

Index

a

- ablating 926–927
- ablating process 926–927
- abrasion resistance 942, 945, 1079–1080
- abrasion testers 945–946
- abrasiveness 123–124
- absorbency and porosity 757–759
- absorption tests 193
- account book paper 1046
- acid dyes 171
- acoustics 995–996
- additives 284
- additives, for repulping 325–327
- adhesive binding. *See* bookbinding (adhesive binding)
- adhesive joints 947
- adhesives 929–930, 949
- aerobic treatment, for wastewater 536
- affinity 164
- agglomerates 247
- aggregates 247
- aggregation and deposition 304
- air along process and surface–active substance sources 316–319
- air bearing caliper measurement 867
- air content measurement methods 322
- air flotation dryers 780
- air/gas measurement 321–322
- air in papermaking process and removal 623
- air impingement drying 720–721
- airmail paper 1046
- air solubility in water 427
- air-supported turnup systems 809
- air system 723, 737, 738, 739, 740, 741
- air–water mixture in Mollier diagram 723–725
- air water moisturizers 873–874
- album board 1057
- alkaline pulping. *See* sulfate process
- alkenyl succinic anhydride (ASA) 201–204
- alkyl ketene dimer (AKD) 198–201
 - application of sizes 200–201
 - dispersions 198–199
 - reactions/sizing features 199–200
 - wax 198
- alum 187
- aluminum (hydroxide) chloride 341–342
- aluminum compounds 291–295
- aluminum nitrate 342
- aluminum salts in water systems 341
- aluminum sulfate 341
- aluminum trihydrate ATH (hydrated alumina) 138
- American Tree Farm System (ATFS) 1029
- amorphous precipitated calcium carbonate 139
- amorphous silicates and silica 138
- amylomaize 152
- amylose retrogradation. *See* retrogradation
- anaerobic treatment, for wastewater 536–537
- analytical and industrial filter papers 1054–1055
- anionic direct dyes 165–167
- anionic trash 1068
- anisotropy 1038, 1039
- antitarnish paper 1057
- apparent knife angle 921
- approach flow system
 - air intake 623–624
 - for graphic paper machines 630–631
 - for packaging paper and board machines 631–632
 - for specialty paper machines 632–634
 - for tissue grade machines 632

- aqueous processes 1090, 1102–1103
- Arab paper 18
- arboxylated styrene–butadiene latexes (XSB) 253
- art drawing papers 1056
- artificial chromo board and triplex board 1052
- artificial leather raw materials 1055–1056
- artificial parchment 228
- aspect ratio 240
- associative cellulosic thickeners (ACTs) 262
- associative thickeners 260–263
- ATMOS tissue machine 832
- Austrian National Library process 1103
- automation 856–857
- automation system 862, 863, 864
- autooxidation 1091
- auxochromes 163

- b**
- bacteria 310
- bacteria level 277–278
- balance of plant (BoP) 1006–1007
- barring
 - in calenders 884–886
 - monitoring system 877
- base paper 1046–1047, 1056–1057
- base paper properties 760–764
- basic dyes 168–169
- basicity 292–293, 339
- basis weight 1071
 - machine direction control 869–870
 - measurement 865–866
- basis weight control 872
- basis weight measurement 865–866
- basis weight profile 654–656, 881, 887–890
- batch coating color preparation 279
- Battelle process 1098
- beating degree 1066–1067
- Bekk smoothness 1079
- belt calender 792, 793, 825
- belt conveyor 855
- belt filters and twin-wire presses 437, 438
- bending stiffness 915, 947, 1079
- bent blade 776–777
- bentonite 140
- Beta technique 1085
- binders 250–252
 - natural polymer binders derivatives 252–253
 - processing 283–284
 - synthetic latex binders 253–254
 - systems, comparison 255
- binder yarn 593
- binding papers 1057
- biocide 140–141, 312–314
- biofilms 337
- biokidneys 495
- biological oxygen demand (BOD) 1068
- biological sludge 538
- birdeyes 266
- bitumen 330
- black liquor evaporation plant 42
- blade and rod coating 775–777
- blade coating 747
- blade-coated LWC/offset and rotogravure 796–797
- blades 263, 663, 669, 670
- bleaching 44, 54–55, 353
- bleed fastness 177
- blistering 763
- blotting papers 1047
- blow box 704
- Blue Wool Scale 177, 190
- board 1052
- board for cups 1053
- board for playing cards 1057
- board grades 1048–1049, 1051–1053
- boil-out 295, 333, 334
- book and paper preservation 1087–1088
 - by aging 1088–1090
 - alterations due to aging 1091–1092
 - oxidative deterioration process 1090–1091
 - aqueous processes 1102–1103
 - bookkeeper process 1101–1102
 - CSC booksaver 1102
 - magnesium oxide dust 1102
 - Papersave process[®] 1098–1101
- bookbinding (adhesive binding) 950–951
- bookbinding board 1057
- bookkeeper process 1101–1102
- bookkeeping transparent paper 1046
- Book Preservation Associates (BPA) 1095
- bound air 319
- BPA process and DAE process 1095
- Braille codes 945
- breaking length 1075
- bridging–dewetting mechanism, for fast film rupture 321
- brightness 117–118, 269, 423–425, 1070, 1080
- British Library process 1097–1098
- broke pulpers 370–371
- broke treatment systems 487–488
- brown mechanical pulp board 1052
- Bückenburger process 1102–1103

building papers and boards 1055
 build-own-operate (BOO) models 496
 build-own-operate-transfer (BOOT) model 496
 bursting strength 1076
 butyl acrylate 254

C

cable and condenser paper 1055
 calcined clay 136
 calcium stearate 264
 calender bowl paper 1056
 calender paper shafts 589
 calender rolls 568–570
 calender stack barring 998
 calendaring 793–794
 – embossing calenders 793–794
 – extended nip calenders 792–793
 – friction calenders 794–795
 – history 786–789
 – machine calenders 789
 – multinip calenders 791–792
 – soft calenders 790–791
 – supercalenders 789–790
 calenders 825
 caliper 1071
 – measurement 867
 – profile 884–886
 caliper control 874–875
 caliper measurement 867
 caliper profile 884–886, 897–900
 Canadian Standard Association (CSA) 1029
 Canadian Standard Freeness (CSF) 56, 459, 1066
 – Shopper Riegler 1067
 cantilever beams 616–617
 car body cardboard 1057
 carbon copy paper 1046
 carbonizing base papers 1047
 carbonless copy papers 1046
 carboxylated celluloses 211–212
 carboxy methyl cellulose (CMC) 249, 252, 257
 cardboard for beer mats 1057
 carousel conveyor 855
 carton boards 756, 823–827, 1051
 cartridge papers and boards 1053
 casein 252, 256–257
 cast coated pulp board 1052
 cast functional layer (resin covers) 586–587
 cationic additives 187–188
 cationic demand of the liquid 1068
 cationic direct dyes 168
 cationic polymers charge control 307–309

