China National Accreditation Service for Conformity Assessment

LABORATORY ACCREDITATION CERTIFICATE

(Registration No. CNAS L3532)

Atotech (China) Chemicals Co., Ltd. Shanghai Technical Center

(Legal Entity: Atotech (China) Chemicals Co., Ltd.)

A6, No.5399, Waiqingsong Road, Qingpu District, Shanghai, China

is accredited in accordance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence to undertake the service described in the schedule attached to this certificate.

The scope of accreditation is detailed in the attached schedule bearing the same registration number as above. The schedule forms an integral part of this certificate.

Effective Date：2019-09-06

Expiry Date：2023-08-04

Signed on behalf of China National Accreditation Service for Conformity Assessment

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The validity of the certificate can be checked on CNAS website at http://www.cnas.org.cn/english/findanaccreditedbody/index.shtml.

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Registration No. CNAS L3532

Accreditation Criteria: ISO/IEC 17025:2017 and relevant requirements of CNAS

Effective Date: 2021-09-03 Expiry Date: 2023-08-04

SCHEDULE 3 ACCREDITED TESTING SCOPE

№	Test Object	Item/Parameter		Standard or Method	Note	Effective Date
		№	Item/ Parameter			
1	Electroplating bath solutions	1	Cr,Fe,Ni,Pb,Cd,Zn	Cd, Cr, Fe, Pb, Ni, and Zn in acidic copper baths by F-AAS A0001605-03-2016		2021-09-03
		2	Cr,Fe,Cu,Pb,Sn,Cd	Cr, Fe, Cu, Pb, Sn and Cd as impurities in acidic zinc baths by AAS A0001615-01-2011		2021-09-03
		3	Copper,Lead	Copper and Lead as impurities in Chromium baths by AAS A0001603-01-2011		2021-09-03
		4	Iron	Iron (Fe) in Chromium(VI)-bathes by AAS A0001757-02-2014		2021-09-03
				Determination of Iron by F-AAS EXT-0176-AA-02-09(2011)	Accredited only for concentration of Iron in passivation plating bath	2021-09-03

The scope of the accreditation in Chinese remains the definitive version.

№	Test Object	Item/Parameter		Standard or Method	Note	Effective Date
		№	Item/ Parameter			
		5	Palladium	Determination of Palladium by AA EXT-0154-AA-05-02(2011)	Accredited only for low concentration bath	2021-09-03
				Determination of Palladium by AAS EXT-0156-AA-05-05(2011)	Accredited only for high concentration bath	2021-09-03
		6	Gold	Determination of Gold by AAS EXT-0161-AA-05-07(2011)	Accredited only for the concentration of gold in gold plating solution	2021-09-03
		7	Cr,Fe,Cu,Zn	Cr, Fe, Cu and Zn as impurities in e´less nickel baths by AAS A0001608-01-2011		2021-09-03
		8	Zn,Cr,Fe,Cu,Ca,Mg,Mn	Zn, Cr, Fe, Cu, Ca, Co, Mg and Mn as impurities in nickel baths by AAS A0001614-02-2011		2021-09-03
		9	Tin	Tin (total) by F-AAS A0000191-06-2016	Accredited only for total tin concentration in electroplating tin solution	2021-09-03
		10	Nickel	Determination of Nickel by AA A0000170-05-2015	Accredited	2021-09-03

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					only for Nickel concentration in zinc-nickel plating bath	
				Complexometric Determination of Nickel by Titration A0000364-05-2018	Accredited only for total nickel concentration in nickel plating bath	2021-09-03
		11	Zinc	Determination of Zinc by F-AAS A0000171-04-2015	Accredited only for zinc concentration in zinc-nickel plating bath	2021-09-03
				Determination of Zinc by F-AAS EXT-0175-AA-02-09(2011)	Accredited only for zinc concentration in passivation solution	2021-09-03
		12	Concentration of total organic carbon	Determination of the TOC content in bath samples with a pH < 5 A0002439-01-2015		2021-09-03
				TOC content in bath samples with a pH > 5 A0001364-03-2012		2021-09-03

