

- ✓ NDT & Inspection
- ✓ Hydrostatic testing
- ✓ Weld qualification
- ✓ Concrete testing
- ✓ Mechanical testing
- ✓ Metallurgical services
- ✓ Chemical analysis & PMI
- ✓ Pressure plant inspection

Penetrant test report



Report number LW25-1771-01 PT
Customer name FUSION-WELD ENGINEERING PTY LTD
Address 1865 Frankston Flinders Road Hastings VIC Australia 3915
Requested by David Cameron
Purchase Order PO-0695
Accredited laboratory LMATS Melbourne Laboratory
Test date 12/11/2025 to 26/11/2025
Job address 1865 Frankston Flinders Road Hastings VIC Australia 3915
Job description PT on welds
Identification 2011 RCCU T/A REPLACEMENT TITANIUM BUNDLE EB0604 FOR HEAT EXCHANGER E0604
Material grade Stainless Steel 316S,Titanium
Test specification AS 4037 -1999 (R 2016) - Sec. 8 (AS 1210 - 2021 Class 2A PV) - NDT, AS/NZS 1554.6:2012 - Category 2B
Test method AS ISO 3452.1:2021-PT - colour contrast
Test designation ISO 3452-2, IIAeL2-Colour contrast (visible), water removal, solvent developer, L2 sensitivity
Test procedure TP-PT-15 (I2, R1)
Production Stage after fabrication
Test area Weld zone & associated HAZ (Refer Table 1 for identification)
Test temperature 18°C to 21 °C approximate range
Equipment L004715 Hold Peak 881D Light meter
Lighting conditions White light illuminance >1200 lx
Surface condition As welded
Surface preparation Wiped

Chemicals details	Brand name	Batch No.	Dwell time (Mins.)
Precleaner	Not Applicable	Not Applicable	Not applicable
Penetrant	MR Chemie MR 311-R	2211056	20
Developer	MR Chemie MR70I	2212066	20
Remover	Not Applicable	Not Applicable	Not applicable

Approved tester Lachlan Hooppell (SNT-TC-1A and AINDT L2 - RT MT PT)
Other testers Jack Machen (ISO 9712 Level 2 MT/PT, Level 1 UT and Radiation license)
Test results Refer to Table 1 for test area identification and results



Accredited for compliance with
ISO / IEC 17025 - Testing

Signatory
Lachlan Hooppell
(SNT-TC-1A and AINDT L2 - RT MT PT)

Report issued on 03/12/2025

Equipment lot : 3

Lighting conditions

White light illuminance >1100lx measured using L005110 DIGITAL LUX Meter

Chemicals details

Precleaner

Penetrant

Developer

Remover

Brand name	Batch No.	Dwell time (Mins.)
MR 85	2403065	Not applicable
MR Chemie MR311-R	2211056	20
MR Chemie MR70I	2212066	10
MR 85	2403065	Not applicable

REVOKED

Table 1: Test items identification (provided by the client) and results (All dimensions in mm unless stated otherwise)

Identification	Drawing No.	Description	Material Grade	Discontinuities	Result
2011 RCCU T/A REPLACEMENT TITANIUM BUNDLE EB0604 FOR HEAT EXCHANGER E0604	10-13-001	Tube welds	Titanium	NUSID	NA
2011 RCCU T/A REPLACEMENT TITANIUM BUNDLE EB0604 FOR HEAT EXCHANGER E0604	10-13-001	Baffle welds	Stainless steel	NUSID	NA

Test restrictions

Limited access due to complex part geometry and inside of the tube welds

Comments

Nil

Test, inspection process specific notes

- This test method cannot detect sub-surface discontinuities or surface opening discontinuities covered with coating.

Normative general notes

1. Test and inspection items may be discarded after 6 weeks, unless alternative arrangements are made with LMATS.
2. Samples, identification of samples and all job specific details were supplied by the client. The test results relate only to the items tested or sampled.
3. Any stated nominal pipe sizes and nominal thickness of the material were provided by the client.
4. Where applicable, the Measurement Uncertainty (MU) applies to the test results as per LMATS procedure. MU can be obtained by contacting one of LMATS ISO 17025 accredited laboratories.
5. Acceptance criteria is applied from the test specification. If the test specification does not include acceptance criteria, then the test or inspection results should be referred to a competent authority for further action.
6. Refer to the attached revision notes if this report has been revised. This report shall not be reproduced except in full without approval of the issuing laboratory to ensure that parts of a report are not taken out of context. The client or their representatives shall not edit this report.
7. LMATS or its professional indemnity insurance provider do not indemnify the contents within this report or the conformity of a tested product unless the invoice for the reported work is paid in full within the agreed credit terms. Reports will be revoked if the invoice for the completed work is not paid in full.

Abbreviations used in this report

A - No discontinuities detected

CP - Crater Pipe

F - Failed

IC - Copper Inclusion

IO - Oxide Inclusion (wagon tracks)

KL - Longitudinal crack

LP - Incomplete root Penetration

NRRD - No Recordable Reflections Detected

p.d. - Processing / film Defects

PU - Uniform Porosity

SGI - Incompletely filled Groove

SMH - Hammer Mark

SSP - Spatter

XP - Excessive Penetration

BT - Burn (melt) Through

DNC - Does Not Comply

GP - Gas Pore

IL - Linear Inclusion (slag line)

IT - Tungsten Inclusion

KT - Transverse crack

LR - lack of Root fusion (missed edge)

NUSID - No unacceptable Surface Indications Detected

PG - Localized Porosity

RP - Report findings

SGS - Shrinkage Groove

SMT - Tool Mark (chipping mark)

SUC(e) - Undercut External

WH - Worm Hole

C - Comply

EC - Elongated Cavity (hollow bead)

HiLo - Linear misalignment

IN - Inclusion

KC - Crater crack

LI - lack of Inter-run fusion

LS - lack of Side fusion

P - Passed

PL - Linear Porosity

SED - Excessive Dressing (underflushing)

SMG - Grinding Mark

SRC - Root Concavity (Suck back)

SUC(I) - Undercut Internal



Image 1 of 1 - General view of the test Item

REVOKED

