

**SINGAPORE LABORATORY
ACCREDITATION SCHEME**



Number : **LA-1995-0088-G**

Date of Issue : **23 April 2022**

Date of Expiry : **22 April 2026**

Certificate of Accreditation

This certifies that

Professional Testing Services Pte Ltd
32 Kian Teck Road
Singapore 628779

is accredited by the Singapore Accreditation Council to

ISO / IEC 17025 : 2017

for specific scope within the field of

Mechanical Testing

as detailed in the attached schedule.

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Chairman

This Certificate is awarded subject to the organisation's compliance with the stated criteria and terms and conditions laid down by the Singapore Accreditation Council.

This Certificate may not be reproduced except with the written permission of the Chairman.

Schedule

Professional Testing Services Pte Ltd
32 Kian Teck Road
Singapore 628779

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FIELD OF TESTING : Mechanical Testing

MATERIALS/ PRODUCTS TESTED	TESTS/ PROPERTIES	STANDARD METHODS/ TECHNIQUES
A. METAL & METAL PRODUCT	1. Tension Test (i) Tensile Test on metal plates & tubular sections, reinforcing bars & other metal products at ambient temperature in the range of 0 kN to 2000 kN with controlled strain rate & cross-head movement, including yield & proof stress, ultimate tensile stress & modulus of elasticity	ASTM A370-2024a ASTM B557-2015 (Reapproved 2023) ASTM E8/E8M-2024 ASME IX-2023 *AWS D1.1/D1.1M (2020) *AWS D1.4/D1.4M-2018 *AWS D1.6/D1.6M-2017 *AWS D1.2/D1.2M-2014 *API 1104-2021 (Errata 1 2023) BS EN ISO 6892-1: 2019 MS ISO 6892-1:2017 *NKK Rules Part K Chapter 2.3.1: 2024 AS 1391: 2020 AS 2205-2.1: 2003 AS 2205-2.2: 2003 JIS Z 2241: 2022 ASTM F606/F606M-2024 BS EN ISO 898-1: 2013 (Sect 8.1, 8.2, 8.5) BS EN ISO 898-2: 2022 BS 4190: 2014 BS 3692: 2014 BS 4449: 2005+A3: 2016 SS 560: 2016+A1: 2024 SS 561: 2010+A2: 2022 BS EN ISO 15630-1: 2019 BS EN ISO 15630-2: 2019 MS ISO 15630-1: 2012 MS ISO 15630-2: 2012 * MS 144: 2014 * MS 145: 2014 * MS 146: 2014 SS 2 Part 1: 1999 SS 2 Part 2: 1999 SS 2 Part 3: 1987 * CS 2: 2012 (Rev 6: 2022)

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MATERIALS/ PRODUCTS TESTED	TESTS/ PROPERTIES	STANDARD METHODS/ TECHNIQUES
A METAL & METAL PRODUCT	1 (i) Tensile Test on metal plates & tubular sections, reinforcing bars & other metal products at ambient temperature in the range of 0 kN to 2000 kN with controlled strain rate & cross-head movement, including yield & proof stress, ultimate tensile stress & modulus of elasticity	SS 18 Part 1: 1999 SS 18 Part 2: 1970 (1981) *SS 32 Part 1: 1999 *SS 32 Part 2: 1986 ASTM A1034/A1034M-2024 ISO 15835-2: 2018
	(ii) Tensile Test at Elevated Temp. (up to 750°C) in the range of 0 kN to 250 kN with controlled strain rate & cross-head movement, including yield & proof stress	ASTM E21-2020 BS EN ISO 6892-2: 2018
	(iii) Through Thickness Tensile Test	ASTM A770 / A770M-2003 (Reapproved 2018) BS EN 10164: 2018 *Lloyd's Chapter 3, Sect 8: 2024 *ABS Pt. 2, Chapter 1, Sect 1-17: 2025
	(iv) All Weld Tensile Test	BS EN ISO 9018: 2015 *AWS D1.1/D1.1M 2020
	(v) Weld Shear Test	*SS 32 Part 1: 1999 *SS 32 Part 2: 1986 SS 561: 2010+A2: 2022 BS EN ISO 15630-2: 2019 MS ISO 15630-2:2012 * MS 145: 2014
	2. Hardness Tests	ASTM E92-2023 ASTM A370-2024a ASTM E140-2012b (Reapproved 2019) ^{E1} ASTM E384-2022 BS EN ISO 9015-1: 2011 BS EN ISO 6507-1: 2023 AS 1817. 1: 2003 (R2017) JIS Z 2244-1:2024
	(i) Vickers Hardness test in the range of 0.3 kgf to 50 kgf	
	(ii) Rockwell Hardness 'B' and 'C' Scale	ASTM E18-2024 BS EN ISO 6508-1: 2023 JIS Z 2245:2021

