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"Atmospheric Corrosion Protection Coatings for the Coke Oven Gas Light Oil Scrubber and Final Cooler"

Dated: 1978

ATMOSPHERIC CORROSION PROTECTIVE COATINGS FOR THE COKE OVEN GAS LBA & FC SCRUBBERS AT THE CHICAGO COKE PLANT

D2-015-006



RESEARCH CENTER

Interlake, inc.

ATMOSPHERIC CORROSION PROTECTIVE COATINGS FOR THE COKE OVEN GAS LBA & FC SCRUBBERS AT THE CHICAGO COKE PLANT

D2-015-006

F. Gabrielow August, 1978 ' INTEROFFICE CORRESPONDENCE

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c.c. J. L. Bitner N. H. Keyser

J. Lee

R. J. Martello

Interlake,inc.

INTEROFFICE CORRESPONDENCE

Copies to:

Date: August 29, 1978

Mr. J. Lee

J. L. Bitner

F. Gabrielow

N. H. Keyser R. J. Martello

Subject:

Field Coating of Gas Scrubbers (LBA & FC) At Chicago Coke Plant

Reference:

D2-015-006

The following are detailed coating recommendations and specifications for the Coke Oven Gas LBA and FC Scrubbers. The coating work is expected to require from 4 to 5 weeks of time providing weather conditions are tolerable. The facility urgently requires an extensive excavation around the footing of the vessels and some piping to reveal all metallic surfaces now buried under debris. Also, the elevator unit requires electrical repairs regarding its controls as well as mechanical repairs of the ground and top doors, entrance steps, motor housing booth and the door.

The field inspections and estimates based on reference drawings indicate that this project involves about 23,000 square feet of metallic surfaces requiring steam/abrasive cleaning and coating.

The following quantities of the coating materials would be required for the project (all items in one gallon containers except item (h)):

(a)	DG #167 POLY/EP PRIMER150 gals.	9	\$12.74 =	\$1,911.00
(b)	DG #39026 ACRI/THANE EN. BROWN 60 gals.	0	14.80 =	888.00
(c)	DG #39025 ACRI/THANE EN. TERRA COTTA 25 gals.	a	14.80 =	370.00
(d)	DG #39052 ACRI/THANE OSHA RED 2 gals.	@	19.60 =	39.20
(e)	DG #39054 ACRI/THANE OSHA YELLOW 5 gals.	@	18.80 =	94.00
(f)	DG #39056 ACRI/THANE OSHA GREEN 1 gal.	@	14.80 =	14.80
(g)	DG #39053 ACRI/THANE OSHA ORANGE 1 gal.	@	19.60 =	19.60
(h)	DG #39099 ACRI/THANE COMPONENT B CATALYST.94 Pints	@	6.80 =	639.20
(i)	DG #4800 REDUCER (for primer) 36 gals.	@	5.00 =	180.00
(j)	DG #4900 REDUCER (for enamel) 24 gals.	@	6.36 =	152.64

Total	l all	it	ems		\$4,308.44
Sales	Tax	9	5%		215.42
				Sub-Total	\$4,523.86

The painting materials are shipped to the job site at no extra charge for the delivery.

Item (a) One unit consists of two one-gallon cans per carton.
Item (b) through (g) require one pint of catalyst (#39099 Component B)
for each gallon of resin (Component A).

To: Mr. J. Lee August 29, 1978 Subject: Field Coating of Gas Scrubbers (LBA & FC) Page 2

at Chicago Coke Plant

Vendor: (DG) VALSPAR CORPORATION
DETROIT GRAPHITE DIVISION
200 SAYRE STREET
ROCKFORD, ILLINOIS 61101; TEL. (815) 965-7721

The total cost of the painting materials, including any price increases in effect at the time of shipment, is estimated at \$4,600.00. We have an option to provide all painting materials for this project. Our cost of painting materials is always appreciably lower than the cost offered by the contractors.

This specification is being reviewed with three candidate painting contractors capable of this kind of work to obtain the cost proposal for this urgent coating project as soon as possible.

F. Gabrielow

FG/ey

ATMOSPHERIC CORROSION PROTECTIVE COATINGS FOR THE COKE OVEN GAS LBA & FC SCRUBBERS AT THE CHICAGO COKE PLANT

Specification No. II-4236
August, 1978

INTERLAKE, INC.
Technical Center
150 West 137th Street
Chicago, Illinois 60627

1.1 Detailed Work Area:

All exterior steel surfaces of the two LBA and one FC Scrubber Towers and accompanying hardware, elevator and top housings; reinforcements, all 30 inch diameter, and all other miscellaneous piping, valve bodies and turning knobs/wheels, flanges, hangers, bolts, nuts, etc.; manholes and accompanying doors, windows, roof vents, and closure assemblies, flood light mounting shell; walkways, platforms, handrails, posts and toe boards; elevator and scrubber's step irons and ladder cages; designated sections of 30-inch as well as smaller diameter gas and liquor mains between the scrubbers and tie-in junctions on the designated nearby facilities, related beam support steel, brackets and trestle steel; all steel surfaces (structural, piping, tower tops) inside the transite housings atop the three towers; all structural steel and steel sheet inside elevator shaft and motor housing; and all other miscellaneous items which relate to this facility as they may be designated by the Corrosion Engineer during the coating work.

