



UNEK

Shaping Australian Industry

Laser Welding Capabilities

Presented by:
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Welding Coordinator
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Our Welding Team

Our **Welding Coordination Team** consists of IIW qualified,
2x International Welding Technologist

Our **Welding Supervision Team** consists of IIW qualified,
2x International Welding Specialist / AS1796 Certificate 10 / AS2214 Welding Supervisors

Our **Welding Inspection Team** consists of IIW qualified,
International Welding Inspectors / AS1796 Certificate 11 / WTIA Senior Welding Inspector
2x ISO9712 VT Level 2 Inspection Personnel
2x ISO9712 PT Level 2 Inspection Personnel

Our **Welding Team** consists of,
10x Qualified & Certified Welders – AS1796 / ISO9606 / AWS D17.1



Welding Capabilities

Welding Capabilities Summary

Uneek Bending offers industry-leading welding solutions using advanced technology and skilled professionals.

Welding Capabilities:

Wide range of welding processes including:

- Orbital GTAW
- GMAW
- WiseRoot+ (STT)
- Synergic GMAW
- Manual GTAW
- Stick (MMAW)

Recently added **Robotic Laser Welding** to enhance precision, repeatability, and productivity.

Extensive experience with **materials** such as:

Carbon Steels, Stainless Steels, Chromoly, Duplex, Inconel.

Quality Assurance:

Operates under a welding management system certified to **ISO 3834-2 (Comprehensive Level)** – a global benchmark for welding quality.

Core Values:

Strong focus on **quality, precision, compliance, on-time delivery,** and staying **within budget**



Management System Certification

- Quality Management System - ISO 9001:2015
- Occupational Health & Safety - ISO 45001:2018
- Environmental Management System - ISO 14001: 2015
- Aircraft, Space & Defence - AS9100D
- Welding Systems Certified –ISO 3834.2, DIN 2303 & EN15085-CL1/P

DISP Accreditation – Application submitted 2024

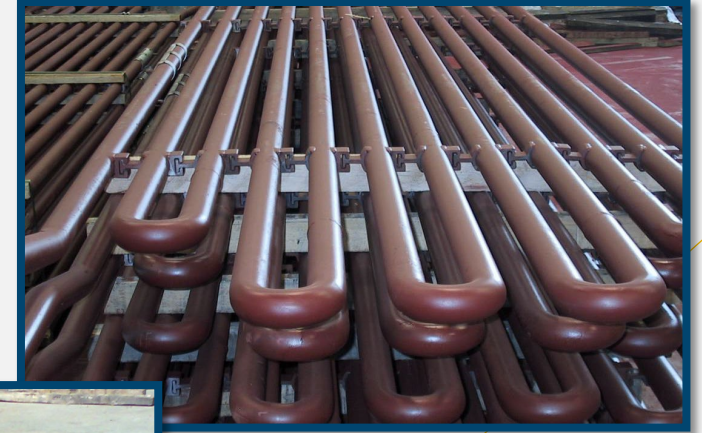
Currently working toward NADCAP (Welding) third quarter 2025



Welding in Power Industry

Component Manufacture

- Burner openings
- Superheater and Economiser Elements
- Boiler Components – Elements and waterwalls
- Tube - Weld Overlay – Stainless Steel and Inconel
- Erosion Shields and Clips – 253Ma
- Pipe Swagging and Flaring
- Heavy fabrication – Helical Heating Coils
- Header Fabrication – CrMo and P91



