

## Index

### **a**

actinomycetes 169  
 Active Substances Manufacturing  
   Ordinance (AMWHV) 30, 109,  
   111  
 adjustment, definition 81  
 Aerobacter 165  
 AES-Chemunex-bioMerieux 313–314  
 aflatoxin 7, 8, 170  
 agar medium S 299, 301  
 agar, nutrient content 300  
 air-samplers 91, 93–95, 146, 151–154,  
   158, 325  
 alarms, assessment of 156  
 alarm values 155  
 alcohols (with OH group) 130  
 aldehydes (with CHO group) 130  
 Alternaria species 170  
 aluminosilicate glass 361  
 American Type Culture Collection  
   (ATCC) 104  
 amino acid decarboxylation 350  
*animalcula* 1  
 animal experimentation 228, 231  
 antibiotic activities 205–208  
 antibiotic concentrations 257–263  
 aqua purificata (AP) 36, 65, 130, 205,  
   211–212, 217–218, 233, 284,  
   297–300, 316  
 archaea 2, 5–6, 11, 15, 17, 32, 104,  
   292  
 artificial biofilm 297  
 asepsis 135

aseptic process simulation 267  
 aseptic production 127–136, 145, 276  
*Aspergillus* 8, 9, 148, 170, 204, 239, 240,  
   279, 315, 341  
*Aspergillus fumigatus* 8, 341  
*Aspergillus niger* 9, 170, 238, 279  
 ATP 14, 309–313, 319  
 authority audits 326, 328–330  
 autoclavable 41, 153, 353, 363  
 autoclaves, risk analysis for 359–360  
 automatic diluter 218  
 automatic dyeing machines 319–320  
 automatic filling machine 320–321  
 automatic staining instruments 319

### **b**

Bacillus 13, 32–33, 112, 163, 341, 349,  
   353  
 Bacillus cereus 199–200  
*Bacillus subtilis (globigii)* 45–47, 148,  
   163, 198, 239, 273, 279, 302, 316,  
   349  
 bacterial cell  
   capsule 11  
   endotoxins 11  
   exotoxins 12  
   fimbriae and pili 11  
   flagella 11  
   morphology  
     bacteria forms 13  
     endospores 13  
   physiology  
     ambient condition 15–18

- bacterial cell (*contd.*)
    - nutrition and metabolism 14–15
    - prokaryotic nuclear substance 10
  - Bacterial Endotoxins Test 179, 247
  - bacterial physiology
    - ambient condition
      - humidity 15–16
      - pH value 17–18
      - radiation 18
      - temperature 15
      - water activity 16–17
    - nutrition and metabolism
      - assimilation 14
      - dissimilation 14–15
      - respiration 15
  - bacteriophages, T phages 5
  - beneficial organisms 2
  - bifidobacteria 224, 225, 353
  - bile-tolerant Gram(-) bacteria
    - qualitative detection of 244
    - quantitative detection of 245
  - biocatalysts 14
  - biocontrol program 145
  - bioindicators, evaluation 211–213
  - biological agents 3, 4, 29–33, 233, 260, 362, 363
  - Biological Agents Ordinance (BiostoffV) 30
  - Biological Substances Ordinance 33, 136
  - blackening fungi 170
  - blister packs 223
  - borosilicate glass 37, 276, 361
  - bouillon 37, 40, 179, 267, 273–274, 279, 320
  - Bowie–Dick test 358
  - bracketing, media fill 269
  - Brevundimonas 13, 166, 167, 226, 279, 282
  - brightfield microscope 341–344
  - BRP-4.x and EC-6, reference standards 186–187
  - brucella 33, 169, 258
  - bubble point test 281
  - buffer stock solution 194
  - Burkholderia* 33, 166, 167, 179, 341
- C**
- calibrated conductometer 303
  - calibration
    - air samplers 93–95
    - autoclaves 90
    - balance 84
    - clean bench 90–93
    - definition of 81
    - description of 83–84
    - error 83
    - fluorescence reader for endotoxin
      - determinations 98
    - hot air sterilizers 89–90
    - incubator 88–89
    - particle counters 95
    - pH meter 85
    - photometer/Reader 96–98
    - piston pipettes 85–86
    - refrigerator/freezer 89
    - stopwatch 86–87
    - thermometer 87–88
    - tube reader for endotoxin
      - determinations 98
    - water activity 96
  - Campylobacter 168, 180, 349, 352
  - Candida albicans* 24, 169, 204, 240, 316
    - detection 246
  - capsid 5
  - cell culture
    - antibiotics for use 232
    - historical 232
    - laboratory 233
    - live cell count 234–235
    - passenging cells 234
    - safety instructions 233
    - total cell count 234–235
    - waste 233
  - cellulose acetate filter 178, 220, 236
  - cellulose prefilters 220
  - CFU 42, 335
  - Charles River Endosafe PTS™ 221
  - chemical disinfectants 130, 292
  - ChemScan 293
  - Chlamydiae 6
  - chromogenic endotoxin test 192

