

HANSER

Stichwortverzeichnis

John S. Dick

How to Improve Rubber Compounds

1800 Experimental Ideas for Problem Solving

ISBN (Buch): 978-1-56990-533-3

ISBN (E-Book): 978-1-56990-534-0

For further information and order see

<http://www.hanser-fachbuch.de/978-1-56990-533-3>

or contact your bookseller.

Subject Index

Numerics

- 1,2-BR 242
- 1,2 configuration 327
- 1,2-dihydro-2,2,4-trimethylquinoline 141
- 1,2-dimercapto-1,3,4-thiadiazole 132, 245, 253
- 1,2-polybutadiene content 242
- 1,2-polybutadiene (PB) 233
- 1,2-poly butadiene resins 188
- 1,3-bis(citraconimidomethyl)benzene (BCI-MX) 71, 250
- 1,4-*cis*-BR 313
- 1,4-*cis*-polybutadiene 160, 177
- 1,4-hexadiene (HD) 243
- 1,5-diaza-bicyclo-(4.5.0)-undecen-(11) 162
- 1,6-bis(*N,N*-dibenzylthiodicarbamyldithio)hexane 139, 181, 250
- 1-acetyl-4-(hydroxyisopropyl) benzene 293
- 2,2,6,6-tetramethylpiperidinyloxy 232
- 2,4,6-tris-(*N*-1,4-dimethylpentyl-*p*-phenylenediamino)-1,3,5-triazine 193
- 2-amino-4 109
- 2-(isopropylsulfanyl)-benzothiazole 231
- 3,4 content 208
- 3,4-IR 242, 314
- 3,4-polyisoprene 314
- 3,5-di-*tert*-butyl-4-hydroxybenzylcyanoacetate 193
- 3-thiopropionic acid 55, 330
- 4,4-bis(diethylamino)-benzophenone (EAB) 63, 327
- 6-dimethoxypyrimidine 109
- 6-ethoxy-2,2,4-trimethyl-1,2-dihydroquinoline 122
- 6PPD 122, 141, 144, 145, 167, 234
 - /TMQ 142, 145
- 6QDI 142, 145
- 7,9,11 carbon phthalate 88
- 77PD 146
- 77PPD 144, 167
- 100% theory 14
- 2121 system 363

A

- A-1 366
- abrasion 170
 - loss 174
 - resistance 170, 177
- abstractable hydrogens 35
- accelerated electrons 227
- accelerator 138, 229, 241, 292
 - concentration 361
 - dispersion 20
- acetal antiozonant 146
- acetophenone 256, 293
- acetylene black 93, 94, 98
- acidic clays 235
- acidic fillers 244
- acid salts 211
- ACM 84, 126, 135, 185, 244
- ACN 10
 - content 32, 128, 228
- acrylic 35
- acrylonitrile butadiene rubber 314
- acrylonitrile content 25
- acrylonitrile styrene butadiene rubber 314
- Acsium 86
- activator 139
 - for inorganic blowing agent 309
- activity 359
- ADC 35, 307
 - vs. OBSH 307
- addition of BR or SBR to an NR compound 247
- addition of TOR to an NR compound 248
- addition of vinyl BR to an NR compound 248
- additives that cause bloom 210

- adhesion 105, 110, 370
 - rubber-to-fabric 110
 - rubber-to-metal 105
 - rubber-to-nylon 110
 - to brass 109
- advanced tackifiers 209
- AEM 14, 43, 67, 79, 121, 126, 135, 186, 189, 287
- AEO-MPES 59, 332
- affinities of carbon black 216
- AG-1530 121
- AG (Dai-EI Alloy AG-1530) 126
- aged sulfenamides 231
- aged tack 209
 - retention 209
- age resistance 361
- Agerite White 43, 132, 147
- agglomeration 165
- aggregate aggregate interaction 55, 92
- aggregate aggregate network 52
- aggregate size distributions 54
- aggressive engine oils 127
- aging and set properties 361
- air aging 127
- air diffusion 108
- air-floated clay 117
- air permeability 102
- air/steam cures 259
- AI (thiocarbanilide) cure 366
- alcohols 256
- aldehyde amine 239, 360
- alkaline fillers 235
- alkaline materials 292
- alkoxysilane 218
 - functionalized SSBR 178
- alkyl-aryl PPDs 141
- alkyl/aryl zinc soap 199
- alkylated chlorosulfonated polyethylene 86
- alkylethoxylate-substituted
 - mercaptopropylethoxysilane 59, 332
- alkylphenol disulfide 147, 249, 370
 - accelerators 249
 - cure 147
 - systems 371
- alkylphenol units 209
- alkyl pyrrolidinones 64, 326
- alkyl zinc soap 199
- Alloy AG-1530 186
- Alphaflex[®] 100, 176, 225
- alumina trihydrate (ATH) 112, 320, 332
- aluminosilicate nanotube 220
- aluminum 96, 99, 108, 245
- AMA 35
- amide additives 301
- amides 296
 - of saturated fatty acids 301
- amine antioxidants 235
- amine-BSA 38, 55, 174, 317, 330
- amine-cured TDI ester type PU compound 66
- amine type accelerators 45
- aminolysis 110
- ammonium polyphosphate 113
- amorphous regions 88
- anaerobic 125
 - heat aging resistance 125
- anionic polymerization 218
- anisometric aggregates 200
- anisotropic 67
- anisotropy 21, 26
- antidegradants 182
- antimony oxide 111, 112
- antiozonants 235
- anti-reversion agent 156
- antistatic agents 97
- antistructuring agent 202
- AOs 293
- aramid 27
 - fiber 22, 39, 59, 142, 175, 318
 - dispersion 219
- Aranox 130
- aromatic oil 66, 235, 262, 315, 333
- aspect ratios 278
- ASTM D2000 125
- ATH Filler 320, 332
- athletic goods 340
- AU 83
- autoclave-cured products 13
- azelate polymeric plasticizers 87
- azodicarbonamide 307
- B
- backringing 311
- back rolling on the mill 270
- bagging on the mill 269
- ball-milled dispersions 18, 31, 69, 179
- banbury batch 265
- banbury mixing 220
 - procedures 257
- banbury rotors 266
 - speed 266

