

# Subject Index

## A

Abrasive wear, 235  
 Acceptance tests, 152  
 Acid precipitation, effects on automotive components, 18  
 Alkaline environments, 255  
 Alloy ranking for corrosion resistance, 120, 274  
 Aluminum alloys  
   automotive components, 20  
   corrosion in seawater, 190, 217  
   furnaces, performance in, 274  
   metal containers, 69  
   stainless steel clad, 18  
 Ammonia test, 152  
 Anaerobic corrosion by sulfate-reducing bacteria, 98, 112  
 ASTM seawater, 190, 224  
 ASTM Standards  
   A 262: 121  
   A 623-83: 76  
   B 117: 19, 76  
   B 287: 207  
   B 368-85: 19, 207  
   C 262-75: 142  
   D 1141-75: 194, 210, 224  
   D 1688: 195  
   D 4412-84: 104  
   G 1: 105, 121  
   G 28-85: 121  
   G 30: 277  
   G 31: 121  
   G 37-85: 153  
   G 38-73: 154  
   G 43-75: 19  
   G 46: 121  
   G 48: 121, 212  
   G 50: 209  
   G 78: 29, 247  
   G 87-84: 19  
 Atmospheric corrosion of automotive components, 18  
   testing methods, 58  
 Automobile components, 18

## B

Bacteria (*See* Microorganisms)  
 Biocides, 112  
 Biological activity (*See* Microorganisms)  
 Biomaterials, metallic, 79  
 Blood serum composition, 81  
 Body fluid substitutes, 79  
 Brasses, 132  
 Breakaway velocity, critical, 190  
 Bronzes, 205, 274

## C

Cadmium plating, 205  
 Carbon dioxide, 246  
 CASS test, 205  
 Cast iron, 98  
 Cement, portland, 255, 264  
 Chelating resin, 190  
 Chlorides, 255, 264, 274  
 Chlorine, 58  
 Complex environments, 3  
 Concrete, corrosion of steel reinforcement in, 255, 264  
 Condensate, 246, 274  
 Containers, metal, 69  
 Continuous digesters, stress-corrosion cracking in, 9  
 Copper and copper alloys  
   ammonia test for stress corrosion of, 152  
   corrosion in seawater, 174  
   dissolved in seawater, 190  
   furnaces, performance in, 274  
   pitting corrosion in potable waters, 165  
   tarnishing, 60  
 Corrosion (*See also* Copper and copper alloys; Electrochemistry; Steels; Stress corrosion)  
   aluminum alloys in seawater, 217  
   anaerobic, 98, 112  
   atmospheric, testing methods, 58  
   of automotive components, 18  
   crevice, 165  
   erosion-corrosion, 190, 235

**Corrosion (*cont.*)**

- fatigue, 132
- galvanic, 18
- intergranular, 142
- local, 165
- pitting
  - copper, 165
  - steel, 246, 255, 274
- polarization, 27, 190, 223, 251, 257, 268
- rates, 27, 190, 235
- resistance
  - alloy ranking for, 120
  - ammonia test for, 152
- tarnishing, 60

**Corrosive environments (*See also* Fluids; Marine environments)**

- atmospheric, 18, 58
- complex, 3
- concrete, 255, 264
- flue gases, 3, 8, 120, 274
- formation water, 235
- furnaces, residential condensing, 3, 8, 274
- road salts, 18
- synthetic versus natural, 79
- water, 165, 235, 264

**Critical breakaway velocity, 190****D*****Desulfovibrio*, 98****Digesters, continuous, stress-corrosion cracking in, 9****E****Electrochemistry**

- aluminum alloys in seawater, 217
- furnace materials, 274
- intergranular corrosion of austenitic stainless steels, 142
- pitting corrosion of copper in potable waters, 165
- steel reinforcement in concrete and in pore solution, 264

**Electrolytes, 217****Erosion-corrosion**

- copper alloys in seawater, 190
- particle-containing formation water, 235

**F****Fatigue corrosion, 132****Ferrallium, 255, 27****Ferric chloride, 205****Ferritic steels, 27, 132, 274****Flue gases, 3, 8, 120, 274****Fluids (*See also* Marine environments)**

- body, 79
- formation water, 235
- metalworking, 112
- pore water, 264
- potable water, 165
- saliva substitutes, 79
- Food packaging materials, 69
- Formation water, 235
- Fracture, environment sensitive, 132
- Fresh water, 165
- Furnaces, residential condensing, 3, 8, 120, 274

**G****Galvanic corrosion, 18****Gels, alkaline, 255****H****Hastelloy G3, 27****Heat exchangers, 3, 8, 120, 274****Hydrogen sulfide, 58, 98****I****Interactions of solution variables, 3****Interstitial fluid composition, 81****Iron, cast, 98****L****Laboratory tests**

