South African Qualification and Certification Committee (Corrosion Protection)

APPENDIX PS

SYLLABUS

MODULE PS

PAINTING SUPERVISORS COURSE

DURATION:
The planned duration is a minimum 5 day course and the theory and practical shall be on a separate date to be advised by the examiner - 40hrs training.

- Time allocation
- Self study
- Awareness
- Elective practical for spray types

1.0 PRE-REQUISITES

- Students must have a good knowledge of English or alternatively the training must meet the requirements of Annexure C – Foreign Language Policy.
- The candidate must be currently employed in a senior or supervisory painting position, or about to be promoted to a paint supervisory position.
- The candidate must have at least 3 years relevant practical experience in the paint industry and be currently employed in a senior painting position OR alternatively must have passed all the modules of the Paint Applicators Course conforming to the SAQCC (Corrosion Protection) PA1 syllabus.
- The candidate must have an ABET level 4 (Literacy) equivalent to 8 years schooling (Standard 6 / Grade 8) and be able to read and comprehend a Data Sheet in the foreign language and read and comprehend a Quality Control Plan (QCP).

2.0 OUTCOMES

On the successful completion of the course, the candidate will have the knowledge and skills to perform the following activities:

- to use paint specifications
- to use a paint data sheet
- to use a Quality Control Plan (QCP)
- to use standards that are referenced for the contract such as Colour standards (eg SABS 1091)
- be able to verify surface preparation standards of cleanliness to ISO 8501:1:1988 and understand St and Sa levels of cleanliness and the definition of Sa 2.5 (Awareness SA3 & SA2)
- understand various abrasive grit materials and the blast profile each grade will achieve
- understand the operation of the abrasive blast cleaning activity in terms of:
  - verifying the correct grit to use and its quality(eg dry)
  - compressor size
  - water and oil traps in place and regularly vented
  - nozzle size needed

  - nozzle pressure
- be able to measure the blast profile
- be able to measure the nozzle pressure
- take corrective action if the blast profile is not to specified limits
- understand the concept of soluble salts on a blast cleaned surface and understand the difference between Chloride salts and Iron salts
- be able to measure the soluble salts using at least one standard test method
- understand the concept of flash rust and what corrective action to take if it occurs
- Be able to measure the environmental conditions of:
  - Temperature
  - Substrate temperature
  - %RH
  - Dew Point
- to measure WFT
- to calculate the DFT from the WFT and understand volume solids
- understand the use of different solvents: (i) for thinning and (ii) for cleaning equipment
- understand the % dilution of solvent the data sheet allows ie 5% by volume and be able to demonstrate this
- understand the effect the solvent addition has on the volume solids and what correction must be made to the WFT/DFT calculation
- understand the concept of twin pack materials and be able to identify the base can catalyst
  - understand the concept of mix ratio and know the reason for not 'splitting' packs is to keep the mix ratio correct
- understand mix ratio by weight or by volume and where to find this on twin pack material data sheets
- understand induction time
- understand the term pot life
- understand the effects of temperature on pot life
- understand the terms drying and cure
- understand the concept of stripe coating
- understand the curing of IOZ and the use of water spray to help cure
- be able to test for full cure on an IOZ and twin pack epoxies using the MEK rub test
- be able to measure DFT
  - use of DFT instrument
  - calibration of DFT instrument
  - awareness of correction factors to apply to DFT for different profiles (only used by prior agreement)
- to determine correct final colour as specified (check colour reference as specified according to a relevant colour standard in the specification and confirm that this is what is actually supplied)
- identify immediate paint defects such as runs and sags and take corrective action
- have the ability to use tools and equipment that are needed to perform painting operations
- have the ability, confidence and self motivation to apply talents independently and with good judgement
- be able to assist the blasters and painters as needed
- understand 'feathering'
- demonstrate high spark testing (competency to be tested)
- demonstrate wet sponge testing (competency to be tested)

3.0 PRINCIPLE DUTIES AND RESPONSIBILITIES

The Paint Supervisor must be capable of performing a wide variety of painting and coating processes which include but is not limited to:

- safety awareness for himself and his colleagues
- earthing of spray pumps and pots
- Electric drill mixing/ sparks/ solvent/ intrinsically safe mixer
- PPE
- alkyd enamels
- vinyls
- waterbased acrylic emulsions
- epoxies – solvent based
- epoxies – solvent free
- epoxies – water based
- micaceous iron oxide MIO based paints
- polyurethanes
- inorganic zinc ethyl silicate primers
- organic zinc rich primers
- epoxy coal tar epoxies
- epoxy glass flake modified
- vinyl esters, glass flake modified
- polyesters, glass flake modified
- duplex systems
- understand the waterbreak free test for oils on galvanized surfaces
- surface preparation (sweep blast) for galvanized surfaces
- supervise parts for painting
- supervise proper mixing of materials to be used
- supervise the application of coating materials such as primers, intermediate coats and top coats to meet specification requirements
- perform daily checks of paint process for quality

4.0 SUBJECTS COVERED BY THE COURSE

4.1 Supervisory Skills

- Supervision
- Planning
- Organizing
- Controlling
- Leading
- Motivation
- Communication
- Control of painting crew
- Daily records

4.2 Standards

- Interpretation of Coating Specifications
- able to apply the ISO 8501-1 cleanliness standard
- understand St2 St3, Sa2,5 and Sa3 terminology – know SA2.5 definition
- Using a QCP
- Understanding a Material Safety Data Sheet (MSDS)
- Understanding a Material Data Sheet (MDS) and what to use from it, for example:
  - Mix ratios (by weight or by Volume?)
- Induction Time.
- Pot life at what temperature.
- Dilution % for thinners.
- Data for spray application.
  - Methods (Conventional, Airless, Pneumatic etc.):
    - Spray Angle.
    - Aperture or Fan angle.
    - Atomization Pressures.
    - Spray tips (how to check tip wear).
    - Airless hose sizes.
    - Safety.

4.3 Surface Preparation

Types of contaminants on a steel surface (oil, salts, millscale, old paint).

4.4 Detection of pinholes/holidays

- High Spark testing.
- Wet sponge testing.
- Advantages and disadvantages of spark testing vs wet sponge testing and the paint thickness criteria.

4.5 Quality control records

- Type of paint used.
- Paint batch numbers.
- Shelf life expiry date.
- Environmental conditions and measurement.
- Ambient temperature.
- Steel surface temperature.
- %RH.
- Dew Point.
- Blast profiles.
- Dry film thicknesses.
- Overcoating times.
- Identification of areas coated.
- Calibration of Instruments.
- Emphasis on Dew Point.
- Self Study:
  - Soluble Salts:
  - Self Study for soluble salts:
    To familiarise themselves with the test methods to include but not limited to the

following:
- Bresle Patch.
- Whatman Test Paper.
- SCM 400 Elcometer.
- Weber Riley.
- Merckoquant test for iron salts.
- Merck colorometric test for chlorides.
  - Student can be tested to describe any of the above test methods for salts.

Paint Defects:
- Skinning.
- Settlement.
- Slow drying.
- Lifting.
- Thickening or gelling.
- Saponification.
- Wrinkling.
- Crazing or alligatoring.
- Sagging, curtaining and runs.

Application Defects:
- fingering
- tramlining
- orange peel
- solvent entrapment

Spray Techniques:
- Airless
- Conventional (Pressure Pot)
- Cup gun (Awareness)
- Diaphram pump (Awareness)

5.0 HEALTH, SAFETY, ENVIRONMENT AND SECURITY AWARENESS

- OHSA (Latest) introduction.
- Induction sessions – explain importance.
- Ascertaining Site Rules.
- The location of Fire extinguishers and Hoses to be known.
- The operation of Fire fighting equipment to be understood.
- The EMERGENCY numbers to be on hand and communication verified.
- Safety requirements – site, personnel and equipment.
- PPE (breathing equipment, masks, glasses, hard hat, gloves, ear plugs, safety boots, overall, visor).
- Flashpoint.
- LEL (Lower Explosion Limit).
- UEL (Upper Explosion Limit).
- Security regulations.
- Lockout - explain meaning of.
- Risk Assessment – explain with example.
- Checking Site Rules.

6.0 ELECTRICAL

- Check earthing requirements for all electrical equipment (Applicators must understand the basics of earthing requirements).
- Airless spray pumps.
- When mixing flammable paint use intrinsically safe drills or pneumatic driven equipment.
- Lighting.
- Safety lighting compulsory for confined spaces. To conform to Class 1 Division 1 of the safety act. All lights must be intrinsically safe.