- barium/calcium stearates 308
- barium zirconate 134
- barrel length 280
- barrel temperature 285
- barrier 261, 288
- BBPIB (peroxides) 45, 232, 241, 293
- BCI-MX anti-reversion agent 71, 156, 250
- belts 338, 341, 343, 345, 347, 349, 350, 351, 355
- belt-skim compound 108
- benzofurazan 55
 - 1-oxide 55
- benzoic acid 230
- BFO 55
- BFZ 55
- BHT 232
- BIIR 148, 225, 252
- BIMS 147, 163, 293, 316, 323
- BIMSM 103, 104, 131, 193, 225, 316
- bin stability 367
- bin storage times 279
- bis-(1,2,3,6-tetrahydrobenzaldehyde)-pentaerythrityl acetal 192
- bis-(3-triethoxysilylpropyl)-tetrasulfane 250
- bis-alkylphenyl disulfide (BAPD) 45
- bis-(diisopropyl)thiophosphoryl disulfide (DIPDIS) 20, 138
- bis-(hydroxyethyl) ether of resorcinol 72
- bis-(hydroxyisopropyl)benzene 293
- bismaleimide 132
- bisphenol 46
 - cure 142, 295
 - package 245
- BIT 262
- black incorporation times (BITs) 262
- black/oil masterbatch 119, 266
- black scorch 201, 238
 - viscosity 201
 - with EPDM compounds 238
- black sidewall compound 193
- BLE 141
- BLE-25 167
- blend 72, 179, 335
 - of carbon blacks 215
 - of N330 and N650 215
- blended compound 46
- blending limitations 335
- blends of polyurethane rubber 14
- blistering 257, 287
- blisters 261, 287, 288
- block polymer 283
- block styrene 62, 223
- bloom 113, 291, 297
 - problems 210
- blow activators 308
- blowout (BO) 332
 - temperatures 157
 - test 157
- blow point 255
- blow rate 307
- blow reactions 307
- BM750H VP RW 332
- BMI-MP 36
- bound acrylonitrile content (ACN) 186, 243
- bound antioxidants 141, 180
- boundary phases 90
- bound rubber content 279
- bound styrene 315
 - content 73
- BR 83, 228, 298, 314, 318
 - acrylate terpolymer 58
 - additive 332
 - phase 69
- branching 222
- branching agent 254
- brass 108
 - plated steel cord 109
 - wire adhesion 106
- BR/BIIR 314
 - blend 217
- breakdown 220
- break down during mixing 219
- BR matrix 217
- BR microstructure 313
- BR/NR blend 272
- broad aggregate carbon black 38
- broad aggregate size 54
- brominated isobutylene-co-*para*-methylstyrene (BIMSM) 103, 104, 147, 163, 293, 316
- brominated isobutylene-co-*p*-methylstyrene elastomer 193
- bromine donors 112
- bromobutyl 235
 - compounds 227
 - rubber 225
- brown vulcanized vegetable oil 137
- bubbles 255
- Buckminsterfullerene C60 12, 74
- Budene 1280[®] 254
- building tack 207

- bumping 260, 310
 - of presses 310
- Burgess type clay filler 35
- butylated hydroxytoluene (BHT) 232
- butyl rubber (IIR) 102, 147, 287, 371
- C
- C5 resins 209
- C5 terpene hydrocarbon resin tackifiers 209
- C7C11P 88
- C9 hydrocarbon resin 160
- cable 348, 349, 352
- calcium carbonate 113, 116, 278
 - (whiting) 213
- calcium chloride 244
- calcium hydroxide 127
- calcium metasilicate 77, 81
- calcium oxide 126, 139, 258, 368
- calcium soaps 296, 301
- calcium stearate 235
- calender 261, 288
- calendering 206
- calender release 289
- carbon black 172, 190, 194, 200, 226, 228, 245, 262, 266, 271, 277, 283, 300, 317
 - aggregate size distribution 328
 - blends 175
 - couplers 55
 - dispersion 214, 217
 - in rubber blends 216
 - disproportionate distribution 329
 - effects 210
 - loadability 226
 - loading 91, 203, 205, 251, 318, 328
 - masterbatch 219
 - /oil balance 40
 - particle size distribution 94
 - polymer interaction 55
 - rubber
 - coupling agent 174
 - interaction 171
 - /silica ratio 98
 - surface area 328
 - vs. silica 322
- carbon carbon bond strength 140
- carbon carbon crosslinks 43
- carbon free radicals 232
- carbon nanotubes 18, 24, 40, 49, 67, 77, 81, 100, 136, 174, 286, 333
- carbon-silica dual phase 59
- carboxylated elastomers 11
- carboxylated functionalized high-vinyl SSBR 174
- carboxylated NBR 188
- carboxylated nitrile 110
 - elastomers 180
- carboxylic acid 64, 222, 326
- carboxylic butadiene rubber 15, 78
- cardanol 129
 - formaldehyde (CF) novolak curing resin 129
- carnauba wax 295
- cashew nut shell liquid 129
- cast polyurethane 163
- CBS 13, 229, 239, 240, 360
 - accelerator 237
- CBS, TBBS, MBS, DCBS 360
- C-C bond links 140, 162
- CD-2038 54
- cellular rubber 67
- cellulose 27, 39
- cellulose fiber 39, 117, 167
- CF 129
 - novolak curing resins 129
- CGC 11
- chain-end modifications of S-SBR 326
- chain entanglements 205
- charcoal 117
- chemical coupler 55, 330
- chemical interaction 4
- chemically modified SBR 324
- chemically modified S-SBR 326
- chemical peptizer 327
- chemical plasticizer 10, 158, 199
- chemical promotor 38, 55, 92, 174, 226, 317, 330
- chipping 164, 165, 168
- chlorinated alicyclic material 112
- chlorinated paraffin 112
- chlorinated polyethylene (CM) 33, 48, 73, 86, 111, 185, 283
- chlorine donors 112
- chloroprene/polyoctenamer 129
- chlorosulfonated polyethylene 86, 111, 133, 186
 - /carboxylated NBR 189
 - /epoxidized NR 188
- chopped fibers 80
- chunking 168
- CIIR 148
 - and NR 370