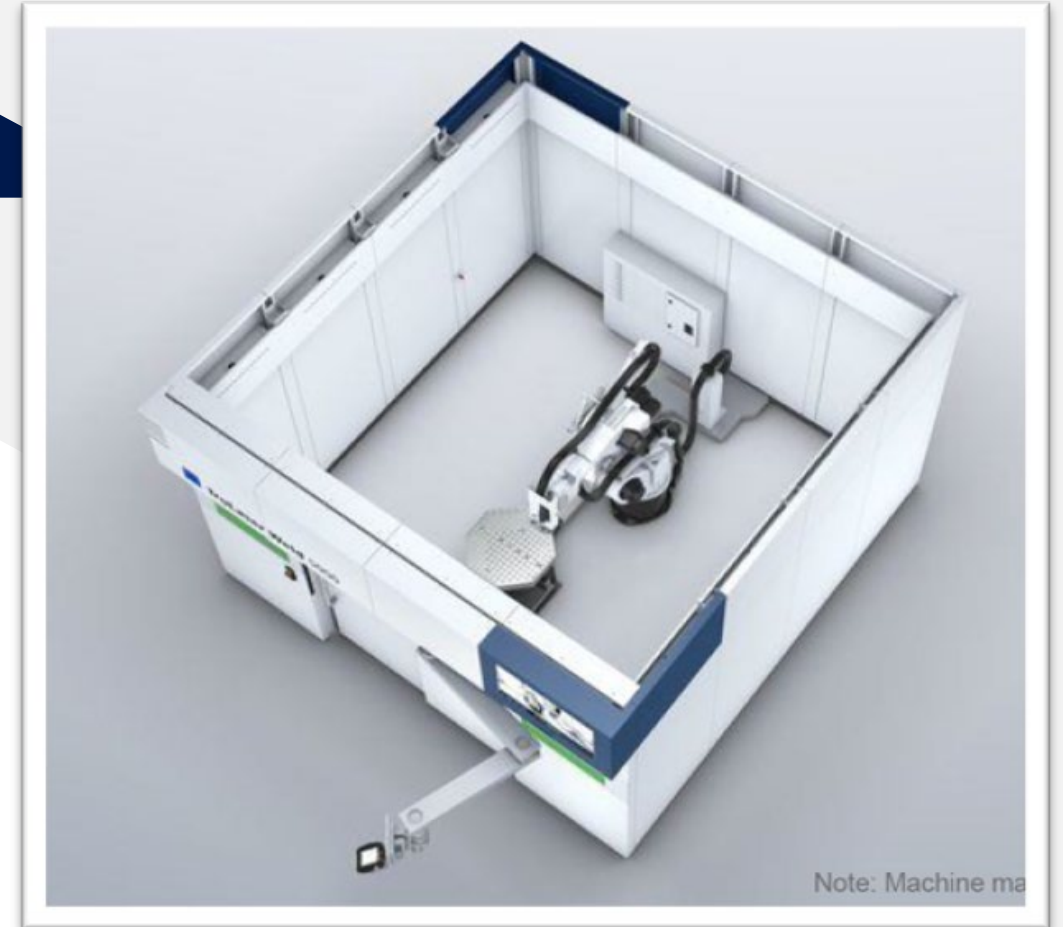
Energy Industry Experience

Energy Producers as Our Valued Clients



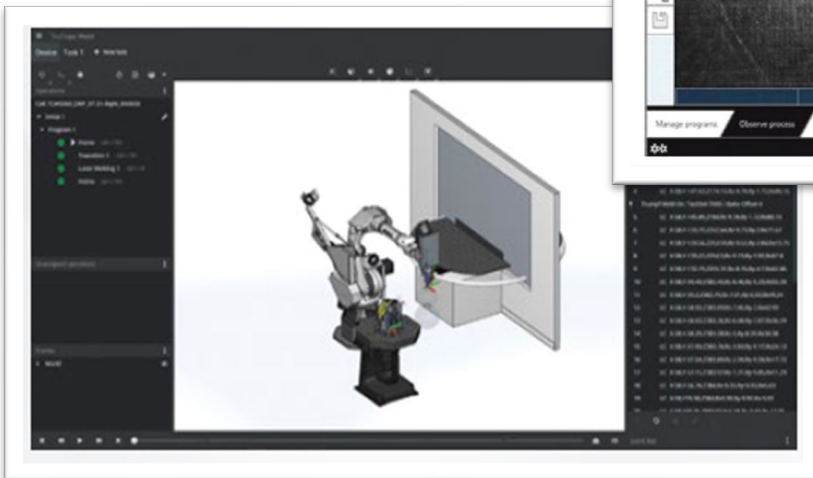
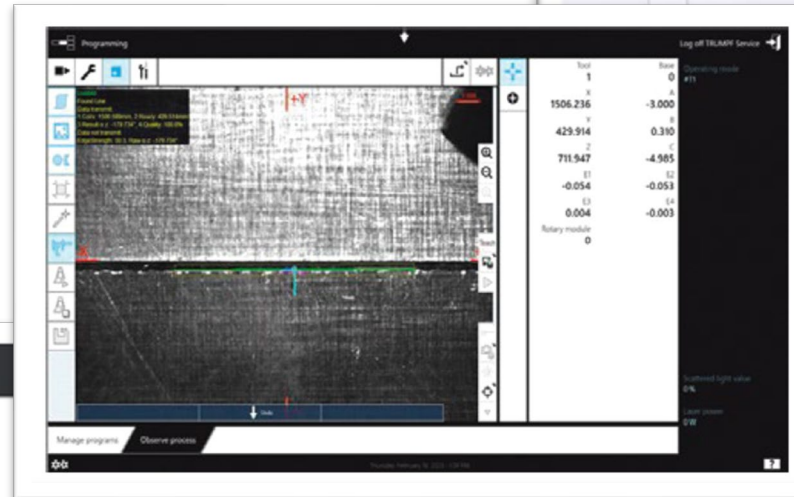
TruLaser Weld 5000

Robotic Laser Welding Cell



System Features

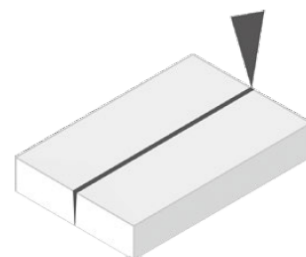
- FusionLine
- BrightLine Scan
- TeachLine
- TruTops Weld Offline Programming



Tech Talk