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		13	Nickel Carrier A-5	Determination of Nickel Carrier A-5 by HPLC A0000483-04-2018		2021-09-03
		14	Concentration of chloride and sulfate in hard chromium baths	Chloride, Sulfate, Nitrate, Phosphate and Catalyst C in Chrome Electrolytes by IC A0000447-07-2018		2021-09-03
		15	Copper	Copper in Copper Electrolytes (iron and non-iron containing) by Titration A0000068-06-2011		2021-09-03
				Determination of Copper in Copper Electrolytes (Iron containing) by Titration A0000069-02-2011		2021-09-03
				Determination of Copper using AAS A0000192-07-2018	Accredited only for copper concentration in tin plating solution	2021-09-03
				Determination of Copper by Titration A0000410-04-2015	Accredited only for concentration of Copper in Acid Copper plating Bath（GMF）	2021-09-03
		16	Sulfuric Acid	Determination of Sulfuric acid by Titration EXT-0411-TIT-02-08（2011）	Accredited only for concentrati	2021-09-03

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					on of sulfuric acid in copper acid plating solution.	
		17	Chloride content	Determination of Chloride by Titration A0000060-07-2017	Accredited only for chloride Ion concentration in Copper Acid plating Bath(EL)	2021-09-03
				Chloride by Titration A0000412-03-2018	Accredited only for chloride Ion concentration in Copper Acid plating Bath（GMF）	2021-09-03
		18	Boric Acid	Determination of the Boric Acid Content by Titration A0000352-05-2018	Accredited only for boric acid	2021-09-03

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					concentration in nickel plating bath	
		19	Chloride content	Determination of Chloride by Titration A0000480-06-2013	Accredited only for chlorine Ion concentration in Ni Electroplating Bath	2021-09-03
		20	Chrome^{6+}	Determination of Chrome^{6+} by Potentiometric Titration EXT-0430-TIT-01-04（2011）	Accredited only for chrome^{6+} concentration in chromium plating solution	2021-09-03
2	Industrial water&Industrial waste water	1	pH value	Water quality- Determination of pH value-Glass electrode method GB/T 6920-1986		2021-09-03
		2	Chromium(VI)	Water quality-Determination of chromium(VI) -1,5 Diphenylcarbohydrazide spectrophotometric method GB/T 7467-1987		2021-09-03
		3	Copper,zinc,lead,cadmium	Water quality -Determination of copper,zinc,lead and cadmium-Atomic absorption spectrometry GB/T 7475-1987		2021-09-03
		4	Sum of Calcium and magnesium	Water quality-Determination of the sum of calcium and magnesium –EDTA titrimetric method GB/T 7477-1987		2021-09-03
		5	Chloride content	Water quality- Determination of chloride-Silver nitrate titration method GB/T 11896-1989		2021-09-03

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		6	Calcium, magnesium	Water quality -Determination of calcium and magnesium - Atomic absorption spectrophotometric method GB/T 11905-1989		2021-09-03
		7	Iron,manganese	Water quality-Determination of iron and manganese –Flame atomic absorption spectrometric method GB/T 11911-1989		2021-09-03
		8	Nickel	Water quality- Determination of nickel - Flame atomic absorption spectrometric method GB/T 11912-1989		2021-09-03
		9	TOC content	Water quality-Determination of total organic carbon-Combustion oxidation nondispersive infrared absorption method HJ 501-2009		2021-09-03
		10	Conductivity	Water quality: Determination of electrical conductivity ISO 7888:1985(E)		2021-09-03
		11	Concentration of chloride, nitrate, nitride, orthophosphate and sulfate	Water quality- Determination of dissolved anions by liquid chromatography of ions-Part 1: Determination of brimide chloride,fluoride, nitrate, nitrite, phosphate and sulfate ISO 10304-1:2007(E)		2021-09-03
		12	Lead	Standard Test Methods for lead in water ASTM D3559-15	Accredited only for Test Method C	2021-09-03
		13	Copper、Nickel、Chrome	water quality-Determination of 32 elements.Inducively coupled plasma optical emission spectrometry HJ776-2015		2021-09-03
3	Chromium Conversion Coatings	1	Chromium(VI)	Metrallic and other inorganic coatings-Chromate conversion coatings on zinc, cadmium, aluminium-zinc alloys and zinc-aluminium alloys-Test methods ISO 3613：2021(E)		2021-09-03
1	Electroplate coatings	1	Microvickers hardness	Metallic materials-Vickers hardness test-Part 1:Test method GB/T 4340.1-2009	Accredited only for HV0.05-HV0.2	2021-09-03

