



**TXC CORPORATION**

5F, NO. 16, Sec. 2 Chung Yang S Rd., Peitou, Taipei, Taiwan.

TEL : 886-2-2894-1202 , 886-2-2895-2201 FAX : 886-2-2894-1206 , 886-2-2895-6207

www.txccorp.com

# SPECIFICATION FOR APPROVAL

CUSTOMER	:	
PRODUCT TYPE	:	HC-49/S SMD
NOMINAL FREQ.	:	14.318180MHz
TXC P/N	:	9C14300479
REVISION	:	A1
CUSTOMER P/N	:	
PM / SALES	:	
DATE	:	
CUSTOMER SIGNATURE & Date		

- (1) TXC requires one copy returned with signature and title of authorized individual that signifies acceptance of the attached specifications.
- (2) Orders received and accepted by TXC after return of signed copy of specification will be produced per these specifications.
- (3) Any changes to these specifications must be agreed upon by both parties and new revision of the Product Specification Sheet will be issued.
- (4) Any issuance of purchase order prior to consigning back the Approval page of "Specification Sheets" from customers will be regarded as the agreement on the contents of these specifications.

Attachment: Product Specification Sheet

- 1
- 2
- 3
- 4
- 5

**RoHS Compliant**



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# PRODUCT SPECIFICATION SHEET

PRODUCT TYPE : HC-49/S SMD

NOMINAL FREQ. : 14.318180MHz

TXC P/N : 9C14300479

REVISION : A1

PE/RD	QA	MFG
<i>Simon Wang</i>	<i>Ten Hsieh</i>	<i>Shu-Chen Ko</i>
2007/12/11	2007/12/11	2007/12/11

## NOTE:

- (1)Lead Free Products are "Directive 2002/95/EC of The European Parliament of 27 January 2003 on the restriction of the use of certain hazardous substances (RoHS) in electrical and electronic equipment" Compliant (Attachment: SGS Test Report).
- (2)Revision "Sx" is for engineering samples only. PE/RD's approval required.
- (3)Revision "Ax" is production ready. PE, QA and MFG's approval required

**RoHS Compliant**

[illegible]

## CONTENT

### SPECIFICATIONS

### PAGE

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- DIMENSIONS 5
- SUGGESTED REFLOW PROFILE 5
- MARKING 6
- PACKING 7
- RELIABILITY SPECIFICATIONS 8

### ATTACHMENT(S) (optional)

### TESTING DATA

- ELECTRICAL CHARACTERISTICS TEST A ☐ YES ☒ NO
- TEMPERATURE CHARACTERISTICS TEST B ☐ YES ☒ NO

## ELECTRICAL SPECIFICATIONS

### Standard atmospheric conditions

Unless otherwise specified, the standard range of atmospheric conditions for making measurement and tests are as follow:

Ambient temperature : 25+/-5°C  
Relative humidity : 40%~70%

If there is any doubt about the results, measurement shall be made within the following limits:

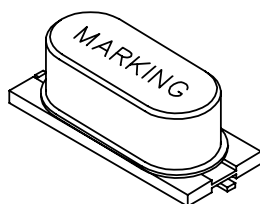
Ambient temperature : 25+/-1°C  
Relative humidity : 40%~70%

### Measure equipment

SAUNDERS 250A/250B CRYSTAL IMPEDANCE METER.

### Crystal cutting type

The crystal is using AT CUT (thickness shear mode).

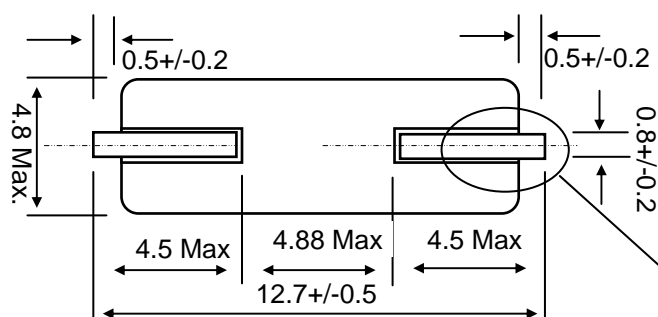
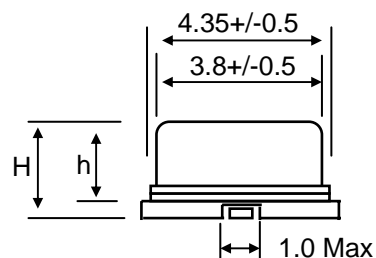
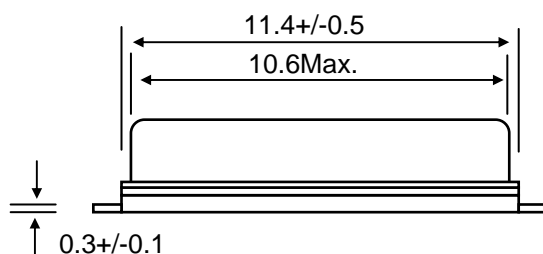