cationic starch 154, 155, 156, 198–199, 204
 causticizing 42
 cellulose derivatives 252
 cellulose-reactive sizing agents 194
 cellulose wadding 1053
 cellulosic fibers 166
 center-supported guide rolls 562
 central distributor tank headbox 650
 centrifugal cleaning 352, 397
 centrifuges 530–531
 ceramic coatings 587
 CD main fiber orientation profile 656–657
 Chain of Custody (CoC) 1029
 changing of fabrics 615–617
 charge control 307–309, 871
 charge control with cationic polymers 307–309
 chelating agents 322–325
 chemical additives interactions 344–347
 chemical oxygen demand (COD) 305, 1068
 chemical pulp 33, 34–36, 1042
 chemimechanical pulp (CMP) 51, 57
 chemithermomechanical pulp (CTMP) 36, 51, 57
 chemistry of agents 302
 Chinese paper 16–17
 chipboard 1052
 chromatography papers 1054–1055
 chromium coatings 588
 chromo board 1052
 chromophores 163
 CIELAB 269, 868, 966, 1080
 CIE whiteness 180–181
 cigar and cigarillo casing paper 1057
 circular sedimentation clarifier 535
 cleaner cascade system 405
 cleaner with rotating housing 407
 cleaning agents and fabric conditioning 331–333
 cleaning and conditioning of fabrics 609–615
 cleanliness efficiency 357
 climate tests 953
 closed filter systems 285, 286
 closed water circuit 538–539
 clothing, cleaning and conditioning 334–336
 cloudiness 1036
 Clupak process 823
 coagulation 338
 coarse hole screening rejects 516
 coarse rejects handling 501, 520
 coarse screening 385–388
 coat weight measurement 868

- coat weight profile 886
- coated board 799
- coated packaging papers 1050
- coated paper grades 798
- coated papers 1050
- coated printing papers 1043–1045
- coated pulp board 1052
- coated surface measurements 1085
- coater blade backing rolls 571
- coating 159–160, 933
- coating coloration 176
- coating color formulations 747–749, 768–769
 - binders 765–767
 - drying 780, 783
 - machines 772–773
 - penetration and migration 757
 - pigments 765
- coating base papers 1055
- coating color preparation
 - batch preparation 287, 288
 - binder processing 281–284
 - continuous coating color preparation 287–288, 289
 - degassing of coating colors 285–287
 - dispersing of pigments 279–281
 - screens and filters 285
 - supply systems for coaters 288–289
 - tanks 284–285
- coating color properties 272
 - structures 276
- coating colors 176, 235–237
 - additives 254–256, 266–272
 - binders 250–254
 - dispersants 247–250
 - pigments 238–240
 - structures 236
- coating color requirements from consecutive processes 755–756
- coating colors components and properties 764–765
- coating holdout 288, 776
- coat weight measurement 868, 1085
- Cobb Unger oil test 904
- cobinders 251, 255–258
- Cobra system 256, 809
- cockling 906–907
- co-cross-linking 218, 223
- coffee stain effect 963, 979
- coldset printing 975
- collecting effect 415
- colloids 337–338
- colorants 160, 175
- color measurement 868
- colorimetric space 176, 177
- colorimetry 176
- color measurement 868
- color origin 161–162
- Combi cleaners 626–627
- combined heat and power (CHP) 1026, 1031
- combustion technology choice 548
- commercial mass deacidification history 1094–1098
- composite roll covers 585–587
- composition and chemical paper testing 1072–1074
- compression resistance test 951
- compression tests 948–949, 953
- computer-to-plate (CtP) technology 953
- Concoramedium test 1078
- conditioning agents 333–334
- Conservación de Sustratos Celulósicos (CSC) Booksaver process 1102
- consistency 881–882
- consistency sensor calibration 871
- contact angle testers 943
- contact drying with steam heated cylinders 715–720
- contacting caliper measurement 867
- contact rewetting 687
- contact time 166–167
- contactless coating 748–749
- contamination factors for successful cleaning result 330–331
- continuous inkjet systems 962, 963
- controlled nip line load distribution 572
- control of basis weight and fiber orientation 642
- control system 859–864
- conventional tissue machines
- conventional wrapping machines 850–851
- converting process 911
- converting products testing 937–938
 - bookbinding (adhesive binding) 950–951
 - cores 949, 950
 - corrugated board 947–948
 - labels 949
 - packages 948–949
 - specific material tests 938–947
 - transportation tests 951–952
- conveying systems 526–527
- coordinated speed change control 869, 950
- copy base papers 1047
- copying papers 1046–1047
- correction press rolls 698
- correspondence envelope paper 1046
- corrugated and kraft grades 67

- corrugated board 947–948
- corrugated crush test (CCT) 1078
- corrugated papers 1050–1051
- corrugating 917–918
- corrugation 846, 854, 917–918
 - corrugating medium 1048
- counterflow cleaner
- covering papers and cardboards 1055
- cover paper and board 1057
- “Cradle to Cradle” concept 1027–1028
- creasing and folding properties 944
- crepe packing material 1049
- crepe paper 1054
- creping 829–830
 - additives 227
- Crescent former 827–828
- critical strain 276
- Croda test 1082
- cross direction control 872–875
- cross-linkers 267, 268
- cross machine direction (CD) 740, 860, 872
- cross machine (CD) control of basis weight
 - and fiber orientation 642
- crown control (CC) roll 573, 893
- crushing 688–689
- crush resistance 1078
- curl 904–906
 - causes and cure 905–906
 - mechanism 905
- curl index 1062–1063
- curtain coating 778–779
- cushion stop lines, segmented 854
- cut cross section 923, 924
- cutting edge length per second (CEL) 456
- cutting point 924
- Cybercell 417
- cylinder drying 780
- cylinder former 665, 669–670, 824
- cylindrical screens 385–387
- d**
- dandy roll 566–567, 664, 671–672
- Darcy’s law 661, 684
- data papers and boards 1046
- deacidification 1092–1098
- deaeration 624–625
 - by centrifugal forces 626–628
 - cleaner 627
 - foam pump 423
 - by gravity 625
 - by vacuum 625–626
- debarking 627, 637
- decoration crepe 1057
- decor base paper 1056
- décor paper 838
- deculators 320
- Define Measure Analyze Improve and Control (DMAIC) process 1060
- deflaker 372
- deflaking effect 392
- deflection control rolls 572–575, 787–788
- deflocculation 248, 279, 640, 644, 645
- defoamers and deaerators 265, 316
 - application and air/gas measurement 321–322
 - chemical composition 321
 - chemicals 319–320
- defoaming and deaeration chemicals 319–320
- degassing, of coating colors 285–286
- deinkability 72–76
- deinked pulp (DIP) 478, 795, 814, 817, 818
- deinking 34, 411
 - additives 327–330
 - grades 68
 - material 478
 - sludges 529
 - sorted graphic paper for 67
 - test 72–76
- deinking additives 327–330
- delignification 34
- Dennison wax-picking test (TAPPI T459om) 1083
- deposit control 309
 - applications survey 314–315
 - impairments due to microorganisms 310–311
 - microbiology 309
 - prevention 312
 - project 315–316
 - regulatory affairs 315
- dewatering 353, 620, 623–624, 681, 829
- dewatering in nip phases 683–685
- dewatering–pressing 525–526
- DEZ process 1096
- dialdehyde starch (DAS) 225
- diapers and sanitary towel covers 1054
- diethyl zinc (DEZ) 1094, 1096
- diffusional mixing of microfibrils 209
- digital printing 977–979
- dilution actuators 872
- dimensional analysis single-curve method 103
- DIN standards 177, 913, 938, 943, 944, 946, 949, 981, 1059, 1060, 1065, 1072, 1079, 1080

