

DURASHIELD™ 310 & 310-61 JARS

APPLICATION SPECIFICATION SHEET – FIELD-APPLIED JOINT & REPAIR SYSTEM (JARS)

EFFECTIVE: 09/21/20

I. Scope

- A. This specification defines application requirements of DuraShield 310 & 310-61 Joint and Repair System (JARS) plural-component 100% solids, 3:1 volumetric mix ratio polyurethane to steel substrates and over-coat areas.
- B. The coating material described in this specification can be applied in either a shop or field environment.
- C. The parts to be considered by this specification are as follows:
 - 1. Girth welds/field joints
 - 2. Valves
 - 3. Repair Areas
 - 4. Other parts as directed by the end user

II. Definitions

- A. PARTS – all service steel that is to be coated under the direction of this specification.
- B. APPLICATOR – the Company selected by the END USER to apply plural-component coatings to the internal and external surfaces of PARTS.
- C. MANUFACTURER – the company responsible for the chemical formulation and characteristics of the plural-component coatings applied to PARTS (LifeLast, Inc. is the Manufacturer that is composed within these specifications).
- D. INSPECTOR – the company or person selected by the END USER to ensure quality control of the work and adherence to this specification, where applicable.
- E. END USER – the pipeline or part owner.
- F. POLYOL – the three-part component of the urethane system, also referred to as Part A and Resin.
- G. ISO/ISOCYANATE – the one-part component of the urethane system, also referred to as Part B and Activator.
- H. BEYOND SPRINGBACK – term used to describe a cure state of the mixed coating, where the coating does not transfer onto an object when touched.

III. Additional Requirements

- A. All specifications and standards mentioned in this document form part of this specification. The applicator shall ensure that a copy of this specification is kept at the coating site and shall ensure that their workers fully understand each specification and standard listed below.
- B. The following standards shall be a part of this specification.

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References

ASTM D4414-2013	Standard Practice for Measurement of Wet Film Thickness by Notch Gages
NACE SP0188-2006	Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates
NACE SP0287-2016	Field Measurement of Surface Profile of Abrasive Blast-Cleaned Surfaces Using Replica Tape
SSPC-PA 2	Determining Compliance to Required DFT
SSPC-SP 1	Solvent Cleaning
SSPC-SP 10/ NACE No. 2	Near-White Metal Blast Cleaning
SSPC-SP 11	Bare Metal Power Tool Cleaning
SSPC-VIS 1	Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning

IV. Surface Preparation

- A. Prior to commencement of work, all parts shall be visually inspected.
- B. Surface imperfections such as burrs, gouges, protrusions and weld splatter shall be removed by filing or grinding.
- C. Prior to abrasive blast or power-tool cleaning the substrate, all contaminants such as dirt, dust, oil and/or grease must be removed in accordance with SSPC-SP 1.
- D. The substrate shall not contain soluble salt concentrations in excess of the following values: chloride levels – 3 ppm (micrograms per square centimeter), nitrates – 5 ppm, sulfates – 10 ppm. Surfaces with soluble salt concentrations in excess of these levels shall be treated until satisfactory results are achieved.
- E. Prior to abrasive blasting or grinding, the metal surface shall be dry and at least 3°C (5°F) above the dew point to prevent oxidation of the part after cleaning. The applicator shall use a contact thermometer, psychrometer, and psychrometric charts, or equipment that provides equivalent accuracy, to monitor these environmental requirements.
- F. All parts that are not to be abraded shall be adequately protected.
- G. All surfaces to be coated will be prepared either by abrasive blast cleaning or by power tool cleaning using a hand hand-held angle grinder, MBX Bristle Blaster or hand-held scarifier. All blast media will be clean and clear of any contaminates, have a maximum of one percent (1%) free silica, and will meet the specification of the coating manufacturer. A 24-grit 3M grinding disk (recommended for coating), a metal grinding disk (required for steel) or equivalent should be used with the angle grinder.
- H. All compressors shall be in good working order and have adequate separators, filters, and drains to ensure contaminants such as oil and water are not deposited onto the steel surface. Accumulation of oil and moisture shall be removed by regular purging.
- I. Substrate Profile Requirements
 1. Bare steel application - an anchor pattern profile will be produced with a minimum average of 0.075 mm (3.0 mils). Individual measurements shall