please refer to marking code page

1.	Nominal Frequency	14.318180 MHz
2.	Oscillation Mode	Fundamental
3.	Load Capacitance	20.0 pF
4.	Frequency Tolerance (25 °C)	+/- 30 ppm
5.	Effective Series Resistance	30 Ohms Max.
6.	Shunt Capacitance (C0)	7.0 pF Max.
7.	Motional Capacitance (C1)	N/A
8.	Drive Level	100 uW Typ.
9.	Operation Temperature Range	-10 °C ~ +70 °C
10.	Stability Over Temperature Range	+/- 30 ppm (related to 25 °C)
11.	Insulation Resistance	500 MOhms Min. at DC 100V
12.	Attenuation of Spurious Frequency Amplitude	N/A
13.	Ratio of Holder to Motional (C0/1)	N/A
14.	Storage Temperature	-40 °C ~ +85 °C
15.	Aging	+/- 5.0 ppm/year
16.	Weight	0.46 g +/- 0.05g

## DIMENSIONS

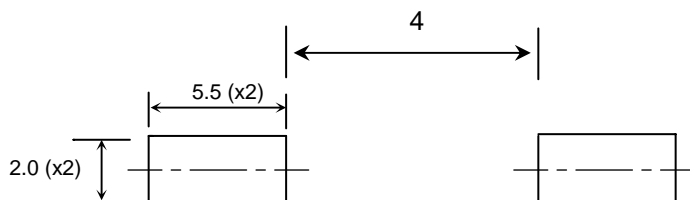
UNIT:mm



CHOOSE	TYPE	H(SMDHIGH)	h(BODY HIGH)
	S3	3.8+/-0.3	3.3+/-0.3
	S2	3.0+/-0.3	2.3+/-0.3

## Suggested Layout

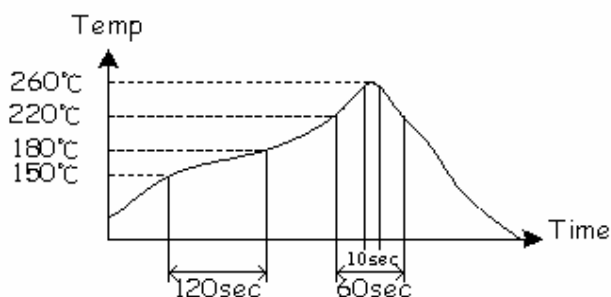
Solder Coating  
(Sn-Ag-Cu Pb Free Coating)



## SUGGESTED REFLOW PROFILE

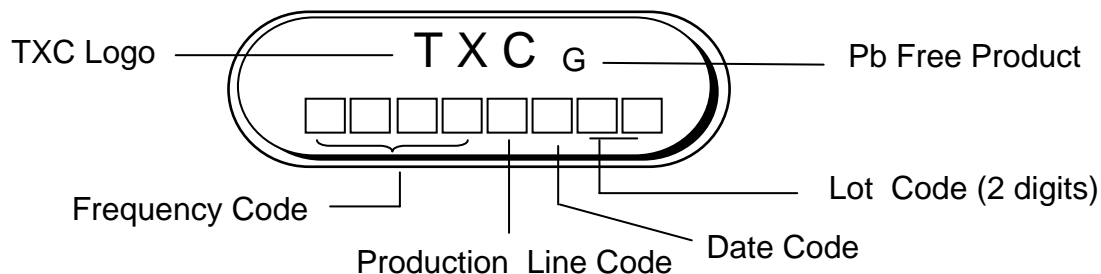
Total time : 200 sec. Max.

