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GIS 06-601

Painting of Metal Surfaces

Group Instruction for Supply

**BP GROUP
ENGINEERING TECHNICAL PRACTICES**

Foreword

This is the first issue of Engineering Technical Practice (ETP) BP GIS 06-601. This Group Instruction for Supply (GIS) is based on the BP heritage document below:

BP

GS 106-2 Painting of Metal Surfaces.

Amoco

A CP-COAT-ATM-C Corrosion Protection—Coatings—Atmospheric Systems Application—
Specification.
A CP-COAT-00-G Corrosion Protection—Coatings—General—Guide.
A CP-COAT-CLR-R Corrosion Protection—Coatings—Color Coding—Recommended
Practice.
A CP-COAT-MPOC-C Corrosion Protection—Coatings—Maintenance Painting of Offshore and
Coastal Facilities—Construction Specification.

Arco

ES 500 Painting and Protective Coatings.

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Introduction

Value of this Group Instruction for Supply:

There are many national and engineering association standards covering the surface preparation and painting of industrial structures but no internationally recognised standard. BP operates in many different countries throughout the world and this document has been written as a stand-alone guidance document from which specifications can be developed regardless of geographical location.

The general requirements given in this Group Instruction for Supply are based upon experience within BP and within other reputable companies, and guidance provided in recognised national and engineering association standards.

Within the protective coatings industry, there is an ongoing trend towards the reduction in, or the complete removal of, the volatile organic compound (VOC) content of coatings. There is also increasing interest in the use of surface preparation and coating application methods that minimise risks to health and the environment. BP fully supports these initiatives and appropriate references are made within the document.

Application:

This Group Instruction for Supply guides BP in the use or creation of a fit-for-purpose specification for enquiry or purchasing activity.

Text in italics is Commentary. Commentary provides background information that supports the requirements and may discuss alternative options. It also gives guidance on the implementation of any 'Specification' or 'Approval' actions; specific actions are indicated by an asterisk (*) preceding a paragraph number.

This Group Instruction for Supply, GIS 06-601, refers to certain local, national, or international regulations; the responsibility to ensure compliance with legislation and any other statutory requirements lies with the user. The user should adapt or supplement this document to ensure compliance for the specific application.

Feedback and Further Information:

Users are invited to feed back any comments and to detail experiences in the application of BP Engineering Technical Practices, to assist in the process of their continuous improvement.

For feedback and further information, please make comments in the [Engineering Technical Practices Library](#).



1. Scope

1.1. Painting aspect

This GIS defines the requirements with respect to the painting of metal surfaces and covers the following main area- General Requirements for Paints and their Application.

1.2. Applicability

This GIS covers both new construction and maintenance painting for onshore, offshore, and internal linings for iron, steel, galvanised steel, stainless steel, and non-ferrous materials (Ni based, Cu based, and Al alloys).

1.3. Exclusions

a. Building surfaces.

See BS 6150 for building surfaces.

b. Pipelines (buried or subsea).

c. Risers on offshore platforms (except in the atmospheric zone).

2. Normative references

BP

GP 44-60	Area Classification (API 500).
GP 44-65	Area Classification (IP 15).

NACE International (NACE)

NACE RP0188	Holiday testing of new protective coatings on conductive substrates.
NACE RP0287	Field Measurement of Surface Profile of Abrasive Blast Cleaned Steel Surfaces using a Replica Tape.
NACE TPC-2	Coatings and Linings for Immersion Service.
NACE 5	Surface Preparation and Cleaning of Metals by Waterjetting Prior to Recoatings.

British Standards Institute (BSI)

BS 5378	Safety signs and colours.
BS 2842	Whirling hygrometer.
BS 4800	Painting colours for building purposes.
BS 1710	Identification of pipelines and services.
BS 6374	Lining of equipment with polymeric materials.

International Organisation for Standardization (ISO)

ISO 8501-1	Preparation of steel substrates before application of paints and related products – Visual assessment of surface cleanliness.
ISO 8501-4	Preparation of steel substrates before application of paints and related products – Visual assessment of surface cleanliness following water jetting.
ISO 11126	Preparation of steel substrates before application of paints and related products – Specification for non-metallic blast cleaning abrasives.



ISO 12944	Paints and varnishes. Corrosion protection of steel structures by protective paint systems.
ISO 1461	Hot dip galvanized coatings on fabricated iron and steel articles.

3. Health, safety, and environment

3.1. *Regulations

- a. Account shall be taken of technical, health, safety, and environmental legislation.
- b. Plant and equipment used for surface preparation and coating application shall be maintained in good working condition and shall comply with applicable health, safety, and environmental (HSE) requirements as follows:
 1. National or local law requirements.
 2. Statutory requirements - containers and any associated packaging shall, as appropriate, be marked in accordance with the Certification, Packaging, and Labelling (CPL) Regulations for Carriage of Dangerous Goods by Road and Rail, and Chemicals Hazards Information and Packaging (CHIP) Regulations. Compressors and any associated pressure vessels shall be protected against overpressure. Current test certificates shall be held on site for inspection.
 3. Site regulations - the contractor shall acquaint himself with all installation safety and security restrictions. No work shall be allowed to take place until a Permit to Work or a Form of Authority has been issued. If the contract is scheduled to last for more than six weeks, the Contractor shall notify the Factory Inspector. The Contractor shall not operate any valves or plant associated with the site or structure.
- c. Explosive atmosphere special regulations - blast cleaning and spray painting equipment shall be continuously electrically bonded from the nozzle to the surface being painted and backwards from the nozzle to the compressor, which shall be earthed (grounded). Compressors used shall meet any HSE requirements specified by BP, including those relating to noise. In hazardous areas, non-spark tools shall be used for cleaning purposes and flameproof equipment shall be compulsory.

