SAMSUNG ELECTRONICS

VD Division
REv: 01 [2010.09.30]

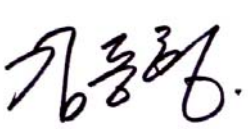
REQUEST FOR APPROVAL

	CONNECTOR-HDMI
SPEC.	19P,2ROW,FEMALE,SMD-A,AU
DESCRIPTION	FD05015-19
CODE_NO.	3701-001293
APPLIED TO	LED TV
REFERENCE	RE-APPROVAL[REV04] A change lead plating Sn->Au

Green Procurement

Vendor Code : D8A6

Registration Date : 2011/02/01

DRAWING	APPROVAL	APPROVAL
		
이우영	김동형	김봉겸
2011.10.04	2011.10.04	2011.10.04
A TERM OF VALIDITY	OVER AT LEAST 15-YEARS FROM ISSUED DATE	

Indemnification

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MAKER	FOOSUNG	TEL	+82-31-205-9270
Manufacture 1	Suwon (Korea)	ADDRESS	#989-3, Gosask-Dong, Gwonseon-Gu, Suwon-City, Kyungki-Do, Korea

COMPONENT APPROVAL SHEET

DRAWN	CHECK	APPROVED
		2011.10.04

Origin Dept : Visual Display G.CS Originator storage : Over at least 15 years
Date : 2011.10.04 Written by : LEE WOO YOUNG (TEL.200-9585)

Item	CONNECTOR-HDMI	Model		Tool maker	-
CODE NO.	3701-001293	Quantity	20 EA	Cavity or Stage	-
Spec.	FD05015-19	Reason for change or addition : [Rev04]			
Manufact-urer	FOOSUNG	RE-APPROVAL (A change lead plating Sn->Au)			

	Characteristics	Specification	Result
	1. Appearance & Marking	The body shall be clean and shall not bears any stain, rust or flaw Easily visible, and correct, contents are as follows	Good
※	2. Dimensions	Meets its specifications	Good
※	3. Contact Resistance	Less than 30mΩ at Terminal & Wafer pin	Good
	4. Insulation Resistance	Not less than 100MΩ between adjacent contact or ground when tested at 500VDC(at 20℃)	Good
	5. Withstand Voltage	No damage, To withstand a voltage of 500V AC(50or60Hz) when applied between adjacent contact or ground for 1 minute (cutoff current; 3.0mA)	Good
	6 Joint CDR	Grade A (New Technology, New Function, New Method of Production)	Good
	7 Etc	Any other things are based on approval sheets	Good

@ Mark items with important characteristics with a ※ symbol

Remarks : Manufacture Qualification audit skipped because of already use Trans of FOOSUNG
☞ Environment regulation material can find in PDM system by Document Code

judgement

O.K

OFFICIAL APPROVAL			
Part Grade	A (B) C	Q-GRADE	A (B) C
Process	AUTO(AX, RA, SC,(SI) , MANUAL(MA)		
RoHs	(Completed) , Not yet , No Relation		
Eco (GPS)	Registration ((Y) N) Approval Date : 2010/11/27 Approval Name : wy82.lee		
Stock Handling	( ) Running Change ( ) Apply immediately (Before MP) ( ) Apply immediately (From MP) ( ) Process change ( ) Document change only ( ) Temporary component change ( ) Etc ( )		

Deliver: PURCHASING PART

KQA-2203F1R0(1996.5.1)

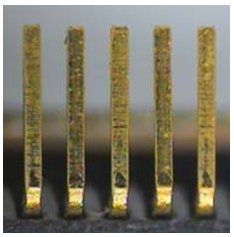
변경점 신고서

협력사명: (주)후성테크

협력회사	立案	審査	決定
	신동대		성유빈
	8/18		8/18

작성일자: 2011. 08. 18.
작 성 자: 신동대 과장

품 명	0.5P HDMISocket 6.2H	CODE-NO.	3701-001293
규 격	0.5mm Pitch, 19Pin	변경사유(목적)	품질 향상
변경내용	Lead부 도금사양 변경 (Sn → Au)		

변 경 전 (그림 참조)	변 경 후 (그림 참조)
Lead 도금사양 : Sn도금 Ni : 1.5~3.5um Sn : 3.0~5.0um 	Lead 도금사양 : Au도금 Ni:1.5~3.5um Au : Min 0.05um 

변경사항	재질(Material)	금형(Machine)	제조공법(Method)	생산기지(Base)	기 타

위와 같이 변경 적용하고자 하오니, 검토 후 회신 바랍니다.

검토결과 회신서

변경점 No:

USER	審査	合議	決定

접수일자: 2011 . . .
접 수 자:

변경점 1차 판정		
	본 변경 내용은 A급(승인변경)변경 사항이므로 승인 후 적용 가능함.	
	본 변경 내용은 B급(단순변경)변경 사항이므로 회신서 접수 즉시 적용 가능함.	
	본 변경 내용은 검토결과 변경이 불가하므로 절대 적용 금지	

검토일자		검토부서		검토자	

단순변경 검토결과 [B급에 한함]	
승인변경 제출자료 [A급에 한함]	●변경 승인서( )부 ●변경 Sample ( )EA ●변경점 신고서 1부 ●기타( ) 상기 자료를 201 . . . 까지 개발실로 제출하여 재 승인 의뢰하시기 바랍니다.
배포선 :	

HISTORY SHEET

STANDARD NAME	APPROVAL	REGISTER NO	3701-001293		
EDITION	DATE	PAGE	CONTENTS	NAME	CHECK
00	2004.01.26	-	CONNECTOR-HDMI, 19P, 1.0mm, 2R, SMD-ANGLE TYPE (MOLEX: 500254-1907)	D.H. KIM	OK
01	2004.07.13	-	CONNECTOR-HDMI, 19P, 1.0mm, 2R, SMD-ANGLE TYPE (MOLEX: 500254-1927) (Shell structure & plating change to puretin(Sn100%)	D.H. KIM	OK
02	2006.01.27	-	MULTI - APPROVAL (Freeport- 51U019S-331N-C4R-SX)	J.M Kim	OK
03	2008.08.29	-	MULTI - APPROVAL (FOOSUNG - FD05015-19) - 19P, 0.5mm, 2R, FEMALE, SMD-A, AU	O.S LEE	OK
04	2009.02.10	-	Re-approval (FOOSUNG - FD05015-19) (ECO No: BNP200908F7) (HDMI connector SPEC change for improvement)	O.S LEE	OK
05	2009.05.22	-	Re-approval (FOOSUNG - FD05015-19) (Terminal Lead Structure change: 0→0.05)	O.S LEE	OK
06	2010.08.03	-	Re-approval (FOOSUNG - FD05015-19) (CAP standardize; 3701-001293,1685 →3701-001685)	O.S LEE	
07	2011.10.04	_	RE-APPROVAL (FOOSUNG) A change lead plating Sn->Au	W.Y LEE	

SAMSUNG ELECTRONICS

Green Procurement
Vendor Code : D8A6
Registration Date : 2009.12.17

REQUEST FOR APPROVAL

ITEM	HDMI 19P RIGHT ANGLE SMD TYPE
SPEC.	0.5mm Pitch, 19Pin, 2R, SMT
DESCRIPTION	FD05015-19
CODE_NO.	3701-001293
APPLIED TO	
REFERENCE	Approval

MAKER		
DRAWING	**AGREEMENT**	**APPROVAL**
		
이기현	권상국	이기천
2011/08/10	2011/08/10	2011/08/10
A TERM OF VALIDITY	**OVER AT LEAST 15-YEARS FROM ISSUED DATE**	

SAM SUNG		
DRAWING	**AGREEMENT**	**APPROVAL**
A TERM OF VALIDITY	**OVER AT LEAST 15-YEARS FROM ISSUED DATE**	

Indemnification

FOOSUNG will indemnify, hold harmless, and at Samsung's request, defend Samsung and Samsung's directors, officers, employees, agents and independent contractors from and against any loss, cost, liability or expense (including court costs and reasonable fees of attorneys and other professionals) arising out of or resulting from any third party claim that any Products and/or Components provided by FOOSUNG infringes patent, copyright, trade secret right or other intellectual property right. If FOOSUNG receives notice of an alleged patent, copyright, trade secret or other intellectual property right infringement or if Samsung's use of the Products and/or the Components provided by FOOSUNG shall be prevented by permanent injunction for reasons of patent, copyright or trade secret infringement, FOOSUNG may, at its sole option and expense, procure for Samsung the right to continued use of the Products and/or the Components as provided hereunder, or modify the allegedly infringing item such that it is no longer infringing, or replace the allegedly infringing item.

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Manufacture 1	Suwon (Korea)	ADDRESS	#989-3, Gosask-Dong, Gwonseon-Gu, Suwon-City, Kyungki-Do, Korea

APPROVAL SHEET
(승인원)

CUSTOMER	SAMSUNG
CUSTOMER CODE NUMBER	3701-001293
ITEM	CONNECTOR
SPEC.	0.5mm Pitch, 19Pin, 2R, SMT
MAKER	FOOSUNG TECH
PART NUMBER	FD05015-19
REMARK	
DATE OF ISSUED	2011.08.10

결 재	작 성	검 토	승 인
			

㈜후성테크

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A CHANGE OF PRODUCT STRUCTUR

< INDEX (목차) >

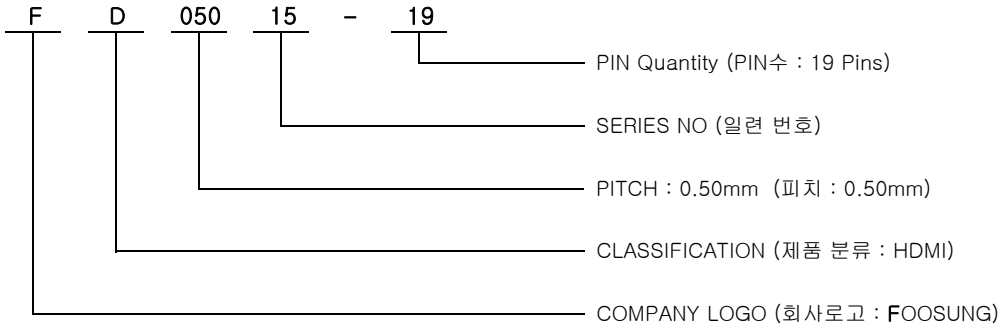
< RECORD OF REVISION >

VERSION	DATE	DESCRIPTION	ISSUED	APPROVED
A	2006-11-14	INITIAL APPROVAL	C.T.OH	J.Y.LEE
B	2009-02-03	A CHANGE OF TERMINAL MATERIAL, PLATING & PRODUCT STRUCTURE	K.H.LEE	S.K.KWON
C	2009-05-07	A CHANGE OF PRODUCT STRUCTURE	K.H.LEE	S.K.KWON
D	2010-10-21	A CHANGE OF INSULATOR	K.H.LEE	S.K.KWON
E	2011-08-10	A CHANGE OF PLATING	K.H.LEE	S.K.KWON

FOOSUNG	PRODUCT SPECIFICATION	Date Issued : 2011년 08월 10일
Title of Subject : HDMI 19P RIGHT ANGLE SMD TYPE		Issued by : K.H.LEE

This specification covers the HDMI 19P RIGHT ANGLE SMD TYPE for limited use.
본 문서는 HDMI 19P RIGHT ANGLE SMD TYPE 커넥터 제품 규격입니다.

1. PART NAME CODE LAW (제품 CODE 부여 방법)



2. MATERIALS (원재료)

- Construction and dimensions shall be in accordance with the reference drawing.
- Material and surface finish shall be as specified below.
- 구조 및 치수는 첨부된 도면에 준하며 구성부품,재질 및 표면 처리는 하기와 같습니다.

ITEM	MATERIAL	MAKER	PLATED / COLOR	DATA	
INSULATOR	PA9T(UL94 V-0)	KURARAY	BLACK		DTUL : 285℃
TERMINAL-A	BRASS	POONG SAN	CONTACT부: Au 0.1㎛ Min Over Ni 1.5~3.5㎛ SMD부: Au 0.05㎛ Min Over Ni 1.5-3.5㎛	Au: 0.15㎛ Ni: 2.82㎛ Au: 0.07㎛ Ni: 2.89㎛	t=0.2mm
TERMINAL-B	BRASS	POONG SAN		Au: 0.15㎛ Ni: 2.93㎛ Au: 0.07㎛ Ni: 2.64㎛	t=0.2mm
SHELL	PHOSPHOR BRONZE	POONG SAN	Over plating : Sn 1.0㎛ Min	1.52㎛	t=0.5mm
CAP	PA46(UL94 V-0)	DSM	BLACK		DTUL : 290℃

3. GENERAL FEATURES (일반 사양)

- Rated current (정격 전류) : AC/DC 0.5A
- Rated voltage (정격 전압) : AC/DC 40V
- Contact resistance (접촉 저항) : 30mΩ Max
- Withstand Voltage (내전압) : AC 500V/1min
- Operation environment (사용 온도) : Temperature Range -20℃ to +85℃
  (Including terminal temperature rise)

4. TEST CONDITIONS (시험 조건)

- MIL-STD-202 : Test method Standard for Electronic and Electrical Component Parts.
  전자, 전기 부품의 시험 법
- MIL-STD-1344 : Test methods for Electrical Connectors.
  전자 기기용 커넥터의 시험 법

5. TEST METHODS, REQUIREMENTS

5-1. 전기적 성능(ELECTRICAL PERFORMANCE)

ITEM (항 목)	TEST CONDITION (시험 방법)	REQUIREMENT (규 격)
Contact Resistance 접촉 저항	Measure it with low voltage less than 20mV and 10mA 개방 전압 20mV MAX, 단락 전류 10mA로 전압 강하법에 의거 측정	Max. 30mΩ
Insulation Resistance 절연 저항	Apply 500V DC between adjacent contacts and measure its resistance within 1 minute 조합 부품간 결합상태에서 인접하는 단자간을 1분 이내에 DC500V로 측정	Min. 100 MΩ
Voltage proof 내전압	Apply the specified voltage between adjacent contacts 조합 부품간 결합상태에서 인접하는 단자간을 1분 이내에 AC500V로 측정	No Damage
T.M.D.S Signals Time Domain Impedance	Ansi/EIA-364-108 Draft Proposal Rise time ≤ 200ps (10%-90%) differential Measurement Specimen Environment Impedance 100Ω differential Source-side reciptacle connector mounted on a conrtolled impedance PCB fixture. ANSI/EIA-364-108 제안서안(提案書案) 라이즈 타임 ≤ 200p	100Ω±15%
T.M.D.S Signals Time Domain Cross talk FEXT	ANSI/EIA-364-90 Draft Proposal Rise time ≤ 200ps (10%-90%) Differential Measurement Specimen Environment Impedance 100Ω differential Source-side reciptacle connector mounted on a conrtolled impedance PCB fixture. Driven pair and victim pair. ANSI/EIA-364-	-26dB Max.

5-2. 기구적 성능(MECANICAL PERFORMANCE)

ITEM (항 목)	TEST CONDITION (시험 방법)	REQUIREMENT (규 격)
Construction, Dimension 구조, 치수	Construction and dimensions shall be in accordance with the reference drawing. 구조 및 치수는 도면에 준할것	As specified in the Drawing 도면에 준함
Mating force 삽입력	Measure force necessary to mate between the counterpart connectors 조합 부품간 삽입시 하중력 측정	Max. 4.5Kgf
Unmating force 발거력	Measure force necessary to unmate between the counterpart connectors 조합 부품간 삽입시 하중력 측정	1~4Kgf
Pin retention force 핀 유지력	It shall be pulled to the pin in the speed of 25mm per minute, and measured the force when the pin begins to remove from the insulator 사출물이 핀을 유지하고 있는 힘을 측정	Min. 0.2kgf/Pin

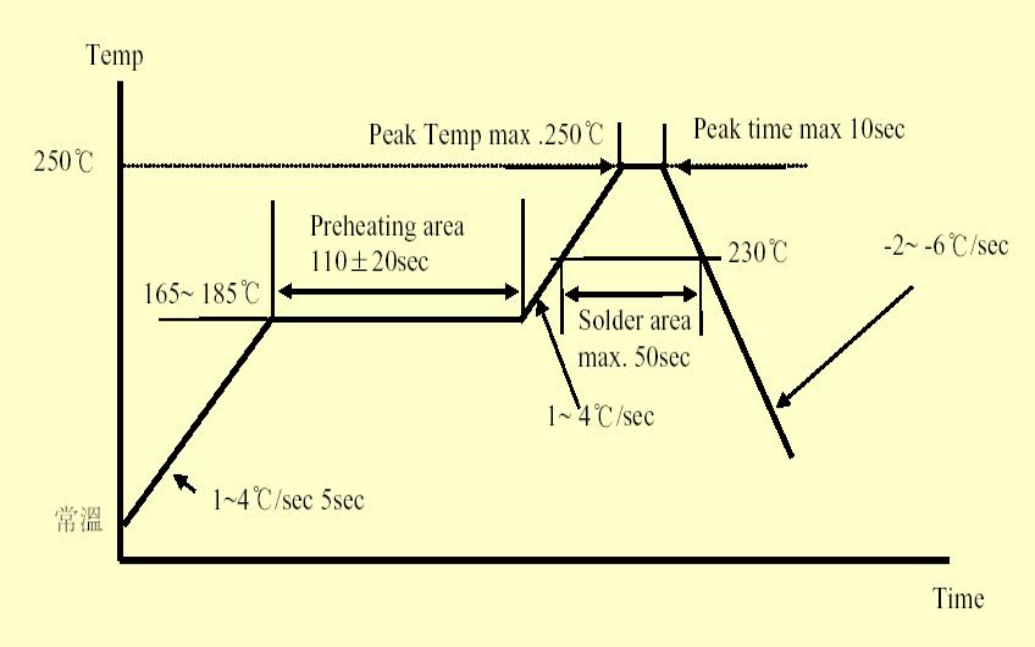
5-3. 환경적 성능(ENVIRONMENTAL PERFORMANCE)

ITEM (항 목)	TEST CONDITION (시험 방법)	REQUIREMENT (규 격)	
Durability 내구 시험	Mate and unmate specimens for 10th/min., 10,000 cycles. 삽, 발거 10,000회 진행후 접촉 저항 측정	Change from initial reguirement: Max. 30mΩ	
Vibration 내진성	Subjects specimens to 1.5mm, 10-55-10Hz for 2 hours at 3 times in each connector, X.Y.Z axes, 6 hours in total -> Exposed 2 hours after the test 진폭 1.5mm, 10-55-10Hz 1cycle로 X,Y,Z 각각 방향에서 2시간씩, 6시간 실시 -> 상온 2시간 후 측정.	Appearance 외관	No Damage
		Contact Resistance 접촉저항	Change from initial reguirement: Max. 30mΩ
		Discontinuity 단락	Max. 1㎲
Heat Resistance 내열성	Subject specimens 85±2℃ for 96 hours -> Exposed 2 hours after the test 온도 85±2℃에서 96시간 방치 -> 상온 2시간 방치 후 측정	Appearance 외관	No Damage
		Contact Resistance 접촉저항	Change from initial reguirement: Max. 30mΩ
Cold Resistance 내한성	Subject specimens -25±2℃ for 96 hours -> Exposed 2 hours after the test 온도 -25±2℃에서 96시간 방치 -> 상온 2시간 방치 후 측정	Appearance 외관	No Damage
		Contact Resistance 접촉저항	Change from initial reguirement: Max. 30mΩ
Thermal Shock (temperature Cycle) 열충격 (온도 Cycle)	Subject specimens to continuous 5cycles. (1 Cycle : -25℃/30min and exposed 10min and 85℃/30min and exposed 10min) 온도 -25℃(30분) -> 상온(10분) -> 85℃(30분) -> 상온(10분)을 1 Cycle로 5 Cycle 반복 후 상온에 2시간 방치 후 측정	Appearance 외관	No Damage
		Contact Resistance 접촉저항	Change from initial reguirement: Max. 30mΩ
Humidity 항온,항습	Subject specimens to 90-95% RH at 40±5℃ for 96 hours -> Exposed 2 hours after the test 온도 40℃, 습도 90-95%, 시간 96시간 방치 -> 상온 2시간 방치 후 측정	Appearance 외관	No Damage
		Contact Resistance 접촉저항	Change from initial reguirement: Max. 30mΩ
		Insulation Resistance 절연저항	Min. 100 MΩ
		Voltage Proof 내전압	No Damage

ITEM (항 목)	TEST CONDITION (시험 방법)	REQUIREMENT (규 격)	
Salt Spray 염수분무	Subject specimens to continuous 2cycles and wash it (1 Cycle : 5% salt concentration at 35℃ for 8 hours and exposed 16hours) 35℃에서 염수농도 5%를 8hr 분무 후, 16시간 휴지를 1 cycle로 2 cycle 실시 후 물에 씻고 측정	Appearance 외관	No Damage
		Contact Resistance 접촉저항	Change from initial reguirement: Max. 30mΩ
Solderability 땜성	Plating surface of solder-dipping section shall be covered with solder entirely. Solder temperature 245 -5+0℃, Immersion period : 3±0.5sec 납조 온도 245 -5+0℃, 침적 시간 : 3±0.5sec, 납이 균일하게 묻을 것.	Solder shall be coverd 90% or more of the area that is dipped Into the solder bath. 납이 균일하게 묻을 것.	

6. REFLOW CONDION

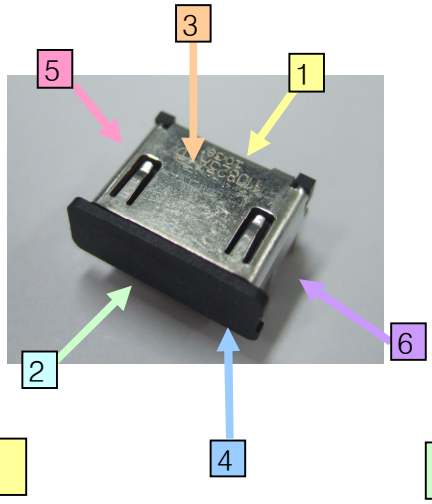
Fluxed soldering section of the connector shall be subjected to twice reflow sodering of condition shown in graph below. After test, the appearance shall be observed.
(아래조건에 준하여 납땜 진행)



7. REVISION

REV.	DATE	DESCRIPTION	ISSUED	CHECKED	APPROVED
A	2008-12-16	RELEASED	C.T.OH	J.Y.LEE	J.Y.LEE
B	2009-02-03	A CHANGE OF TERMINAL MATERIAL, PLATING & PRODUCT STRUCTURE	K.H.LEE	K.Y.CHOI	S.K.KWON
C	2011-08-10	A CHANGE OF PLATING	K.H.LEE	C.G.LEE	S.K.KWON

PRODUCT PHOTO	Date Issued : 2011년 08월 10일
Title of Subject : HDMI 19P RIGHT ANGLE SMD TYPE	Issued by : S.H.Hong



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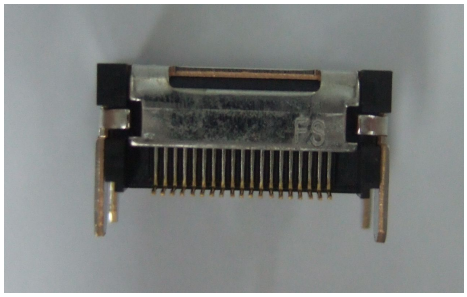

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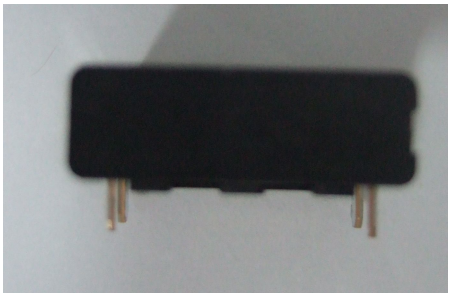

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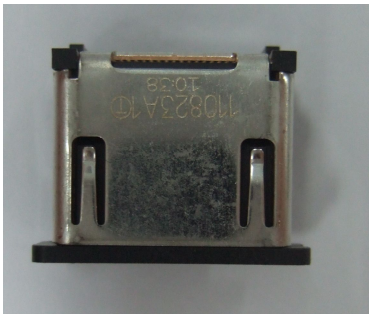

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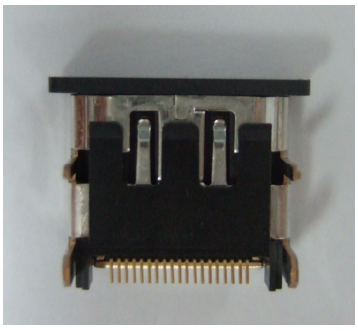

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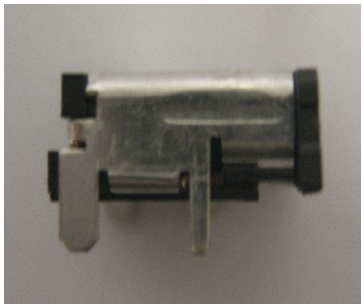
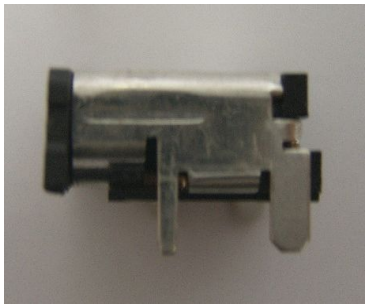


6

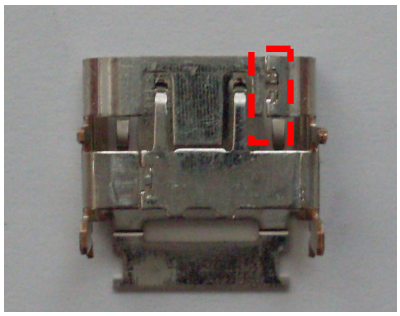


PRODUCT PHOTO	Date Issued : 2011년 08월 10일
Title of Subject : HDMI 19P RIGHT ANGLE SMD TYPE	Issued by : S.H.Hong

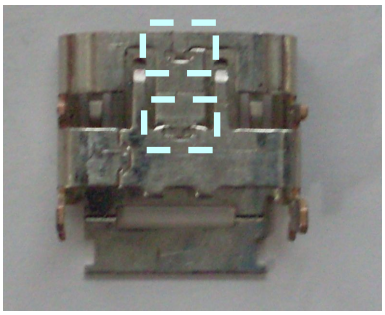
[Rev. B]

< SHELL >

변경전



변경후



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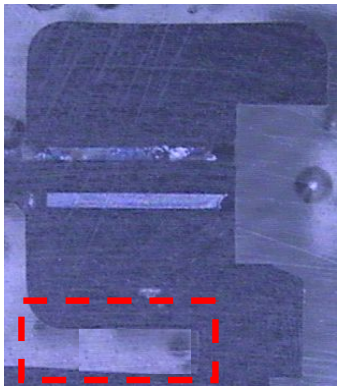

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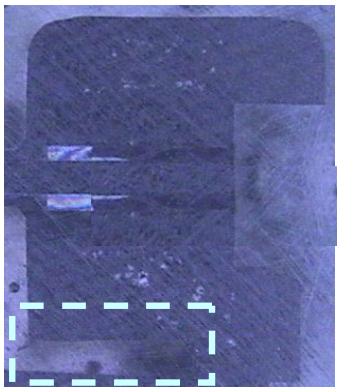
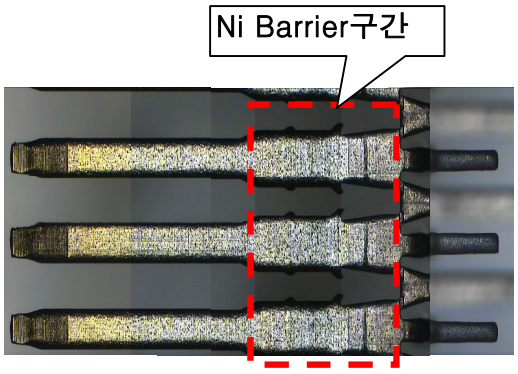


PRODUCT PHOTO	Date Issued : 2011년 08월 10일
Title of Subject : HDMI 19P RIGHT ANGLE SMD TYPE	Issued by : S.H.Hong

[Rev. B]

< TERMINAL >

변경전



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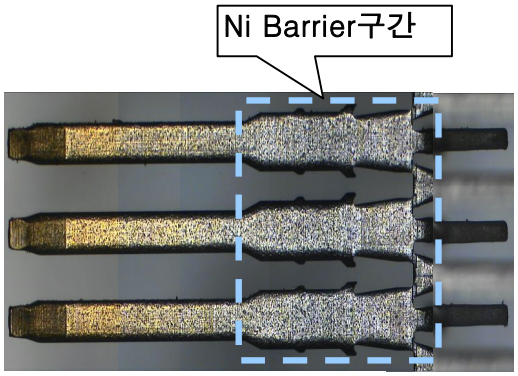

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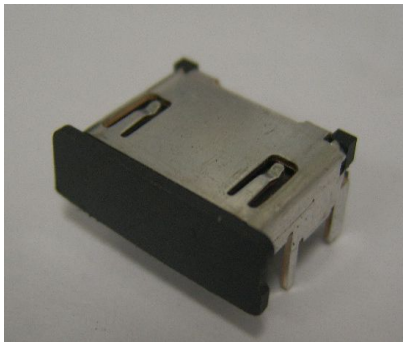
변경전

변경후

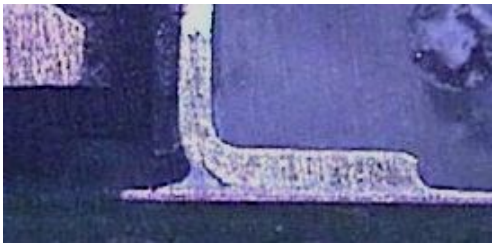


PRODUCT PHOTO	Date Issued : 2011년 08월 10일
Title of Subject : HDMI 19P RIGHT ANGLE SMD TYPE	Issued by : S.H.Hong

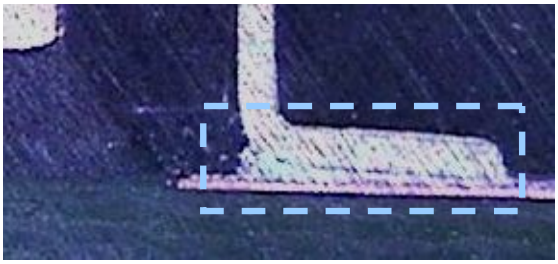
[Rev. C]

< TERMINAL >

변경전



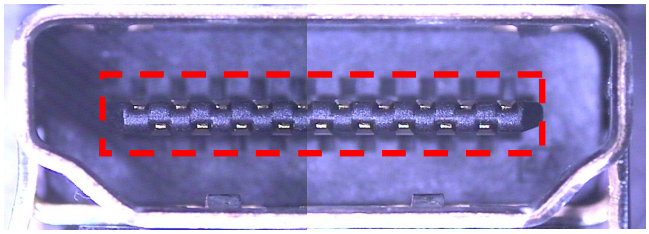
변경후



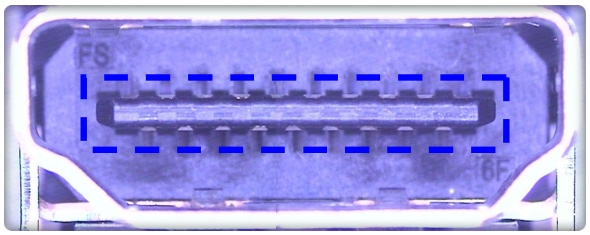
[Rev. D]