- direct dyes 164–168
 - anionic 165–167
 - cationic 168
 - dirt 1069–1070, 1081
 - dirt specks 411, 425
 - reduction 425, 426, 463
 - disk filters 438–439, 440, 441
 - disc refiners 53
 - disc thickeners 437–438, 439, 530
 - disintegration 352, 371
 - continuous and discontinuous 373–374
 - disk disperser
 - mechanism model 467–468
 - principle design and operating parameters 465–467
 - disk filters 438–439, 440, 441
 - disk screen 372–373
 - disk screening 372–373, 385
 - disk thickener 437–438, 439
 - dispersants 247–250
 - dispersed size particle 195
 - dispersing 279–281, 353, 474, 475–476, 480–481, 486
 - dispersion
 - dispersion system
 - disk disperser 465–468
 - displacement dewatering 696–698
 - by pressure 697
 - by vacuum 697–698
 - dissolved air flotation (DAF) 426, 429, 481, 488, 505, 506
 - dissolved soyabean proteins 253
 - dissolved substances fixation 303
 - distributed control system (DCS) 860, 862, 864
 - distributor rollers 961
 - distributor tank 640
 - dithionite 453
 - doctor blade 955, 957
 - dosing of dyes 173–174, 175
 - double coating 774
 - double-felted nip 704–705
 - double-layer press felt 600
 - drag reduction 86
 - drainage index (DI) 596
 - drawing cut 921
 - drop-on-demand (DOD) inkjet technologies 962, 963
 - drop test 949
 - drum debarker 37
 - drum pulper 368–370
 - reject handling 520–521, 522
 - drum pulping rejects 513–514
 - drum pulpers 368–370
 - drum thickeners 436–437
 - dry ammonia ethylene oxide (DAE)-process 1095
 - dryer fabrics
 - cleaning 614–615
 - fabric design and history 604–605
 - manufacture 605–606
 - requirements 603–604
 - dryer hood ventilation 737
 - dryer section 713
 - types 730–732
 - drying 829
 - drying curve 725–726
 - drying of coated and surface-sized paper and board 742–744
 - drying rate and energy balance 713–715
 - dry lamination 933
 - dry strength additives (DSAs) 209–210, 211–213
 - application 213
 - cellulose derivative 211–212
 - synthetic 212–213
 - dusting 1083
 - dyeing mechanism 162–164
 - dyes 269
 - dynamic mechanical analysis (DMA) 1078
 - dryness 679, 680, 682, 698
- e**
- Eastern spread of paper making 17
 - Eco-Efficiency Analyses (EEAs) 1027
 - eco-label 1029–1031
 - edge crush resistance 1078
 - edge crush test (ECT) 947, 1076
 - efficiency assessment 1014–1016
 - efficient equipment and investment 1017
 - electricity and hazards 987
 - electromagnetic sensor 867
 - electromagnetic spectrum 161
 - electronic nose 1073
 - electrophotographic printing (laser printing) 977–978
 - electrophotography 965–966, 977–978, 1047
 - electrostatic assist (ESA) 955, 973
 - electrostatic stabilization 248
 - elementary chlorine-free (ECF) pulp 461
 - embossing 916, 931, 945
 - embrittlement, of paper 1092
 - emulsion adhesives 929
 - energy 1026
 - optimal energy layout for entire paper mill 1018–1020
 - optimization 1016–1017

- process modifications to reduce intake 1017–1018
- significance 1013
- energy balance 713–715
- energy recovery from backflows 628–629
- entrained air (air bubbles) 317
- envelope lining tissue 1046
- environmentally friendly production 1021
 - energy 1026
 - in paper and board production 1023
 - resource utilization 1023–1024
 - secondary pulps 1025
 - virgin pulps 1024–1025
 - water 1026
 - worldwide and European efforts 1023
- epoxidized polyamide resins 218–224
- equivalent black area (EBA) 1070, 1081
- European papermaking, processing steps in 21
- European Recovered Paper Council (ERPC) 34, 72, 73, 74
- evaporation plants 41–42
- evener roll headbox. *See* rectifier roll headboxes
- exclusion of gases and vapors 1084
- expanded granular sludge bed (EGSB) reactors 537
- extended nip calenders 792–793
- extensible kraft sack paper (Clupak) 1049
- extrusion method 583

f

- fabrics 591
- fabrics in operation 606
- facial tissue and handkerchiefs 1054
- fancy cardboard 1048
- fatty acid soap 414–416
- FEFCO 947
- felt and wool-felt board 1055
- felt dewatering. *See* suction box dewatering
- felting techniques 14–15
- felts 699–701
- f*-factor 801
- fiber fractionation 1063–1064
- fiber materials feeding 359
- fiber orientation anisotropy in web 676–678
- fiber-reinforced functional layer 585–586
- fiber stock preparation systems
 - primary 476–477
 - secondary 478
 - peripheral systems 488
- fiber support index (FSI) 595–596
- fiber surface schematic models 209
- fiber suspension testing
 - beating degree 1066–1067
 - brightness 1070
 - consistency 1065
 - dirt 1069–1070
 - fiber classification 1066
 - sampling 1064–1065
 - shives and flake content 1066
 - stickies 1068–1069
 - water properties 1068
 - water retention 1067–1068
- fibers 28, 29–30
- fibers as individuals 26–27
- fiber flocs and vicissitudes 28
- fibrous materials 33
 - chemical pulp 34–36
 - grades list 66–68
 - use of grades 68–69
- fibrous material testing 1061
 - composition 1061–1062
 - fiber fractionation 1063–1064
 - length and length-related properties 1062–1063
- filing board 1048
- filled/paper rolls 786
- filler machine direction control 870
- fillers measurement 866
- fillers 167
- fillers (white pigments) 186–187
- film-coated LWC offset 797
- film coating 777–778
- film press 158
- film size press 570–571
- filter encasing paper 1056
- filter mass 1055
- final stage screens 387–388
 - coarse screening 387–388
 - fine screening 389–390
- FINAT 949, 951
- fine rejects 501
 - difference with sludge 516–517
 - handling, and combined systems 523, 525
 - from low-consistency cleaning 517
 - from slotted fine screening 517–518
- fine screening 388–391
 - basket types 388–389
 - final stage screen 389–390
 - machine types 388
 - systems 390–391
- finer and filler distribution 903–904
- finishing 841
 - reel slitting

