

# SUBJECT INDEX

- abrasives, 7, 61, 65, 68, 72, 73, 86, 111, 112, 117-119, 122, 124, 125, 142, 143, 147, 148, 150, 151, 159, 163, 174, 182, 199, 201, 266, 302, 316, 321, 333, 371-375, 381-391, 395-398, 405, 406, 413, 454, 455 aluminum oxide (Al<sub>2</sub>O<sub>3</sub>), 68, 73, 117, 127, 150, 281, 398 emery, 199 sand, 86 silicon carbide (SiC), 150, 397 silicon dioxide (SiO<sub>2</sub>) 150, 398
- accelerators, 349, 351
- accessible, 97, 108, 109, 198, 448
- acetic acid, 67, 74, 75, 152
- adhesion, 52, 61, 65, 67, 73, 74, 80, 150, 163, 344, 435
- aliphatic acids, 349
- allowance factor, 22-24
- aluminum, 6, 7, 35, 52, 62, 64-68, 71-74, 83-85, 87, 114, 116-121, 125, 177, 130, 133, 147, 149, 150, 153-155, 168, 178, 182, 183, 203, 207-215, 218, 220-223, 228, 229, 232, 255, 256, 260-262, 266, 269-282, 287, 288, 290, 299, 307, 311, 315, 321-324, 328-331, 333-335, 338, 345, 346, 455
- aluminum oxide (see *abrasives*)
- aluminum wheels, 322, 329
- AmplWCheck, 288, 289
- amplitude and speed, 131, 250
- ancillary equipment, 166, 167, 419-422
- angles, 97, 107, 115, 134, 225, 251, 274-276, 335, 450, 474
- anti-redeposition agents, 152
- apricot pits, 122 arrowhead, 7, 112, 125 ashing, 149, 160 automation, 27, 143, 199, 230, 252, 253, 258, 259, 296, 297, 332, 357, 383, 422, 439-442
- Bakelite, 201
- ball burnishing, 121, 156, 246, 257, 258
- ball cones, 113, 121, 125
- barrel surface velocity, 14
- barrel tumbling, 26, 52, 63, 68-72, 74, 85, 88, 102, 141, 171, 173, 174, 176, 181, 186, 188, 198-200, 219, 221, 222, 225, 226, 229, 230, 283, 304, 356, 359, 363, 365, 371, 420, 421, 442, 458
- barreling, 171, 183, 184
- beeline, 325
- benchtop units, 73, 173, 249, 373
- benchtop barrel tumbling, 173
- bench-type dial gage, 478
- beryllium copper, 73, 122, 272
- black streaks, 281
- bleaching, 147, 148, 152 agent, 147
- blistering, 67, 163
- blowholes, 61, 68
- blunting edges, 61
- bowl vibratory equipment, 238, 241-244, 246-256, 274
- brads, 121, 122, 261
- brass, 64, 70, 75, 114, 121, 122, 133, 152, 154, 156, 168, 176, 178, 221, 278, 313, 329, 330, 333, 335, 349, 375, 410, 412, 453
- bronze, 45, 152, 264, 269, 274-276, 390, 410
- buffing, 68, 105, 118, 200, 319, 330, 346, 355, 381, 383
- builder, 151
- bulk density, 17, 120, 127, 129, 132, 257, 258
- burr, 8, 9, 13, 26, 28, 31-40, 42-48, 54, 55, 57, 62, 63, 70, 83, 84, 88, 89, 91-93, 95, 97, 99-101, 106-109, 111, 121, 132-134, 138, 143, 153, 178, 188, 198, 202, 207 direction, 39 entrance exit feather, 48 hardness, 106 hanging, 48 height, 13, 47, 92, 218-220, 226, 266-269, 28 286, 335, 465, 467, 468, 477-482, 484, 485 inspector, 465, 484 length, 41, 107, 218 Poisson, 48 prevention of, 448 properties, 47, 91, 92, 106, 198, 207, 264, 480, 481 radius, 47 rollover, 47 size, 9, 38, 83, 84, 91, 93, 95, 97, 99, 101, 103 105-109, 218, 226, 266, 267, 282-284, 286, 288, 328, 331, 345, 380, 448, 453, 454, 465, 482, 483 tear, 48 tensile, 48 thickness, 13, 45, 47, 91, 92, 218-220, 263, 266-268, 317, 335, 465, 468, 479, 480, 484 Burr Edge and Surface Finishing of Japan (BEST-J) burr-free, 31, 33, 70, 207, 271, 274, 276, 448, 465, 468, 470, 473, 483
- cadmium, 429, 431, 445
- calcined alumina, 143, 229
- calculating capacity, 14
- calculating cycle times, 264
- calibration, 35, 36, 41-43, 465, 468, 480, 482, 484, 486
- capacitive methods, 482
- capacity of a barrel, 180
- capital equipment, 1, 2, 6, 431
- carpet tacks, 117, 122, 142, 362, 363
- cascade finishing, 413
- case history, 229, 299, 318
- centrifugal barrel (CBF), 3, 4, 15, 26-28, 41, 45, 52, 63, 64, 69-72, 74, 85, 88, 102, 104, 107, 112, 116, 118, 126, 193-196, 198-200, 202, 204-207, 210, 212, 213, 216-219, 221-223, 225, 226, 229-232, 264, 271, 284, 291, 296-298, 304, 305, 315, 322, 329, 350, 355, 356, 412, 443, 445
- central lubrication systems, 422