- /BR 315
- cis*-BR 62, 178, 193, 254
- cis* content 62, 157
- cis*-IR 16, 72
- cis*-polybutadiene 213, 316
- clasticity (nerve) 205
- clay 117, 136, 168, 212
 - fillers 213
 - loading 304
- clays 76, 278
- CM 33, 48, 84, 111, 133, 180, 185, 213
- CNSL 129
- CNT 67, 174, 333
 - compounds 286
- CO 84, 185
- coagent 20, 45, 70, 81, 233, 241
 - cures 78
- coagents 156, 250
 - for peroxide cures 202, 232
 - for scorch delay 233
- coagulated NR 179
- coagulating system 244
- coagulation 281
- coating 296
- cobalt 108, 141
 - boroacylate 106
 - naphthenate 107
 - neodecanoate 105
 - salts 105
- co-catalyzed *cis*-BR 62
- co curing a EPDM/NR blend 45
- coefficient of friction 101
- CO-epichlorohydrin copolymer 185
- cofuming 59
- coke 278
- cold-emulsion SBR 63
- cold flow 198, 254
 - resistance 254
- cold SBR 177
- common low-sulfur cure 364
- compatibility 16, 314
- compatibilizer 179, 201, 217, 219, 336
 - of escor acid 150
- complexity 1
- compound cost 115
- compound orientation 304
- compound viscosity 201, 257, 259
- compression 370, 371
 - set 43, 45, 47, 139, 366
 - resistant 50
- concentration of sulfur 241
- conductive blacks 94
- conductive carbon blacks 93
- conductive path 90
- conductive silicones 91
- constant energy 157
- constant strain 157
- constant viscosity (CV) natural rubber 281
- constrained geometry metallocene catalyst 262
- continuous and discontinuous domains 336
- continuous coagulation 216
- continuous compounding 221
- continuous mixing 123
 - operation 284
 - systems 221
- continuous phase 70
- continuous use temperature rankings 126
- continuous vulcanization processes 259
- controlled strain 169
- controlled stress 169
- conventional cure 155, 362
 - systems 181, 361
- conveyor belt 207
- cooling batches overnight 217
- cooling rate 211
- cooling system 221, 234, 294
 - for mixer 221
- cooling the mold 312
- copolyester 41, 196
 - matrix 135, 189
- copper 96, 99, 141, 245
 - /zinc plating 107
- cord 356
- cost 115, 284, 335
 - savings 117
- cotton 39, 211
- coumarone indene resins 209
- couple-able 116
- coupling agent 38, 55, 58, 59, 174, 317
- covulcanization 336
- CPA 368
- CPE 133, 136, 185
- CR 83, 88, 273, 289, 299
 - compound 296, 301
 - /EPDM Alloy 162
 - in place of NR 247
- crack initiation 153
- crack propagation rates 168
- CRGO 67

- critical shear stress 285
- crosslink density 27, 44, 70, 114, 155, 181, 190, 361
 - distributions 60
- crosslink distribution 65
- crosslinked skin 259
- crosslinking 156
 - agent 139, 181
- crush 173
- CRV 368
- crystallinity 199
- crystallization 85, 87
- crystallizing elastomers 84
- crystallizing polymer 10
- CSM 48, 84, 111, 133, 180, 186, 213, 299
- CTP 44, 118, 237, 366
- curative 292
 - package 336
- curative ratio 71
- cure blow balance 307, 308
- cured modulus 361
- cured physical properties 335
- cure kinetics 231
 - effects 241
- cure pressure 304
- cure rate 239, 241, 244, 245, 360
 - index 359
 - properties 361
- cure suppressor 232
- cure system 120, 231, 241, 245, 359, 368
- cure temperature 60, 231, 241, 298
- cure time 119
- curing bladders 99
- curing pressure 255
- curing stage 261, 288
- cut and tear resistance 71
- cut growth 152, 153
- cut resistance 170
- cutting 165
 - and chipping 158
 - properties 75, 165
 - resistance 153
- CuxS 106
- CV grades 281
- CV natural rubber 281
- cycled through zero strain 169
- cycles to failure results 129
- cycle times 266
- cyclic diolefin resins 168
- cyclohexylthiophthalimide (CTP) 118, 230
- D
- DAI-EL Alloy 121
- DAI-EL fluoroelastomers 245
- dampers 350
- damping 66
- dangling chain ends 182
- DBDPO 112
- DBEEA 88, 128
- DBP weighted averaging technique 118
- DBU 162
 - /MMBI 140, 162
- DCBS 106, 229, 239, 249, 360
- DCP 232, 241, 251, 293
- DCPD 168
- decabromodiphenyl oxide 112
- Dechlorane Plus® 112
- degradant 96
- degradation resistance 125
- degree of orientation 21
- delaminated clays 278
- delayed-action accelerators 249
- delayed scorch 36, 233
- De Mattia cut growth 162
 - resistance 131
- De Mattia flex fatigue 155, 168
- density 118
- deproteinized natural rubber 47, 159
- design of experiments 5
- developed tread width 320
- devolatilization 303
- dialkyl PPD 146
- diallyl phthalate (DAP) 233
- diamine 237
 - cure 244, 295
 - -cured 48
- diaryl PPDs 293
- diatomaceous earth 208, 296
- dibenzamido-diphenyl disulfide 10, 158, 199
- di-beta-naphthyl-*p*-phenylenediamine 132
- diblock copolymer 16, 179
- di(butoxyethoxy ethyl) adipate 88
- dibutylmethylene bis-thioglycolate 88
- dicumyl peroxide 36, 232, 233
- dicyclopentadiene (DCPD) 243
- die land length 275
- diene rubber base 298
- die swell 271, 273
- diffusion of ozone 129
- dihydroquinoline-type AOs 141
- diisocyanates 256