< INSULATOR >

변경전

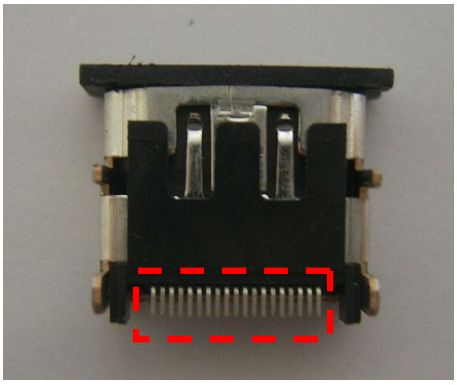


변경후

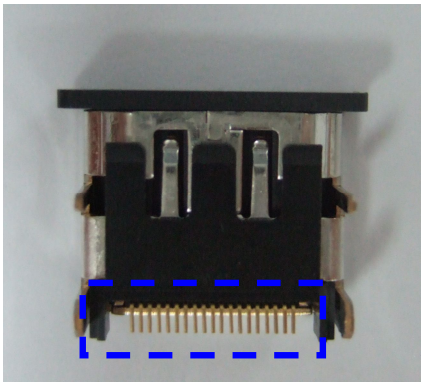


[Rev. E]

변경전

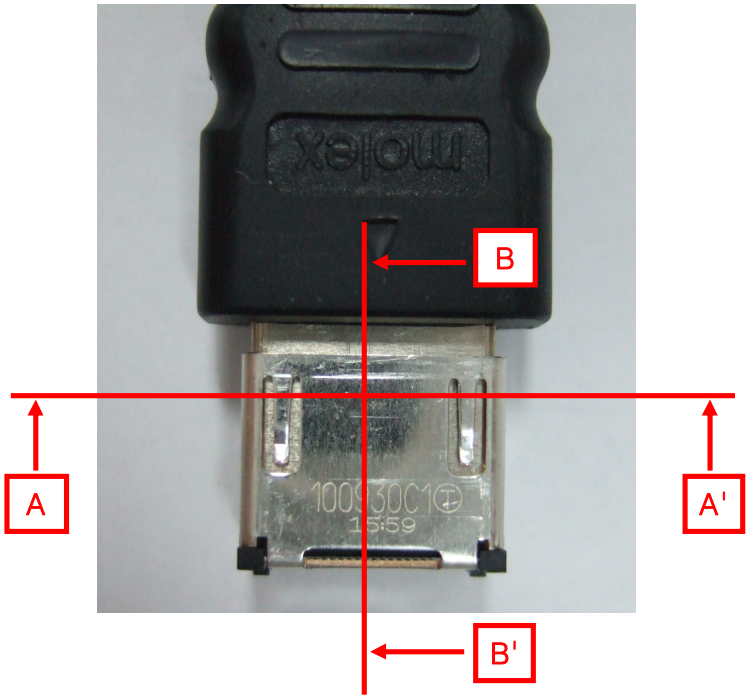


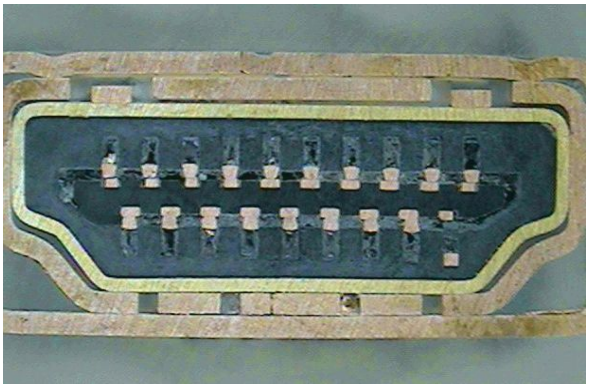
변경후



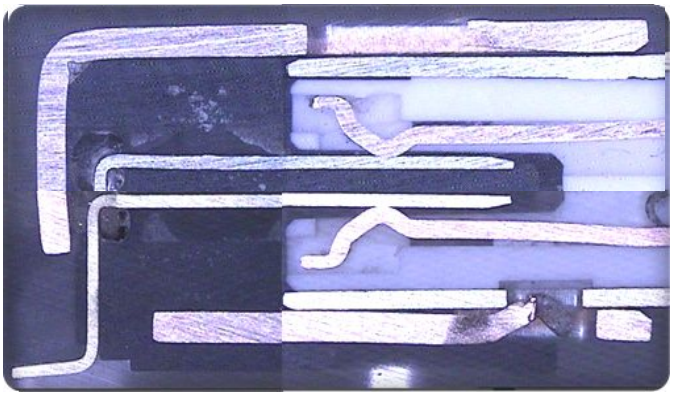
FOOSUNG	PRODUCT PHOTO	Date Issued : 2011년 08월 10일
Title of Subject : HDMI 19P RIGHT ANGLE SMD TYPE		Issued by : S.H.HONG

CONTACT



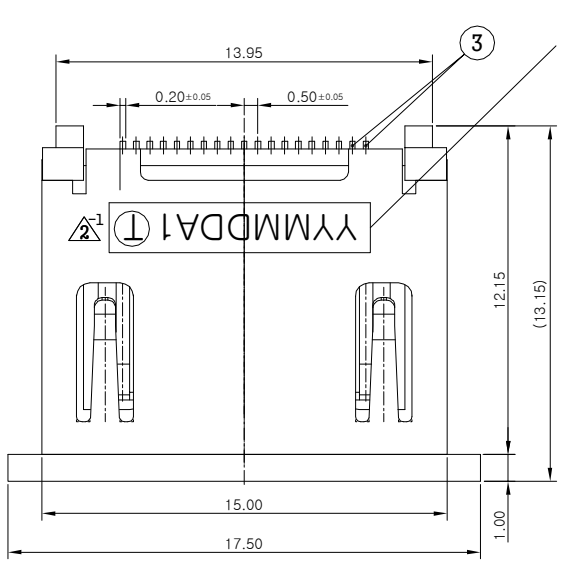


SECTION A-A'

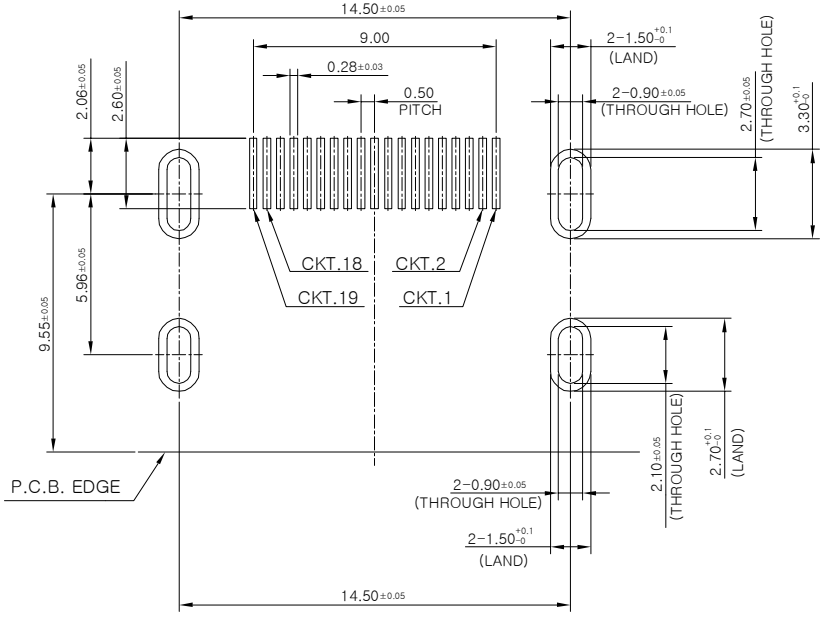


SECTION B-B'

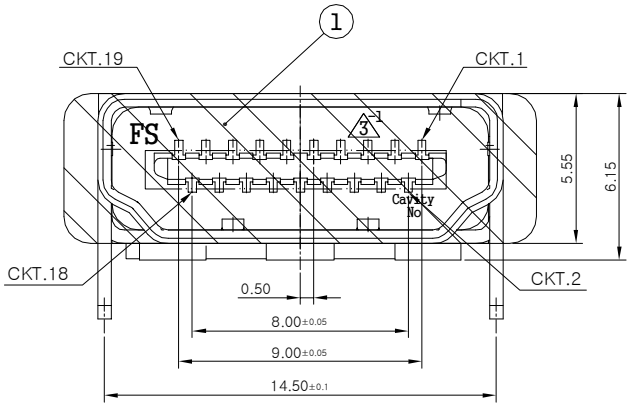
No.	Date	Revison Record	Designed	Checked	Approved
△1-2	2009.02.03	TERMINAL 재질 및 도금사양 변경, CAP추가	이기현	이령구	권상국
△2-1	2009.12.19	LOT MARCKING추가-2B	이기현	권상국	권상국
△3-1	2010.10.18	PIN밀림개선을 위한 수정-3E	이기현	권상국	권상국
△4-1	2011.08.10	도금사양 변경-3H	이기현	이철기	권상국

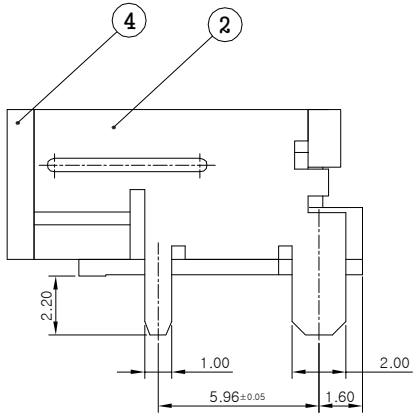


YY 年 MM 月 DD 日 A 生산 LINE (A,B,C--) 1 Ⓣ
- 검사확인
- 1 : 오전
- 2 : 오후



PCB PATTERN LAYOUT (T1.6±0.15)





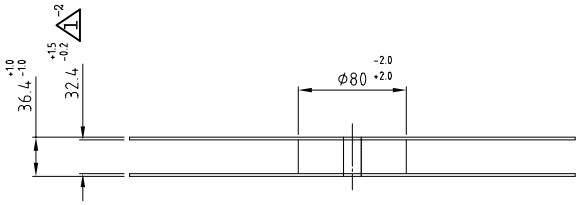
NOTE

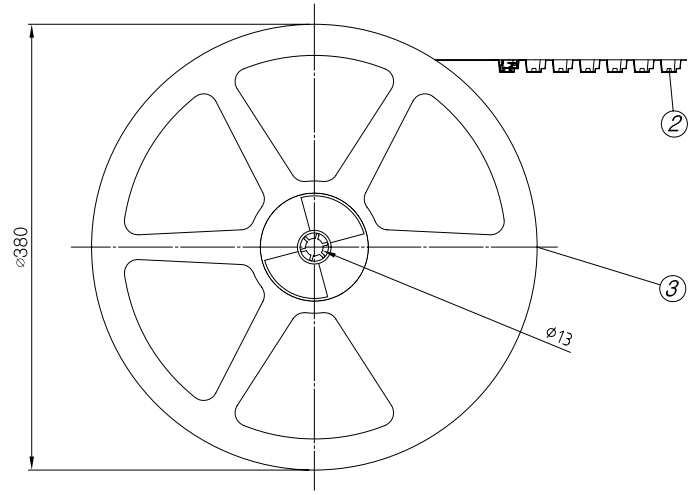
1. No rust, contamination, damage nor deformation effecting on function.
   (제품 기능 및 성능에 유해한 BURR, 변형, 휨, 이물질 등이 없을 것.)
2. LEAD Co-planarity (LEAD 평탄도) : Max 0.08mm
△4-1 3. PLATING(도금사양)
   - TERMINAL
     CONTACT AREA: Au 0.1㎛ Min Over Ni1.5~3.5㎛
     SOLDER AREA: Au 0.05㎛ Min Over Ni1.5~3.5㎛
   - SHELL : Sn 1.0㎛ Min

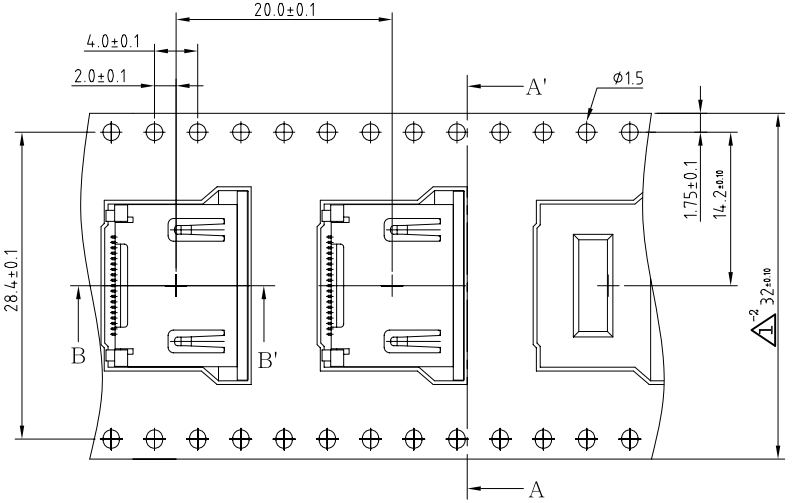
NO.	DESCRIPTION	PART NO.	Q'TY	MATERIAL	FINISH	REMARK
5	CAP	FD05015-M02	1	PA46 (TS250F6)	BLACK COLOR	UL94V-0
4	TERMINAL-B	FD05015-P02	10	△1-2 C2680	SEE NOTE	0.2T
3	TERMINAL-A	FD05015-P01	9	△1-1 C2680	SEE NOTE	0.2T
2	SHELL	FD05015-P03	1	C5210R-H	SEE NOTE	0.5T
1	INSULATOR	FD05015-M01	1	PA9T (GN2330)	BLACK COLOR	UL94V-0

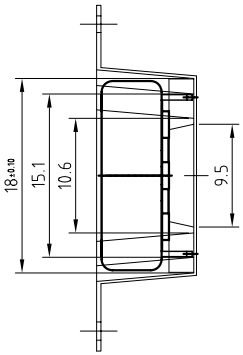
SCALE	5/1	DESIGNED	CHECKED	APPROVED	TITLE 0.5P HDMI HEADER 19P RIGHT ANGLE(SMD)
SIZE	A3	K.H.LEE		S.K.KWON	CODE FD05015-19
UNIT	mm				
SHEET	1/1	GENERAL TOLERANCE	± 0.2		FOOSUNG FOOSUNG TECH
3rd Angle Projection					

Rev No.	Date	Revison Record	Designed	Checked	Approved
△2	09.0203	제품변경에 따른 REEL변경	이기현	이령구	권상국

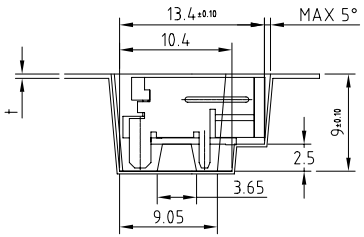






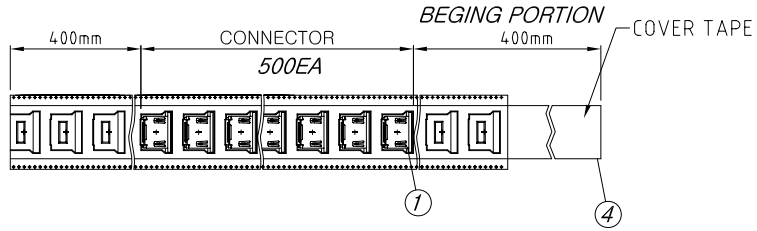


SECTION A-A'



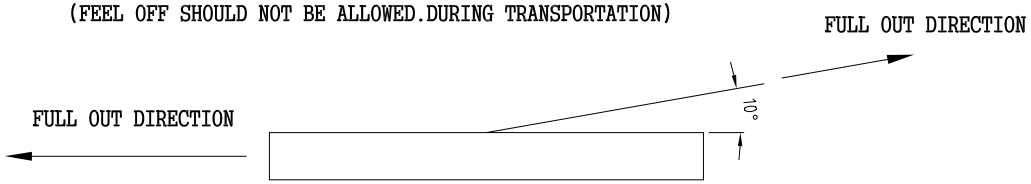
SECTION B-B'

FULL OUT DIRECTION



NOTE

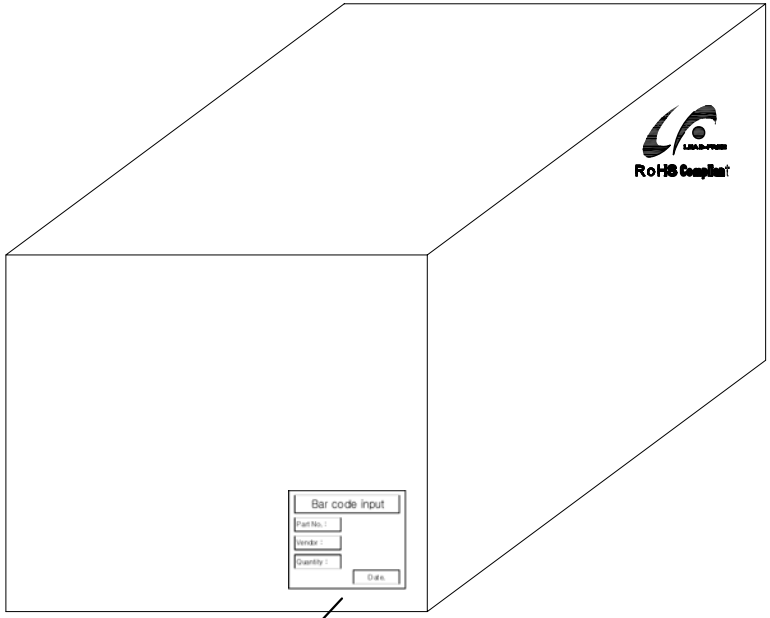
1. REEL - OFF FORCE OF COVER TAPE: 20~130gf
   (FEELING DIRECTION AS SHOWN IN FOLLOWING FIG.)
   THIS REQUIREMENTSHOULD BE APPLIED AT SHIPMENT
   (FEEL OFF SHOULD NOT BE ALLOWED.DURING TRANSPORTATION)

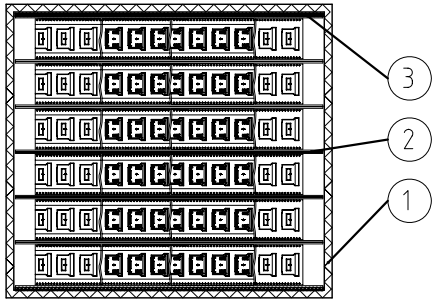


NO	DESCRIPTION	Q'TY	MATERIAL	FINISH	REMARK
4	COVER TAPE	-	PET		
3	BOBBIN	1EA	A.B.S		
2	CARRIER TAPE	1EA	POLYETHYLENE		
1	CONNECTOR	500EA			

SCALE	DATE	DESIGNED	CHECKED	APPROVED	PRODUCT NAME 모델명	0.5P HDMI HEADER 19P RIGHT ANGLE(SMD)	PRODUCT NO 모델번호	FD05015-19
2 / 1	081114	K.H.LEE	L.K.LEE	S.K.KWON	PART NAME 부품명	REEL PACKAGE	PART NO 부품번호	-
3rd Angle Projection					UNITE	TOLERANCE		
		FOOSUNG TECH IT BUSINESS DEPT			m m	10 UNDER ± 0.2 10 OVER ± 0.25 30 OVER ± 0.3		Rev 01

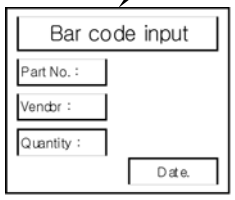
Rev No.	Date	Revison Record	Designed	Checked	Approved
2	09.0203	포장수량 변경(8reel->6reel, 4,000ea-> 3,000ea)	이기현	이령구	권상국





NOTE

1. 제품 BOX 치수는 제작치수 기준
2. BOX 두께 : 8mm
3. 재질 : LKKKK (BA골 이중양면 골판지(DW))
4. 제작치수 : 390 * 390 * 270
5. 인쇄사양 :
   - RoHS 개선품 => Green
   - 그 외 색상 => BLUE
6. 적용제품 :
   0.5P HDMI HEADER 19P RIGHT ANGLE(SMD)
7. PAD(0.8t) 제품 위,아래 적용.
8. BOX 적재 시 5단 이상 적재하지 말 것.
9. 포장사양 변경 시 사전에 반드시 담당자와 협의 할 것.



구분	적재 ITEM	한 REEL 제품수량	한 BOX 제품수량
1	0.5P HDMI HEADER 19P RIGHT ANGLE(SMD)	500EA	3,000 EA 2

NO	DESCRIPTION	Q'TY	MATERIAL	FINISH	REMARK
3	PAD(0.8t)	2EA	LKKKK		
2	REEL	6EA 2	PET		
1	OUT BOX	1EA	LKKKK		

SCALE	DATE	DESIGNED	CHECKED	APPROVED
5 / 1	081114	K.H.LEE	L.K.LEE	S.K.KWON
3rd Angle Projection				

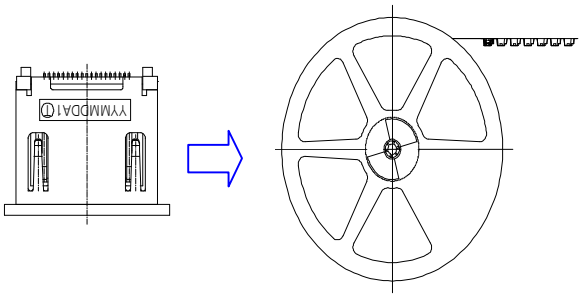
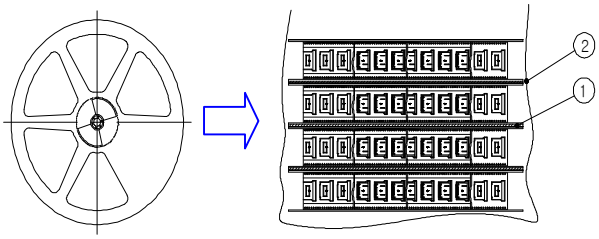
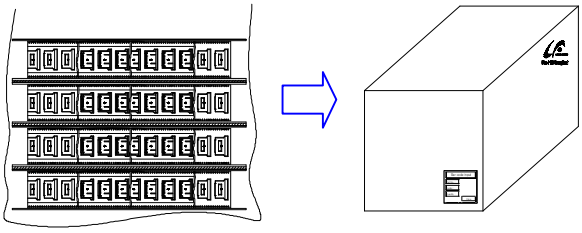
FOOSUNG TECH
IT BUSINESS DEPT

PRODUCT NAME 모델명	0.5P HDMI HEADER 19P RIGHT ANGLE(SMD)	PRODUCT NO 모델번호	FD05015-19
PART NAME 부품명	BOX PACKAGE	PART NO 부품번호	-
UNITE	TOLERANCE		
m m			

Rev 01

FOOSUNG PACKING SPECS	Date Issued : 2011년 08월 10일
Title of Subject : HDMI 19P RIGHT ANGLE SMD TYPE	Issued by : K.H.LEE

◆ Packing Method

Packing Process	Drawing(Picture)	Work Procedure
1차 개별포장 (500ea/1REEL)		1)제품을 CARRIER TAPE 에 포장한다. →Pick Up 면을 위로 향하게 포장한다.
2차 Pe Beg포장 (수량)		1)포장된 CARRIER TAPE 를 (총4단) Pe Beg 에 포장한다.
3차 OUTER포장 (2,000EA/1OUTER BOX)		1)포장된 Pe Beg 을 OUTER BOX 에 포장한다.

◆ Use of the Packing Material

No	Process	Item	Raw Material	Spec	Q'ty	Color	Remark
1	1차포장	REEL	PET	Φ380 * 36.4mm	4	청색	SMST
2	2차포장	PAD	골판 종이	385mm * 385mm * 0.8mm	1	황색	대원
3		PE BEG	PE	73cmX25cmX3.0t	1	무색	대일
4	3차포장	OUTER BOX	골판 종이	390mm * 390mm * 205mm	1	황색	대원

Certification status on HDMI Licensing, LLC.	Date Issued : 2011년 08월 10일
Title of Subject : HDMI 19P RIGHT ANGLE SMD TYPE	Issued by : S.H.Hong

◆ HDMI Licensing,LLC. [Approved Connector List]

Approved Connectors

In accordance with version 1.3c of the HDMI Compliance Test Specification ("CTS"), HDMI Licensing, LLC will maintain a list of approved connectors ("Approved Connector" list). For a device to pass CTS 1.3c testing at an Authorized Testing Center ("ATC"), all connectors on such device must appear on the Approved Connector list. To add a connector to this list, the system or connector vendor must test the connector at a qualified facility of the vendor's choosing, and the vendor must then submit to the ATC or HDMI Licensing, LLC full and passing testing results as set forth in the Connector Test Result Form ("CTRF"). The CTRF is available on the **Adopter Extranet**. Only HDMI Adopters may add their products to the Approved Connector List.

Successful completion of the CTRF and/or ATC Testing, and the fact that a connector is listed as an "Approved Connector" below does not guarantee that any connector or product will conform to the High-Definition Multimedia Interfaces, function correctly or interoperate with any other product. Each Adopter is solely responsible for ensuring that its products function correctly, fully comply with the HDMI Specification and Adopter Agreement, and interoperate with other products.

Policy for model name issue of approved connector list—Effective Immediately

It has come to our attention that many of connector submissions submitted in the past were incorrect.

The family model numbers such as "XXXXX" or "-----" are not allowed in connector model numbers. Please note that this is not a new policy. Base model and family model numbers have never been allowed for connectors.

Our goal is to correct all connector submissions as soon as is feasible. A single complete model number is required per each CTRF submitted for listing. We will be working with Adopters to ensure that all new submissions and revisions of current models are correctly implemented. We apologize for any inconvenience and look forward to working together to correct all submissions.

All existing connectors currently listed on the Approved Connector List are still valid until further notice.

There are currently four types of connectors available:

Foosung Tech Co., Ltd.	FD05015-19
	FD05017-19
	FD05019
	FD05020
	FW05040-21
	FW05049-21
	FW05050-21
	FW05051-20

FOOSUNG	QC FLOW CHART	Issued by : K.M.NAM	Date Issued : 2011년 08월 10일
		Title of Subject : HDMI 19P RIGHT ANGLE SMD TYPE	

[QC 공 정 도] (1/2)

문서번호	FSO-056	개정이력	NO	개정일	개정근거	확인
품 명	HDMI19P R/A		7			
품 번	FD0601 5-19		6			
제정일자	2009.01.19		5			
			4	2010.11.22	수입,공정,출하검사 내용수정	
			3	2010.07.26	OTO,OTF 추가	
			2	2010.03.03	파일공정 추가	
			1	2009.03.07	CAF, VISION 설비 도입	

결재	작성	검토	승인

공정 No	FLOW CHART SUB material	FLOW CHART Main	공정명	설 비	관리항목	SPEC 및 기준	측정방법	담당자	기록관리	관련표준	비고
1	INSULATOR CAP TERMINAL SHELL ▽	◇	수입검사		치수 외관 도금두께 환경관리물질	수입검사기준서 참조	공구현미경 확대경 도금두께 측정기 XRF	수입검사원	수입검사성적서	수입검사기준서 부적합처리절차서 특채처리절차서	KEEP SAMPLE 업체 출하 검사성적서 입고 의뢰서 도금두께 → OTF관리
2	INSULATOR투입 ▽	○	TERMINAL 'A' 가압입	TER'L INSERT M/C	Air압력 금형주기 Spare교체주기	5±1 kgf 주기별check 90일	설비부착GAUGE	OP	작업일지 설비점검CHECKSHEET	작업지도서 설비표준	
3		○	TERMINAL 'A' 경압입	경압입 M/C	Air압력 금형주기 Spare교체주기	5±1 kgf 주기별check 90일	설비부착GAUGE	OP	작업일지 설비점검CHECKSHEET	작업지도서 설비표준	AIR 압력 → OTO 관리
4		○	TERMINAL 'B' 가압입	TER'L INSERT M/C	Air압력 금형주기 Spare교체주기	5±1 kgf 주기별check 90일	설비부착GAUGE	OP	작업일지 설비점검CHECKSHEET	작업지도서 설비표준	
5		○	TERMINAL 'B' 경압입	경압입 M/C	Air압력 금형주기 Spare교체주기 핀유지력	5±1 kgf 주기별check 90일 MIN 0.20kgf	설비부착GAUGE	OP	작업일지 설비점검CHECKSHEET	작업지도서 설비표준	AIR 압력 → OTO 관리 핀유지력 → OTF관리
6		○	절단공정	절단공정 M/C	Air압력 금형주기	5±1 kgf 주기별check	설비부착GAUGE	OP	작업일지 설비점검CHECKSHEET	작업지도서 설비표준	AIR 압력 → OTO 관리
7	SHELL투입 ▽	○	INSULATOR ASS'Y + SHELL 조립	자동 조립 M/C	Air압력 금형주기	5±1 kgf 주기별check	설비부착GAUGE	OP	작업일지 설비점검CHECKSHEET	작업지도서 설비표준	
8		○	SHELL BENDING	SHELL BENDING M/C	Air압력 금형주기	5±1 kgf 주기별check	설비부착GAUGE	OP	작업일지 설비점검CHECKSHEET	작업지도서 설비표준	AIR 압력 → OTO 관리
9		◇	내압검사	내압검사기	TEST TIME 내압시험	0.5sec 700V	설비부착GAUGE	OP	작업일지 설비점검CHECKSHEET	작업지도서 설비표준	
10		◇	SHELL LOCATION 검사	자동 LOCATION 검사장비	Air압력	2kgf	설비부착GAUGE	OP	검사일지 설비점검CHECKSHEET	작업지도서 설비표준	

FOOSUNG **QC FLOW CHART**	Issued by : K.M.NAM	Date Issued : 2011년 08월 10일
	Title of Subject : HDMI 19P RIGHT ANGLE SMD TYPE	

【 QC 공 정 도 】 (2/2)

문서번호	FSQ-056
품 명	HDMI19P R/A
품 번	FD0601 5-19
제정일자	2009.01.19

개정이력 NO	개정일	개정내역	확인
7			
6			
5			
4	2010.11.22	수입,공정,출하검사 내용수정	
3	2010.07.26	OTO,OTF 추가	
2	2010.04.04	마킹공정 추가	
1	2009.04.07	CAP, VISION 설비 보완	

결재	작성	검토	승인
	(서명)	(서명)	(서명)

공정 No	FLOW CHART SUB	FLOW CHART Main	공정명	설 비	관리항목	SPEC 및 기준	측정방법	담당자	기록관리	관련표준	비고
11		◇	VISION검사 (내부핀 유무)	VISION 검사기	검출력 SENSOR점검	주별CHECK 주별CHECK	공구현미경	OP	작업일지 설비점검CHECKSHEET	작업지도서 설비표준	
12	CAP투입 ▽	○	CAP조립	자동 조립 M/C	Air압력 급유주기 Rail청소 상태 CAP조립상태	5±1 kgf 주기별check 일별check 이상없을것	설비부착GAUGE	OP	작업일지 설비점검CHECKSHEET	작업지도서 설비표준	
13		◇	VISION검사 (평탄,치수)	VISION 검사기	검출력 SENSOR점검	주별CHECK 주별CHECK	공구현미경	OP	작업일지 설비점검CHECKSHEET	작업지도서 설비표준	
14		◇	공정검사		외관 치수 LOCATION 검사	이상없을것	확대경 공구현미경 JIG	공정검사자	공정검사일지	공정검사지도서	외관 : 20EA/TIME별 치수 : 5EA/TIME별 LOCATION검사 : 5EA/TIME별 평탄(MAX 0.08) → OTF관리
15		○	LASER MARKING	LASER MARKING M/C	마킹위치 마킹상태 마킹인쇄내용	이상없을것	육안	OP	작업일지 설비점검CHECKSHEET	작업지도서 설비표준	
16		○	CARRIER TAPE포장	자동 포장기	온도 외관 PEEL FORCE값	설비별 조건 표준화 이상없을것 20~80gf	PEEL OFF TESTER 확대경	작업자 작업자 공정검사자	설비점검CHECKSHEET 작업일지 공정검사일지	설비표준 작업지도서 공정검사지도서	실링상태(터짐,들어짐),캐리어변형
17		◇	외관검사		핀누락,핀변형 사출파손,CRACK SHELL 변형 핀압입상태	이상없을것	확대경	외관검사자	작업일지 공정검사일지	작업지도서 공정검사지도서	전수검사
18		◇	출하검사		외관 치수,LOCATION검사 기능 LOT NO.	이상없을것 출하검사기준서참조 출하검사기준서참조 이상없을것	확대경 공구현미경,JIG 기능검사 장비	출하검사자	검사기준서 검사일지	출하검사기준서 부적합제품관리규정 [illegible]	외관 : G-Ⅱ, AQL0.04 치수,LOCATION : n=5,C=0 기능 : n=5,C=0
19		○	LABEL 부착 및 BOX포장	BARCODE LABEL PRINTER	LOT NO. TILT,훼손 DIRTY	이상없을것	육안	작업자	포장LOT기록일지	식별 및 추적성관리규정 [illegible]	
20		○	출하		LOT NO. LABEL부착상태 BOX포장상태	이상없을것	육안	작업자	출하대장	출하관리규정 LOT관리규정	

