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Blast Cleaning Technology

With 385 Figures and 169 Tables

Springer

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Chapter 1
Introduction

1.1 Motivation

Reams (1939), in his book *Modern Blast Cleaning and Ventilation*, and Rosenberger (1939), in his book *Impact Cleaning*, probably delivered the first serious state-of-the-art reviews about the industrial fundamentals of blast cleaning. They were followed by Plaster (1972) with his two-volume compendium on '*Blast Cleaning and Allied Processes*'. In Germany, Horowitz' (1982) book about *Oberflächenbehandlung mittles Strahlmitteln* (*Surface Treatment with Blasting Media*) became very popular and is still a widely used reference. Since then, 25 years of intense progress in both industrial applications and scientific research have passed. The aim of this book is to provide an extensive up-to-date engineering-based review about the fundamental principles of blast cleaning.

This book is concerned with the blast cleaning of metallic substrates prior to the application of protective coatings or adhesives.

1.2 Introductory Remarks

From the point of view of the material removal mechanism, blast cleaning can be considered to be an erosion process. "Erosion", as a tribological term, is the removal of materials due to the action of impinging solid particles. Erosion is a natural phenomenon [the correct designation in terms of geology is *corrasion* (Bates and Jackson, 1980)] and there exist a number of impressive examples about the material removal capability of natural erosion. One example, the erosion of rock columns, is illustrated in Fig. 1.1.

Blast cleaning is one of the most frequently utilised treatment methods in modern industry. The starting point of the utilisation of blast cleaning for industrial purposes was Tilghman's patent on "*Improvement in cutting and engraving stone, metal, glass, etc.*" (Tilghman, 1870). Benjamin Chew Tilghman (1821–1901), an American scientist, invented the "*cutting, boring, grinding, dressing pulverizing, and engraving stone, metal, glass, wood, and other hard or solid substances, by means of a stream of sand or grains of quartz, or of other suitable materials, artificially driven*

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