Max. welding depths for deep penetration welding ^[1]				
Power	W	3000	4000	6000
Stainless steel	mm	5	7	10
Mild steel	mm	5	7	10
Aluminum	mm	3	4	6

Max. sheet thicknesses for heat conduction welding ^[1]				
Power		3000 W	4000 W	BrightLine Scan ^[2]
Stainless steel	mm	2.5	3	6
Mild steel	mm	2.5	3	6
Aluminum	mm	2.0	2.5	4

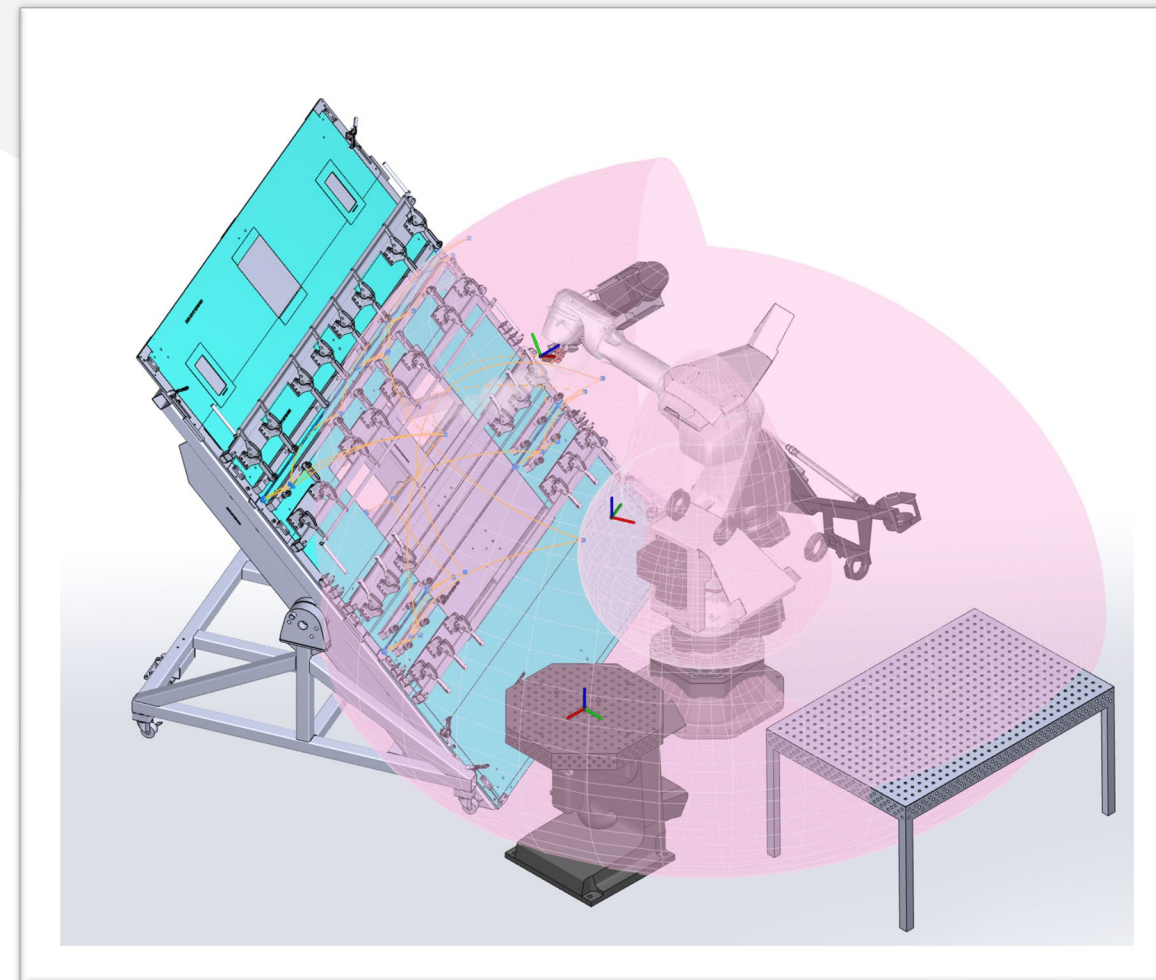
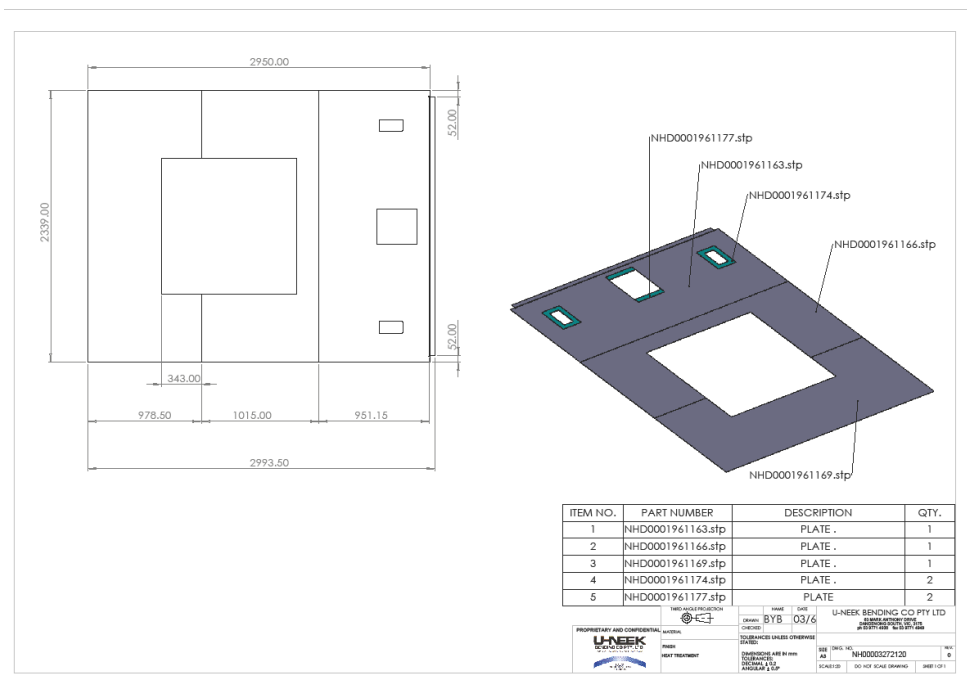