FOOSUNG	EVALUATION TEST REPORT	Date Issued : 2011년 08월 10일
Title of Subject :	HDMI 19P RIGHT ANGLE SMD TYPE	Issued by : S.H.HONG

1. SUMMARY

	Test Title	Test Condition	Specification	Sample1	Sample2	Sample3	Sample4	Sample5	Conclusion
Electrical	1-1 Contact Resistance	◎ Measured the resistance of mated connector. 20mV,10mA	Max. 30mΩ	22.4	22	21.7	21.9	21.6	PASS
	1-2 Insulation Rsistance	◎ Test voltage : DC 500V 1minute	Min. 100MΩ	9999↑	9999↑	9999↑	9999↑	9999↑	PASS
	1-3 Voltage proof	◎ Test voltage : AC 250V 1minute	No Damage	OK	OK	OK	OK	OK	PASS
Mecanical	2-1 Total Insertion Force	◎ Measure force necessary to mate between the counterpart connector	Max. 4.5kgf	2.74	2.69	2.62	2.70	2.59	PASS
	2-2 Total Withdrawal Force	◎ Measure force necessary to unmate between the counterpart connector	1~4kgf	2.24	2.06	2.19	1.94	2.11	PASS
	2-3 Pin retention Force	◎ It shall be pulled to the pin in the speed of 25mm per minute,and measured the force when the pin begins to remove from the insulator	Min. 0.2kgf/Pin	1.35	1.30	1.42	1.36	1.12	PASS
Environmental	3-1 Durability	◎ Mate and unmate speccimens for 10th/min., 30 cycles in total.	Apperance : No Damage	OK	OK	OK	OK	OK	PASS
			Contact Resistance : Max 50 mΩ	21.7	21.8	21.5	21.6	21.5	PASS
	3-2 Vibration	◎ Amplitude: 1.5mm 1Cycle:10-55-10Hz for 2 hour Total Cycle :3Cycle	Apperance : No Damage	OK	OK	OK	OK	OK	PASS
			Contact Resistance : MAX 30mΩ	22.4	21.7	21.6	22.2	21.8	PASS
			Discontinuity : Max 1㎲	OK	OK	OK	OK	OK	PASS
	3-3 Heat Resistance	◎ Chamber temperature :85±2℃ Exposede time : 96hrs	Apperance : No Damage	OK	OK	OK	OK	OK	PASS
			Contact Resistance : MAX 30mΩ	21.6	21.5	21.7	22	21.8	PASS
	3-4 Cold Resistance	◎ Chamber temperature :-25±2℃ Exposede time : 96hrs	Apperance : No Damage	OK	OK	OK	OK	OK	PASS
			Contact Resistance : MAX 30mΩ	21.8	21.6	21.7	21.89	22.2	PASS
	3-5 Thermal Shock	◎ 1Cycle: -25℃(30min)-> Room temperature(10min) -> 82℃(30min) -> Roomtemperature(10min) Total Cycle: 5 Cycle	Apperance : No Damage	OK	OK	OK	OK	OK	PASS
			Contact Resistance : MAX 30mΩ	21.6	21.8	21.6	22.1	21.7	PASS
	3-6 Humidity	◎ Chamber temperature : 40±5℃ Relative humidity : 30~95% Exposede time : 96hrs	Apperance : No Damage	OK	OK	OK	OK	OK	PASS
			Contact Resistance : MAX 30mΩ	21.7	21.7	22.5	22.2	22.4	PASS
			Insulation Resistance : Min. 100MΩ	9999↑	9999↑	9999↑	9999↑	9999↑	PASS
			Voltage proof : No Damage	OK	OK	OK	OK	OK	PASS
	3-7 Salt Spray	◎ 1 Cycle : 5% salt concentration at 35 for 8 hours and exposed 16hours Exposede time : 96hrs TotalCycle: 2Cycle	Apperance : No Damage	OK	OK	OK	OK	OK	PASS
			Contact Resistance : MAX 30mΩ	22.1	21.8	21.9	22.3	22.4	PASS
	3-8 Solderability	◎ Solder temperature : 245 +0/-5℃ Immersion period : 3±0.5sec	Min. 90%	OK	OK	OK	OK	OK	PASS
	3-9 Wrenching Strength	◎ Mated connectorS Apply perpendic forces to plug at a 15mm distance fro edge of the receptacle. Forces applied in 3 directions (from fro side)	Min. 4.6kgf	7.13	6.85	6.76	8.03	7.75	PASS
				11.83	10.96	10.84	11.86	11.39	PASS
				13.48	15.04	13.69	14.74	14.08	PASS

FOOSUNG	EVALUATION TEST REPORT	Date Issued : 2011년 08월 10일
Title of Subject :	HDMI 19P RIGHT ANGLE SMD TYPE	Issued by : S.H.HONG

1.ELECTRICAL

1-1. **Contact Resistance** data (접촉 저항 자료)

▶ Test condition of Contact Resistance (접촉 저항 시험조건) : Measure it with low voltage less than 20mV and 10mA

▶ Test equipment (시험장비) : Contact Resistance GAUGE

▶ Test Spec (시험 SPEC) : MAX 30mΩ

▶ Test DATA : (Unit : mΩ)

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	17.4	17.5	16.8	16.4	15.6	15.3	16.6	15.8	16.2	16.7	15.3	17.5	16.4	PASS

1-2. **Insulation Resistance** data (절연 저항 자료)

▶ Test condition of Insulation Resistance (절연 저항 시험조건) : Apply 500V DC between adjacent contacts and measure its resistance within 1 mir

▶ Test equipment (시험장비) :

▶ Test Spec (시험 SPEC) : Min 100MΩ

▶ Test DATA : (Unit : MΩ)

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	9999↑	9999↑	9999↑	9999↑	9999↑	9999↑	9999↑	9999↑	9999↑	9999↑	-	-	-	PASS

1-3. **Voltage proof** data (내전압)

▶ Test condition of Voltage proof (내전압 시험조건) : Apply the specified voltage between adjacent contacts

▶ Test equipment (시험장비) :

▶ Test Spec (시험 SPEC) : No Damage

▶ Test DATA

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	-	-	-	PASS

2.MECANICAL

2-1. **Total Insertion Force** data (총합삽입력)

▶ Test condition of total insertion force (총합삽입력 시험조건) : Measure force necessary to mate between the counterpart connectors

▶ Test equipment (시험장비) : PUSH PULL GAUGE

▶ Test Spec (시험 SPEC) : Max. 4.5kgf

▶ Test DATA : (Unit : kgf)

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
DATA	1.47	1.65	1.56	1.58	1.43	1.68	1.78	1.59	1.76	1.51	1.43	1.78	1.60	PASS

2-2. **Total withdrawal force** data (총합발거력)

▶ Test condition of total withdrawal force (총합발거력 시험조건) : Measure force necessary to mate between the counterpart connectors

▶ Test equipment (시험장비) : PUSH PULL GAUGE

▶ Test Spec (시험 SPEC) : 1~4kgf

▶ Test DATA

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
DATA	2.29	2.48	2.74	2.19	2.54	2.67	2.81	2.58	2.61	2.66	2.19	2.81	2.56	PASS

2-3. **Pin retention force** data (Pin 유지력)

▶ Test condition of pin retention force (Pin유지력 시험조건) : It shall be pulled to the pin in the speed of 25mm per minute, and measured the force when the pin begins to remove from the insulator

▶ Test equipment (시험장비) : PUSH PULL GAUGE

▶ Test Spec (시험 SPEC) : Min. 0.2kgf/Pin

▶ Test DATA

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	0.98	0.71	0.75	0.82	0.79	1.05	0.96	0.91	0.81	0.73	0.71	1.05	0.85	PASS

3. Environmental

3-1. Durability data (내구성 자료)

◎Test condition of Durability (내구성 시험조건) : Mate and unmate specimens for Normal,10,20,30 cycles

가) **Appearance** (외 관)

▶ Test Spec (시험 spec) : No damage

No	Condition	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Conclusion
1	NORMAL	OK	OK	OK	OK	OK	Pass
2	10	OK	OK	OK	OK	OK	Pass
3	20	OK	OK	OK	OK	OK	Pass
4	30	OK	OK	OK	OK	OK	Pass
Referance data	100	OK	OK	OK	OK	OK	Pass
	300	OK	OK	OK	OK	OK	Pass
	500	OK	OK	OK	OK	OK	Pass

나) **Contact Resistance** data (접촉 저항 자료)

▶ Test condition of Contact Resistance (접촉저항 시험조건) : Measure it with low voltage less than 20mV and 1

▶Test equipment (시험장비) : Contact Resistance GAUGE

▶ Test DATA : (Unit : mΩ)

No	Condition	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Conclusion
1	NORMAL	16.3	16.8	17.5	15.3	17.3	Pass
2	10	16.2	16.9	17.2	15.6	17.6	Pass
3	20	16.2	17.1	17.3	16.0	17.2	Pass
4	30	16.1	17.4	17.0	16.2	18.0	Pass
Referance data	100	16.2	17.3	17.1	15.9	17.3	Pass
	300	16.3	17.3	17.2	15.4	17.4	Pass
	500	16.3	17.4	17.5	15.6	17.5	Pass

다) **Mating,Unmating** data (삽,발거력 자료)

▶ Test condition of Mating,Unmating (삽,발거력 자료) : Measure force necessary to mate between the counterpart connectors

▶ Test equipment (시험장비) : PUSH-PULL GAUGE

▶ Durability Test Spec (시험 SPEC) : Total Insertion Force MAX 3.0kgf , Total Withdrawal Force MIN 0.3kgf

▶ Test DATA (Condition : Unlocking) (Unit : kgf)

No	Condition	Sample 1		Sample 2		Sample 3		Sample 4		Sample 5		Conclusion
		Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	
1	NORMAL	1.59	2.67	1.57	2.51	1.86	2.64	1.93	2.51	1.86	2.58	Pass
2	10	1.56	2.65	1.54	2.50	1.85	2.63	1.89	2.49	1.85	2.56	Pass
3	20	1.54	2.48	1.53	2.53	1.83	2.58	1.86	2.47	1.83	2.55	Pass
4	30	1.52	2.60	1.52	2.52	1.81	2.55	1.85	2.47	1.82	2.53	Pass
Referance data	100	1.50	2.58	1.45	2.52	1.75	2.53	1.81	2.42	1.77	2.51	Pass
	300	1.46	2.55	1.40	2.48	1.72	2.49	1.76	2.38	1.74	2.45	Pass
	500	1.41	2.51	1.38	2.45	1.68	2.46	1.72	2.36	1.69	2.40	Pass

3-2. Vibration Data (내진성 자료)

◎ Test condition of Vibraion (내진성 시험조건) : Subjects specimens to 1.5mm,10-55-10Hz for 2 hours at 3 times in each connector, X.Y.Z axes, 6 hours in total -> Exposed 2 hours after the test

가) **Appearance** (외 관)

▶ Test Spec (시험 spec) : No damage

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	-	-	-	PASS

나) **Contact Resistance** data (접촉 저항 자료)

▶ Test condition of Contact Resistance (접촉저항 시험조건): Measure it with low voltage less than 20mV and 10mA.

▶ Test equipment (시험장비) : Contact Resistance GAUGE

▶ Test Spec (시험 SPEC) : NORMAL MAX 30mΩ, AFTER TEST MAX 30mΩ

▶ Test DATA : (Unit : mΩ)

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	17.1	16.2	16.8	17.0	16.9	16.7	17.3	17.5	17.2	16.5	16.2	17.5	16.92	PASS

다) **Discontinuity** data (단락 자료)

▶ Test equipment (시험장비) :

▶ Durability Test Spec (시험 SPEC) : Max 1㎲

▶ Test DATA

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	-	-	-	PASS

3-3. **Heat Resistance** DATA (내열성 자료)

◎ Test condition of Heat Resistance (내열성 시험조건) : Subject specimens 85±2℃ for 96 hours -> Exposed 2 hours after the test

가) **Appearance** (외 관)

▶ Test Spec (시험 spec) : No damage

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	-	-	-	PASS

나) **Contact Resistance** data (접촉 저항 자료)

▶ Test condition of Contact Resistance (접촉저항 시험조건): Measure it with low voltage less than 20mV and 10mA.

▶ Test equipment (시험장비) : Contact Resistance GAUGE

▶ Test Spec (시험 SPEC) : NORMAL MAX 30mΩ, AFTER TEST MAX 30mΩ

▶ Test DATA : (Unit : mΩ)

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	16.3	16.2	15.8	16.3	17.1	16.2	15.9	17.1	17.3	16.4	15.8	17.3	16.5	PASS

3-4. **Cold Resistance** DATA (내한성 자료)

◎ Test condition of Cold Resistance (내한성 시험조건) : Subject specimens -25±2℃ for 96 hours -> Exposed 2 hours after the test

가) **Appearance** (외 관)

▶ Test Spec (시험 spec) : No damage

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	-	-	-	PASS

나) **Contact Resistance** data (접촉 저항 자료)

▶ Test condition of Contact Resistance (접촉저항 시험조건): Measure it with low voltage less than 20mV and 10mA.

▶ Test equipment (시험장비) : Contact Resistance GAUGE

▶ Test Spec (시험 SPEC) : NORMAL MAX 30mΩ, AFTER TEST MAX 30mΩ

▶ Test DATA : (Unit : mΩ)

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	16.8	16.7	17.5	18.2	17.0	17.2	16.8	16.9	17.0	17.1	16.7	18.2	17.1	PASS

3-5. **Thermal shock** DATA (열충격 자료)

◎ Test condition of Heat Resistance (내열성 시험조건) : Subject specimens 85±2℃ for 96 hours -> Exposed 2 hours after the test
(1 Cycle : -25℃/30min and exposed 10min and 85℃/30min and exposed 10min)

가) **Appearance** (외 관)

▶ Test Spec (시험 spec) : No damage

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	-	-	-	PASS

나) **Contact Resistance** data (접촉 저항 자료)

▶ Test condition of Contact Resistance (접촉저항 시험조건): Measure it with low voltage less than 20mV and 10mA

▶ Test equipment (시험장비) : Contact Resistance GAUGE

▶ Test Spec (시험 SPEC) : NORMAL MAX 30mΩ, AFTER TEST MAX 30mΩ

▶ Test DATA : (Unit : mΩ)

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	17.2	17.1	16.8	16.1	17.3	17.3	16.9	16.4	16.5	17.0	16.1	17.3	16.9	PASS

3-6. **Humidity** DATA (항온,항습 자료)

◎ Test condition of Humidity (항온,항습 시험조건) : Subject specimens to 90-95% RH at 40±5℃ for 96 hours -> Exposed 2 hours after the test

가) **Appearance** (외 관)

▶ Test Spec (시험 spec) : No damage

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	-	-	-	PASS

나) **Contact Resistance** data (접촉 저항 자료)

▶ Test condition of Contact Resistance (접촉저항 시험조건): Measure it with low voltage less than 20mV and 10mA.

▶ Test equipment (시험장비) : Contact Resistance GAUGE

▶ Test Spec (시험 SPEC) : NORMAL MAX 30mΩ, AFTER TEST MAX 30mΩ

▶ Test DATA : (Unit : mΩ)

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	16.9	16.2	17.5	17.2	17.3	17.1	16.6	16.9	17.0	17.5	16.2	17.5	17.02	PASS

다) **Insulation Resistance** data (절연 저항 자료)

▶ Test condition of Insulation Resistance (절연 저항 시험조건) : Apply 500V DC between adjacent contacts and measure its resistance within 1 mi

▶ Test equipment (시험장비) :

▶ Test Spec (시험 SPEC) : Min 100MΩ

▶ Test DATA : (Unit : MΩ)

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	9999↑	9999↑	9999↑	9999↑	9999↑	9999↑	9999↑	9999↑	9999↑	9999↑	-	-	-	PASS

라) **Voltage proof** data (내전압)

▶ Test condition of Voltage proof (내전압 시험조건) : Apply the specified voltage between adjacent contacts

▶ Test equipment (시험장비) :

▶ Test Spec (시험 SPEC) : No Damage

▶ Test DATA

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	-	-	-	PASS

3-7. Salt Spray DATA (염수분무 자료)

◎ Test condition of Salt Spray (항온,항습 시험조건) : Subject specimens to continuous 2cycles and wash it
(1 Cycle : 5% salt concentration at 35℃ for 8 hours and exposed 16hours)

가) **Appearance** (외 관)

▶ Test Spec (시험 spec) : No damage

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	-	-	-	PASS

나) **Contact Resistance** data (접촉 저항 자료)

▶ Test condition of Contact Resistance (접촉 저항 시험조건): Measure it with low voltage less than 20mV and 10mA.

▶ Test equipment (시험장비) : Contact Resistance GAUGE

▶ Test Spec (시험 SPEC) : NORMAL MAX 30mΩ, AFTER TEST MAX 30mΩ

▶ Test DATA : (Unit : mΩ)

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	16.4	16.4	16.2	17.8	16.1	16.8	17.0	16.6	16.2	17.1	16.1	17.8	16.66	PASS

3-8. Solderability DATA (납땜성 자료)

◎ Test condition of Solderability (납땜성 시험조건) : Plating surface of solder-dipping section shall be covered with solder entirely.
Solder temperature 245 -5+0℃, Immersion period : 3±0.5sec

▶ Test Spec (시험 SPEC) : Solder shall be coverd 90% or more of the area that is dipped into the solder bath.

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	-	-	-	PASS

3-9. **Wrenching Strength** (접합성 자료)

◎ Test condition of Wrenching Strength (접합성 시험조건) : Mated connectorS Apply perpendicular forces to plug at a 15mm distance from the edge of the receptacle. Forces applied in 3 directions (from Front, Rear, Side)

▶ Test equipment (시험장비) : PUSH PULL GAUGE

▶ Test Spec (시험 SPEC) : Min 4.6kgf

▶ Test DATA : Front

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	7.13	6.85	6.76	8.03	7.75	7.14	7.58	8.11	6.96	7.48	6.76	8.11	7.38	PASS

▶ Test DATA : Rear

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	11.83	10.96	10.84	11.86	11.39	11.62	10.95	12.43	11.76	11.28	10.84	12.43	11.49	PASS

▶ Test DATA : Side

No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample10	MIN	MAX	AVG	Conclusion
1	13.48	15.04	13.69	14.74	14.08	14.46	14.05	15.11	14.79	14.25	13.48	15.11	14.37	PASS

FOOSUNG	INSPECTION REPORT	Date Issued : 2011년 08월 10일
Title of Subject :	HDMI 19P RIGHT ANGLE SMD TYPE	Issued by : S.H.HONG

1. SUMMARY

1-1. DIMENSION

No	Dimension	n=1	n=2	n=3	n=4	n=5	Min	Max	Avg	CPK	Conclusion
1	13.95 ±0.2	13.81	13.82	13.81	13.81	13.82	13.81	13.82	13.81	12.75	Passed
2	0.5 ±0.05	0.51	0.51	0.52	0.52	0.51	0.51	0.52	0.51	15.49	Passed
3	15.0 ±0.2	15.04	15.00	15.04	15.01	15.01	15.00	15.04	15.02	4.07	Passed
4	17.50 ±0.2	17.47	17.49	17.47	17.47	17.49	12.15	17.49	15.11	5.69	Passed
5	12.15 ±0.2	12.15	12.16	12.16	12.15	12.17	12.15	12.17	12.15	7.48	Passed
6	1.00 ±0.2	1.01	1.00	1.00	1.01	1.00	1.00	1.01	1.00	8.99	Passed
7	8.0 ±0.05	7.97	7.98	7.99	7.99	7.99	7.97	7.99	7.99	5.95	Passed
8	9.0 ±0.05	8.97	8.96	8.98	8.98	8.96	8.94	8.98	8.96	7.73	Passed
9	14.5 ±0.2	14.57	14.59	14.58	14.59	14.56	14.56	14.62	14.58	2.74	Passed
10	0.5 ±0.2	0.50	0.50	0.49	0.50	0.49	0.49	0.50	0.50	14.40	Passed
11	5.55 ±0.05	5.59	5.61	5.58	5.58	5.56	5.56	5.75	5.64	1.39	Passed
12	1.0 ±0.2	0.96	0.96	0.95	0.95	0.96	0.95	0.96	0.96	9.70	Passed
13	5.96 ±0.2	6.07	6.03	6.06	6.04	6.04	6.03	6.07	6.05	2.29	Passed
14	2.0 ±0.2	1.96	1.94	1.96	1.96	1.95	1.94	1.96	1.95	9.31	Passed
15	1.6 ±0.2	1.51	1.50	1.50	1.49	1.50	1.49	1.51	1.50	4.57	Passed
16	2.25 ±0.2	2.25	2.24	2.26	2.23	2.24	2.18	2.26	2.22	6.34	Passed
17	6.08 ±0.2	6.10	6.07	6.07	6.08	6.09	6.01	6.23	6.10	5.84	Passed
18	Pin Flatness MAX 0.1	0.047	0.054	0.057	0.047	0.049	0.05	0.07	0.05	1.55	Passed
19	appearance	good	good	good	good	good	good	good	good	good	Passed

1-2. PLATING

	SPEC	SAMPLE 1	SAMPLE 2	SAMPLE 3	SAMPLE 4	SAMPLE 5	Min	Max	AVG	Conclusion
TERMINAL (contact)	Ni: 1.5~3.5㎛	2.75	2.75	2.81	2.86	2.97	2.75	2.97	2.83	PASS
	Au: 0.1 Min	0.14	0.15	0.15	0.15	0.15	0.14	0.15	0.15	PASS
TERMINAL (Lead)	Ni: 1.5~3.5㎛	2.97	2.91	2.88	2.80	2.90	2.80	2.97	2.89	PASS
	Au: 0.05 Min	0.06	0.06	0.07	0.07	0.07	0.06	0.07	0.07	PASS
Shell	Sn: 1.0 Min㎛	1.17	1.30	1.29	1.32	1.37	1.17	1.37	1.29	PASS

1-3. PROCESS CAPAVILITY (SPEC : CPK. Min 1.33)

	SPEC	AVG	S.D(표준편차)	Min	Max	CPK	Conclusion
Contact Resistance	Max. 30 mΩ	16.9	0.22	16.4	17.3	20.12	GOOD
Pitch	0.5±0.05	0.497	0.01	0.480	0.520	1.24	GOOD
Total Insertion Force	Max. 4.5kgf/pin	1.61	0.09	1.46	1.83	5.71	GOOD
Total Withdrawal Force	1-4kgf/pin	2.57	0.10	2.27	2.80	4.56	GOOD
Pin retention force	MIN. 0.2kgf/pin	0.89	0.02	0.86	0.94	7.00	GOOD

1-4. OUTGOING INSPECTION DATA: 합격

- 당社 Specification 에 모두 준함.

DIMENSION CHECK DATA

Date Issued :
2011년 08월 10일

Issued by : S.H.Hong

Approval	☑ App. ☑ Dim. ☐ Con.	Company	FOOSUNG TECH
Part Name	HDMI 19P RIGHT ANGLE SMD TYPE	Revised ECN No.	-
Part No.	FD05015-19	Result	Passed
Date	2011년 08월 10일	Inspector	S.H.Hong

Unit : mm

No	Dimension	n=1	n=2	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10	Result
1	13.95 ±0.2	13.81	13.80	13.82	13.80	13.80	13.81	13.82	13.81	13.81	13.82	Passed
2	0.5 ±0.05	0.52	0.52	0.50	0.51	0.51	0.52	0.52	0.51	0.51	0.51	Passed
3	15.0 ±0.2	15.02	15.02	15.04	15.00	15.02	15.01	15.02	15.00	15.04	15.01	Passed
4	17.50 ±0.2	17.48	17.49	17.48	17.47	17.49	17.50	17.51	17.49	17.48	17.49	Passed
5	12.15 ±0.2	12.15	12.20	12.16	12.15	12.16	12.16	12.16	12.16	12.16	12.20	Passed
6	1.00 ±0.2	0.99	1.00	1.00	1.01	0.99	1.01	1.00	1.01	1.01	0.99	Passed
7	8.0 ±0.05	7.98	7.98	7.99	7.96	7.98	7.98	8.00	7.98	7.98	7.98	Passed
8	9.0 ±0.05	8.96	8.96	8.96	8.95	8.95	8.96	8.96	8.96	8.95	8.97	Passed
9	14.5 ±0.2	14.63	14.59	14.63	14.55	14.56	14.55	14.56	14.56	14.63	14.62	Passed
10	0.5 ±0.2	0.49	0.49	0.51	0.49	0.49	0.50	0.50	0.50	0.50	0.50	Passed
11	5.55 ±0.05	5.59	5.59	5.58	5.58	5.59	5.57	5.56	5.59	5.58	5.59	Passed
12	1.0 ±0.2	0.96	0.95	0.95	0.97	0.95	0.97	0.96	0.96	0.95	0.97	Passed
13	5.96 ±0.2	6.02	6.05	6.05	6.07	6.03	6.03	6.05	6.05	6.04	6.04	Passed
14	2.0 ±0.2	1.95	1.96	1.96	1.96	1.95	1.96	1.95	1.96	1.96	1.96	Passed
15	1.6 ±0.2	1.51	1.50	1.49	1.49	1.51	1.50	1.51	1.51	1.51	1.51	Passed
16	2.20 ±0.2	2.23	2.24	2.25	2.24	2.22	2.23	2.24	2.23	2.23	2.24	Passed
17	6.15 ±0.2	6.04	6.08	6.07	6.09	6.11	6.04	6.09	6.10	6.11	6.09	Passed
18	Pin Flatness MAX 0.1	0.061	0.059	0.048	0.059	0.050	0.051	0.048	0.063	0.060	0.049	Passed
19	appearance	good	good	good	good	good	good	good	good	good	good	Passed

< REMARKS >

DIMENSION CHECK DATA

Date Issued :
2011년 08월 10일

Issued by : S.H.Hong

Approval	☑ App. ☑ Dim. ☐ Con.	Company	FOOSUNG TECH
Part Name	HDMI 19P RIGHT ANGLE SMD TYPE	Revised ECN No.	-
Part No.	FD05015-19	Result	Passed
Date	2009년 05월 07일	Inspector	S.H.Hong

Unit : mm

No	Dimension	n=11	n=12	n=13	n=14	n=15	n=16	n=17	n=18	n=19	n=20	Result
1	13.95 ±0.2	13.80	13.81	13.82	13.80	13.81	13.81	13.80	13.81	13.82	13.80	Passed
2	0.5 ±0.05	0.51	0.51	0.52	0.51	0.51	0.50	0.52	0.51	0.52	0.51	Passed
3	15.0 ±0.2	15.01	15.01	15.01	15.00	15.02	15.01	15.02	15.01	15.03	15.02	Passed
4	17.50 ±0.2	17.49	17.49	17.48	17.47	17.47	17.49	17.47	17.51	17.50	17.49	Passed
5	12.15 ±0.2	12.15	12.18	12.17	12.16	12.18	12.16	12.17	12.16	12.17	12.17	Passed
6	1.00 ±0.2	1.00	1.00	0.99	1.00	1.01	0.99	1.00	1.01	1.00	1.01	Passed
7	8.0 ±0.05	7.98	7.98	7.99	7.98	7.98	7.98	7.98	7.99	7.99	7.99	Passed
8	9.0 ±0.05	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.97	Passed
9	14.5 ±0.2	14.56	14.56	14.56	14.57	14.63	14.56	14.62	14.63	14.63	14.56	Passed
10	0.5 ±0.2	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	Passed
11	5.55 ±0.05	5.57	5.58	5.59	5.57	5.57	5.56	5.58	5.59	5.58	5.59	Passed
12	1.0 ±0.2	0.95	0.95	0.95	0.96	0.97	0.97	0.97	0.97	0.96	0.96	Passed
13	5.96 ±0.2	6.05	6.05	6.05	6.05	6.05	6.04	6.04	6.04	6.04	6.05	Passed
14	2.0 ±0.2	1.96	1.96	1.96	1.96	1.96	1.96	1.95	1.95	1.95	1.96	Passed
15	1.6 ±0.2	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.50	1.51	1.51	Passed
16	2.20 ±0.2	2.25	2.24	2.23	2.23	2.24	2.24	2.23	2.23	2.24	2.25	Passed
17	6.15 ±0.2	6.10	6.08	6.07	6.11	6.11	6.10	6.08	6.09	6.08	6.09	Passed
18	Pin Flatness MAX 0.1	0.060	0.061	0.047	0.069	0.068	0.051	0.059	0.063	0.046	0.051	Passed
19	appearance	good	good	good	good	good	good	good	good	good	good	Passed

< REMARKS >

DIMENSION CHECK DATA

Date Issued :

2011년 08월 10일

Issued by : S.H.Hong

Approval	☑ App. ☑ Dim. ☐ Con.	Company	FOOSUNG TECH
Part Name	HDMI 19P RIGHT ANGLE SMD TYPE	Revised ECN No.	-
Part No.	FD05015-19	Result	Passed
Date	2009년 05월 07일	Inspector	S.H.Hong

Unit : mm

No	Dimension	n=21	n=22	n=23	n=24	n=25	n=26	n=27	n=28	n=29	n=30	Result
1	13.95 ±0.2	13.82	13.81	13.81	13.80	13.81	13.80	13.80	13.82	13.81	13.80	Passed
2	0.5 ±0.05	0.51	0.51	0.52	0.50	0.50	0.51	0.51	0.50	0.51	0.51	Passed
3	15.0 ±0.2	15.01	15.00	15.04	15.01	15.00	15.01	15.00	15.01	15.01	15.01	Passed
4	17.50 ±0.2	17.49	17.48	17.48	17.47	17.48	17.48	17.50	17.47	17.50	17.47	Passed
5	12.15 ±0.2	12.19	12.16	12.18	12.19	12.16	12.18	12.16	12.18	12.17	12.18	Passed
6	1.00 ±0.2	1.00	1.00	1.00	1.01	1.01	0.99	1.00	1.00	1.01	0.99	Passed
7	8.0 ±0.05	7.98	7.99	7.97	7.97	7.98	7.97	7.98	7.99	7.97	7.97	Passed
8	9.0 ±0.05	8.99	8.96	8.96	8.96	8.96	8.96	8.94	8.96	8.96	8.96	Passed
9	14.5 ±0.2	14.60	14.56	14.56	14.57	14.57	14.57	14.59	14.56	14.56	14.57	Passed
10	0.5 ±0.2	0.50	0.49	0.49	0.50	0.50	0.49	0.50	0.50	0.49	0.50	Passed
11	5.55 ±0.05	5.59	5.58	5.59	5.59	5.58	5.59	5.58	5.58	5.56	5.59	Passed
12	1.0 ±0.2	0.96	0.96	0.97	0.96	0.96	0.97	0.96	0.96	0.96	0.96	Passed
13	5.96 ±0.2	6.06	6.03	6.02	6.05	6.04	6.05	6.03	6.05	6.05	6.04	Passed
14	2.0 ±0.2	1.96	1.95	1.95	1.95	1.95	1.96	1.95	1.95	1.96	1.95	Passed
15	1.6 ±0.2	1.49	1.49	1.50	1.50	1.48	1.51	1.48	1.49	1.48	1.49	Passed
16	2.20 ±0.2	2.23	2.23	2.24	2.25	2.25	2.24	2.23	2.22	2.24	2.23	Passed
17	6.15 ±0.2	6.10	6.07	6.08	6.06	6.08	6.06	6.09	6.09	6.09	6.10	Passed
18	Pin Flatness MAX 0.1	0.049	0.051	0.054	0.043	0.049	0.046	0.037	0.046	0.043	0.059	Passed
19	appearance	good	good	good	good	good	good	good	good	good	good	Passed

