Engineering Standard

SAES-H-100 31 July 2004

Coating Materials & Application
Requirements for Industrial Facilities

Paints and Coatings Standards Committee Members
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Saudi Aramco DeskTop Standards

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1 Scope

1.1 This Standard covers minimum mandatory coating requirements for the corrosion protection of industrial facilities in onshore, offshore, atmospheric, and/or immersion services.

This Standard does not apply to infrastructure facilities, off-the-shelf items, powder coatings, or to coatings applied primarily for cosmetic purposes unless specifically invoked in the scope of work or other mandatory Saudi Aramco document.

1.2 This Standard, along with the applicable paint system from SAES-H-101, is also applicable to purchase orders for shop-applied coatings on specially engineered items for Saudi Aramco unless it is specifically waived in the purchase order. This entire standard may be attached to, and made part of, purchase orders.

2 Conflicts and Deviations

2.1 Any conflicts between this standard and other applicable Saudi Aramco Engineering Standards (SAESs), Materials System Specifications (SAMSSs), Standard Drawings (SASDs), or industry standards, codes, and forms shall be resolved in writing by the Company or Buyer Representative through the Manager, Consulting Services Department of Saudi Aramco, Dhahran.

2.2 Direct all requests to deviate from this standard in writing to the Company or Buyer Representative, who shall follow internal company procedure SAEP-302 and forward such requests to the Manager, Consulting Services Department of Saudi Aramco, Dhahran.

3 References

The selection of material and equipment, and the design, construction, maintenance, and repair of equipment and facilities covered by this standard shall comply with the latest edition of the references listed below, unless otherwise noted.

3.1 Saudi Aramco References

Saudi Aramco Engineering Procedures

SAEP-302	*Instructions for Obtaining a Waiver of a Mandatory Saudi Aramco Engineering Requirement*
SAEP-316	*Performance Qualification Of Coating Personnel*

Saudi Aramco Engineering Standards

SAES-H-101	*Approved Protective Coatings Systems*
SAES-H-101V	*Approved Saudi Aramco Data Sheets - Paints and Coatings*
SAES-H-102	*Safety Requirements for Painting*

Saudi Aramco Material System Specification

09-SAMSS-060	*Packaging Requirements for Coatings*

Saudi Aramco Inspection Requirement

Form 175-091900	*Coating: Shop-applied; for Tanks, Piping, Pipelines (and Associated Appurtenances & Fittings), Structures, Process Equipment; Internal and External, Onshore, Offshore, and/or Subsea*

Saudi Aramco General Instruction

GI-0006.021	*Safety Requirements for Abrasive Blast Cleaning Issued by Loss Prevention Department*

3.2 Industry Codes and Standards

American Society for Testing and Materials

ASTM C146	*Standard Test Methods for Chemical Analysis of Glass Sand*
ASTM D512	*Standard Test Methods for Chloride Ion in Water*
ASTM D516	*Standard Test Method for Sulfate Ion in Water*

Swedish Standards Institution

SIS 05-59-00	*Pictorial Surface Preparation Standard for Painting Steel Surfaces*

Steel Structures Painting Council

SSPC Vis 1	*Guide to Vis 1 - 89 - Visual Standard for Abrasive Blast Cleaned Steel*
SSPC PA2	*Measurement of Dry Paint Thickness with Magnetic Gages*
SSPC SP1	*Solvent Cleaning*

4 Safety

Minimum safety requirements applicable to shop and field painting (including surface preparation) shall be as given in SAES-H-102.

5 Surface Preparation

5.1 General

5.1.1 The type of abrasive to be used shall be determined by the degree of cleanliness and surface profile requirements as specified in SAES-H-101. Silica Sand as abrasive material is prohibited in Saudi Aramco as per GI-0006.021 requirements.

5.1.2 When required, solvent cleaning shall be carried out in accordance with SSPC SP1. Do not use kerosene, diesel, or other degreasers that leave an oily film unless the surface is subsequently cleaned with a non-greasy solvent or cleaner such S/N 26-854-642, and 45-605-875/880.