- fire protection 992–993
 - first aid 990–991
 - fisheyes 266
 - fixatives and charge control 300
 - dissolved substances fixation 303
 - particular substances treatment 303–305
 - test methods for agents 305–306
 - treatment strategies for interfering substances 300–302
 - fixed point measurement 865
 - flame-retardant paper 231
 - flake content 374–376
 - flake reduction 376
 - flat-back embossers 794
 - flat crush test 947
 - flavonic acid-based FWAs, structural
 - formula of 182
 - flexographic printing 956–959, 971–972
 - flotation cells 417–420
 - flotation system and flotation selectivity
 - 420–421
 - flocculation 86–87, 98, 104, 298, 338–341
 - flocks. *See* agglomerates
 - flong 1057
 - flow 87–88
 - flow approaching screen openings
 - 380–382
 - flow mechanisms 88–90
 - flower crepe paper 1057
 - fluid dynamics, on substrate and
 - solidification 955–956, 958, 960–961, 963
 - fluidization 99
 - fluidized bed incineration 545–546, 547
 - fluorescence hue 184
 - fluorescent whitening agents (FWAs)
 - 178–179, 181. *See also* optical brightening agents (OBAs)
 - cationic additives 187–188
 - cis-trans isomerism 182
 - fluorescence hue 184
 - greening/graying limit 188–189
 - light fastness 190
 - fluting 1051
 - FMC and Lithco process 1098
 - foam 265
 - foam handling 421–422
 - foils 670
 - foil boxes 670
 - folding 914–916
 - folding boxboard (FBB) 761, 1049
 - folding strength 1078
 - footprint approach 1031
 - Forest Stewardship Council (FSC) 1025, 1029
 - forming board 670
 - forming fabrics
 - forming process 913–914
 - forming roll 563–564, 670
 - formulations 272–274
 - Fourdrinier machines 643, 824
 - Fourdrinier wire section 663–664, 666–667
 - fractionation 352
 - machinery 432–433
 - technical aspects 433–434
 - freeness. *See* beating degree
 - frequency shifting, of roll system 886
 - freshwater treatment 342–343
 - frictional connection 931
 - friction calenders 794–795
 - functional chemicals 145–146
 - functional printing 205, 953
 - furnish type influence 685–686
- g**
- gap former 665–666, 668–669
 - gardener's crepe 1057
 - gas chromatography (GC) 1073
 - gas control 871
 - ghosting effect 975
 - glassyne 1050
 - gloss 270, 1081
 - measurement 868
 - gloss control 875
 - gloss measurement 868
 - glueability 271, 928–930, 946–947
 - gluing 928–930
 - glutinous rice 152
 - glyoxal 267
 - glyoxalated polyacrylamide resins 222–224
 - gooseneck system 809
 - grade change control 869
 - granite rolls 589
 - granite rolls and calender paper shafts 589
 - graphic papers 506–508, 813–814, 1041–1048
 - approach flow system 630–631
 - grades systems 478
 - – wood-containing natural printing papers 1042–1043
 - grate incineration 544–545, 547
 - gravity table 530
 - gravure paper 972–974
 - gravure printing 954–956, 969
 - graying point. *See* saturation point
 - grease permeability 1084

grease proofness 942
 greaseproof papers 1048, 1050
 greenhouse gas (GHG) 1023, 1026
 greening/graying limit 188–189
 grinding process 48–49
 ground calcium carbonate (GCC) 127–130,
 238, 242–243, 750–751
 guide rolls 245, 560–561
 guillotine cutter 921
 gypsum (calcium sulfate) 135–136,
 245–246
 gypsum liner board 1055

h

Haindl fractionators (for shive analysis)
 1063
 hand-build method 583
 handling technology 518–525
 hard metal coatings 587
 hasp 802, 803
 hazardous substances 985–986
 headbox
 – acoustics basics 995–996
 – falling hazards on papermaking plants
 994–995
 – fire protection 992–993
 – industrial trucks 993
 – load-lifting equipment in hoisting
 operation 993–994
 – operational parameters 651
 – of paper mills neighborhood 1002
 – pressure equipment 991–992
 – primary measures 997–998
 – protection 984–991
 – secondary measures 998–1002
 – sound sensitivity to individual 996–997
 – state-of-the-art headboxes 642–643
 – suspension acceleration, deflocculation,
 and delivery 640–641
 – uniform distribution across machine
 width 636
 headbox with central distributor tank 650
 headbox flow rate 882–883
 heat flux 714
 high-intensity pressing 696
 heat recovery system 738–739
 heat resistance 178
 heat sealing 946
 heatset printing 975–976
 heat-setting principle 598
 heat-set web offset (HSWO) 763
 heat transfer 88, 714, 715–717, 720, 721
 722, 726, 740
 Helio-test 1079

Hemhoff test 1072
 hemicelluloses 45
 hemocytometer 305
 hexamethyldisiloxane (HMDSO)
 1098–1099
 high-consistency cleaning rejects 515
 high-consistency cleaners and systems
 403, 404
 high consistency pulpers 367–368
 high consistency pulping rejects 514–515
 high consistency refining 459
 high consistency refining machines
 459
 high-pressure water jet turnup 810–811
 high-turbulence headboxes. *See* hydraulic
 headboxes
 high velocity hood. *See* tissue dryer hood
 high-weight coated (HWC) papers 761
 hollow sphere 246–247
 homo-cross-linking 218
 Hookean behavior 275
 horizontal impact tests 952
 hornification 81
 hotmelt 929
 hot sealing paper 1057
 hot setting paper 1057
 household filter papers 1054
 humic acids 184
 hybrid former 665, 668, 824
 hydraulic headboxes 644–650
 – for Fourdrinier wire section
 – secondary headbox 649–650
 – for twin-wire gap formers 647–648
 – two-layer headbox 648–649
 hydraulic pressure and fiber structure
 resistance 681–683
 hydraulic punch presses 525
 hydrein roll 574
 hydrocyclones 354, 397, 398, 399–403
 – basics
 – selection and operation rules 402–403
 hydrophobic alkali-swellaable emulsions
 (HASEs) 262, 400
 hydrophobic ethoxylated urethanes (HEURs)
 261
 hydrophobic modified hydroxyethyl cellulose
 (HMHEC) 262
 hydro vario roll 575
 hygienic papers 1053–1054
 hygroscopicity 1036

i

IC cleaners 403
 imitation cork paper 1056

- impeller flotation cell 417
 - impregnation 933
 - impulse drying 723
 - impulse pressing technique 696
 - incineration technologies
 - industries 548
 - inclined wire 667–668
 - index board 547, 1046
 - industrial trucks 993
 - information system 862, 864
 - infrared drying 722, 780
 - infrared heating 874
 - INGEDE methods 70, 71, 72–73, 76–78, 1070, 1085
 - ink absorption 1082
 - ink acquisition 955, 957, 960, 962
 - ink corrosion 1091
 - ink-jet printing 1047
 - inkjet printing 962–965, 978–979
 - inks and process properties 956, 958, 961, 964
 - ink transfer, to substrate 955, 958, 960, 963
 - input–output configurations, for paper
 - converting machines 934
 - insect resistant and insecticide paper 1057
 - insolubilizers 266–268
 - intaglio printing 954–955
 - integrated recycled paper mill (IRPM)
 - dewatering–pressing 525–526
 - handling technology 518–525
 - freshwater 502
 - metal detection and magnetic separation 526
 - shredding 525
 - storage systems 528
 - types 512–518
 - – peripheral sludge systems and primary and biosludge integration 529–531
 - – process stage sludges and characteristics 529
 - – sludge pressing 531–532
 - subsystems and peripheral systems 493–494
 - technical and operational aspects 494–496
 - process water 502–503
 - typical paper mill water loops 503–510
 - reject subsystems 501
 - sludge subsystems 500–501
 - water subsystems 500
 - interface controlled dewatering 497, 682
 - internal sizing steps 195
 - internal water and effluent treatment
 - internal water treatment 343
 - International Electrotechnical Commission (IEC) 1055
 - intoxication 987
 - ion chambers 865
 - ISO brightness 180
- j**
- Jacquard system 597
 - Janus calender 791
 - Janus MK 2, 791
 - jet direction 638
 - jet velocity 637
 - jet quality 662
 - joining 927–928
 - joining process 927–928
- k**
- K&N test 1082
 - kaolin 124–127
 - clays 242
 - kaolin (hydrous) 124–127
 - kitchen towels 1053–1054
 - KIT test 1084
 - kneading disperser 468–469
 - knott method 583
 - kraft-faced liner 1051
 - kraft liner 1048, 1051
 - kraft packing papers 1049
 - kraft paper 1046, 1049
 - kraft sack paper 1049
 - kraft tissue 1049
- l**
- labels 949
 - laminated base paper 799
 - laminating 933–934
 - latexes 281
 - latex properties 767
 - layout and load plans 1007–1009
 - leather fiberboard 1057
 - leave bleached kraft pulps (LBKPs) 461
 - letter file cardboard 1048
 - letterpress board 1048
 - letterpress printing 957
 - leuko dye 230
 - life cycle approach 1031
 - Life Cycle Assessments (LCAs) 1027
 - life lessons 26
 - light fastness 177, 190, 946
 - lightweight coated (LWC) paper machines 817
 - lightweight reject handling 522–523
 - lignin sulfonates 250

