1 Corrosion

Objective
When you have gone through this chapter, you should be able to
- explain how corrosion affects metallic materials
- explain which factors influence the corrosion process
- use the galvanic series to determine the risk of galvanic corrosion when metals are joined together
- distinguish between different types of corrosion and describe their characteristic features.

Introduction

Annually corrosion costs society vast sums. In the Western World the costs have been estimated to constitute approximately 3-4% of the gross national product.

A major part of the damage is due to too little knowledge about corrosion and the conditions which cause corrosion. If the selection of materials is not considered carefully enough, the result can be extensive corrosion damage. It has been estimated that improved knowledge about corrosion and corrosion protection can reduce costs by approximately 15%.

In case of corrosion protection by means of paint coatings the applicator and the inspector are important. In order to ensure that the job is carried out correctly they must have a good understanding of subjects like *corrosion, surface preparation* and *protection against corrosion.* Later in the book these subjects will be discussed in greater detail.

What is corrosion?

It is a common opinion that corrosion is the same as rust, which is not entirely true. Rust is the corrosion product formed when iron and steel corrode. But many other materials are also attacked. The patina on copper and white rust on zinc are well-known examples. These are also corrosion products. *Consequently, corrosion is the deterioration or breakdown of materials due to a reaction with the environment.* Besides destroying metals, corrosion also contributes towards breaking down concrete and plastic materials.

Why, then, are a number of construction materials around us broken down, and how does this happen? If we look at the metals, most of them are produced by