5.1.3 The reference standards for abrasive blasting shall be SIS 05-59-00 and SSPC Vis 1.

5.1.4 The reference standard for profile measurement shall be the Clemtex Anchor Pattern Standards. This does not preclude the use of other techniques providing they agree with the reference standard.

5.2 Abrasive Materials

5.2.1 Abrasive shall be kept dry and clean. Regardless of the type of abrasive, the sulfate content shall be less than 100 PPM, the chloride shall be less than 100 PPM chloride, and 2.0% by weight of calcium carbonate.

5.2.2 The use of reclaimed slag abrasives is prohibited. The use of reclaimed garnet is permitted provided it meets the requirements of paragraph 5.2.1.and a CSD-approved recycling system is utilized.

5.2.3 The use of sand as a blasting abrasive shall not be permitted in accordance with GI-0006.021.

5.2.4 For spot removal of existing coating for inspection purposes, use other non-silica sand abrasive such as garnet, grit and slag. The affected areas shall be re-blasted with suitable abrasive prior to re-coating.

5.3 Pre-blast Check

5.3.1 The coating inspector shall decide if the substrate requires solvent or detergent cleaning before abrasive blasting.

5.3.2 Prior to blasting, rough welds and cut-offs shall be ground to a minimum radius to ensure proper coating application. Weld spatter shall be removed.

5.3.3 Abrasive blasting shall be carried out only when the steel surface is at least 3°C above the Dew Point as determined from Table I.

5.4 Equipment

5.4.1 Compressed air supply shall be free of oil, moisture and contamination. As a minimum, the inspector shall check and approve the air quality at the start and mid-point of each 8-hour period. This shall be determined as follows:

Attach a piece of blotter or absorbent paper to a clip board, then hold it approximately 45-60 cm in front of the blast nozzle during air flow only, with a nozzle pressure of 388 kPa (50 psig) for approximately one minute. Satisfactory results shall be no water or oil contamination on the blotter.

Commentary Note:

The blast system shall be operated for at least 5 minutes under actual field conditions at the specified pressures prior to making the blotter test. A properly sized dehumidifier can be connected downstream of the compressor during periods of high relative humidity to improve moisture removal from the air stream.

5.4.2 The Operational remote control valve (Dead-man) shall be securely attached to the nozzle. Minimum nozzle pressure acceptable for blasting steel shall be 620 kPa (90 psig) measured at the nozzle side.

5.4.3 High intensity flood or spotlights shall be installed in vessels, tanks, and other poorly illuminated locations for visibility.

5.4.4 Sufficient dust suction Blowers shall be fitted adequately to remove dust and fine blasting debris during the blasting operation

5.4.5 All personnel entering tanks or vessels after abrasive blasting shall wear rubber-soled shoes with clean disposable covers, sweatbands and lint-free gloves.

5.5 Cleaning

5.5.1 Spent abrasive shall be removed from cleaned external surfaces by dry brushing and blowing down with clean, dry compressed air. Internal surfaces shall be dry brushed and vacuum cleaned.

5.5.2 Abrasive-cleaned surfaces shall be primed or coated before the surface condition degrades below the specified cleanliness level.

5.5.3 Abrasive blasted surfaces shall call for inspection prior to priming or coating if the surfaces are hold for more than 4 hours after blasting.

6 Paint, Storage

6.1 Paints and thinners shall be stored in well-ventilated buildings at storage temperatures as recommended in the Manufacturer's data sheet

6.2 Paints materials used at construction sites must be covered with appropriate canvas, tarpaulins, or equivalent for a temporary storage period not to exceed 14 days.

6.3 Temperature sensitive and self polymerization Paints materials must be stored in air conditioned storage area to maintain the temperature as recommended in the Manufacturer's data sheet.

6.2 Each paint container shall be clearly marked in accordance with 09-SAMSS-060.

6.3 Paints shall not be used from a container showing a sign of leakage.

6.4 Paints which have exceeded the shelf life given in the Saudi Aramco Data Sheet (see definition in SAES-H-101) shall be set aside and must not be used unless written authorization to the contrary is given by the Consulting Services Department.