- dimensional stability 271
 - dimethylimidazolidinone 64, 326
 - dioctyl adipate (DOA) 88
 - dioctyl phthalate 314
 - diol chain extenders 72
 - DIPDIS 20, 34
 - cure 138
 - dipentamethylenethiuram tetrasulfide (DPTT) 36, 233
 - diphenylguanidine (DPG) 128, 308
 - directionally oriented 117
 - discoloration 148
 - resistance 192
 - discontinuous
 - domains 216, 336
 - phases 16, 42, 70
 - dispersible grade 58
 - of precipitated, hydrated silica 331
 - of precipitated silicas 217
 - dispersible silicas 175, 319
 - dispersing agents 267
 - dispersion 30, 170, 214, 216, 220, 221, 257, 263
 - of sodium bicarbonate 309
 - disulfide crosslinks 155, 361
 - dithiocarbamate 138, 229, 239, 360
 - cures 252, 370
 - dithiodicapro lactam (DTDC) 45
 - dithiodimorpholine-based accelerator 120
 - dithiophosphate 138, 239, 252, 360
 - diurethane 256
 - cure 129, 233, 248
 - divinylbenzene crosslinked 17, 73, 254
 - Dixon[®] 1176 200
 - DMBPhy 232
 - DMBTG 88
 - DMI 64, 326
 - DNPD 43, 132, 147
 - DNPD and ZnO cure for a BIIR compound 251
 - DOE 108
 - DOP 314
 - DOTG 240, 366, 368, 369, 371
 - double-chain networking 67
 - double networked vulcanizates 78
 - double networking 21, 78, 169
 - double strain amplitude (DSA) in shear 61
 - down-hole 24, 127
 - DPG 240
 - DPG, DOTG 360
 - DPNR 47
 - DPTT 36, 292, 362
 - drill bit compounds 46
 - dry grip 322
 - dry traction 321
 - DSC 45
 - DTDM 45, 139, 361, 363, 364, 372
 - as a sulfur donor for EV cures 230
 - dual-phase fillers 59
 - CRX4210A 317
 - dump temperature 155
 - DVA innerliners 103
 - dynamar 295
 - rubber additive 298
 - RA 5300 277
 - dynamic flex properties 155
 - dynamic ozone protection 144
 - dynamic stiffness (E*) 165
 - dynamic vulcanization 189
- E
- EAB 64, 327
 - EAM 83
 - earthmover tire treads 175
 - ebony type 41
 - EBR 161
 - ECO 83, 185, 299
 - economic cost 115
 - economic diluents 117
 - ED 127
 - efficient plasticizers 88
 - efficient vulcanization (EV) 137, 249, 361
 - elastomeric ionomers 22
 - elastomer selection 120
 - electrical conductance 95
 - electromagnetic alternating field 120
 - electromagnetic field (induction heating) 246
 - electron beam 42, 78, 227
 - elemental sulfur 44
 - emulsion SBR (OE) 325
 - ENB 12, 201
 - content 238
 - energy at dump 205
 - ENR 102, 218, 243, 313
 - ENR50 314
 - EPDM 11, 28, 31, 83, 85, 88, 120, 148, 194, 208, 237, 264, 282, 292
 - base 201
 - /C60 combination 12, 74
 - compounds 299
 - /CR 131

- alloy 131
- grades 308
- /HIIR/NR triblend 147
- masterbatches 201
- /NR blends 123
- /POE 131
- /PP 189
 - thermoplastic vulcanizates 163
- EpGdO 133
- epichlorohydrin 185
 - copolymer 299
 - rubber 90
 - terpolymer compounds 140
- EPM 233
- epoxidized glycerol dioleate 133
- epoxidized natural rubber (ENR) 31, 102, 218, 243, 313
- epoxidized NR/carboxylated NBR 189
- epoxidized soybean oil 133
- epoxidizing NR 47
- epoxy resin 367
- EPR 149
- equal strain energy condition 169
- equilibrium cure 250
- E-SBR 178, 242, 313
- E-SBR 1500 243
- E-SBR/BR blend 313
- escor acid terpolymer 131, 162
- ESO 133
- ester linkages 196
- ester plasticizer 291
- esters 88
- ethylac 230
- ethylene-acrylate rubber 189
- ethylene-acrylic elastomer (AEM) 14, 48, 67, 186
- ethylene-acrylic rubber 85
- ethylene bis-tetrabromophthalimide 112
- ethylene content 73, 224, 263
- ethylene diamine diamide 55, 330
- ethylene distribution 85
- ethylene methacrylate acrylic acid terpolymer 131, 150, 162
- ethylene sequencing 23, 224
- ethylene thiourea 20, 299
- ethylene vinyl acetate 130, 150
- ETMQ 122
- ETPV 135, 189
- ETU 20, 237, 366, 367
- EU 83
- EV 181
 - cures 155, 249
- EVM 83, 130, 150
 - compound 227
- expandable graphite 104
- experimental ideas 6, 8
- explosive decomposition 127
- extender oils 258
- extending fillers 19
- extension ratio 21, 68, 78
- external release agents 295
- extrudate swell 275
- extrude 286
- extruded stock 211
- extruder 261, 284, 288
 - gear pump 123
 - output 283
 - temperature 260, 285
- extruding 123
- extrusion 275, 278, 286
 - appearance 277
 - die 274
 - swell 275
 - grades of EPDM 286
 - rate 280
 - without loss of quality 281
 - speed 281, 282
 - temperature 275
- EXXPRO® 131, 132
- F
- fabric adhesion 110
- fabric liners 211
- factice 300
- fast cure rate 366
- faster crystallizing polychloroprene 32
- faster mix cycle time 266
- fatigue crack growth 154
- fatigue resistance 170
- fatigue-to-failure test 166
- fatty acid 309
 - and metallic soaps 213
 - based emulsification system 244
 - ester groups 223
 - soaps 199
- fatty amine processing aids 263
- FCG 154
- feed 288
- feed strip cross-section area 280
- feed temperature 285

