

# **BLASTING AND CEMENTING PROCEDURES**

## **CONTAMINATION**

All metal surfaces should be inspected for contamination such as grease or other foreign matter prior to grit or sandblasting. Such foreign matter shall be removed and shall conform to the SSP-SP1 specification.

Grit shall be inspected at a maximum one-month period for contamination. Inspection is accomplished by depositing a sample of grit in a clean container filled with clean water.

If contamination is present, foreign material will float to the top of the water in the form of particles or an oil slick. The foreign material should make itself known within one hour. Discard all contaminated grit.

## **GRIT OR SANDBLASTING**

All surfaces to be rubber lined are to be grit or sandblasted to a clean gray-white metal surface with a minimum profile of 2.0 mils for proper metal to rubber bond. The blasted surface shall conform to SSPC-SP5 (or NACE 1) specifications for a white metal blast.

Due to the pulverizing effect of sandblasting on metal surfaces, sand should only be used one time and then discarded.

When blasting, the blast nozzle should never be held in one spot for any length of time. This may cause the metal to become distorted. A sweeping motion should be employed across a defined area and completed prior to moving to the next area.

## **REMOVAL OF BLASTING MATERIAL**

Brushing with a clean oil-free brush, vacuuming or using filtered compressed air is recommended.

## **PRECAUTIONS**

All working surfaces, such as bearings and motors, should be removed if possible. If this is not possible, these areas should be covered and sealed to prevent sand or grit from entering.

The sandblast operator is to be fully protected from flying particles and provided with fresh filtered air.

### PREPARATION

1. Articles being removed from the blasting unit shall be placed in such a way as not to be resting on the newly blasted surface. In a case where this is not possible, a clean covered surface will be prepared and the article placed on it.
2. Any areas of contamination over 3" in diameter shall be cleaned and reblasted. Areas less than 3" can be removed by thoroughly washing with a solvent conforming to SSPC- SP1 specification and be thoroughly dry before priming.
3. Priming shall begin a maximum of four hours after blasting has been completed. This time factor is very important and can be considerably less when the relative humidity is higher. Any visible rust will require reblasting.

### ADHESIVE SELECTION

1. Only the adhesive system prescribed for the specific lining, (see lining specification), should be used.

### CEMENTS - IN SHOP USE

1. All cement containers, other than those in immediate use, shall be tightly closed to avoid solvent evaporation. Refer to the Lining Specification in sections 2,3,4 or 5. For more information on the primers and cements, refer to section 5.
2. When cements are not being used, they should be stored at a temperature of 55°F (13°C) or less.
3. Identification of the different types of cements is very important, considering many different types of cements are the same color. This can be accomplished by affixing a metal tag on each container with the cement number stamped on the tag.
4. If confusion arises over what type of cement is in a particular container, then that cement should be discarded, the container solvent cleaned and refilled with a known cement.
5. Cements may be actively applied for a period of four hours. Any cement that is not in active use should be sealed or returned to the master container.
6. Inserting a wide mesh screen in the cement container, positioned such that after dipping the cement applicator into the cement two or three strokes across the screening will significantly reduce waste and, also, provide a more even distribution of cement.

### CEMENT AGE LIMITS

1. All Blair Rubber Company cements, in unopened containers, have a shelf life of 6 months from date of shipment. See section 5 for more details.

If there is any question as to the acceptability of cements, an adhesion test plate should be made and a pull test performed. If the cement does not pass the minimum pull test, it should be discarded. This test should be run a minimum of every 30 days. The minimum typical adhesion is listed in the lining data sheet.

Temperature, storage control and good inventory practices will significantly reduce the need for adhesion test plate checks.

### CEMENT APPLICATION

1. Cement application can be divided into two groups; pouring for pipe and brushing or rolling for all applications including pipe.

#### A. POURING CEMENTS - PIPE

For pouring pipe cement, it should be thinned approximately two parts cement to one part thinner, depending on temperature and humidity. The pipe should be placed at an angle of approximately four feet of the drop to every twenty feet of length. As the cement is being poured into the pipe, rotate the pipe slowly. This will cause the cement to flow around the inside diameter of the pipe. This should be continued until the entire inside has been coated with the cement. Do not rotate the pipe again until the first coat is dry. Follow the same procedure for the following coats of cement.

#### B. BRUSHING OR ROLLING CEMENTS

1. A separate brush or roller for each type of cement should be provided. Never should those be interchanged. Identification of cement type to be used should be affixed to each brush or roller in use.
2. Care should be exercised when brushing or rolling cements so that excessive cement is not applied to the rubber or metal. This will cause the cement to dry quickly on the surface and remain wet under this dry layer. This effect, when noted, can increase dry time in excess of 50% and, if not detected, will cause a blow in the rubber lining during vulcanization as the solvent attempts to vent itself. In hot weather, rolling may cause small blisters in the primers. This is not detrimental.

#### C. DRYING TIMES

**Endurabond™ Primer:** Dry 2 hours minimum with a layover time of up to 7 days maximum.

**Endurabond™ Intermediate:** Dry 1 hour minimum with a layover time of up to 7 days maximum.

**Endurabond™ Tack:** Dry 20 minutes to 2 hours, depending on temperature and humidity.

### D. SAFETY

Material Safety Data Sheets (MSDS) are provided and available for each cement and solvent. These MSDS are provided to ensure safe use of the products and to provide the worker with information on the protective equipment required for application. (Goggles, gloves, and a respirator should be used).

