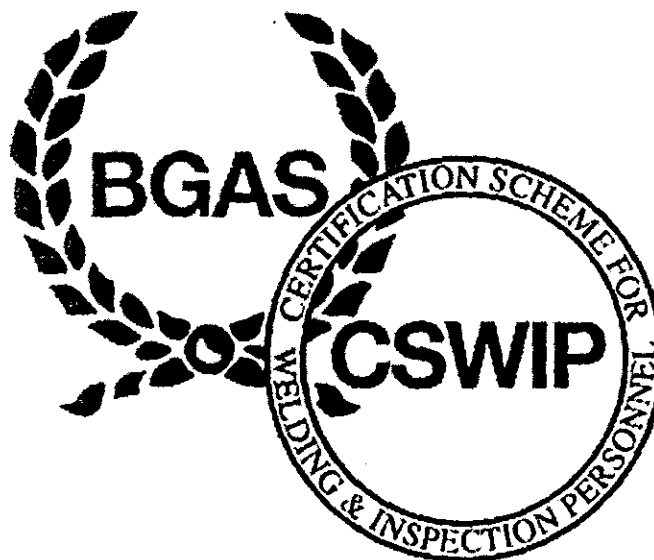


BGAS-CSWIP
INSPECTOR APPROVAL

PAINTING INSPECTOR



BGAS Approvals Scheme

May 1999

Candidates for the BGAS/CSWIP Painting Inspection Approval may be questioned on the following topics.

GRADE 3

- 3.1 Corrosion Theory
- 3.2 Basic Paint Technology & Testing
- 3.3 Surface Preparation
- 3.4 Application, Curing and Drying
- 3.5 Plant and Equipment
- 3.6 Inspection, Standards and Specifications
- 3.7 Health & Safety
- 3.8 Record Keeping
- 3.9 Practical

GRADE 2

Satisfy the requirements of Grade 3 plus:

- 2.1 Paint Formulation
- 2.2 Paint Testing
- 2.3 Other Coatings
- 2.4 Working practices – Onshore

GRADE 1

Satisfy the requirements of Grade 2 plus:

- 1.1 Specialised Systems and Materials
- 1.2 Safety, Health & Welfare – Offshore
- 1.3 Working practices – Offshore

GRADE 3

3.1 Corrosion Theory

Nature of corrosion, condition necessary for it to occur in atmospheric, submerged or buried conditions.
Factors influencing corrosion rates.
Effects of scale, corrosion and contamination on corrosion rate.
Mechanisms by which coatings prevent corrosion and basics of C P and relationship with coatings.
How design factors influence corrosion.

3.2 Basic Paint Technology & Testing

Main generic types of paint and their properties.
Main constituents of paints, terms – meanings.
Functions of and relationship between primers, undercoats and finishes.
Compatibility between paint and system types.
Identification of main solvents used in paints.
Wet and dry film thicknesses – testing.
Adhesion – testing.
Nature of protective coatings.

3.3 Surface Preparation

Assessment of scaled/corroded surfaces – BS7079.
The need for and methods of surface preparation and qualities achieved – BS7079.
Methods for preparing steel, zinc, aluminium, copper, etc
Degreasing, pickling, phosphating, wire brushing.
Blast cleaning, high pressure water jetting, (gunning) cleaning, needle gunning, discing, water blastings (with abrasives).
Properties of main abrasive types, rogue peaks.
Surface contamination, salts, oil and grease.
Waiting periods before coating, conditions influencing these.

3.4 Application, Curing and Drying

Methods of paint application – brush, dip, roller, electrostatic spray, conventional spray, airless spray, electrodeposition.
Methods by which paints dry – air drying, solvent evaporation, chemical curing (ambient and storing temperatures) – and their influence on application and overall properties. Viscosity.
Determining whether paints are ready for overcoating.
Compatibility. Fault recognition and remedies.

3.5 Plant and Equipment

Equipment for surface preparation, critical parts and their function, suitability for purpose, need for maintenance, testing.

Factors affecting work done by open blasting, cleaning equipment, centrifugal and hydroblast cleaning, pressures, hoses, filters

Safety Aspects IGESR

Equipment for conventional spray, airless spray, guns, brushes, rollers and care of all.

