

## Contents

Preface IX

How to use the Handbook XI

Warranty disclaimer 1

### **High Purity Water** 3

Introduction 3

Physical and chemical properties 4

Unalloyed and low alloyed steels/Cast steel 6

Non-alloyed cast iron 21

High-alloyed cast iron 22

Ferritic chromium steels with < 13% Cr 22

Ferritic chromium steels with  $\geq$  13% Cr 24

High-alloyed multiphase steels 26

Austenitic CrNi steels 27

Austenitic CrNiMo(N) steels 52

Nickel 56

Nickel-chromium alloys 56

Nickel-chromium-iron alloys (without Mo) 56

Nickel-chromium-molybdenum alloys 67

Nickel-copper alloys 67

Nickel-molybdenum alloys 68

Zinc 68

Bibliography 69

**Drinking Water 81**

- Introduction 82
- Unalloyed steels and cast steel 87
- Unalloyed cast iron 102
- Structural steels with up to 12% chromium 104
- Ferritic chromium steels with more than 12% chromium 104
- Ferritic-austenitic steels with more than 12% chromium 104
- Austenitic chromium-nickel steels 104
- Austenitic chromium-nickel-molybdenum steels 104
- Austenitic chromium-nickel steels with special alloying additions 104
- Zinc 112
- Bibliography 147

**Seawater 155**

- Introduction 155
- Unalloyed and low-alloyed steels/cast steel 193
- Unalloyed cast iron and low-alloy cast iron 224
- High-alloy cast iron 226
- Ferritic chromium steels with  $< 13\%$  Cr 228
- Ferritic chromium steels with  $\geq 13\%$  Cr 229
- High-alloy multiphase steels 235
- Ferritic/pearlitic-martensitic steels 235
- Ferritic-austenitic steels/duplex steels 235
- Austenitic CrNi steels 237
- Austenitic CrNiMo(N) steels 239
- Austenitic CrNiMoCu(N) steels 244
- Nickel 260
- Nickel-chromium alloys 262
- Nickel-chromium-iron alloys (without Mo) 262
- Nickel-chromium-molybdenum alloys 262
- Nickel-copper alloys 263
- Nickel-molybdenum alloys 270
- Other nickel alloys 270
- Zinc 270
- Bibliography 273

**Waste Water (Municipal) 289**

- Introduction 290
- Unalloyed steels and cast steel 292
- Unalloyed cast iron 294
- Ferritic chromium steels with more than 12% chromium 299
- Ferritic austenitic steels with more than 12% chromium 299
- Austenitic CrNi steels 299
- Austenitic CrNiMo(N) steels 299
- Austenitic CrNiMoCu(N)-steels 299
- Zinc 305
- Bibliography 307

**Waste Water (Industrial) 311**

- Introduction 311
- Unalloyed steels and low-alloy steels/cast steel 312
- Unalloyed cast iron and low-alloy cast iron 316
- High-alloy cast iron 316
- Silicon cast iron 316
- Ferritic chromium steels with < 13 % Cr 320
- Ferritic chromium steels with  $\geq 13$  % Cr 320
- High-alloy multiphase steels 320
- Ferritic/pearlitic-martensitic steels 320
- Ferritic-austenitic steels/duplex steels 320
- Austenitic CrNi steels 323
- Austenitic CrNiMo(N) steels 323
- Austenitic CrNiMoCu(N) steels 323
- Nickel-chromium alloys 339
- Nickel-chromium-iron alloys (without Mo) 339
- Nickel-chromium-molybdenum alloys 339
- Nickel-copper alloys 339
- Zinc 343
- Bibliography 344

**Key to materials compositions 351****Index of materials 391****Subject index 401**