< REMARKS >

DIMENSION CHECK DATA

Date Issued :

2011년 08월 10일

Issued by : S.H.Hong

Approval	☑ App. ☑ Dim. ☐ Con.	Company	FOOSUNG TECH
Part Name	HDMI 19P RIGHT ANGLE SMD TYPE	Revised ECN No.	-
Part No.	FD05015-19	Result	Passed
Date	2009년 05월 07일	Inspector	S.H.Hong

Unit : mm

No	Dimension	n=31	n=32	n=33	n=34	n=35	n=36	n=37	n=38	n=39	n=40	Result
1	13.95 ±0.2	13.80	13.81	13.80	13.81	13.81	13.82	13.80	13.80	13.81	13.82	Passed
2	0.5 ±0.05	0.51	0.51	0.51	0.50	0.52	0.50	0.52	0.51	0.50	0.51	Passed
3	15.0 ±0.2	15.03	15.02	15.04	15.03	15.00	15.01	15.02	15.02	15.02	15.01	Passed
4	17.50 ±0.2	17.49	17.49	17.48	17.50	17.49	17.49	17.47	17.48	17.48	17.50	Passed
5	12.15 ±0.2	12.17	12.19	12.16	12.15	12.17	12.16	12.16	12.17	12.16	12.19	Passed
6	1.00 ±0.2	1.00	1.00	1.00	1.01	0.99	1.00	0.99	1.01	1.01	0.99	Passed
7	8.0 ±0.05	7.97	7.97	7.98	7.97	7.97	7.97	7.99	7.99	7.99	7.99	Passed
8	9.0 ±0.05	8.96	8.97	8.96	9.98	8.96	8.96	8.96	8.98	8.96	8.96	Passed
9	14.5 ±0.2	14.59	14.57	14.56	14.57	14.62	14.58	14.58	14.61	14.56	14.60	Passed
10	0.5 ±0.2	0.50	0.50	0.50	0.50	0.49	0.49	0.49	0.50	0.49	0.50	Passed
11	5.55 ±0.05	5.58	5.58	5.55	5.56	5.57	5.59	5.58	5.57	5.59	5.56	Passed
12	1.0 ±0.2	0.95	0.96	0.96	0.97	0.96	0.96	0.96	0.96	0.96	0.96	Passed
13	5.96 ±0.2	6.04	6.04	6.05	6.03	6.04	6.05	6.03	6.06	6.05	6.04	Passed
14	2.0 ±0.2	1.95	1.95	1.96	1.96	1.96	1.95	1.96	1.95	1.96	1.96	Passed
15	1.6 ±0.2	1.51	1.50	1.49	1.49	1.51	1.50	1.50	1.51	1.50	1.49	Passed
16	2.20 ±0.2	2.24	2.26	2.25	2.25	2.24	2.23	2.24	2.23	2.24	2.23	Passed
17	6.15 ±0.2	6.05	6.10	6.08	6.06	6.07	6.10	6.10	6.08	6.08	6.08	Passed
18	Pin Flatness MAX 0.1	0.039	0.048	0.030	0.070	0.070	0.051	0.054	0.055	0.059	0.049	Passed
19	appearance	good	good	good	good	good	good	good	good	good	good	Passed

< REMARKS >

DIMENSION CHECK DATA

Date Issued :
2011년 08월 10일

Issued by : S.H.Hong

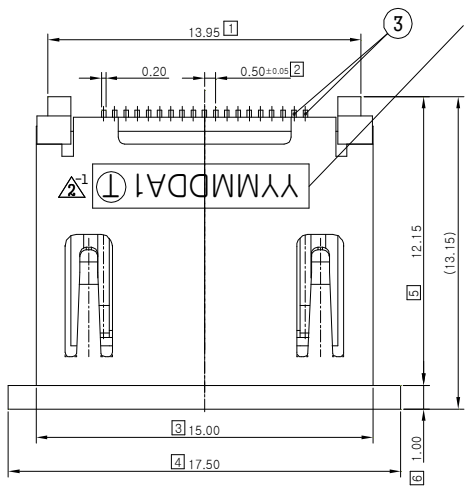
Approval	☑ App. ☑ Dim. ☐ Con.	Company	FOOSUNG TECH
Part Name	HDMI 19P RIGHT ANGLE SMD TYPE	Revised ECN No.	-
Part No.	FD05015-19	Result	Passed
Date	2009년 05월 07일	Inspector	S.H.Hong

Unit : mm

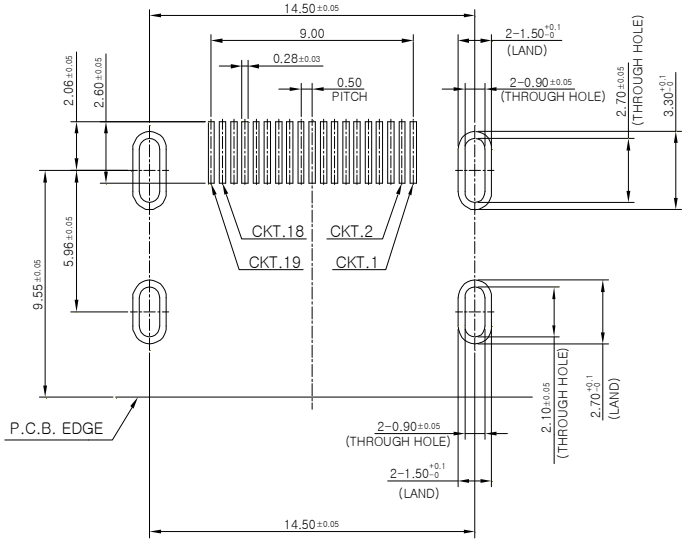
No	Dimension	n=41	n=42	n=43	n=44	n=45	n=46	n=47	n=48	n=49	n=50	Result
1	13.95 ±0.2	13.81	13.82	13.81	13.81	13.82	13.81	13.82	13.81	13.81	13.82	Passed
2	0.5 ±0.05	0.51	0.51	0.52	0.52	0.51	0.52	0.52	0.51	0.51	0.52	Passed
3	15.0 ±0.2	15.04	15.00	15.04	15.01	15.01	15.00	15.02	15.02	15.02	15.01	Passed
4	17.50 ±0.2	17.47	17.49	17.47	17.47	17.49	17.49	17.47	17.49	17.49	17.47	Passed
5	12.15 ±0.2	12.15	12.16	12.16	12.15	12.17	12.16	12.16	12.16	12.17	12.17	Passed
6	1.00 ±0.2	1.01	1.00	1.00	1.01	1.00	1.00	1.00	0.99	1.01	0.99	Passed
7	8.0 ±0.05	7.97	7.98	7.99	7.99	7.99	7.97	7.97	7.99	7.97	7.99	Passed
8	9.0 ±0.05	8.97	8.99	8.96	8.99	8.96	8.96	8.96	8.96	8.97	8.99	Passed
9	14.5 ±0.2	14.57	14.59	14.58	14.59	14.56	14.60	14.61	14.59	14.58	14.59	Passed
10	0.5 ±0.2	0.50	0.50	0.49	0.50	0.49	0.49	0.50	0.50	0.49	0.50	Passed
11	5.55 ±0.05	5.58	5.59	5.58	5.59	5.52	5.58	5.58	5.57	5.59	5.57	Passed
12	1.0 ±0.2	0.96	0.96	0.95	0.95	0.96	0.97	0.97	0.95	0.97	0.97	Passed
13	5.96 ±0.2	6.07	6.03	6.06	6.04	6.04	6.05	6.03	6.07	6.03	6.02	Passed
14	2.0 ±0.2	1.96	1.94	1.96	1.96	1.95	1.95	1.96	1.96	1.95	1.95	Passed
15	1.6 ±0.2	1.51	1.50	1.50	1.49	1.50	1.50	1.50	1.51	1.49	1.49	Passed
16	2.20 ±0.2	2.25	2.24	2.26	2.23	2.24	2.23	2.23	2.24	2.24	2.23	Passed
17	6.15 ±0.2	6.10	6.07	6.07	6.08	6.09	6.10	6.09	6.09	6.08	6.07	Passed
18	Pin Flatness MAX 0.1	0.047	0.054	0.057	0.047	0.049	0.031	0.043	0.032	0.047	0.032	Passed
19	appearance	good	good	good	good	good	good	good	good	good	good	Passed

< REMARKS >

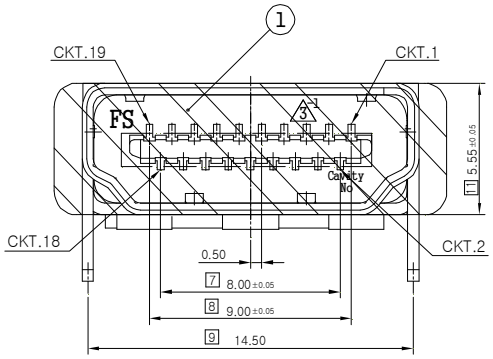
No.	Date	Revison Record	Designed	Checked	Approved
12	2009.02.03	TERMINAL 재질 및 도금사양 변경, CAP추가	이기현	이령구	권상규
21	2009.12.19	LOT MARCKING추가-2B	이기현	권상규	권상규
31	2010.10.18	PIN밀림개선을 위한 수정-3E	이기현	권상규	권상규
41	2011.08.10	도금사양 변경-3H	이기현	이철기	권상규

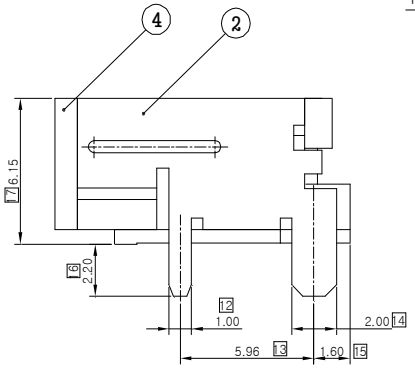


YY 年 MM 月 DD 日 A 生산 LINE (A,B,C--) 1 ① 검사확인 1 : 오전 2 : 오후



PCB PATTERN LAYOUT (T1.6±0.15)





NOTE

1. No rust, contamination, damage nor deformation effecting on function. (제품 기능 및 성능에 유해한 BURR, 변형, 휨, 이물질 등이 없을 것.)
2. LEAD Co-planarity (LEAD 평탄도) : Max 0.08mm
3. 41 PLATING(도금사양)
   - TERMINAL
     CONTACT AREA: Au 0.1㎛ Min Over Ni1.5~3.5㎛
     SOLDER AREA: Au 0.05㎛ Min Over Ni1.5~3.5㎛
   - SHELL : Sn 1.0㎛ Min

NO.	DESCRIPTION	PART NO.	Q'TY	MATERIAL	FINISH	REMARK
5	CAP	FD05015-M02	1	PA46 (TS250F6)	BLACK COLOR	UL94V-0
4	TERMINAL-B	FD05015-P02	10	12 C2680	SEE NOTE	0.2T
3	TERMINAL-A	FD05015-P01	9	11 C2680	SEE NOTE	0.2T
2	SHELL	FD05015-P03	1	C5210R-H	SEE NOTE	0.5T
1	INSULATOR	FD05015-M01	1	PA9T (GN2330)	BLACK COLOR	UL94V-0

SCALE	5/1	DESIGNED	CHECKED	APPROVED	TITLE 0.5P HDMI HEADER 19P RIGHT ANGLE(SMD)
SIZE	A3	K.H.LEE		S.K.KWON	CODE FD05015-19
UNIT	mm				
SHEET	1/1	GENERAL TOLERANCE	± 0.2		FOOSUNG FOOSUNG TECH
3rd Angle Projection					

DIMENSION CHECK DATA

Date Issued :

2011년 08월 10일

Title of Subject	HDMI 19P RIGHT ANGLE SMD TYPE	S.H.Hong

◆ PLATING THICKNESS DATA

Material	Shell		Terminal(contact부)			Terminal(lead부)		
	소재	표면도금 (Sn)	소재	하지도금 (Ni)	표면도금 (Au)	소재	하지도금 (Ni)	표면도금 (Sn)
Spec	c5210	Min 1.0㎛	C2680	1.3~3.5㎛	Min 0.1㎛	C2680	1.3~3.5㎛	3.0~5.0㎛
실측(Avg)	-	1.29㎛	-	3.10㎛	0.38㎛	-	2.37㎛	3.24㎛
Conclusion	-	Pass	-	Pass	Pass	-	Pass	Pass

DIMENSION CHECK DATA

Date Issued :

2011년 08월 10일

Title of Subject	HDMI 19P RIGHT ANGLE SMD TYPE	S.H.Hong

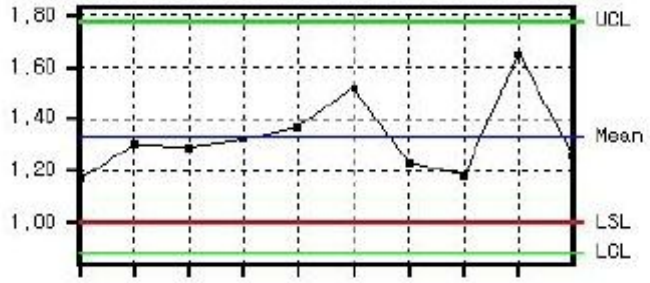
◆ Shell

No.	μm Sn		Sn 1.01 tolerance 1.33 1.65
1	1.17		
2	1.30		
3	1.29		
4	1.32		
5	1.37		
6	1.52		
7	1.23		
8	1.18		
9	1.65		
10	1.26		
MEAN	1.33		
S.DEV	0.151		

COL : 0.20 mm

----- Sn -----
--- Bronz ---

SEC: 10



Sn//Bronz STATISTICAL RESULT

	Sn μm
Data No:	10
최대값 :	1.65
최소값 :	1.17
범위 :	0.48
평균값 :	1.33
표준편차:	0.151
변동계수:	11.362
Cp :	
Cpk:	0.728
LSL:	1.00
USL:	

FOOSUNG DIMENSION CHECK DATA		Date Issued : 2011년 08월 10일
Title of Subject	HDMI 19P RIGHT ANGLE SMD TYPE	S.H.Hong

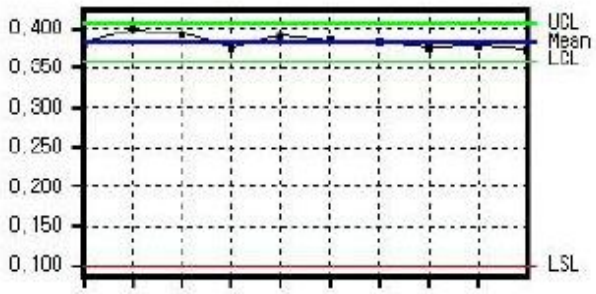
◆ TERMINAL (Contact)

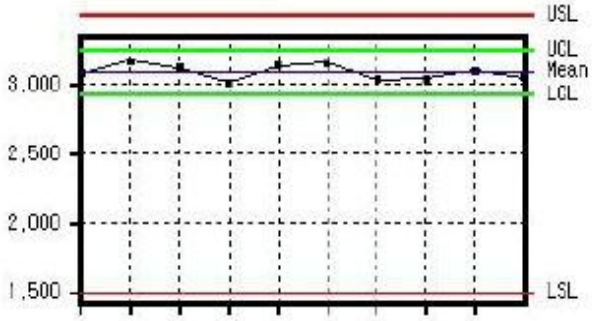
No.	μm Au	μm Ni	Au 0.367 tolerance 0.383 0.399
1	0.380	3.079	
2	0.399	3.170	
3	0.392	3.122	
4	0.376	3.016	
5	0.390	3.135	
6	0.384	3.154	
7	0.383	3.035	
8	0.375	3.046	
9	0.378	3.101	
10	0.373	3.049	
MEAN	0.383	3.091	
S.DEV	0.008	0.054	

COL : 0.20 mm

----- Au -----
----- Ni -----
--- Brass ---

SEC: 10





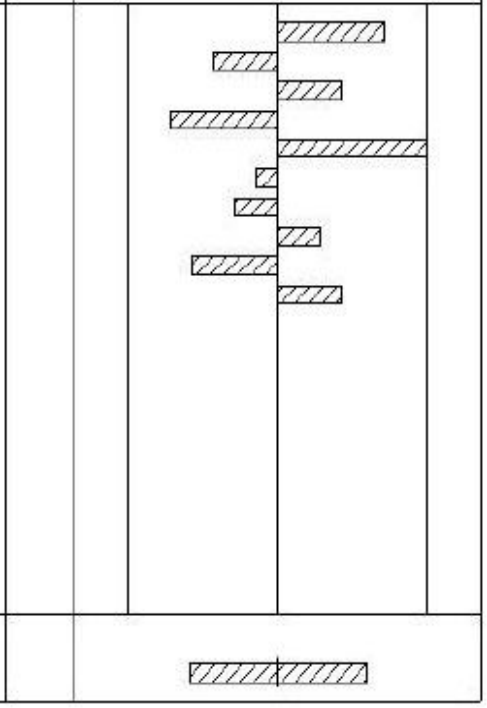
Au/Ni//Brass STATISTICAL RESULT

	Au μm	Ni μm
Data No:	10	10
최대값 :	0.399	3.170
최소값 :	0.373	3.016
범위 :	0.026	0.154
평균값 :	0.383	3.091
표준편차:	0.008	0.054
변동계수:	2.089	1.747
Cp :		6.173
Cpk:	11.792	2.525
LSL:	0.100	1.500
USL:		3.500

FOOSUNG DIMENSION CHECK DATA		Date Issued : 2011년 08월 10일
Title of Subject	HDMI 19P RIGHT ANGLE SMD TYPE	S.H.Hong

◆ TERMINAL (Lead)

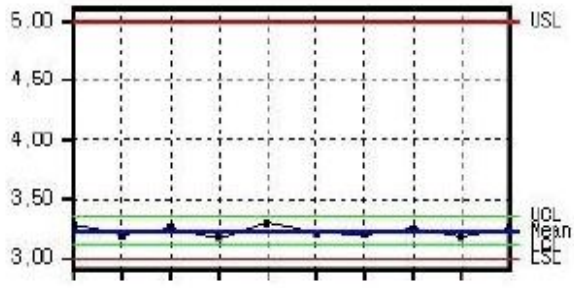
No.	μm Sn	μm Ni
1	3.28	2.12
2	3.20	2.28
3	3.26	2.44
4	3.18	2.42
5	3.30	2.60
6	3.22	2.46
7	3.21	2.52
8	3.25	2.47
9	3.19	2.34
10	3.26	2.43
MEAN	3.23	2.41
S.DEV	0.041	0.134

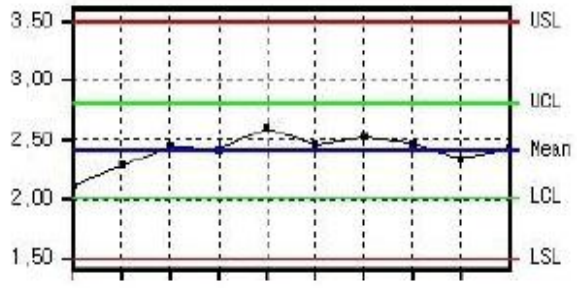


COL : 0.20 mm

----- Sn -----
----- Ni -----
--- Brass ---

SEC: 30





Sn/Ni//Brass STATISTICAL RESULT

	Sn μm	Ni μm
Data No:	10	10
최대값 :	3.30	2.60
최소값 :	3.18	2.12
범위 :	0.12	0.48
평균값 :	3.23	2.41
표본편차:	0.041	0.134
변동계수:	1.267	5.565
Cp :	8.130	2.488
Cpk:	1.870	2.264
LSL:	3.00	1.50
USL:	5.00	3.50

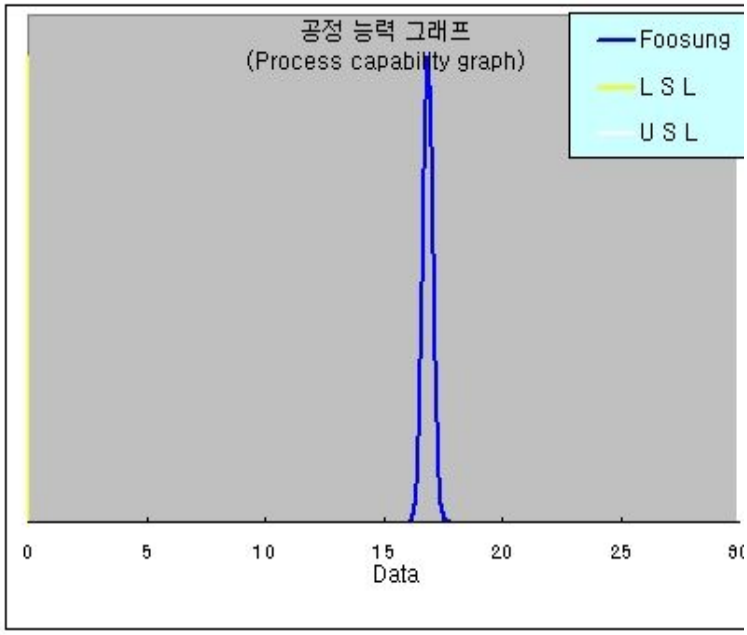
FOOSUNG	PROCESS CAPABILITY DATA	Date Issued : 2011년 08월 10일
Title of Subject :	HDMI 19P RIGHT ANGLE SMD TYPE	S.H.Hong

◆ Contact Resistance(접촉저항)

접촉저항

측정치(Data)

Sample	Foosung
1	16.8
2	17.0
3	17.2
4	16.8
5	16.9
6	17.0
7	16.6
8	16.9
9	16.4
10	16.7
11	17.0
12	17.1
13	16.8
14	16.9
15	17.2
16	17.0
17	17.0
18	16.8
19	17.1
20	16.8
21	17.0
22	16.8
23	16.8
24	17.0
25	16.8
26	16.9
27	16.9
28	17.2
29	17.2
30	17.0
31	16.8
32	16.4
33	16.7
34	16.8
35	16.7
36	17.0
37	17.0
38	16.8
39	16.6
40	16.8
41	17.2
42	17.0
43	16.7
44	16.9
45	16.6
46	16.8
47	17.0
48	16.9
49	17.1
50	16.7



기초 통계량(Basic Statistics)

통계량(Statistics)		Foosung
◆	시료수(N)	50
◆	평균(Mean)	16.898
◆	중앙값(Median)	16.900
◆	표준편차(S.D)	0.22
◆	최대값(Max)	17.300
◆	최소값(Min)	16.400
◆	Cp	23.03
◆	Cpk	20.12
◆	공정능력(Process capability)	매우 좋음
◆	LSL(Lower spec level)	0.00
◆	USL(Upper spec level)	30.00
◆	평가 기준 SPEC이 MIN 기준이므로 UCL 에 치우치며, 산포 범위(그레프)가 좁고 높을수록 공정능력이 있다고 판단함	

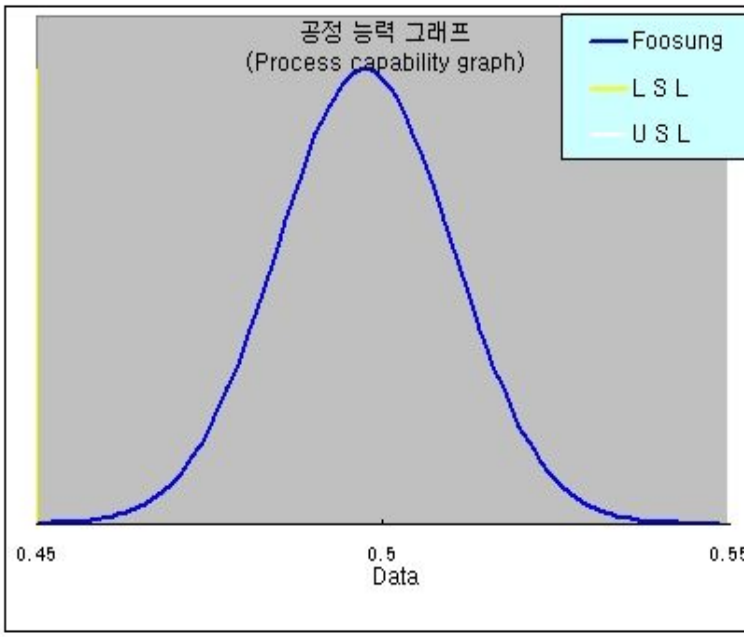
FOOSUNG	PROCESS CAPABILITY DATA	Date Issued : 2011년 08월 10일
Title of Subject :	HDMI 19P RIGHT ANGLE SMD TYPE	S.H.Hong

◆ DIMENSION POINT(Pitch)

PITCH

측정치(Data)

Sample	Foosung
1	0.51
2	0.49
3	0.48
4	0.49
5	0.50
6	0.49
7	0.51
8	0.49
9	0.48
10	0.50
11	0.51
12	0.50
13	0.51
14	0.49
15	0.52
16	0.50
17	0.48
18	0.48
19	0.50
20	0.52
21	0.49
22	0.52
23	0.50
24	0.48
25	0.49
26	0.52
27	0.51
28	0.50
29	0.52
30	0.51
31	0.49
32	0.50
33	0.52
34	0.48
35	0.50
36	0.49
37	0.49
38	0.50
39	0.51
40	0.49
41	0.49
42	0.48
43	0.50
44	0.50
45	0.48
46	0.49
47	0.49
48	0.49
49	0.48
50	0.51



기초 통계량(Basic Statistics)		
통계량(Statistics)		Foosung
◆	시료수(N)	50
◆	평균(Mean)	0.497
◆	중앙값(Median)	0.500
◆	표준편차(S.D)	0.01
◆	최대값(Max)	0.520
◆	최소값(Min)	0.480
◆	Cp	1.31
◆	Cpk	1.24
◆	공정능력(Process capability)	너무 부족
◆	LSL(Lower spec level)	0.45
◆	USL(Upper spec level)	0.55
◆	평가 기준 SPEC이 MIN 기준이므로 UCL 에 치우치며, 산포 범위(그래프)가 좁고 높을수록 공정능력이 있다고 판단함	

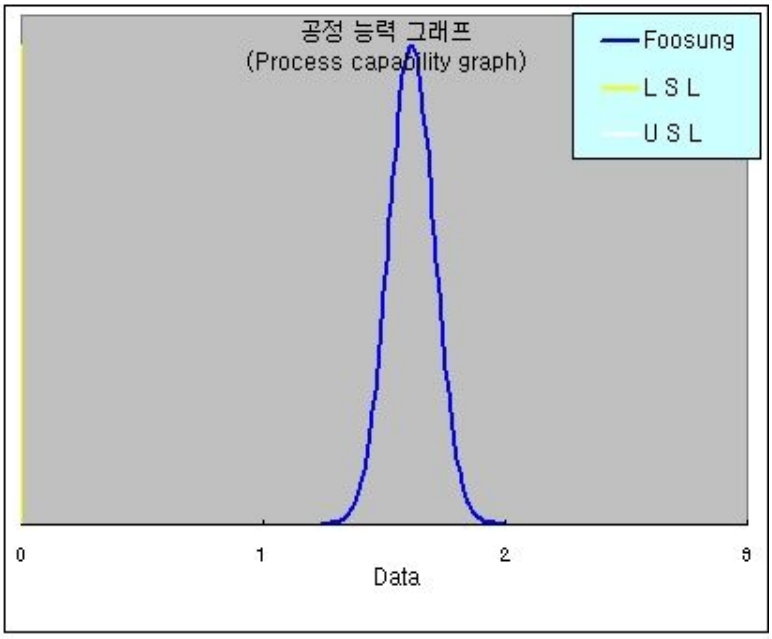
FOOSUNG	PROCESS CAPABILITY DATA	Date Issued : 2011년 08월 10일
Title of Subject :	HDMI 19P RIGHT ANGLE SMD TYPE	S.H.Hong

◆ Total Insertion Force(총합삽입력)

삽입력

측정치(Data)

Sample	Foosung
1	1.69
2	1.68
3	1.57
4	1.52
5	1.66
6	1.68
7	1.49
8	1.77
9	1.65
10	1.60
11	1.64
12	1.72
13	1.59
14	1.60
15	1.78
16	1.58
17	1.52
18	1.64
19	1.49
20	1.66
21	1.52
22	1.59
23	1.72
24	1.58
25	1.65
26	1.64
27	1.52
28	1.70
29	1.66
30	1.54
31	1.58
32	1.46
33	1.68
34	1.51
35	1.69
36	1.55
37	1.60
38	1.49
39	1.48
40	1.67
41	1.58
42	1.61
43	1.68
44	1.54
45	1.72
46	1.69
47	1.61
48	1.47
49	1.50
50	1.54



기초 통계량(Basic Statistics)

통계량(Statistics)		Foosung
◆	시료수(N)	50
◆	평균(Mean)	1.613
◆	중앙값(Median)	1.605
◆	표준편차(S.D)	0.09
◆	최대값(Max)	1.830
◆	최소값(Min)	1.460
◆	Cp	7.96
◆	Cpk	5.71
◆	공정능력(Process capability)	매우 좋음
◆	LSL(Lower spec level)	0.00
◆	USL(Upper spec level)	4.50
◆	평가 기준 SPEC이 MIN 기준이므로 UCL 에 치우치며, 산포 범위(그래프)가 좁고 높을수록 공정능력이 있다고 판단함	

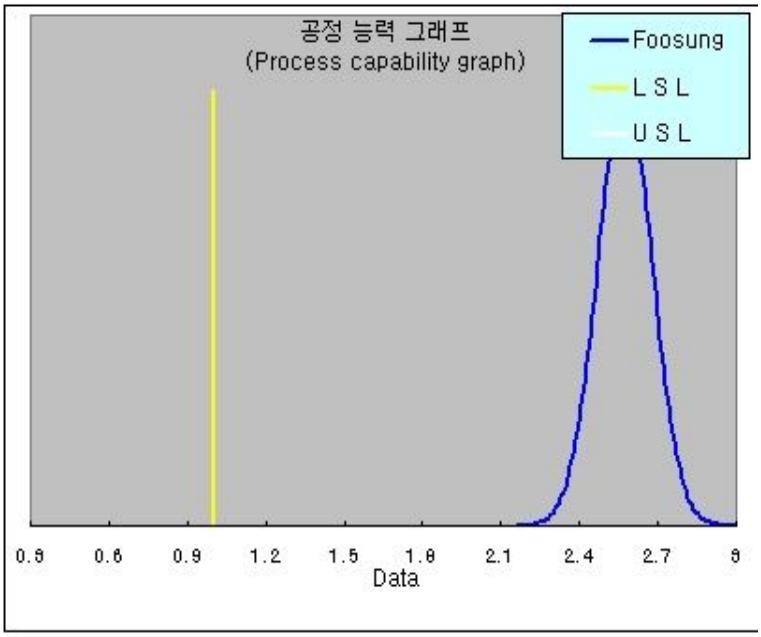
FOOSUNG	PROCESS CAPABILITY DATA	Date Issued : 2011년 08월 10일
Title of Subject :	HDMI 19P RIGHT ANGLE SMD TYPE	S.H.Hong

◆ Total Withdrawal Force(총합발거력)

발거력

측정치(Data)

