



Bureau Veritas United Kingdom Limited,
"Parklands", 825a Wilmslow Road,
Didsbury, Manchester,
M20 2RE
United Kingdom



JOINING PROCEDURE APPROVAL TEST CERTIFICATE

E1

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3 Inspection Authority : **Bureau Veritas UK Ltd**
4 Reference Number : JP/18/MET/METALOCKA/1

3 Manufacturer's Joining Procedure : METALOCK process A
Reference Number / JPQR No.

5 Manufacturer : Metalock Engineering UK

6 Address : Unit H5, Pilgrims Walk, Prologis Park,
Coventry, CV6 4QG

7 Code/Testing Standard : Manufacturers Standard

8 Date of Joining repair/joint: 20.02.2018

9 RANGE OF APPROVAL :

10 Joining Process(es) : Metalock Process – Cold Stich Repair

11 Joint Type : Insert + Loctite (if required)

12 Parent Metal Group(s) : Cast Iron Grade 250 to BS EN 1561 : 2011

and Sub group(s) Materials with hardness values 60HB to 250HB

13 Parent Metal Thickness (mm) $\geq 6.0\text{mm}$

Joint Metal Thickness (mm) 6.0mm to 25.0mm (as limited by insert length), 25.0mm Deep

Single run / Multi run / Direction : Single Run / Multi Run / Multi Directional

14 Outside Pipe Diameter (mm) : $\geq 25\text{mm}$ (PC, PE, PF, PH, PJ, PG, H-L045, J-L045)

15 Insert Metal Type/Designation : Metalock Ni36

Insert Material Size : All

16 Designation of Adhesive : Loctite SI5990

17 Type of Joining Current and Polarity : None

Mode of Metal Transfer : None

Heat Input : None

18 Joining Position : All

19 Minimum Installation Temperature : -2.0°C Min.

20 Post-Joining Heat Treatment : None

21 Other Information : The joining process has been developed and used for the repair of Cast Iron products for both structural and pressure containing components. The process does not create fusion within the metal joining line and therefore not deemed a welding process.

The Joining process has proven;

- i) leakage rate greater than 7.6×10^{-6} Torr/l/sec (24 hour PT examination test)
- ii) pressure bearing load to 1.66 MPa, on 25mm thickness section

The testing performed, witnessed and certificate issued, is in the absence of any current and valid BS EN ISO published standard

The joining process does not meet the requirement of a harmonised standard as issued under OJ2018/C 049/0. The permanent joining procedures has been assessed in compliance with PED 2014/68/EU Annex I 3.1.2 by process followed/test results achieved and acceptable for the repair of PED category SEP, I, II, III & IV Pressure Equipment with limitations to be assessed by Metalock Engineering UK, Unit H5, Pilgrims Walk, Prologis Park, Coventry, CV6 4QG

22 Certify that test joints were prepared, joint processed and tested satisfactory in accordance with the requirements of the Manufacturers standard indicated above

23 Location

Bureau Veritas UK Limited
"Parklands", Wilmslow Road, Didsbury,
Manchester, M20 2RE, United Kingdom

Tel No. 0845 600 1828
WEB: www.bureauveritas.co.uk

Name, Date and Signature

Alan Clements, 25th March 2018



Examiner or Test Body
(CEOC Member Organisation)

Bureau Veritas UK Limited
Notified Body No. 0041

Note: Joining Procedure Qualification to above specification has been performed and is applicable to the named manufacturer alone.
This qualification is not a Standard Welding Procedure per ISO 15612 and may not be reproduced in whole or part and used as such.

DETAIL OF JOINT TEST

E2

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3 Manufacturer's Joining Procedure : METALOCK process A
Reference Number / JPQR No.