		3000 W	6000 W
2 mm aluminum	Standard	7 m/min.	10.2 m/min.
	BrightLine Scan	3.5 m/min.	5.3 m/min.
1.5 mm stainless steel	Standard	8 m/min.	13 m/min.
	BrightLine Scan	3.4 m/min.	6 m/min.
3 mm mild steel	Standard	3 m/min.	7 m/min.
	BrightLine Scan	1.8 m/min.	4.3 m/min.

1 mm stainless
 welding speeds
 of up to
 18m/min!!

Current Projects

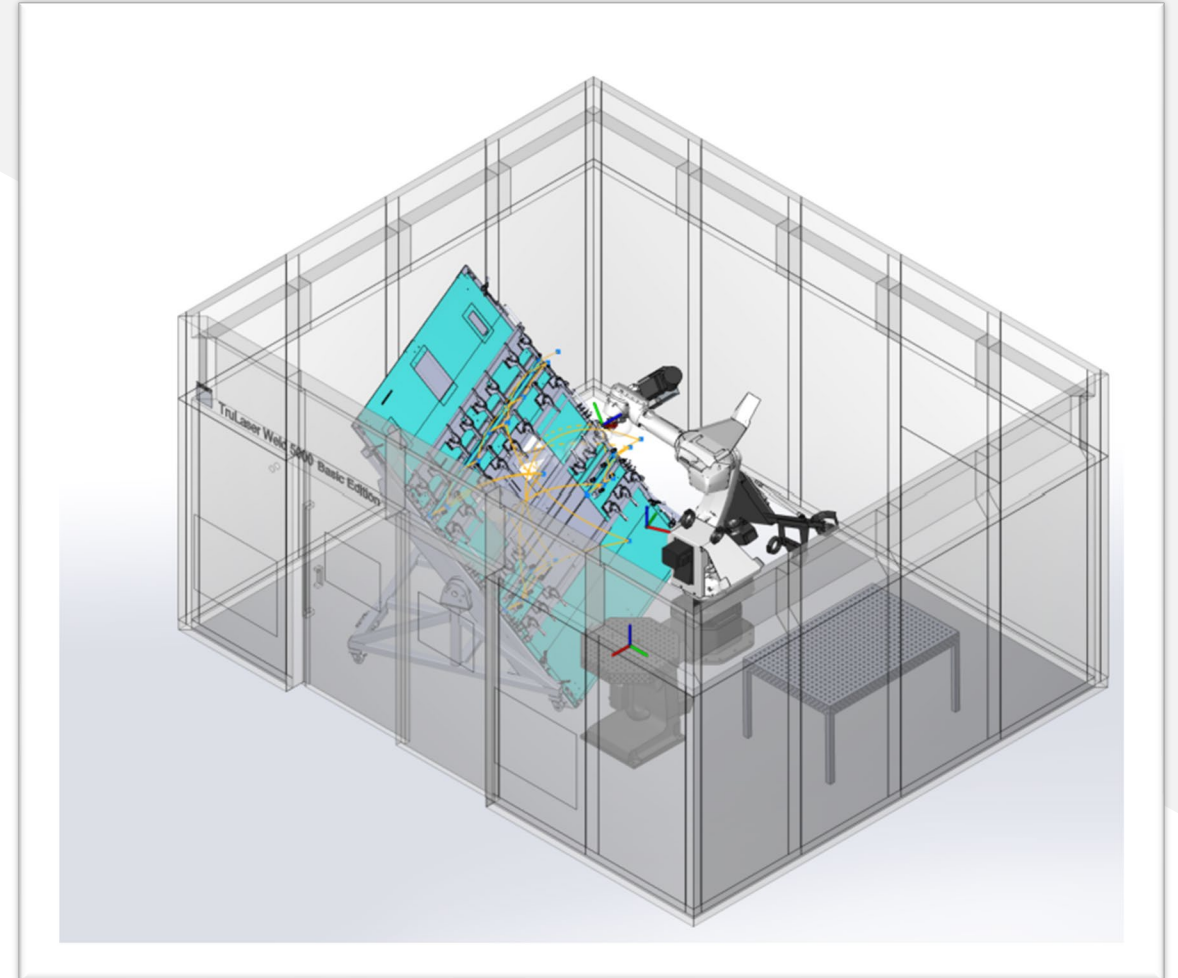
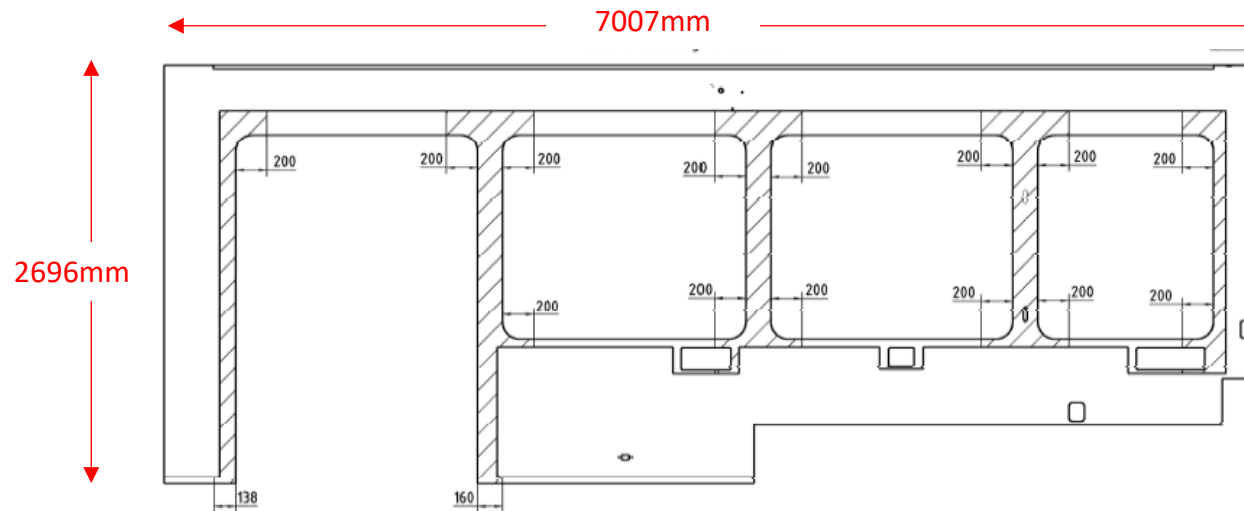
- Rolling Stock – Alstom X'Trapolis 2.0 Victorian Trains
- Light Rail – Victorian Next Generation Tram (NGT) Project
- Defence – Aerospace F35 Strike Fighter parts



