GENERAL CEMENTING INSTRUCTIONS

1. SURFACE PREPARATION

a) Surfaces shall be inspected prior to the start of surface preparation to assure that they are dry and that visible deposits of oil and grease have been removed by "Solvent Cleaning" (SSPC-SP1). In addition, the inspector shall identify surface imperfections (such as weld spatter, porosity, pits, laminations, slivers or crevices) for repair as appropriate. (Ref. RMA Bulletins 1, 2, 3.)

b) Ambient conditions shall be checked before and during operations, which will expose bare steel (e.g. abrasive blasting, power tools) to determine the air and surface temperatures, relative humidity and dew point temperature. These operations shall not be permitted when the surface temperature is less than 5°F above the dew point and/or the relative humidity is over 80%. The temperature must be 50°F (10°C) to 90°F (32°C).

2. ABRASIVE BLAST CLEANING

a) The compressed air supply for abrasive blasting shall be inspected before and during operations for the presence of oil and/or water by means of the white blotter test. The test shall be performed downstream of separators. The blotter shall be free of visible contaminants of oil or water after being held in the air stream at a distance of 18" (457mm) to 24" (610mm) inches from the source for at least two minutes. (Ref. SSPC Painting Manual Vol. 1 **Good Painting Practice**, Chapter Six, Section VI.A. "Air Compressor and Air Cleanness".) Air pressure at the nozzle shall be determined using a hypodermic needle pressure gauge according to the procedure outlined in SSPC-Vol. I **Good Painting Practice**.

b) Chapter VI.E "Blast Cleaning Nozzles and Nozzle Pressure." A hypodermic needle gauge indicates the pressure at the nozzle, the end of the system.

c) Abrasive shall be inspected to assure that it is clean, dry and the type size capable of producing the desired surface profile. Reference data for determination of the adequacy of abrasive type and size can be found in NACE Publication 6G164 and SSPC-SP COM "Surface Preparation Commentary" Sections 5 and 6 which states the type, grade, and surface condition of the steel to be cleaned, type of blast cleaning system employed and the finished surface to be produced.

d) On stainless steel components, special care must be taken to assure that a profile of 2.0 mils (0.05mm) minimum is achieved.

e) Strict adherence to air temperature, 50°F (10°C) to 90°F (32°C), relative humidity and shell temperature 5°F (2.8°C) above the dew point will be required. At the beginning and middle of every shift, the inspector will record in the area of the tank they will be working, the steel temperature, the air temperature, and calculate the dew point and relative humidity.

RELATIVE HUMIDITY	MAXIMUM TIME SPAN BETWEEN BLASTING AND PRIMER APPLICATION
Over 80%	No Application
70 – 80%	1 Hour
60 – 70%	4 Hours
50 – 60%	8 Hours
49% or Below	24 Hours

f) The entire surface of the tank to be lined is to be white metal blasted clean (SSPC-SP-5) to a profile of 2.0 mils (0.051mm) minimum. This will be tested and recorded by the contractor using a Testex Press 0 film blast profile gauge (Testex, Inc.) or other suitable method. Applicator shall supply testing materials as specified and make them available for additional inspection.

g) All sandblasted areas are to be vacuumed and wiped to “white glove” clean to remove all contaminating materials prior to applying primers.

h) All areas blasted are to be primed with one coat of primer as soon as possible after blasting and before any visible rust appears. Allow to dry a minimum of one-hour.

i) A test panel must be made prior to the start of production blasting to establish the proper grade of blast media to be used to achieve the required blast profile. The test and panel must be reviewed and approved. Test panel shall be supplied by the lining applicator.

j) Upon commencement of sandblasting and continuing for the remainder of the project, no gasoline, kerosene or diesel operated engines will be permitted in or near the tank without venting such equipment to the exterior atmosphere.

3. APPLICATION GUIDELINES

All cements shall be thoroughly stirred and mixed sufficiently during use, so solids will stay in suspension. When brushing cements, they shall be of such consistency to give a smooth, uniform coverage. The brushing action shall be gentle, so as to prevent "brushing through" and removing the base coat. Use only brushes with nylon or animal bristle. When applying cements with a paint roller, use a short nap roll cover (mohair, etc.) and pay special attention to see that excessive cement pickup doesn't occur.