7 Paint, Preparation

7.1 Paints, which have gelled, shall not be used.

7.2 Paint skins shall be cut and removed before application on recently opened and partially used containers. If any skinning is found on previously unopened paint, the cans should be set aside and not used unless authorization to the contrary is given by the Consulting Services Department.

Prior to application, all paint shall be thoroughly mixed until it is homogeneous. For quantities over 5L, a power stirrer shall be used.

Exception:

For thick catalyzed coatings with filler, splash zone compounds and all thixotropic coatings, a power mixer shall be used regardless of the quantity.

If sludge has formed in the bottom of the paint container, stirring to mix shall be continued until the paint is fully homogeneous mix. If sludge cannot be dispersed, the paint shall not be used.

7.4 If thinning is required, the thinner type and quantity to be added shall be as given in the Saudi Aramco Data Sheet (see definition in SAES-H-101). 2-pack paints and all paints in quantities over 5L shall be mixed with a power stirrer/mixer during adding the thinner. Thinner shall be added only when the paint is fully homogeneous mixed.

7.5 All paint materials for each coating system shall be supplied by the same Manufacturer unless otherwise approved by the Consulting Services Department. The Manufacturer shall also either supply the thinner or approve the thinner being used with his products.

7.6 Partial mixing and use of two-component and multi-component coatings is prohibited.

8 Paint, Application

8.1 General

8.1.1 Paint shall not be applied if one or more of the following conditions exist unless the paint is specifically formulated for the averted condition:

a) The substrate temperature is less than 10°C or more than the temperature limit given in the applicable Saudi Aramco Data Sheet.

b) The substrate contains oil, grease, dirt, loose paint, loose rust, or other surface contaminants.

c) The substrate temperature is less than 3°C above the dew point (see Table I).

d) Adverse weather conditions exist such as, but not restricted to, the following:

1) Wind is strong enough to blow sand, salt spray, or other foreign matter onto the surface being painted.

2) Wind is strong enough to cause dry spray or to otherwise seriously disturb the spray pattern when application is by spray gun.

8.1.2 In multi-coat applications, primer, intermediate coat, and topcoats shall be of contrasting colors.

8.1.3 All weld lines, edges, bolts, nuts and rivets shall be given a brush applied stripe coat prior to all paint applications. Special attention shall be given to structures and equipment in offshore and immersion services. When inorganic zinc is used stripe coating should be applied after the first coating

8.1.4 When using inorganic zinc primer the contractor shall check for surface zinc oxide formation immediately prior to applying an epoxy topcoat. Any oxide formation shall be removed by high pressure cleaning using sweet water (with maximum chloride contents of 50 PPM and maximum TDS of 500 PPM), or by sweet water hosing followed by scrubbing with stiff brushes to remove zinc salts. The surface shall be allowed to dry thoroughly prior to applying the topcoat. To avoid pinholes and bubbles occurring in the intermediate coat of epoxy, a mist-coat thinned 10 to 20% should first be applied to the inorganic zinc primer.

8.1.5 Recoating intervals shall be as given in the Saudi Aramco Data Sheet. (See definition in SAES-H-101V). In stringent application conditions, the latest Materials Technical Data Sheet of the manufacturer shall be used as a supporting document to the Saudi Aramco Data Sheet given in SAES-H-101.

8.1.6 The finished coating film shall have the following characteristics:

a) The dry film thickness shall be within the minimum and maximum limits allowed in the applicable APCS. Dry film thickness shall be checked in accordance with SSPC PA2.

b) Generally free of application related defects such as runs, sags, drips, dry spray or foreign matter

c) Uniform in appearance.

Commentary Note:

Heavy dry spray during application of inorganic zinc primer is prohibited.

d) Adhesion strength of all coating systems shall not be less than that required in the appropriate Saudi Aramco Materials System Specification for new product approval.

e) Areas with blisters, cracks, porous or below minimum dry film thickness shall be repaired in accordance with paragraph 8.3.

Commentary Note:

Inorganic zinc applied below minimum dry film thickness shall be brought up to the minimum thickness using zinc rich epoxy.