- chromogenic test 179, 184, 230, 248, 249, 257
- citrate utilization 350
- Citrobacter freundii* 43, 166
- Cladosporium 170
- clean room (partial barrier) 122, 136, 150, 177, 276, 319, 324
- cleaning agent 131, 133, 173, 227–228, 287, 355
- cleaning effect 130, 355
- cleaning validation  
microbiological methods in 287–289
- cleanroom classification 156
- Clostridia detection 246
- clothing 30, 31, 35, 111, 116–118, 120–123, 136, 145, 148, 272, 279, 336, 363
- coagulins 180
- Collection de l'Institut Pasteur (CIP) 90, 104, 204, 207, 279, 297
- color solutions, staining 347–349
- combined/differential stains 347
- conduct during audits 326–328
- container closure integrity test 282–286
- contamination, sources of 113–115
- contract testing 365–366
- control standard NP-4 186–188
- copper wires 282
- Corynebacteria 162, 353
- Corynebacterium tuberculostearicum* 162
- CPM 202, 367
- Cryptococcus neoformans* 169
- Culture Collection of Switzerland (CCOS) 104, 372
- customer audits 326, 330
- cytoplasm 10, 13, 129
- cytoplasmic membrane 10, 13, 129
- d**
- dark field microscope 344–345
- decontamination 116, 150–154, 162, 279, 324, 355–363
- Deinococcus radiodurans* 18
- depyrogenation 274–277, 355, 361  
tunnel 276
- detergents and disinfectants 227–228, 362
- diazo coupling 192
- dilute nitric acid 302
- dilution table 188
- DIN standards 31, 91, 214, 362
- direct contact methods 147
- direct inoculation 178–179
- disease outbreaks 296
- disinfectant 227  
and detergents 227–228, 362  
for eliminating microorganisms in biofilms 296
- disinfection 128, 133  
program 362  
measures, in case of accidents 363
- disinfestation 135, 140
- Dixon test 334
- DOL (steam-ozone-air) 358
- drinking water 36, 110, 130, 164, 291, 293, 294, 303–305, 316
- droppers 222
- dry heat, sterilization with 276–278
- DSZM 104
- e**
- ELISA 184, 197, 233, 308, 334, 351
- endotoxin content, calculation 190, 191
- endotoxin equivalent unit (EEU) 199
- endotoxin limit value (ELC) 189, 247–256, 299
- endotoxins 11, 112  
detection of 288–289  
formulations 187
- endotoxin standard series 186, 188, 189
- endotoxins testing 246, 257  
automation of 321–322  
OOE results 334, 335  
OOS results 334, 335
- Enterobacteriaceae 20, 21, 24, 43, 163–166, 179, 258, 351, 353
- Enterococci 160–161, 258
- environmental monitoring  
employees testing 148–150  
room air testing 145–146

environmental monitoring (*contd.*)