centrifugal barrel deburring, 193  
centrifugal barrel finishing (CBF), 15, 26, 45, 63, 102, 107, 118, 193, 195, 198, 200-202, 204-206, 210, 212, 213, 219, 223, 226, 230-232, 235, 271, 291, 298, 304, 315, 350, 355, 412  
centrifugal disk, 16, 17, 26-28, 52, 102, 104, 200, 201, 284, 295-305, 315, 412, 422, 427, 439, 440, 458, 464  
centrifugal force, 135, 175, 194, 198, 248, 260, 296, 298, 311, 316, 331, 385, 387, 389, 390, 435  
ceramic, 6, 7, 17, 29, 64, 65, 67, 71, 73, 75, 85, 86, 111-114, 116-123, 125, 127, 129, 130, 134, 136, 138, 139, 142, 178, 183, 201, 203, 204, 206, 207, 210, 211, 224, 228, 245, 246, 263, 266, 280, 289, 297, 299, 315, 329, 346, 363, 372, 387, 388, 391, 393, 396, 397, 428, 430, 432, 434, 435, 441, 452, 476  
ceramic parts, 118, 183, 263, 441  
chanifers, 37, 39, 40, 46, 55, 486  
channel cross-sections, 249  
checklist, 4, 6, 109, 194, 196, 448, 449, 455  
chemical, 8, 9, 11, 58, 74, 75, 88, 102-105, 148, 151, 152, 155, 157, 160, 161, 165, 166, 169, 176, 183, 188, 238, 314, 315, 320, 321, 349-356, 363, 397, 405, 406, 408, 409, 426, 431-435, 457  
accelerators, 30, 349, 351, 356  
actions, 151  
deburring, 8, 104, 350, 351, 356  
etching, 74, 157  
loose abrasive finishing, 349, 351, 353, 355-357  
magnetic finishing, 405  
polish, 351, 352, 354  
spindle finishing, 102, 320, 321  
chip lodging, 124  
cleaners, 79, 81, 147, 149, 157, 183, 228, 426, 442  
cleaning, 1, 5, 7-9, 62, 65, 67, 70, 71, 73-75, 87, 120-122, 139, 140, 143, 148, 149, 152, 155-158, 160, 163, 166, 167, 182-184, 186, 197, 237, 238, 245, 280, 284, 303, 307, 308, 315, 354, 373, 413-418, 422, 426, 433, 434, 442, 454, 464, 480  
color, 40, 61, 62, 66, 70, 73, 74, 85, 87, 102-106, 117, 118, 120, 122, 131, 143, 147, 149, 152, 155, 156, 161, 168, 172, 176, 183, 184, 201, 264, 319, 350, 449, 452, 453, 474, 476  
color-coded approach, 40  
coloring agent, 147, 152, 156  
combinations, 72, 73, 75, 147, 153, 154, 281, 282, 350, 436, 482, 484  
combined vibratory and blasting, 259  
combined –qobal and eentrifugal machines, 260  
combined vibratory and spindle finishing, 260  
ombined vibratory, spindle, and electrolytic finishing, 260  
comparisons, 11, 25, 26, 198, 199, 284, 287, 299, 304, 457, 460  
compartmented machines, 247, 254  
compound(s), 1, 5-9, 11, 14, 24-27, 52, 55, 58, 64, 65, 67, 70, 71, 73, 74, 79, 85, 111, 117, 119-121, 123, 125, 126, 130, 131, 134, 137-140, 143, 144, 147-169, 171-173, 175, 176, 178, 182-184, 188, 193, 197, 198, 200-202, 204, 206, 213, 215, 218, 220, 228, 246, 261, 263, 264, 284, 287, 290, 297, 301, 304, 314, 315, 332, 350, 364, 413, 414, 416, 422, 426, 432, 445, 446, 455, 462  
delivery, 5, 197, 425, 439, 441  
economics, 162  
efficiency, 26  
metering, 148, 157, 161  
solutions, 147-149, 151, 153, 155, 157, 159-161, 163, 165, 167, 169  
computer programs, 1, 13  
computer-aided selection, 1  
concentration, 25, 29, 71, 73, 131, 134, 151, 152, 157-163, 166, 182, 279, 327, 350-353, 356, 398, 410, 429, 433, 448, 452, 454  
concentration measurement, 161  
consumables, 24, 284, 304  
Consumer Product Safety Commission, 34  
contamination, 65  
continuous machines, 246, 247, 312  
conversion factors, 29  
cooling, 73, 156, 160, 229, 230, 289, 301, 302, 433  
copper alloy, 75, 351  
copper-coated aluminum oxide, 407  
corncocks, 86, 87, 117, 118, 122, 124, 141, 147, 200, 300, 331, 423, 426, 442  
corner radii, 83, 202, 205, 273, 287  
corporate quality expectations, 36  
corrosion inhibitor, 121, 142, 182  
corrosion resistance, 65, 150  
Corundum, 117, 336  
cost(s) allocation, 12  
comparing approximate, 1  
of apathy, 10  
of doing nothing, 11  
equipment, 28  
‘ftw-r %~aze’ 12  
labor, 25, 82, 184, 321, 431  
operational, 6, 129, 225, 284, 323, 457  
overhead, 1  
power, 1  
process development, 12  
rework, 2, 12  
rule of thumb, 1  
coupling agent, 147  
cracks, 51, 56-58, 130, 453  
crushed plastic, 118  
cryogenic barrel tumbling, 102, 363, 365  
cryogenic deflashing, 122, 263, 359, 361, 362, 369  
cryogenic loose abrasive finishing, 359-369  
customer expectations, 32, 486  
cut down, 14, 120, 121, 156  
cut rate, 129, 132, 138, 454  
cutoff projection, 47  
cutting, 6, 7, 11, 21, 28, 31, 33, 46-48, 55, 64, 83, 84, 88, 109, 111, 112, 116-121, 123-125, 129-131, 134, 136-139, 141-143, 148-153, 156, 158, 160, 165, 166, 173, 175, 176, 182-184, 186, 198-201, 203, 204, 260, 261, 269, 271, 277, 278, 280, 286, 287, 298, 299, 301, 302, 314, 316, 317, 327, 330, 334, 339, 346, 347, 349, 352, 353, 355, 360, 373, 374, 386, 391, 393, 452-454, 480  
cyanides, 156  
cylinder block, 416  
cylinders, 85, 95, 113, 115, 117, 125, 129, 132, 136,