8.1.8 In case of brush application, the maximum brush size used shall be 125 mm.

8.1.9 Paints to be sprayed shall be filtered through a 30 to 60-mesh screen prior to use and shall be continuously agitated with a low-speed stirrer during application.

8.2 Thin film Coatings (up to 500 microns DFT) for Immersion Service (Paints for Tanks and Vessels including Vapor Zones)

8.2.1 Paints for immersion service (including vapor zones) shall be applied by airless spraying equipment.

Exception:

See paragraph 8.1.4 for stripe coats.

8.2.2 Vessels or tanks with large area to blast and coat in one day shall be completed with as minimum coating joints as possible.

8.2.3 Holding primers, if permitted to be used, shall be first approved by the Consulting Services Department.

8.2.4 During painting the interior of tanks or vessels, forced ventilation shall operate continuously throughout the paint application and curing period. The tank or vessel shall not be closed, nor forced ventilation stopped, until the cure times to immersion specified in the Approved Saudi Aramco Data Sheet (refer to SAES-H-101V) have been reached.

8.2.5 A 360° spray gun nozzle with proper tip size shall be used to coat the interior of nozzles and traps inside tanks and vessels.

8.2.6 All coated tanks, vessels, and offshore structures in immersion services shall be holiday checked using a wet sponge at 67.5 volts if coating thickness does not exceed 500 micron. A small amount of a wetting agent such as Foto flow shall be added to the water to aid in finding holidays. Dry spark tester shall be used for holiday detection if the coating dry film exceeds 500 microns. Holidays shall be repaired in accordance with paragraph 8.3.

8.2.7 Paint thickness within 2 m of anode connections shall be at least 30% greater than the specified minimum dry film thickness.

Exceptions:

APCS-19 and APCS-20 series.

8.3 Thick film Coatings (from 600 to 1500 microns DFT) for Immersion Services

8.3.1 Blasted surface profile shall be between 60 – 100 microns.

8.3.2 Mixing the catalyst with coating shall be carried out according to Saudi Aramco approved data sheets (SAES-H-101V) using power operated slow stirrer to prevent air ingress to the mixed coating material. Partial mixing catalyst with coating is prohibited. For small areas, paints' manufacturer shall supply smaller quantity containers with their measured catalyst for one time mixing.

8.3.3 All edges, cavities, internal piping, bolts and nuts, nozzles, and any inaccessible areas shall be stripe coated before the spray coating application.

8.3.4 Coating shall be applied in a single coat "Wet-On-Wet" method to achieve the required film thickness. Only airless spraying equipment with higher ratio pumps (45:1 or higher) shall be used.

8.3.5 Allow forced ventilation during the curing time of these coatings.

8.3.6 High voltage dry spark holiday detector shall be used to detect pinholes and coating film discontinuity after the coating is fully cured.

8.4 Repair Procedure for Immersion Coatings

8.4.1 Cover all coated areas near to the defective area before commence repair or patching up. Use heavy duty textile or fabric adhesive tape.

8.4.2 Clean defective area by solvent or detergent wash.

8.4.3 For areas less than 0.1 m^2, grind to a rough metal surface using at least an 80 grit disc sander. Alternatively spot blast to bare steel. Feather edge the coating at least 50 mm beyond bare metal.

8.4.4 For areas greater than 0.1 m^2, blast clean to obtain the metal surface pre treatment originally specified. Feather edge the coating at least 50 mm beyond bare metal.

8.4.5 Remove dust and debris by brush or vacuum.

8.4.6 Apply coating by brush for areas less than 0.1 m² and by spray for areas greater than 0.1 m² to the original specification except that the first coat of a multi-coat system shall be thinned by 15%.

8.4.7 The coating shall be holiday tested when fully cured. Any defects shall be repaired.

8.5 Repair Procedure for Coatings - Follow the surface preparation and application requirements in the applicable APCS and the manufacturer's technical data sheet.

9 Quality Control

Requirements in this section refer only to painting in the following categories;

a) New construction
b) Major renovation
c) Internal coatings for immersion service

The requirements of SAEP-316 apply to these categories when the painting is performed in Saudi Arabia.

9.1 Quality Control Equipment

The coating contractor shall have the quality control equipment listed in (Attachment A) on site for the inspection of surface preparation and coatings application.