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- not be less than 0.065mm (2.5 mils). Profile measurements shall be taken with replica tape and spring micrometer in accordance with NACE SPO287.
- J. The part shall either be abrasive blasted in accordance with the SSPC-SP 10/ NACE No. 2 specification to achieve an anchor pattern that is both sharp and angular or power tool abraded using an angle grinder with either a metal grinding disk (for steel) or 24-grit 3M grinding disk (for preparation of the coating) or equivalent in accordance with SSPC-SP 11 specification. Grinding should be done in such a way to achieve the roughest surface possible, and the direction of the final grind marks should run perpendicular to the flow of water in the pipe. The applicator shall ensure this surface is attained by regular checks with the SSPC-VIS 1 Standard. Profile depth shall be checked using replica tape and a spring micrometer (NACE SPO287). *Note: profile should be deep enough such that it is very noticeable when scraping the end of a fingernail across the profile grooves.*
 - K. When over-coating existing coating material, the applicator will verify adhesion compatibility with the coating Manufacturer before proceeding (DuraShield 310 & 310-61 Joint & Repair System is compatible with LifeLast DuraShield 110/110-61 and DuraShield 210/210-61 polyurethanes). Once compatibility is determined, the existing coating shall be sweep blasted or abraded with a grinder to remove the gloss and provide a roughened surface suitable for over-coating. This process should remove approximately 1-3 mils of coating.
 - L. Existing coating shall be feathered a minimum of 4 cm (1.5 in.) when coating adjacent bare steel, such as girth welds. Prior to coating, the applicator will tape off, using duct tape, a line between feathered coating and the remaining non-blasted coating prior to application of new coating material, making sure that edge of tape is on the roughened coating.
 - M. Cleaned surfaces shall be dry air blasted and either brushed off or vacuumed in a manner that removes dust and debris prior to coating, and shall be coated before any contamination occurs. Any cleaned steel showing contamination shall be re-prepared in accordance with section IV.J above prior to coating.

V. Coating Application

- A. The coating shall be applied according to the proceeding guidelines.
- B. Thinning is not allowed.
- C. One DuraShield 310 & 310-61 JARS kit is designed to cover the welds seams of 60” diameter pipe with 4” holdbacks on each side – for total coverage of 60” diameter by 12” wide (including 2” over-coats on existing coating) – at two coats of 20-25 mils per coat.
- D. The coating thickness shall be specified by the end user, the engineer, or the manufacturer. The applicator shall measure and record coating thickness using a thickness gauge that is acceptable to the end user or engineer.
- E. The relative humidity, dew point and steel surface temperature shall conform to the recommended parameters outlined in the *DuraShield 310 or 310-61 JARS Technical Data Sheet*. Ensure that the POLYOL (Part A) and ISO (Part B) components are within the recommended product application temperatures for hand application as listed on the *Technical Data Sheet*. The applicator shall use a contact thermometer, a psychrometer and psychrometric charts, or equipment that provides equivalent accuracy, to monitor these environmental requirements.
- F. First, the “Base Coat – Part A” will be applied using the containers clearly marked