Sample	Foosung
1	2.64
2	2.49
3	2.27
4	2.88
5	2.42
6	2.64
7	2.72
8	2.59
9	2.47
10	2.51
11	2.52
12	2.60
13	2.48
14	2.70
15	2.66
16	2.61
17	2.54
18	2.48
19	2.55
20	2.57
21	2.61
22	2.51
23	2.55
24	2.49
25	2.66
26	2.64
27	2.48
28	2.72
29	2.60
30	2.52
31	2.49
32	2.61
33	2.67
34	2.58
35	2.49
36	2.55
37	2.58
38	2.64
39	2.57
40	2.60
41	2.54
42	2.47
43	2.76
44	2.51
45	2.60
46	2.69
47	2.46
48	2.78
49	2.64
50	2.75



기초 통계량(Basic Statistics)		
통계량(Statistics)		Foosung
◆	시료수(N)	50
◆	평균(Mean)	2.574
◆	중앙값(Median)	2.570
◆	표준편차(S.D)	0.10
◆	최대값(Max)	2.800
◆	최소값(Min)	2.270
◆	Cp	4.80
◆	Cpk	4.56
◆	공정능력(Process capability)	매우 좋음
◆	LSL(Lower spec level)	1.00
◆	USL(Upper spec level)	4.00
◆	평가 기준 SPEC이 MIN 기준이므로 UCL 에 치우치며, 산포 범위(그레프)가 좁고 높을수록 공정능력이 있다고 판단함	

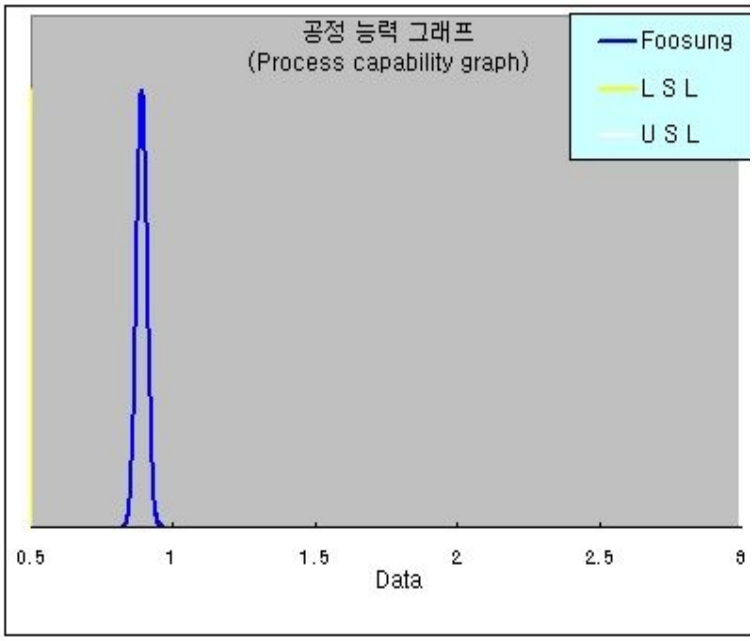
FOOSUNG	PROCESS CAPABILITY DATA	Date Issued : 2011년 08월 10일
Title of Subject :	HDMI 19P RIGHT ANGLE SMD TYPE	S.H.Hong

◆ Pin retention force(핀 유지력)

핀유지력

측정치(Data)

Sample	Foosung
1	0.88
2	0.87
3	0.92
4	0.88
5	0.94
6	0.90
7	0.88
8	0.88
9	0.89
10	0.92
11	0.88
12	0.89
13	0.90
14	0.88
15	0.89
16	0.91
17	0.89
18	0.91
19	0.91
20	0.88
21	0.90
22	0.87
23	0.87
24	0.87
25	0.89
26	0.90
27	0.90
28	0.88
29	0.91
30	0.89
31	0.90
32	0.88
33	0.91
34	0.87
35	0.91
36	0.93
37	0.89
38	0.87
39	0.88
40	0.93
41	0.88
42	0.88
43	0.89
44	0.90
45	0.89
46	0.89
47	0.88
48	0.87
49	0.91
50	0.87



기초 통계량(Basic Statistics)		
통계량(Statistics)		Foosung
◆	시료수(N)	50
◆	평균(Mean)	0.891
◆	중앙값(Median)	0.890
◆	표준편차(S.D)	0.02
◆	최대값(Max)	0.940
◆	최소값(Min)	0.860
◆	Cp	22.37
◆	Cpk	7.00
◆	공정능력(Process capability)	매우 좋음
◆	LSL(Lower spec level)	0.50
◆	USL(Upper spec level)	3.00
◆	평가 기준 SPEC이 MIN 기준이므로 UCL 에 치우치며, 산포 범위(그래프)가 좁고 높을수록 공정능력이 있다고 판단함	

출하검사 성적서

Date Issued : 2011년 08월 10일

Title of Subject : HDMI 19P RIGHT ANGLE SMD TYPE

Issued by : K.M.NAM

出 荷 檢 査 成 積 書

후성테크	작성	검토	승인
	남광문		인중교

VD	작성	검토	승인

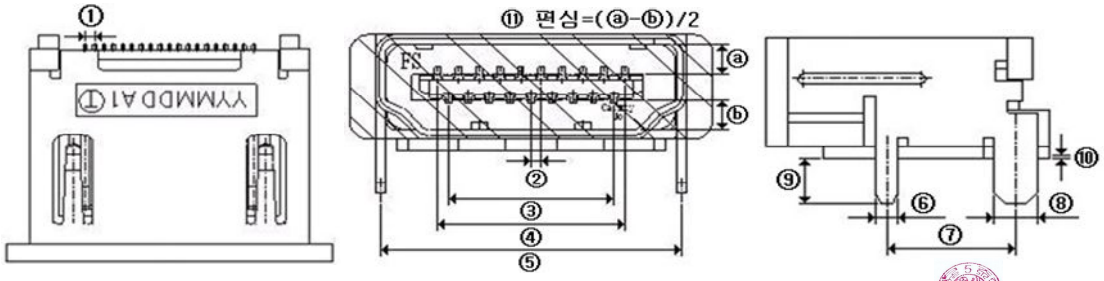
고 객 명	VD	부 품 명	0.5P HDMI HEADER 19P RIGHT ANGLE SMD TYPE	LOT SIZE	- EA
협력회사명	㈜후성테크	CODE NO.	3701-001293	LOT NO	-

검 사 일	2011.09.24	검 사 원	남광문	합불판정	합격	재질	INSULATOR PA9T

검사항목	검사방식	시료수	불량수	검사항목	검사방식	시료수	불량수
외 관	KS A ISO 2859-1 G-III AQL=0.04%	-	-	치 수	n=5 , c=0	5	0

	치수 NO	규 격 (SPEC)	시료 NO. 1	2	3	4	5	6	7	8	9	AVG	CPK	판 정
치수검사	치 수①	0.50±0.05	0.51	0.49	0.49	0.51	0.50					0.499	2.097	PASS
	치 수②	0.50±0.05	0.51	0.51	0.50	0.51	0.49					0.503	2.126	PASS
	치 수③	8.00±0.05	8.02	8.00	8.02	8.01	8.01					8.009	1.675	PASS
	치 수④	9.00±0.05	9.01	9.00	9.01	9.01	9.02					9.008	2.176	PASS
	치 수⑤	14.50±0.20	14.54	14.54	14.53	14.52	14.51					14.527	4.486	PASS
	치 수⑥	1.00±0.20	0.99	0.97	1.04	1.03	0.97					1.001	1.971	PASS
	치 수⑦	5.96±0.20	5.95	5.95	5.94	5.96	5.95					5.950	12.992	PASS
	치 수⑧	2.00±0.20	2.03	2.01	2.02	2.03	2.02					2.021	10.829	PASS
	치 수⑨	2.20±0.20	2.19	2.20	2.22	2.20	2.22					2.204	4.644	PASS
	치 수⑩	평탄도 MAX 0.08	0.03	0.04	0.04	0.04	0.04					0.040	3.104	PASS
	치 수⑪	편심(±0.05)	0.00	0.01	0.01	0.00	0.01					0.008	2.585	PASS
외 관	핀누락	이상 없을 것	양호	양호	양호	양호	양호					-	-	PASS
	핀변형	이상 없을 것	양호	양호	양호	양호	양호					-	-	PASS
	SHELL변형	이상 없을 것	양호	양호	양호	양호	양호					-	-	PASS
	포장상태	이상 없을 것	양호	양호	양호	양호	양호					-	-	PASS
기능검사	PIN유지력	MIN 0.2kgf	0.89	0.93	0.94	0.90	0.89					0.913	9.697	PASS
	접촉저항	MAX 30mΩ	17.29	17.16	16.63	16.82	16.99					16.981	16.493	PASS
	삽입력	MAX 4.5kgf	1.69	1.66	1.66	1.59	1.54					1.627	8.978	PASS
	발거력	1~4kgf	2.40	2.54	2.47	2.60	2.31					2.465	4.324	PASS
	절연저항	MIN 100MΩ	9999↑	9999↑	9999↑	9999↑	9999↑					-	-	PASS
	내전압	AC500V 이상 없을 것	양호	양호	양호	양호	양호					-	-	PASS
	REFLOW	이상없을 것	양호	양호	양호	양호	양호					-	-	PASS

도 해



※ 본 검사 LOT는 당사 출하 검사 규정에 만족하며 품질을 보증합니다.

대표이사 이 기 천

환경규제 적용품

RoHS 개선품

LEAD-FREE

비 고	

출하검사 성적서

Date Issued : 2011년 08월 10일

Title of Subject : HDMI 19P RIGHT ANGLE SMD TYPE

Issued by : K.M.NAM

DATA 세부기능	외관	땜성 (REFLOW)	내전압	절연저항	접촉저항	핀유지력	삽입력	발거력	도금두께					판 정
									SHELL	TERMINAL(CONTACT)		TERMINAL(SMD)		
	이상 없을것	MIN 95%	AC500V / 1min	MIN 100MΩ	MAX 30mΩ	MIN 0.2kgf	MAX 4.5kgf	MIN 1.0~4.0kgf	Sn : Min 1.0(㎛)	Au : Min 0.1(㎛)	Ni : 1.5~3.5(㎛)	Au : Min 0.05(㎛)	Ni : 1.5~3.5(㎛)	
1	양호	양호	양호	9999↑	16.6	0.93	1.59	2.35	1.486	0.143	2.756	0.071	2.950	PASS
2	양호	양호	양호	9999↑	17.5	0.87	1.53	2.65	1.454	0.143	2.831	0.072	2.904	PASS
3	양호	양호	양호	9999↑	17.0	0.88	1.71	2.21	1.417	0.146	2.820	0.071	2.883	PASS
4	양호	양호	양호	9999↑	16.5	0.86	1.69	2.34	1.507	0.142	2.756	0.075	2.836	PASS
5	양호	양호	양호	9999↑	17.2	0.94	1.62	2.35	1.473	0.150	2.842	0.073	2.980	PASS
6	양호	양호	양호	9999↑	16.9	0.93	1.58	2.33	1.499	0.143	2.751	0.078	2.927	PASS
7	양호	양호	양호	9999↑	17.0	0.95	1.51	2.38	1.495	0.150	2.824	0.073	2.819	PASS
8	양호	양호	양호	9999↑	17.3	0.87	1.73	2.50	1.516	0.148	2.767	0.074	2.812	PASS
9	양호	양호	양호	9999↑	16.8	0.88	1.57	2.48	1.483	0.148	2.779	0.079	2.830	PASS
10	양호	양호	양호	9999↑	16.6	0.91	1.69	2.58	1.517	0.143	2.832	0.075	2.862	PASS
11	양호	양호	양호	9999↑	16.7	0.93	1.60	2.67	1.424	0.148	2.819	0.078	2.845	PASS
12	양호	양호	양호	9999↑	16.8	0.87	1.60	2.63	1.469	0.142	2.826	0.072	2.804	PASS
13	양호	양호	양호	9999↑	17.4	0.91	1.69	2.20	1.589	0.140	2.762	0.074	2.847	PASS
14	양호	양호	양호	9999↑	17.0	0.92	1.61	2.68	1.480	0.142	2.797	0.079	2.991	PASS
15	양호	양호	양호	9999↑	17.4	0.85	1.66	2.69	1.479	0.145	2.764	0.073	2.834	PASS
16	양호	양호	양호	9999↑	17.1	0.86	1.54	2.47	1.559	0.147	2.781	0.071	2.835	PASS
17	양호	양호	양호	9999↑	17.1	0.87	1.71	2.27	1.500	0.148	2.818	0.079	2.920	PASS
18	양호	양호	양호	9999↑	16.9	0.85	1.77	2.56	1.498	0.149	2.838	0.073	2.817	PASS
19	양호	양호	양호	9999↑	16.8	0.90	1.55	2.57	1.455	0.144	2.783	0.076	2.932	PASS
20	양호	양호	양호	9999↑	17.4	0.89	1.80	2.48	1.508	0.148	2.841	0.078	2.976	PASS
21	양호	양호	양호	9999↑	17.3	0.90	1.78	2.52	1.548	0.145	2.765	0.075	2.921	PASS
22	양호	양호	양호	9999↑	17.0	0.85	1.53	2.62	1.487	0.141	2.779	0.077	2.946	PASS
23	양호	양호	양호	9999↑	17.4	0.86	1.55	2.67	1.549	0.145	2.782	0.080	2.849	PASS
24	양호	양호	양호	9999↑	17.3	0.92	1.60	2.58	1.442	0.142	2.801	0.070	2.853	PASS
25	양호	양호	양호	9999↑	16.9	0.88	1.64	2.64	1.504	0.147	2.845	0.074	2.835	PASS
26	양호	양호	양호	9999↑	17.4	0.91	1.67	2.21	1.409	0.146	2.806	0.075	2.887	PASS
27	양호	양호	양호	9999↑	17.3	0.93	1.52	2.66	1.526	0.148	2.774	0.073	2.813	PASS
28	양호	양호	양호	9999↑	17.3	0.92	1.60	2.55	1.472	0.147	2.843	0.077	2.822	PASS
29	양호	양호	양호	9999↑	17.0	0.91	1.55	2.60	1.509	0.142	2.838	0.072	2.913	PASS
30	양호	양호	양호	9999↑	17.2	0.86	1.70	2.50	1.512	0.147	2.809	0.074	2.864	PASS
31	양호	양호	양호	9999↑	17.3	0.89	1.69	2.45	1.410	0.143	2.777	0.077	2.837	PASS
32	양호	양호	양호	9999↑	17.5	0.89	1.66	2.66	1.499	0.141	2.783	0.077	2.879	PASS
33	양호	양호	양호	9999↑	17.0	0.94	1.54	2.42	1.575	0.150	2.801	0.071	2.809	PASS
34	양호	양호	양호	9999↑	16.8	0.86	1.79	2.35	1.518	0.145	2.764	0.073	2.899	PASS
35	양호	양호	양호	9999↑	17.2	0.86	1.50	2.35	1.410	0.148	2.796	0.075	2.976	PASS
36	양호	양호	양호	9999↑	17.0	0.94	1.75	2.69	1.513	0.148	2.835	0.071	2.842	PASS
37	양호	양호	양호	9999↑	17.3	0.86	1.52	2.47	1.518	0.144	2.767	0.074	2.919	PASS
38	양호	양호	양호	9999↑	17.0	0.90	1.76	2.64	1.409	0.141	2.831	0.073	2.985	PASS
39	양호	양호	양호	9999↑	17.0	0.92	1.75	2.69	1.439	0.144	2.773	0.079	2.899	PASS
40	양호	양호	양호	9999↑	16.6	0.85	1.80	2.55	1.434	0.144	2.793	0.073	2.884	PASS
41	양호	양호	양호	9999↑	16.6	0.89	1.60	2.40	1.450	0.140	2.819	0.074	2.969	PASS
42	양호	양호	양호	9999↑	16.7	0.87	1.59	2.35	1.591	0.149	2.798	0.078	2.813	PASS
43	양호	양호	양호	9999↑	16.5	0.87	1.74	2.67	1.478	0.143	2.762	0.075	2.844	PASS
44	양호	양호	양호	9999↑	16.9	0.86	1.67	2.70	1.576	0.147	2.758	0.071	2.957	PASS
45	양호	양호	양호	9999↑	17.4	0.92	1.57	2.42	1.531	0.149	2.835	0.079	2.851	PASS
46	양호	양호	양호	9999↑	17.1	0.93	1.72	2.33	1.477	0.146	2.849	0.071	2.860	PASS
47	양호	양호	양호	9999↑	17.4	0.93	1.61	2.26	1.423	0.149	2.833	0.073	2.910	PASS
48	양호	양호	양호	9999↑	16.9	0.91	1.66	2.58	1.543	0.149	2.783	0.079	2.987	PASS
49	양호	양호	양호	9999↑	17.1	0.87	1.66	2.68	1.509	0.142	2.794	0.072	2.825	PASS
50	양호	양호	양호	9999↑	17.2	0.88	1.75	2.65	1.516	0.144	2.779	0.072	2.842	PASS

FOOSUNG 출하검사 성적서	Date Issued : 2011년 08월 10일
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선행검증 Check-Sheet [Connector]

규격	-	Code-NO	3701-001293	협력사명	㈜후성테크	검사결과	合格
모델명	0.5P HDMI HEADER 19P R/A SMD TYPE	검사일자	2011.09.24	검사자	남광문D		

대분류	Check 항목	SPEC	결 과	판 정
단품특성	외관상태는 이상 없는가?	이상 없을 것	SPEC대비 양호	合
	외관치수 및 Pin별 치수는 승인 Spec을 만족 하는가?	제품도에 준함	SPEC대비 양호	合
	상대물과 조립 후 접촉저항은 승인 Spec을 만족 하는가?	30mΩ MAX	17.06mΩ	合
	삽,발거력은 승인 Spec을 만족 하는가?	삽:4.5kgf MAX 발:1.0~4.0kgf	삽:1.64kgf 발:2.51kgf	合
	Pin간 내전압은 승인 Spec을 만족 하는가?	절연파괴 및 섬락이 없고 사용상결함이 없을것.	SPEC대비 양호	合
	절연저항은 승인 Spec을 만족 하는가?	MIN 100MΩ	9,999 ↑	合
	유해물질 관련 Data는 승인원에 첨부 되었는가?	승인원	O.K	合
구 조	상대물과 형합시 Pin 접점구조는 이상 없는가?	이상 없을 것	이상없음	合
	Locking Type은 상대물과 형합시 Locking부 변형 등 이상 없는가?	이상 없을 것	이상없음	合
	[실패사례] 상대물이 역삽입이 될 가능성은 없는가?	이상 없을 것	이상없음	合
	[실패사례] SMT용 Slim형 Type의 GND부 납땜 면적은 충분히 확보되어 있는가?	이상 없을 것	이상없음	合
	[실패사례] SMT용 Slim형 Type은 IR-Reflow 3회 통과 후 열변형에 의한 형합성은 이상 없는가?(추가)	이상 없을 것	이상없음	合
	[실패사례] LVDS Cable Connector-Housing간 업체별 형합성 및 Locking 상태는 이상없는가?(추가)	업체별 형합시 Locking 상태 이상없을 것	이상없음	合
상대물 형합성	상대물에 형합시 Damage를 주는 요인은 없는가?	이상 없을 것	이상없음	合
	상대물에 형합시 작업성은 이상이 없는가?	이상 없을 것	이상없음	合
환경유해물질	환경유해물질은 관리 기준치를 만족하고 있는가?	승인원	이상없음	合
도금사양	도금사양은 표준화에 맞게 설정 되었는가?	TERMINAL-Au,Ni(㎛) SHELL,S/G-Sn(㎛)	이상없음	合
	도금사양 및 도금두께는 SPEC을 만족 하는가?	TERMINAL(CONTACT) Au MIN 0.10㎛ Ni 1.5~3.5㎛ TERMINAL(SMD) Au MIN 0.05㎛ Ni 1.5~3.5㎛ SHELL Sn MIN 1.0㎛	TERMINAL(CONTACT) Au: 0.145㎛ Ni: 2.799㎛ TERMINAL(SMD) Au: 0.075㎛ Ni: 2.882㎛ SHELL Sn: 1.492㎛	合
	Lead Free는 적용이 되었는가?	적용 될 것	적용	合
	Lead Free 조건 납땜성 Test시 특성 및 외관 변형은 없는가?	이상 없을 것	이상없음	合
신뢰성 평가	내습시험시 규정된 기준을 만족 하는가?	30mΩ MAX	17.0mΩ	合
	내열시험시 규정된 기준을 만족 하는가?	30mΩ MAX	16.5mΩ	合
	열충격시험시 규정된 기준을 만족 하는가?	30mΩ MAX	16.9mΩ	合
	염수시험시 규정된 기준을 만족 하는가?	30mΩ MAX	16.6mΩ	合
공정능력	CPK는 1.33이상을 만족 하는가?	1.33 MIN	3.10	合

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Title of Subject : HDMI 19P RIGHT ANGLE SMD TYPE

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Process Quality Control Plan

Vendor Name	FOOSUNG TECH	**Manufacturer Site**	KOREA
Item	**0.5P HDMI HEADER 19P R/A SMD**	**Drafter**	K.M.NAM
SPEC	**0.5mm Pitch, 19PIN, 2R, SMT**	**Date(Orig.)**	2011.09.24
CODE-NO	**3701-001293**	**Date(Rev.)**	-

Pro. No	Process Name	Failure				Method						결과
		Failure Mode	SEV (심각도)	Control Item	Occur (발생도)	Spec. / Tolerance	Evaluation Measurement Technique	SPL Size	SPL Freq.	Detes (검출도)	RPN	
1	A TERMINAL압입	압입불량	8	AIR 압력	3	5.0±1.0 kgf/cm^2	작업표준서	1	4회/일	3	72	CTQ
		도금불량	8	도금두께(Au)	3	MIN 0.1㎛	승인원	10	TERMINAL 입고시	3	72	CTF
				도금두께(Ni)		1.5~3.5㎛						
				도금두께(Au)		MIN 0.05㎛						
				도금두께(Ni)		1.5~3.5㎛						
2	B TERMINAL압입	압입불량	8	AIR 압력	3	5.0±1.0 kgf/cm^2	작업표준서	1	4회/일	3	72	CTQ
		압입불량	8	핀유지력	2	MIN 0.20kgf	승인원	5	일	3	48	CTF
3	평탄교정	평탄불량	8	AIR 압력	3	5.0±1.0 kgf/cm^2	작업표준서	1	4회/일	3	72	CTQ
4	SHELL 벤딩작업	SHELL 벤딩불량	8	AIR 압력	3	5.0±1.0 kgf/cm^2	작업표준서	1	4회/일	3	72	CTQ
		도금불량	8	도금두께(Sn)	3	MIN 1.0㎛	승인원	10	SHELL 입고시	3	72	CTF
5	내전압검사	SHORT불량	7	내전압기 전압	2	AC 700V	작업표준서	1	10회/일	3	42	CTQ
6	VISION검사	평탄불량	8	평탄도	3	MAX 0.08	승인원	5	10회/일	3	72	CTF
		피치불량	8	피치	3	0.50±0.05	승인원	5	10회/일	3	72	CTF
7	캐리어 TAPE 포장	실링불량	7	실링값	3	20~80gf	작업표준서	1	10회/일	3	63	-

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PQCP Results

Pro. No	Process Name	Failure		Method			Inspection Data											
		Failure Mode	Control Item	Spec./Tolerance	SPL Size	SPL Freq.	1	2	3	4	5	6	7	8	9	10	Cpk	Result
1	A TERMINAL압입	압입불량	AIR 압력	5.0±1.0kgf/cm^2	1	4회/일	5.1	5.0	5.1	5.0	5.1	5.0	5.0	5.0	5.1	5.0	4.78	OK
		도금불량	도금두께(Au)	MIN 0.10㎛	10	TERMINAL 입고시	0.14	0.14	0.14	0.15	0.15	0.15	0.15	0.14	0.15	0.14	5.84	OK
			도금두께(Ni)	1.5~3.5㎛			2.83	2.76	2.80	2.76	2.78	2.82	2.84	2.78	2.84	2.77	2.01	OK
			도금두께(Au)	MIN 0.05㎛			0.07	0.07	0.08	0.07	0.07	0.08	0.07	0.08	0.08	0.08	1.97	OK
			도금두께(Ni)	1.5~3.5㎛			2.80	2.85	2.99	2.83	2.84	2.92	2.82	2.93	2.98	2.92	6.96	OK
2	B TERMINAL압입	압입불량	AIR 압력	5.0±1.0kgf/cm^2	1	4회/일	5.1	5.0	4.9	4.9	5.1	4.9	5.0	5.0	5.1	5.0	3.65	OK
		압입불량	핀유지력	MIN 0.20kgf	5	일	0.87	0.88	0.91	0.93	0.87	0.91	0.92	0.85	0.86	0.87	9.78	OK
3	평탄교정	평탄불량	AIR 압력	5.0±1.0kgf/cm^2	1	4회/일	5.1	5.0	5.1	5.0	5.0	5.0	4.9	5.1	5.0	5.0	4.11	OK
4	SHELL 벤딩작업	SHELL 벤딩불량	AIR 압력	5.0±1.0kgf/cm^2	1	4회/일	4.9	5.0	5.1	5.0	5.1	5.0	5.1	5.0	5.1	5.0	3.84	OK
		도금불량	도금두께(Sn)	MIN 1.0㎛	10	SHELL 입고시	1.55	1.49	1.55	1.44	1.50	1.41	1.53	1.47	1.51	1.51	2.38	OK
5	내전압검사	SHORT불량	내전압기 전압	AC 700V	1	10회/일	700	700	700	700	700	700	700	700	700	700	–	OK
6	VISION검사	평탄불량	평탄도	MAX 0.08	5	10회/일	0.04	0.03	0.04	0.04	0.05	0.04	0.04	0.03	0.04	0.04	2.87	OK
		피치불량	피치	0.50±0.05	5	10회/일	0.51	0.50	0.51	0.50	0.51	0.49	0.51	0.50	0.51	0.49	2.18	OK
7	캐리어 TAPE 포장	실링불량	실링값	20~80gf	1	10회/일	45	44	43	46	47	46	45	44	42	48	4.78	OK

신규부품 수율평가 결과

■ 부품정보

부품명	코드명	협력사명	평가일자
0.5P HDMI HEADER 19P R/A(SMD)	FD05015-19	후성테크	2011.08.10

■ 평가결과

구분	Main Process	Sub Process	
	조립	사출	Press
투입수	10,300	10,300	200,000
이탈수	5	3	9
불량율(%)	0.05%	0.03%	0.00%
초기수율(FTY)	99.95%	99.97%	100.00%
PPM	485	3	0
시그마수준(Zst)	4.80	4.94	5.42
누적수율(RTY)	99.92%		
전체공정 시그마수준	4.65		

■ Main Process 이탈 이력

조립	투입수:	10,300
불량내용	수량	비고
PIN압입 불량	3	
PIN 평탄	2	
Total	5	

■ Sub Process 이탈 이력

사출	투입수:	10,300
불량내용	수량	비고
사출 깨짐	3	
Total	3	

Press	투입수:	200,000
불량내용	수량	비고
PITCH	1	
SHELL 이음매	2	
PIN 휨	6	
Total	9	

MEASUREMENT LIST

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HDMI 19P RIGHT ANGLE SMD TYPE

NO	설 비 명	관리번호	기기번호	제 조 사	모 델	구입년월	교정주기	최종교정일	설치부서	교정 일정 계획 (2010년)											
										1	2	3	4	5	6	7	8	9	10	11	12
1	Digital Vernier calipers	FSE-001	9E0909801	TESA	IP65	2003년 1월	1 년	10/5/27	제품보증 (C/S)					●							
2	Mullohm Hi tester	FSE-002	30514687	HIOKI	3540	2003년 8월	1 년	10/5/17	연구소					●							
3	Push-pull gage	FSE-003	H5003D049	SHIMPO	FGN-5B	2003년 8월	1 년	10/5/17	신뢰성실					●							
4	Forced convection oven	FSE-004	K020256	JEIOTECH	OF-22GW	2004년 5월	1 년	10/5/17	신뢰성실					●							
5	Video signal generator	FSE-005	M0P4G0967	MASTER& NOW SYSTEM	MSPG-925LTH	2004년 5월	1 년	10/5/17	신뢰성실					●							
6	W/I Auto tester	FSE-006	HG000216	KIKUSUI	TOS8870A	2004년 5월	1 년	10/5/17	신뢰성실					●							
7	Salt spray test chamber	FSE-007	05023A	SJ SCIENCE	SJ-ST-C900	2004년 3월	1 년	10/5/17	신뢰성실					●							
8	Salt refractometer	FSE-008	325186	ATAGO	S-10E	2004년 3월	-		신뢰성실	검교정 비대상											
9	PH meter	FSE-009	164456	EU TECH	PH6	2004년 3월	-		신뢰성실	검교정 비대상											
10	Coating thickness gauge	FSE-010	-	MICRO PIONEER	XRF-2000	2004년 3월	3 년	09/2/6	수입검사		○	(2011 year Schedule)									
11	Dipping Pot	FSE-011	-	SESHIN	SOLDER POT	2004년 6월	-		REFLOW실	검교정 비대상											
12	Video Measuring System	FSE-012	40066	RATIONAL	VMS-2515A	2004년 6월	2 년	10/5/17	신뢰성실					●	(2010 year Schedule)						
13	Thermal shock test chamber	FSE-013	050523B	SJ SCIENCE	SJ-TS-Z24	2004년 7월	1 년	10/5/17	REFLOW실					●							
14	Temp, test chamber	FSE-014	050523C	SJ SCIENCE	SJ-TH-S50	2004년 7월	1 년	10/5/17	신뢰성실					●							
15	Thermo-Hygro meter	FSE-015	E0407L02	G-WOON HI TECH	GMK-930HT	2004년 8월	-		신뢰성실	검교정 비대상											
16	Digital Vernier calipers	FSE-016	4207856	MITUTOYO	CD-15CP	2004년 12월	1 년	10/5/17	연구소					●							
17	Digital Vernier calipers	FSE-017	4207679	MITUTOYO	CD-15CP	2004년 12월	1 년	10/5/17	연구소					●							

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NO	설 비 명	관리번호	기기번호	제 조 사	모 델	구입년월	교정주기	최종교정일	설치부서	교정 일정 계획 (2010년)											
										1	2	3	4	5	6	7	8	9	10	11	12
20	Toolmaker's microscope	FSE-020	550101	MITUTOYO	MF-UA	2005년 6월	2 년	10/5/17	수입검사					●							
21	Peel back test	FSE-021	6587	ITP	TP-150	2005년 8월	-		제조(4F)	검교정 비대상											
22	Toolmaker's microscope	FSE-022	550107	MITUTOYO	MF-UA	2005년 6월	2 년	10/5/17	수입검사					●							
23	Toolmaker's microscope	FSE-023	550133	MITUTOYO	MF-UA	2005년 6월	2 년	10/5/17	제조(4F)					●							
24	Mount press	FSE-024	N04203	METKON	FINOPRESS	2005년 10월	-		신뢰성실	검교정 비대상											
25	Grinding & Polishing instruments	FSE-025	N04407	METKON	GRIPO	2005년 10월	-		신뢰성실	검교정 비대상											
26	Precision cutter	FSE-026	N03169	METKON	MICRACUT125	2005년 10월	-		신뢰성실	검교정 비대상											
27	Measuring microscope	FSE-027	550134	MITUTOYO	MF-UA	2005년 10월	2 년	10/5/17	제조(5F)					●							
28	AUTO TESTER	FSE-028	-	HANYOUNG	GF7-P61	2006년 4월	-		신뢰성실	검교정 비대상											
29	Digital Vernier calipers	FSE-029	5493799	MITUTOYO	CD-15CPX	2006년 2월	1 년	10/5/17	연구소					●							
30	Vibration tester	FSE-030	-	㈜ IMV	VA-ST-06	2006년 2월	-		신뢰성실	검교정 비대상											
31	Cordinate measursing machine	FSE-031	4060412	INTEK IMS	PREMIUM 400C	2006년 3월	1 year	10/5/17	신뢰성실					●							
32	XRF measursing machine	FSE-032	10600257001709	SEICO	SEA1000A	2008년 4월	-		수입검사	검교정 비대상											
33	Elecronic balance	FSE-033	CFEA20023	CAS	25AC	2008년 4월	1 년	10/5/17	수입검사					●							
34	PUSH-PULL	FSE-034	F01809	AIKOH	RX-50	2008년 6월	1 년	10/5/19	연구소					●							
35	Toolmaker's microscope	FSE-035	100070804	MITUTOYO	MF-B2010B	2008년 12월	2 년	10/5/17	연구소					●							

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Issued by : S.H.HONG	Date Issued : 2011년 08월 10일
HDMI 19P RIGHT ANGLE SMD TYPE	

NO	설 비 명	관리번호	기기번호	제 조 사	모 델	구입년월	교정주기	최종교정일	설치부서	교정 일정 계획 (2010년)											
										1	2	3	4	5	6	7	8	9	10	11	12
39	Elecronic balance	FSE-039	H06-05739	AND	HC-3KI	-	1 년	10/5/17	제조					●							
40	Digita Thermo Meter	FSE-040	090813-1	ACE	NS-2058	-	1 년	10/5/17	신뢰성실					●							
41	Digita Thermo Meter	FSE-041	090813-5	ACE	NS-2058	-	1 년	10/5/17	수입검사					●							
42	Digita Thermo Meter	FSE-042	090813-2	ACE	NS-2058	-	1 년	10/5/17	제조(5F)					●							
43	Digita Thermo Meter	FSE-043	090813-3	ACE	NS-2058	-	1 년	10/5/17	제조(F)					●							
44	Digita Thermo Meter	FSE-044	090813-6	ACE	NS-2058	-	1 년	10/5/17	원자재창고					●							
45	Digita Thermo Meter	FSE-045	090813-4	ACE	NS-2058	-	1 년	10/5/17	완제품창고					●							
46	Digita Thermo Meter	FSE-046	090817-2	ACE	NS-2058	-	1 년	10/5/17	완제품창고					●							
47	Digita Thermo Meter	FSE-047	090817-1	-	HTC-1	-	1 년	10/5/17	부자재창고					●							
48	Toolmaker's microscope	FSE-048	100100709	MITUTOYO	MF Series AT112-120F	2009년 9월	2 년	10/5/17	출하검사(4F)					●							
49	Toolmaker's microscope	FSE-049	100130709	MITUTOYO	MF Series AT112-120F	2009년 9월	2 년	10/5/17	연구소					●							
50	PUSH-PULL	FSE-050		IMADA	ZP-500N	2010년 2월	1 년	10/5/17	신뢰성실					●							
51	Toolmaker's microscope	FSE-051	100130807	MITUTOYO	MF Series AT112-120F	2010년 3월	1 년	10/5/17	제조(4F)					●							
52	Thermo-Hygro meter	FSE-052	1784085	TESTO	TESTO 625	2010년 4월	1 년	10/5/17	제조					●							
53	Digita Thermo Meter	FSE-053	신규등록중	TESTEC		2010년 5월	1 년	10/5/17	REFLOW실					●							
54	Digita Thermo Meter	FSE-054	신규등록중	TESTEC		2010년 5월	1 년	10/5/17	수입검사대기					●							

Self-Declaration of Substances

Date Issued : 2011년 8월 10일

Title of Subject : HDMI 19P RIGHT ANGLE SMD TYPE

Issued by : S.H.Hong

The list of substances with environmental impacts contained in materials, components, and parts should be submitted to Samsung Electronics. Please indicate if the following substances or materials are used in product or in its manufacture.