Any rust spots that appear during or after the cementing application shall be removed to clean metal. These areas shall then be re-primed and/or re-cemented. In the event the lining cannot be applied for an extended period of time and the cement loses its tack, the cemented surface shall be freshened or re-tackified by applying another coat of cement and/or cement-solvent mixture. Cements are very difficult to process at temperature lower than 50°F or temperature above 90°F. High temperatures will allow the cement to dry too quickly for easy working and it may become necessary to cool the surface before application.

Extreme care must be taken to prevent sweating of the metal surface if auxiliary cooling is necessary. The relative humidity should, at no time, be high enough to produce a dew point and cause moisture to deposit on the cemented surface. The condition is known as "blushing" and it makes the cement seem wet even after it has been drying for a long time. To prevent condensation the substrate shall be a minimum of 5°F above the dew point or wet bulb temperature. Cemented surfaces should not be exposed to sunlight and/or weather.

4. DRYING TIME

Drying time for cements should be long enough for the solvent to evaporate. The rate of evaporation is influenced by temperature, humidity and thickness of wet film, etc., but normally 60 minutes is sufficient. Cemented parts should be kept free from all contamination during the drying and lay over period.

5. STORAGE

Cements should be stored in a clean, cool, well ventilated area. Storage at high temperatures may have a permanent effect on the adhesion properties. If the

temperature is too high for too long, the cement can gel (set up). To avoid solvent loss and consequent thickening of the cement, containers should be tightly sealed. When cements are transferred to smaller holding cans, the cans should be free from contamination and provisions should be made to return cements to closed containers when not in use.

6. SAFETY PRECAUTIONS

Solvent fumes from adhesive cements may be explosive under certain conditions. Therefore, no flame, welding or smoking shall be permitted during application. Precautions should be taken to ensure that all electrical switches or materials that could cause sparks are a safe distance from solvent fumes. Tanks, tables and air-moving blowers shall have ground wires to eliminate the possibility of static sparks during cementing operations.

Operators shall be provided with suitable masks and breathing equipment during the cementing operation as protection against toxic solvent vapors. Adequate provisions for removal of solvent fumes by a suction blower and recirculation of fresh air shall be provided.

Always review Material Safety Data Sheets for specific hazards and PPE requirements

Refer to product specific technical data sheets in Sections 6 and 7 for adhesive recommendations

All work practices should conform to local, state, provincial and federal law

NATURAL RUBBER AND CHLOROBUTYL WITH NATURAL RUBBER TIE GUM OR STICKY BACK - ADHESIVE INSTRUCTIONS

Polycorp Adhesive System

a) C-90 Green Metal Primer
b) C-91 Red Intermediate Primer
c) Appropriate Tack Cement

Note – See individual Technical Data Sheets for specific Polycorp adhesive materials and approved alternatives.

Metal Preparation And Cementing

a) See paragraph 1 and 2 for surface preparation and cleaning instructions.
b) Apply one coat of green primer. **Note:** Apply primer as soon as possible after blasting. Allow to dry a minimum of 1 hour.
c) Apply one coat of red intermediate primer over the primer. Allow to dry a minimum of 1 hour. **Note:** The tack cement should be applied over the primer just before the rubber lining is ready to be installed.
d) Apply one coat of tack cement over the intermediate. Allow to dry a minimum of 1 hour and maximum of 24 hours.
e) Apply a coat of tack cement on the back of the lining to be applied. **NOTE: FOR LINING WITH STICKY BACK, NO TACK CEMENT IS REQUIRED ON THE BACK OF THE LINING.**
f) Apply the rubber lining sheet in the usual way. **Note:** Do not sandblast, apply cements or lining below 50°F or above 90°F. Also, when the humidity is above 80% or the dew point is less than 5°F above the substrate temperature, no work should be done.
g) If primers are exposed to sunlight, primer will have to be reapplied.
h) Generally re-tack metal tack cement only in the area that is to be lined within a working shift.

Repairs

a) Any spark leaks or other defects should be repaired using the original lining or a suitable repair stock.
b) Metal and/or rubber areas to be repaired must be buffed to roughen the surfaces and the rubber edges beveled.
c) Scrub the repair area with toluene and allow to dry thoroughly.

d) Prime and cement metal as indicated above.
e) Treat hard cured rubber as metal and apply the primer, intermediate and tack cement coats.
f) Fill any cut-out area with the appropriate gauge repair lining and overlay with another piece approximately 2" to 4" beyond the filled area, splicing to the original lining.
g) Cure with steam hose or pipe confining steam to repair area.

Cement Shelf Life and Coverage

Product	Shelf Life (Max. 70°F Storage)	Coverage per Gallon
C-90	1 Year	300 sq. ft.
C-91	1 Year	300 sq. ft.
Tack Cement	1 Year	200 sq. ft.