limitations in use 761
 limiting dry content 685
 linting 1083
 lip 670
 liquid penetration, into paper surfaces 943
 Lithco process 1098
 load-deformation properties 1078–1079
 load-lifting equipment in hoisting operation 993–994
 long dwell time applicator (LDTA) 775
 long fiber fraction 486–487
 long-fiber paper 1057
 Lorilleux Porometrique test 1082
 low consistency (LC) cleaners
 low consistency cleaners and systems 403, 405–407
 low consistency pulpers 365–366
 low consistency pulping rejects 514
 low consistency refining machines 458–459
 lubricants 263–264
 LWC paper machines 817

m

machine calenders 786, 788, 789, 797
 machine condition monitoring system 876
 machine control system (MCS) 859–860, 864
 machine direction control 869–872
 machine direction (MD) 860–861, 869–872. See also cross machine direction (CD)
 machine glazed (MG) machines 825, 836
 machine-made board 1049
 machine room ventilation 738
 machinery cleaning and water circuit 334
 macroflocs 339–340
 macrostickies 1069
 magnesium ethanolate (METE) 1098–1099
 magnesium oxide dust 1102
 main coating pigments 242–245
 main fiber orientation (MFO) profile 656–657, 890–892, 893–894
 manifold distributor 640
 map and nautical chart papers 1048
 mass balance and definitions, in separation system 356
 mass deacidification history 1094
 mass deacidification process development 1092–1094
 mass spectrometry (MS) 1073
 material paper 1035–1036, 1039–1040
 matrix embossing machines 794
 McNett fiber classifier 1063
 MD/MC ratio of paper properties 651–652
 mechanical deaeration 626–628
 mechanical pulp 33, 47–48, 1042
 – machines and aggregates 53
 – mechanical, thermal, and chemical impacts in refiner process 51–53
 – principles 50–51
 mechanical shear stress 774
 mechanism 162–164
 mechanistic-based models 103–104
 mechanization and industrialization 19–21
 MedienStandard Druck 969
 medieval European paper 18–19
 medium consistency MC flow 98–100
 melamne–formaldehyde resins 216, 267
 metal–EDTA chelate complex 323
 metals and alloys 587–588
 metered size press (MSP) 745, 746, 747, 752
 metering 773–774
 microbial-induced corrosion 311
 Microcontour test 1082
 microflocs 338–339, 340
 microflotation and circuit cleaning sludge 529
 micronized talc 133
 micropolymers 299
 mill board 1053
 millwide water circuit systems
 mineral fillers 109
 mixed office waste (MOW) 478, 481
 mixed soda pulp paper 1049
 mixing 446, 447
 mixing and storing 353
 modified natural ground calcium carbonate 138–139
 moisture content 1072
 moisture control 872–874
 moisture expansion (ME) 1072
 moisture machine direction control 870
 moisture measurement 866
 moisture profiles 698, 892, 894–897
 moisturizers 873
 Moller method 103
 monitoring systems 862, 864
 motor control center (MCC) 861–862
 mottling 271–272, 763, 1082
 multicylinder dryer section
 multinip calenders, modern 791–792
 multiparameter modeling 83–85
 multiple carbon base papers 1047
 multiple paper recycling 81–85
 multi-ply production 824

multipurpose paper 980
 multistage pressure screen 55
 multi-station winders. *See* single-drum winders
 multizone rolls 573–575, 788

n

nanofibrillized cellulose (NFC) 142
 natron pulp 38
 natural ground calcium carbonate (GCC) 127–130
 natural polymer binders derivatives 252–253
 natural products 256–257
 NCR-paper (noncarbon required) 229
 needle-bleached kraft pulp (NBKP) 461
 neutral sulfite semichemical (NSSC) pulping 36, 45, 46
 neutral wet-strength resins 219
 newsprint 795, 814–815, 1042
 newsprint paper machines 814–815
 Newtonian behavior 275
 nip 683, 811, 955
 Nipcorect roll[®] 575
 Nipco roll 573–574, 787, 885
 nip dewatering 681
 nip load system 805
 noise 986–987
 noise abatement and protection 995
 noise propagation 995–996
 nonadhesive labels 949
 nonionic polymers 250
 nonselective flotation 353, 425–430
 Nordic turnup 428, 809

o

objective and description 849
 occupational health and safety 983
 office and administration papers 940, 1046–1048
 off-line coating 772
 off-line multinip calender 838
 off-machine coaters (OMC) 772
 offset paper 974–976
 offset printing 959–961, 971
 offset wrapping machines 851
 old and brittle paper strengthening 1103–1104
 old corrugated containers (OCCs) 476, 484, 486
 one-time carbon (OTC) base paper 1047
 one-zone rolls 575
 online multinip calender 814, 816
 opacity 270, 1081

opaque drawing papers 1056
 open screens 285
 optical brightening agents (OBAs) 158, 268–269. *See also* fluorescent whitening agents (FWAs)
 optical caliper measurement 867
 optical laser pitch counter, tests with 305–306
 optical properties 1080–1081
 optical sensor 867
 OptiLoad calender 791
 originals preservation by mechanical paper splitting 1104–1105

p

packaging paper 820–823, 850
 – approach flow system 631–632
 packaging paper and board grades 1048–1053
 pad printing 955
 pair test 1073
 pan dewatering. *See* nip dewatering
 paper and board for technical and specialty uses 1054–1057
 paper and board grades 783
 paper associations 1109–1111
 paper color 868
 paper curl 729
 PAPERDAM 968
 paper deterioration
 paper for continuous forms 1046
 paper invention 16
 Paper Machine Clothing Association (PCA) 598
 paper machine 21, 334–336
 paper machine clothing cleaning and conditioning 334–336
 papermaking into Central and Southern Asia 17–18
 paper mill water loops, typical 503–504
 – circuit closure current limits 508–509
 – zero-effluent systems 509–510
 paper–printing process and print results 968
 Papersave process[®] 1098–1100
 – ZFB:2 procedure 1100–1101
 paper shrinkage 727–728
 paper splitting machine 1104–1105
 paper strength theory 208–210
 paper testing 1059
 Papiertechnische Stiftung (PTS) 947, 1028, 1029
 papyrus 15–16
 parchment and barrier papers 227–229