150, 186, 202-204, 208, 212, 218-220, 280, 281, 297-299, 303, 310, 314, 363, 377, 384, 430, 450, 471

deburr, 1-3, 11, 12, 28, 33, 37, 39, 40, 45, 75, 100, 107, 118, 129, 142-144, 148, 153, 164, 193, 224, 225, 262, 288, 315, 320, 327, 329, 344, 352, 365, 388, 411, 418, 429, 451, 483

deburring economic calculations, 7

decontaminate, 61 deflash, 63, 122, 321, 359, 365-367, 369

defoaming, 120

degreasing, 121, 125, 156, 166, 430

dents, 57, 61, 62, 69

depreciation, 1, 2, 6, 7, 12, 128, 131, 132, 134-140, 181, 226, 285, 304, 323

descaling agent, 147

design specifications, 35

design to allow more process choices, 450

destructive methods, 480

detergent, 7, 72, 73, 75, 80, 147, 149, 165, 277

diamonds, 113, 115, 118, 121, 122

dictionaries, 44

dings, 56, 57, 61, 69, 313

discharge chute, 252

dissolved solids, 431, 432

documentation, 36, 39, 41, 44, 83, 201, 465, 473, 482, 485

dolomite, 67, 70, 72, 73, 77, 83, 84, 87, 207, 208, 210, 211, 220-222, 228

drag finishing, 52, 54, 55, 200, 322, 323, 325-327, 328, 330, 331, 344

drains, 120, 131, 167, 176, 240, 244, 257, 297, 314, 327, 420, 452, 454, 459

dross, 48

dry finishing, 147, 200, 300-302

dry ice, 75, 122, 359, 364-369

dry media, 118, 141, 183, 200, 201, 298, 302, 303, 315

dry processing, 200 dry skin, 445

dry-processing, 118

dryers, 134, 247, 420, 426, 442

drying, 5, 118, 134, 157, 183, 187, 197, 230, 241, 247, 248, 252, 254, 426, 427, 442, 462, 464