- FEPM 86
- FFKM 126, 127, 184
- fiber 142, 167, 175
 - masterbatch 219
 - orientation 22
 - pulps 39, 77, 80
- fibrous lath-like crystal structure nanomicrofiller 267
- field trials 7
- filler 171, 199
 - disagglomeration 214, 263
 - dispersion 214
 - effects 203
 - loading 303
 - networking 56
 - /polymer contact points 52
- fill factor 257
- finer 266
- FKM 36, 46, 84, 86, 121, 126, 127, 142, 183, 194, 245, 277, 295, 298
 - /ACM Alloy 121, 186
 - -based compound 237
 - compound 295
 - elastomers 127
- flame retardance 111
- flaw size 165
- Flectol H 141
- flex fatigue properties 361
- flex fatigue resistance 153
- flexible coating 148
- Flory Rhener equation 190
- flow direction 17
- fluorine content 185
- fluoroalkoxyphosphazene 163, 187
- fluorocarbons 101
- fluoroelastomer-based compounds 114, 245
- fluoroelastomers 46, 80, 126, 127, 152, 183, 185, 187, 195, 295, 298
- fluorosilicone 71, 111, 187
- footprint 322
- forgotten rubber 130, 150
- free-radical crosslinking 74
- free sulfur 44
- friction 101
- friction ratio 270, 288
- Friedel Crafts alkylation reaction 132
- front back transition point 270
- Fuel C 185
- fuel economy 179
- fumed silica 39, 296
- functionalization of polymers 116
- functionalized polymers 178
- functionalized solution SBRs 218
- functionalized S-SBR (SSBR) 64, 323
- functional zinc salts 250
- FVMQ 83, 163
- FZ 163, 187
 - rubber 187
- G
- gage thickness 259
- gaskets 130, 343, 348, 350, 351
- gas permeation resistance 103
- gas-phase EPDM 32, 121, 130
- gas-phase polymerized EPDM 12, 73, 224
- gauge thickness 334
- gear extruder 279
- gear pump 123, 279, 284
- GECO 48, 180, 185
- gelled polymer 310
 - and breakdown 219
- geminal hydroxyls 116
- GEN 7
- general ranking 183
- geometry metallocene catalyst technology 224
- glass flakes 103
- glass transition peak 61
- glass transition temperature (T_g) 21, 60, 61, 83, 179
- glutarate polymeric plasticizers 292
- glycidoxypropyltrimethoxysilane 64, 326
- good dispersion 220
- GPMOS 64, 326
- grain 97, 304
- graphene 100, 104
- graphite 67, 99, 104, 200, 333
 - oxide 67, 333
 - products 99
- graphitic layer structure 54
- graphitization 99
- green strength 107, 222
- green tire technology 174
- green tread 314
- groove void volume 320
- ground oyster shells 213
- ground quartz 166
- ground rubber 17, 76, 122, 310
- ground rubber tire (GRT) 17
- G-type 72, 161, 208, 225

- guanidines 239, 360
- Guayule natural rubber (NR) 159, 226, 247
- H
- half-life 232
- halloysite nanotubes 19, 28, 220
- halobutyl 62
- halobutyl compounds 212
- halobutyl innerliner problem 211
- halobutyl/polyoctenamer 159
 - top coating 129
- halobutyl rubber 131, 132, 249, 261
 - compound 235
 - innerliner 211, 257
- halogenated polymer 372
- hardagglomerates 56
- hardness 169, 170
 - stability 156
- HBU 58
- heat aging 32
 - resistance 125, 139
- heat buildup (HBU) 58, 66, 332
- heated dies 279
- heat history 231
- heat resistance 125, 139, 367, 370
- heat stabilizer 134, 140
- heat treatment 57, 116, 171
- HER 33, 72, 134
- hexamethoxymethylomelamine (HMMM)
 - 40, 176
- hexamethylene-1,6-bisthiosulfate (HTS)
 - 71, 138, 156, 250
- hexamethylenediamine carbamate (HMDC)
 - 14, 43, 244
- hexamethylenetetramine (HMTA) 40, 293
- high-activity magnesium oxide 126, 299
- high *cis*-BR 325
- higher bound acrylonitrile 10
- higher surface activity 53
- high-gloss 148, 193
 - ozone-resistant compounds 148
- high loadings 120
- high-mastication screw 274, 279
- high mixing temperatures 292
- high molecular weight paraffin 144
- high performance (HP) peroxide 202, 232
- high-performance rubbers 189
- high reinforced carbon black/aromatic oil 321
- high severity 172
- high-structure fillers 190
- high styrene content 315
- high-styrene resins 41, 133
- high-styrene SBR 321
- high-temperature applications 128
- high temperature curing 41
- high-temperature tensile strength 23
- high tensile x elongation 164
- high-vinyl 1,2-polybutadiene resins 293
- high-vinyl polyisoprene 315
- high-vinyl SBR 315
- high-viscosity oil/resins 320
- high-viscosity oils 60, 137
- high volatile 258
 - content 92
- high zinc oxide loading 139
- HIIR 162, 235, 243
- Hi-Sil EZ[®] 217
- HMDC 14, 43
- HMMM 40, 106, 108, 176, 333
- HMT 40, 333, 368
- HMTA 129
- HNBR 46, 66, 79, 83, 87, 104, 126, 127, 151,
 - 161, 180, 187, 194, 199, 203, 282, 301
 - coatings 187
- HNS 281
- HNTs 19, 28, 220
- homogenizers 336
- homogenizing 198
 - agents 49, 201, 265
- hose 339, 343, 347, 349, 350, 351, 352,
 - 353, 356
 - construction 117
- hot air aging resistance 125
- hot air and/or heat aging resistance 125
- hot-emulsion SBR 63
- hot feed extruder 274
- hot tear resistance 79, 297
- HPHT 127
- HPMA 116
- (HP) peroxide formulations 202, 232
- HQEE 33, 72, 134
- HTS 71, 138, 156, 250
- humidity 211, 231, 258
- HVA-2 45, 132, 241, 369
- HXNBR 11, 13, 46, 72, 80, 110, 129, 180
 - coating 149
- hybrid crosslinks 156, 181
- hybrid cures 36
- Hycar[®] 1312 188, 208, 278
- Hycar Nitrile Polymers 65

