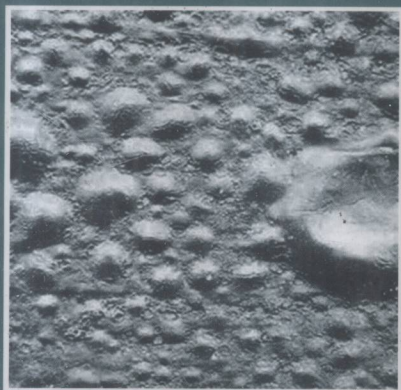


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Edited by Anand S. Khanna



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High-performance organic coatings

Related titles:

Surface coatings for protection against wear
(ISBN 978-1-85573-767-9)

This authoritative book presents an overview of the current state of research in, and applications for, wear-protective coatings. Focusing on the different types of surface technologies used for wear-protective coatings, each chapter provides an in-depth analysis of a particular type of surface coating, its properties, strengths and weaknesses in various applications. Each surface coating examined includes case studies describing its performance in a specific application. *Surface coatings for protection against wear* is an invaluable reference resource for all engineers concerned with the latest developments in coating technology.

Innovative pre-treatment techniques to prevent corrosion of metallic surfaces – EFC 54
(ISBN 978-1-84569-365-7)

There has long been a need for effective pre-treatment techniques to prevent corrosion of metallic surfaces. This important volume discusses coating and preparation methods for aluminium alloys such as silane films, sol-gel coatings and magnesium-rich primers. It also reviews pre-treatments for steel, copper, zinc and magnesium alloys. Other chapters consider electrochemical and other techniques to monitor the effectiveness of pre-treatments in preventing corrosion together with methods for monitoring dissolution-precipitation mechanisms of a range of pre-treatments.

Techniques for corrosion monitoring
(ISBN 978-1-84569-187-5)

This book provides a comprehensive analysis of the techniques used for corrosion monitoring and includes practical applications and case studies. Corrosion monitoring technologies are a vital step in efforts to combat corrosion, which can have major economic and safety implications. The first part of the book reviews electrochemical techniques for corrosion monitoring. A second group of chapters analyses other physical or chemical methods of corrosion monitoring. Part III examines corrosion monitoring in special environments and conditions. Part IV covers the selection of monitoring techniques and probes, while a final group of chapters discusses applications and case studies.

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Corrosion is a natural process and many metals and alloys used in industrial applications need protection in order to minimize or prevent corrosion. There are various methods of corrosion control which include better design, choice of better materials, protection by inhibitors, cathodic and anodic protection, and protection by coatings. Among these, coating is the simplest and most widely used method.

Steel is used all over the globe in a huge number of applications. Steel, however, is a very reactive material even in normal environmental conditions, corroding in moist air. It needs protection wherever it is used. Whether it is a steel structure, steel frame, steel tank, overhead steel pipe or underground cross-country pipeline, all need corrosion protection. The most common method to protect steel from corrosion is paint coatings.

A paint coating is basically a polymer resin, dispersed in a solvent, modified by additives to achieve specific properties and pigments for providing colour, corrosion protection and other important properties. The nature of the coating revolves round the type of resin that is used, whether alkyd, epoxy, urethane, vinyl or polyester. High-performance properties can be achieved by adding different kinds of pigments, which give not only colour and opacity but also strength, lower permeability and, in turn, longer life. High performance can also be achieved by using solventless systems which not only give higher thickness per coat but also are environmentally friendly because of their low volatile organic content (VOC).

Any discussion of coating is incomplete unless it considers surface preparation and paint application. Surface preparation is a key aspect of paint coatings: any mistake at this stage will compromise the coating. It is advisable to carry out proper surface preparation by following a suitable standard and measuring its anchor profile. New paint formulations or surface tolerant coatings able to cope with partially cleaned surfaces, are important requirements for maintenance of offshore structures, chemical plants, refineries and power plants where surface cleaning may be difficult.

Paint application has become a very specialized subject. Today it is important to know about not only traditional methods of paint application by brush and roller but also the use of more sophisticated techniques such as airless spray, electrostatic powder application, together with the special application skills required to apply elastomeric polyurethane, polyurea and many other fast-curing polyester coatings. Methods for the maintenance of paint coatings are also increasingly important.

Despite proper application, paint coatings do fail prematurely. It is very important to understand what causes the paint to fail and what the various remedial measures are. Another issue in paint coatings is to estimate the life of the coating. It is very important to correctly estimate paint life. Are conventional testing techniques adequate or do we need new methods to estimate the life of a coating? Lastly, it is essential to incorporate good paint inspection and quality assurance techniques both during paint application and afterwards. The importance of supervisors, coating inspectors and others responsible for maintaining quality should be emphasized. They should be provided with good theoretical and practical training.

This book covers a range of key issues in the effective use of high-performance organic paint coatings, including important industrial applications, offshore structures, underground pipelines, automotive coatings, coil coatings, coatings for rebars and concrete structures, coatings for ships and in other aggressive environments.

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