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# DURASHIELD™ 310-61 JARS

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

EFFECTIVE: 01/09/12

### I. Scope

A. This specification defines application requirements of DuraShield 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. PART – 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. RESIN – the two-part component of the urethane system to be referred to as Part A.

G. ACTIVATOR – the one-part component of the urethane system to be referred to as Part B.

H. BEYOND SPRINGBACK – term used to describe a cure stage 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.

| | |
|---|---|
| Society of Protective Coatings (SSPC) | |
| SSPC-SP1 | Solvent Cleaning |
| SSPC-SP10/ NACE No. 2 | Near-White Metal Blast Cleaning |
| SSPC-SP11 | Power Tool Cleaning to Bare Metal |
| SSPC-VIS-1-89 | Pictorial Surface Preparation Standard |
| | |
| NACE International | |
| RP0287-2002 | NACE Standard Recommended Practice for Field Measurement of Abrasive Blast Cleaned Surfaces Using Replica Tape |
| SP0188-2006 | NACE Discontinuity (Holiday) testing of new protective coatings on conductive substrates. |

## IV. Surface Preparation

A. Prior to commencement of work, all parts shall be visually inspected.
B. Rough welds and other sharp projections shall be ground smooth by the end user or as designated by the inspector.
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-SP1.
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 warmed to a temperature 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-held angle grinder. 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 manufacture. 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 oil and water are not deposited onto the steel surface. Accumulation of oil and moisture shall be removed by regular purging.
I. For bare steel application an anchor pattern profile will be produced with a minimum average of 0.075 mm (3.0 mils). Individual measurements shall not be less than 0.065 mm (2.5 mils). Profile measurements shall be taken with replica tape and spring micrometer in accordance with NACE RP0287-2002.
J. The part shall either be abrasive blasted in accordance with the NACE No. 2/SSPC-SP10 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 accor-

dance with SSPC-SP11 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 finish is attained by regular checks with the SSPC-VIS-1-89 Standard. Profile depth shall be check using replica tape and a spring micrometer (NACE RP0287-2002). *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 310-61 Joint & Repair System is compatible with LifeLast DuraShield 210 & 210-61 coatings). 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 4 cm (1.5 in.) to 8 cm (3 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. Profile measurements will be taken, at a minimum, at the start of each shift, after a shut down to refill blasting pot, and after every hour of preparation or at every joint/weld.

N. Cleaned surfaces shall be dry air blasted and either brushed off or vacuumed, in a matter to remove dust and debris prior to coating, and shall be coated before any rust blooming occurs. Any cleaned steel showing rust stains shall be re-prepared 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 310-61 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 inspector, or the manufacturer. The applicator shall measure and record coating thickness using a thickness gauge that is acceptable to the end user/inspector.

E. The relative humidity, dew point and steel surface temperature shall conform to the recommended parameters outlined in the *DuraShield 310-61 JARS Technical Data Sheet*. Ensure that the resin (Part A) and activator (Part B) components for both coats (Base Coat and Top Coat) 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 “DuraShield 310-61 JARS Base Coat – Part A”.

G. The applicator will thoroughly mix contents of the Base Coat resin container marked "Base Coat – A" with supplied mixing stick to ensure uniform consistency prior to adding the activator container marked "Activator 9000 – Part B".

H. Once Base Coat resin container "A" is thoroughly mixed, the applicator will pour all of the Activator 9000 from one of the containers marked "Activator 9000 – Part B" into container "A" in such a manner to prevent spilling any of activator "B".

I. Once Activator Part "B" is completely poured into Base Coat resin "A," the applicator will immediately mix both components – resin "A" and activator "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 insure 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 the weld joint (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 cover in angles and crevices, and to provide a smooth and uniform surface. Special care should be taken of the weld corners and seams. Note: DuraShield 310 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, as it is not possible to adequately mix the material on the sides and bottom of the container. If more material is needed to finish initial coating process, the applicator will mix more material according to steps G. to I.

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 thickness of 20-25 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 stringback" (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 310-61 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 cover in angles and crevices, and to provide

a smooth and uniform surface. The applicator shall not scrape the mixed container during the application process to use all material. If more material is needed to finish initial coating process the applicator will mix more material using the previously outlined steps.

Q. Refer to the *and DuraShield 310-61 JARS 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, missed areas and excessive roughness.
   2. Sags and runs shall be kept to a minimum. Excessive runs can be sanded smooth and overcoated with a layer of DuraShield 310 or DuraShield 310-61.

B. Coating Thickness
   1. The coating thickness shall be measured using a wet film thickness gage. At a minimum, the thickness shall be measured for every 50 $ft^2$ of applied area or every joint for joint repair applications. The dry film coating thickness shall be tested using a properly calibrated magnetic pull off or eddy current equipment after completion of each joint or repair. In either measure, if the thickness of the coating is below the minimum specified millage anywhere along the length of the pipe, then adjustments must be made to the spray system to account for this.

C. Holiday Testing
   1. Holiday testing will be conducted on the completed coating after cure or 24 hours, whichever is less, using a high voltage spark test in accordance with NACE Standard RP-0188.
   2. Coating shall be at 75% or greater of its fully cured hardness value prior to holiday testing.
   3. Coating thickness used for holiday detection shall be the minimum specified coating thickness.
   4. All holidays shall be plainly marked immediately after detection and shall be repaired according to Section VII in this specification.
   5. Holiday testing will be performed in such a way as to mitigate possible damage to the coating by performing as few of passes as required over the coating.