Contents

Preface IXHow to use the Handbook XIWarranty disclaimer 1

Hydrochloric Acid 3
Unalloyed and low-alloyed steels/cast steel 3
Unalloyed and low-alloy cast iron 13
High-alloy cast iron 14
Austenitic cast iron (and others) 14
Ferritic chromium steels with < 13 % Cr 14
Ferritic chromium steels with ≥ 13 % Cr 19
Ferritic/pearlitic-martensitic steels 21
Ferritic-austenitic steels/duplex steels 24
Austenitic CrNi steels 26
Austenitic CrNiMo(N) and CrNiMoCu(N) steels 43
Special iron-based alloys 44
Bibliography 46

Mixed Acids 49

Unalloyed and low alloy steels/cast steel 49
Unalloyed cast iron and low-alloy cast iron 53
High-alloy cast iron 53
Ferritic chromium steels with <13 % Cr 53
Ferritic chromium steels with ≥ 13 % Cr 55
Ferritic-austenitic steels/duplex steels 57
Austenitic CrNi steels 63
Austenitic CrNiMo(N) and CrNiMoCu(N) steels 79

Austenitic CrNiMoCu(N) steels 92 Bibliography 108

Nitric Acid 113

Unalloyed steels and cast steel 113

Unalloyed cast iron 118

High-alloy cast iron 119

High-silicon cast iron 119

Structural steels with up to 12 % chromium 120

Ferritic chromium steels with more than 12% chromium 120

Ferritic-austenitic steels with more than 12% chromium 129

Austenitic chromium-nickel steels 131

Austenitic chromium-nickel-molybdenum steels 167

Austenitic chromium-nickel steels with special alloying additions

Special iron-based alloys 195

Bibliography 197

Phosphoric Acid 219

Unalloyed steels and cast steel 219

Unalloyed cast iron 240

High-alloy cast iron 242

High-silicon cast iron 242

Structural steels with up to 12 % chromium 250

Ferritic chromium steels with more than 12 % chromium 253

Ferritic-austenitic steels with more than 12 % chromium 274

Austenitic CrNi steels 293

Austenitic CrNiMo(N) steels 302

Austenitic chromium-nickel steels with special alloying additions

Special iron-based alloys 354

Bibliography 357

Sulfuric Acid 369

Unalloyed steels and cast steel 369

Unalloyed cast iron 420

High-alloy cast iron 436

High-silicon cast iron 436

Structural steels with up to 12 % chromium 444

Ferritic chromium steels with more than 12 % chromium 453

Ferritic-austenitic steels with more than 12% chromium 470 Austenitic chromium-nickel steels 486 Austenitic chromium-nickel-molybdenum steels 518 Austenitic chromium-nickel steels with special alloying additions 560 Special iron-based alloys 584 Bibliography 592

Key to materials compositions 609 Index of materials 647 Subject index 663