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		2	Neutral salt spray test	Corrosion-resistant testing method of the metal deposits and conversion coatings for the light industrial products Neutral salt spraying test (NSS) QB/T 3826-1999		2021-09-03
		3	Peel Strength	Standard Test Method for Peel Strength of Metal Electroplated Plastics ASTM B533-85(2019)		2021-09-03
		4	Stone Impact test	Stone Impact Resistance of coatings GMW 14700-2017 Method C	Accredited only for electrode layer	2021-09-03
		5	Grind-Saw Test	Standard Practice for Qualitative Adhesion Testing of Metallic Coatings ASTM B571-2018 Clause 8		2021-09-03
				Minimum Performance Requirements for Decorative chromium Plated Plastic Parts GMW 14668-2019 Clause 3.4.6		2021-09-03
		6	Adhesion between the plated coating and substrates	Standard specification for decorative electroplated coatings of copper plus Nickel plus Chromium on plastics. ASTM B604-91(2019) Appendixes A1		2021-09-03
		7	Thickness of electroplated coatings	Metallic and oxide coatings-Measurement of coating thickness-Microscopical method ISO 1463：2003		2021-09-03
				Metallic coatings - Measurement of coating thickness - X-ray spectrometric methods ISO 3497：2000	Accredited only for chrome layer and nickel gold layer	2021-09-03
				Standard test method for measurement of metal and oxide coating thickness by microscopical examination of cross section ASTM B487-2020		2021-09-03
				Standard test method for measurement of coating thickness by X-ray Spectrometry ASTM B568-98(2014)	Accredited only for chrome	2021-09-03

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					layer and nickel gold layer	
		8	Electrochemical potential determination of multilayer nickel deposits	Metallic coatings-Measuremnt of coating thickness-Coulometric method by anodic dissolution ISO 2177：2003		2021-09-03
				Standard test method for simultaneous thickness and electrode potential determination of individual layers in multilayer Nickel deposit(STEP test) ASTM B764-04(2014)		2021-09-03
		9	Number of discontinuities in chromium electroplating	Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium ASTM B456-2017 Appendixes X4,X5		2021-09-03
				Standard Specification for Decorative Electroplated Coatings of Copper Plus Nickel Plus Chromium on Plastics ASTM B604-91 (2019) Appendixes X4		2021-09-03
		10	Copper accelerated acetic acid salt spray test	Corrosion tests in artificial atmospheres-salt spray tests ISO 9227：2017		2021-09-03
				Standard Test method for copper-accelerated Acetic Acid-salt spray(Fog)testing (CASS test) ASTM B368-21		2021-09-03
		11	Internal stress of electroplated metal layer	Standard test method for measurement of internal stress of plated metallic coatings with the Spiral contractometer ASTM B636/B636M-2015		2021-09-03
		12	Ductility of electroplated metal layer	Standard practice for micrometer bend test for ductility of electrodeposits ASTM B490-09(2014)		2021-09-03
		13	Temperature cycle	Minimum Performance Requirements for Decorative chromium Plated Plastic Parts GMW 14668-2019 Clause 3.4.9		2021-09-03
		14	Temperature Storage	Minimum Performance Requirements for Decorative chromium Plated Plastic Parts GMW 14668-2019 Clause 3.4.7		2021-09-03
		15	Quick Thermal Cycle	Minimum Performance Requirements for Decorative chromium Plated Plastic Parts GMW 14668-2019 Clause 3.4.8		2021-09-03

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2	Electroless Nickel Coating	1	Phosphorus content	SOP Quantitative analysis of P concentration in electroless Ni by EDX WI-TC-MS-023		2021-09-03