- hydrated silica 314
- Hydrin 100 102
- Hydrin Rubber 185
- hydrocarbon resins 136, 168
- hydrogen abstraction 20, 35
- hydrogenated carboxylated nitrile rubber 180
- hydrogenated nitrile rubber 72
- hydrogenation of carboxylated nitrile 11, 72, 80
- hydrogen bonding 335
- hydrolysis 218
 - of the ester bonds 110
 - resistance 196
- hydrophobic-treated silica 202
- hydroquinone 72
- hydroxy functionalized 116
- hydroxylamine neutral sulfate 281
- hydroxy propyl methacrylate 116
- hygroscopic 211
- Hypalon 20 195
- Hypalon 30 195
- Hypalon 4085 120
- Hypalon[®] (CSM) 86, 195
- hysteresis 52, 58, 61
- hysteretic 169
- I
- IBR 315, 324
- ice grip 323
- ice traction 323
- IIR 83, 194, 318, 325
- IIR and Vinyl BR 316
- impingement abrasion resistance 177
- incubation time 231
- induction heating 246
- industrial complexity 3
- ingredient property relationships 3
- inhibitors 230
- injection molding 301
- innerliner 103, 131, 132, 261
- inorganic vs. organic blowing agents 307
- in situ* silanization 319
- in situ* silica formation 218
- insoluble sulfur 106, 210, 292
- interaction 4
- interaggregate contact 54
- interaggregate spacing 56
- inventory system 292
- ion-exchanged montmorillonite clay 226
- ionically crosslinked 22
- ionic crosslinks 155
 - sites 15
- ionic elastomer 22
- ionolyzer 22
- ionomeric elastomer 15
- ionomers 22
- IR 157, 298
 - /NR 47
 - (polyisoprene) 207
 - polymers 242
 - vs. NR 207, 272, 276, 281
- IRX 1045 80
- ISB Accelerator 231, 240
- isobutylene based elastomers 249, 252
- isooctane 185
- isoprene butadiene rubber 315, 324
- J
- jute 27
 - fibers 39
- K
- Ketjenblack EC 94
- ketones 256
- kickers 230, 240
 - for sulfenamide cures 230
- Krynac 833, isoprene acrylonitrile copolymer 65
- L
- labile crosslinks 222
- labile hydrogens 34
- laboratory mixing 7
- laboratory trials 7
- large precursor cracks 168
- latex films 247
- lath-like crystal structure 27
- LCB 222, 273
- L/D 278
- lead oxide (litharge) 127
- length-to-diameter ratio 22
- likes dissolve likes 335
- linear *cis*-BR polymers 62
- linearity 62, 325
- liner 211, 261
 - roll 211
- lining 349
- linked fatty acid ester groups 223
- liquid BR 121

- liquid EPDM 301
 - as an additive 282
 - liquid EPR plasticizer 198
 - liquid high-vinyl 1,2-polybutadiene resins 232
 - liquid IR as an additive 281
 - liquid NBR 208
 - polymer 278
 - liquid phase mixing of carbon black 216
 - liquid phase mixing technology 216
 - liquid polychloroprene 199
 - liquid polymeric plasticizers 198
 - lithopone 168
 - LL carbon black 54, 173, 317
 - loadability 115
 - loading levels 257
 - loading of a large particle size filler 199
 - loading of the carbon 38
 - loading of the carbon black 164
 - long-chain branching 204, 222, 254, 273
 - longer cures 156
 - loose gel 12, 27, 154, 197, 219
 - low-activity magnesium oxide 126
 - low compression 370
 - lower compound viscosity 202, 308
 - lower cost polyurethanes 120
 - lower cure temperature 248
 - lower MW elastomers 263
 - lower viscosity 234
 - lower volatility 128
 - low glass transition temperature polymers 323
 - low hysteresis applications 54
 - low hysteresis carbon blacks 54, 173, 328
 - low molecular weight paraffin 144
 - low-polarity polymer modifiers 88
 - low set 44, 363
 - low-severity abrasion resistance 173
 - low-severity tire tread wear 172
 - low-structure carbon blacks to 115
 - low-temperature 367
 - properties 83
 - low viscosity HNBR 199, 263, 282, 302
 - low-viscosity oils 60
 - low-volatility oils 300
 - LPPM 88
 - LT-HNBR 87
 - lubricant fillers 200
 - lumps in dumped batches 268
 - Luperox TBEC 292
- M
- magnesium carbonate treated sulfur 265, 363
 - magnesium hydroxide 82, 113
 - magnesium oxide 128, 140, 235, 243, 244, 299, 366, 369, 370
 - magnesium silicate 332
 - magnesium silicate talc 200
 - magnesium sulfate 128
 - magsilica 120, 246
 - maleated polybutadiene (PBDMA) 39, 77, 219
 - maleic anhydride 162, 222
 - modified EPDM 12
 - manganese 141
 - marching modulus 253
 - masterbatch 119, 219, 220
 - concentrate 219
 - masticate feed 285
 - mastication time 274
 - MBCA 14, 25, 50, 71
 - MBM 35
 - MBS 13, 229, 231, 239, 240, 249, 360
 - MBT 292, 360, 362, 370, 372
 - MBT, MBTS 360
 - MBTS 229, 360, 363, 364, 369, 370, 371
 - MC-treated sulfur 364
 - MDI prepolymer 33, 66
 - systems 72, 134
 - ME₃TU 367
 - mechanical shear 222
 - mechano-chemical conditions 160
 - medium extracted solvate 59, 333
 - melamine polyphosphate 113
 - melt fracture 280
 - phenomena 275
 - point 280
 - melt temperature (T_m) 21
 - mercaptan-modified neoprene 133
 - MES 59, 333
 - metallic contamination 278
 - metallocene catalyst 31, 264, 282
 - for EPDM 204
 - metallocene-catalyzed EPDM grades 224
 - metal poisons 141
 - metal powder loadings 96
 - metal-sulfonated EPDM compound 22
 - metered feed rate 280
 - methacrylate types 35
 - methacrylsilanes 58
 - methanol 185
 - methylene-bis-ortho-chloroaniline 14