dust collection, 298, 301, 423

economics of plugging, 82

edge, 31-42, 44-48, 54, 55, 57, 61, 62, 83, 84, 88, 91-93, 95, 97-101, 105-107, 109, 116, 119, 126, 132, 133, 148, 171, 172, 177, 183, 198, 199 breakout, 39, 47, 57 breaks, 39, 387 feather, 40, 48 finishing, 31, 32, 34, 35, 37-39, 41, 42, 44, 49, 89, 91, 101, 107, 109, 116, 145, 188, 191, 229, 234, 236, 271, 374, 378, 380, 381, 388, 399, 412, 458, 487 radii, 42, 45, 61, 83, 88, 92, 97, 99, 106, 183, 198, 202-204, 207, 209, 229, 264, 267, 269, 271-274, 276, 279, 282, 286, 299, 309, 315, 328, 335, 345, 440, 447, 448, 450 requirements, 31, 33, 35-37, 39-41, 43, 45, 47, 49, 107, 447, 465 standards, 31-35, 269, 465 tolerances, 97

effect of media size, 19, 116, 204, 228, 254, 255, 270, 337

effective drawings, 33

electrical methods, 481

electrical resistivity, 73, 74

electrochemical barrel finishing, 407-409, 411

electrochemical magnetic loose abrasive finishing, 405

electrochemical mass finishing, 407, 408, 410, 411

electrochemical vibratory deburring, 412

electrochemical vibratory spindle finishing, 412

electroplating, 61, 67, 73, 74, 163, 200, 351, 354

embedded, 65-67, 71, 72, 148, 150, 200, 385

embrittlement, 58, 156, 359, 360-362, 364, 367, 369 point, 360

emery, 87, 114, 117, 119, 157, 199, 354

emollients, 147

entrance burr, 48

environmental, health, and safety, 144, 168, 188, 232, 290, 305, 323, 330, 369, 399, 406, 436

equipment, 1-6, 12, 14-17, 21-28, 35, 36, 39-44, 61, 67, 79, 93, 111, 112, 118, 121, 122, 126, 128, 130, 131, 133-135, 138-140, 142, 148, 151-157, 161, 171-173, 178, 181, 182, 184, 185, 188, 194-196, 197, 199, 200-202, 224-227, 230, 237, 238, 241, 244-246, 249-254, 257-259, 264, 265, 269, 270, 274, 282-289, 296-299, 304, 309-312, 314, 315, 320, 321, 323, 327, 330, 338, 340, 346, 351, 352, 354, 355, 359-365, 367, 369, 373, 375, 376, 381-384, 387, 388, 397, 406, 407, 413-416, 425, 426-428, 430, 431, 434-436, 439-442, 445, 446, 454, 455, 458-460, 462-465, 469, 483, 484, 486, 487 ergonomics, 427, 445, 446

exit burr, 48, 93, 109

exotic metals, 154

explosions, 168, 290, 332

explosive, 168, 445 e

yeglass frames, 183, 184, 201, 299

fatigue life, 65, 69, 200

feather burr, 48

feather edge, 40, 48

felt, 86, 122, 158

ferris wheel style vibratory machine, 245

figure-8 motion centrifugal barrel, 194

film, 65, 67, 70, 71, 73-75, 132, 140, 153, 157, 176, 182, 303, 406

filter press, 165, 166, 429-432

fin, 48, 345

fine-pitch screw, 46

finishing, 1-7, 11-15, 17, 19, 20, 24-32, 34, 35, 37-39, 41, 42, 44, 45, 49, 51, 52, 54-56, 58, 59, 61, 63-70, 75, 78, 83, 85, 87, 102 barrel, 15, 26, 45, 63, 102, 103, 107,

