# Subject Index

## A

<table>
<thead>
<tr>
<th>Acid rain</th>
<th>287</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aeration</td>
<td>187</td>
</tr>
<tr>
<td>Aluminum</td>
<td>17, 262</td>
</tr>
<tr>
<td>2024</td>
<td>132</td>
</tr>
<tr>
<td>6061</td>
<td>132</td>
</tr>
<tr>
<td>7075</td>
<td>20, 131, 132</td>
</tr>
</tbody>
</table>

| Anodized aluminum | 135 |

<table>
<thead>
<tr>
<th>ASTM standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 262, 455-464</td>
</tr>
<tr>
<td>B 457, 139</td>
</tr>
<tr>
<td>C 665, 215</td>
</tr>
<tr>
<td>C 764, 216</td>
</tr>
<tr>
<td>D 610, 129</td>
</tr>
<tr>
<td>D 1141, 249</td>
</tr>
<tr>
<td>E 399, 34</td>
</tr>
<tr>
<td>E 647, 34</td>
</tr>
<tr>
<td>G 1, 225, 231, 2375</td>
</tr>
<tr>
<td>G 3, 74, 403</td>
</tr>
<tr>
<td>G 5, 255, 328</td>
</tr>
<tr>
<td>G 28, 437, 438, 442, 450, 452</td>
</tr>
<tr>
<td>G 30, 251, 376</td>
</tr>
<tr>
<td>G 31, 67, 78, 250, 375</td>
</tr>
<tr>
<td>G 36, 376</td>
</tr>
<tr>
<td>G 38, 252</td>
</tr>
<tr>
<td>G 39, 252</td>
</tr>
<tr>
<td>G 40, 359</td>
</tr>
<tr>
<td>G 43, 19</td>
</tr>
<tr>
<td>G 46, 375</td>
</tr>
<tr>
<td>G 48, 251, 315, 375</td>
</tr>
<tr>
<td>G 53, 159, 161</td>
</tr>
<tr>
<td>G 59, 198, 233</td>
</tr>
<tr>
<td>G 61, 326, 328, 334</td>
</tr>
</tbody>
</table>

| Autoclave | 339, 417 |

## B

<table>
<thead>
<tr>
<th>Bent beam test</th>
<th>251</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biofouling</td>
<td>203</td>
</tr>
<tr>
<td>Bode plot</td>
<td>126-137</td>
</tr>
<tr>
<td>Brass</td>
<td>262</td>
</tr>
<tr>
<td>Brazed joints</td>
<td>177</td>
</tr>
<tr>
<td>Brick masonry</td>
<td>285-296</td>
</tr>
<tr>
<td>Cracking</td>
<td>293</td>
</tr>
<tr>
<td>Brine</td>
<td>341</td>
</tr>
</tbody>
</table>

## C

<table>
<thead>
<tr>
<th>Cabinet tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclic</td>
</tr>
<tr>
<td>Humidity tests</td>
</tr>
<tr>
<td>Kesternich</td>
</tr>
<tr>
<td>Salt spray</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
</tr>
<tr>
<td>Sulfur dioxide-salt fog</td>
</tr>
<tr>
<td>Calcareous deposit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Can corrosion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accelerated test</td>
</tr>
<tr>
<td>Effects of chromium</td>
</tr>
<tr>
<td>Effect of lacquer</td>
</tr>
<tr>
<td>Pack test</td>
</tr>
<tr>
<td>Solder attack</td>
</tr>
<tr>
<td>Storage conditions</td>
</tr>
<tr>
<td>Cathodic depolarizer</td>
</tr>
<tr>
<td>Cathodic protection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium chloride content</td>
</tr>
<tr>
<td>Clad metal</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coatings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alodine 600, 131</td>
</tr>
</tbody>
</table>
Coatings (continued)
  Chromate conversion, 123
  Deterioration of, 159
  Epoxy/polyurethane, 20
  Inorganic, 17
  Lacquer, 48
  Undermining, 60
Coinage material, 260–274
  Soilage properties, 271–274
Computer program, 28
Concrete, 275–284, 429
  Sodium thiocyanate content, 283
Copper and copper alloys, 262
  614 yellow brass, 360
Correlation
  ASCC test, 54
  Corrosion ranking, 225
  Cyclic sulfur dioxide-salt fog, 21
  Electrochemical tests, 144
  Environmental wear behavior, 274
  FUCA test, 160
  Immersion tests, 177
  Laboratory tests, 11
  Pit ranking, 244
  Salt spray tests, 14
  Tafel extrapolation, 238
Corrosion behavior diagram, 75–79
Corrosion fatigue, 34, 174
  Fatigue crack growth, 34
Creep, 292
Crevise corrosion, 9, 78, 103, 227, 250, 299–323, 324–336, 337–357, 376
  Area ratio effects, 318
  Critical concentration, 10
  Critical temperature, 9
  Effect of geometry, 10, 313, 354
  Effect of pH, 315, 349
  Incubation period, 354
  Mathematical model, 300
  Multiple crevice assembly, 385, 396
  Oxygen concentration effects, 319
  Propagation, 303
C-ring test, 251
Cupro-nickel, 262
Current decay curve, 210
Data acquisition, 24–35
Dealloying
  Solders, 57
Deformation
  Corrosion induced, 292
  Deicing salts, 275
  Dezincification, 176
  Double cantilever beams, 251
Electrochemical tests, 65–90, 325
  Cell design, 339
  Compartmentalized cell, 304
  Controlled potential, 72, 210, 406, 416, 431
  Cyclic potentiodynamic polarization, 77, 95, 110, 228, 328
  Electrical resistance, 67
  EPR test, 421
  Galvanostaircase polarization, 112
  Galvanostatic polarization, 254, 276
  Impedance, 87, 122–142
  Polarization resistance, 71, 113–120, 147, 197–206, 233
  Effect of scan rate, 201
  Potential measurements, 236, 277, 309, 345
    Metallic coated steel, 146–151
    Nickel-aluminum bronze, 30
    Potential step method, 327
  Potentiodynamic polarization, 31, 71, 72, 255
    Effect of scan rate, 72, 96
    Rapid scan technique, 75
    Slow scan technique, 73
  Potentiostaircase polarization, 113
  Potentiostatic polarization, 254, 401
Tape method, 91–107
Tafel region, 69, 154, 199, 233
Environmental wear test, 260–274
Environments
Aircraft carrier, 17
Erosion corrosion, 175, 358–372
   Effect of velocity, 361
   Jet test, 360
   Shear stress, 363
Exfoliation tests, 19