- methylene donor 41, 110, 176, 293
- methylol phenol-formaldehyde (PF) resin
 - cure 142, 372
- methylol-terminated PF resin 372
- methylol-terminated phenolic resin cure system 371
- MgO 370
- microcrystalline wax 144
- microdispersion 57
- microencapsulation 145
- microporosity 165
- microvoids 303
- milk 269
- millable polyurethane 16, 86, 103, 188, 248
- millable PU blends 177
- millable PU/SBR 121, 188
- mill mixing 220
- mill temperature 270
- mineral filler 37, 117
- minimum rolling bank 287
- miscellaneous 351, 352, 357, 358
- miscellaneous applications 341
- miscellaneous products 348, 353, 354
- Mistron CB 37
- Mistron[®] Vapor 27, 200
- Mistron[®] Vapor R 76
- mix cycle 170, 264
- mixed diaryl *p*-phenylenediamine antiozonant 149
- mixed PPDs 167
- mixing 153, 170, 197, 210, 227, 234, 274, 294, 319
 - cycle 274
 - sequence 56, 170
 - techniques 42, 57, 336
 - temperature 210
 - time 205
 - two-pass 220
 - work history 205
- MMT 28
- modified S-SBR 326
- modified starch 167
- modifiers 88
- moisture 231, 257, 258
 - contamination of sulfenamide accelerators 231
 - effects 288
 - -treated silica 59, 332
- mold 296, 298
 - coating 296
 - design 311
 - flow 301
 - fouling 297
 - release 295, 296
 - agents 300
 - residence time 259
 - temperature 311
- molding temperature 304
- molecular slippage 182
- molecular weight 207
 - distribution 204, 224, 335
 - effect 11, 46, 222
- molybdenum disulfide 101, 176
- monodispersed 62
- monosulfidic crosslinks 45, 137, 157, 247
- Monsanto FTFT 162
- montmorillonite 18, 28, 136
- Mooney viscosity 212
- motor mounts 129, 346
 - and bushings 340
- mount 159
- m-PBM 369
- MQ 84
- MT black replacement 118
- multicut transfermix 284
- multifunctional crosslinking agents 42
- multiple crystallinity transitions 23
- multiple glass transition terpolymers 64, 179
- multiple glass transition terpolymers of isoprene, butadiene, and styrene 316
- multiple response 4
- MVQ 83
- MWCNT 136
- N
- N110 carbon black 70
- N134 173
- N220 173
- N234 173, 174
- N293 93
- N294 93
- N299 70
- N326 107, 226
- N339 173
- N347 61
- N351 173
- N472 90, 93
- N550 80
- N650 80
- N683B 299

- N990 191
- nanoblacks 329
- nanoclays 18, 24, 28, 40, 77, 81, 136, 226
- nanocomposites 18, 74, 104, 286
- nanofillers 81, 220, 226, 333
- nanomicro filler 267
- Nanoprene[®] 58, 332
- nano-structured carbon blacks 173
- nanotechnology 100
- nanotubes 24, 40, 77, 136, 174
- naphthenic oils 66
- narrow molecular weight distribution 65, 254, 269
- natural rubber 13, 18, 132, 149, 181, 182, 187, 206, 207, 216, 223, 228, 231, 247, 251, 272, 281, 332
 - blend 207
 - /carbon black masterbatches 216
 - compounds 286
 - latex 31
- NBC 145
- NBR 10, 25, 83, 84, 203, 226, 262, 298, 314
 - cure packages 363
 - /EPDM blend 152
 - /PP 189
 - /PVC 17, 48, 112, 180
 - /PVC blend 73, 86, 121, 151
 - with gel 273
- N*-(cyclohexylthio)phthalimide (CTP) 44, 237
- negative synergism 336
- neodymium catalyst 62
- neodymium-catalyzed 159
- neodymium-catalyzed high *cis*-BR 325
- neodymium polybutadienes 272
- Neoprene FB 199
- Neoprene GRT 131, 150
- Neoprene WB[®] 273
- nerve 205, 206, 302
- nervy 206
- network properties 241
- Ni-*cis*-BR 198
- nickel 141
 - dibutylthiocarbamate (NBC) 129, 145
 - salts 55
- nip 288
 - setting 270
- N*-isopropyl-*N*-phenyl-*p*-phenylenediamine 193
- nitrile rubbers (NBRs) 299
- nitrogen 143
 - inflation 143
 - oxides 110
- nitrosamines 138, 226, 330
- nitroso compounds 38, 174, 330
- nitroxyl free radical 232
- N,N*-di-beta-naphthyl-*p*-phenylene-diamine (DNPD) 43, 147, 251
- N,N*-dicyclohexyl-2-benzothiazyl sulfenamide 106
- N*-nitrosamine generators 371
- N,N'*-*m*-phenylenedimaleimide (BMI-MP) 36, 233
- N,N'*-*m*-phenylene dimaleimide (HVA-2) 233
- N,N*-phenylene dimaleimide 45
- non-ETU cure systems 366
- nonextractible 188
- nonhalogenated rubber compound 229
- nonproductive 220
- non-staining 146, 148
 - acetal AO 146
 - antiozonant 193
- non-thiourea 368, 369
- non-thiuram cure systems 372
- norbornene (ENB) 243
- novolak resins 41
- Novor[®] 248, 256
 - crosslinking agents 129
- N*-phenyl-*N'*-1,3-dimethylbutyl-*p*-quinone diimine (6-QDI) 142, 145
- N*-phenyl-*N'*-Cp-toluenesulfonyl 130
- NR 83, 88, 120, 178, 223, 298, 318, 325
 - -based compounds 199, 228
 - /BIIR/IM blend 65
 - /CIIR blend 149
 - /CIIR/EPDM triblend 160
 - compounds 128
 - /EPDM 292
 - /EPDM blend 140, 149
 - /EPDM covulcanized blend 208
 - motor mount 129
 - mount 148, 159
 - phase 70
 - processing 199
 - /SBR blend 178, 179, 227
- NR/BR 178, 275
 - blend 64, 70, 84, 154, 160, 324
 - /EPDM 154
 - /NIR blend 65
- NR, SBR, BR 359
- NR vs. BR vs. SBR cure rates 243