Solder melting point :220 °C



## MARKING

### Marking For Pb Free Parts :

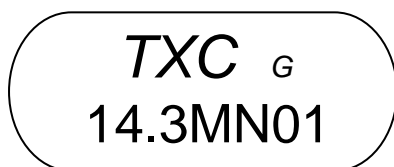


#### Date Code:

YEAR					MONTH											
					JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2001	2005	2009	2013	2017	A	B	C	D	E	F	G	H	J	K	L	M
2002	2006	2010	2014	2018	N	P	Q	R	S	T	U	V	W	X	Y	Z
2003	2007	2011	2015	2019	a	b	c	d	e	f	g	h	j	k	l	m
2004	2008	2012	2016	2020	n	p	q	r	s	t	u	v	w	x	y	z

\*This date code will be cycled every four years.

### For example : Marking

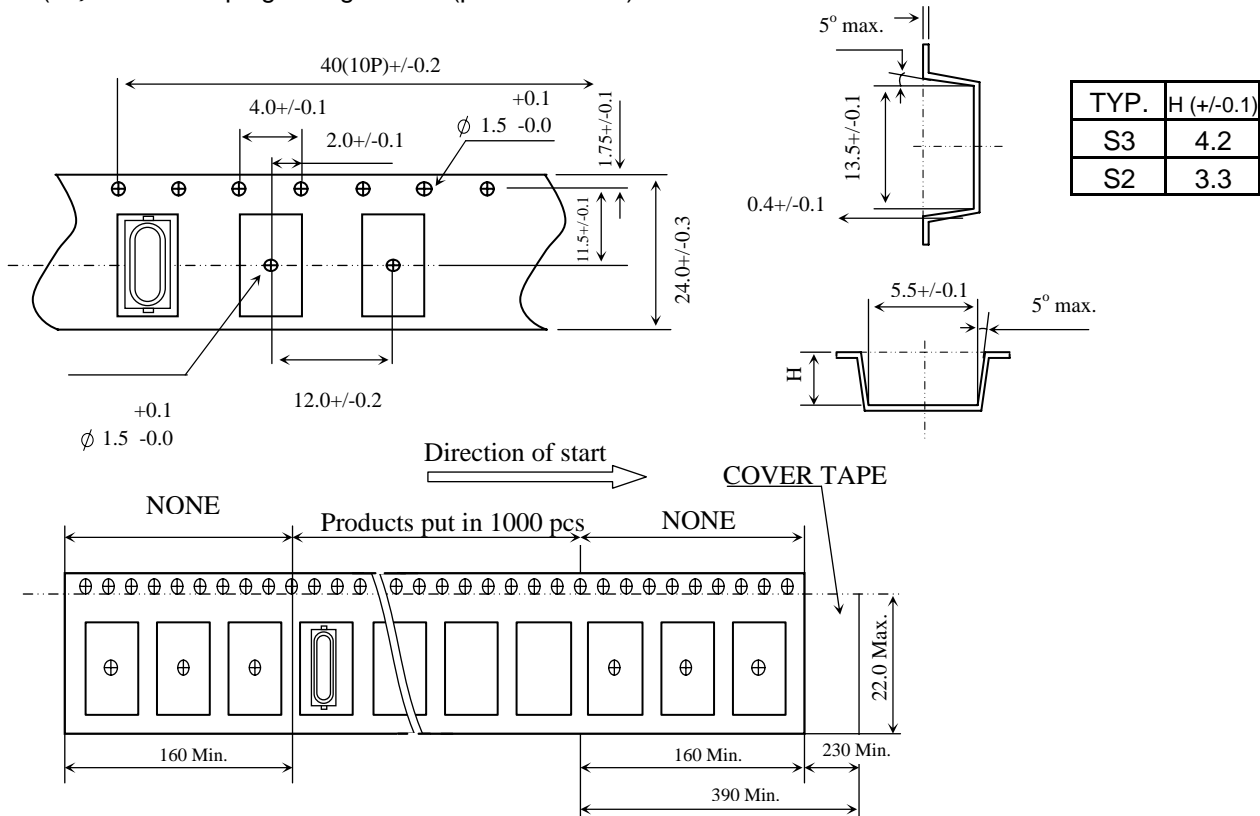


Introduction :