118, 152, 160, 167, 171-176, 181, 185, 188, 193, 195, 198-202, 204-206, 210, 212, 213, 219, 223, 226, 230-232, 240, 271, 298, 304, 315, 349, 350, 355, 371, 373, 407-409, 411, 412, 446, 459 cascade, 413 centrifugal, 232, 351, 411 centrifugal disk, 26, 52, 295, 296, 300-302, 304, 439, 440 magnetic, 3, 105, 371, 387, 389, 405 orboresonant, 102-104, 307-308 recipro-, 3, 26, 102-104, 343-346 roll flow, 3, 295 spindle, 3, 26, 88, 102-104, 260, 296, 304, 309-313, 316-318, 320-323, 329, 331, 333-339, 344, 356, 371, 395, 405, 411, 412, 458, 460 vibratory, 6, 26, 28, 52, 55, 63, 67, 75, 84, 85, 97, 100, 102, 103, 108, 121, 124, 129, 131, 133, 135, 137, 138-140, 160, 163, 165-167, 172, 194, 195, 237, 240, 241, 256, 259, 261-266, 275-277, 279, 281-285, 287, 288, 296-298, 304, 320, 321, 330, 349, 353, 354, 359, 371, 412, 449, 450, 484  
 fixtured parts, 184, 254, 255, 321, 331  
 fixturing, 183, 255-257, 259, 271, 316, 321, 329, 416, 417, 448, 454  
 flash, 34, 46, 48, 108, 121, 154-156, 184, 187, 199, 229, 263, 349, 359, 360, 362-364, 365, 367-369  
 flatness, 62, 66, 281, 417  
 flaws, 51, 56, 57  
 flexible finishing systems, 441  
 flocculent, 166, 432  
 flocculent holding tank, 432  
 flow finishing, 3, 102-104, 295, 325, 344  
 flow rate, 131, 138, 156-162, 166, 327, 417, 434, 435, 452, 454  
 flow-through compounding, 166, 167  
 fluidized bed finishing, 333, 337-339  
 fluidized bed spindle finishing, 3, 320, 333-339  
 foam, 58, 80, 81, 82, 120, 131, 142, 147, 152, 155, 166, 271, 361, 363, 430, 452  
 foam control, 147, 152  
 fragile, 21, 119, 121, 130, 141, 152, 175, 179, 185, 193, 195, 201  
 friction, 61, 74, 122, 251, 258, 269, 374  
 fully automatic system, 162  
 functional testing, 467, 479

G forces, 15, 230  
 G level, 226  
 galvanic action, 157  
 galvanotechnic, 54  
 gear tooth, 387  
 glass beads, 65, 71, 73, 87, 143  
 glossary, 39, 44, 46  
 gold-plated, 73  
 grain size, 123, 124, 270, 287, 335, 336, 392, 393, 395, 397, 398  
 graphite balls, 407-412  
 gyrofinishing, 309

handling damage, 56  
 hanging burr, 48  
 hardcoating, 65  
 hardened textile spinning rings, 355  
 hardness, 47, 58, 68, 87, 106, 111, 112, 126, 133, 148, 151-153, 157, 160, 167, 181, 198, 208, 215, 220, 221, 240, 244, 251, 260, 261, 264, 266, 269, 277, 282, 369, 396-398, 408, 481, 483  
 heavy parts, 18, 21, 185, 188, 251, 253, 256, 308  
 hexagonal, 173, 174, 180, 181, 193-195, 202  
 hoist pans, 173  
 holes, 39, 56, 57, 70, 71, 73, 75, 78, 79, 81, 83, 84, 87, 93, 96, 97, 100, 101, 107, 112, 115-118, 121, 123-125, 142, 143, 172, 182, 183, 185, 195, 224, 227, 231, 252, 257, 264, 286, 315, 319, 327, 328, 335, 345, 354, 362, 388, 415, 417, 419, 424, 448, 455, 471-473, 475, 476, 478-480  
 horizontal units, 173  
 hydraulic control valve body, 415, 416  
 hydraulic loading, 434  
 hydraulic transmission, 417  
 hydrogen, 156, 445

immersion lapping, 102, 320, 321, 331, 332  
 impingement, 185, 194, 295, 298, 313, 328, 338, 344, 408  
 impregnation, 65, 68  
 improving efficiency, 447, 455  
 inadequate notes, 38  
 inspecting for burrs, 465, 474  
 inspection instruction, 42, 43  
 inspection specifications and practices, 35  
 inspection techniques, 36, 42, 45, 469, 482, 484  
 intergranular attack, 57, 58  
 internal finishes, 56 ISO, 35, 36