Future Projects

- Light Rail – Victorian Next Generation Tram (NGT) Project

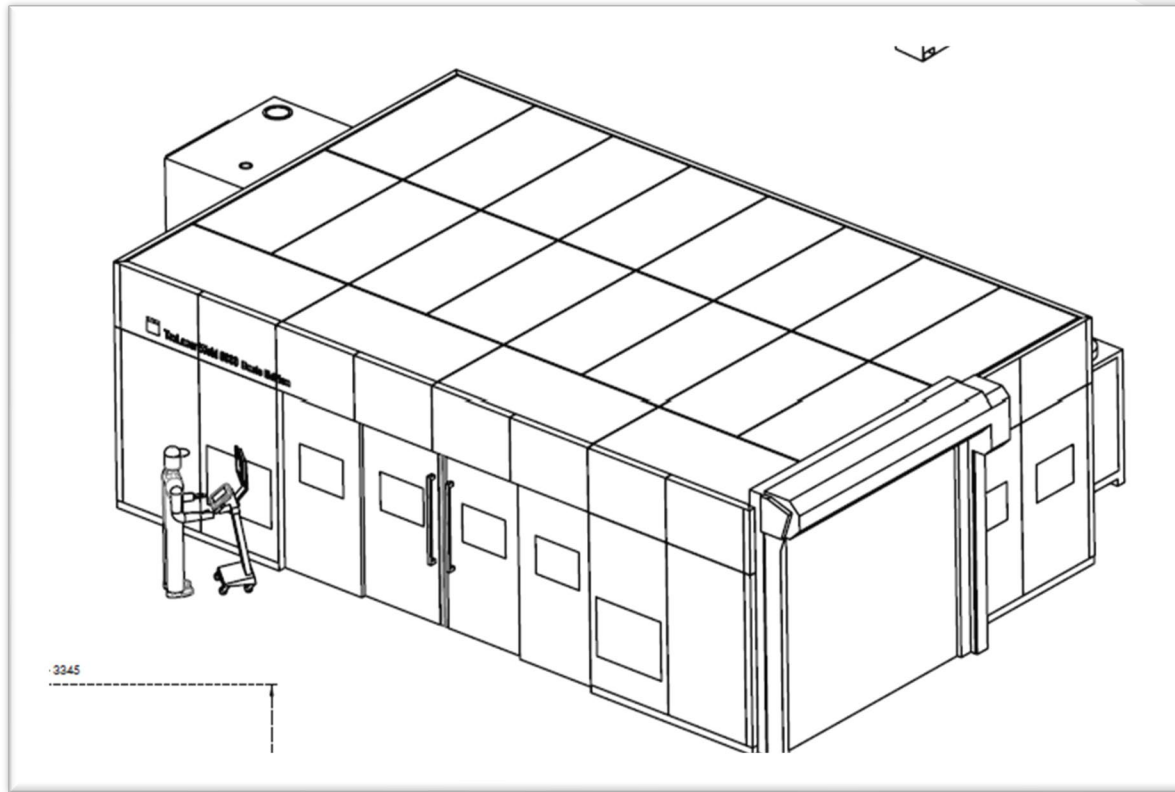
9 individual critical structural parts



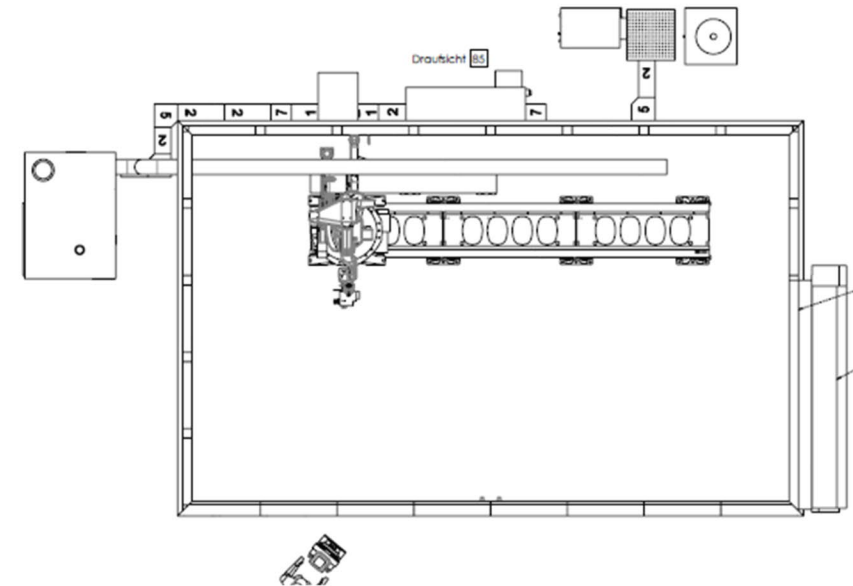
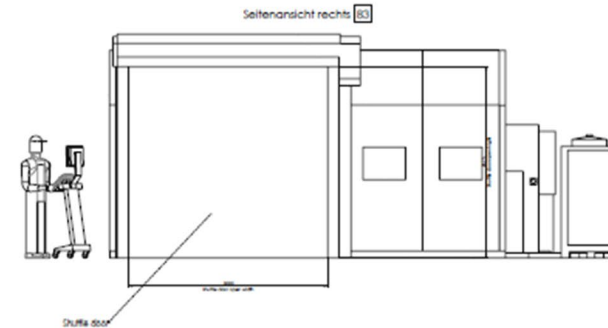
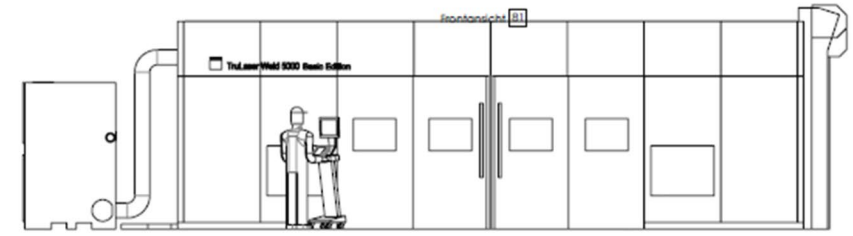
TruLaser Weld 5000 XXL