9.2 Quality Control Records

9.2.1 Quality Control Equipment Check Sheet (Attachment B)

This form shall be completed prior to job start-up. It shall be completed and signed by the coating contractor supervisor and then signed by the Saudi Aramco Inspector. No work is allowed until this form is completed.

9.2.2 Daily Job Log

The coating contractor supervisor shall fill out a log, on a daily basis, recording all problem areas, delays, non-compliances, and corrective actions taken for Saudi Armco inspector witnessing and surveillance.

9.2.3 In-process Inspection Sheet (Attachment C)

This form shall be completed and signed every work-day by the contractor supervisor. The Saudi Aramco inspector shall initial each item marked with an asterisk before work is allowed to begin on subsequent items.

9.2.4 Paints/Coatings and Equipment Log (Attachment D)

This form shall be completed and signed by the coating contractor supervisor and verified and signed by the Saudi Aramco inspector.

9.2.5 Final Acceptance Report

The final acceptance report shall include the 4 quality control documents described above.

9.2.6 Non Conformance Report

The non-conformance report shall be issued whenever any defect is resulted by coating materials deficiencies or/ and application malfunctioning. Remedial action and method of repair shall be defined and agreed. The Saudi Aramco inspector shall ensure that report copies have been routinely circulated and remedial actions have been implemented correctly.

9.3 Additional Inspection Requirements Applicable to Purchase Orders

Saudi Aramco Form 175-091900 applies whenever this Standard is referenced in a Purchase Order.

Revision Summary

31 July, 2004 Major revision.

Attachment A - Quality Control Equipment Kit

1. SAES-H-100, The Applicable APCS Sheet(s) From SAES-H-101, and the Approved Saudi Aramco Data Sheet(s) From SAES-H-101V.
2. Quality Control Equipment Check Sheet (Attachment "B")
3. In-Process Inspection Sheet (Attachment "C")
4. Anchor Pattern Measurement Device(s)
5. Wet Film Thickness Gage
6 Dry Film Thickness Gage (with a range appropriate for the Coating)
7. High Intensity Battery Powered Light for Internal Coatings
8. Coveralls
9. Lint-Free Gloves
10. Rubber-Soled Shoes
11. Thermometer for Air Temperature
12. Humidity Gage or Sling Psychrometer
13. Contact Thermometer for Metal Temperature
14. Sharp Knife
15. Hypodermic Needle Pressure Gage
16. Disposable Dust Covers for Shoes
17. SSPC PA2, "Paint Thickness Measurement"

Attachment B - Quality Control Equipment Check Sheet

Organization: _____ Job Location _____

Compressor: _____ Date _____

	1	2	3	4	5
Size	_____	_____	_____	_____	_____
Manifold Outlet	_____	_____	_____	_____	_____
Size	_____	_____	_____	_____	_____
Gauges	_____	_____	_____	_____	_____
No. of Outlets	_____	_____	_____	_____	_____
Oil Leaks	_____	_____	_____	_____	_____
General Condition	_____	_____	_____	_____	_____

Remarks: _____

_____

Deadman Handles and Hoses: Fitted _____ Not Fitted _____

Hoses Antistatic: Yes____ No____ Couplings and Safety Pins: Yes____ No____

Remarks: _____

_____

Air Hoods, Air Lines, and Purifiers: Type _____ Size _____

Condition: _____

_____

Blast Nozzles: Size _____ Condition _____ Size _____

Remarks: _____

Attachment B - Quality Control Equipment Check Sheet (Cont'd)

Blast Pots

	1	2	3	4	5
Type	_____	_____	_____	_____	_____
Size	_____	_____	_____	_____	_____
Condition	_____	_____	_____	_____	_____
Mixing Valves	_____	_____	_____	_____	_____
Moisture Traps	_____	_____	_____	_____	_____