- parchment base paper 1050
- Parker-Print-Surf (PPS) 1079
- particle charge 123
- particle charge-detecting devices 1069
- particle clusters disruption 248
- particle morphology 120
- particle size 240–241
- particle size distribution (PSD) 241–242
- particle size and particle size distribution 120–122
- Parylene process 1104
- passivation 333, 335
- pasted board 1052
- penetration tests 193
- perforated (open) rolls 562–563
- periodic bulging 963, 964
- peroxide bleaching 452–453
- personal protection 989
- photographic base paper 1056
- photographic protective wrapping (black photo) paper 1057
- pH 277
- pH-value and sizing 167
- picture postcard board 1048
- pigment slurries preservation 140–141
- pigments 171–176, 238–240, 279–281. *See also individual entries*
 - inorganic 171–172
 - main coating pigments 242–245
 - make-down process 281
 - organic 172–173
 - particle size 240–241
 - particle size distribution (PSD) 241–242
 - slurries preservation 140–141
 - special 245–247
- piling 1083
- pin adhesion test (PAT) 947
- pinholes 955
- plant engineering
 - basic engineering 1005–1006
 - detail engineering 1009–1110
 - principle methods 1004–1005
 - procurement engineering 1012–1013
- plasma coating 588
- plastic films 932
- plastic pigments
 - in coating 246–247
- pocket ventilation 736–737
- polyacrylamides (PAMs) 212–213, 296
- polyacrylate salts 249
- polyamidoamine epichlorohydrin (PAAE) 218, 219–221
- poly(cyclohexylenedimethylene terephthalate) (PCTA) 604
- polyethylene 264
- polyethyleneimine (PEIs) 224, 296
- polyisocyanate 225
- polymeric sizing agents 204–207
- polyphenylene sulfide (PPS) 604, 605
- polyphosphates 249
- poly(propylene glycols) 264
- polyurethane roll covers 583–585
- polyvinyl alcohol (PVOH) 257, 751
- poly(vinyl acetate) latexes (PVAc) 253
- polyvinylamine (PVA) 154, 213, 225, 283–284
- polyvinylformamide/polyvinylamine resins (PVF/PVAm) 213
- poly(vinyl pyrrolidone) (PVP) 257
- pond size press 570
- Pope reel 802, 803, 804, 808, 826
- porosity 270–271
- positive locking 931–932
- potassium zirconium carbonate 267
- potato starch 148, 150
- precipitated calcium carbonate (PCC) 130–133
 - amorphous 139
 - as coating pigment 238, 244
 - as mineral fillers 130–133
- predewatering, of sludge 246, 530–531
- press designs with roll press nips 689–690
- press drying 723
- press felts
 - cleaning 612, 614
 - design and history 600–601
 - manufacturing 601–602
 - requirements 598–600
 - transfer belts 602–603
- press impulse 682–683
- press nip geometry 577
- press rolls 567–572
- press section 568, 679
- press span 1055
- pressure cutting 919–922
- pressure equipment 991–992
- Pressure Equipment Directive 1011
- pressure grinding 49
- pressure groundwood (PGW) 48, 685
- printability 967, 1081–1083
 - influencing 271
 - properties 943–944
 - sensors 869
- print gloss 270–271
- printing and press papers 1041
- printing properties 1081–1083
- printing technologies 953–954
- print unevenness 1082

- private–public shared peripheral systems (PPP) 496
- process and instrumentation diagrams (P&IDs) 1007
- process and quality parameters 966
- process chemicals 291
 - application 298–299
 - flocculation 338–341
 - freshwater treatment 342–343
 - functionality 295–296
 - internal water treatment 343
 - microbiology 309
 - prevention 312
 - regulatory affairs 315
 - trends 299
 - potential problems by use of aluminum salts in water systems 341–342
 - wastewater treatment 343–344
 - water 337–338
 - water systems in paper and board mills 336–337
- process condition monitoring system 876–877
- processing 53–54
- procurement engineering 1012–1013
- Product Carbon Footprint (PCF) 1027
- production maximization control 869
- profile roll 573
- promethium 865
- properties 56–59
- ProSoft calender 791
- protective colloids 249
- proteins 283, 284
- PTS Method 70
- pull test (tear out test) 950–951
- pulp 13
- pulp brightening 186
- pulper reject handling 521–522
- pulper ropes 522
- pulper ropes handling 522
- pulpers 364–365
- pulping and detrashing 513–516
- pulp flow in open channels 100
- pulping and sizing 21, 23
- pulp stone 49
- pulsation dampening 638–639, 644, 646–647, 648
- pulsation elimination (for MD basis weight control) 641
- puncture energy test 947, 948
- puncture resistance 1076
- pyrophyllite 135

q

- quality control system (QCS) 860–861, 864, 868–869
- quality management 1059, 1060

r

- radial and axial stretch wrapping 853, 854
- radial stretch wrapping 853, 854
- radiation and hazards 988
- reagent and indicator papers 1054
- recalled paper with spots 311
- recovered paper 59–61, 1025
 - grades list 66–68
 - resources 65–66
 - use of grades 68–69
 - utilization rates for paper grades 63–64
- recovered pulp 359, 361
- rectifier roll headboxes 643–644
- recyclability and paper products requirements 69–72
- recycled fibers (RCFs) 759, 760–761
 - limitations in use 761
- recycling 34, 761
- reductive bleaching 453–454
- reel drum design 806–807
- reel drums 571
- reeling
 - air-supported turnup systems 809
 - center drive 804
 - new generation reels 804
 - Nordic turnup 809
 - oscillation 806
 - tape turnup system 810
 - turnup with high-pressure water jet 810–811
- reel slitting
 - automatic functions 848–849
 - automation/operation 849
- refiner fillings 997, 998
- refiner mechanical pulp (RMP) 51
- refiner process 50–53
- refining 353
 - basics 455–456
 - for fiber preparation 477, 481
 - operational and technological aspects 459–462
 - principle solution 455
- reflection curves of white and colored paper 162
- refractive index 118
- reject systems 501
 - metal detection and magnetic separation 526

- types 512–518
- reject thickening factor 395
- reject subsystems 501
- replacement fuels 396, 543–544
- residuals, definition of 511
- resistance to picking (ISO 3783) test 1083
- resource utilization 1023–1024
- retaining paper strength 210
- retention 660, 882
- retention aids and drainage accelerators
 - application 298–299
 - functionality 295–296
 - trends 299
- retention time, temperature, speed (RTS™) 51
- retrogradation 152, 282
- return on invest (ROI) 1061
- rewetting 686–688, 825, 873
- riveting 931
- Robinson test 1072
- rod coating 775–777
- roll applicator 775–776
- roll covers and coatings
 - application and function 577–581
 - objectives and basic design criteria 577
- roll doctor 557
- roll-to-roll transport 934–936
- roller refiner 457
- roll conveying 854–856
- roll handling
 - automation 856–857
 - offset wrapping machines 851
 - wrapping machines using stretch film 853–854
- roll hardness 801, 802, 804
- rolls 560
- roofing felt base 1055
- rope marks 846
- rosin size 187, 195–198
- rotating-drum sludge thickener 530
- rotogravure 954
- rotor–stator dispersing principle, with variable shear technology 280
- rubber roll covers 582–583
- rub resistance 178, 945
- runnability 1081, 1083