jewelry, 118, 122, 154, 201, 245, 351

Kepner-Tregoe problem solving, 456  
 Kovar, 67, 72, 74, 221

large parts, 27, 141, 185, 209, 225, 229, 253, 257, 262, 325, 329, 338, 344, 360, 460  
 lay, 51  
 lead, 1, 10, 28, 48, 97, 134, 161, 229, 251, 431, 445  
 leather, 86, 122  
 lighting for visual inspection, 473  
 limitations, 8, 84, 89, 100, 107, 109, 117, 145, 225, 234, 271, 291, 293, 297, 328, 344, 484  
 lining, 121, 131, 134, 168, 172, 174, 198, 230, 240, 244, 250, 251, 258, 287, 297, 298  
 liquid carbon dioxide, 359, 361, 369  
 liquid nitrogen, 359, 361-365, 367-369  
 load size, 181, 185, 360  
 loading, 5, 20, 21, 24, 27, 138, 153, 173, 174, 183-185,

.188, 194, 197-200, 227, 229, 241, 245, 252, 254, 255, 258, 263, 287, 297, 298, 301, 302, 304, 308, 309, 313-315, 321, 326, 338, 343, 369, 382-384, 416, 423, 424, 434, 439, 464  
lodging, 5, 70, 75, 76, 77, 78, 81, 83, 115, 116, 118, 119, 121, 122, 123, 124, 125, 135, 138, 139, 142, 143, 183, 197, 231, 252, 253, 262, 264, 287, 288, 299, 315, 331, 441, 452, 455  
long cycle times, 95, 228, 287, 328, 344, 450  
long processing cycles, 173, 176  
lubricants, 66, 147, 154, 166, 453  
lubricity, 131, 147, 152, 154, 155, 160, 261, 327  
lubricity control, 147, 152  
luster, 61, 62, 70, 102-106, 118, 120, 131, 142, 147, 149, 156, 160, 172, 184, 201, 315, 353, 355, 372, 457  
  
machine (see *equipment*) magnesium, 67, 70, 73, 85, 154, 160, 168, 178, 290, 322, 363  
magnetic barrel tumbling, 371  
magnetic drum separator, 424  
magnetic float polishing, 372, 387, 396, 398, 404, 405  
magnetic pole shape, 376, 378, 381  
magnetic-abrasive finishing (MAF), 371-375, 377-385, 388-393, 395, 397, 399-404  
magnetic-abrasive polishing (MAP), 371, 392  
magnetic-abrasive spindle finishing, 321, 371, 395  
magnification, 4, 5, 31, 33, 37, 42, 44, 47, 56, 67, 71, 72, 196, 197, 221, 465, 470, 471, 473, 481, 484, 486  
maintenance, 1, 2, 5, 7, 9, 12, 42, 148, 167, 185, 197, 262, 287, 289, 298, 329, 422, 423, 429, 430, 434, 435, 441, 445, 461, 464  
maleic acid, 349  
manufacturing specifications, 35  
masking, 63, 66, 81, 83, 228, 271, 281, 288  
Mass Finishing Job Shops Association, 6  
mass orbital barrel finishing, 193  
materials handling, 17, 27, 28  
matte surface, 54, 64, 69, 119, 121  
mechanically gaged methods, 477  
media, 1, 4-8, 10-12, 14-21, 24-29, 52, 55, 56, 61, 63-80, 83-87, 91, 93, 95-97 brads, 119 carry out, 139 carpet tacks, 122, 142, 363 composition, 111 cones, 113, 273 costs, 124, 125, 126 density, 322 effects, 202 glaze, 140 impregnation by, 70-74, 207, 263, 302 natural abrasives, 117, 118 novaculite, 111, 114, 117 nylon, 118, 122, 143 pins, 113, 280 polyester, 119, 120, 127, 130 properties, 127, 395 random-shaped, 71, 79, 116, 118, 131, 232 resin-bonded, 117, 119, 300 serrated pins, 121 shape, 112, 123, 143, 231, 260, 299, 455 steel media, 120-122 storage, 289, 425 storage bins, 425 triangles, 85, 112 urea-formaldehyde, 119, 120 walnut, 117, 122, 315, 363 wear, 11, 14, 117, 123, 126, 128, 129, 135, 136, 137, 152, 158, 164, 181, 205, 206, 207, 251, 264, 287, 454 weight, 116, 132, 137, 329 wood, 113, 122 wooden pegs, 122  
metal, 31, 48, 56, 57, 65, 67, 68, 69, 70, 73, 74, 75, 79, 81, 82, 83, 95, 97, 103, 109, 113, 114, 120, 121, 122, 124, 125, 129, 131, 132, 133, 134, 138, 139, 140, 142, 147, 150, 151, 152, 153, 154, 155, 156, 165, 168, 169, 176, 177, 178, 182, 183, 185, 198, 199, 201, 202, 205, 206, 207, 224, 228, 229, 230, 232, 237, 249, 254, 255, 261, 264, 269, 272, 274, 278, 279, 287, 289, 296, 299, 301, 311, 312, 314, 315, 317, 334, 335, 337, 349, 350, 351, 353, 354, 356, 363, 371, 372, 380, 382, 388, 389, 390, 394, 395, 407, 408, 410, 419, 422, 423, 424, 428, 429, 431, 433, 434, 441 brighteners, 85, 147 fiber media, 395 forms, 20, 34, 35, 37, 39, 48, 69, 85, 118, 121, 122, 125, 148, 149, 151, 152, 154, 172, 178, 185, 333, 361, 382, 405, 411, 428, 442 removal, 1, 2, 5, 12, 26, 37, 58, 63, 74, 80, 82, 91, 93, 95, 101, 107-109, 112, 119, 121, 123, 125, 128, 129, 131, 132, 134, 138, 140, 142, 143, 150, 151, 156, 168, 176, 177, 182, 184, 197-200, 205-207, 212, 220, 226, 230, 250, 254, 255, 261, 264, 265, 267, 269, 271, 273, 274, 278-282, 284, 287, 288, 296, 299, 301, 304, 311, 312, 315, 317-319, 321, 327, 328, 333-335, 345, 349-354, 360, 364, 365, 369, 377, 378, 380, 382, 386, 387, 391-394, 396-398, 405, 408-410, 412-416, 426  
Metal Finishing, 54, 120, 422-424, 428, 434, 440  
metal gages, 55  
microburr, 486  
microcracking, 58  
microcrystalline, 65, 72, 119, 346, 347  
microscopes, 42, 470, 474-477, 481  
microscopic, 31, 36, 44, 121, 483  
minimize burr properties mirror-like finishes, 121  
mixing ratio, 14, 177, 349, 408, 409  
multiple cycles, 184  
multiple pass designs, 248  
  