1.Company Profile

Company Name	FOOSUNG TECH	Product Part Name	HDMI 19P RIGHT ANGLE SMD TYPE	Approval
Company Code	D8A6	Product Part Code	FD05015-19	(Name) KWON SANG KOOK
Person	Lee, Jang gyu	Date	2011-08-10	
Tel.	031-205-9273	E-mail	jglee73@foosung.com	(Signature)
Company Code	#989-3, Gosask-Dong, Gwonseon-Gu, Suwon-City, Kyungki-Do, Korea			

2.Lis of Substances with Environmental impacts

Type	Substance / Material	Is it used ⓐ		Required Douments for submittal ⓑ		
		Yes(O)	No(X)	Analysis Data	Composition sheet	Corrective plan
Class 1	Cadmium and compounds		X		O	
	Lead and compounds	O		O		X
	Mercury and		X			
	Chrome(VI) and compounds		X			
	Polybrominated biphenyls(PBBs)		X			
	Polybrominated diphenylethers(PBDEs)		X			
Class 2	Polychlorinated biphenyls(PCBs)					
	Polychlorinated terphenyls(PCTs)					
	Polychlorinated naphthalences(PCNs)					
	Ozone depleting substances					
	(CFCs,HCFCs,Halons)					
	Asbestos and componds					
	Formaldehyde					
	Short-chain chlorinated paraffins					
	(Alkane 10~13 Carbon chain)					
	Azo colorants					
	Nickel and compounds					
	Organic and compounds					
	Arsenic and compounds					
Class 3	Phthalates					
	PVC					
	Beryllium and compounds					
	Other chlorinated flame retardants					
	Other brominated flame retardants					
	-TBBP-A					

Analysis Data

Issued by : J.G.LEE	Date Issued : 201-08-10
Title of Subject : HDMI 19P RIGHT ANGLE SMD TYPE	

Company Name (Code No) : FOOSUNG TECH.

DATE:(mm/dd/yy) : 08/ 10/ 2011

No	Part name	Part code	Component mame by material type	Type of material	Material supplier	Type of manufacturing process	CAS-No	Analysis Data (ppm = mg/ kg)						Remarks
								Cd	Pb	Hg	Cr+6	PBBs	PBDEs	
1	INSULATOR	FD05015-M01	PA9T	GN2330	KURARAY	molding		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
2	TERMINAL A, B (CONTACT)	FD05015-P02(P03)	Copper Alloy	C2680	POONGSAN	stamping		N.D.	25.00	N.D.	N.D.	-	-	
			Ni Plating	Ni	Daesung Hi-P & Myung jin Che.	plating		N.D.	3.11	N.D.	N.D.	-	-	
			Au Plating	Au	Daesung Hi-P & Myung jin Che.	plating		N.D.	N.D.	N.D.	N.D.	-	-	
2	TERMINAL A, B (SMD)	FD05015-P02(P03)	Copper Alloy	C2680	POONGSAN	stamping		N.D.	25.00	N.D.	N.D.	-	-	
			Ni Plating	Ni	Daesung Hi-P & Myung jin Che.	plating		N.D.	3.11	N.D.	N.D.	-	-	
			Sn Plating	Sn	Daesung Hi-P & Myung jin Che.	plating		N.D.	N.D.	N.D.	N.D.	-	-	
3	SHELL	FD5015-P01	Copper Alloy / Sn Plating	C5210R-H / Sn	POONGSAN	stamping		N.D.	34.00	N.D.	N.D.	-	-	
4	CAP	FD5015-M02	PA46	TS250F6	DSM	molding		N.D.	N.D.	N.D.	N.D.	-	-	

* N.D. : Not Delected.

Unused Certificate

Date Issued : 2011년 08월 10일	
Title of Subject : HDMI 19P RIGHT ANGLE SMD TYPE	Issued by : J.G.LEE

Date : 08 / 10 / 2011 /

We agree that our HDMI 19P RIGHT ANGLE SMD TYPE does exceed the maximum concentration level of the substances with environmental impacts within products, required by Samsung Electronics

Samsung Electronics				Suppliers / Vendors	
Division				Company Name	FOOSUNG TECH
Department				Person	Hong, Sang Hyun
Tel.				E-mail	jglee73@foosung.com
Approval	Drafting	Judgment	Decision	Approval	(Representative) KWON SANG KOOK
					(Signature)

Part Name : CONNECTOR

Code No: FD05015-19

Substance Name	Raw Material			Additional			
	Maker	Material	Material type	Maker	Material	Material type	Purpose
INSULATOR	KURARAY	PA9T	GN2330	-	-	-	-
TERMINAL A,B	POONG SAN	BRASS	C2680 R-H	Daesung Hi-P	Ni+Au+Sn	Ni+Au+Sn	Plating
SHELL	POONG SAN	PHOSPHOR BRONZE	C5210 R-H	POONG SAN	Sn	Sn	Plating
CAP	DSM	PA46	TS250F6	-	-	-	-

[Samsung Electronics I Regulated Substances and Threshold Threshold Levels]

Cadmium	Lead	Mercury	Chrome(VI)	PBBs	PBDEs
5ppm	100ppm	100ppm	100ppm	100ppm	100ppm

* ppm = mg/kg(wt.basis)

Letter or Warranty and Represeniation("Letter")	Date Issued : 2011년 08월 10일
Title of Subject : HDMI 19P RIGHT ANGLE SMD TYPE	Issued by : S.H.Hong

To : Samsung Electronics Co., Ltd. ("Sec") and its affiliated companies

From : FOOSUNG TECH, Co., Ltd. (" Company")

1. Company hereby warrants and represent as follows:
   A. Company complies with all relevant international regulations concerning the substances with environmental impacts.
   B. Company complies with the Samsung Electronics Standards for Control of Substances with Environmental impacts within Products Samsung Environmer Standards, ("0QA-2049") in controlling environmentally hazardous substances
   C. The documents and data sheets on the subtances with environmental impacts contained in Company's supplies including, without limitation, products, parts, components, raw materials and packaging materials, are accufate and truthful.

2. Company agree to defend, hold harmless, and indemnify SEC from any claim arising out of or related to Company's failure to comply with the above warranties and representations including, without limitation, all counsel fees and legal costs, judgments, orders, awards, ank/or any damages arising out of and/or related to any such claim.

3. This Letter shall be effective from 2011/08/10 to 2012/08/10, and there after, shall be automatically renewed for each additional year unless SEC or Company objects such renewal in writing al least a month prior to an expiration date.

4. All disputes related to this Letter shall be finally settled by arbitration. The arbitration shall be conducted in English and in accordance with the Commercial Arbitration Rules of the Korean Commercial Arbitration Board. The arbitration shal take place in Seoul, Korea. the award rendered by the arbitrator shall be final and binding for both SEC and Company.

The undersigned is an authorized representative of the Company.

Signature : _____. Date : 2011. 08. 10

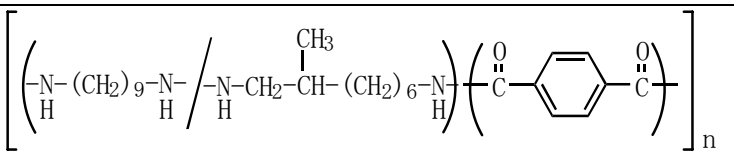
Print Name and Title : LEE, gi cheon.. President

Company Name and Address : #989-3, Gosask-Dong, Gwonseon-Gu, Suwon-City, Kyungki-Do, Korea

MATERIAL SAFETY DATA SHEET

Date : 2002.4.3 (1/2)

Revised : 2005.4.1

Company	KURARAY CO., LTD.
Address	Ote-Center Building, 1-1-3, Otemachi, Chiyoda-ku, Tokyo, 100 –8115, Japan
Phone Number	+81-3-6701-1677(For Information)
Fax Number	+81-3-6701-1654
Factory address	892, Tsuitachi, Saijou city, Ehime, 793 –8525, Japan
Phone Number	+81-897-56-1158
Fax Number	+81-897-53-1092
Chemical name	Polyamide 9T（Polynonamethylene terephthalamide）
Trade name	Genestar － GN2330
Chemical family	(1,4-Benzenedicarboxylic acid, polymer with 2-methyl-1,8-octandiamine and 1,9-nonanediamine)
CAS. No.	169284-22-4
Chemical formula	
1. Hazardous Ingredients	1,4-Benzenedicarboxylic acid, polymer with 2-methyl-1,8-octandiamine and 1,9-nonanediamine(CASNo.169284-22-4) ca.43±3% Flameretardants(Brominated compound) ca.24±3% Glass filler(CAS No.65997-17-3) ca.33±3% The above-mentioned materials are not hazardous.
2. Physical data	
Boiling point	N.A.(Not Applicable)
Vapor pressure	N.A.
Vapor density	N.A.
Solubility in water	Negligible
Specific gravity	1.62±0.03
Melting point	306 ± 5 ℃
3. Fire and explosion hazard data	
Flash ignition temp.	≧ 200℃
Extinguishing media	Water, Dry chemical and Carbon dioxide
Characteristic fire and explosion hazards	Polyamides usually burn with a bluish tinge. The gaseous decomposition products smell like burnt hair or wool.
4. First aid	
Emergency procedures	If molten polymer contacts the skin, cool immediately with cold water and obtain medical care for thermal burn. If exposed to vapors from overheating, remove to the fresh air and obtain medical care.
5. Stability data	
Materials to avoid contact	Strong acids, bases and oxidizing agents.
Polymerization	Will not occur.

6. Cares to be taken in case of spill or leak	
When material is spilled	Sweep up to prevent slipping on polymer pellets.
Waste disposal method	Disposal methods should conform with local government's and other regulations.
7. Protection procedures	
Respiratory protection	Unnecessary under normal processing.
Ventilation	Adequate ventilation is required at molding machine.
Protective gloves	At treating hot polymers.
Eye protection	Safety goggles for processing.
8. Other precautions	
Precautions to be taken in handling and storing	Keep dry storage and containers should be closed to prevent any contamination. After handling, wash hands with soap and plenty of water. In case of sensitive skin to reinforcing material dust ,may cause irritation and itching to skin. Wear long sleeved shirts, long pants and protective gloves.
Hazardous decomposition products	Toxic fume of CO, CO2, NH3, HCN and Brominated compound may be evolved.
Information on toxicity	Toxicity data and references: N.A.
Mutagenic effects	Negative in the AMES test.

* The contents of these hazard information were prepared based on materials, information, and data available at the present time; they may be revised according to new information.
* These written information does not guarantee the quality or safety of your company's finished product. Determination of the suitability of the finished product shall be the responsibility of your company.

Test Report

No. : CE/2010/B0600 Date : 2010/11/10 Page : 1 of 15

KURARAY CO., LTD.
OTE CENTER BLDG., 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO, JAPAN

The following sample(s) was/were submitted and identified by/on behalf of the client as:

Sample Description	:	NEW HEAT-RESISTANT POLYAMIDE RESIN
Style/Item No.	:	GENESTAR GN2330-1-BK
Sample Receiving Date	:	2010/11/03
Testing Period	:	2010/11/03 TO 2010/11/10

==========

Test Result(s) : Please refer to next page(s).

Conclusion : Base upon the performed tests by submitted samples, the test results of PAHs comply with the PAHs requirement according to (Category 1) of ZEK 01.2-08 of German ZLS and its amendments.

Chenyu Kung / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory – Taipei

KURARAY CO., LTD.
OTE CENTER BLDG., 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO, JAPAN

Test Result(s)

PART NAME No.1 : BLACK PLASTIC PELLETS

Test Item (s):	Unit	Method	MDL	Result No.1	Limit
Cadmium (Cd)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.	-
Lead (Pb)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.	-
Mercury (Hg)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.	-
Hexavalent Chromium Cr(VI) by alkaline extraction	mg/kg	With reference to IEC 62321: 2008 and performed by UV-VIS.	2	n.d.	-
Perfluorooctane sulfonates (PFOS) PFOS – Acid PFOS – Metal Salt PFOS – Amide	mg/kg	With reference to US EPA 3540C: 1996 method for PFOS Content. Analysis was performed by LC/MS.	10	n.d.	-
PFOA (CAS No.: 000335-67-1)	mg/kg	With reference to US EPA 3540C: 1996 method for PFOA Content. Analysis was performed by LC/MS.	10	n.d.	-
PVC	**	Analysis was performed by FTIR and FLAME Test.	-	Negative	-
Hexabromocyclododecane (HBCDD) (CAS No.: 025637-99-4)	mg/kg	With reference to US EPA 3540C method. Analysis was performed by GC/MS.	5	n.d.	-
Halogen					
Halogen-Fluorine (F) (CAS No.: 014762-94-8)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC.	50	3720	-
Halogen-Chlorine (Cl) (CAS No.: 022537-15-1)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.	-
Halogen-Bromine (Br) (CAS No.: 010097-32-2)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC.	50	129000	-
Halogen-Iodine (I) (CAS No.: 014362-44-8)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.	-

KURARAY CO., LTD.
OTE CENTER BLDG., 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO, JAPAN

Test Item (s):	Unit	Method	MDL	Result No.1	Limit
Sum of PBBs	mg/kg	With reference to IEC 62321: 2008 and performed by GC/MS.	-	n.d.	-
Monobromobiphenyl			5	n.d.	-
Dibromobiphenyl			5	n.d.	-
Tribromobiphenyl			5	n.d.	-
Tetrabromobiphenyl			5	n.d.	-
Pentabromobiphenyl			5	n.d.	-
Hexabromobiphenyl			5	n.d.	-
Heptabromobiphenyl			5	n.d.	-
Octabromobiphenyl			5	n.d.	-
Nonabromobiphenyl			5	n.d.	-
Decabromobiphenyl			5	n.d.	-
Sum of PBDEs			-	n.d.	-
Monobromodiphenyl ether			5	n.d.	-
Dibromodiphenyl ether			5	n.d.	-
Tribromodiphenyl ether			5	n.d.	-
Tetrabromodiphenyl ether			5	n.d.	-
Pentabromodiphenyl ether			5	n.d.	-
Hexabromodiphenyl ether			5	n.d.	-
Heptabromodiphenyl ether			5	n.d.	-
Octabromodiphenyl ether			5	n.d.	-
Nonabromodiphenyl ether			5	n.d.	-
Decabromodiphenyl ether			5	n.d.	-
Phthalates					
BBP (Benzyl butyl phthalate) (CAS No.: 000085-68-7)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	-
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 000117-81-7)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	-
DIDP (Di-isodecyl phthalate) (CAS No.: 026761-40-0)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.01	n.d.	-
DINP (Di-isononyl phthalate) (CAS No.: 028553-12-0)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.01	n.d.	-
DNOP (Di-n-octyl phthalate) (CAS No.: 000117-84-0)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	-
DBP (Dibutyl phthalate) (CAS No.: 000084-74-2)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	-

KURARAY CO., LTD.
OTE CENTER BLDG., 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO, JAPAN

Test Item (s):	Unit	Method	MDL	Result No.1	Limit
Polynuclear Aromatic Hydrocarbons (PAHs)					
Acenaphthene (CAS No.: 000083-32-9)	mg/kg	With reference to ZLS standard ZEK 01.2-08 method. Analysis was performed by GC/MS.	0.2	n.d.	-
Acenaphthylene (CAS No.: 000208-96-8)			0.2	n.d.	-
Anthracene (CAS No.: 000120-12-7)			0.2	n.d.	-
Benzo[a]anthracene (CAS No.: 000056-55-3)			0.2	n.d.	-
Benzo[a]pyrene (CAS No.: 000050-32-8)			0.2	n.d.	-
Benzo[b]fluoranthene (CAS No.: 000205-99-2)			0.2	n.d.	-
Benzo[g,h,i]perylene (CAS No.: 000191-24-2)			0.2	n.d.	-
Benzo[k]fluoranthene (CAS No.: 000207-08-9)			0.2	n.d.	-
Chrysene (CAS No.: 000218-01-9)			0.2	n.d.	-
Dibenzo[a,h]anthracene (CAS No.: 000053-70-3)			0.2	n.d.	-
Fluoranthene (CAS No.: 000206-44-0)			0.2	n.d.	-
Fluorene (CAS No.: 000086-73-7)			0.2	n.d.	-
Indeno[1,2,3-c,d] pyrene (CAS No.: 000193-39-5)			0.2	n.d.	-
Naphthalene (CAS No.: 000091-20-3)			0.2	n.d.	-
Phenanthrene (CAS No.: 000085-01-8)			0.2	n.d.	-
Pyrene (CAS No.: 000129-00-0)			0.2	n.d.	-
Sum of 16 PAHs			-	n.d.	-

KURARAY CO., LTD.
OTE CENTER BLDG., 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO, JAPAN

PASS

Test Item (s):	Unit	Method	MDL	Result No.1	Limit
EN 71 PART 3 Migration of certain elements		With reference to EN 71 PART 3: 1994 (A1: 2000) (EN 71 & BS 5665 are identical)			
Soluble Antimony (Sb)	mg/kg	ICP-AES	5	<5.0	60
Soluble Arsenic (As)	mg/kg	ICP-AES	2.5	<2.5	25
Soluble Barium (Ba)	mg/kg	ICP-AES	10	<10.0	1000
Soluble Cadmium (Cd)	mg/kg	ICP-AES	5	<5.0	75
Soluble Chromium (Cr)	mg/kg	ICP-AES	5	<5.0	60
Soluble Lead (Pb)	mg/kg	ICP-AES	5	<5.0	90
Soluble Mercury (Hg)	mg/kg	ICP-AES	5	<5.0	60
Soluble Selenium (Se)	mg/kg	ICP-AES	5	<5.0	500

Note：

1. mg/kg = ppm；0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. " - " = Not Regulated
5. ** = Qualitative analysis (No Unit)
6. Negative = Undetectable / Positive = Detectable

KURARAY CO., LTD.
OTE CENTER BLDG., 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO, JAPAN

Reference information for PAHs:
Requirement of ZEK 01.2-08 : Restraining maximum values for products

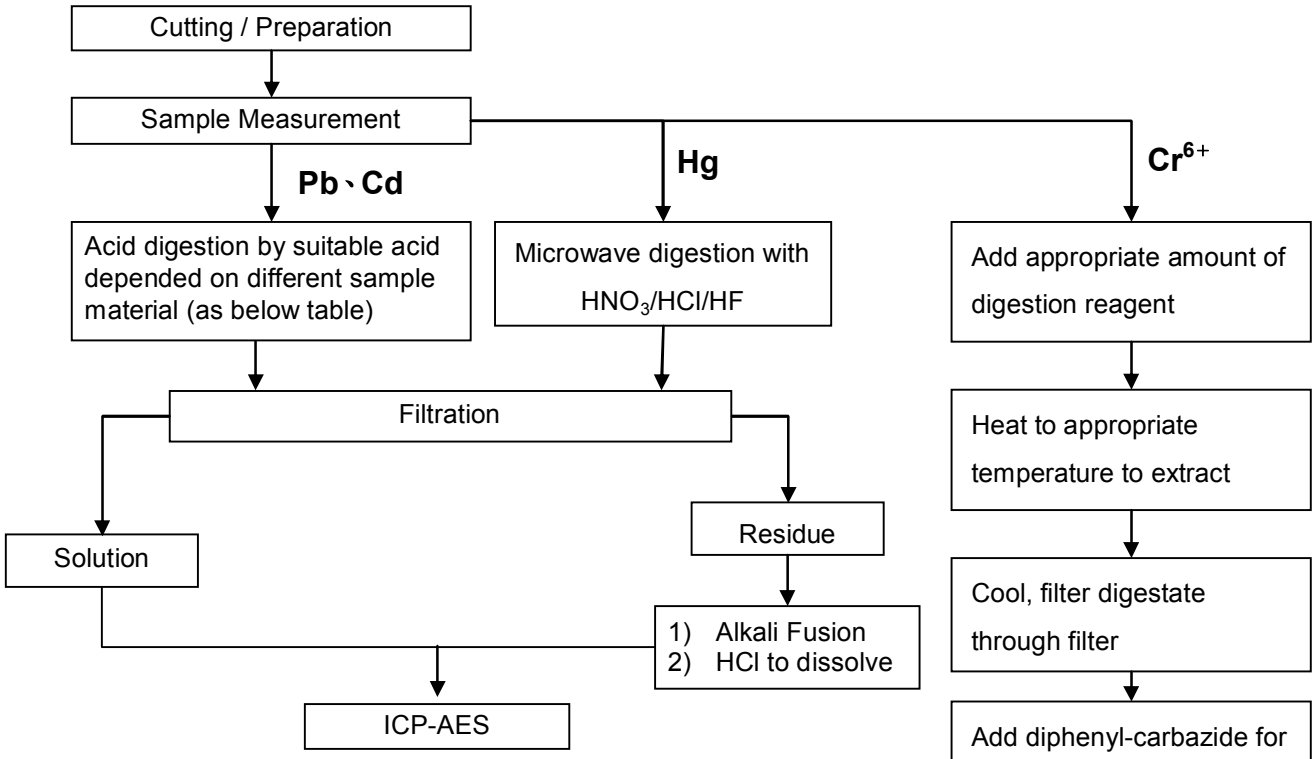
Parameter	Category 1	Category 2	Category 3
	Materials in contact with foodstuff or materials which are meant to put in the mouth as well as toys for children <36 months.	Materials with foreseeable skin contact >30 s (prolonged skin contact) and toys not covered by category 1.	Materials with foreseeable skin contact <30 s (short time skin contact) or without skin contact.
Benzo[a]pyrene (mg/kg)	<MDL (<0.2)**	1	20
Sum of 16 EPA-PAH (mg/kg)*	<MDL (<0.2)**	10	200

Remark :
* = Only PAH substances >0.2 mg/kg are taken into account while calculating the sum of PAHs
** = In case that the maximum values exceed the limits of category 1, but are within the limits of category 2, one may confirm the suitability of the tested material for contact with foodstuff or oral mucosa by additional specific migration tests of PAH components based on DIN EN 1186ff and §64 LFGB 80.30-1. The conclusion of the migration test results must be made based on food law criteria.

PFOS Reference Information : Directive 2006/122/EC
(1) May not be placed on the market or used as a substance or constituent of preparations in a concentration equal to or higher than 0.005 % by mass.
(2) May not be placed on the market in semi-finished products or articles, or parts thereof, if the concentration of PFOS is equal to or higher than 0.1 % by mass calculated with reference to the mass of structurally or microstructurally distinct parts that contain PFOS or, for textiles or other coated materials, if the amount of PFOS is equal to or higher than 1μg/m^2 of the coated material.

KURARAY CO., LTD.
OTE CENTER BLDG., 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO, JAPAN

1) These samples were dissolved totally by pre-conditioning method according to below flow chart. （Cr^{6+} test method excluded）
2) Name of the person who made measurement: Climbgreat Yang
3) Name of the person in charge of measurement: Troy Chang

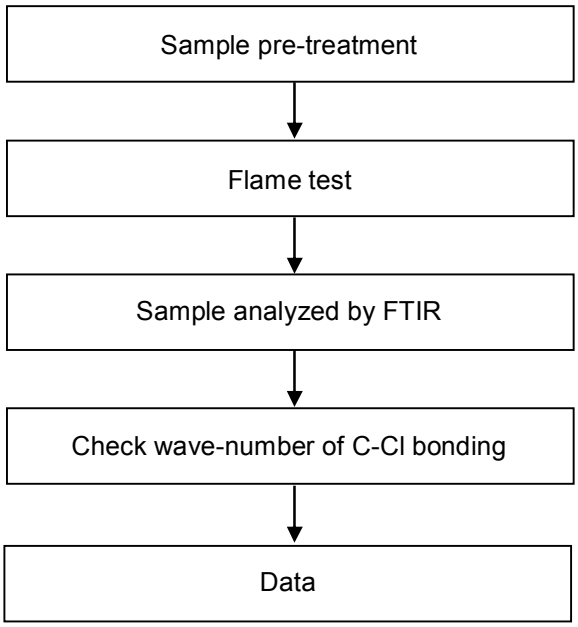


Sample Material	Digestion Acid
Steel, copper, aluminum, solder	Aqua regia, HNO_3, HCl, HF, H_2O_2
Glass	HNO_3/HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO_3
Plastic	H_2SO_4, H_2O_2, HNO_3, HCl
Others	Any acid to total digestion

KURARAY CO., LTD.
OTE CENTER BLDG., 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO, JAPAN

Analysis flow chart for determination of PVC in material

1) Name of the person who made measurement: Eva Chao
2) Name of the person in charge of measurement: Shinjyh Chen



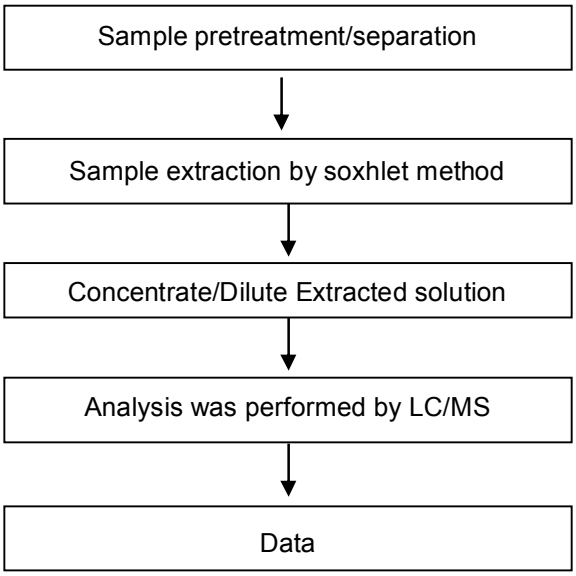
KURARAY CO., LTD.
OTE CENTER BLDG., 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO, JAPAN

Analytical flow chart of Soxhlet extraction (LC/MS) procedure

1) Name of the person who made measurement: Lydia Fu

2) Name of the person in charge of measurement: Shinjyh Chen

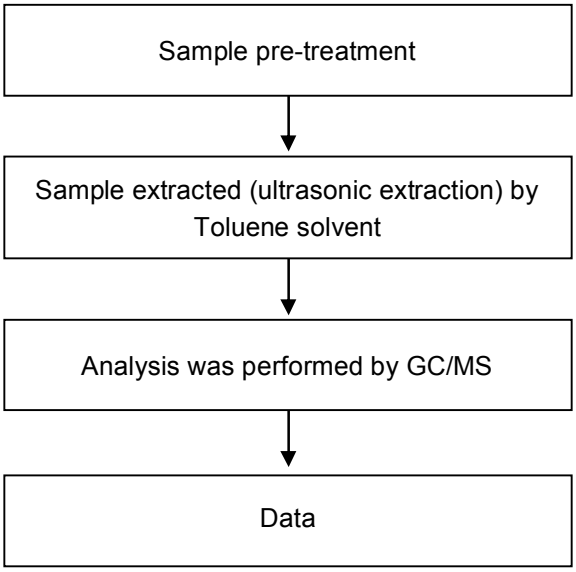
■ Test Items: PFOS/PFOA、Benzotriazole



KURARAY CO., LTD.
OTE CENTER BLDG., 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO, JAPAN

PAHs (Polynuclear Aromatic Hydrocarbons) analytical flow chart

1) Name of the person who made measurement: Andy Shu
2) Name of the person in charge of measurement: Shinjyh Chen



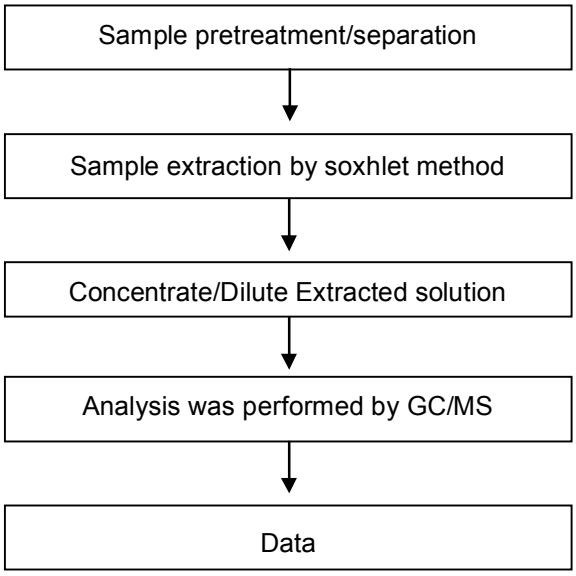
KURARAY CO., LTD.
OTE CENTER BLDG., 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO, JAPAN