7.0 ENVIRONMENTAL SAFETY

- Keeping the environment clean.
- Good housekeeping.
- Isolate solvent soaked rags.
- Discard used paint tins in a skip.
- Disposal of such waste to be in accordance with the local health authority instructions.
- Do not pour solvents into the drainage system.

8.0 CONFINED SPACE ENTRY WORK

- Entry permits.
- Understand 'lockout' procedures.
- Check that ventilation requirements conform with the paint manufacturers requirements.
- Explain 'Upper Explosion Limit' UEL.
- Explain 'Lower Explosion Limit' LEL.
- Explain Flash point.
- Explain 'intrinsically safe equipment.
- Explain 'oxygen levels' and minimum level required.
- Describe how oxygen levels are measured.
- The safety officer to grant permit for work in confined spaces.
- Always two workman present – one doing the work inside and one at the entrance manhole.
- Communication signals to be in place and understood by the workman.

9.0 FORMAT AND STRUCTURE OF EXAMINATIONS

The examination shall consist of two sections, namely, a theoretical and a practical section.

9.1 THEORETICAL

The theoretical section shall consist of a 90 minute written examination covering the following topics:

Understand Productivity
Surface Preparation

- Contaminants(salts)
- Methods of surface preparation Definition SA2.5
  Problem areas for the supervisor to be aware of:
  - Use the right solvent.

- Calculate dilution %.
- Inorganic Zinc Silicate curing with water spray if humidity levels are low.
- Duplex systems.
- Surface preparation.

Paint application:

- Brush.
- Roller.
- Spray:
  - Airless (Test competency)
  - Conventional (Pressure Pot) (Test competency)
  - Cup gun
  - Diaphram pump

Interpretation of coating specifications (QCP, Paint Data Sheet)

Quality control:

- Surface preparation.
- Wet Film Thickness and Dry film thickness.
- Freedom from pin-holes.
- Adhesion.
- Daily records (To include time of surface preparation, environmental readings at specific times, thickness results etc.)

Paint and application defects (Runs, Wrinkling, Overspray)

9.2 PRACTICAL

The practical section shall consist of a three hour practical examination in which the candidates shall be required to demonstrate their competency in the following areas:

- Surface Cleanliness – use of ISO 8501-1:1988 on prepared panels.
  - Soluble Salts:
    - One type for the following to be demonstrated and examined:
      - Bresle Patch.
      - Whatman Test Paper.
      - SCM 400 Elcometer.
      - Weber Riley.
      - Merckoquant test for iron salts
      - Merck colorometric test for chlorides
  - Wet film thickness measurement
  - Dry film thickness:
    - Calibration of instrument.
    - Measurement.
    - Averages.
    - Maximum reading.
    - Minimum reading.
- MEK cure test (understand)
- Cross cut and cross hatch adhesion (understand)
- Evaluation of environmental conditions (Surface Temperature, humidity, dew point)
- Identification of defects (understand)
- Interpretation of coating specifications (QCP, Paint data sheet).
- Surface preparation techniques:

  - Hand cleaning
  - Mechanical cleaning
  - Abrasive blast cleaning
- Paint application methods:
  - Brush
  - Roller
  - Spray (Trouble-shooting with equipment)
  - High Spark testing
  - Wet sponge testing
- Control of painting crew
- Daily records

10.0 MINIMUM EXAMINATION MARKS REQUIRED

The candidates shall be required to obtain the following minimum examination pass marks:

Theoretical Examination: 60%

Practical Examination: 80%

11.0 CONDITIONS FOR RE-EXAMINATION

Should a candidate fail either the theoretical or practical section of the examination (while passing the other section) the candidate shall be required to re-write only that section which they failed in order to complete the requirements for the module.

12.0 REQUIREMENTS FOR RE-EXAMINATION

Previously certified Candidates who have been out of the painting operation industry for more than six months shall be required to be re-examined.

13.0 PERIOD OF VALIDITY OF CERTIFICATE

The certificate shall not have an expiry date.

14.0 CERTIFICATE

The certificate will be prescriptive for what the candidate is qualified for i.e. “Painting Supervisor” or “Painting Quality Controller” and these terms shall be interchangeable. Their use shall be as required by the Client.

-oOo-