surfaces testing 147–148

Erwinia 163, 166

*Enterobacter* 21, 43, 163–166

*Escherichia coli* 19, 163

detection 244

with flagella 343

standards 187–188

ethylene oxide 128, 212, 330, 357

EU GMP Guideline 30, 34, 109, 140, 146,  
154, 156, 235, 272, 323, 324

Exophiala 170

exotoxins 12, 15

## f

Failure Mode and Effects Analysis  
(FMEA) 332

FAME 339, 351–353

fatty acids, types of 352

FDA 29, 31, 184–186, 190, 191, 200, 220,  
221, 235, 267, 270, 274, 291,  
326–330

fecal streptococci 160

fever-inducing substances 179–185

fission algae 1

flow cytometry 315–316

fluorassure 313

fluorescence microscope 345

fluorescence reader for endotoxin  
determinations 98

fluorescent substrate 184, 313

Food and Agricultural Organization 7

formal process validation 268

forward flow test 281

FT-IR spectroscopy 339, 353

fungi 170

staining of 347–349

*Fungi imperfecti* 7

further audits 329, 330

Fusarium 7, 170

## g

gas chromatography 339, 352–353

gas diffusion test 281

gaseous hydrogen peroxide 358

gaseous sterilization 151

gelatin liquefaction 350

gelation reaction 190

gel-clot test 37, 181, 186, 194, 200, 201,  
248, 249, 253, 256

Genetic Engineering Act 32, 105, 330

gentamycin activity 258–262

gentamycin, formula 258–262

*Geobacillus stearothermophilus* 102

German Accreditation Body (DAkkS) 84

German Animal Pathogen Ordinance  
105

German Genetic Engineering Act  
(GenTG) 32

German Ordinance on the Manufacture of  
Pharmaceuticals and Active  
Pharmaceutical Ingredients  
(AMWHV) 30, 109, 111

germination kinetics 358

Glucashield™ buffer 221

GlucateLL® test kit 220

β-1,3-D-glucans 220–221, 334, 335

glucose monohydrate 48, 57–62, 65, 67,  
72, 76, 217, 230

glycine 248, 249, 253, 256

Good Manufacturing Practice (GMP) 81,  
122, 123, 140, 142, 155, 202, 286,  
326, 329, 330, 359

gram negative bacteria 11, 15, 112, 129,  
163–169, 179, 180, 244, 245, 274,  
292, 334, 347–349, 353

gram positive bacteria 11, 43, 130,  
160–163, 180, 197, 204, 348, 349

gram staining 208, 319, 325, 349

Gram's stain 347, 348

Gram(+) bacteria

Staphylococci 160

Gram(-) bacteria

Enterobacteriaceae 163–166

pseudomonads 166–169

growth promotion test 44, 269

Grubbs test 334

## h

halogens (chlorine, iodine) 130

hand disinfectant 116, 227, 363

hand disinfection 116, 118, 128–131, 135, 325  
hand washing pastes 227  
hatch ray path 341  
heavy metal salts 130  
highly purified water (HPW) 58, 71, 301  
hot air sterilizer 37, 38, 89–90, 231, 275, 284, 355, 363  
hygiene 109–112  
  officer 112, 122, 136, 140, 157, 323  
  protocol 134, 136–137, 382  
  register 111–112, 140, 157  
  training courses 140–143  
hygiene measures  
  machine hygiene 123–127  
  personal hygiene 115–122  
  product purity 127  
  room hygiene 122, 127

**i**  
immunological rapid tests 351  
incubator 37–39, 81, 87–89, 197, 212, 228, 232–234, 283, 306, 319, 324  
indirect contact methods 147  
indole formation 350  
industrial hygiene  
  goal of 111  
Infection Control Act 31, 35  
Infection Protection Act (IfSG) 20, 29, 101, 105, 304, 330  
infection routes  
  direct 22–24  
  indirectly 24  
  nosocomial diseases 24  
  zoonoses 24–26  
infectious waste, disposal of 362–363  
inhibition and amplification test 246–247  
initial qualification test 189  
inoculating loop 283, 340  
inoculation tests 101, 228  
interference, elimination of 193–194  
*International Code for the Nomenclature of Bacteria* 22

*International Committee of Systematic Bacteriology* 22  
*in vitro* pyrogen test (IPT) 197–201, 231  
ion-exchange process 210  
ionizing rays 127, 357  
isolator (absolute barrier) 150

**k**

Köhler illumination setting 344  
kinetic chromogenic test 184, 230  
kinetic turbidimetric test 230, 248, 253  
Klebsiella species 165