The content of the mains for instance -- COKE OVEN GAS; SCRUBBING LIQUOR; WASH OIL; ETC. -- and directional arrows shall be stenciled in 3 - to - 4 inch high characters at appropriate intervals with contrasting colors in accordance to the Safety Code requirements.

The Contractor shall not be limited to the wording of the work items indicated nor carrying the coating work on the work items in the order of their listing.

The general area of the work is illustrated in the reference drawings Nos. 1500, 1505 and 1510.

1.2 Surface Preparation: Deoil (steam/solvent) and Commercial Blast SSPC-SP-6-63 and/or NACE No. 3 Finish clean as set forth in the NACE visual standard and as further defined in the Paragraph 3 of therein Specifications.

1.3 Coating Application Technique:

Airless electrostatic spray, i.e, BINKS Model 71 Airless Electrostatic Hand Spray Gun, Ransburg Electro-Hydrolic Handgun R-E-H, or equivalent/ better unit, with 2500 psi at the tip. The spray gun shall be equipped every time with the tip that produces spray fan width consistent with the width of the metal object being coated! Brush/roller coating is required on the hand rails, posts, toe boards, step irons and other small diameter/surface work pieces. No mitten applications are permitted.

1.4 FIELD PRIME:

Two LBA Towers, one FC Tower, and all other steel surfaces ---

One full cross-hatch spray coat of DEGRACO #167

POLY/EP PRIMER (two component 1:1 mixed polyamide catalyzed epoxy); orange;
Solids volume: 39%;
DFT(1): 3.0 mils (2) (2.5 min. & 3.6 max.);
WFT(3): 8.0 mils (6.5 min. & 9.0 max.);
Dry to overcoat: 3-4 hours @ 75°F;
Pot life: 12 hours @ 70°F;
Spreading rate: 135 sq. ft./gal.

Note: The primed surfaces must be topcoated within 4 days from the day of given application!

1.5 FIELD FINISH I:

Two LBA Towers, all 30-inch diameter mains, small diameter piping, valve bodies, platforms and walkways, and other designated surfaces except FC Tower shell --

One full cross-hatch spray coat of DEGRACO #39026

ACRI/THANE ENAMEL BROWN (81-07-02); (two-component
8:1 mixed aliphatic acrylic urethane);
Solids volume: 52%;
DFT: 2.0 mils (1.5 min. & 2.5 max.);
WFT: 4.0 mils (3.0 min. & 5.0 max.);
Dry to overcoat: 4 hours (@ 75°F & RH 50%);
Pot life: 8 hours (@ 70°F);
Spreading rate: 270 sq. ft./gal.

1.6 FIELD FINISH II:

One FC Tower shell, interiors of main elevator cabin and shaft, other miscellaneous designated surfaces ---

One full cross-hatch spray/(brush) coat of DEGRACO #39025 ACRI/THANE ENAMEL TERRA COTTA (81-15-07);
Solids volume: 52%;
DFT: 2.0 mils (1.5 min. & 2.5 max.);
WFT: 4.0 mils (3.0 min. & 5.0 max.);
Other data as in Field Finish I.

⁽¹⁾ Dry film thickness.

⁽²⁾ One mil equals one thousandth of an inch.

⁽³⁾ Wet film thickness.

⁽⁴⁾ At DFT specified and surface application factor.

1.7 FIELD FINISH III:

All step irons and cages, handrails and posts from above toe board line, certain columns 6-feet above footing line --

One full roller/brush coat of DEGRACO #39054
ACRI/THANE SAFETY YELLOW (54-25-59);
DFT: 2.0 mils (1.5 mils min.);
WFT: 4.0 mils (3.0 mils min.);

1.8 FIELD FINISH IV:

All toe boards, certain designated miscellaneous steel items --

One full roller/brush coat of DEGRACO #39052
ACRI/THANE SAFETY RED (87-25-09);
DFT: 2.0 mils (1.5 mils min.);
WFT: 4.0 mils (3.0 mils min.).

The work entails providing by the contractor of all necessary equipment, labor, and supervision, and, if required, all specified coating materials, to carry out removal of all soil and debris minimum six inches below the top of the concrete footings and two feet beyond the present radiuses, blast cleaning of all dust, dirt, and caked corrosive scales from the designated surfaces, specified surface preparation, application of the coatings, curing and protection of the paint systems until acceptance of the work. The ultimate purpose of these operations is to provide most durable corrosion proofing and esthetic appearance possible of the designated facility.

