butadiene styrene (ABS) plastic, maximum surface temperature 80 C (176 F), minimum temperature -40 C (-40 F). Suitable where exposed indoors to high humidity and occasional exposure to water.

Reports: January 13, 1988; January 13, 1988.

Replaces MH15431B dated March 4, 1994.

(Cont. on C card)

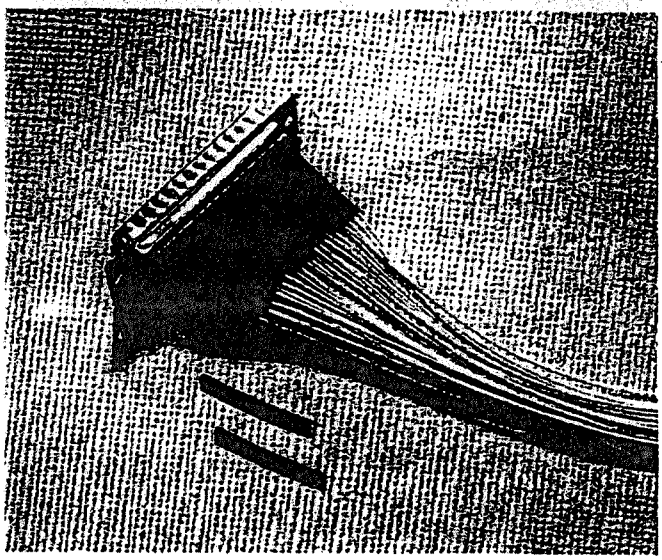
Fax-on-Demand: (800) 260-9099
(650) 361-6523

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)*	

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

	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)*

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).	

Versafit is a trademark of Raychem Corporation.

Users should independently evaluate the suitability of the product for their application.

Raychem

333 Pfingsten Road
Northbrook, Illinois 60062-209
United States Country Code (1)
(847) 272-8800
FAX No. (847) 272-8129
http://www.ul.com

Underwriters Laboratories Inc.®

RAYCHEM CORP
THERMOFIT DIV
UL COORDINATOR
300 CONSTITUTION DR
MENLO PARK CA 94025

Your most recent listing is shown below. Please review this information and report any inaccuracies to the UL Engineering staff member who handled your project.

For information on placing an order for UL Listing Cards in a 3 x 5 inch format, please refer to the enclosed ordering information.

YDPU2 April 28, 2000
Extruded Tubing, Electrical - Component

RAYCHEM CORP THERMOFIT DIV E35586
300 CONSTITUTION DR, MENLO PARK CA 94025

Cat. No.	Max V	Max Oper Temp	Shrinkdown Class	Col Recognized	Max Temp Rated Oil Resistance * °C	VW-1 Rated #
Irradiated flexible heat shrinkable polyolefin.						
CGPT	600	125	I	+	—	No
GPO135	600	125	I	+	—	No
DCPT	600	125	I	+	—	No
RNF-100 or LSFR	600	125	I	+	—	No
RNF-100UK	600	125	I	+	—	No
CP125	600	125	I	+	—	No
RNF-3000	600	125	I	+	—	No
RT-876	600	125	I	+	—	No
RT-21	600	125	I	+	—	No
RT-21UK	600	125	I	+	—	No
Versafit @	600	125	I,II	+	—	Yes
Versafit V4	300	125	I	+	—	Yes
CFR125	600	125	I	+	—	Yes
Versafit-3X	600	125	I	+	—	Yes
RP-4800	600	125	I	BK	—	No
RT-421	600	125	I	BK	—	Yes
Verseal	600	125	I	BK	—	No
VTW	300	125	I	+	—	Yes
VersaThin	300	125	I	+	—	Yes
Versafit V2	600	125	I	+	—	Yes
DWP-125	600	125	I	+	—	No
RPS, Shrinkmark	600	125	I	+	—	Yes
TMS	600	125	I	+	—	No

A not-for-profit organization dedicated to public safety an committed to quality service