TruLaser Weld 5000 XXL

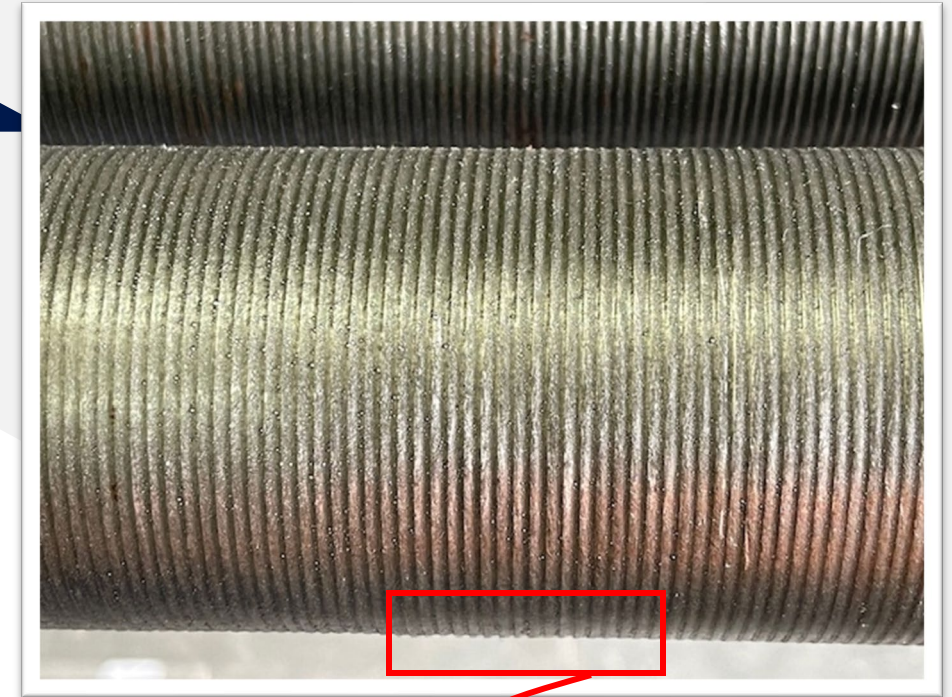


9400 x 6000mm



Current R&D Projects

- Power Industry – Inconel Laser Cladding



Inherent notch effect of applied coating

Current R&D Projects

- Power Industry – Inconel Laser Cladding



Smoother fusion profiles

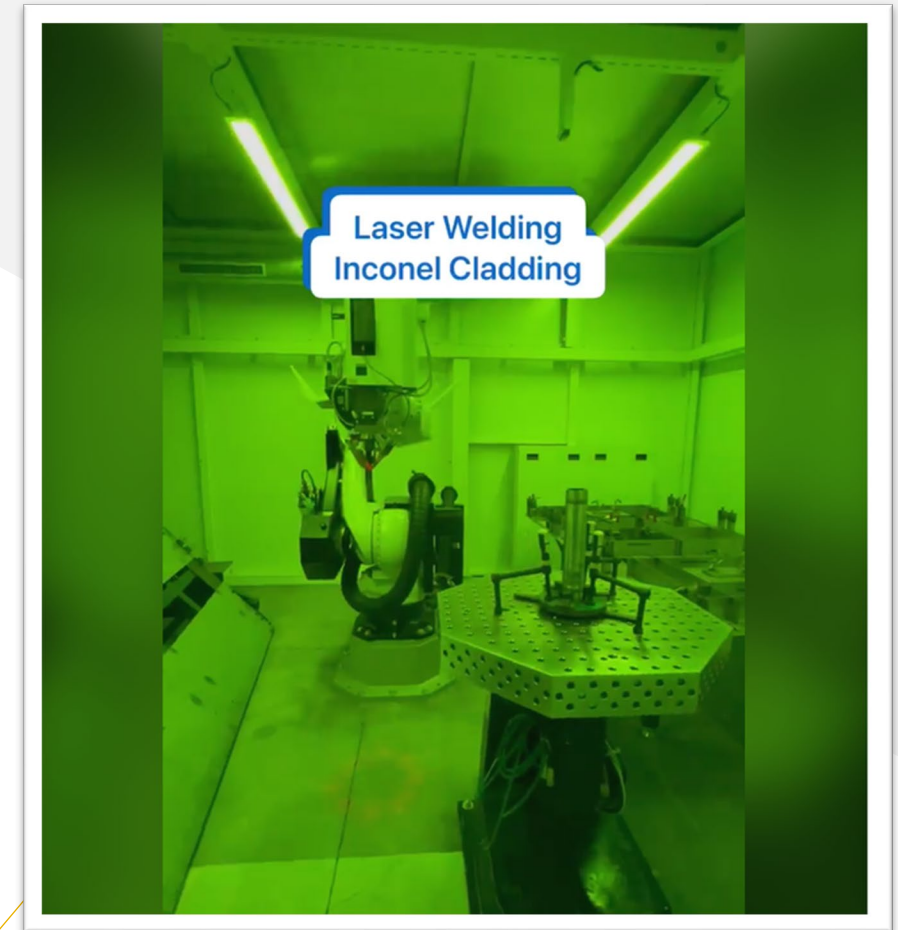


GTAW applied cladding

Current R&D Projects

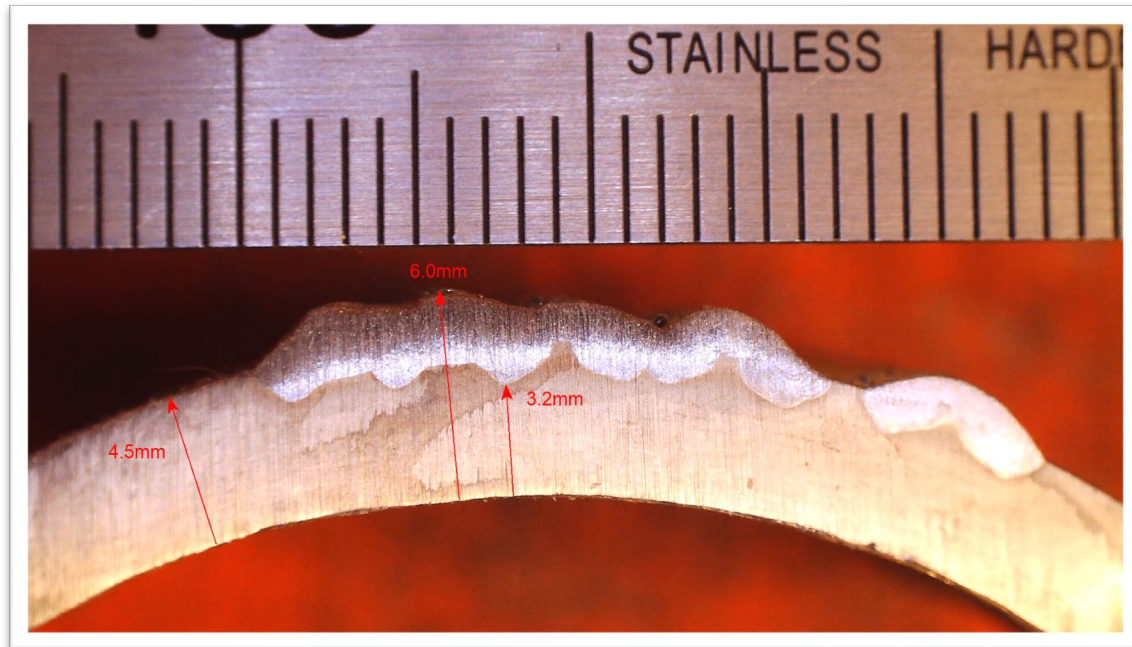
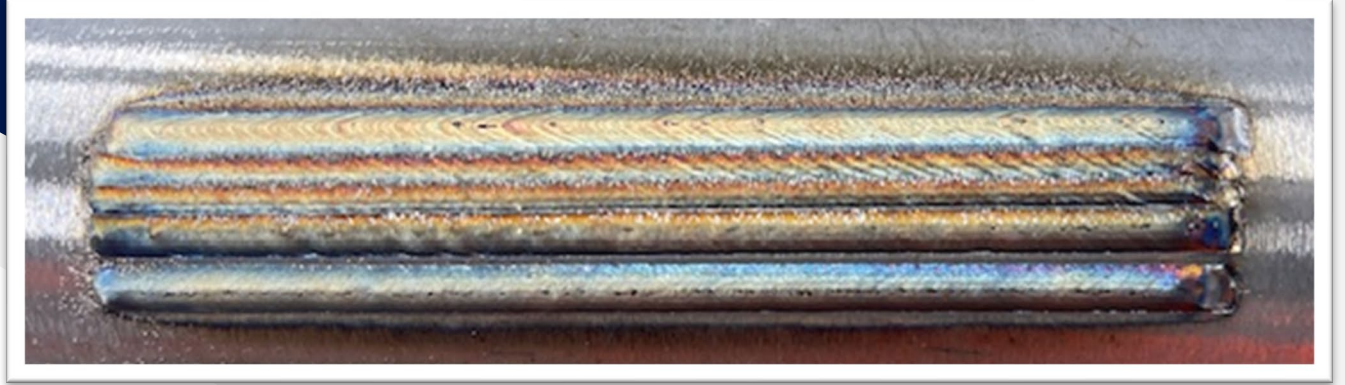
- Power Industry – Inconel Laser Cladding

https://www.linkedin.com/posts/mathew-billman-b6215589_laser-welding-rd-inconel-pipe-cladding-activity-7361968681653846017-SrbA?utm_source=share&utm_medium=member_desktop&rcm=ACoAABK1mToBGYYxb43jd8tVKWQaBmfNN8HruEO