Cement solvents are toxic and shall not be applied in confined areas without sufficient ventilation or fresh air masks.

All spark or heat producing equipment must be kept away from areas where cements are being used.

All equipment, including the article being cemented, should be thoroughly grounded to avoid static spark.

Operator's shoes should have rubber soles and heels. When cementing, use only explosion proof lights that have been safety checked and are shown to be in good repair.

## SOLVENT THINNERS

1. Reference cement specification for solvent thinners. See section 5.

## SURFACE PREPARATION STANDARDS

### NACE STANDARDS

### STEEL STRUCTURES PAINTING COUNCIL STANDARD (SSPC)

### SWEDISH STANDARD (SA)

#### NACE NO. 1

**White Metal Blast Cleaning, SSPC-SP-5, Sa 3** - Removal of all mill scale, rust, rust scale, paint, or foreign matter by the use of abrasives propelled through nozzles or by centrifugal wheels. A white metal blast cleaned surface finish is defined as a surface with a gray-white, uniform metallic color, slightly roughened to form a suitable anchor pattern for coatings. The surface, when viewed without magnification, shall be free of all oil, grease, dirt, visible mill scale, rust, corrosion products, oxides, paint, or any other foreign matter.

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### NACE NO. 2

**Near-White Blast Cleaning, SSPC-SP-10, Sa 2-1/2** - Removal of nearly all mill scale, rust, rust scale, paint or foreign matter by the use of abrasives propelled through nozzles or by centrifugal wheels, to the degree hereafter specified. A Near-White Blast Cleaned Surface Finish is defined as one from which all oil, grease, dirt, mill scale, rust, corrosion products, oxides, paint or other foreign matter have been completely removed from the surface except for very light shadows, very slight streaks or slight discolorations caused by rust stain, mill scale oxides, or light, tight residues of paint or coating that may remain. At least 95 % of each square inch of surface area shall be free of all visible residues, and the remainder shall be limited to the light discoloration mentioned above.

### NACE NO. 3

**Commercial Blast Cleaning -SSPC-SP-6, Sa 2** - Removal of mill scale, rust, rust scale, paint or foreign matter by the use of abrasives propelled through nozzles or by centrifugal wheels, to the specified. A Commercial Blast Cleaned Surface Finish is defined as one which all oil, grease, dirt, rust scale and foreign matter have been completely removed from the surface and all rust, mill scale and old paint have been completely removed except for slight shadows, streaks, or discolorations caused by rust stain, mill scale oxides or slight, tight residues of paint or coating that may remain. If the surface is pitted, slight residues of rust or paint may be found in the bottom of pits; at least two-thirds of each square inch of surface area shall be free of all visible residues and the remainder shall be limited to the light discoloration, slight staining, or tight residues mentioned above.

### NACE NO. 4

**Brush-Off Blast Cleaning - SSPC-SP-7, Sa 1** - Removal of loose mill scale, loose rust, and loose paint to the degree hereafter specified, by the impact of abrasives propelled through nozzles or by centrifugal wheels. It is not intended that the surface shall be free of all mill scale, rust, and paint. The remaining mill scale, rust and paint should be tight and the surface should be sufficiently abraded to provide good adhesion and bonding of paint. A Brush-Off Blast Cleaned Surface Finish is defined as one from which all oil, grease direct, rust scale, loose mill scale, loose rust and loose paint or coatings are removed completely, but tight mill scale and tightly adhered rust, paint and coatings are permitted to remain provided that all mill scale and rust have been exposed to the abrasive blast pattern sufficiently to expose numerous flecks of the underlying metal fairly and uniformly distributed over the entire surface.

**Solvent Cleaning - SSPC-SP-1** - Removal of all detrimental foreign matter such as oil, grease, dirt, soil, salts, drawing and cutting compounds, and other contaminants from steel surfaces by the use of solvents, emulsions, cleaning compounds, steam

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or other similar materials and methods which involve a solvent or cleaning action.

### PRACTICAL SPREADING RATE/COVERAGE

Theoretical formulas assume that all of the coating (except solvents) is uniformly applied to the substrate with no overspray or application loss. The theoretical coverage is used in calculating cost comparisons between coating systems and suppliers and establishes a factual starting point from which the practical spreading rate/coverage can be estimated. The practical coverage makes allowances for application losses and is a more reliable indicator of what will be experienced in the field. Application losses are affected by many factors, including wind, application technique, application equipment and type/profile of the substrate to be coated. Loss factors will vary depending on the specific situation.

The practical coverage/spreading rate of a coating is calculated as follows:

**Theoretical coverage X (1-Loss Factor) = Practical Coverage**

Example:

Theoretical coverage of 200 square feet per gallon at recommended dry film thickness. Loss factor of 30%.

200 Sq. Ft./Gal. X (1-.30) = 140 Sq. Ft./Gal.

### PAINT CONSUMPTION

In order to estimate the total number of gallons necessary for a specific job, it is necessary to know the total area to be painted. Theoretical and/or practical paint consumption estimates can then be calculated using the following formulas:

$$\frac{\text{Total Area (Sq. Ft. or Sq. M)}}{\text{Theoretical Coverage (Sq. Ft./Gal. or Sq.M/Liter) X (1 - .30)}} = \text{Practical Consumption (Gallons or Liters)}$$