**l**

laboratory cleaning and disinfection 360–362  
  qualification of 361–362  
  validation of 362  
LAL test 180, 195, 197, 200, 201, 220, 221, 230, 246, 257, 287, 288, 331, 332  
large containers 223  
large lids 223  
leak test 90, 282–285, 291  
Legionella 32, 167, 179, 291, 304–308, 349, 351  
LER effect 200–202  
light vs. electron microscope 341  
limit test (method A) 186, 189  
liquid nutrient media (bouillons) 15, 40  
live cell count 234–235  
low endotoxin recovery (LER) 186, 200, 202, 335  
luciferin-luciferase reaction 309  
lysate sensitivity 189–191, 247, 248, 257, 312, 335

**m**

machine hygiene 115, 123–127  
maintenance qualification 81  
MALDI-TOF 353–354  
masking/demasking 200  
MAT 35, 179, 184, 197, 200, 201, 231, 351  
maximum valid dilution (MVD) 189, 194, 195, 230, 246–248, 256

- m-CP Agar 304
- media fill
  - acceptance criteria 268, 270–271
  - bouillons 273–274
  - bracketing concept 268
  - employees training 269
  - fail 272–273
  - implementation 269–270
  - targets 267–268
- medical microbiology
  - infection routes
    - direct 22–24
    - indirectly 24
    - nosocomial diseases 24
    - zoonoses 24–26
  - medical monitoring 118–120
- membrane filters, integrity testing of 281
  - bubble point test 281
- membrane filtration 37, 147, 178, 223, 227, 236–238, 240, 242–246, 276, 299, 301, 302, 304, 307, 319
- Merck-Millipore Quantum 292–293
- metabolites 7, 8, 14, 15, 340
- microbial contamination 44, 232, 282, 299, 301, 302
- microbial purity 115
- microbiological action limit 223
- microbiological laboratories
  - laws and technical regulations 29–33
  - medical care for employees 33–35
  - nutrient media 39–47
  - operating description 36–37
  - required devices/equipment 37–39
- microbiology
  - history of 1–2
  - meaning of 2–3
  - medical 22–26
- Micrococci 161, 353
- Micrococcus kristinae* 161
- Micrococcus luteus* 148, 159, 161, 162
- Micrococcus varians* 161
- microorganism groups
  - archaea 5–6
  - bacteria 6
  - cell wall 10
  - Chlamydiae 6
  - cytoplasm 10
  - cytoplasmic membrane 10
  - fungi 7
  - mycoplasma 7
  - plasmids 10
  - prions 4–5
  - protozoa 9
  - reserve substances 10
  - Rickettsia 7
  - viroids 5
  - viruses 5
- microorganism identification
  - colored row, principle of 349–351
  - FT-IR spectroscopy 353
  - gas chromatography 339
  - generation time 340
  - growth curve 339–340
  - immunological procedures 351–352
  - MALDI-TOF 353–354
  - microscopic examination 341–347
  - PCR 352
  - pure cultures preparation 340
  - sensory and macroscopic
    - characteristics 340–341
  - staining 347–349
- microorganisms
  - stock collection
    - cultivation 106–107
    - microbiological pharmaceutical laboratory 101
    - reference 101–105
    - shipping 105
    - storage 105–106
  - taxonomy of
    - classification 18–22
    - nomenclature 22
- microorganisms evaluation 158–159
- microorganisms, register
  - Bacillus 163
  - Corynebacteria 162
  - Enterococci 160–161
  - fungi 170
  - Gram(+) bacteria 160–163
  - Gram(-) bacteria 163–169