3.0 SURFACE PREPARATION AND COATING WORK:

- Remove all debris and soil around the footings and structural steel as notified; remove all oily, greasy, and tarry deposits if any present, cleaning all contaminated areas with a solvent naphtha or other suitable commercial cleaner or steam and wipe all surfaces dry.
- 3.2 Power air blast all designated exterior service surfaces of existing or repaired carbon steel, masonry material and/or stainless to remove any caked and loose dirt, rust scale and other contaminants to provide a commercial quality cleanliness according to SSPC-SP-6-63 and/or NACE No. 3 finish as set forth in the NACE visual standard.

Commercial blast cleaned surface is defined as surface from which all oil, grease, dirt, rust scale, and foreign matter have been completely removed and all rust, mill scale, and old paint have been removed except for slight shadows, streaks, or discolorations caused by rust stain or mill scale oxide binder. If the surface is pitted, slight residues of rust or paint are found in the bottom of pits.

- 3.3 Air blow all flue dust, fine blasting materials and any dirt off of all service surfaces prior to the application of the specified primer and subsequent finish coatings as often as necessary to achieve a quality result and contamination free applications.
- 3.4 Virgin Ottawa sand or "Black Beauty" abrasives may be used for the air blast cleaning work. All necessary measures shall be undertaken to use only reasonably dry abrasives as well as to protect them from the rain moisture and compressed air moisture. The air compressor must be equipped with an automatic air moisture trap or have a moisture trap drained manually daily as often as necessary.
- 3.5 All coating materials issued to the contractor shall be protected from condensation and outdoor precipitation moisture as well as direct exposure to sunlight resulting in hazardous overheating of the painting materials above 80°F. No coating materials shall be left overnight unprotected on the job site.
- The primer coating shall be applied as soon as possible after the blasting and air cleaning operations are thoroughly accomplished and always before the prepared surfaces begin to rust. No air blast cleaned surface shall stand overnight before coating application. The prepared surfaces left unprimed overnight must be re-cleaned next day before priming is resumed again. The specified coating shall be applied at proper drying time intervals to absolutely dry surfaces and under favorable outdoor conditions (no rain and drizzle; no objectionable high wind, airborne dust, proper nozzle size of spray gun, etc.) by skilled applicators in a workmanlike manner necessary to achieve a quality result in the coating work.

- 3.7 When spraying, two or more cross-passes, that is one horizontal pass overlaid by another vertical pass, are required to obtain the specified dry film thickness. This technique shall result in more uniform, pinhole free coverage than a one-pass coverage.
- Painting contractor may perform coating work only when there is no atmospheric precipitation, outdoor temperature is above 50°F and relative humidity (RH) is below 85 percent or less if so specifically required on the product labels. The coating work must be temporarily suspended if the forecasted precipitation would occur in less than an hour time to allow a minimum pre-drying time for the coatings already applied.
- 3.9 The job standard of an adequate size shall be established on a readily accessible area prior to the beginning of the actual full scale work. The job standard shall include surface preparation an application of the paint coatings in accordance with these specifications on representative surfaces. The job standard work shall be performed by the painting contractor's personnel who will be performing the work on the job site, and using representative equipment that will be used on the job. All concerned parties from the Interlake, Inc. and painting contractor shall be present during all phases of the work to reach mutual agreement and approval of the completed job standard. The job standard shall not be considered as having been established until an approval by the owner's Corrosion Engineer is reached.
- 3.10 The painting contractor shall provide the personnel and require the use on the job of all necessary instrumentation such as (a) wet film gauges for the primer and finish coats while these are wet; (b) dry film gauges capable to read to the nearest 0.2 mil per one division.
- 3.11 All coating equipment, paint filters, tools, lighting and all necessary spare parts shall be explosion proof and/or non-sparking to suit the particular safety requirements of the job. All this equipment shall be available for use every time the coating work is performed and maintained in good working order.

Spray equipment must include the air agitated pressurized paint pots, all routinely required mechanical paint mixers, paint filters and cartridges, set of spray tips, tools, scrapers, wire and bristle brushes which are available on the job any time of the work day. The spray equipment must be suitable to perform a quality job specified herein. The necessary cleaning and/or repairs shall be made throughly and promptly so that as little time as possible is wasted.

Equivalent bulk cleaning solvents shall be provided by the contractor (such as MEK and naphtha) and may be used to clean contractor's equipment and appliances only. This is provided these cleaners and/or solvents are thoroughly removed thereafter and that they will not adversely affect the quality of the specified coating materials. The Corrosion Engineer shall be consulted on the equivalent bulk cleaners and solvents prior to their use.