National Institute for Science and Technology, 34  
nickel dust, 290  
nicks, 56, 313  
noise, 25, 173, 188, 195, 232, 238, 245, 254, 290, 305, 330, 415, 419, 421, 422, 445, 459, 462, 464  
noise suppressors, 419  
novel approaches to finishing  
  
octagonal barrel, 172, 181  
oil removal system, 426  
oiled, 118, 178, 183  
oiling/rust prevention, 426  
open-end tilting, 172  
operating costs, 6, 181, 285, 304, 429, 431, 457  
operator, 2, 5, 6, 8, 11, 15, 17, 25-27, 28, 40, 41, 54-56, 75, 77, 105, 106, 124, 138, 144, 152, 157, 161-163, 173, 174, 176, 185, 188, 197, 230, 250, 254, 284, 287-290, 298, 309, 312, 315, 323, 338, 349, 350, 355,

356, 366-368, 383, 390, 414-416, 419-421, 423,  
 427-429, 436, 442, 445, 447, 449, 459, 460, 467, 473,  
 476  
 operator qualification, 449  
 optimize process knowledge optimizing performance,  
 28  
 orange peel, 57, 201 orboresonant, 102-104, 307, 308  
 oval balls, 121  
 oval vibratory machine, 247  
 overhead hoists, 173, 436