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A METAL & METAL PRODUCT	2. (iii) Brinell Hardness	ASTM E10-2023 BS EN ISO 6506-1: 2014 AS 1816.1: 2007 (R2017) JIS Z 2243-1:2018
	(iv) Knoop Hardness	ASTM E384-2022 BS EN ISO 4545-1: 2023
	3. Compression Test (i) Compression strength, up to 600 kN in loading	ASTM E9-2019
	4. Shear Test	ASTM B565-2020 *SS 32 Part 1: 1999 ASME II Part A-2023, SA 263-265 ASTM A263-2012 (Reapproved 2019) ASTM A264-2012 (Reapproved 2019) ASTM A265-2012 (Reapproved 2019)
	5. Impact Test (i) Charpy V-notch Impact tests from ambient temperature down to -115°C & -196°C	ASTM A370-2024a *AWS D1.1/D1.1M 2020 ASME IX-2023 ASTM E23-2024 BS EN ISO 148-1: 2016 MS ISO 148-1:2008 AS 1544.2: 2003 (R2017)
	6. Bend Test / Roller Bend test	ASTM A370-2024a AWS D1.1/D1.1M-2020 ASME IX-2023 *API 1104-2021 (Errata 1 2023) BS EN ISO 5173: 2023 ASTM E190-2021 ASTM E290-2022 AS/NZS 2205-3.1: 2024 AS 2205-3.3: 2003 AWS D1.6/D1.6M-2017 AWS D1.2/D1.2M-2014 AS 1085.20: 2020 AWS D1.3/D1.3M: 2018
	7. Bend Test / Rebend Test	SS 2 Part 1: 1999 SS 2 Part 2: 1999

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A METAL & METAL PRODUCT	7. Bend Test / Rebend Test	SS 2 Part 3: 1987 *SS 32 Part 1: 1999 *SS 32 Part 2: 1986 BS 4449: 2005+A3: 2016 *SS 18 Part 1: 1999 SS 560: 2016+A1: 2024 SS 561: 2010+A2: 2022 BS EN ISO 15630-1: 2019 BS EN ISO 15630-2: 2019 MS ISO 15630-1 :2012 MS ISO 15630-2: 2012 * MS 144: 2014 * MS 145: 2014 * MS 146: 2014 * CS 2: 2012 (Rev 6: 2022)
	8. Fracture Test	*AWS D1.1/D1.1M-2020 ASME IX-2023 BS EN ISO 9017: 2018 AWS D1.6/D1.6M-2017 AWS D1.2/D1.2M-2014
	9. Flattening Test	ASTM A370-2024a *ABS Pt. 2, Chapter 3, Sect 5-19: 2025 *Lloyd's Chapter 2, Sect 4.2: 2024 API 5L: 2018 (Errata 1 2018) BS EN ISO 8492: 2013 JIS G 3444:2021
	10. Flaring/Flanging Test (up to outside diameter of 2 inches)	ASTM A370-2024a *ABS Pt. 2, Chapter 3, Sect 5-23 & 25: 2025 *Lloyd's Chapter 2, Sect 4.3 & 4.4: 2024 BS EN ISO 8493: 2004 BS EN ISO 8494: 2013
	11. Nick-Break Test	ASTM A370-2024a *API 1104-2021 (Errata 1 2023)
	12. Macro-etching metals & alloys Macroscopic examination on welds	ASTM E340-2023 ASTM E381-2022 ASME IX-2023 *AWS D1.1/D1-1M-2020 *API 1104-2021 (Errata 1 2023) BS EN ISO 17639: 2022 AS 1085.20: 2020 AS/NZS 2205.5.1: 2024

