

Method Statement



Project: Sealing of leaking pipes – pressure tolerance up to 300psi

System: Polymeric Engineered Solutions Metal Repair Systems used in conjunction with formed plates with abrasive blast clean surface preparation

Prepared by: L. Cauvel
Director
Polymeric Engineered Solutions

1. Introduction

This document details the requirements for surface preparation, application procedure and inspection for Polymeric Engineered Solutions Power Metal repair systems used for sealing of fluid process pipework.

The document draws attention to the need for special attention when selecting suitable repair materials for operation on pressurised pipework and as such may differ from other documents governing the selection and application of organic repair materials.

Any requirements stated in this document are in addition to those stipulated in the Technical Data Sheet for the following composite repair materials –

1. Power Metal 101 Metal Repair Paste
2. Power Metal 107 Metal Repair Paste XL (Extended working life material)

2. HEALTH & SAFETY

2.1. Safety Data Sheets

2.1.1 MSDS information shall be provided for all material supplied and shall comply with the relevant regulatory information regardless of where coating application takes place.

2.1.2. As well as supplying the above information for the coating material to be applied, the same information shall be made available for any ancillary materials involved in the repair process, e.g. cleaner/degreasers, etc.

2.2. GENERAL HEALTH AND SAFETY

2.2.1. The personnel responsible for application of the repair material shall be responsible for ensuring that all documentation pertaining to the safe use of any of the materials used within the repair process is available for review, and a copy is located at the application site for use in an emergency.

2.2.2. The personnel responsible for application of the coating material shall also ensure that all requirements for Personal Protective Equipment (PPE) are carried out and in addition any other regulations, such as those governing Occupational Exposure Limits, are also met.

2.2.3. All surface preparation, application and inspection shall be carried out within the prescribed Health and Safety framework of the site at which such work takes place.

2.2.4. All regulations pertaining to Permit to Work systems in operation at the application site shall be strictly observed.

2.2.5. Any special workplace requirement relating to the application site shall be noted and acted upon accordingly.

3. INITIAL PREPARATION

TOOL BOX TALKS ARE TO BE CARRIED OUT BETWEEN THE SUPERVISORY TEAM AND THE REPAIR TEAM PRIOR TO COMMENCING ANY PHASE OF THE APPLICATION.

3.1 Ensure the damaged pipe is isolated and drained of any material.

3.2 Unless being carried out in an enclosed space, prior to blast preparation of the surface all adjoining equipment and structures shall be fully protected from mechanical damage and ingress of dust from the surface cleaning process.

3.3 Prior to commencing work adequate lighting shall be made available.

3.4 All traces of oil and grease contamination shall be removed by a suitable cleaner/degreaser, e.g. MEK, prior to blast cleaning of the surface.

4. BLAST CLEANING

UNDER NO CIRCUMSTANCES SHALL BLAST CLEANING BE UNDERTAKEN IF THE RELATIVE HUMIDITY IS MORE THAN 85% OR THE SUBSTRATE TEMPERATURE IS LESS THAN 5°F ABOVE THE DEW POINT.

4.1. Prior to commencing blast cleaning the application personnel shall ensure that all of the requirements described in Sections 2 and 3 have been met.

4.2 Angular blast cleaning abrasives shall be clean and dry and free from any contaminants, such as salts, which may adversely affect the performance of the coating.

4.3 Prior to blast cleaning the area to be blasted shall be clearly defined and explained to the operator.

4.4 As a general rule for holed pipe surfaces the repair should cover at least 2 inches either side of the hole. For cracks or weeping surfaces the entire length of pipe from flange face to flange face should be prepared.

4.5 Areas not to be blasted shall be adequately protected to prevent damage.

4.6 Under no circumstances shall chilled Iron grit be used on any Stainless Steel surfaces.

4.7 Angular abrasives only shall be used. The use of shot or bead media is not acceptable. The use of sand is not acceptable.

4.8 All blast-cleaning equipment shall be free from water or oil. Suitable oil/water traps shall be installed on all compressed air supplies.

4.9 Prior to commencing grit-blasting of the pipe a small patch test shall be undertaken to ensure that:

- a) A surface cleanliness of SSPC-SP10, or NACE 2, can be achieved.
- b) A minimum surface profile of 3 mils can also be achieved.

This standard shall then be maintained throughout.

4.10 The surface profile shall be measured by use of the Testex[®] replica tape system in accordance with the recognized standard

4.11 A permanent record of all readings shall be recorded on the quality control form for the filter concerned.

4.12 Where any hard surface corrosion is still in place, abrasive blasting may not clean the entire surface, therefore use a hammer and chisel to ensure any stubborn surface contamination is cleaned from the surface

4.13 Following completion of blast cleaning all dust, blast media and other debris shall be removed by sweeping or vacuuming. The surface shall then be washed with MEK and allowed to dry.