Pb Free Product  
49S 14.31818 MHz  
Made in NGB 2006/JAN 01Lot

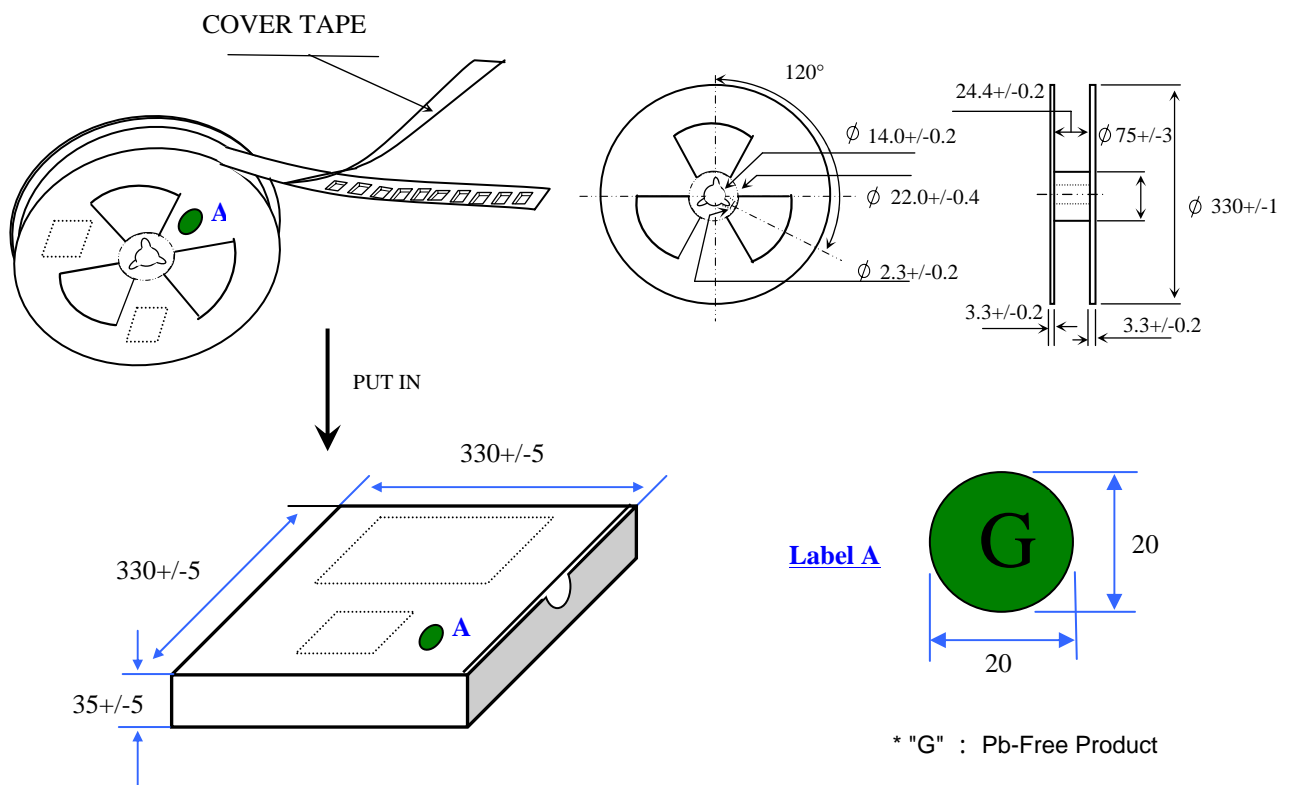
## (A) Tape and reel configuration:(Unit : mm)

( a ) Emboss tapping configuration. (per EIA-481-2)



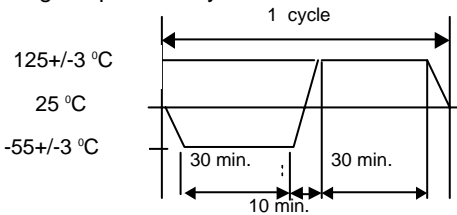
( b ) Reel configuration.