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- “DuraShield 310 (or DuraShield 310-61) JARS Base Coat – Part A”.
- G. The applicator will thoroughly mix contents of the Base Coat POLYOL container marked “Base Coat – A” with supplied mixing stick to ensure uniform consistency prior to adding the ISO container marked “Activator 9000 – Part B”.
- H. Once Base Coat POLYOL container “A” is thoroughly mixed, the applicator will pour all of the Activator 9000/ISO from one of the containers marked “Activator 9000 – Part B” into container “A” in such a manner to prevent spilling any of ISO “B”.
- I. Once ISO Part “B” is completely poured into Base Coat POLYOL “A”, the applicator will immediately mix both components – POLYOL “A” and ISO “B” – together using a cordless or electric drill outfitted with a paint/epoxy mixing blade. The mixing of components “A” and “B” shall be done in such a manner to ensure uniform mix has been achieved. This process requires that the applicator use supplied mixing stick to scrape the sides and bottom of the container during the mixing process. The mixing process shall take no less than 2 minutes. When mixing is complete, the mixture will be of uniform color and consistency.
- J. After mixing, the applicator will immediately apply the Base Coat material first to substrate, with special attention to the weld joint/seam (if applicable). The applicator will use the supplied brush to apply the mixed coating to the prepared surface and do so in such a manner to keep sags and runs to a minimum, provide adequate coverage on angles and crevices, and to provide a smooth and uniform surface. Special care should be taken with weld corners and seams. Note: DuraShield 310/310-61 polyurethane is not like a paint; it is much thicker. As such, rather than merely dipping the brush into the mixed coating, it is recommended that the brush be actually used like a trowel or putty knife, delivering copious amounts of the coating to the substrate with each dip. It can then be brushed out once delivered to the substrate.
- K. Once the weld is completely coated, the remaining “mixed” material should be brush-applied to the steel surrounding the welds (commonly called the holdbacks), completely covering all exposed steel. The applicator shall not scrape the sides or bottom of the “mixed” container during the application in an attempt to use all material.
- L. The application process of the Base Coat shall be done in such a manner to apply all of the mixed coating within the allowable pot life of 12 minutes. The Base Coat is designed for and should be applied at a minimum of 20 mils in one coat.
- M. Allow the Base Coat to cure for approximately 2 – 2.5 hours at 24°C (75°F). Warmer temperatures will speed the cure of the coating and colder temperatures will slow its curing process. The Base Coat should be “beyond springback” (see definition in Section 2.8), but can still be sticky, prior to applying the Top Coat.
- N. Once the Base Coat is sufficiently cured, the “Top Coat” can be applied. Be sure to apply the Top Coat to the Base Coat within the “Maximum Recoat Time” as is listed in the *DuraShield 310 or DuraShield 310-61 JARS Technical Data Sheet*.
- O. Follow Steps G. through I. for mixing the Top Coat.
- P. After thoroughly mixing the Top Coat components, the applicator will immediately apply the Top Coat. The applicator will use the supplied brush to apply the mixed coating to all areas within the tape lines – including onto both the Base Coat and the prepared existing coating (over-coat) areas. This should be done in such a manner to keep sags and runs to a minimum, provide adequate coverage on angles and crevices, and to provide a smooth and uniform surface. The applicator shall

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not scrape the mixed container during the application process to use all material.

- Q. Refer to the *DuraShield 310 JARS* or *DuraShield 310-61 Technical Data Sheet* for cure time required before placing system into service.

VI. Inspection and Testing

A. Visual

1. Coating shall be uniform in color. The coating shall be visually inspected and found to be free of blisters, cracks, pinholes and missed areas.
2. Sags and runs shall be kept to a minimum. Excessive runs can be sanded smooth and, if required, overcoated with a layer of DuraShield 110/110-61, DuraShield 210/210-61 or DuraShield 310/310-61, if required.

B. Coating Thickness

1. Wet Film – The coating thickness shall be measured using a wet film thickness gage according to ASTM D4414. The thickness shall be measured during application for every 50 ft² of covered area. A minimum of one measurement per section shall be taken.
2. Dry Film – Performed in accordance with SSPC-PA 2, Level 1.

C. Holiday Testing

1. Holiday testing shall be conducted on the applied DuraShield 310/310-61 once it has reached its “Cure to Handle” state, using a high voltage spark test in accordance with NACE SP0188 and the AWWA C222 Standard.
2. Coating thickness used for holiday detection shall be the minimum specified coating thickness.
3. All holidays shall be plainly marked immediately after detection and shall be repaired according to Sections IV and V of this specification.
4. Holiday testing will be performed in such a way as to mitigate possible damage to the coating by performing as few of passes as necessary.

Cure Speed	Standard
Tack Free	4 hours
Recoat Time	72 hours
To Handling/Traffic	15 hours