S

- Sankey diagram 1015, 1016
- satin white 247
- saturating base papers 1055, 1056
- saturation point 269
- SC paper machines 815–816
- SC-A/offset and rotogravure 796

- SC-B/offset and rotogravure 795–796
- scanning electron microscope (SEM) 753
- scanning measurement 864–865
- school writing paper 1046
- screening 352. See also fiber stock preparation systems
 - efficiency 394–397
 - fine screening 388–391
 - flow approaching screen openings 380–382
 - flow in accept area 382–383
 - flow through screen openings 382
- screening gap 392–394
- separation probability 379–380
- thickening factor 394
- screening residue 277
- screwing 931
- screw presses 439–440, 441, 442, 525, 532
- sealability 930–931, 946
- sealing 930–931
- seamed felts 600
- seamless felts 600
- secondary kraft sack paper 1049
- secondary pulps 1025
- security, banknote, and archival papers 1048
- selective flotation 352, 411
 - brightness 423–425
 - dirt specks 425
 - two-phase flow 412–414
- self-adhesive products 949
- semichemical paper 1051
- semimechanical pulp properties 46–47
- semimechanical pulp 44–45
- semipermeable belts 695
- separating 918
- separating process 353–354, 918
- separation diagram 357
- separation rewetting 686–687
- serviettes 1054
- setback 282
- sewing 931
- shear cutting 922–926
- shear force effects 400
- sheet cutting 841
- sheet-fed machines 937
- sheet-fed offset printing 763, 976
- sheet forming 663, 667, 675
- sheet-lined board 1053
- sheet stealing 705
- sheet support binder (SSB) 593
- sheet-to-sheet transport 936–937
- shoe calender 792–793
- shoe nips 691–692

- shoe press 690–691
- short dwell time applicators (SDTAs) 752, 777
- shredding 525
- shrink wrap 849
- silicon base paper 1050
- silicone base paper 798–799
- silicone derivatives 416
- simple presses 525
- single coating 774
- single-drum winders 847–848
- single-felted nip 705
- single issue approach 1031
- single-nip shoe press 692–694
- Sinner's circle 331
- size emulsions preparation 203
- sizing features 203
- size press 746
- sketching papers 1056
- slat conveyor 855
- slice lip actuators 872
- slime pins 310
- sludge dewatering systems 528
- sludge handling 430
- sludge pressing 531–532
- sludge subsystems 500–501
- smoothness and gloss 270
- smoothness and gloss profiles 900
- sodium tripolyphosphate 250
- soft calender 788, 790–791, 799
- soft sensors 869, 871, 878
- sole-binder 251, 254
- solid-state detectors 865
- solid waste composition and characteristics 539
- solids content 277
- solvent resistance 178
- sorted graphic paper, for deinking 67
- sorting deck 857
- sound sensitivity, to individual 996–997
- soyabean protein 253
- soy lecithin/oleic acid blends 264
- specialty filler pigments 139–140
- specialty papers 833–839
 - approach flow system 632–634
 - chemical additives 226, 231–233
- specialty papers and chemical additives 226, 231–233
- specific edge load (SEL) 456, 461
- specific surface area 122
- spent cooking liquor regeneration 41
- spiral wrapping machines 851–853
- splitting 918–926
- spore-forming fungi 310
- spray nozzles 557
- spray sizing 747
- spraying starch 157
- spreader rolls 561–562
- stacking test 949
- staling 152
- stapling 931
- starche 146–147, 211, 281–283
 - applications 155–157
 - as binders 281–283
 - coating 159–160, 933
 - cooking process 283, 284
 - derivatives 252
 - sources 148–149
 - spraying starch 157
 - structural unit and starch processing 149–152
 - surface sizing 157–159
- starch gelatinization 151, 642
- start-up control 869
- state-of-the-art headboxes 642–643
- state-of-the-art press sections
- state-of-the-art web forming designs 666
- steam and condensate systems 735–736
- steambox actuators 872–873
- stepwise approximation method 101–103
- sterilization paper 1057
- stickies 330, 463, 1068–1069
- stock consistency 167
- stock dyeing 174
- stock freeness 166
- stock preparation systems processes 354–355
- stone groundwood (SGW) 48
- storage systems 528
- storing 446
- straight-through presses 689, 691, 694, 695
- strain at rupture 1074
- strength properties 1074–1078
- stress-growth test 276
- stress-relaxation test 276
- stretch wrap 849–850
- stretching and guiding of fabrics and belts 606–609
- strontium 865
- structural cohesion 918
- styrene-acrylic ester (SAE) copolymers 206–207
- styrene-butyl acrylate dispersion (SBA) 253
- styrene-maleic anhydrides (SMAs) 204–206
- substantivity 164
- substrate papers 1055

- suction box 671
- suction couch roll 564, 664
- suction press roll 564–566
- suction rolls 671, 997
- suitcase board 1057
- sulfate process 36, 38–42
- sulfite pulp 42, 44
- sulfite wrapping paper (ZP) 1049–1050
- sulfur dyes 169–170
- supercalendered base paper for waxing 1050
- supercalenders 786–788, 789–790, 815–816
- surface coloration 176
- surface densification 707–710, 904
- surface open area (SOA) 596
- surface pH 942
- surface properties 1079–1080
- surface roughness 705–707
- surface sizing 147, 157–159, 745
- surface smoothness 904
- surface tension 1083
- suspended solids removal 534–535
- sustainability
- Sustainable Forest Initiative (SFI) 1029
- sweep coagulation 339
- swimming roll 573, 786–787, 886
- symmetry in z-direction 880, 903
- synchro-cross-cutter 925, 926
- synchronized and unsynchronized profiles 902–903
- synthetic dry strength additives 212–213
- synthetic latex binders 253–254
- synthetic products 257
- synthetic surfactants 416
- system 464–465
- systems in paper and board mills 336–337
- t**
- table rolls 664, 670
- tail threading and web handling 732–735
- talc 133–135, 245
- tapa (bark cloth) 14
- tape turnup system 810
- tapioca starch 149
- TAPPI 180, 186, 685, 1069, 1077
- tear resistance 1076
- technical drawing papers 1056
- tenax migration 1073
- tensile energy absorption (TEA) 729, 1075
- tensile index 1074
- tensile stiffness index (TSI) 941–942, 1075
- tensile stiffness orientation (TSO) 941–942, 1075–1076
- tensile strength 1073
- testing, of paper and board 1070
- test liner 1051
- test methods for agents 305–306
- tetrasodium pyrophosphate 250
- The Programme for the Endorsement of Forest Certification (PEFC) 1025, 1029, 1030
- thermal coatings 587–588
- thermographic paper 230
- thermomechanical pulp (TMP) 51
- thermoplastic covers, sleeves and coatings 588
- Thermopulp™ (Thermo pulp) 51
- thickeners 258–260
 - associative 260–263
 - and cobinders 256, 266
 - mechanisms in aqueous phase 260
 - role in coating colors 259
- thickening 475, 480–481, 486
- thickening factor 394
- through air dryer (TAD) 740–742
- through air drying 721–722
- ticket board 1048
- tinting (shading) 268
- tissue 226–227, 1053–1054
- tissue cylinder 739–740
- tissue dryer hood 740
- tissue dryer section 739–742
- tissue grade machines and approach flow system 632
- tissue machines 827, 830–831
- tissue paper and products test methods 952
- titanium dioxide 137, 186
 - in coating 247
 - as specialty filler pigment 137
- toilet paper (bathroom tissue) 1053
- torque 844, 847, 848
- transfer belts 602–603, 695
- translucent drawing paper 1056
- transparency 1081
- transport in machines 934
- transportation tests 951–952
- trash, definition of 511
- triangle test 1073
- tri-nip press 689, 705
- turbulence 636–637
- turntable 856
- turnup systems 808
- turnup with high-pressure water jet 810–811
- twin-wire formers 665–666
- two-drum winders 844–847
 - with air relief 845–846