Analytical flow chart of Soxhlet extraction (GC/MS) procedure

1) Name of the person who made measurement: Lydia Fu

2) Name of the person in charge of measurement: Shinjyh Chen

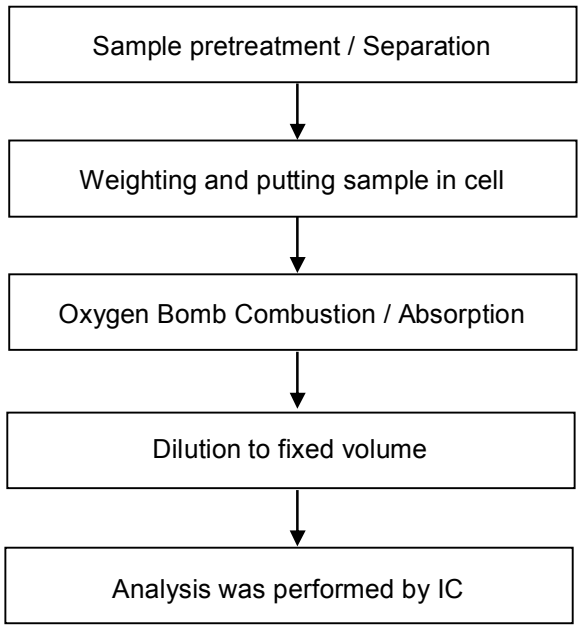
■ Test Items: Phthalate、Benzotriazole、HBCDD、NP、DBBT、Organic phosphorus compounds



KURARAY CO., LTD.
OTE CENTER BLDG., 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO, JAPAN

Analytical flow chart of halogen content

1) Name of the person who made measurement: Rita Chen
2) Name of the person in charge of measurement: Troy Chang

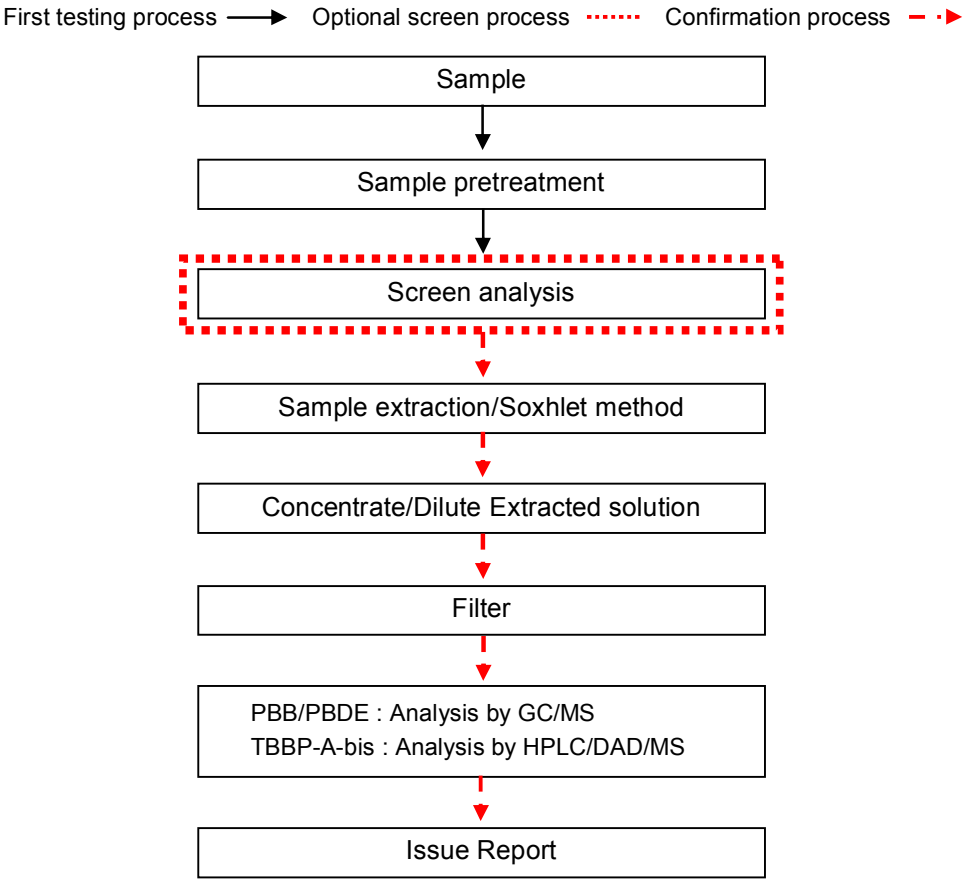


KURARAY CO., LTD.
OTE CENTER BLDG., 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO, JAPAN

Analytical flow chart

1) Name of the person who made measurement: Roman Wong
2) Name of the person in charge of measurement: Troy Chang

■ Test Items: PBB/PBDE, TBBP-A-bis



KURARAY CO., LTD.
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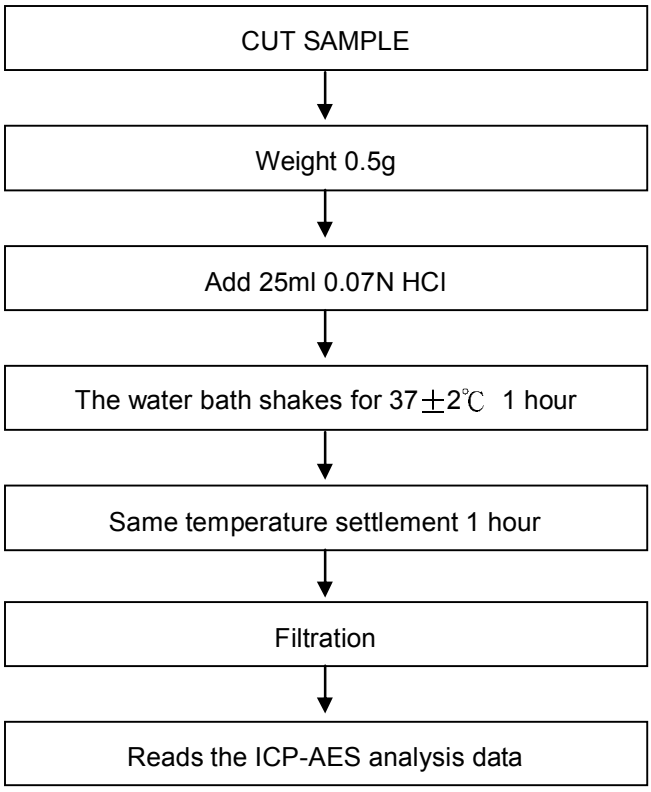
EN 71 PART 3 Analytical flow chart

1) Name of the person who made measurement: Climbgreat Yang
2) Name of the person in charge of measurement: Troy Chang



KURARAY CO., LTD.
OTE CENTER BLDG., 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO, JAPAN

CE/2010/B0600

** End of Report **

Material Safety Data Sheet

Stanyl® TS250F6D

Section 1. Chemical product and company identification

Product name : Stanyl® TS250F6D

Supplier : DSM Engineering Plastics Europe
P.O. Box 43, 6130 AA Sittard
The Netherlands

DSM Engineering Plastics Americas
2267 W. Mill Road
Evansville, IN 47720
USA

DSM Engineering Plastics Asia Pacific
11F, The Headquarters Building
No. 168 Middle Xi Zang Road
Changhai 200001
China

Material uses : plastic products

Code : WW29601

Emergency telephone number : **The Netherlands: +31 (0)46 476 55 55**

Section 2. Composition, information on ingredients

Chemical description : Base polymer: Polyamide 46 ; CAS no. 50327-22-5, alternative 50327-77-0

Name	CAS number	% by weight
Fiber Glass	65997-17-3	0 - 50
Antimony trioxide	1309-64-4	0 - 10

Remarks : The components of this product are embedded in an impervious polymer matrix and are therefore not biologically available. Any hazardous constituents are fixed in the polymer matrix and therefore present a negligible exposure risk under normal conditions of processing and handling. Additives contained in this product do not pose a risk to health unless they are liberated during processing (fumes from melting, dusts). Suitable Industrial Hygiene precautions should be implemented to prevent (respirable) dust and fume exposures. Exposure to (melting) fumes should be kept as low as possible, using suitable ventilation equipment. Dusts and fumes created from secondary processing may be irritating to respiratory tract and skin and should be considered as potentially hazardous. If user operations generate dust, fumes or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Section 3. Hazards identification

Physical state : Solid. [Granules , Pellets.]

Emergency overview :

NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

No known significant effects or critical hazards. Avoid prolonged contact with eyes, skin and clothing.

HCS Classification : Not regulated.

OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.

Potential acute health effects

Eyes : May cause eye irritation. (redness).

Continued on next page

Skin : Heated material can cause thermal burns resulting in pain, redness, blistering.

Inhalation : Over-exposure by inhalation may cause respiratory irritation. (coughing)

Ingestion : There is no known acute effect after over-exposure to this product.

Medical conditions aggravated by over-exposure : None known.

Remarks : Hazard of slipping on spilled product. Heated material can cause thermal burns. Electrostatic charging can occur during unloading or processing of this material. If necessary take precautionary measures against static discharges. This product contains additives classified as carcinogenic, mutagenic or reprotoxic. The likelihood of adverse health effects arising from normal use of the product are considered very low. Appropriate precautions should be taken if the product is subjected to secondary processing. If user operations generate dust, fumes or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Dust may cause mechanical irritation.

See toxicological information (section 11)

Section 4. First aid measures

Eye contact : Rinse with plenty of running water. Get medical attention if symptoms occur.

Skin contact : Rinse with plenty of running water. Do not pull coagulated product loose. Do not pull clothing loose from skin. Get medical attention.

Inhalation : If inhaled, remove to fresh air. Get medical attention if symptoms occur.

Ingestion : If swallowed, rinse mouth with water (only if the person is conscious). Get medical attention if symptoms occur.

Section 5. Fire fighting measures

Auto-ignition temperature : >420°C (>788°F)

Flash point : Closed cup: >375°C (>707°F)

Hazardous thermal decomposition products : In case of fire, may produce hazardous decomposition products such as carbon monoxide, carbon dioxide, (dense) black smoke, aldehydes, organic acids, nitrogen oxides (NO, NO_2 etc.), ammonia (NH_3), amines, hydrogen bromide, bromine, bromine compounds, silicium oxides, metal oxides, bromoformate ($COBr_2$). Hydrogen cyanide (HCN)

Extinguishing media

Suitable : Use dry chemical powder. Alcohol-resistant foam.

Special fire-fighting procedures : Fight fire from protected location or maximum possible distance. Keep the area surrounding the fire cool. Avoid contact with heated material.

Protection of fire-fighters : Wear suitable protective clothing. Self-contained breathing apparatus.

Section 6. Accidental release measures

Personal precautions : Avoid creating dusty conditions and prevent wind dispersal. Use suitable protective equipment (section 8). Keep away from sources of ignition. Take precautionary measures against static discharges.

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Methods for cleaning up : No special recommendations.

Personal protection in case of a large spill : No special recommendations.

Section 7. Handling and storage

Handling : Use with adequate ventilation. Local exhaust ventilation should be provided. Avoid creating dusty conditions and prevent wind dispersal. Take measures against static discharge. Keep away from sources of ignition.

Storage : Store in a fireproof location. Keep away from incompatible materials and avoid specific conditions (See section 10).

Remarks : Never stack pallets more than two high to prevent the risk of them falling over. Big Bags may not be stacked. Pallets should not be stacked along the aisles.

Continued on next page

Section 8. Exposure controls, personal protection

Engineering controls : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Personal protection

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands : When handling hot material, wear heat-resistant protective gloves that are able to withstand the temperature of molten product. Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Product name	Exposure limits
Fiber Glass	**ACGIH TLV (United States, 0/0). Notes: www.osha.gov; Exposure Limits for Synthetic Mineral Fibers** TWA: 5 mg/m³, 0 times per shift, 8 hour(s). Form: Continuous filament glass fibers ; ACGIH-A4-Not classifiable as a human carcinogen.
Antimony trioxide	**ACGIH TLV (United States, 1/2006). Notes: as Sb** TWA: 0.5 mg/m³, (as Sb) 8 hour(s). **OSHA PEL (United States, 11/2006). Notes: as Sb** TWA: 0.5 mg/m³, (as Sb) 8 hour(s). **OSHA PEL 1989 (United States, 3/1989). Notes: as Sb** TWA: 0.5 mg/m³, (as Sb) 8 hour(s).

Section 9. Physical and chemical properties

Physical state : Solid. [Granules , Pellets.]

Color : naturally opaque, dependent on the added pigment

Melting/freezing point : 295°C (563°F)

Specific gravity : >1

Vapor pressure : Not applicable

Solubility : Insoluble in the following materials: cold water.

Section 10. Stability and reactivity

Stability and reactivity : The product is stable.

Conditions to avoid : No special recommendations.

Materials to avoid : No special recommendations.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Remarks : At processing temperatures some degree of thermal degradation may occur. see section 5.

Continued on next page

Section 11. Toxicological information

Toxicity data

Ingredient name	Result	Species	Dose	Exposure
Antimony trioxide	LD50 Oral	Rat	>34600 mg/kg	-

Chronic effects on humans : **CARCINOGENIC EFFECTS**: Classified 2B (Possible for humans.) by IARC, 3 (Possible for humans.) by European Union [Antimony trioxide]. Classified A2 (Suspected for humans.) by ACGIH [Antimony trioxide]. Classified + (Proven.) by NIOSH [carbon black]. Classified 2B (Possible for humans.) by IARC [carbon black]. Classified A4 (Not classifiable for humans or animals.) by ACGIH [carbon black].

Other toxic effects on humans : Not considered to be toxic to humans.

Special remarks on other toxic effects on humans : Not available.

Specific effects

Carcinogenic effects : No known significant effects or critical hazards.

Mutagenic effects : No known significant effects or critical hazards.

Reproduction toxicity : No known significant effects or critical hazards.

Remarks : The components of this product are embedded in an impervious polymer matrix and are therefore not biologically available. This product contains additives classified as carcinogenic, mutagenic or reprotoxic. The likelihood of adverse health effects arising from normal use of the product are considered very low.

Section 12. Ecological information

Ecotoxicity data

Ingredient name	Test	Result	Species	Exposure
Antimony trioxide	Intoxication	Acute EC50 423.45 mg/L	Daphnia	48 hours
	Biochemistry	Acute EC50 0.74 mg/L	Algae	48 hours
	Mortality	Acute LC50 >440 mg/L	Fish	96 hours

Products of degradation : Products of degradation: carbon oxides (CO, CO_2) and water, nitrogen oxides (NO, NO_2 etc.), halogenated compounds. Some metallic oxides.

Remarks : This product is not biodegradable and not toxic to aquatic organisms. The components of this product are embedded in an impervious polymer matrix and are therefore not biologically available.

Section 13. Disposal considerations

Waste disposal : Waste must be disposed of in accordance with national and local environmental regulations.

Consult your local or regional authorities.

Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	Not regulated.	-	-	-		-
TDG Classification	Not regulated.	-	-	-		-
Mexico Classification	Not regulated.	-	-	-		-
ADR/RID Class	Not regulated.	-	-	-		-

Continued on next page

IMDG Class	Not regulated.	-	-	-		-
IATA-DGR Class	Not regulated.	-	-	-		-

Section 15. Regulatory information

U.S. Federal regulations : TSCA 8(a) PAIR:bromine compounds
TSCA 8(b) inventory: All components in compliance with TSCA Inventory requirements.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Antimony trioxide
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: bromine compounds: Immediate (acute) health hazard; Antimony trioxide: Delayed (chronic) health hazard

Clean Water Act (CWA) 307: Antimony trioxide

Clean Water Act (CWA) 311: Antimony trioxide

Clean Air Act (CAA) 112 accidental release prevention: No products were found.

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

SARA 313

		Product name	CAS number	Concentration
Form R - Reporting requirements	:	Antimony trioxide	1309-64-4	0 - 10
Supplier notification	:	Antimony trioxide	1309-64-4	0 - 10

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations : **Connecticut Carcinogen Reporting**: None of the components are listed.
Connecticut Hazardous Material Survey: None of the components are listed.
Florida substances: None of the components are listed.
Illinois Chemical Safety Act: None of the components are listed.
Illinois Toxic Substances Disclosure to Employee Act: None of the components are listed.
Louisiana Reporting: None of the components are listed.
Louisiana Spill: None of the components are listed.
Massachusetts Spill: None of the components are listed.
Massachusetts Substances: The following components are listed: ANTIMONY TRIOXIDE
Michigan Critical Material: None of the components are listed.
Minnesota Hazardous Substances: None of the components are listed.
New Jersey Hazardous Substances: The following components are listed: ANTIMONY TRIOXIDE
New Jersey Spill: None of the components are listed.
New Jersey Toxic Catastrophe Prevention Act: None of the components are listed.
New York Acutely Hazardous Substances: The following components are listed: Antimony trioxide
New York Toxic Chemical Release Reporting: None of the components are listed.
Pennsylvania RTK Hazardous Substances: The following components are listed: ANTIMONY OXIDE (SB2O3)
Rhode Island Hazardous Substances: None of the components are listed.

WARNING: This product contains a chemical known to the State of California to cause cancer.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Antimony trioxide	Yes.	No.	No.	No.

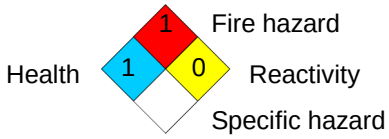
Remarks : Not controlled under WHMIS (Canada). All components in compliance with (N)DSL Inventory requirements.

Continued on next page

Section 16. Other information

Label requirements : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

National Fire Protection Association (U.S.A.) :



Information : DSM Engineering Plastics, Technical Marketing
P.O. Box 604, 6160 AP Geleen
The Netherlands, Europe
Phone +31(0) 46 4767847 / 4767411, Fax +31(0) 46 4760796
E-mail: dietmar.kleborn@dsm.com

MSDS:
DSM Responsible Care & Product Safety
P.O. Box 6500, 6401 JH Heerlen
The Netherlands, Europe

Date of printing : **2/20/2008.**

Date of issue : **2/20/2008.**

Date of previous issue : **12/1/2006.**

Version : **4**

Notice to reader

The information contained in the Material Safety Data Sheet is based on our data available on the date of publication. The information is intended to aid the user in controlling the handling risks; it is not to be construed as a warranty or specification of the product quality. The information may not be or may not altogether be applicable to combinations of the product with other substances or to particular applications.
The user is responsible for ensuring that appropriate precautions are taken and for satisfying themselves that the data are suitable and suffcient for the product's intended purpose. In case of any unclarity we advise consulting the supplier or an expert.

Sources of key data : Literature data and/or investigation reports are available through the manufacturer.

Alterations compared to the previous version : Alterations compared to the previous version are marked with a little (blue) triangle.

Test Report

No. : CE/2010/92441 Date : 2010/09/20 Page : 1 of 5

DSM JAPAN ENGINEERING PLASTICS K.K.
2-6-3, SHIBA KOEN, MINATO-KU, TOKYO, 105-0011, JAPAN

The following sample(s) was/were submitted and identified by/on behalf of the client as :

Sample Description	:	PA46 STANYL®
Style/Item No.	:	TS250F6D 9B0040 TY0808
Sample Receiving Date	:	2010/09/14
Testing Period	:	2010/09/14 TO 2010/09/20

==========

Test Requested : In accordance with the RoHS Directive 2002/95/EC, and its amendment directives.

Test Method : With reference to IEC 62321: 2008
Procedures for the Determination of Levels of Regulated Substances in Electrotechnical Products.

(1) Determination of Cadmium by ICP-AES.
(2) Determination of Lead by ICP-AES.
(3) Determination of Mercury by ICP-AES.
(4) Determination of Hexavalent Chromium by UV/Vis Spectrometry.
(5) Determination of PBB and PBDE by GC/MS.

Test Result(s) : Please refer to next page(s).

SGS TAIWAN LTD
Chenyu Kung / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory – Taipei

DSM JAPAN ENGINEERING PLASTICS K.K.
2-6-3, SHIBA KOEN, MINATO-KU, TOKYO, 105-0011, JAPAN

Test results by chemical method (Unit: mg/kg)

Test Item (s):	Method (Refer to)	Result No.1	MDL
Cadmium (Cd)	(1)	n.d.	2
Lead (Pb)	(2)	22	2
Mercury (Hg)	(3)	n.d.	2
Hexavalent Chromium Cr(VI) by alkaline extraction	(4)	n.d.	2
Sum of PBBs	(5)	n.d.	-
Monobromobiphenyl		n.d.	5
Dibromobiphenyl		n.d.	5
Tribromobiphenyl		n.d.	5
Tetrabromobiphenyl		n.d.	5
Pentabromobiphenyl		n.d.	5
Hexabromobiphenyl		n.d.	5
Heptabromobiphenyl		n.d.	5
Octabromobiphenyl		n.d.	5
Nonabromobiphenyl		n.d.	5
Decabromobiphenyl		n.d.	5
Sum of PBDEs		n.d.	-
Monobromodiphenyl ether		n.d.	5
Dibromodiphenyl ether		n.d.	5
Tribromodiphenyl ether		n.d.	5
Tetrabromodiphenyl ether		n.d.	5
Pentabromodiphenyl ether		n.d.	5
Hexabromodiphenyl ether		n.d.	5
Heptabromodiphenyl ether		n.d.	5
Octabromodiphenyl ether		n.d.	5
Nonabromodiphenyl ether		n.d.	5
Decabromodiphenyl ether		n.d.	5

TEST PART DESCRIPTION:

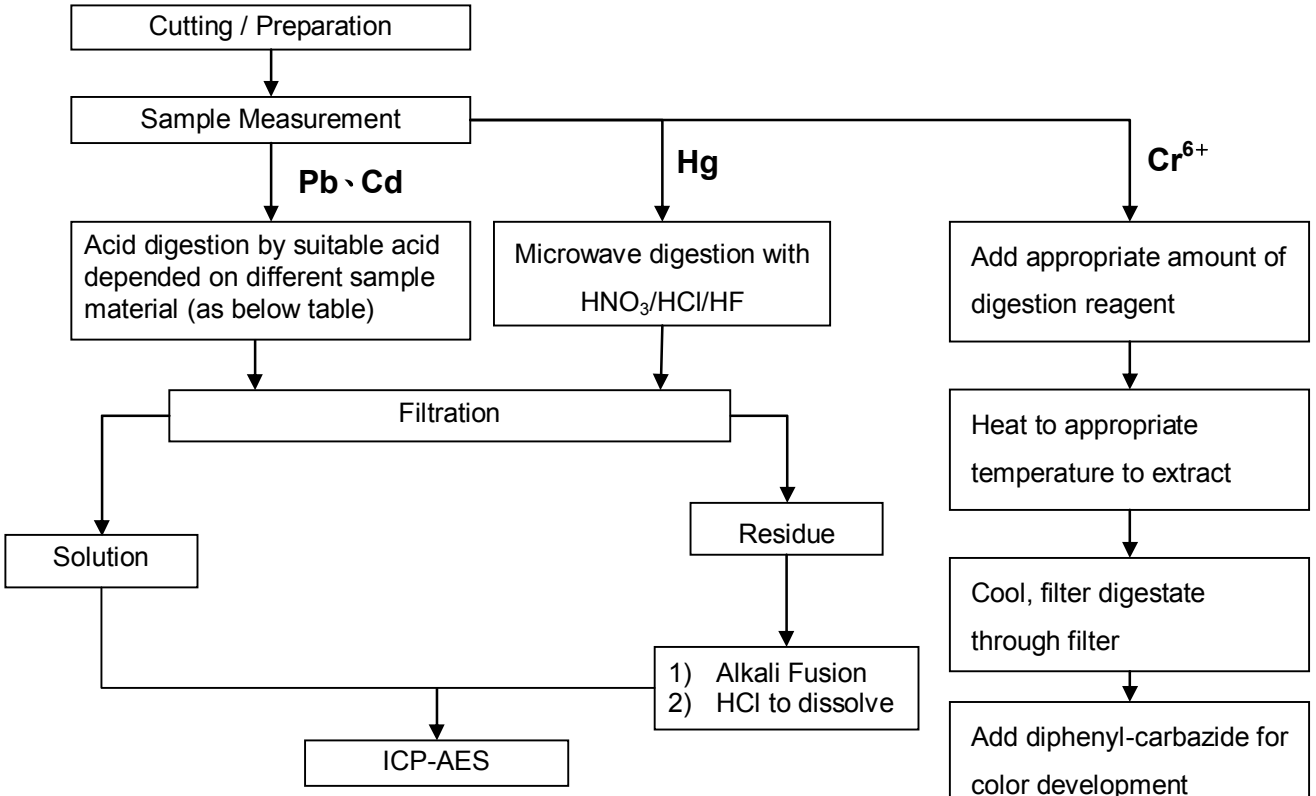
No.1 : BLACK PLASTIC PELLETS

Note :

1. mg/kg = ppm; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. "-" = Not Regulated

DSM JAPAN ENGINEERING PLASTICS K.K.
2-6-3, SHIBA KOEN, MINATO-KU, TOKYO, 105-0011, JAPAN

1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} test method excluded)
2) Name of the person who made measurement: Climbgreat Yang
3) Name of the person in charge of measurement: Troy Chang

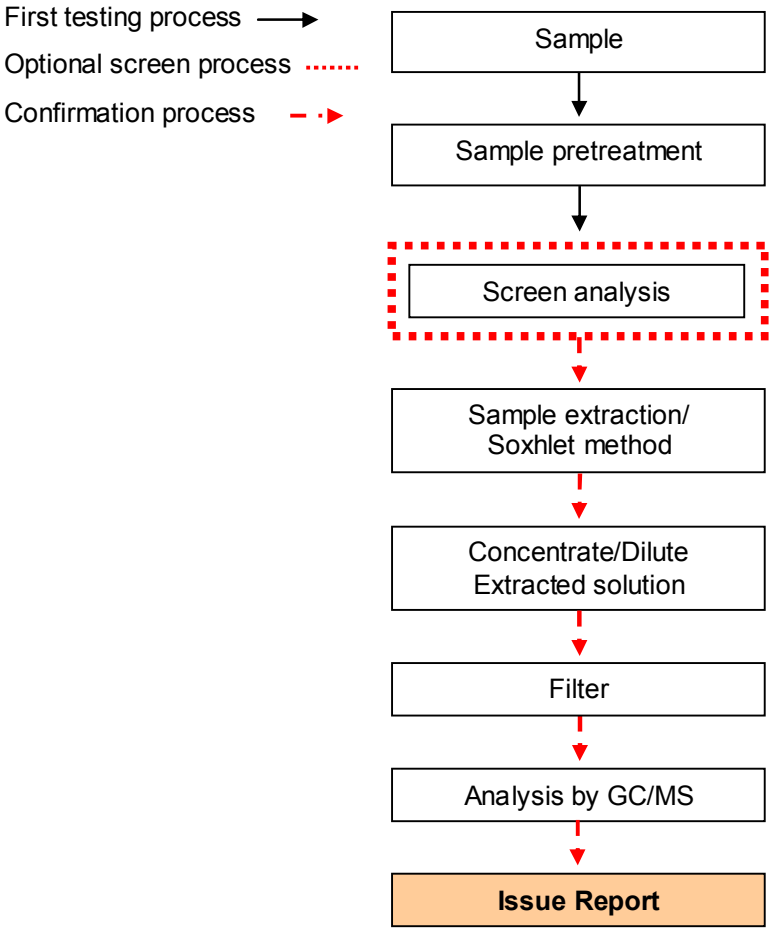


Sample Material	Digestion Acid
Steel, copper, aluminum, solder	Aqua regia, HNO_3, HCl, HF, H_2O_2
Glass	HNO_3/HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO_3
Plastic	H_2SO_4, H_2O_2, HNO_3, HCl
Others	Any acid to total digestion

DSM JAPAN ENGINEERING PLASTICS K.K.
2-6-3, SHIBA KOEN, MINATO-KU, TOKYO, 105-0011, JAPAN

PBB/PBDE analytical FLOW CHART

1) Name of the person who made measurement: Roman Wong
2) Name of the person in charge of measurement: Troy Chang



DSM JAPAN ENGINEERING PLASTICS K.K.
2-6-3, SHIBA KOEN, MINATO-KU, TOKYO, 105-0011, JAPAN

** End of Report **

POONGSAN 주식회사 풍산 온산공장	물질안전보건자료 (Material Safety Data Sheet)	
	물질명 : 황동 (Brass) Cas No :	Page 1/3
	발행일자	2006.4.17
	개정일자	2008.11.24

1. 제품 및 제조회사 정보

① 물질명 : 황동 대, 봉, 선 (C2600, C2680, C2700, C2800 Brass Strip, Bar, Wire)
② 용도 : 전기부품 외
③ 유해성분류 (노동부고시기준) : 자료없음
④ 화학적 일반 특성 : 고체
⑤ 제조자 주소 / 정보 : (주)풍산 온산공장
주소 : 울산광역시 울주군 온산읍 대정리 611번지
⑥ 공급자 주소 / 정보 : (주)풍산
주소 : 서울특별시 중구 충무로 3가 60-1

2. 위험유해성

① 유해성분류
CERCLA 지수 : 보건=(0) 화재=(3) 폭발=(1)
② 급성영향 : 금속열, 설사, 복통, 현기증, 신경손상, 쇼크, 구토증상, 피부염을 유발할 수 있음
③ 만성영향 : 급성영향과 동일하며 달모, 두통, 폐질환을 병행할 수 있음
④ 인체침입경로 : 호흡기, 소화기

3. 구성성분 명칭 및 조성

명 칭	이 명	CAS No	함유량(%)
① Copper	Cu	7440 - 50 - 8	61.0 ~ 70.5%
② Zinc	Zn	7440 - 66 - 6	39.0 ~ 29.5%

4. 응급조치요령

① 피부 : 오염된 의복과 신을 벗긴 후 다량의 물로 씻을 것
② 눈 : 다량의 물로 씻을 것
③ 흡입 : 신선한 공기가 있는 곳으로 옮긴 후 필요에 따라 인공호흡을 시킬 것
④ 섭취 : 구토들 하면 흡입을 위해 기도들 확보하고 식염수로 위세척을 할 것
⑤ 의사정보 : 즉시 의학적인 조치들 받을 것

5. 화재 및 폭발시 대처방법

① 인화점/발화점 : 자료없음
② 폭발 : 용융된 상태의 경우 물과 격렬히 반응할 수 있음.
③ 소화제 종류 : 분말소화제, 소다 회, 석회 또는 모래들 사용할 것
④ 진화방법 : 타는 물질에 물을 뿌리지 말고 모래등을 사용할 것
⑤ 유해연소생성물 : 자료없음

6. 누출사고시 대처방법

① 개인 보호 조치 : 유출된 물질을 만지지 말고 감독자의 지시들 따들 것
② 환경 보호 조치 : 누출된 물질을 회수하여 분리수거 후 재활용할 것
③ 사고 후 조치 : 전문가의 지시에 따라 조치할 것

7. 취급 및 저장방법

① 취급시 주의사항 : 산, 할로겐 화합물, 탄화수소와 격리할 것
용융액에 물유입시 폭발가능성 있음
동분취급 작업시 방진 마스크, 보안경, 보호의 착용
② 저장시 주의사항 : 수분방지 대책이 된 건조하고 환기가 잘되는 곳에 보관할 것

8. 노출 방지 및 개인 보호구

① 허용농도
TWA : 10mg / ㎥ (충분진으로 OSHA 기준)
② 공학적인 조치 : 방폭구조로 된 국소 배기장치 및 전체 환기장치들 설치할 것
③ 개인보호구 : 보안경, 보호의, 보호장갑, 방진마스크, 기타

9. 물리 화학적 특성

① 외관 : 고체
② 냄새 : 무취
③ PH : 적용안됨
④ 용해도 : 적용안됨
⑤ 비점 : 자료없음
⑥ 융점 : 900℃
⑦ 폭발성 : 자료없음
⑧ 산화성 : 자료없음
⑨ 비중 : 8.50
⑩ 증기압 : 적용안됨

10. 안전성 및 반응성

① 안정성 : 상온 상압에서 안정함
② 반응성 : 산 또는 물과 반응하여 인화성이 강한 수소들 발생함
③ 피해야 할 조건 : 화합물질과의 혼합(합성)시에는 전문가의 지시들 따를 것
④ 피해야 할 물질 : 화학반응시 급격한 분해 또는 폭발가능성 있음

11. 독성에 관한 정보

① LD50 : 자료없음
② LC50 : 자료없음
③ 발암성 : 없음

12. 환경에 미치는 영향

① 수생 및 생태독성 : 자료없음
② 토양이동성 : 자료없음
③ 잔류성 및 분해성 : 자료없음
④ 동생물의 생체내 축적 가능성 : 자료없음

13. 폐기 시 주의사항

① 폐기물관리법상 규제현황 : 미규정
② 폐기방법 : 관련규정을 준수하여 폐기할 것
③ 폐기 시 주의사항 : 특이사항 없음

14. 운송에 필요한 정보

① 선박안전법 위험물선박운송 및 저장규칙에 의한 분류 및 규제 : 자료없음
② 운송 시 주의사항 : 자료없음
③ 기타 외국의 운송관련 규정에 의한 분류 및 규제 : 자료없음

15. 관련법규에 관한 정보

① 산업안전 보건법 : MSDS 작성대상 물질
② 환경관리법 : 해당없음
③ 소방법 : 해당없음

16. 기타 참고사항

① 관련 근거 : 산업안전보건법 제41조 [물질안전보건자료의 작성, 비치 등]
② 참고 자료 : 화학물질 및 물리적인자의 노출기준 (노동부 고시 제97-65호)

■ MSDS 관련문의 : (주)풍산 온산공장 시험분석팀 (052-231-9383)

Test Report No. F690501/LF-CTSAYAU10-05130

To: **POONGSAN CORPORATION**
611 Daejung-ri Onsan-eup
Ulju
ULSAN
KOREA

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

SGS File No.	:	AYAU10-05130
Product Name	:	C2680
Item No./Part No.	:	N/A
Received Date	:	Oct. 27, 2010
Test Period	:	Oct. 28, 2010 to Nov. 03, 2010
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)
Conclusion	:	Based on the performed tests on submitted sample(s), the results **comply with** the RoHS Directive 2002/95/EC and its subsequent amendments.

