Optical Measurement of Surface Topography

Richard Leach (Ed.)

Optical Measurement of Surface Topography

Springer

Editor

Prof. Richard Leach
National Physical Laboratory
(NPL)
Industry & Innovation Div.
Hampton Road
TW11 0LW Teddington, Middlx.
United Kingdom
E-mail: richard.leach@npl.co.uk

ISBN 978-3-642-12011-4 e-ISBN 978-3-642-12012-1

DOI 10.1007/978-3-642-12012-1

Library of Congress Control Number: 2011924476

Typesetting: Data supplied by the authors

Cover Design: Scientific Publishing Services Pvt. Ltd., Chennai, India

Printed on acid-free paper

9 8 7 6 5 4 3 2 1

springer.com

Preface

The measurement and characterisation of areal surface topography is becoming crucial to many modern manufacturing methods. The control of areal surface structure allows a manufacturer to radically alter the functionality of a part. Examples include structuring to effect fluidics, optics, tribology, aerodynamics and biology. To control such manufacturing methods requires appropriate measurement strategies. There is also soon to be the introduction of a series of ISO specification standards in this area and this book will become a companion guide to these standards. These new standards are many and complex, as are the new measurement techniques, so industry will hopefully benefit from such a book.

There is now a wealth of new optical techniques on the market, or being developed in academia, that can measure areal surface topography. Each method has its strong points and limitations. This book will start with introductory chapters on optical instruments, their common language, generic features and limitations, and their calibration. Each type of modern optical instrument will then be described (in a common format) by experts in the field.

Acknowledgements

First and foremost I would like to thank all the chapter authors for their hard work and dedication to this book and David Flack (NPL) for reviewing some of the chapters. I also have to thank my beautiful wife to be for allowing me to spend hours writing and days travelling in order to become an expert in such an international field – thanks Sharmin. Last, but not least, my parents, sisters, son and step son also need to be thanked for their unwavering support.

This book is dedicated to the first engineer I ever met and the one that I want to please the most – thanks dad!

Contents