Remarks: _____

_____

Compressor to Blast Pot Air Hoses: Size _____ Condition _____

Remarks: _____

_____

Airless Spray: _____

	1	2	3
No. of Spare Filters	_____	_____	_____
Hand Set	_____	_____	_____
Liquid Line Size	_____	_____	_____
Hand Set Condition	_____	_____	_____
Gauges	_____	_____	_____
Tip Size	_____	_____	_____
Condition of Reversible	_____	_____	_____
No. of Machines on Site	_____	_____	_____
Spare Hand Set	_____	_____	_____
Spare Tip	_____	_____	_____
Tools	_____	_____	_____

Remarks: _____

_____

Paint Mixers: Type _____ Size _____

Remarks: _____

_____

Crew Supervisor: _____

Saudi Aramco Inspector's Name: _____ Signature _____

Attachment C - In Process (Inspection Sheet)

Date: _____
Time: _____ To _____

					Crew Supvr. (Init. Line)	Saudi Aramco Insp. (Init. Line)
I.	Surface Preparation					
A.	Chemical Cleaning					
1.	Required?	(Circle)	Yes	No	_____	_____
1.1	If Required, Check The Type Solvent Clean _____ Detergent Wash _____ Steam Clean _____					
1.2	If Required, Acceptable?	(Circle)	Yes	No	_____	_____
B.	Grinding					
1.	Required?	(Circle)	Yes	No	_____	_____
1.1	If Required, Acceptable?	(Circle)	Yes	No	_____	_____

Remarks: _____
_____
_____

C.	Abrasive Blasting		
1.	Dew Point - Start _____, Mid Point _____	_____	_____
2.	Substrate Temp-Start ____, Mid Point _____	_____	_____
3.	Nozzle Press. - Start ____, Mid Point _____	_____	_____
4.	Anchor Pattern-Start ____, Mid Point _____	_____	_____
5.	Degree Of Cleanliness:		
	Start (Sa) _____	_____	_____
	Mid Point (Sa) _____	_____	_____

Remarks: _____
_____
_____

Attachment C (Cont'd)

						Crew Supvr. (Init. Line)	Saudi Aramco Insp. (Init. Line)
D.	Pre-Priming Cleanliness						
	1.	Dust and Abrasive Removed By Brushing?				_____	_____
			(Circle)	Yes	No		
	2.	Substrate Vacuumed	(Circle)	Yes	No	_____	_____
*	3.	Acceptable For Priming	(Circle)	Yes	No	_____	_____
II.	Painting						
A.	Prime Coat						
*	1.	Ensure All Non-Explosion Proof Lighting Has Been Disconnected Prior to the Start and During Painting				_____	_____
	2.	Ventilation Acceptable?	(Circle)	Yes	No	_____	_____
	3.	Mixing Acceptable?	(Circle)	Yes	No	_____	_____
	4.1	Ratio of Thinning (If Req):	_____			_____	_____
	5.	Dew Point:Start _____, Mid Point _____				_____	_____
	6.	Substrate Temp:Start ____, Mid Point____				_____	_____
	7.	Average Wet Film Thickness: _____				_____	_____
	8.	Average Dry Film Thickness: _____				_____	_____
*	9.	Prime Coat Acceptable	(Circle)	Yes	No	_____	_____

Remarks: _____
_____

B.	Intermediate Coat						
*	1.	Ensure All Non-Explosion Proof Lighting has been Disconnected Prior to the Start and During Painting					
	2.	Ventilation Acceptable?	(Circle)	Yes	No	_____	_____
	3.	Mixing Acceptable?	(Circle)	Yes	No	_____	_____
	4.	Ratio of Thinning: (If Req)	_____			_____	_____
	5.	Dew Point: Start _____, Mid Point	_____			_____	_____
	6.	Substrate Temp:Start _____, Mid Point	_____			_____	_____
	7.	Average Wet Film Thickness	_____			_____	_____
	8.	Average Dry Film Thickness	_____			_____	_____
*	9.	Intermediate Coat Acceptable	(Circle)	Yes	No	_____	_____

Remarks: _____
_____

Attachment C (Cont'd)