- two-drum winders (*contd.*)
 - with belt support 846
 - classical 844–845
 - modified 845
 - with soft covered drums 846
- two-layer paper 1051
- two-phase flow, in flotation
 - bubble aggregate to suspension surface 413
 - bubble generation 412–413
 - collision of dirt particles with bubbles 413
 - foam removal 414
- two-sidedness, of paper 1039

u

- ultralightweight coated (ULWC) papers 761
- ultrasonic penetration test 943
- uncoated board 799
- uncoated papers 797–798
- unfixed particles in filtrate, volume distribution of 306
- unidirectional flow 401
 - recovered pulp 359, 361
 - virgin pulp 359
 - at low consistencies 448
 - at medium and high consistencies 449–450
- up-ender 404, 857
- urban mill model 498–499
- urea–formaldehyde resins 217, 267

v

- vacuum boxes 612, 614
- vacuum deaeration 624, 628
- vacuum degassing for curtain coating 287
- vacuum rolls in dryer section 567
- vacuum variation 883–884
- vegetable gums 211
- vegetable parchment 227, 1050
- ventilation systems 736–739
- vertical drop tests 952
- virgin pulps 1024–1025
- vibration tests 952
- virgin fibers 33, 477
- virgin pulp 359, 1024–1025
- viscoelasticity 275–276, 1039
- viscoelastic suspension behavior 96–97
- viscosity 274–275
- viscous fingering 955, 958
- void volume 596
- volumetric and stock mass flow 638

- vulcanization 583
- vulcanized fiber 227–228

w

- warp bound sheet support binder 593
- washing 353
 - machinery 443–444
 - technological aspects 444–445
- washing process 41
- washing process stage sludge 529
- waste, definition of 511
- waste to energy and incineration of rejects and residuals 542–548
- wastewater 532
 - biological sludge 538
 - biological treatment 535–537
 - characterization 533
 - COD as parameter 533
 - closed water circuit 538–539
 - treatment 343–344, 534
 - sludges 540
 - suspended solids removal 534–535
- water, reject, and sludge (WSR) subsystems 499–500
- water 337–338, 1026
 - for anionic direct dyes 167
 - chemical and physical parameters 337–338
- water absorption 1084
 - water circuit systems
- water circuit systems
- water circuits 501
 - freshwater 502
 - process water 502–503
 - typical paper mill water loops 503–510
- Water Footprint (WF) 1027, 1031
- watermarking and security 24–26
- water retention 276–277
- water retention value (WRV) 276–277, 685, 1068
- water-soluble binders 251
- water systems, in paper and board mills 336–337
- water subsystems 500
- water vapor permeability 942
- waste regulations 540–541
- wastewater treatment 343–344
- wastewater treatment sludges 540
- wax emulsions 264
- waxy maize 152
- waxy potato starch 152
- weaving principle 597
- web break monitoring 877

- web forming 827–828
 - web guiding 704
 - web inspection system 877
 - web properties uniformity 879
 - CD profiles 887–900
 - formation 907–908
 - MD and CD basis weight profile tests in laboratory 900–901
 - test samples 902
 - MD and CD profiles requirements and interdependencies 880
 - MD profiles 881–887
 - profile deviations definition by statistical methods 879
 - web transfer 701
 - closed 702–704
 - in closed draw 701
 - in open draw 701–702
 - web transfer and guiding 701–705
 - web-wide cutting knife 809
 - Wei T'o process 1096–1097
 - wet creped tissue 830
 - wet end chemistry
 - dewatering and retention 156–157
 - strength additive 155–156
 - wet end control 175, 870–871
 - wet-end process (WEP) 619, 1016, 1017
 - wet lamination 934
 - wet moulding (ATMOS) tissue machines 832–833
 - wet pressing impact on paper surface properties 705
 - surface densification 707–710
 - surface roughness 705–707
 - wet strength 1078
 - wet strength change during drying 728–729
 - wet-strength resins (WSRs) 210, 214–215, 224–226
 - wet suction boxes 670–671
 - wetting 248
 - WFC paper production machines 819–820
 - WFU paper production machines 817–818
 - wheat starch 149
 - white line chipboard (WLC) 826, 1049
 - whiteness 179–180, 269
 - white water 557, 621, 660
 - winder 841–844
 - drums 571–572
 - winder drums 571–572
 - winder types 844–847
 - winding 916–917
 - wire section
 - drainage and retention 659–661
 - fiber deposition and orientation 662
 - flocculation level and dispersing in web formation 663
 - machine elements 670–672
 - wires 672
 - wires, retention aids, and chemical additives 666
 - web formation 675
 - web symmetry in fines and filler distribution 676
 - wood-containing and fine (WF) papers 760
 - wood-containing natural printing papers 1042–1043
 - wood-containing paper grades
 - wood-containing papers 48
 - wood-containing systems 478–481
 - woodfree coated (WFC) paper production machines 819–820
 - woodfree DIP grades and systems 481, 483
 - wood-free natural printing papers 1043
 - woodfree paper grades
 - uncoated papers 797–798
 - woodfree uncoated (WFU) paper production machines 817–818
 - wood log chipping 37
 - wood preparation for pulping processes 36–38
 - wood pulp fiber suspensions 85–86
 - work-horse 845
 - wrapped drum 844, 846
 - wrapping material 849–850
 - wrapping machines 853–854
 - conventional
 - offset
 - spiral
 - wrapping machines using stretch film 853–854
 - writing papers 1046
- x**
- xerography. See electrophotography
 - X-ray absorption method 1085
- y**
- Yankee cylinder 799, 829, 832, 836
 - Yankee dryer 894. See also tissue cylinder
 - yellowing 1091
- z**
- z-directional strength 1077–1078
 - z-direction symmetry 903
 - ZELLCHEMING methods 1063, 1066
 - zero-effluent systems 509–510
 - ZFB:2 procedure 1100–1101

zirconium acetate 267

0-line position 737

zonal heating of rolls 874–875

– zonal heating and cooling 875

zone-controlled calender rolls 874

zone-controlled deflection rolls
787–788