## (B) Packing & Label :(Unit : mm)





**RELIABILITY SPECIFICATIONS**

No.	Test Item	Test Methods	REF.DOC
1	Drop Test	50 cm height, fall freely onto firm wood for 3 times.	JIS C6701
2	Mechanical Shock	Device are shocked to half sine wave ( 1000 G ) three mutually pendicular axes each 3 times. 0.5m sec. duration time	MIL-STD-202F
3	Vibration	Frequency range                      10 ~ 55 Hz Amplitude                                1.52 mm Sweep time                              1 minute Pendicular axes each test time    2 hours (Total test time 6 hours)	MIL-STD-883E
4	Solderability	Temperature                            235 °C +/- 5°C Immersing depth                      0.5 mm minimum Immersion time                        5 +/- 0.5 seconds Flux                                        Rosin resin methyl alcohol solvent ( 1 : 4 )	MIL-STD-883E
5	Resistance To Soldering Heat	Pre-heat temperature                125 °C Pre-heat time                            60 ~ 120 sec. Test temperature                       260 +/- 5 °C Test time                                 10 +/- 1 sec.	MIL-STD-202F
6	High Temp. Storage	+ 125 °C +/- 2 °C for 500 +/- 12 hours	MIL-STD-883E
7	Low Temp. Storage	- 40 °C +/- 2 °C for 500 +/- 12 hours	
8	Thermal Cycles	Total 100 cycles of the following temperature cycle <div style="text-align: center;">  <p>125+/-3 °C</p> <p>25 °C</p> <p>-55+/-3 °C</p> <p>30 min.    10 min.    30 min.</p> <p>1 cycle</p> </div>	MIL-STD-883E
9	Humidity	Device are left in temperature at +85 °C +/-2 °C with relative humidity of 85% for 500 hours.	JIS-C-5023

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


Sample Description : DIP 49U/S CRYSTAL / SMD 49S CRYSTAL  
Style/Item No. : 9A/9B/9C SERIES  
Sample Receiving Date : 2007/01/25  
Testing Period : 2007/01/25 TO 2007/02/01

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

Test Method : With reference to IEC 62321, Ed.1 111/54/CDV  
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 for metallic samples by Spot test / Colorimetric Method.
- (5) Determination of Hexavalent Chromium for non-metallic samples by UV/Vis Spectrometry.
- (6) Determination of PBB and PBDE by GC/MS.

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

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



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

Test Item (s):	Method (Refer to)	Result					MDL
		No.1	No.2	No.3	No.4	No.5	
Cadmium (Cd)	(1)	n.d.	---	n.d.	---	n.d.	2
Lead (Pb)	(2)	n.d.	---	n.d.	---	n.d.	2
Mercury (Hg)	(3)	n.d.	---	n.d.	---	n.d.	2
Hexavalent Chromium Cr(VI) by Spot test / boiling water extraction	(4)	---	Negative	---	Negative	---	See Note 5
Hexavalent Chromium Cr(VI) by alkaline extraction	(5)	---	---	---	---	n.d.	2
<b>Sum of PBBs</b>	(6)	---	---	---	---	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
<b>Sum of PBDEs (Mono to Nona) (Note 4)</b>		---	---	---	---	n.d.	-
Monobromobiphenyl ether		---	---	---	---	n.d.	5
Dibromobiphenyl ether		---	---	---	---	n.d.	5
Tribromobiphenyl ether		---	---	---	---	n.d.	5
Tetrabromobiphenyl ether		---	---	---	---	n.d.	5
Pentabromobiphenyl ether		---	---	---	---	n.d.	5
Hexabromobiphenyl ether		---	---	---	---	n.d.	5
Heptabromobiphenyl ether		---	---	---	---	n.d.	5
Octabromobiphenyl ether		---	---	---	---	n.d.	5
Nonabromobiphenyl ether		---	---	---	---	n.d.	5
Decabromobiphenyl ether		---	---	---	---	n.d.	5
<b>Sum of PBDEs (Mono to Deca)</b>		---	---	---	---	n.d.	-

## TEST PART DESCRIPTION:

NO.1 : BODY  
NO.2 : PLATING LAYER OF BODY  
NO.3 : SILVER COLORED METAL PIN  
NO.4 : PLATING LAYER OF SILVER COLORED METAL PIN  
NO.5 : BLACK PLASTIC

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- Note :
1. mg/kg = ppm
  2. n.d. = Not Detected
  3. MDL = Method Detection Limit
  4. Sum of Mono to NonaBDE & according to 2005/717/EC DecaBDE is exempt.
  5. Spot-test:
    - Negative = Absence of Cr(VI) coating / surface layer,
    - Positive = Presence of Cr(VI) coating / surface layer;
    - (The tested sample should be further verified by boiling-water-extraction method if the spot test result cannot be confirmed.)
  - Boiling-water-extraction:
    - Negative = Absence of Cr(VI) coating / surface layer.
    - Positive = Presence of Cr(VI) coating / surface layer;
    - the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.
  6. "-" = Not Regulated
  7. "---" = Not Conducted