SGS Testing Korea Co. Ltd. / Gimhae Laboratory

Sharpless Park
Annie Lim
Jonadan Lee /Testing Person

Thomas Hwang / Gimhae Lab. Mgr

SGS Testing Korea Co.,Ltd.
204, GBMC, 155-1, Nongso-ri, Juchon-myeon, Gimhae-si, Gyeongnam, Korea 621-842
t +82 (0)55 3108 800 f +82 (0)55 3108 809 http://www.sgslab.co.kr , www.kr.sgs.com/greenlab

Sample No. : AYAU10-05130.001

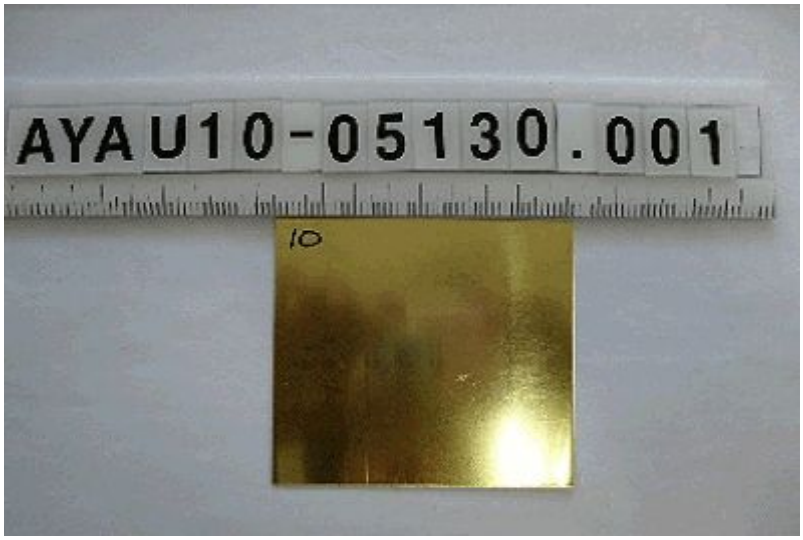
Sample Description : C2680

Item No./Part No. : N/A

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321:2008, ICP	1	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321:2008, ICP	5	21.0
Mercury (Hg)	mg/kg	With reference to IEC 62321:2008, ICP	2	N.D.
Hexavalent Chromium (Cr VI) By boiling water extraction*	-	With reference to IEC 62321:2008	-	Negative

Picture of Sample as Received:



NOTE:
(1) N.D. = Not detected.(<MDL)
(2) mg/kg = ppm
(3) MDL = Method Detection Limit
(4) - = No regulation
(5) ** = Qualitative analysis (No Unit)
(6) * = Boiling-water-extraction:
Negative = Absence of CrVI coating
Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

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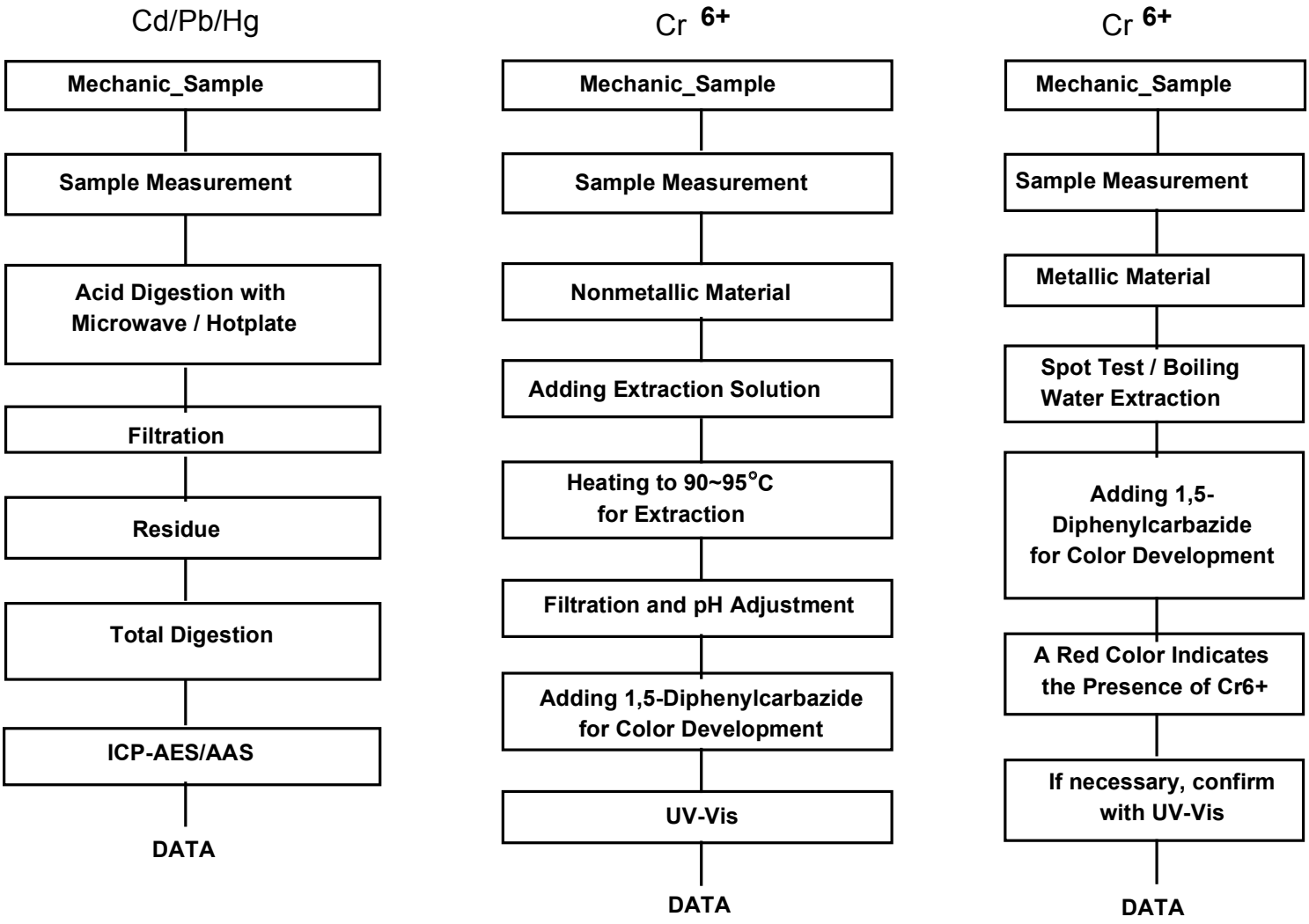
Testing Flow Chart for RoHS:Cd/Pb/Hg/Cr^{6+} Testing



The samples were dissolved totally by pre-conditioning method according to above flow chart for Cd,Pb,Hg.

Section Chief : Sharpless Park

*** End ***

NOTE:
(1) N.D. = Not detected.(<MDL)
(2) mg/kg = ppm
(3) MDL = Method Detection Limit
(4) - = No regulation
(5) ** = Qualitative analysis (No Unit)
(6) * = Boiling-water-extraction:
Negative = Absence of CrVI coating
Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

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POONGSAN CORPORATION ONSAN PLANT	물질안전보건자료 (Material Safety Data Sheet)	
	물질명 : Phosphorus Bronze Cas No :	Page 1/2

1. 제품 및 제조회사 정보

① 물질명 : 인청동 (Phosphorus Bronze)
② 용도 : 전기부품 외
③ 유해성분류 (노동부고시기준) : 자료없음
④ 화학적 일반 특성 : 고체
⑤ 제조자 주소 / 정보 : (주)풍산 온산공장
주소 : 울산광역시 울주군 온산읍 대정리 611번지
⑥ 공급자 주소 / 정보 : (주)풍산
주소 : 서울특별시 중구 충무로 3가 60-1

2. 구성성분 명칭 및 조성

명 칭	이 명	CAS No	함유량(%)
① Copper	Cu	7440 - 50 - 8	나머지
② Tin	Sn	7440 - 31 - 5	3.5~9.0%
③ Phosphorus	P	7723 - 31 - 5	0.03~0.35%

3. 위험유해성

① 유해성분류
CERCLA 지수 : 보건=(0) 화재=(3) 폭발=(1)
② 급성영향 : 금속열, 설사, 복통, 현기증, 신경손상, 쇼크, 구토증상, 피부염을 유발할 수 있음
③ 만성영향 : 급성영향과 동일하며 탈모, 두통, 폐질환을 병행할 수 있음
④ 인체침입경로 : 호흡기, 소화기

4. 응급조치요령

① 피부 : 오염된 의복과 신을 벗긴 후 다량의 물로 씻을 것
② 눈 : 다량의 물로 씻을 것
③ 흡입 : 신선한 공기가 있는 곳으로 옮긴 후 필요에 따라 인공호흡을 시킬 것
④ 섭취 : 구토를 하면 흡입을 위해 기도를 확보하고 식염수로 위세척을 할 것
⑤ 의사정보 : 즉시 의학적인 조치를 받을 것

5. 화재 및 폭발시 대처방법

① 인화점/발화점 : 자료없음
② 폭발 : 용융된 상태의 경우 물과 격렬히 반응할 수 있음.
③ 소화제 종류 : 분말소화제, 소다 회, 석회 또는 모래를 사용할 것
④ 진화방법 : 타는 물질에 물을 뿌리지 말고 모래등을 사용할 것
⑤ 유해연소생성물 : 자료없음

6. 누출사고시 대처방법

① 개인 보호 조치 : 유출된 물질을 만지지 말고 감독자의 지시를 따를 것
② 환경 보호 조치 : 누출된 불실을 회수하여 분리수거 후 새활용할 것
③ 사고 후 조치 : 전문가의 지시에 따라 조치할 것

POONGSAN CORPORATION ONSAN PLANT	물질안전보건자료 (Material Safety Data Sheet)	
	물질명 : Phosphorus Bronze Cas No :	Page 2/2

7. 노출 방지 및 개인 보호구

① 허용농도
TWA : 10mg / ㎥ (총분진으로 OSHA 기준)
② 공학적인 조치 : 방폭구조로 된 국소 배기장치 및 전체 환기장치를 설치할 것
③ 개인보호구 : 보안경, 보호의, 보호장갑, 방진마스크, 기타

8. 취급 및 저장방법

① 취급시 주의사항 : 산, 할로겐 화합물, 탄화수소와 격리할 것
용융액에 물유입시 폭발가능성 있음
동분취급 작업시 방진 마스크, 보안경, 보호의 착용
② 저장시 주의사항 : 수분방지 대책이 된 건조하고 환기가 잘되는 곳에 보관할 것

9. 안전성 및 반응성

① 안정성 : 상온·상압에서 안정함
② 반응성 : 산 또는 물과 반응하여 인화성이 강한 수소를 발생함
③ 피해야 할 조건 : 회합물질과의 혼합(합성)시에는 전문가의 지시를 따를 것
④ 피해야 할 물질 : 화학반응시 급격한 분해 또는 폭발가능성 있음

10. 물리 화학적 특성

① 외관 : 고체
② 냄새 : 무취
③ PH : 적용안됨
④ 용해도 : 적용안됨
⑤ 비점 : 자료없음
⑥ 융점 : 880℃
⑦ 폭발성 : 자료없음
⑧ 산화성 : 자료없음
⑨ 비중 : 8.80
⑩ 증기압 : 적용안됨

11. 구성성분 명칭 및 조성

① LD50 : 자료없음
② LC50 : 자료없음
③ 발암성 : 없음

12. 관련법규에 관한 정보

① 산업안전 보건법 : MSDS 작성대상 물질
② 환경관리법 : 해당없음
③ 소방법 : 해당없음

Test Report No. F690501/LF-CTSAYAA11-00108

To: **WOLSUNG METAL CORP.**
2Ra-203
Shiwha Industrial Complex
Shihung-city
GYEONGGI-DO 429-450
Korea

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

SGS File No.	:	AYAA11-00108
Product Name	:	Phosphor Bronze Strip
Item No./Part No.	:	N/A
Received Date	:	Jan. 03, 2011
Test Period	:	Jan. 04, 2011 to Jan. 06, 2011
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 / Chemical Lab Mgr

Timothy Jeon
Jinhee Kim
Cindy Park
Jerry Jung/ Testing Person

SGS Testing Korea Co.,Ltd.
322, The O valley, 555-9, Hogye-dong, Dongan-gu, Anyang-si, Gyeonggi-do, Korea 431-080
t +82 (0)31 4608 000 f +82 (0)31 4608 059 http://www.sgslab.co.kr ,www.kr.sgs.com/greenlab

Sample No. : AYAA11-00108.001

Sample Description : Phosphor Bronze Strip

Item No./Part No. : N/A

Comments : Materials are C5210/C5191 Tin-Plated/Phosphor bronze strip.

Heavy Metals

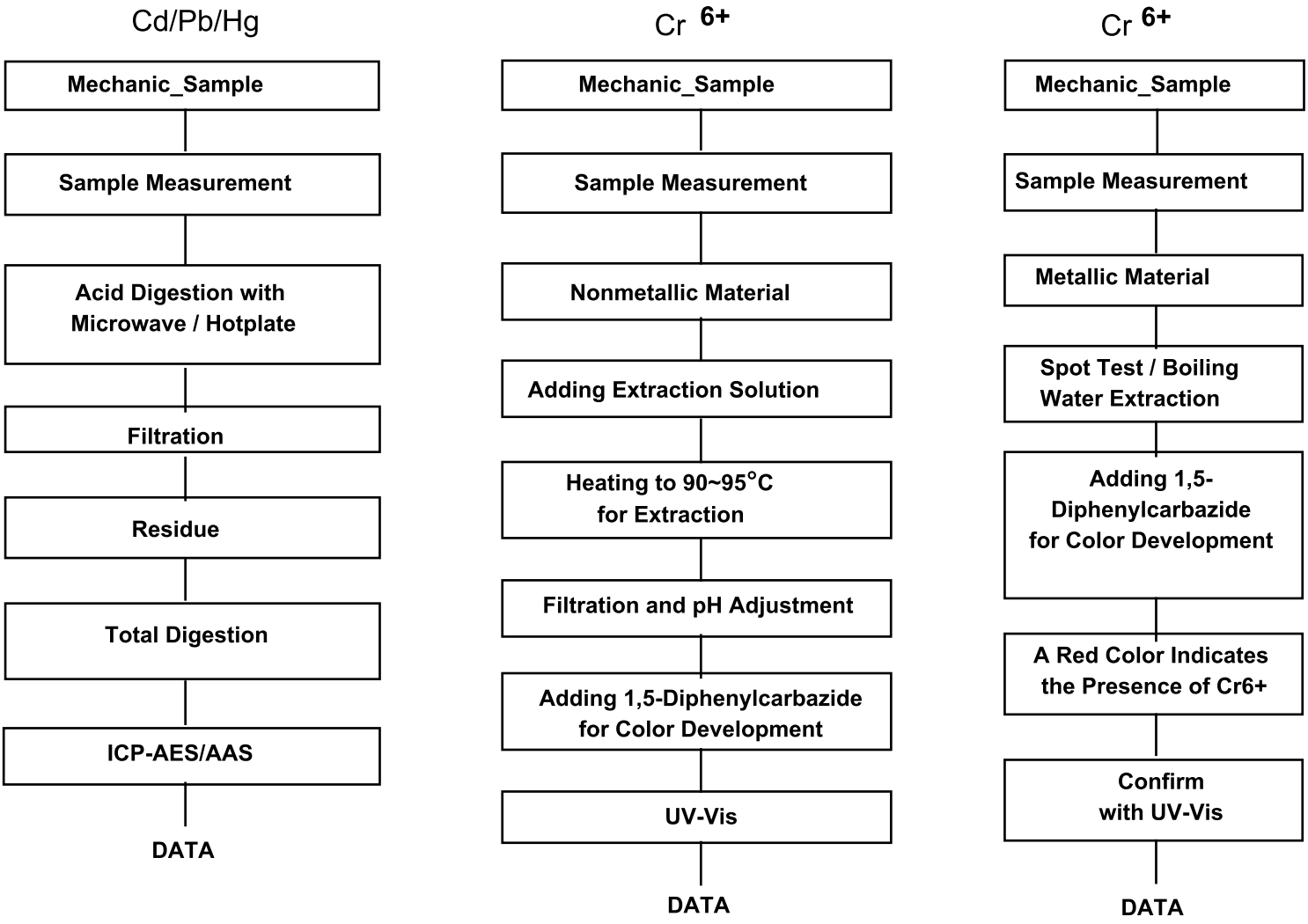
Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321:2008, ICP	0.5	1.83
Lead (Pb)	mg/kg	With reference to IEC 62321:2008, ICP	5	48.9
Mercury (Hg)	mg/kg	With reference to IEC 62321:2008, ICP	2	N.D.
Hexavalent Chromium (Cr VI) By boiling water extraction*	-	With reference to IEC 62321:2008	-	Negative

Picture of Sample as Received:

NOTE:
(1) N.D. = Not detected.(<MDL)
(2) mg/kg = ppm
(3) MDL = Method Detection Limit
(4) - = No regulation
(5) ** = Qualitative analysis (No Unit)
(6) * = Boiling-water-extraction:
Negative = Absence of CrVI coating
Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

SGS Testing Korea Co.,Ltd.
322, The O valley, 555-9, Hogye-dong, Dongan-gu, Anyang-si, Gyeonggi-do, Korea 431-080
t +82 (0)31 4608 000 f +82 (0)31 4608 059 http://www.sgslab.co.kr ,www.kr.sgs.com/greenlab

Testing Flow Chart for RoHS:Cd/Pb/Hg/Cr^{6+} Testing



The samples were dissolved totally by pre-conditioning method according to above flow chart for Cd,Pb,Hg.

Section Chief : Gilsae Yi

*** End ***

NOTE:
(1) N.D. = Not detected.(<MDL)
(2) mg/kg = ppm
(3) MDL = Method Detection Limit
(4) - = No regulation
(5) ** = Qualitative analysis (No Unit)
(6) * = Boiling-water-extraction:
Negative = Absence of CrVI coating
Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

SGS Testing Korea Co.,Ltd.
322, The O valley, 555-9, Hogye-dong, Dongan-gu, Anyang-si, Gyeonggi-do, Korea 431-080
t +82 (0)31 4608 000 f +82 (0)31 4608 059 http://www.sgslab.co.kr ,www.kr.sgs.com/greenlab

Test Report No. F690501/LF-CTSAYAA11-18437

Issued Date: 2011. 06. 10

To: **MYUNGJIN CHEMICAL CO., LTD.**
701-5
Gojan-dong
Namdong-gu
Incheon 405-820
Korea

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

SGS File No.	: AYAA11-18437
Product Name	: PLATING SOLUTION
Item No./Part No.	: Au
Received Date	: 2011. 06. 07
Test Period	: 2011. 06. 08 to 2011. 06. 10
Test Results	: For further details, please refer to following page(s)
Test Performed	: SGS Korea tested the sample(s) selected by applicant with following results.

SGS Korea Co. Ltd.

Timothy Jeon
Jinhee Kim
Cindy Park
Jerry Jung/ Testing Person

Jeff Jang / Chemical Lab Mgr

SGS Korea Co.,Ltd.
322, The O valley, 555-9, Hogye-dong, Dongan-gu, Anyang-si, Gyeonggi-do, Korea 431-080
t +82 (0)31 4608 000 f +82 (0)31 4608 059 http://www.sgslab.co.kr ,www.kr.sgs.com/greenlab

Sample No. : AYAA11-18437.001

Sample Description : PLATING SOLUTION

Item No./Part No. : Au

Comments : Material is Plating solution.

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321:2008, ICP	0.5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321:2008, ICP	5	N.D.
Mercury (Hg)	mg/kg	With reference to IEC 62321:2008, ICP	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	With reference to IEC 62321:2008, UV-VIS	1	N.D.

Picture of Sample as Received:

NOTE: (1) N.D. = Not detected.(<MDL)
(2) mg/kg = ppm
(3) MDL = Method Detection Limit
(4) - = No regulation
(5) ** = Qualitative analysis (No Unit)
(6) * = Boiling-water-extraction:
Negative = Absence of CrVI coating
Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

SGS Korea Co.,Ltd.
322, The O valley, 555-9, Hogye-dong, Dongan-gu, Anyang-si, Gyeonggi-do, Korea 431-080
t +82 (0)31 4608 000 f +82 (0)31 4608 059 http://www.sgslab.co.kr ,www.kr.sgs.com/greenlab
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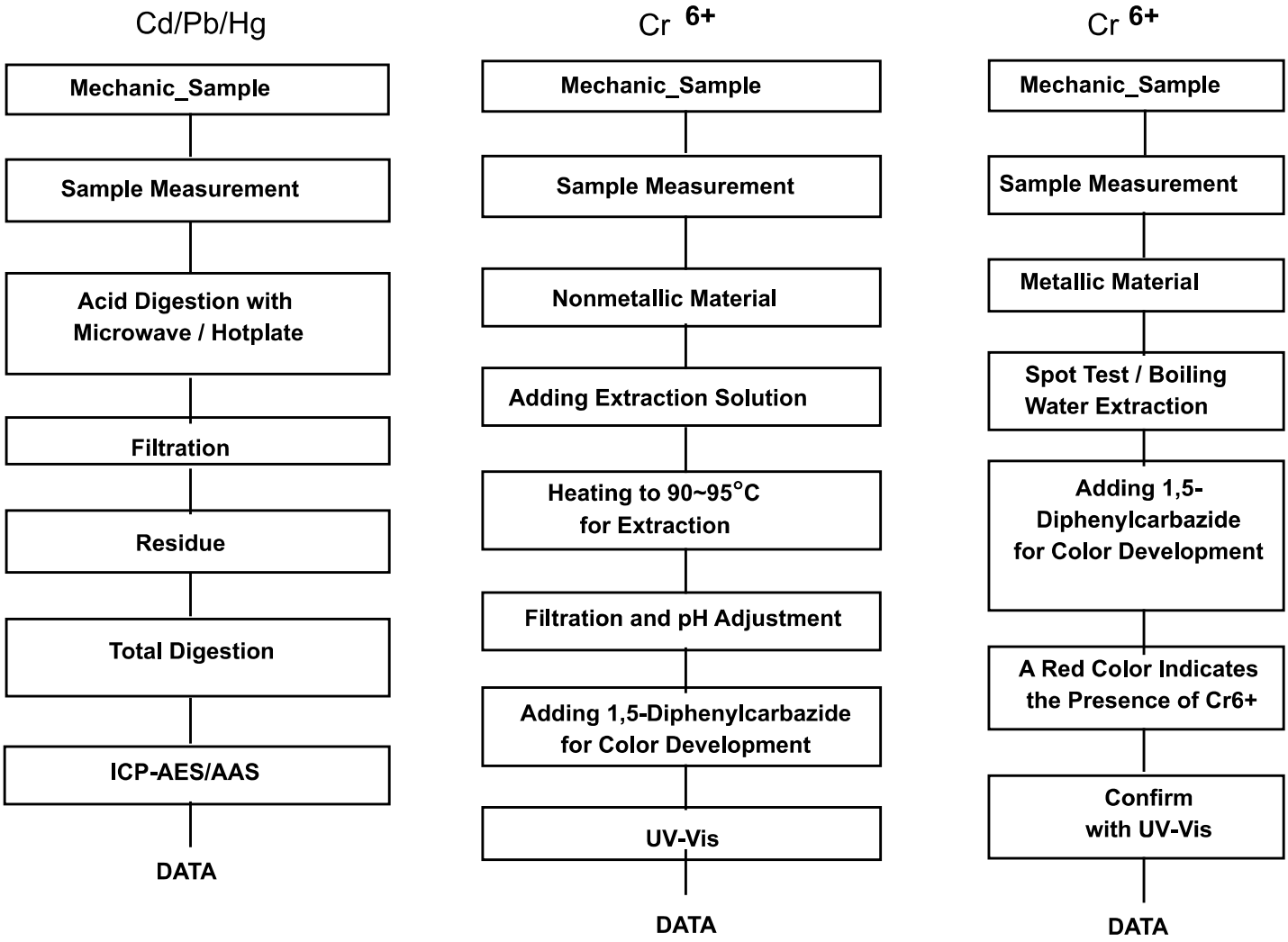
Flow Chart for RoHS:Cd/Pb/Hg/Cr^{6+} Testing



The samples were dissolved totally by pre-conditioning method according to above flow chart for Cd,Pb,Hg.

Section Chief : Gilsae Yi

*** End ***

NOTE:
(1) N.D. = Not detected.(<MDL)
(2) mg/kg = ppm
(3) MDL = Method Detection Limit
(4) - = No regulation
(5) ** = Qualitative analysis (No Unit)
(6) * = Boiling-water-extraction:
Negative = Absence of CrVI coating
Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

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Test Report No. F690501/LF-CTSAYAA11-18438

Issued Date: 2011. 06. 10

To: **MYUNGJIN CHEMICAL CO., LTD.**
701-5
Gojan-dong
Namdong-gu
Incheon 405-820
Korea

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

SGS File No.	: AYAA11-18438
Product Name	: PLATING SOLUTION
Item No./Part No.	: Ni
Received Date	: 2011. 06. 07
Test Period	: 2011. 06. 08 to 2011. 06. 10
Test Results	: For further details, please refer to following page(s)
Test Performed	: SGS Korea tested the sample(s) selected by applicant with following results.

SGS Korea Co. Ltd.

Timothy Jeon
Jinhee Kim
Cindy Park
Jerry Jung/ Testing Person

Jeff Jang / Chemical Lab Mgr

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Sample No. : AYAA11-18438.001

Sample Description : PLATING SOLUTION

Item No./Part No. : Ni

Comments : Material is Plating solution.

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321:2008, ICP	0.5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321:2008, ICP	5	N.D.
Mercury (Hg)	mg/kg	With reference to IEC 62321:2008, ICP	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	With reference to IEC 62321:2008, UV-VIS	1	N.D.

Picture of Sample as Received:

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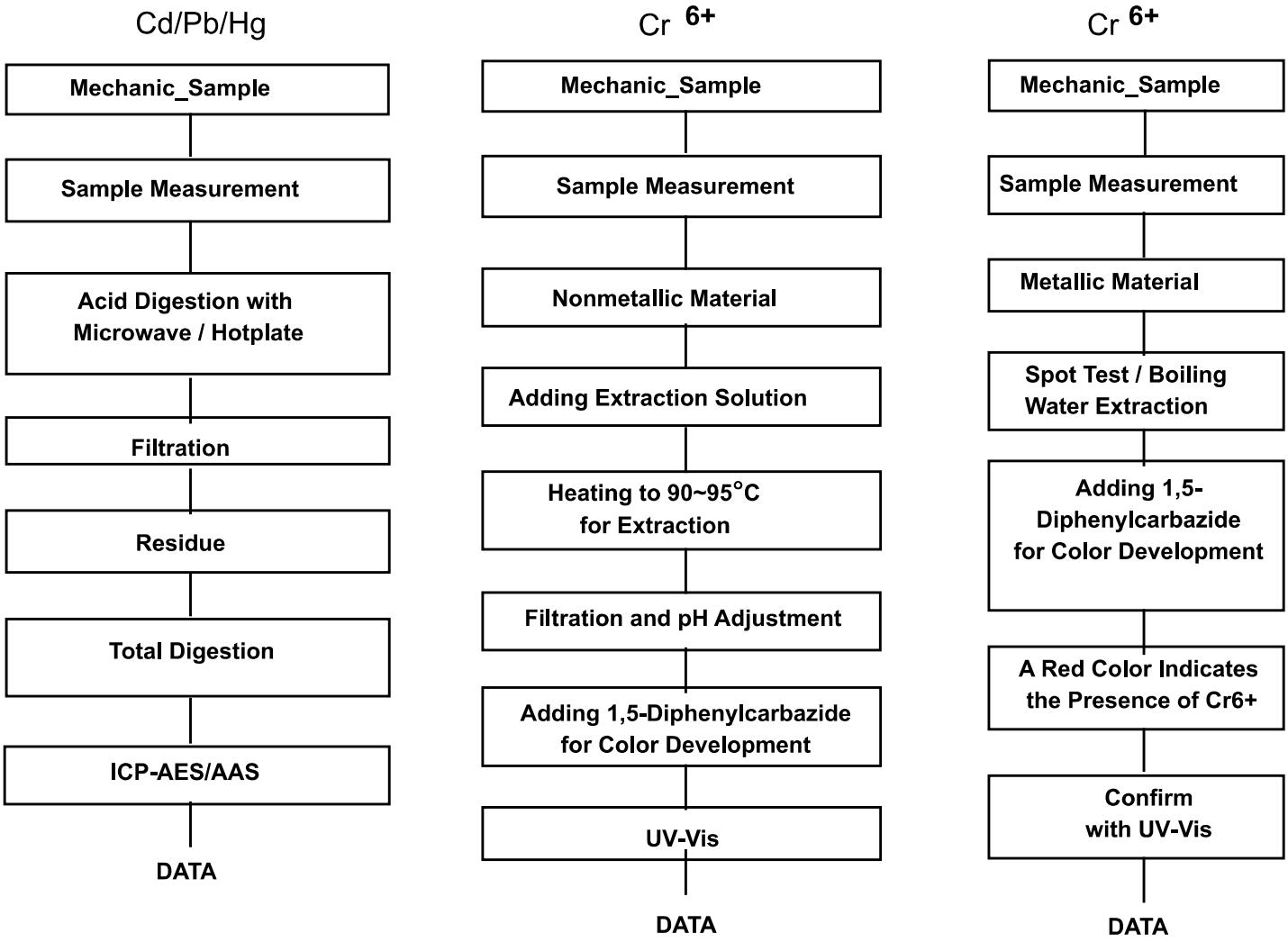

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