4.14 The condition of the blasted surface must be maintained until application of 101 Power Metal Repair Paste. If this is not possible then the surface shall be re-blasted prior to application of the coating system.

4.15 The formed steel plate has to be clean and be of sound structure

4.16 The steel plate face to be adhered to the steel pipe must be abrasive blast cleaned to a minimum SSPC-SP10, 3 mil profile. Angled grit must be used to ensure the correct profile is achieved.

5. APPLICATION OF 101 METAL REPAIR PASTE TO THE STEEL PIPE

5.1 If the surface of the pipe is badly pitted or scarred, then 101 Power Metal Repair paste must be applied to the surface to create a smooth finish.

5.2 Mix the two components of 101 Power Metal Repair Paste on a clean mixing surface in line with the instructions listed in the Technical Data Sheet provided.

5.3 Once the material is of a consistent mixture apply the material to the pitted surfaces using the green applicator tool provided. Ensure the material is pressed onto the affected areas and smooth off any imperfections using a gloved hand.

5.4 Leave the material to harden, approx. 2 hours at 68°F

5.5 Once the material on the pipe has hardened sufficiently apply a 2nd layer of material to the surface of the pipe at approximately 40-60 mils wet film thickness.

6. APPLICATION OF 101 POWER METAL REPAIR PASTE TO STEEL PLATE AND FIXING OF STEEL PLATE TO PIPE SURFACE

6.1 101 Power Metal Repair Paste must be mixed in accordance with the instructions set out in the Technical data sheet provided.

6.2 Once a consistent material has been mixed, apply the material to the surface of the steel plate using the applicator tool.

6.3 The product must be applied to a uniform wet film thickness of 3/32 to 1/8”

6.4 Whilst the product is still wet on the surface of the pipe and face of the formed steel plate press the plate onto the surface of the pipe. This procedure is a two man job. This will ensure the plate is sited in the correct position over the repair area

6.5 Once the plate is positioned correctly any excess material must be wiped away from the repair as soon as possible.

6.6 Once the area has been cleaned the plate can be clamped or strapped in place to allow the product to cure

7. POST CURING AND BACK IN SERVICE TIMES

7.1 PES 101 Power Metal Repair Paste can be post cured to ensure essential process equipment can be back in service quicker.

7.2 The curing times of 101 Power Metal Repair Paste can be quickened by applying the following temperatures –

Full load and pressure

2 days @ 68°F

1 day @ 86°F

12 hours @ 104°F

6 hours @ 122°F

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APPENDIX 1: INSPECTION REQUIREMENTS OF COATING APPLICATION

Test	Test method	Frequency	Acceptance Criteria	Consequence
ENVIRONMENTAL CONDITIONS	AMBIENT AND STEEL TEMPERATURE RELATIVE HUMIDITY	START OF EACH SHIFT + HOURLY THROUGHOUT SHIFT.	MINIMUM OF 5°F ABOVE DEW POINT <85% R.H.	NO REPAIR WORK TO BE CARRIED OUT
	STEEL TEMPERATURE	START OF EACH SHIFT THEN CONSTANTLY	>50°F <140°F	HEATERS TO BE USED TO RAISE SURFACE AND PRODUCT TEMP PRODUCT NOT TO BE USED ON SURFACES HIGHER THAN 140°F, DUE TO THE EFFECTS OF THERMAL SHOCK
VISUAL EXAMINATION	VISUAL FOR PINHOLES AND MISSES	100% OF ALL SURFACES	NO DEFECTS	ALL DEFECTS TO BE REMEDIED DURING APPLICATION WHEREVER POSSIBLE.
PRODUCT IDENTIFICATION	RECORDING OF BATCH NUMBERS		ALL BATCH NUMBERS SHALL BE RECORDED.	

*For repair systems to be applied to surface temperatures higher than 140°F please contact your PES Technical Consultant.

Appendix 2: Photographic evidence of abrasive blast prepare surfaces repaired using 101 Metal Repair Paste and formed steel plate

There are many areas where PES metal repair systems can be used, please see below various areas where these systems have been used.



The pipe surface was blast prepared to SSPC-SP10, 3 mil profile. The formed steel plate was coated with 101 Power Metal Repair Paste and pushed onto the surface of pipe. Once cured a single coat of 202 Ceramic Repair Fluid was applied to give further chemical resistance to the repair