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MATERIALS/ PRODUCTS TESTED	TESTS/ PROPERTIES	STANDARD METHODS/ TECHNIQUES
A METAL & METAL PRODUCT	13. Micro-etching metals & alloys Microscopic Examination	ASTM E407-2023 ASTM E3-2011 (Reapproved 2017)
	14. Determination of Metal Composition	
	(i) Carbon and low-alloy steel Elements: Al, B, C, Cr, Co, Cu, Mn, Mo, N, Ni, Nb, P, Si, S, Sn, Ti, V, W	ASTM A751-2021 ASTM E415-2021 AS 1085.20: 2020 BS EN 10351: 2011 CR 10320: 2004 * MS ISO 15630-1: 2012 * MS ISO 15630-2: 2012 * MS 144: 2014 * MS 145: 2014 * MS 146: 2014 * CS 2: 2012 (Rev 6: 2022)
	(ii) Stainless Steels Elements: Cr, Ni, Mo, Mn, Si, N, Cu, C, P, S	ASTM A751-2021 ASTM E1086-2022
	(iii) Steel, Stainless Steel, Iron, Nickel & Cobalt Alloys Elements: C, S, N, O	ASTM E1019-2024
	(iv) Nickel & Nickel Alloys Elements: Al, B, C, Ca, Cr, Co, Cu, Fe, Mg, Mn, Mo, Ni, Nb, P, S, Si, Sn, Ti, Ta, W, V, Zr	ASTM E2594-2020 ASTM E3047-2022
	(v) Titanium & Titanium Alloys Elements: Al, B, Cr, Co, Cu, Fe, Mn, Mo, Ni, Nb, Pd, Ru, Si, Sn, Ta, W, V, Y, Zr	ASTM E2371-2021a
	(vi) Titanium & Titanium Alloys Elements: H	ASTM E1447-2022
	(vii) Titanium & Titanium Alloys Elements: O, N	ASTM E1409-2013 (Reapproved 2021)

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MATERIALS/ PRODUCTS TESTED	TESTS/ PROPERTIES	STANDARD METHODS/ TECHNIQUES
A METAL & METAL PRODUCT	(viii) Aluminium & Aluminium Alloys Elements: Ag, As, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Sc, Si, Sn, Sr, Ti, Tl, V, Zn, Zr	ASTM E1251-2024 ASTM E3061-2024
	(ix) Refractory & Reactive Metals and their Alloys Elements: C	ASTM E1941-2010 (Reapproved 2024)
	(x) Positive Material Identification	ASTM A751-2021 ASTM E1476-2004 (Reapproved 2022)
	(xi) Steel Elements: C, S N Mn Ni Cu Mo	ISO 10278: 1995 ISO 13898-2: 1997 ISO 13898-3: 1997 ISO/TS 13899-1: 2004
	(xii) Copper & Copper Alloy Elements: Ag, Al, As, B, Be, Bi, C, Cd, Co, Cr, Cu, Fe, Mg, Mn, Ni, P, Pb, S, Sb, Se, Si, Sn, Te, Ti, Zn, Zr Elements: Ag, Al, As, B, Be, Bi, Cd, Co, Cr, Cu, Fe, Mg, Mn, Ni, P, Pb, Sb, Se, Si, Sn, Te, Ti, Zn, Zr	BS EN 15079: 2015 BS EN 15605: 2010
	15. Portable Hardness Test	ASTM E110-2014 (R2023) ASTM A956/A956M-2022 ASTM E10-2023
	16. Pitting Corrosion	ASTM G48-2011 (Reapproved 2020) ^{E1} Method A, Method B
	17. Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels	ASTM A262-2015 (Reapproved 2021) Practice A (ii), B (iii), C (iv) & E (i)
	18. Detecting susceptibility to Intergranular Attack in Wrought, Nickel-Rich, Chromium – Bearing Alloys	ASTM G28-2024