Cat. No.	Max V	Max Oper Temp	Shrinkdown Class	Col Recognized	Max Temp Rated Oil Resistance * °C	VW-1 Rated #
TMS-SCE	600	125	I	+	—	Yes
Permark , Raymark	600	125	I	+	—	Yes
RT-117	600	125	I	+	—	No
Rayprintt	600	125	I	+	—	Yes
TTMS	600	125	I	+	—	Yes
Thermofix	600	125	I	+	—	Yes
SPTMS	600	125	I	+	—	Yes
Versafit-FBT	600	105	I	+	—	Yes
Basic-105	600	105	I	+	—	Yes
Versafit V	600	105	I	+	—	Yes
FRSP	600	125	I	+	—	Yes
Irradiated semi-rigid shrinkable polyolefin.						
RT-3	600	125	I	+	—	No
Thermofit CRN	600	125	I	+	—	No
TMS-UK, CGTM	600	125	1	+	—	No
Irradiated heat shrinkable polyvinylidene fluoride (PVF2).						
Kynar	600	150	I	All	—	Yes
Kynar UK	600	150	I	All	—	Yes
RW-175	600	150	I	All	—	Yes
Heat Shrinkable neoprene.						
NT	600	90	II	BK	—	No
Heat Shrinkable polyvinyl chloride (PVCP).						
Thermofit PVC	600	105	I	BK	—	Yes
Heat shrinkable polyvinyl chloride (PVC).						
PVC	600	105	I	All	—	Yes
Polytetrafluoroethylene (PTFE).						
UTFE	600	200	—	Any	—	Yes

- Tubing is considered to comply with the optional VW-1 flammability requirements only if it is so marked.
+ - All colors except clear.
* - Tubing is considered to comply with the optional oil resistant requirements only if it is so marked.
@ - Tubing is considered to comply with class II requirements if so marked.
Marking: Company name, tradename "Thermofit" or "Versafit", "VersaThin", "VersaPrint" or "E35586" and temperature rating on tags attached to both ends of the tubing, on the shipping spool label or on the smallest unit container. Catalog number shall be on the tubing, shipping carton, spool or tag attached to the tubing.

See General Information Preceding These Recognitions
For use only in equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.

CERTIFICATIOI RECORD

The company named below has been authorized by CSA to represent the products listed in this record as "CSA Certified" and to affix the CSA Mark to these products according to the terms and conditions of the CSA Service Agreement and applicable CSA program requirements (including additional Markings).

File No: 031929 0 000

Class No: 9032 01 INSULATING DEVICES AND MATERIALS - Insulating Tubing and Sleev ing

SUBMITTOR

Raychem Corporation
Thermofit Division
300 Constitution Dr.
Menlo Park, CA 94025
USA
Attention: Dr. James Balquist
Specifications & Agency Approvals Manager

FACTORIES

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Dorcan Swindon
Wiltshire, SN3 5HH
ENGLAND
Attention: Mr. Cripps
Quality Manager, Wire & Cable Div.

Raychem Corporation
80061 Thermofit Division
300 Constitution Dr.
Menlo Park, CA 94025
USA
Attention: Dr. James Balquist
Specifications & Agency Approvals Manager

Raychem Electronics Shanghai Ltd.
254450 287 Qing Jiang Rd.
Cao He Jing High Tech Park,
Shanghjai, 201103
CHINA

November 3, 1997(Replaces:April 28, 1997)

Flexible, cross-linked, heat shrinkable polyolefin tubing:

Part No	Voltage Max	Temp Deg C Max	Trade Size Inch	mm	Color	OFT+
RNF-100	600	125	3/64 to 4	1 to 124	*	-
RNF-3000	600	125	3/64 to 4	1 to 124	*	-
RPS	600	125	3/64 to 4	1 to 124	*	Yes
RT-21	600	125	3/64 to 4	1 to 124	*	-
ShrinkMark	600	125	3/64 to 4	1 to 124	*	Yes
TMS	600	125	3/64 to 4	1 to 124	*	-
TMS-SCE	600	125	3/64 to 1	1 to 26	*	Yes
Versafit	600	125	3/64 to 4 and No 20	1 to 124	*	Yes
Versafit V2	600	125	3/64 to 4 and 20	1 to 124	*	Yes
Versafit 3X	600	125	3/64 to 4	1 to 124	*	Yes
CGPT GP0135	600 600	125 125	3/64 to 4 3/64 to 4	1.2 to 102 1.2 to 102	-	-
CGTM	600	125	-	2.4 to 38	-	-
DCPT	600	125	3/64 to 1	-	-	-
VersaThin	150	125	3/64 to 4	-	*	Yes
Versafit V4 VTW	150 150	125 125	3/64 to 4 3/64 to 4	-	* *	Yes Yes