- alloy ranking for corrosion resistance, 120, 274

- aluminum alloys in seawater, 217

- copper alloys in seawater, 174

**Lacquers, 69****M****Machine tools, spoilage of metalworking fluids, 112****Marine environments**

- aluminum corrosion, 190, 217

- AISI 410 stainless, pitting in synthetic seawater, 246

- ASTM seawater, 190, 224

- copper corrosion, 174, 190

- dissolved copper effects in seawater, 190

- erosion-corrosion of copper alloys in seawater, 190

- microorganisms in seawater, 175

- pitting of AISI 410 stainless steel, 246

- salt spray (fog), 205

- synthetic, 190, 205, 217

Mass loss rate, 235  
Materials characterizations, 69  
Metal containers, 69  
Metallic biomaterials, 79  
Metalworking fluids, spoilage of, 112  
Microorganisms  
    anerobic corrosion by sulfate-reducing bacteria, 98, 112  
    in seawater, 175, 223  
    spoilage of metalworking fluids caused by, 112  
Monit, 27

## N

Nickel alloys  
    Fe-Ni alloys, 66  
    furnaces, performance in, 274  
    ranking for corrosion resistance, 120  
    sulfur dioxide scrubber chemistry, 11, 27  
Nitric acid, 142  
Nitrogen dioxide, 58

## P

Paper industry, 120  
Particles suspended in formation water, 235  
Passivation of metallic biomaterials, 83  
Permeability, 264  
pH effects, 132  
Pipe erosion, 235  
Pitting  
    alloy ranking for corrosion resistance, 120  
    copper in potable waters, 165  
    electrochemistry of, in steel reinforcement in concrete, 264  
    furnace materials, 274  
    simulation of, in steel reinforcement in concrete, 255  
    stainless steel in synthetic seawater and condensate, 246  
Polarization  
    curves, 27, 223, 251, 257, 268  
    resistance, 27, 190  
Pore solution, 264  
Porosity of concrete, 264  
Potential-pH diagrams, 137  
Preservatives, 112  
Pulp and paper industry, 120

## R

Regression analysis of complex environments, 3  
Road salts, 18

## S

Saline waters (*See* Marine environments)  
Saliva substitutes, 79  
Salt spray (fog), 205  
Sand, 235  
Screening experiments, 3  
Scrubber chemistry, 11, 27  
Seawater (*See* Marine environments)  
Seawater, synthetic, 217, 246  
Sensitizing, 142  
Serum composition, 81  
Silver tarnishing, 60  
Sodium chloride, 217  
Solutions  
    chemistry, 27  
    pore, 264  
    standard, 132  
    synthetic saliva, 79  
    synthetic seawater, 190, 205, 217  
Stainless steels (*See* Steels)  
Statistical analysis, 15  
Steels  
    AISI 410 stainless, pitting in synthetic seawater, 246  
    austenitic, intergranular corrosion of, 142  
    automotive components, 18  
    chrome coated, 75  
    chromium, 235  
    corrosion resistance, ranking for, 120, 274  
    Fe-Ni alloys, 66  
    ferritic, 132  
    furnaces, performance in, 274  
    reinforcement in concrete, electrochemistry of corrosion in, 264  
    reinforcement in concrete, pitting corrosion of, 255  
    stainless-clad aluminum, 18  
    stainless, corrosion in furnace condensates, 8  
    stainless steel type 317L, 27  
    stress-corrosion cracking in continuous digesters, 9  
    sulfur dioxide scrubber chemistry, 11, 27  
    synthetic versus natural marine environments, 205  
    tinplate, 69  
Storage of metallic materials, 58  
Stress corrosion  
    copper alloys, ammonia test, 152  
    environment-sensitive fracture, 132  
    steels, cracking in continuous digesters, 9  
Structural materials, corrosion of (*See* Concrete; Pitting; Steels; Sulfur dioxide scrubber chemistry)  
Sulfides, 60, 98, 112  
Sulfur dioxide scrubber chemistry, 11, 27

Supersaturation, 190

Synovial fluid composition, 81

Synthetic environments (*See* Atmospheric corrosion; Complex environments; Fluids; Marine environments; Water)

## T

Test methods, electrochemical, potentiokinetic, 142

Tinplate, 69

Titanium alloys

ranking for corrosion resistance, 120

sulfur dioxide scrubber chemistry, 11, 27

## W-Z

Water

formation, 235

pore, 264

potable, pitting corrosion of copper in, 165

saline (*See* Marine environments)

Wear, abrasive, 235

Zinc, 205