Contents

Preface IX	
How to use the Handbook XI	
Warranty disclaimer 1	
Acetic Acid 3	
Unalloyed steels and cast steel 3	
Unalloyed cast iron 12	
High-alloy cast iron, high-silicon cast iron 13	
Structural steels with up to 12 % chromium 19	
Ferritic chromium steels with more than 12% chromium 19	
Ferritic-austenitic steels with more than 12 % chromium 19	
Austenitic chromium-nickel steels 32	
Austenitic chromium-nickel-molybdenum steel s 51	
Austenitic chromium-nickel steels with special alloying additions 6	8
Special iron-based alloys 73	
Bibliography 77	

Alkanecarboxylic Acids 95 Unalloyed steels and cast steel 95 Unalloyed cast iron 95 Austenitic chromium-nickel-molybdenum steels 100 Austenitic chromium-nickel steels with special alloying additions 100 Special iron-based alloys 100 High-alloy cast iron, high-silicon cast iron 101 Structural steels with up to 12% chromium 102 Ferritic chromium steels with more than 12% chromium 103 Ferritic-austenitic steels with more than 12% chromium 103

Austenitic chromium-nickel steels 104

VI | Contents

Austenitic chromium-nickel-molybdenum steels 107
Austenitic chromium-nickel steels with special alloying additions 107
Special iron-based alloys 107
Bibliography 116

Carbonic Acid 119

Unalloyed and low-alloy steels/cast steel 119
Unalloyed cast iron and low-alloy cast iron 119
Ferritic chrome steels with < 13 % Cr 146
Ferritic chromium steels with ≥ 13 % Cr 147
High-alloy multiphase steels 147
Ferritic/perlitic-martensitic steels 147
Austenitic chromium-nickel steels 151
Austenitic CrNiMo(N) steels 169
Austenitic CrNiMoCu(N) steels 169
Bibliography 172

Formic Acid 175

Unalloyed steels and cast steel 175

Unalloyed cast iron 175

High-alloy cast iron, high-silicon cast iron 175

Structural steels with up to 12 % chromium 176

Ferritic chromium steels with more than 12 % chromium 176

Ferritic-austenitic steels with more than 12 % chromium 179

Austenitic chromium-nickel steels 180

Austenitic chromium-nickel-molybdenum steels 180

Austenitic chromium-nickel steels with special alloying additions 180

Special iron-based alloys 183

Bibliography 185

Sulfonic Acids 187

Unalloyed steels and cast steel 187

High-alloy cast iron, high-silicon cast iron 191

Ferritic chromium steels with more than 12 % chromium 191

Austenitic chromium-nickel steels 191

Austenitic chromium-nickel-molybdenum steels 194

Austenitic chromium-nickel steels with special alloying additions 196

Bibliography 197

Alkaline Earth Hydroxides 199

Unalloyed steels and cast steel 199

Unalloyed cast iron 218

High-alloy cast iron, high-silicon cast iron 218

Structural steels with up to 12% chromium 219

Ferritic chromium steels with more than 12% chromium

Ferritic-austenitic steels with more than 12% chromium 219

Austenitic chromium-nickel steels 219

Austenitic chromium-nickel-molybdenum steels 219

Austenitic chromium-nickel steels with special alloying additions

Bibliography 220

Ammonia and Ammonium Hydroxide 223

Unalloyed and low-alloy steels/cast steel 223

Unalloyed and low-alloyed cast iron 223

Highly alloyed cast iron 244

Cast ferrosilicon 244

Austenitic cast iron (amongst others)

Ferritic chrome steels with < 13 % Cr 244

Ferritic chrome steels with ≥ 13 % Cr 244

Ferritic/perlitic-martensitic steels 244

Ferritic-austenitic steels/duplex steels 244

Austenitic chromium-nickel steels 244

Austenitic chromium-nickel-molybdenum(N) steels and CrNiMoCu(N) steels 244

Bibliography 247

Lithium Hydroxide 251

Unalloyed steels and cast steel 251

Unalloyed cast iron 257

High-alloy cast iron, high-silicon cast iron 257

Ferritic chromium steel with more than 12% chromium 257

Austenitic chromium-nickel steels 258

Austenitic chromium-nickel-molybdenum steels 258

Bibliography 261

Potassium Hydroxide 263

Unalloyed steels and low-alloy steels/cast steel 263

Unalloyed cast iron and low-alloy cast iron 269

High-alloy cast iron 269

VIII

Cast ferrosilicon 269

Austenitic cast iron (among other things) 269

Ferritic chrome steels with < 13 % Cr 270

Ferritic chrome steels with ≥ 13 % Cr 271

Ferritic/Perlitic-martensitic steels 271

Ferritic-austenitic steels/duplex steels 271

Austenitic chromium-nickel steels 274

Austenitic CrNiMo(N) steels and CrNiMoCu(N) steels 277

Bibliography 286

Sodium Hydroxide 293

Unalloyed and low-alloy steels/cast steel 293
Unalloyed cast iron and low-alloy cast iron 316
High-alloy cast iron 319
Silicon cast iron 319
Austenitic cast iron (etc.) 319
Ferritic chromium steels with < 13 % Cr 319
Ferritic chromium steels with ≥ 13 % Cr 329
High-alloy multiphase steels 334
Ferritic/perlitic-martensitic steels 334
Ferritic-austenitic steels/duplex steels 334
Austenitic chromium-nickel steels 342
Austenitic chromium-nickel-molybdenum(N) steels 349
Austenitic CrNiMoCu(N) steels 361
Special iron-based alloys 362
Bibliography 363

Key to materials compositions 371
Index of materials 411
Subject index 421