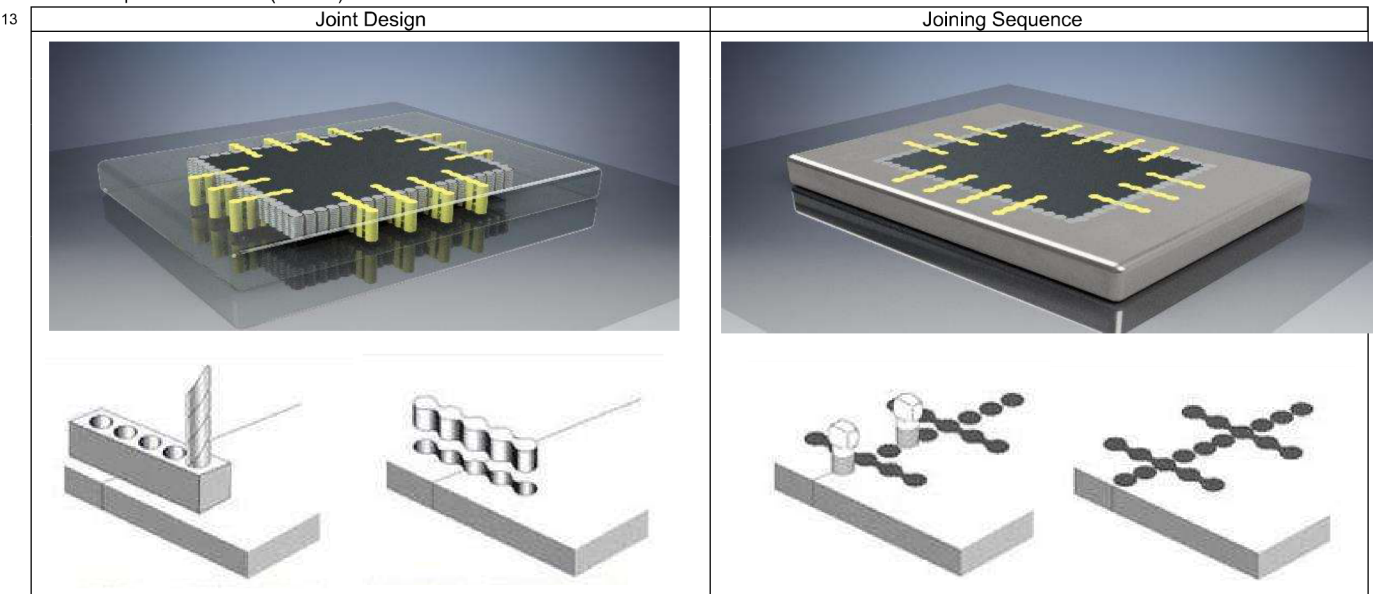
5 Manufacturer : Metalock Engineering UK
Address : Unit H5, Pilgrims Walk, Prologis Park, Coventry, CV6 4QG

3 Inspection Authority : **Bureau Veritas UK Ltd**
4 Reference Number : JP/18/MET/METALOCKA/1
5 Date of Joining : 20.02.2018
6 Location : Coventry

7 Method of Preparation : Machine / De-grease
and Cleaning :
9 Parent Metal : Cast Iron Grade 250 to BS EN
Specification : 1561 : 2011

8 Repairer Name : Paul McCarthy
10 Joining Process : Metalock Process A
11 Joint Type : Insert + loctite
12 Joint Preparation Details (Sketch)

10 Parent Metal Thickness : 25.0mm
11 Pipe Outside Diameter (mm) : -
12 Test Piece/Joining Position : PA



Joining Details

Run Sequence	Insert Type	Joint Type	Consumable	Joint Seal	Application	Finish Method
1 – Join across joint	Metalock Insert	Interference/Peening	-	Interference	Mechanical	Ground Flush
2 – Join along joint	Metalock Screw	Threaded insert	Loctite	Adhesion	Mechanical	Ground Flush

16 Joint Material : Metalock Ni36
17 Type, Designation, Trade Name : Metalock
18 Any Special Baking or Drying: None
22 Adhesive Consumable : Loctite SI5990
23 Details of Back Gouging /Backing : None / Base Metal
24 Minimum Installation Temperature : - 2.0°C Min.
25 Interpass Temperature : N/A
26 Post Joining Heat Treatment : None

Other Information

29 The above test piece was Joined & tested In the presence of
30 **Bureau Veritas UK Limited**
31 "Parklands", Wilmslow Road, Didsbury,
Manchester, M20 2RE, United Kingdom