						Crew Supvr. (Init. Line)	Saudi Aramco Insp. (Init. Line)
C.	Top Coat						
*	1.	Ensure All Non-Explosion Proof Lighting has been Disconnected Propr to the Start and During Painting				_____	_____
	2.	Ventilation Acceptable?	(Circle)	Yes	No	_____	_____
	3.	Mixing Acceptable?	(Circle)	Yes	No	_____	_____
	4.1	Ratio of Thinning - (If Req)	_____			_____	_____
	5.	Dew Point: Start _____, Mid Point	_____			_____	_____
	6.	Substrate Temp:Start _____, Mid Point	_____			_____	_____
	7.	Average Wet Film Thickness	_____			_____	_____
	8.	Average Dry Film Thickness	_____			_____	_____
	9.	Final Curing Time Time _____ At Steel Temp _____	_____				_____
*	10.	Top Coat Acceptable	(Circle)	Yes	No	_____	_____

Remarks: _____
_____

* Indicates Mandatory Saudi Aramco Inspection Points

Attachment D - Paints/Coatings and Equipment Log

PLANT NO. _____ PLANT NAME _____
Equipment No. _____ Type _____
Service Fluid _____ Working Pressure _____Temp. _____
Previous Coating _____ Shop/Field Applied _____

CONTRACTOR ORGANIZATION:
Name _____ Reg. No. _____ Phone No. _____
Work Started _____ Work Completed _____

ABRASIVE BLAST: Sa _____
Started _____ AM/PM Date _____ Finished _____ AM/PM Date _____
Compressor Size _____ (CFM/1000LPM, etc.) Nozzle Size _____
Moisture-Oil Separator Size _____
Grit SAMS Stock No. _____ Amount at Job Site _____
Air Hose Size _____ Length _____ Blast Hose Size _____ Length _____

COATING SPECIFICATION: APCS _____

Primer Prod. No. _____	Topcoat Prod. No. _____
Mfgr. Date _____	Mfgr. Date _____
Batch No. _____	Batch No. _____
Color _____	Color _____
SAMS Stock No. _____	SAMS Stock No. _____
Amount at Job Site _____	Amount at Job Site _____

COATING APPLIED BY (Brush-Airless-Conventional) _____

REMARKS: _____
_____
_____

CREW SUPERVISOR: Name _____ Signature _____

Saudi Aramco INSPECTOR: Name _____ Signature _____

Mailing Address _____ Phone No. _____

Table I - Dew Point Calculation Chart Ambient Air Temperature (Degrees Celsius)

% Relative Humidity	-7°C	-1°C	4°C	10°C	16°C	21°C	27°C	32°C	38°C	43°C	49°C
90	-8	-2	3	8	14	19	25	31	36	42	47
85	-8	-3	2	7	13	18	24	29	35	40	45
80	-9	-4	1	7	12	17	23	28	34	39	43
75	-9	-4	1	6	11	17	22	27	33	38	42
70	-11	-6	-1	4	10	16	20	26	31	36	41
65	-11	-7	-2	3	8	14	19	24	29	34	39
60	-12	-7	-3	2	7	13	18	23	28	33	38
55	-13	-8	-4	1	6	12	16	21	27	32	37
50	-14	-9	-5	-1	4	10	15	19	25	30	34
45	-16	-11	-6	-2	3	8	13	18	23	28	33
40	-17	-12	-8	-3	2	7	11	16	21	26	31
38	-19	-13	-9	-5	-1	4	9	14	18	23	28
30	-21	-16	-11	-7	-2	2	7	11	16	21	25

Example: If the air temperature is 21°C and the relative humidity is 70%, the dew point is 16°C.

Table II - Calculating DFT, WFT and Theoretical Coverage

Dry Film Thickness (DFT)

No solvent added: $DFT = WFT \times \%\ \text{Solids by volume}$

Solvent added: $DFT = WFT \times \dfrac{\%\ \text{Solids by volume}}{1 + \%\ \text{thinner by volume}}$

Theoretical Coverage:

$$\text{Coverage } (m^2) = \text{No. L coating} \times \%\ \text{Solids per L} \times \frac{1000}{\text{DFT(micrometers)}}$$

$$\text{Coverage } (ft^2) = \text{No. Gal coating} \times \%\ \text{Solids per Gal} \times \frac{1604}{\text{DFT(mils)}}$$