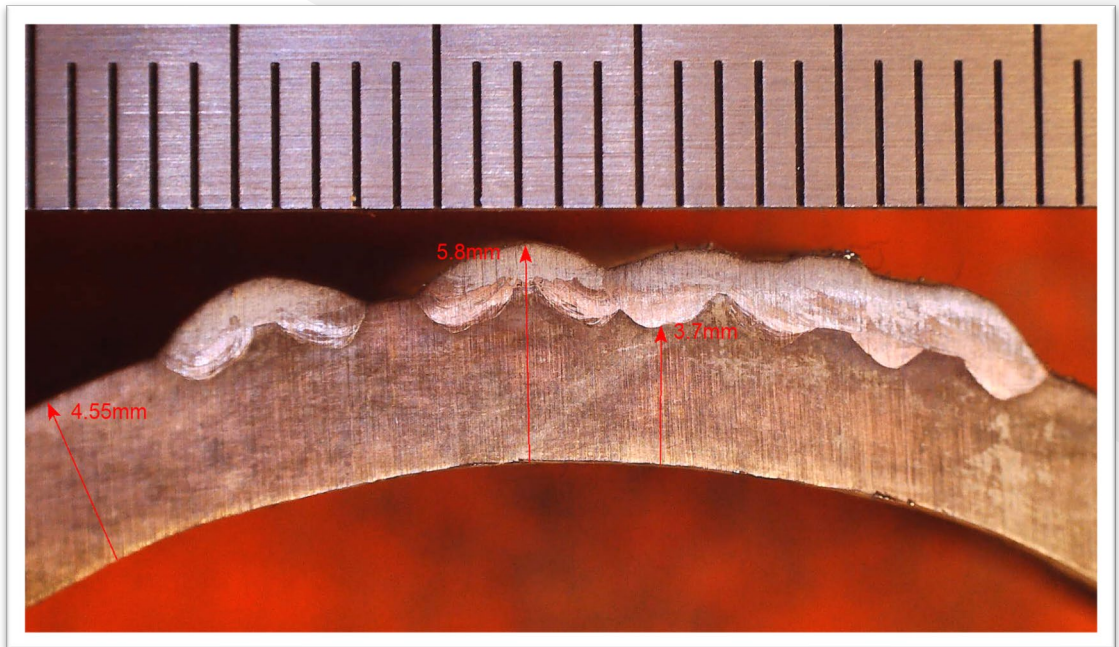


Preliminary Welding Trials

- Welding Variable Assessment– Inconel Laser Cladding



1.3mm penetration depth

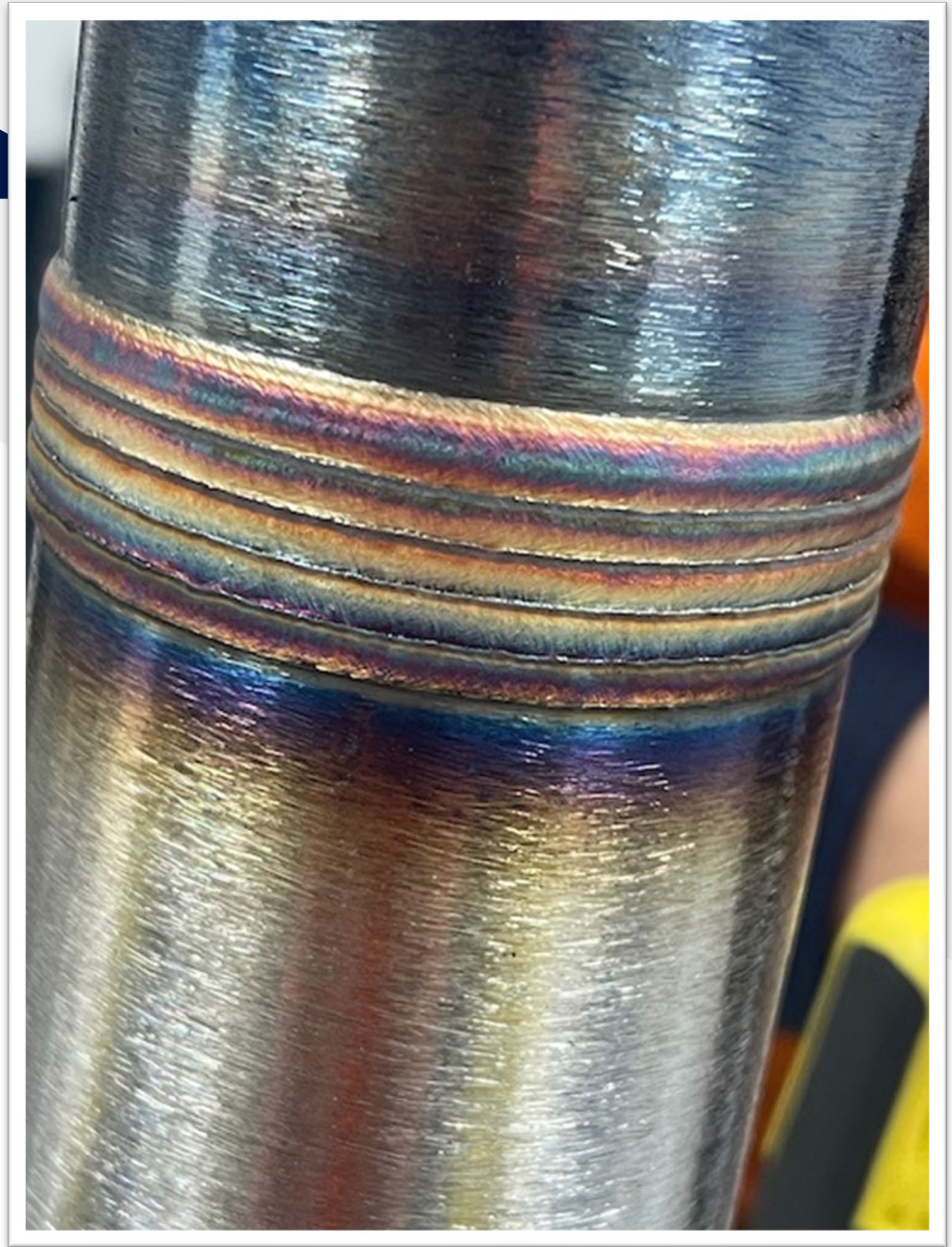


1.3mm cladding height

Preliminary Welding Trials

- Welding Variable Assessment– Inconel Laser Cladding

Latest circumferential welded sample



Welding Capabilities

Procedure Qualification

Our extensive library of **Welding Procedures**

Almost 200 welding procedures qualified to a range of Australian and International Standards

Australian Standards

- AS 3992
- AS 1554.1
- AS 1554.4
- AS 1554.5
- AS 1554.6
- AS 1665

International Standards

- ASME XI
- AWS C1.1
- ISO 15614.1
- ISO 15614.2
- ISO 15613
- ISO 15614.11

Aerospace Standards

- AWS D17.1

Materials Qualified

- Carbon Steels
- Stainless Steels
- Cr-Mo
- Nickel Alloys
- Aluminium Alloys
- Quench & Tempered
- Titanium
- Inconel
- Hastelloy - C276
- Duplex / Super Duplex
- Copper Alloys
- Clad and Weld Overlay



Welding Procedure Specification EN ISO 15614-11 – Level B

WPS No.	WPS 101 (U11)	Revision No.	0	Date	01/11/2024
Supporting Procedure Qualification Record					
WPOR 101 (U11)					
Welding Process					
S2 - Laser Beam Welding					

Material Grade Qualified	301LN HT / UNS S30153 / 1.4318	Prequalified Joint No.	-
Steel Type/Weldability Group	-	Table No.	-
Pipe or Plate Thickness range	1.2 – 1.8	Root Gap	0 – 0.1
Pipe Diameter Range Qualified	-	Root Face	Full
Joint Type	Closed Square Butt	Included Angle	-
Weld positions qualified	2G / PC	Backing	-
Weld Direction	Forward		

Equipment Details

Laser Equipment	Trumpf TruLaser Weld 5000	Technology Set	U11
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Welding Parameters