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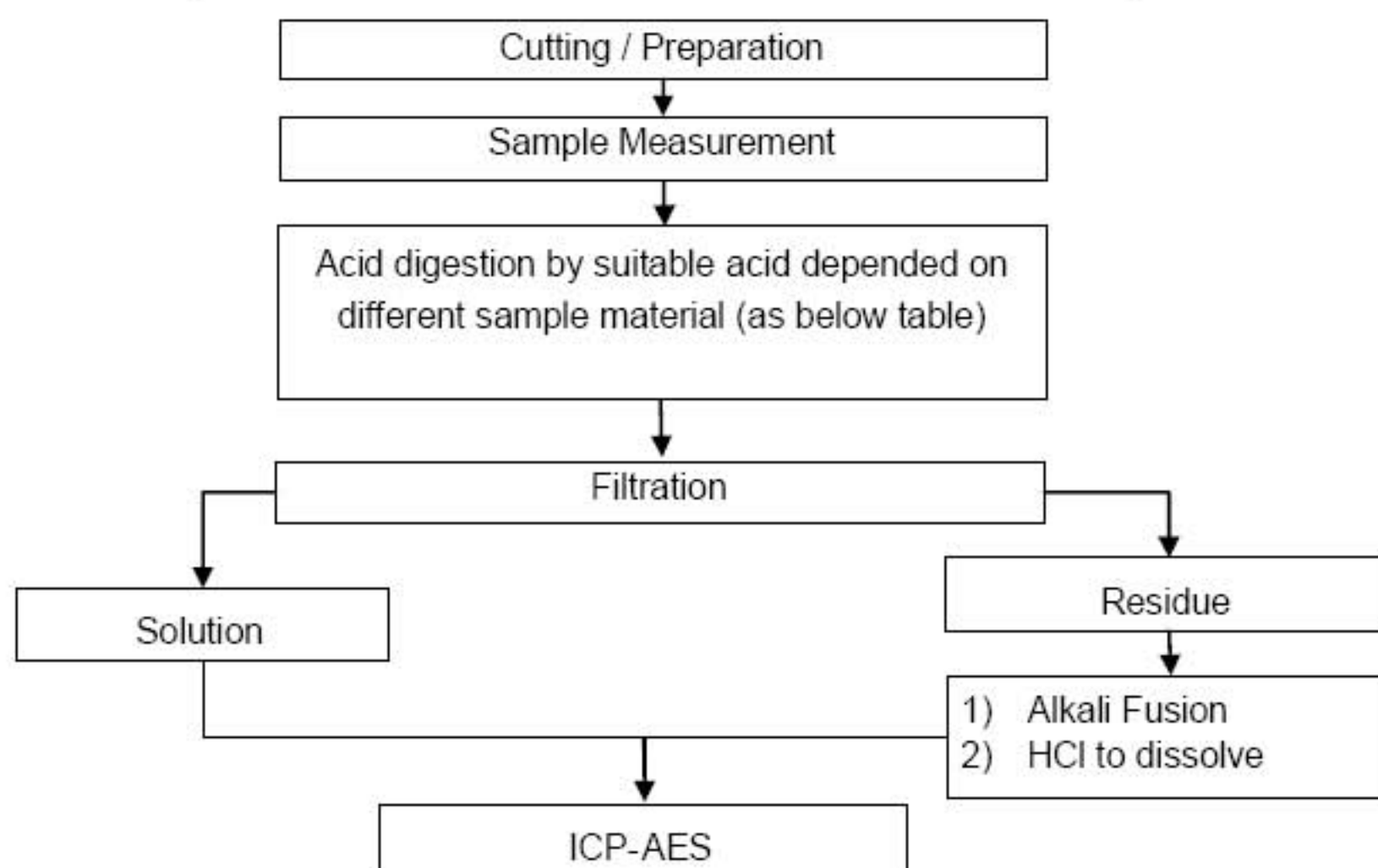
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- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart.
- 2) Name of the person who made measurement: Troy Chang
- 3) Name of the person in charge of measurement: Daniel Yeh

## Method 1: Flow Chart of Digestion for Cd , Pb analysis



Steel, copper, aluminum, solder	Aqua regia, HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub>
Glass	HNO <sub>3</sub> /HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO <sub>3</sub>
Plastic	H <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O <sub>2</sub> , HNO <sub>3</sub> , HCl
Others	Any acid to total digestion

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\*\* End of Report \*\*