SEMI F60-1214

Test Method for ESCA Evaluation of Surface Composition of Wetted Surfaces of Passivated 316L Stainless Steel Components

Test Report

Applicant Name: **Linlin Xie**

Product Name: **316L stainless steel products**

BEIJING JU RUI ZHONG BANG HT-TECH CO.LTD

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Test Report

Applicant Name:	**Linlin Xie**
Applicant Address:	**No.1261, Enterprise Development Service Center, Xiji Town, Tongzhou District, Beijing**
Manufacturer:	**Precess (Beijing)Semiconductor Co.,Ltd.**
Product description:	**316L stainless steel products**
Product Number:	**1**
Trademark:	**/**
Report Number:	**MG20241230-25596-1**
Date of Issue:	**2024.12.31**

Evaluated by: Xiuhao Jiang 2024.12.31 **signature** **date**

Reviewed by: Lixia Yang 2024.12.31 **signature** **date**

BEIJING JU RUI ZHONG BANG HT-TECH CO.LTD

signature **date**

1. Description of Test Samples

1.1 General Description of the Product

316L stainless steel products

1.2 Sample Photo

2. Measurement Conditions

2.1 List of Test and Measurement Instruments

Equipment	Equipment type	Equipment number	Calibration date/ Next Calibration date
XPS	PHI-5000Versa-ProbeIII	SA-211	2024.05.17/2025.05.17

2.2 Referenced Standards

Test Items	Reference standards
Total Cr/Fe ratios， Cr/Fe ratio at 10Å CrOx/FeOx ratios Cr(2p3/2)、Fe(2p3/2)、C(1s) narrow region spectra Surface elemental compositions Depth profile of Cr,Fe,Ni,O,C	SEMI F60 （No depth profile of Cr,Fe,Ni,O,C and Cr/Fe ratio at 10Å by the manufacturer）

2.3 Summary of Method

2.3.1 Acquire elemental survey and calculate elemental composition of 'as received' wetted surface.

2.3.2 Acquire chromium and iron regions at high resolution of 'as received' wetted surface. The total Cr/Fe ratio and CrOx/FeOx ratios are calculated from these data.

2.3.3 Acquire a compositional depth profile to determine the relative abundance of carbon, oxygen, chromium, iron and nickel.

2.3.4 A survey spectrum extending from at least 0 to 1100 eV.

2.3.5 The high-resolution Cr(2p3/2)、Fe(2p3/2)、spectra from the as-received surface.

2.3.6 A compositional depth profile plot including Cr,Fe,Ni,O,C.

2.4 Acquisition parameters

TOA: 35°

X-ray source: Al Kα mono(1486.6 eV)

Beam size: 200μm

Analyst: mige01

Analysis date:2024.12.29

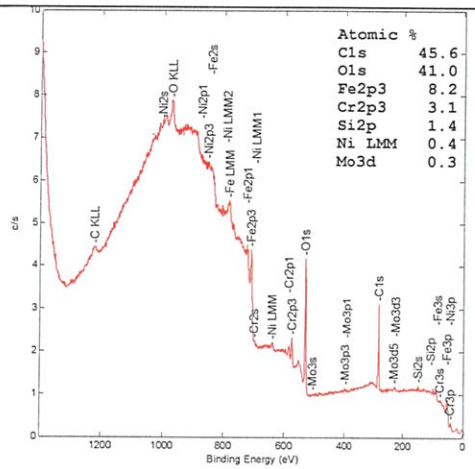
The angle of the incident X-ray with respect to the sample plane: 60°

Sample preparation: by the component manufacturer

The method to determine Oxide thickness：/

3. Test Result

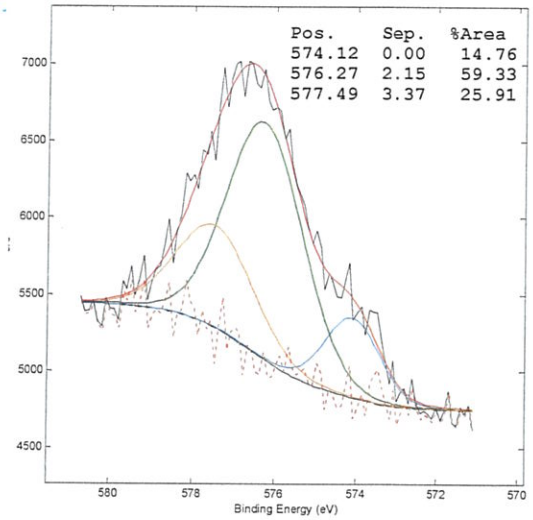
3.1Surface survey spectrum



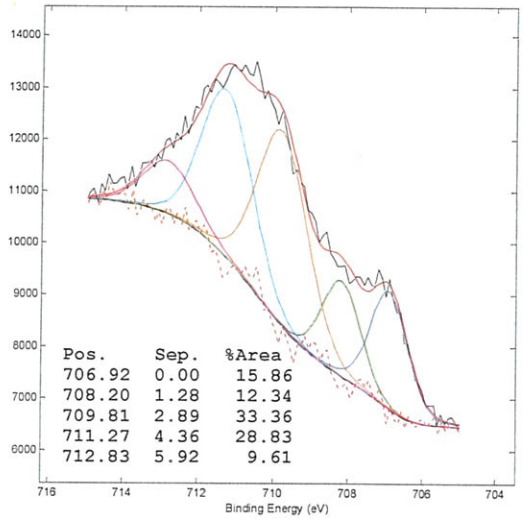
3.2 Tabular summary of Cr/Fe, CrOx/FeOX

Item	
Total Cr/Fe ratio	0.38
Cr/Fe ratio at 10Å	/
CrOx/FeOx ratio	0.45
Oxide thickness	/
Carbon thickness	/
Iron/chromium enriched oxide layer thickness	/

3.3 Cr2p3、Fe2p3 narrow region spectra



XPS Cr2p3



XPS Fe2p3

3.4 Depth profile of Cr,Fe,Ni,O,C

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End of Test Report