3.2. Safety precautions for pressurised hoses

- a. Pressurised hoses shall be marked and tested and results shall be logged to ensure safe operation.
- b. Test certificates shall be provided giving the maximum safe working pressure.
- c. Hoses and other pressure items shall be checked at least once per week to confirm that any damage or any loss of electrical continuity is not a safety hazard.
- d. The 'dead-man' handle shall only be manually held in position by the blaster.
- e. A log of safety inspections shall be kept.

3.3. *General hazards

- a. Activities associated with the surface preparation works, including access to and from the work place, shall be subject to a Health and Safety Risk Assessment. Hazards shall be identified and safety equipment shall be provided to ensure safe working conditions at all times.
- b. COSHH and environmental assessments shall be carried out (with BP participation) before start of the work.
- c. At the job planning stage, an assessment of the potential for release of hazardous materials into the environment shall be made, including provisions for the safe disposal of used



materials and waste in accordance with the Environmental Protection Act – EPA – (Duty of Care).

- d. The recommendations of the document, “Personal Protection Advice for the Use of Marine Paints and Compositions,” shall be adhered to.
- e. Items shall be provided to ensure protection of personnel whilst carrying out their duties. Appropriate protective clothing shall be worn at all times. Routine checks shall be made of the integrity of personal protective equipment. Fire fighting equipment shall be deployed in high-risk areas such as paint storage and mixing areas, elevated temperature substrates, and close to diesel driven plant. A portable gas tester should also be provided.
- f. In confined spaces, sufficient ventilation shall be provided at the workplace to prevent operator exposure to dangerous fumes.
- g. In any event, whilst blasting or spraying of coatings, independent air-fed masks shall be worn such that the operator is unaffected by the environment. The operator’s hood should be cleaned and disinfected at least weekly. In particular areas where natural ventilation is insufficient, positive ventilation shall be applied.
- h. Solvent drums and containers shall be earthed (grounded).
- i. Work areas shall be cordoned off with appropriate warning signs in accordance with BS 5378 and appropriate containment and protection shall be provided to avoid damage to adjacent items.
- j. If surface preparation and painting operations covered in this document are carried out in the vicinity of rivers, lakes, and other watercourses, special precautions may be necessary to prevent the possibility of pollution. Operations shall be carried out in accordance with the Water Resources Act.
- k. No material or plant shall be placed in any building or positions where they could present a hazard to persons performing their normal duties.

In countries where HSE standards are not available, BP will advise the Contractor on appropriate standards to be adopted.

3.4. Scaffolding, staging, and accessibility

- a. Fixed scaffolding, staging, trolleys, cradles, etc. shall be used in accordance with the relevant local regulations that are currently in force. In the UK, the requirements shall comply with the Construction (Working Places) Regulations and where relevant SI 1019 - The Offshore Installations (Operational Safety, Health and Welfare) Regulations.
- b. Scaffolding boards shall be firmly fixed or tied down at all times.
- c. Access shall be provided for surface preparation, painting, and detailed inspection of surfaces for compliance with the Specification. The access provided shall enable free movement of operators taking account of any restrictions imposed by protective clothing and equipment.

3.5. Paint manufacturer's information

- a. For all products, Manufacturer’s data sheets and materials safety data sheets containing information on HSE factors shall be supplied. This information shall be provided before start-up and shall be available on site for the full duration of the work.
- b. The data sheets shall give specific information on the chemical composition of the materials involved and the precautions that must be taken during their storage and use.



3.6. Training responsibilities

- a. Contractor's personnel shall receive appropriate training on site safety procedures before commencing work. This shall include the following, as a minimum:
 1. The operation and HSE aspects of all surface preparation and painting equipment.
 2. The main HSE hazards associated with the site and specific work location.
 3. Hazards associated with any of the materials to be used.
 4. HSE regulations, permit-to-work systems, site emergency procedures, accident and incident reporting procedures of the site.
- b. A registered first-aider shall be provided.

Contractors, sub-contractors, and self-employed persons have the duties of employers under the COSHH regulations.

3.7. Flammable atmospheres

3.7.1. Area classification

- a. BP will advise area classifications for both plant design and construction/maintenance periods. Some classifications (e.g. Zone 1 – in accordance with GP 44-65 hazard classification [Division 1 – in accordance with GP 44-60 hazard classification]) for plant design may preclude the use of certain paint compositions, e.g. paints with aluminium metallic pigments and metal-sprayed aluminium coatings shall not be used in Zone 1 (Division 1) Areas.
- b. The classification for construction or maintenance periods affects the minimum rating permissible for electrical equipment (see clause 6.3.5).
- c. Data for the proposed paint systems and solvents shall be provided to BP in order to permit area classifications to be determined for the duration of the painting works.

3.7.2. Precautions in cleaning and application of paints

Specific precautions shall be taken to avoid the build-up of flammable atmospheres from cleaning solvents or paints in confined spaces. These shall include attention to weather protection, ventilation, and type of lighting used.

3.8. HSE restrictions on coating systems

HSE regulations are requiring improved coatings with, for example, reduced VOC content. As a result, the paint industry is developing new products based on:

- *Water based technology.*
- *High solids epoxies.*

Experience with improved coatings that may be required by HSE regulations, e.g. reduced VOC content, is still relatively limited, but such coatings may be considered if:

- a. Application conditions are favourable.
- b. Equivalent performance to established systems can be demonstrated.

4. Paint composition and minimum preparatory requirements

4.1. Approvals

- a. Paint purchase shall be only from manufacturers approved by BP for the particular application.