- Micrococci 161–162  
 Paenibacillus 163  
 partially acid-resistant rods 169  
 Propionibacteriaceae 162–163  
 Streptococci 160  
 yeasts 169–170  
 microscopic cell size measurement 226  
 microtiter plates 38, 183, 184, 192, 193, 197, 198, 233, 321, 351, 353  
 Milliflex® Quantum 314–315  
 mimiviruses 5  
 moist heat (autoclave) 278–279, 355–357, 363  
 moist swabs 148, 287  
 monocyte activation test (MAT) 35, 179, 184, 197–201, 231, 351  
 Moraxella 167, 291  
 Mucor 170  
 mycobacteria other than tuberculosis (MOTT) 210  
 mycobacteria testing 210–211  
 mycoplasmas 7, 197, 208–210, 232, 274, 352
- n**
- Nalimov test 334  
 Natron glass 361  
 negative controls test 188–189  
 Neubauer counting chamber 234, 235  
 nocardia 169, 349  
 non-compendial methods  
   β-1,3-D-glucans 220–221  
   packaging materials testing 221–224  
   probiotic bacteria detection 224–225  
   vitamin concentrations 214–219  
 normal glass 361  
 nucleoid 6, 10  
 nutrient media  
   composition of 39  
   liquid nutrient media (bouillons) 40  
   preparation  
     Acetobacter Preservation Agar DSM 48  
     Bacto Neurospora crassa Agar 48–49  
     Baird Parker Agar 49  
     Biotin Inoculum 58  
     Biotin Maintenance Nutrient Medium 57–58  
     bismuth sulfite agar 72  
     BPLS agar 49  
     Brolacin agar 73  
     Ca-Bio-Nik-Agar 58–59  
     Calcium Pantothenate Maintenance Nutrient Medium 59–60  
     ChromoCult® Coliform Agar 52  
     Clostridia Culture Medium 60  
     CLP Agar 52  
     CSA (0.7) 50  
     CSA (4.0) 50  
     CSB 50–51  
     CSB, double buffered 51  
     Deoxycholate Lactose Agar 53  
     DEV Endo Agar 52  
     DEV Lactose Peptone Broth, double concentrated 53  
     DEV Nutrient Agar 53–54  
     Fluorocult LMX Broth 61  
     Folic Acid Cultivation Agar according to Freed 61–62  
     Glucose Broth 62  
     Inoculation medium for *Klebsiella pneumoniae* according to Seiffert 77  
     *Klebsiella* maintenance medium 76–77  
     Lactose broth 63  
     Lactose TTC Agar with Tergitol 7 54  
     Lethen Agar 54–56  
     Lysine decarboxylase culture medium 64  
     MacConkey agar 55  
     MacConkey Broth 64  
     Malonate broth 73  
     Mannitol saline phenol red agar 73–74  
     Meat Extract Agar 61  
     Mossel broth 74

nutrient media (*contd.*)

MRS agar with cysteine 74–75  
 nitrate broth 66  
 nutrient gelatin 66–67  
 ODC broth 66  
 OF Test Nutrient Medium 65  
 OM 211 for *Staphylococcus aureus*  
 76  
 inhouse production 77  
 Peptone Water 65  
 protective medium for lyophilization  
 67  
 purchasing 77–78  
 R2A agar 55  
 Rappaport-Vassiliadis Salmonella  
 Broth 75  
 RCM Agar (for Clostridia) 60  
 RCM agar plus lithium chloride 75  
 required devices 48  
 Sabouraud agar 55–56  
 Selenite Cystine Enrichment Broth  
 67  
 SIM Culture Medium 67–68  
 Simmons citrate agar 68  
 SLP Agar 68–69  
 Sodium chloride Peptone Buffer  
 64–65  
 Standard I agar 56  
 Standard I Slant Agar 56  
 TBG Broth 69  
 Thioglycolate Broth 69  
 Urea Slant Agar 62–63  
 Vitamin B<sub>12</sub>-test broth 69–70  
 Vitamin Biotin Test Broth 71  
 Vitamin folic acid test broth 70  
 Vitamin Nicotinic Acid Test Broth  
 70  
 Vitamin Pantothenic acid test broth  
 71  
 VRBD agar 57  
 wort agar 71–72  
 XLD agar 57  
 yeast agar 72  
 Yeast Extract Agar according to ISO  
 6222 63

selective nutrient media 43  
 solid nutrient media 40–42  
 with chromogenic substrates 43–47  
 nutrition and metabolism  
 assimilation 14  
 dissimilation 14–15  
 respiration 15

**o**

oligodynamic effect 130, 205, 207  
*o*-nitrophenyl- $\beta$ -galactopyranoside  
 (ONPG) 350  
 OOE results 330–337  
 OOS results 323, 326, 330–337  
 out of trend (OOT) 334  
 oxidizing agents 130