F
Ferric chloride test, 375
Fluid velocity, 82
Fluorescent UV and condensation test, 159
Fretting corrosion, 262

G
Galvanic corrosion, 7, 50, 147
   Area ratio effects, 50
   Current distribution, 32
   Soldered tin, 57
   Tin plated steel, 49
   Zero resistance ammeters, 32
   Galvanized steel, 147, 172
Heat exchanger, 36–47
   Galvanic corrosion, 33
   Zirconium, 36
Heat exchanger tubes, 359
   Current distribution, 33
Heat transfer
   Corrosion effects, 36
High temperature
   Reference electrode, 417
Humidity test
   Cyclic, 261
Hydrogen embrittlement, 251
Hydrogen induced cracking, 7, 254
Hydrogen sulfide, 246
Hydrothermal conditions, 338
Hysteresis, 110, 111, 229, 242, 325

I
Immersion tests, 66, 374
   Electrolyte-volume ratio, 51
Inhibitors, 12, 228–245
Insulation, 215–217
Intergranular corrosion, 437–454
   Effect of mill condition, 459
   Effect of surface preparation, 455
   Stress corrosion cracking, 421

L
Localized corrosion, 66
   Weld metal attack, 41

M
Masonry, 286
Metal pick-up, 179
Microcomputer, 24–35
Mortar, 275–284
Multiple crevice assembly, 302, 329
Nickel and nickel alloys, 262
   Hastelloy C, 437–454

P
Pipe
   Brass, 176
   Copper, 173
   Galvanized steel, 172
Pitting, 10, 77, 91–107, 172, 250, 324–336, 444
   Effect of pH, 98
   Pitting potential, 10, 242, 413
   Effect of surface pretreatment, 97
Polarization curves
   3003 aluminum, 112
   Brass, 113, 367
   Copper, 112, 114
Polarization curves (continued)
Nickel-aluminum bronze, 32
Stainless steel
18-2 ferritic, 101
Type 304, 96, 97, 100
Type 316, 319
Type 420, 404–412
Steel, 280, 281
Coated, 155–156
N80, 232
Pore water, 280
Potable water, 170
Pourbaix diagrams, 67–68
Precracked specimen, 253
Prestressed steel (see reinforcing steel)

R
Reinforcing steel, 102, 275–284, 286, 428–436
Repassivation potential, 324
Effect of scan rate, 96
Rotating cylinder, 82

S
Seawater, 197–206, 207–214, 304
Fouling, 203
Synthetic, 208, 304
Sensitization, 456
Austenitic stainless steel, 416
Slow strain rate tests, 253, 415–425
Solder attack, 177
Can corrosion, 53
Lead dissolution, 56
Solder joints, 178
Sour gas, 7, 249
Specimen preparation, 231, 342, 455–464
Stainless steel
17-4, 20
18Cr-2Mo, 100, 307
18Cr-4Ni-2Mo, 308
26Cr-1Mo, 308
254 SMO, 308
Type 304, 94, 307, 327, 415, 421, 455
Type 316, 307
Type 317, 308
Type 420, 401
Type 430, 307
Type 904, 306, 317
Steel, 17, 185, 198, 209, 216, 262, 276, 428
A36, 287
N80, 231
1005, 203
1010, 130
Metallic coated, 144
Polybutadiene coated, 125
Pore resistance, 127
Tin plate, 48
Stress corrosion cracking, 6, 84, 251, 376, 415–427, 428
Constant load test, 432
Controlled potential test, 406
Critical stress, 10
Effect of chloride concentration, 407
Effect of hydrogen sulfide, 406
Effect of pH, 407
Intergranular
Critical potential for, 421
Modulus measurements, 85
Polarization tests, 86
Slow strain rate test, 84, 433
Step-stress tension test, 404
U-bend specimens, 251, 392
Stress intensity, 253
Stress-strain curves
Type 304 stainless steel, 423
Sulfide stress cracking, 7, 251, 400–414
Step-stress tension test, 404
Surface preparation, 105, 217, 223
Surface treatment, 128
T
Tensile bars, 251
Tin plate
  Can corrosion, 49
  Passivation treatment, 60–62
Titanium
  Grade 2, 338
  Grade 12, 337
V
Vapor phase corrosion, 44
Velocity effects, 81–83

W
Wear corrosion, 262
Wear tests, 260–274
Weld metal attack, 41, 100, 450

Z
Zirconium, 36
  P60707, 37
Effect of heat flux, 42
Weld metal attack, 41