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MATERIALS/ PRODUCTS TESTED	TESTS/ PROPERTIES	STANDARD METHODS/ TECHNIQUES
A METAL & METAL PRODUCT	19. Determining Volume Fraction by Systematic Manual Point Count	ASTM E562-2019 ^{E1}
	20. Fracture Mechanics Toughness Test, Crack Tip Opening Displacement (CTOD) Test	BS 7448-1: 1991 BS 7448-2: 1997
	(i) (SENB) Single Edge Notched Bend	ASTM A370-2024a BS EN ISO 15653: 2018 AS 2205.7.3: 2003 BS ISO 12135: 2021
	(ii) (SENT) Single Edge Notched Tension	BS 8571: 2018 DNV RP F108: 2006 Section 2 DNVGL RP F108: 2017
	21. Hydrogen Induced Cracking (HIC) Test	NACE Standard TM0284-2016 item no. 21215
	22. (SSCC) Test	ASTM G39-1999 (Reapproved 2021) ASTM A370-2024a BS EN ISO 7539-1: 2012 BS EN ISO 7539-2: 1995 NACE Standard TM0177-2024 (Methods A, B & C)
	23. Salt Spray Test	ASTM B117-2019
	24. Fatigue Test	MS 146: 2014 BS 4449: 2005 + A3: 2016 SS 560: 2016+A1: 2024 BS EN ISO 15630-1: 2019 AS 1085.20: 2020 MS ISO 15630-1: 2012 ISO 15835-2: 2018 CS 2: 2012 (Rev 6: 2022)
	25. Relaxation Test	JIS G 3137: 2020
	26. Detecting detrimental intermetallic phase in duplex austenitic/ferrite stainless steels	ASTM A923-2023 Method A(ii) & C(i) only

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MATERIALS/ PRODUCTS TESTED	TESTS/ PROPERTIES	STANDARD METHODS/ TECHNIQUES
A METALS AND METAL PRODUCTS	27. Determining average grain size	ASTM E112-2024
	28. Determination of Diffusible Hydrogen Content of Weld Metal, via Gas Chromatography, Produced by Arc Welding	AWS A4.3-1993 (R2006) BS EN ISO 3690: 2018
	29. Surface Geometry and Tolerances: Determination of the relative rib or indentation area	BS EN ISO 15630-1: 2019 MS ISO 15630-1: 2012 * MS 144: 2014 * MS 145: 2014 * MS 146: 2014 AS/NZS 4671:2019 CS 2: 2012 (Rev 6: 2022)
	30. Dimensions, Mass per Metre and Tolerances: Determination of deviation from Nominal mass per metre	BS EN ISO 15630-1: 2019 MS ISO 15630-1: 2012 * MS 144: 2014 * MS 145: 2014 * MS 146: 2014 AS/NZS 4671:2019 CS 2: 2012 (Rev 6: 2022)
	31. Particle Size Distribution by Light Scattering (dry dispersions only)	ASTM B822-2020
	32. Slip Test of Mechanical Splices for Steel Reinforcing Bars	ASTM A1034/A1034M-2024 ISO 15835-2: 2018
	33. Determination of Density for Powder Metallurgy Materials and Products	ASTM B311-2022
	34. Sectioning Test	ASME IX-2023

(*) : Specification

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Approved Signatories

- | | |
|-------------------------|--|
| 1. Tee Chng Kin | - All accredited tests |
| 2. Seto Yuen Hee | - item A1 – A12, A29, A30, A32, A34 |
| 3. Ong King Liong | - item A14 (i), (ii), (iv), (viii), (x), (xii), A15, A28 |
| 4. Johnson Lee Gao Shan | - item A12, A13, A16 – A19, A21 – A23 & A26, A27 |
| 5. Tang Tung Yieng | - item A14 (i), (ii), (iv), (x), A15 |
| 6. Luke Joon Shiong | - item A14 (i), (ii), (iv), (x), A15 |
| 7. Lee Chen Heng | - item A1, A2, A5, A6, A12, A20 (i), A24 |
| 8. Yip Pooi Chee | - item A14 except A14(x), A28, A31, A33 |
| 10. Dr. Yeoh Yong Chen | - item A1, A2, A5, A6, A7, A12, A20 (i), A24, A34 |
| 11. Chia Jin Hong | - item A13, A16, A17(ii), A26 |

Note :

This laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025:2017. A laboratory's fulfilment of the requirements of ISO/IEC 17025:2017 means the laboratory meets both the technical competence requirements and **management system requirements** that are necessary for it to consistently deliver technically valid test results. The **management system requirements** in ISO/IEC 17025:2017 are written in language relevant to laboratory operations and operate generally in accordance with the principles of ISO 9001.