Bureau Veritas,
Tel No. 0845 600 1828
WEB. www.bureauveritas.co.uk

Name, Date and Signature

Alan Clements, 25th March 2018

Examiner or Test Body
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TEST RESULTS

E3

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3 Manufacturer's Joining Procedure : METALOCK Process A
Reference Number / JPQR No.
5 Visual Examination : Acceptable
6 MPI / DPI Examination : Acceptable – Report No. 48943
7 Tensile Tests : ISO 4136/BS EN ISO 6892 - 2012

3 Inspection Authority : **Bureau Veritas UK Ltd**
4 Reference Number : JP/18/MET/METALOCK/1

Radiography Examination * : Acceptable - Report No. C72504
Ultrasonic Examination* : N/A
Temperature :

Sample No. / Type	Re N/mm ²	Rm N/mm ²	Load N	Z %	Fracture Location	Remarks
Requirement :	-	-	-	-		
#1 – 25.10 x 18.69mm	-	47	21,900		Along joint line	For Information only refer page 4
#2 – 25.26 x 18.71mm	-	39	18,260		Along joint line	For Information only refer page 4

10 Bend Test N/A

Former Diameter : N/A

Sample No / Type	Bend Angle	Result
	-	

11 Fillet Fracture Test* : N/A

12 Macro Examination : N/A

Micro Examination* : N/A

13 Impact Test * Type : Size : Requirement : N/A

Notch Location / Direction	Temp °C	Values	Average	Remarks

15 Hardness Tests* BS EN ISO 6507-1 : 2005
16 Type / Load : Hv /10 Kg
17 Values : Parent Metal : 176 (6)
18 Peened Zone : 185, 215, 209 (3,4,5)
19 Joining Material : 177, 218 (1,2)

Location of Measurements (sketch*)



20 Other Tests : Hydraulic pressure test to 240 psig (1.66 MPa)

21 Remarks :

22 Testing according to the requirements of : Manufacturers Standard

23 Laboratory Report Reference No. : ROTTECH 18-00534
24 Test Results : As Reported
25 Test carried out in the presence of : Bureau Veritas UK Limited,

* If Required

27 **Bureau Veritas UK Limited**
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Name, Date and
Signature

Alan Clements, 25th March 2018

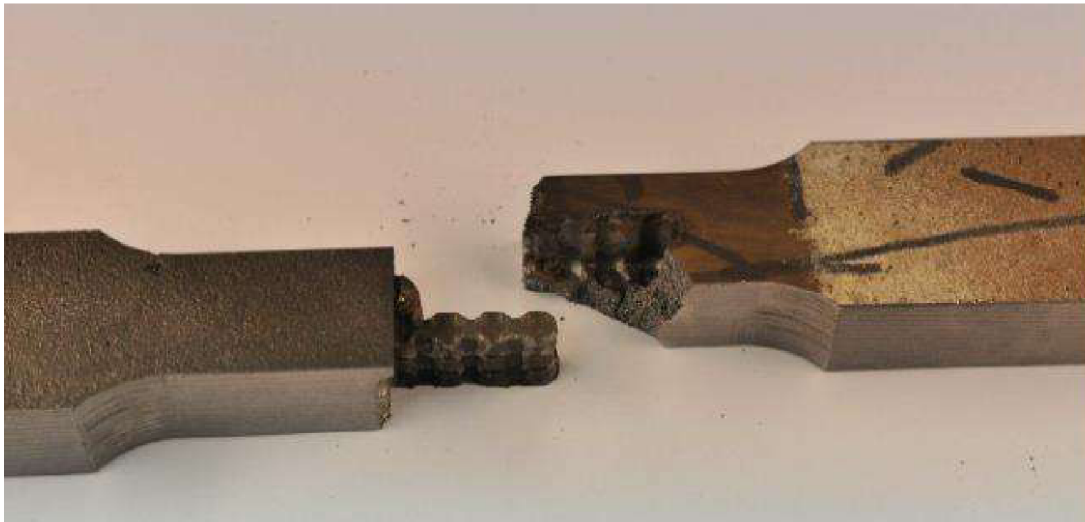
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Tensile Test Sample preparation