3.6 Inspection, Standards and Specifications

Environment testing, surface quality assessment, profiles, measurements – standard for various coating types. BS7079.

Instrumentation, colour standards BS4800.

Paint manufacturers Data and Safety sheets, technical details.

Appreciation and knowledge of B S and typical commercial painting standards.

Appreciation of the need for good relationships, communications and liaison with all involved in painting operations and the philosophy of ‘right first time’.

Need for intermediate stage testing. Awareness of the need to monitor workmanship, material equipment, environmental factors and how these affect finished work.

3.7 Health & Safety

Legislation covering Health & Safety Act, 1974.

Factories Act, COSHH.

Obligations and responsibilities – lead paint, chromates, protection of eyes and ears, breathing apparatus. Permits.

Flammability, control of pollution.

Hazards – toxicity, access to work, storage of materials, use of tools, equipment and power sources, hoses, T L V, L E T, earthing.

Contribution tidiness can make to safety, fire risk etc.

3.8 Record Keeping and Reporting

Capability to communicate effectively in writing and orally.

Need to collect and maintain accurate, factual, impartial, detailed records.

What needs recording, its frequency and detail, changes, timings, stoppages.

Knowledge of reporting “structure”.

3.9 **Practical**

Identification of abrasives.
Assessment of surface quality, profile measurement.
Contamination and its removal, testing.
Environmental tests.
Identification of paints/solvents.
Wet/dry film thickness measurement.
Identification of other test equipment.
Fault identification.

3.9.1 *Identification of Abrasives*

Visual determination of particle size and shape.
Presence of contamination, excess fines.
Identification of materials/types.

3.9.2 *Original and Prepared Surface Quality*

Visual assessment.
Recognition of manually cleaned surfaces.
Measurement of surface profile.
BS7079

3.9.3 *Contamination*

Cleanliness, residual dust and detritus.
Decontaminate greasy surface and test for soluble salts.
Determine suitability of surfaces for subsequent painting.
BS7079

3.9.4 *Environmental Tests*

Measurement of dew point, RH – tables and charts.
Maintenance and care of test equipment.
Measurement of steel surface temperatures.

3.9.5 *Materials*

Identify – containing paint, M I O, emulsion, aluminium pigmented paint, oleo resinous, epoxy, water bourn acrylic T S A, zinc silicates.
Density and viscosity of paint, use of thinners.

3.9.6 *Thickness Measurement*

Wet film thickness measurement, constraints and influence on D F T volume solids.

Dry film thickness measurement, calibration of instruments.

3.9.7 *Test Equipment*

Recognise and appreciate limitations, code calibration and working of equipment for testing:

Film continuity

Adhesion

Thickness

Abrasive particle size

Viscosity, density, fineness of grind and opacity.

3.9.8 *Faults and Failures*

From samples and photographs, recognise common faults and failures and their causes including:

Deliberate actions

Carelessness

Poor workmanship

Safety breaches

GRADE 2

Satisfy the requirements of Grade 3 plus:

2.1 Paint Formulation

Pigments and extenders, polymers, resins and fillers.
Paint formulations for speciality coatings:
2 pack systems – epoxies, silicates, urethanes moisture cured urethanes.
High build single coat systems.
Solventless coating.
High temperature paints/coatings.

2.2 Paint Testing

During production: pigment, binder, volatiles, volume solids, viscosity, density, gloss, opacity, fineness of dispersion, flash point.

For performance: durability, weathering, impact, salt spray, humidity, porhesion, temperature cycling, C D water soak, immersion, abrasion resistance, flexibility.

2.3 Other Coatings

Sprayed metals, galvanising, anodising, stainless steel, powders, insulation materials – thermals and acoustic.
Properties, advantages and disadvantages.
Application and usage – problems and precautions.
General all-round theoretical and practical knowledge and understanding on protective coatings.

2.4 Working Practices – Onshore

Coating workshop or site layouts
Production flow arrangements
Inspection procedures, quality plans

Fabrication methods, handling coated items
Practical problems and their solutions
Contractual difficulties and their solutions
Assessment and reporting of levels of competence, supervision, knowledge, safety practices, maintenance and operation of plant and equipment, material storage.
Features of design, choice of materials and techniques which will produce difficulties.
Knowledge of full range of B S Standards covering painting and coatings.