CHLOROBUTYL SPECIFIC ADHESIVE INSTRUCTIONS

Polycorp Adhesive System

a) C-100 Grey Metal Primer
b) C-101 Black Intermediate Cement
c) CB Tack Cement

Note – See individual Technical Data Sheets for approved alternatives.

Metal Preparation And Cementing

a) The metal should be grit blasted to remove dirt, grease, scale, etc.
b) Clean the blasted metal surface by brushing or blowing with clean compressed air.
c) Apply the primer as soon as possible after blasting and cleaning.
d) Apply one coat of Grey Primer C-100 on the metal and allow to dry about 1 hour minimum and preferably 24 hours.
e) Apply one coat of Black Intermediate C-101 over the C-100 and allow to dry 1 hour minimum and 24 hours maximum.
f) When ready to apply rubber, apply one coat of CB Tack over the C-101 and on the back of the lining. Allow both to dry 10 to 15 minutes until the cements are tacky.
g) Apply chlorobutyl lining in the usual way.
h) The C-100, C101, and CB Tack adhesive will cure properly during an autoclave, internal pressure or atmospheric cure.

Repairs

a) Any repairs must be made using the original chlorobutyl lining or approved alternative.
b) Metal and/or rubber areas to be repaired must be buffed well to roughen the surfaces and the cured rubber edges beveled.
c) The cured buffed rubber must be washed with xylol or toluol. Allow to dry thoroughly.
d) Cement metal as described above. Cement cured buffed rubber with two coats of
e) C-101 and two coats of CB Tack.
f) Apply rubber repair in the usual way.
g) Cure with steam hose or pipe confining steam to repair area.

Cement Shelf Life and Coverage

Product	Shelf Life (Max. 70°F Storage)	Coverage per Gallon
C-100	1 Year	300 sq. ft.
C-101	1 Year	300 sq. ft.
CB Tack	6 Months	200 sq. ft.

HYPALON SPECIFIC ADHESIVE INSTRUCTIONS

Polycorp Adhesive System

a) C-100 Primer
b) C-200 Intermediate Metal Primer
c) 021052 Black Tack Cement

Note – See individual Technical Data Sheets for approved alternatives.

Metal Preparation And Cementing

a) See paragraph 1 and 2 for surface preparation and cleaning instructions.
b) Apply the primer as soon as possible after blasting and cleaning.
c) Apply one coat of Primer C-100 on the metal and allow to dry for a minimum of 1 hour.
d) Apply one coat of Primer C-200 on the metal and allow to dry for a minimum of 1 hour.
e) Apply one coat 021052 Black Tack on the metal and the back of the Hypalon. Allow to dry a minimum of 30 minutes.
f) Apply the Hypalon using 45° butt skive. Cap the skives with a 4" cap strip. Cement both cap strip and skive area first with one coat of 021052 before applying cap strips.

Repairs

a) Any repairs must be made using the original Hypalon lining.
b) Metal and/or rubber areas to be repaired must be buffed well to roughen the surface and the cured rubber edges beveled.
c) The cured buffed rubber must be washed with xylene or toluene.
d) Prime and cement metal as described above. Cement cured buffed rubber with two coats of 021052.
e) Apply rubber repair in the usual way. Cement back of overlay patch with one coat of 021052 only.
f) Cure with steam hose or pipe confining steam to repair area.

Cement Shelf Life and Coverage

Product	Shelf Life (Max. 70°F Storage)	Coverage per Gallon
C-100	1 Year	300 sq. ft.
C-200	1 Year	300 sq. ft.
021052	6 Months	200 sq. ft.

NATURAL RUBBER ADHESIVE INSTRUCTIONS – CHEMICAL CURE

Polycorp Adhesive System

a) C-90 Green Metal Primer
b) C-91 Red Intermediate Cement
c) Appropriate Tack Cement
d) C-600 Yellow Chemical Curing Agent or C-700 Pinkish Cream Curing Agent.

Note – See individual Technical Data Sheets for approved alternatives.