Spot Dia.	Laser End Ramp	Max. Laser Power	Robot Speed	Processing Angle
0.62 mm	12 ms	2000 W	0.075 m/s	0/8
Offset	Laser Start Ramp	Min. Laser Power	Laser Technology	Wire
0 mm	12 ms	500 W	Deep Pen. w BLS	None

Gas	Gas Type	Pre Flow Time	Fixture Gas Type	Pass Sequence
Crossjet	Ar	0.5 s	None	1
80 l/min	Nozzle Type	Post Flow Time	Fixture Flow	
30 l/min	Linear	0 l/min		
Optics	Collimation	Focal Length	Laser	Operating Mode
100 mm	200 mm	TruFibre	Continuous	Full Penetration

Shielding type	Composition	Flow Rate (Litre/Min)
Argon 4.7	≥ 99.997%	30 l/min
Backing Type	Composition	Flow Rate (Litre/min)
-	-	-

Thermal Treatment (Welding):

Weld pre-heat temp Min	10°C	Time maintained for	-
Inter-run temp Max	-	Inter-run temp Min	-
This document aligns with the essential variable requirements outlined in ISO 15609-4 (CL4.1)			

Approved by U-NEEK Bending Co:

Written By	Qualification	Signature	U-NEEK
Mathew Billman	AU/IWT/0053	<i>Mathew Billman</i>	Welding Coordinator
Reviewed By	Qualification	Signature	
Craig Jones	CIWT/AU/S014/0	<i>Craig Jones</i>	Approval

Robotic Laser Welding SS301LN HT –
Rolling Stock



Procedure Qualification Record

Number	PQR095
Date	1 st December 2023
Process	GTAW

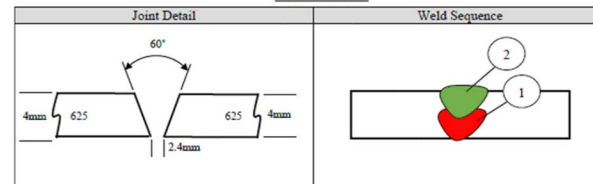
Material to be Welded:

Inconel 625 – Additive Manufactured			
Pipe diameter	190 OD	Prequalified Joint No.	Item 1
Pipe or Plate Thickness	4.0mm	Table No.	2.3
Steel Type/Group	43	Root Gap	2.4
Weld position qualified	6G/H-LO45	Root Face	0
Weld Direction	Up	Included Angle	60°
Joint Type	Single Vee	Backing	NA

Welding codes or standards for which this procedure has been approved:

AS3992:2020

Technical Data:



Gas Shielding type	Gas Composition	Gas Flow Rate (Litre/Min)
Coregas Argon 4.7	Ar 99.99%	13
Gas Backing Type	Gas Composition	Gas Flow Rate (Litre/Min)
Coregas Argon 4.7	Ar 99.99%	16

Thermal Treatment:

Weld pre-heat temp Min	18.5°C (Ambient)	Time maintained for	N/A - Hours
Inter-run temp Max	70°C	Method of measurement	Heat Gun - Infrared
Post Weld Heat Treatment	NA		
Initial Furnace Temp	NA		
Heating Rate	NA		
Holding Temp	NA		
Still air Cooling	NA		
Company Name	NA	Report No.	N/A
In Accordance to:	NA		

Additive Manufactured Inconel 625 –
Defence Research



Procedure Qualification Record

Number	PQR 031 Rev 1
Date	10 th December 2015
Process	

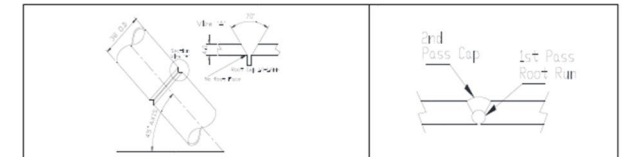
Material to be Welded:

ASTM A335 – P11			
Pipe diameter	38	Prequalified Joint No.	1
Pipe or Plate Thickness	4	Table No.	2.3
Steel Type/Group	C	Root Gap	1-1.6
Weld position qualified	6g	Root Face	0
Weld Direction	Down	Included Angle	70°
Joint Type	Single Vee	Backing	None

Welding codes or standards for which this procedure has been approved:

ASME IX AS/NZS 3992:1998

Technical Data:



Gases:

Shielding type	Composition	Flow Rate (Litre/Min)
Air Liquid M1	Argon- 82% Co2- 18%	12
Backing Type	Composition	Flow Rate (Litre/Min)
NA	NA	NA

Thermal Treatment:

Weld pre-heat temp Min	50°C	Time maintained for	N/A Hours
Inter-run temp Max	150°C	Method of measurement	Infrared gun
Inter-run temp Min	50°C		

Post Weld Heat Treatment	NA		
Initial Furnace Temp	NA		
Heating Rate	NA		
Holding Temp	NA		
Still air Cooling	NA		

Manual GTAW Chrome Moly Steel P11 –
Power Industry

Manufacturing Examples



Thermic fluid heater for offshore oil platform



Inconel fired heat coil for minerals processing

Our Business Partners



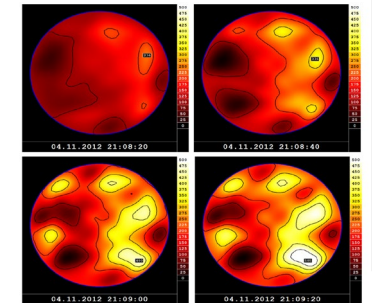
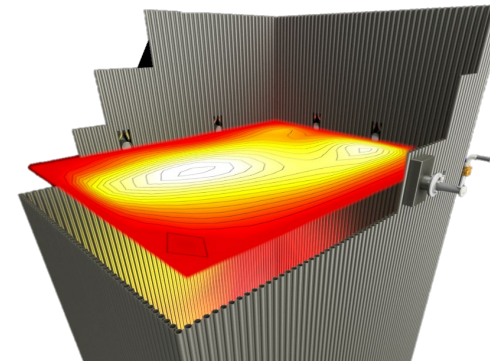
ENERGY SOLUTIONS



Bonnenberg & Drescher GmbH

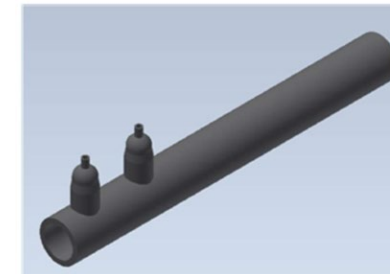
AGAM Acoustic Temperature Measurement

- true gas temperature
- without the influence of radiation
- no aging or no drift



Steinmuller Engineering Services GmbH

- design of plant/equipment
- Performance review & improvement



S.I.E.A- BIOCAL

- Biomass to energy





Industry Supply Chain

Supplying all industries



Transport



Defence



Power



Oil & Gas



Thank You.



Uneek Bending Co.



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