**p**

packaging materials testing 221–224  
*Paenibacillus* 13, 163  
*Pantoea agglomerans* 166  
 partially acid-resistant rods 169  
 pasteurization 113, 135–136, 291, 357  
 PCR 2, 5, 20, 209, 210, 225, 292, 308,  
 309, 352  
*Penicillium* 170  
 personal hygiene 111  
 clothing 117–120  
 general behavior 120–122  
 hand disinfection 116–118  
 medical monitoring 118–120  
 wash and disinfect hands 116  
 pest control  
 aftercare 139–140  
 biological methods 136, 139  
 chemical methods 139  
 infestation control 139  
 physical methods 139  
 precautionary measures 138–139  
 pH value controls 253  
 Phage T4 347  
 phase contrast microscope 344  
 phenols 130  
 physical operation 155–158  
 Physikalisch-Technische Bundesanstalt  
 (PTB) 84, 86



- physiological saline solution 40, 148, 320, 337
- pigging 297
- pipettors 222
- plate casting method 2, 225, 227
- plate casting process 241–242
- polyglucosans 220
- polymerase chain reaction (PCR) 2, 5, 20, 209, 210, 225, 292, 308, 309, 352
- pouring evaluation process 223
- preservation checking 202–205
- preservative load test 205, 207
- primary cell cultures 232
- prions 4–5, 25, 273, 375
- probiotic bacteria detection 224–225, 375
- process-related validation 280
- process validation
  - cleaning validation 286–289
  - container closure integrity test 282–286
  - depyrogenation 274–276
  - media fill 267–274
  - sterile filtration 279–281
  - sterilization with dry heat 276–278
  - sterilization with moist heat 278–279
- product purity 115, 127
- product-related validation 280
- prokaryotic nuclear substance 10
- Propionibacteriaceae 162–163
- proteinaceous infectious particle 4
- Proteus* 21, 42, 165, 341
- protozoa 2, 9, 30, 112, 295, 303
- provisional recommendations 31
- Pseudomonads 15, 112, 143, 158, 166, 168, 179, 258, 282, 291, 292, 295, 353
- Pseudomonas aeruginosa* 24, 43, 105, 129–130, 142, 166–167, 204, 239, 282–286, 303, 310, 312
  - detection 245
- pupillary ray path 343–344
- purified water 58, 71, 148, 149, 185, 291, 293, 297–301
- pyrogenic effect 11, 180, 197, 292
- pyrogen test 179, 180, 197–200, 202, 230, 274, 337, 365
- pyrogens 35, 112, 179, 180, 197, 230–231, 246, 274, 280, 336, 337, 351
- pyrogens testing
  - OOS and OOE results 337
- Pyroturb<sup>®</sup> test kit 220
- q**
- Q fever 7, 22
- qualification of laboratory and validity
  - of standard curves 191–192
  - of standard lines 192–193
- quality assurance
  - authority audits 328–330
  - conduct during audits 326–328
  - customer audits 330
  - self-inspections 328
  - structure of SOP system 323–324
  - suppliers audits 330
  - training 324–326
- quality assurance further audits 330
- quantitative test 186, 189–190
- quartz glass 361
- r**
- rabbit pyrogen test 180, 197, 231, 365
- Ralstonia pickettii* 167, 282
- rapid microbiological methods 311
  - via ATP content 309–313
  - flow cytometry 315–316
  - Milliflex<sup>®</sup> Quantum 314–315
  - Scan RDI<sup>™</sup> 313–314
- ray fungi 169
- ready-to-use ampoules 213–214
- Recombinant Regents 179
- reserve substances 10, 347
- Rhodotorula 170
- Rickettsia 7, 24, 33
- room air testing 145–146
- room hygiene 115, 122–127
- Rothia mucilaginosa* 161–162
- rouging/blacking 301–302