All work shall be continuously inspected by the contractor who is ultimately responsible for all phases of the coating work to be in compliance with these specifications so that it results in the best possible corrosion proofing of the facility involved. The owner's Corrosion Engineer and Project Engineer shall have an access to the work in progress at all times and shall reserve the right (1) to implement any mechanical repairs revealed by the blast cleaning, (2) to inspect this work at any time for compliance with all requirements of these specifications. Also, owner's Corrosion Engineer reserves the right, (3) to approve each phase of the work before further work may be carried out, (4) to halt all work observed to be improper or not in compliance with these specifications and to require that the painting contractor promptly corrects all improper practices, unjustifiable spillage and waste of the paint materials, defective equipment and/or deficient work, when such are noticed, at his expense.

4. SPECIAL AND GENERAL CONDITIONS

The following provisions and general conditions shall apply to these specifications as a whole with the exception of the provisions which may conflict with the heretofore set requirements as interpreted by the owner's Corrosion Engineer:

- 4.1 The Specification I.I.C. 1001 Standard General Conditions.
- 4.2 Interlake, Inc. Contractor's Responsibility.
- 4.3 The coating work of the facility will require such arrangement as to enable the contractor to safely cope with any elevation of the facility being coated, preservation of the job carried out until final approval of the job is reached as well as the utmost control of the airborne over spray to prevent objectionable air and product contamination in the surrounding plant work areas and outside the plant areas.
- 4.4 The contractor shall pay utmost attention to the fire and electrical hazards, scaffolding, and personal safety belts and hook-up lines which shall be fully implemented on the job. Personal breathing mask or its disposable filter variation shall be worn all the time by the spraymen while carrying out the spraying. The contractor is responsible for compliance with all other OSHA, state and city regulations applicable to the job at the time the coating work is being carried out.
- 4.5 All manufacturer's product and label instructions shall be observed as they are an integral part of these specifications.
- 4.6 The assigned crew members by the contractor shall be most satisfactorily qualified to accomplish the coating work as specified herein and they shall not be indiscriminately substituted for during the course of the work without consulting the owner's Corrosion Engineer on the matter.
- 4.7 The Interlake, Inc. Corrosion Engineer reserves the right (1) to modify these specifications and use of the painting materials as may be required during the actual painting; and (2) elect to supply the painting materials to the Contractor. The Contractor shall not order any painting materials without specific prior instructions of the owner's Corrosion Engineer to this effect.
- 4.8 The Contractor shall guarantee that the coating work will be carried out in a workmanlike manner so that the best coating adhesion, corrosion proofing and esthetic effects are obtained. The selected colors shall be free of however accidentally spilled spots, and color lines are to be properly clean cut. Furthermore, the Contractor shall guarantee to repair or replace to the satisfaction of the Owner and his Corrosion Engineer at no additional cost any defective coating system due to poor surface preparation, workmanship or improper application, which may show itself within one year after date of the final acceptance.

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AN ACCOUNT BREAKDOWN OF THE CONTRACT PRICE FOR THE PAINTING OF 107 FOOT HIGH LBA & FC TOWERS AT THE CHICAGO COKE PLANT

Provide the breakdown of the contract price for the labor, equipment, materials and supervision related to the cleaning, surface preparation, priming, and finish painting of the designated service surfaces in accordance with the II-4236 (1978) specifications:

	mated total square-foot area of the lity to be painted:	
	iled quantity and cost of the specified t materials:	
	DEGRACO #167 POLY/EP PRIMER	gals; \$
	DEGRACO #39026 ACRI/THANE EN. BROWN (81-07-02)	gals;
	DEGRACO #39025 ACRI/THANE EN. TERRA COTTA (81-15-07)	gals;
	DEGRACO #39052 ACRI/THANE OSHA RED (87-25-09)	gals;
	DEGRACO #39054 ACRI/THANE EN. OSHA YELLOW (54-25-99)	gals;
	DEGRACO #39056 ACRI/THANE EN. OSHA GREEN (38-23-27)	gals;
	DEGRACO #39053 ACRI/THANE EN. OSHA ORANGE (69-25-26)	gals;
	DEGRACO #39099 COMPONENT B CATALYST (1 pint/gal. of A/T EN.)	pints;
	DEGRACO #4900 Reducer (for A/T EN.)	gals;
	DEGRACO #4800 Reducer (for Primer)	gals;
	Sub-Total	gals; \$
	Total Amount for Labor, Equipment, All Materials Excluding Paints	\$
	Total Amount for Complete Painting (Labor and Materials)	\$
	Number of Working Days Required to Complete the Painting Project	
Compa	env Name.	

Authorized Signature and Title:

Date:

Contract Price Expiration Date:



