CLADDING TECHNOLOGY SHANXI CO., LTD

Welding Procedure Specification (WPS)

WPS No.: WPS-CT2601

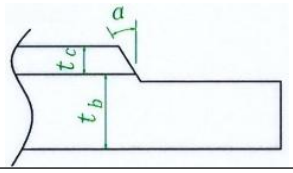
Company Name: C LA DDING TEC HNOLOGY SHA NXI C O., LTD

CorrespondingpWPSNo.:pWPS-CT2601 Corresponding PQR No.: PQR-CT2601
Date：May 15,2026(R2025-8-29)

Welding Process: GTAW
Degree of Automation: Manual☐ Mechanized☐ Automatic■
Joint Type: Butt☐ Fillet☐
Weld Overlay■ Pipe-to-Pipe Fillet Weld■
Sheet Backing (Material & Spec.): None
Other: Workpiece Rotation

Schematic (Joint Type, Groove Detail & Dimensions, Weld Pass Sequence); (Tube-to-Tubesheet Joint: Tube O.D., Wall Thickness, Tubesheet Periphery, Prefabricated Liner/Sleeve Detail, Ligament Width) α=30°

te≥2.5 mm
tb≥8 mm



Base Metal:

Test Coupon No.	1	2
Material	L245N/BN	LC1812/316L
Standard or Specification	GB/T 9711-2023&API 5L-46	SY/T 6601-2017&API 5LC-4
Specification/mm	Φ89×8	Φ70×3
P-Number	Fe-1	Fe-8
Group Number	Fe-1-1	Fe-8-1
Thickness Range for Butt Welds	___	___
Thickness Range for Fillet Welds	≥8 mm	≥2.5 mm
Pipe Diameter, Wall Thickness Range (Butt or Fillet)	___	___
Base Metal Thickness Range for Weld Overlay	≥8 mm	___

Other: Weld overlay base metal L245N, fillet weld L245N+LC1812 Pipe-to-Pipe Fillet Weld

Filler Metal:：

Filler Metal Type (Category)	Nickel-Chromium-Molybdenum Alloy Wire & Rod	
Classification (Trade Name)	SNi6625/ERNiCrMo3(NiCr22Mo9Nb)	
Standard	GB/T 15620-2008	
Filler Metal Size/mm	Φ1.2	
Filler Metal Class	NiS-3	
Weld Metal Thickness Range for Butt Welds/mm	___	
Weld Metal Thickness Range for Fillet Welds/mm	___	

Other: Overlay thickness ≥3.0mm

Preheat & Postweld Heat Treatment:		Gases:			
Min. Preheat Temp./°C	___	Item	Gas Type	Mixture Ratio	Flow Rate
Max. Interpass Temp./°C	≤100	Shielding Gas	Ar	1	20 L/min
Postheat Temp./°C	___	Trailing Gas	___	___	___
Postheat Holding Time/h	___	Backing Gas	___	___	___
Postweld Heat Treatment:		Welding Position:			
Heat Treatment Temp./°C	___	Position for Butt Welds	___	Progression (Up, Down)	___
Heat Treatment Time/h	___	Position for Fillet Welds	Pipe-to-Pipe Fillet Weld	Progression (Up, Down)	Up

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Electrical Characteristics::

Tungsten Type & Diameter/mm: 3.2 Nozzle Diameter/mm: 8

Metal Transfer Mode (Spray Transfer, Short-Circuit Transfer) —

(Based on welding position and material thickness, specify the range for current, voltage, and travel speed in the table below.)

Bead/ Layer	Process	Filler Metal	Size mm	Current & Polarity	Welding Current A	Arc Voltage V	Hot Wire Current A	Wire Feed Speed mm/min	Travel Speed mm/min	Power kw	Max. Heat Input kJ/cm
1	GTAW	ERNiCrMo-3	Φ1.2	DCEN (DC+)	162~198	**11.4~12.2**	**49~51**	**1200**	**320**	**0.46~0.55**	**4.35**
2	**GTAW**	**ERNiCrMo-3**	Φ1.2	DCEN (DC+)	210~230	**11.4~12.2**	**49~51**	**1500**	**320**	**0.45~0.53**	**5.26**

Technical Measures

Weaving or Non-weaving: **Non-weaving** Weaving Parameters:

Pre-cleaning & Interpass Cleaning: **Pre-cleaning & Interpass Cleaning: Machining + Grinding, No interpass cleaning** Back Gouging Method:

Single or Multiple Passes/Side: **2 passes/side** Single or Multiple Electrodes: **Single Wire**

Contact Tip to Work Distance/mm: **7-10** Peening:

Tube-to-Tubesheet Joint Connection Methods: — Cleaning Method for Tube-to-Tubesheet Joints:

Configuration and Dimensions of

Preplaced Metal Sleeve— the Preplaced Metal Sleeve:

Other: **40%-50% overlap between adjacent beads, Hot wire overlay welding.**

Inspection Requirements & Reference Standards:

Visual Inspection:: SY/T 6623-2018&API SPEC 5LD-2015(R2020) 'CRA Clad or Lined Steel Pipe'

Radiographic Testing: NB/T 47013.2-2015 'Nondestructive Testing of Pressure Equipment - Part 2: Radiographic Testing'

Ultrasonic Testing: NB/T 47013.3-2023 'Nondestructive Testing of Pressure Equipment - Part 3: Ultrasonic Testing'

Groove & Overlay Penetrant Testing: NB/T 47013.5-2015 'Nondestructive Testing of Pressure Equipment - Part 5: Penetrant Testing'

Prepared By	WuKai	Date	May 15, 2026 (R20250829)	Reviewed By	WuKai	Date	May15, 2026 (R20250829)	Approved By	He Zhongchen	Date	May15, 2026 (R20250829)