Tensile Test #1



Tensile Test #2



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De (D)

En (GB)

Fr (F)

It (I)

1. SCHWEISSVERFAHREN- PRÜFUNG BESCHNUNG 2. Seite von 3. Hersteller – Schweißanweisung Prüfstelle 4. Beleg-Nr.:/Prüf-Nr.: 5. Hersteller: 6. Anschrift 7. Vorschrift/Prüfnorm: 8. Datum der Schweißung: 9. PRÜFUMFANG 10. Schweißverfahren: 11. Nahtart: 12. Werkstoffgruppe: 13. Prüfstückdicke: 14. Schweißnahtdicke 15. Nahtdicke 16. einlagig / mehrlagig 17. Rohraußendurchmesser (mm) 18. Art des Zusatzwerkstoffes/ Bezeichnung: 19. Markenname 20. Durchmesser 21. Schutzgas / Schweißpulver 22. Wurzelschutz 23. Stromart / Polung 24. Ausziehlänge / Vorschub 25. Wärmeeinbringung 26. Schweißposition 27. Vorwärmung: 28. Zwischenlagentemperatur 29. Nachwärmen 30. Wärmenachbehandlung: 31. Weitere Informationen 32. Hiermit wird bestätigt, daß die Prüfungsschweißungen in Übereinstimmung mit den Anforderungen der vorbezeichneten Vorschriften bzw. Prüfnormen zufriedenstellend vorbereitet, geschweißt und geprüft wurden. 33. Ort Datum Name und Unterschrift 34. Prüfstelle	1. JOINING PROCEDURE APPROVAL TEST CERTIFICATE 2. Page of 3. Manufacturers Joining Procedure Inspecting Authority 4. Reference No./Reference No: 5. Manufacturer: 6. Address: 7. Code/Testing Standard: 8. Date of Joining: 9. RANGE OF QUALIFICATION 10. Joining Process: 11. Joint Type: 12. Parent Metal Group and Sub Group: 13. Parent Metal Thickness (mm): 14. Joint metal thickness 15. Throat Thickness 16. Single run/multi run 17. Pipe Outside Diameter (mm): 18. Filler Metal Designation: 19. Filler metal make: 20. Filler material size 21. Designation of shielding gas/flux 22. Designation of backing gas: 23. Type of Joining Current and polarity: 24. Mode of metal transfer 25. Heat input 26. Joining Positions: 27. Preheat Temperature: 28. Interpass temperature 29. Post heating 30. Post Joining Heat Treatment: 31. OTHER INFORMATION 32. Certified that test joints were prepared, joined and tested satisfactorily in accordance with the requirements of the code/testing standard indicated above. 33. Location Date of issue Name and signature: 34. Inspecting Authority	1. CERTIFICAT DE QUALIFICATION D'UN MODE OPÉRATOIRE DE SOUDAGE 2. Page de 3. Mode Opératoire de soudage du constructeur/fabricant Organisme d' inspection 4. N° de référence/ N° de référence: 5. Constructeur/fabricant 6. Adresse: 7. Code/Norme d'essai: 8. Date du soudage: 9. DOMAINE DE VALIDITÉ 10. Procédé de soudage: 11. Type de joint: 12. Groupe de matériau de base et sous-groupe : 13. Epaisseur du matériau (mm): 14. Epaisseur du joint soudé 15. Valeur de gorge 16. Monopasse / multipasses 17. Diamètre extérieur (mm): 18. Désignation du métal d'apport 19. Marque du métal d'apport 20. Dimensions du métal d'apport 21. Désignation du gaz/du flux 22. Désignation du gaz envers 23. Nature de courant de soudage et polarité: 24. Mode de transfert de métal 25. Énergie de soudage 26. Positions de soudage: 27. Température de préchauffage: 28. Température entre passes 29. Post-chauffage 30. Traitement thermique après soudage: 31. AUTRES PARAMETRES 32. Nous certifions que les essais de soudage ont été préparés, soudés et contrôlés avec succès conformément aux exigences du code (ou de la norme) d'essai ci-dessus mentionné(e). 33. Lieu Date d'émission Nom et signature 34. Organisme d' Inspection	
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