GRADE 1

Satisfy the requirements of Grade 2 plus:

1.1 Specialised Systems and Materials

Heavy duty coatings – splash zone, deck areas.
Riser coatings and claddings, antifouling materials.
Paint systems under insulation and claddings.
Fireproofing systems – intumescent, vermiculite, classification and fire ratings.
Benefits and limitations of specialised systems.

1.2 Safety, Health & Welfare – Offshore

Permit to work systems – types and main requirements.
Breathing apparatus
Scaffolding and escape routes.
Electrical grounding.
Requirements of S I 10.19 (Offshore Statutory Instrument).
Over the side working.
Survival training, offshore induction training, medicals.
Safety instrumentation/equipment/harnesses.

1.3 Working Practices –Offshore

Areas of an offshore structure/systems to suit.

‘Local’ environment problems/differences and the need for regular monitoring. Contamination. Restricted access, hours, adjacent activities.

Effect of wind and tides upon cure rates, paint dispersal, masking.

Housekeeping, tidiness, storage of materials. Care maintenance condition, purpose and safety of equipment.

Contractor malpractices.

Knowledge of BG Offshore specifications.

9. EXAMINATION REQUIREMENTS: PAINTING INSPECTORS

9.1 There are three grades of painting inspector, and three of Painting Site Operative.

9.1.1 Grade 3 Painting Inspector

Theory

Candidates shall be questioned on the general principles of corrosion and the conditions that cause it to occur and therefore the mechanisms by which paint and/or coating systems prevent corrosion.

Practical

Measurement of environmental conditions, surface profile and cleanliness, paint film thickness, and discussion paint systems and faults.

9.1.2 Grade 2 Painting Inspector

The Grade 2 approved inspector requires the same breadth of knowledge as Grade 3; however, a greater theoretical and practical understanding is required including paint technology & manufacture.

A comprehensive knowledge of paint inspection as detailed in Table 2.

9.1.3 Grade 1 Painting Inspector

The Grade 1 approval is related to offshore painting and systems.

The Grade 1 inspector is likely to be working in difficult conditions and without advice being readily available. A candidate must therefore demonstrate a comprehensive knowledge of systems and procedures used both onshore and offshore and of the current Transco specifications.

In view of the above, it is expected that successful candidates would have had at least one year's prior experience in industrial painting inspection, preferably offshore.

9.1.4 Grade 4 Painting Supervisor

The Painting Supervisor will need to have a good working knowledge of current H.S.E, and QA/QC legislation.

They should be aware of, and be able to correctly interpret, current painting and coating Specification Requirements.

They should demonstrate an ability to oversee the correct mixing of two pack paint products, the correct assembly and use of equipment and the correct application and inspection of paint systems.

They should further demonstrate good management, administration and organisational skills, as well as a sound knowledge of good working practices.

Environmental considerations.

9.1.5 Grade 5A Blast Cleaning / Preparation Operative

The Blast cleaning / Preparation Operative shall demonstrate a knowledge of, and be able to work to, current Safety rules and H.S.E Legislation.

They should be able to recognise and subsequently remove the various types of surface contamination.

Their knowledge of blast cleaning, wire brushing and rust grading to relevant standards and specification will enable them to provide surface profiles to requirements. They will be able to safely set up and dismantle all associated equipment.

They shall demonstrate safe handling and movement of materials being prepared for painting or coating, and a sound knowledge of good housekeeping practices.

Environmental considerations

9.1.6 Grade 5B Painting Operative

The Painting Operative shall demonstrate a knowledge of and ability to work to current Safety rules and H.S.E Legislation.

They should be able to interpret protective painting and coating systems to Specification Requirements.

Their detailed product knowledge will enable them to correctly mix and apply different one or two coat paint/coating systems to the required specifications.

They should be able to assemble, check, use and safely wash out the various types of equipment used for paint/coating application.

They should be able to recognise and eradicate common paint faults; and observe good housekeeping practices at all times.

Environmental considerations.