Paliney, 72, 221  
 part, 1, 3-7, 9-11, 13, 16-28, 31, 32, 35, 37, 38-40,  
 44-46, 48, 51, 52, 54-58, 61-68, 70, 71, 73-75, 77-79,  
 81-84, 88, 91, 93, 95, 97, 99-109, 116 administration,  
 442 aesthetics and media separation configuration,  
 91, 315, 327, 414, 417 containers, 425 counters, 426  
 delivery and removal geometry, 63, 66, 91, 93, 106,  
 198, 225, 229, 231, 250, 264, 331, 374, 455 hardness,  
 106, 181, 198, 264 material properties orienters, 423  
 size, 9, 63, 108, 185, 198, 207, 214, 217, 221, 222, 225,  
 226, 249, 250, 251, 253, 263, 264, 270, 278, 282, 284,  
 298, 345, 346, 369, 416, 422 surface finishes tolerances,  
 108 weighing devices, 426 part-on-part damage, 141,  
 257, 323  
 parts stick to the walls, 287  
 passivating films, 349  
 peeling, 67  
 pH, 73, 140, 147, 151, 154, 157, 160, 161, 168, 221, 223,  
 273, 350, 353, 354, 356, 398, 431-434  
 pH buffers, 147  
 phase transformations, 58  
 piece part geometry, 225 pins, 65, 67, 72, 73, 74, 79, 81,  
 82, 113, 121, 122, 125, 220, 221, 222, 276, 277, 280,  
 360, 371-373  
 piston rings, 257, 338, 339  
 plastic deformation, 58 plating, 13, 62, 65, 67, 70, 73, 74,  
 85, 87, 102106, 119, 139, 149, 186, 200, 226, 228, 286,  
 326-330, 344, 354, 417, 431, 446, 454, 455 plug, 78,  
 80, 82, 125, 143, 253, 288, 467, 469, 477  
 Poisson burr, 48  
 polishing, 52, 56, 64, 70, 71, 74, 87, 100, 105, 116, 117,  
 118, 120, 121, 149, 150, 152, 154, 172, 175, 176, 182,  
 184, 186, 201, 230, 245, 298, 299-302, 312, 315, 319,  
 321, 327, 329, 330, 338, 346, 349, 352, 353, 355, 371,  
 372, 387-390, 392-398, 405, 408, 409, 464  
 polyester film, 74  
 porcelain, 72, 114, 119, 203  
 portable media separator, 424  
 portable vibratory machine, 247  
 practical hints, 140  
 precision parts, 12, 39, 63, 72, 75, 88, 100, 106-108, 125,  
 200, 229, 271, 277, 412, 468-470  
 precleaning, 87, 139  
 pre-formed media, 95  
 prefreezing parts, 369  
 pre-mix, 159, 162  
 prevent burrs preventing flash, 369  
 problem solving, 167, 452, 455, 456

process control, 12, 134, 160, 161  
 process variables, 174, 195, 263, 264, 266, 359  
 product design, 91  
 production calculator, 22  
 production rate, 21, 22, 226, 227, 285, 304, 323, 329, 422,  
 458  
 Products Finishing, 54  
 pseudo burrs, 267  
 pump impellers, 256, 339

racetrack finishing, 325  
 radius measurements, 133, 134  
 raised metal, 42, 48, 57, 465, 481  
 rattling, 141  
 razor blades, 355  
 recipro-finishing, 3, 26, 102-104, 343-346  
 recirculation, 163, 165, 166, 246, 247, 314, 421, 425, 435  
 recrystallation, 58  
 regulatory requirements, 169, 436  
 removing sharp edges, 450  
 removing suspended solids, 433  
 repeatability, 88, 101, 107, 134, 214, 271, 274, 328, 345,  
 466, 485  
 residual stresses, 58, 66, 68, 69, 106, 200, 303, 337  
 response surface methodology, 266, 456, 457  
 rinse agents, 147  
 rinsing, 5, 73, 75, 149, 154, 167, 182, 197, 241, 252, 261,  
 304, 439  
 robotic loading and unloading, 423, 424  
 rock pickin, 75  
 roll flow finishing, 3, 295  
 rollover burr, 47, 48  
 root cause problem solving, 455  
 rotary barrel tumbling, 171  
 rotary gear pump head, 418  
 rotational speeds, 172, 175, 187, 199, 326, 334, 335, 386  
 rotational volume, 18, 19, 21, 24  
 rotational volume (RV) factor, 19  
 roughness, 13, 31, 33, 51-53, 55, 56, 58, 63, 64, 111, 114,  
 121, 128, 129, 133, 134, 138, 139, 144, 156, 177, 198,  
 199, 202, 205, 208, 231, 260, 261, 264, 265, 276, 282,  
 283, 286, 299, 301, 302, 317-319, 328, 334, 337, 338,  
 343, 350, 377, 378, 380, 381, 383, 384, 386, 387, 391,  
 393-395, 398, 409, 410, 428, 453-455

round barrels, 173  
 round bowl, 28, 237, 241, 246, 251  
 round bowl equipment, 241  
 round vibrator, 16, 26-28  
 roundness, 63, 277, 381-383, 391, 392, 405  
 rubber-lined, 173, 326  
 rule, 1, 8, 28, 48, 58, 61, 63, 75, 77, 91, 126, 150, 166,  
 200, 212, 337, 360, 428, 434, 454, 466  
 run sheet, 179, 180  
 run time meter, 421, 423  
 rust, 56, 57, 66, 78, 83, 105, 122, 142, 149, 154-157,  
 161, 163, 168, 182, 227, 254, 262, 280, 304, 420, 426,  
 442  
 rust preventatives, 156