RSTM (rapid sterility test medium)  
313

## S

Sabouraud glucose nutrient 239–240  
 Salmonella, detection of 245  
 salmonellae 112, 164–165, 352  
 sampling 30, 154, 158, 275, 284, 291,  
 293–294, 324, 325, 335  
 Scan RDI™ 313–314  
 secondary cell cultures 232  
 sedimentation plates 41, 146, 152, 153,  
 158, 325, 326  
 selective nutrient media 43, 45  
 self-inspections 324, 326, 328  
 serological group D 160  
 Serratia 21, 163, 165, 258, 282  
 sewage fungus 292  
 Shigellae 164  
 Sinner's circle 355, 357  
 skin fungi 8  
 small lids 222  
 solid nutrient media 40–42  
 SOP system 323–324  
 specimen transport 294–297  
 spectrophotometer 38, 96, 219, 322  
 Sphingomonas 166, 167  
 spore count 212, 213  
 spore strips 90, 211–213  
 Standing Commission on Vaccination  
 (STIKO) 35, 377  
 Staphylococci 23, 159, 160, 258  
*Staphylococcus aureus* 160  
 detection 245  
 OM 211 for 76  
*Staphylococcus auricularis* 160  
 state health authorities 329  
*Stenotrophomonas maltophilia* 167  
 Sterikon® plus 90, 211, 213–214  
 sterile filtration  
 integrity testing of 281  
 process-related validation 280  
 product-related validation 280  
 type 280  
 sterile nutrient media 267

sterile production, physical monitoring in  
154–155

sterility test isolator

documentation 154

example of 151–154

monitoring in 153–154

sterility testing 31, 44, 177–179, 238, 319,  
336

OOS and OOE results 336–337

sterilization 127–128

autoclaves, risk analysis for 359–360

Bowie-Dick test 358

dry heat 355

gases 357–358

germination kinetics 358

moist heat (autoclave) 355–357

radiation 357

stock collection

cultivation 106–107

reference 101–105

requirements 101

shipping 105

storage 105

stoppers 222, 270, 279, 282–284, 361

Streptococci 15, 160, 258

Streptomyces 169, 258, 340

sugar cleavage 350

suppliers audits 330

surface-active substances 130

## t

TAMC

plate casting method 225

testing, OOS and OOE results  
335–336

TAMC/TYMC 36, 174–177, 238–246

and specified microorganisms  
238–246

Technical Rules for Biological Agents  
(TRBA) 31, 33

temperature brakes 89

test execution 190

test organisms 203, 204, 206, 211, 215,  
239, 261

thermometers 81, 87–88, 231, 337

thermosensors 89, 231, 337  
 total bacterial count 31, 43, 176,  
     225–226  
 total cell count 234–235  
 TSB nutrient medium 239  
 tube reader for endotoxin determinations  
     98  
 turbidimetric endotoxin test 98, 190–191  
 turbidimetric method 38, 208, 257–263  
 turbidimetric-kinetic method 190  
 turbidimetric-kinetic test 179, 248, 249,  
     257  
 TYMC testing  
     OOS and OOE results 335–336

**u**

ultraviolet rays 357  
 unmasking 202  
 urea cleavage 350  
 U.S. Centers for Disease Control and  
     Prevention (CDCP) 90

**v**

VAAM Expert Group Quality  
     Management 367–368  
 validation of pharmacopoeial methods  
     antibiotic concentrations 257–263  
     endotoxins testing 246–257  
     sterility testing 236–238  
     TAMC/TYMC and specified  
         microorganisms 238–246  
 verification, definition of 81  
 viable but non-culturable (VBNC) 314

*Vibrio* 11, 12, 17, 22, 24, 167–168, 294,  
     340

*Vibrio cholera* 12, 24, 294

viroids 5

vitamin concentrations

    cyanocobalamin in 216, 218

    vibrating mill operating 216

vitamin D<sub>3</sub> 199

Voges–Proskauer reaction 350

**w**

War Weapons Control Act 20, 105

wash and disinfect hands 116

washing emulsions 227

water contamination 164, 294, 296, 302

water extraction 302

water for injection (WFI) 147, 231, 284,  
     301–302

water intrusion test 90, 281, 360

water qualities 291, 299, 300

wet germs 24

wet mopping method 136

**y**

yeasts 2, 7–8, 24, 29, 36, 44, 47–48,  
     57–61, 63, 72, 104, 106, 111–112,  
     142, 158, 169–170, 180–181, 197,  
     204, 217, 224, 228, 238–240,  
     273–274, 313–315, 341, 347, 351,  
     353

**z**

zoonoses 24–26