Metal Preparation and Cementing

a) See paragraph 1 and 2 for surface preparation and cleaning instructions.
b) Apply one coat of C-90 Green Primer Cement. Apply one coat of C-91 Red Intermediate Cement. Apply two coats of cement.
c) After application of the cement, allow to dry a minimum of 30 minutes.
d) Apply the chemical cure tank lining sheet in the usual way. For best results, activate the cement side of the lining with a solution made up of 5 parts toluol to 1 part C-600 by weight.
e) Once the lining is installed, coat the surface of the lining with three coats of C-600 or three coats of C-700. Allow 2 hours drying time between coats.
f) The lining will completely cure at 80^{o}F in approximately 3 weeks. At 120 ^{o}F the lining will cure in approximately 10 hours (based on ¼" thickness)
g) It is recommended to steam assist cure.

Repairs

a) Metal and/or rubber areas to be repaired must be buffed to roughen the surfaces and the rubber edges beveled.
b) Scrub the repair area with toluene and allow to dry thoroughly.
c) Cement as indicated above using one coat C-90, one coat C-91 and two coats cement on the metal and two coats cement on the cured soft rubber. Treat hard rubber as metal and apply the C-90, C-91 and cement coats.
d) Fill any cut-out area with the appropriate gauge repair lining and overlay with another piece approximately 2" to 4" beyond the filled area, splicing to the original lining.

Cement Shelf Life and Coverage

Product	Shelf Life (Max. 70°F Storage)	Coverage per Gallon
C-90	1 Year	300 sq. ft.
C-91	1 Year	300 sq. ft.
Cement	1 Year	200 sq. ft.

NEOPRENE SPECIFIC ADHESIVE INSTRUCTIONS

Polycorp Adhesive System

a) C-100 Metal Primer
b) C-200 Intermediate Primer
c) 021052 Black Tack Cement

Note – See individual Technical Data Sheets for approved alternatives.

Metal Preparation And Cementing

a) See paragraph 1 and 2 for surface preparation and cleaning instructions.
b) Apply the primer as soon as possible after blasting and cleaning.
c) Apply one coat of Primer C-100 on the metal and allow to dry for a minimum of 1 hour.
d) Apply one coat of Primer C-200 on the metal and allow to dry for a minimum of 1 hour.
e) Apply one coat 021052 Black Tack on the metal and the back of the neoprene. Allow to dry a minimum of 30 minutes.

Repairs

a) Any repairs must be made using the original neoprene lining.
b) Metal and/or rubber areas to be repaired must be buffed well to roughen the surface and the cured rubber edges beveled.
c) The cured buffed rubber must be washed with xylene or toluene.
d) Prime and cement metal as described above. Cement cured buffed rubber with two coats of 021052.
e) Apply rubber repair in the usual way. Cement back of overlay patch with one coat of 021052 only.
f) Cure with steam hose or pipe confining steam to repair area.

Cement Shelf Life and Coverage

Product	Shelf Life (Max. 70°F Storage)	Coverage per Gallon
C-100	1 Year	300 sq. ft.
C-200	1 Year	300 sq. ft.
021052	6 Months	200 sq. ft.

NITRILE SPECIFIC ADHESIVE INSTRUCTIONS

Polycorp Adhesive System

a) C-200 Black Metal Primer
b) C-101 Black Special Intermediate Cement
c) 021052 Black Tack Cement

Note – See individual Technical Data Sheets for approved alternatives.

Metal Preparation and Cementing

a) See paragraph 1 and 2 for surface preparation and cleaning instructions.
b) Apply the primer as soon as possible after blasting and cleaning.
c) Apply one coat of Black Primer C-200 on the metal and allow to dry for a minimum of 1 hour.
d) Apply one coat Black Intermediate C-101 on the back of the nitrile lining and allow to dry a minimum of 30 minutes.
e) Apply one coat 021052 over both the C-200 on the metal and over the C-101 on the back of the lining. Allow to dry until tacky, about 20 minutes.
f) Apply the nitrile rubber lining in the usual way using a 2" overlap open skive.
g) Once the first sheet of is installed, coat the seam overlap area with one coat of C-101 and one coat 021052.

Repairs

a) Any repairs must be made using the original lining.
b) Metal and/or rubber areas to be repaired must be buffed well to roughen the surfaces and the cured rubber edges beveled.
c) The cured buffed rubber must be washed with xylol or toluol.
d) Cement metal and lining as described above. Cement cured buffed rubber with two coats C-101 and two coats of 021052.
e) Apply rubber repair in the usual way.
f) Cure with steam hose or pipe confining steam to repair area.

Cement Shelf Life and Coverage

Product	Shelf Life (Max. 70°F Storage)	Coverage per Gallon
C-200	1 Year	300 sq. ft.
C-101	1 Year	300 sq. ft.
021052	6 Months	200 sq. ft.

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