- NS-110[®] 331
NSBR 314
N-tert-butyl-2-benzothiazole sulfenimide
(TBSI) 249
number average molecular weight 269
nylon 103
nylon-6 39
- O
- OBSH 307
- blowing agent 308
octylated diphenylamine 130
octyl phenol formaldehyde resins 209
off-gassing 256
off-the-road tires 165
oil 267, 291, 300
- and/or solvent resistance 183
- attack 187
- drilling operations 24
- effects 273
- extended
- masterbatches 158
- polymer 119
- immersion 189
- levels 210
- loading 51, 176, 205
- or wax treatment 265
- swell 189
one change at a time 4
one-pass 210
- mix 118
one property at a time 4
one-variable-at-a-time 5
onset of vulcanization 228
optical whiteners 116
optimal loading 215
optimal molecular weight 209
optimal surface area 172
optimal $\tan \delta$ 169
optimum batch size 119, 234, 265
optimum crosslink density 70
optimum cure 156
order of additions 217
order of efficiency for crosslinking 35
organically modified layered silicates 67, 333
organocobalt salts 105
organosilane 28, 38, 59, 116
- and carbon black 330
- coupling chemistry 218
orientation 304
original (unaged) tack 209
OTR 165
- tires 158
- tread 157
- compound 167
overall oil resistance 183
overcuring 13
over-masticating 327
overmastication 257
overmixing 30
oversized molds 259
oxidized carbon 97
oxygen 110
ozone 110
- attack 129, 149
- resistance 144, 195
- P
- PA 135
p-alkylated phenolic resin tackifiers 209
p-aminobenzenesulfonyl azide 38, 174, 330
Paracril[®] X3684 299
paraffinic 293
paraphenylene diamines 144
para-tertiary-butyl-phenol-formaldehyde
tackifying resins 209
para-tertiary-octyl-phenol-formaldehyde
tackifying resins 209
particle size 164
- carbon blacks 170
- of blowing agent 307
PBDMA 39, 77, 80
PCTP 10, 158
PEG 368
pellets 266
penacolite resins 110
pentachlorothiophenol 10, 158
pentaerythritol triacrylate 250
peptizer 10, 158, 199, 267, 327
Perbunan[®] NT 299
percent dispersion of carbon black and fillers
214
percolation threshold 91, 95
perfluoroelastomers (FFKM)s 126, 184
perfluoromethylvinyl ether (PMVE) 86
permeability 102
peroxide 42, 81, 108, 232, 360
- based system 245
- coagents 293
- use 140

- cure
 - coagents 241
 - system 233
 - vs. sulfur cure 140, 190, 248
- -cured 36
- cures 34, 71, 142, 181, 232, 256, 295
- vulcanization 233
- /ZnDMA 155
- peroxyketal class 292
- peroxyketal peroxides 241
- PET tire cord 110
- phase boundaries 90
- phase distribution 57
- phase mixing 15, 42, 57, 69, 154, 171, 216, 227, 275
 - techniques 217
- phenol acetylene resins 209
- phenol-formaldehyde resin cure 248
- phenol-formaldehyde tackifying resin 209
- phenolic antioxidants 192
- phenolic resins 235
- phenolic tackifiers 209
- phenylene diamine AOs 182
- phosphate 113
- phthalic anhydride 230
- Pico abrasion 182
- pigment polymer interaction 30
- pin barrel extruder 197, 284
- plasma polymer film 220
- plasticizers 189, 258
- platelets 278
- plate-like particles 37
- platinum catalyst 242
- platinum cures for silicone rubber 242
- platinum cure system 245
- platy fillers 213
- PNF 83
- PNR 66, 84
 - vulcanizate 66
- polarity 335
- polar surfaces 238
- poly-(1,2-butadiene)diol prepolymer 48
- polyacrylate 46, 295
 - elastomers 203
 - rubber 135, 185
- polyamide 135
- polybutadiene 187
 - rubber 159, 228
- polychloroprene 10, 112, 208, 213, 296, 299
 - /carboxylated NBR 189
 - cure packages 366
 - /epoxized NR 188
- polydimethylsiloxane 113
- polyepichlorohydrin 35, 102
- polyester adhesion to rubber 110
- polyester grades of millable polyurethane 103
- polyethylene glycol 23, 308
- polyethylene mold release agent 296, 299
- polyisobutylene with brominated
 - p*-methylstyrene 132
- polymer bound predispersion 219
- polymer filler interaction 190
- polymer-filler modification 314
- polymeric plasticizers 291
- polymer structure 241
- polynorbornene 33, 86
 - as an additive 225
- polyoctenamer 180, 199, 225, 248, 263, 273, 282
 - as an additive 225
- polyoctene 16
- polypropylene liners 211
- Polystay 100 167
- polysulfide crosslinks 20, 81, 155, 181, 361
- polysulfide rubber 187
- polysulfidic crosslinks 157, 361
- polyterpenes 209
- poly(trifluoropropyl) methylsiloxane 187
- polyurethane 14, 33, 50, 72, 134, 177, 188, 196
 - based on MDI prepolymer 196
 - elastomers 14, 120, 163
 - rubber 50
- poly(vinyl chloride)/carboxylated NBR 189
- poor dispersion 257
- porosity 168, 255, 275, 303
- post-cure 46, 180, 251, 305
 - procedure 46
- post-curing 36
- post-polymerization treatment 222
- post-vulcanization baking 251
- pound-volume cost 115, 118
- powder blended curative packages 290
- powdered milk 269
- powdered rubber 265
- PPA-790® 300
- PPD 144, 167
- PPDI 134
- PPD microencapsulation 145
- p*-phenylene diisocyanate 134

- p,p*-oxybis(benzenesulfonylhydrazide) 307
- precipitated hydrated silica 75, 165, 175, 314, 316, 319
- precipitated silica 39, 106, 152, 166, 229
- precoating steel tire cord 109
- predispersions 219
- preforms 259
- preheat 285
- preheating the preform 312
- premature scorch 210
- press bumping 260
- pressurized liquid medium 259
- pre-vulcanization inhibitor 118
- preweighed blends 290
- primary accelerators 360
- primary amine 218
 - sulfenamide 360
- printing 354
- processability 201, 282, 335
- process aid 336
- processing additive 199, 306
- processing aid 119, 265, 278
 - for silica compounds 202
 - for silica dispersion 218
- processing aids 15, 201, 267
- processing oil 205, 261, 288, 291, 300
- processing safety 359
- processing temperatures 199
- process oils 258
- productivity 123, 284
- promotor cures 42
- prooxidant 96, 141
- propylene 127, 184
- PTFE 100, 176
 - additive 225
- PU 33
 - /NBR 50
- PVC 112, 151
- pyrolytic graphite 99
- pyrrole 220

- Q
- QDI 181, 182
- quaternary ammonium BIMS ionomers 225
- quaternary ammonium salts 136
- quinonediimine 182

- R
- RA 5300 295, 298
- radical compounding 330
- radical cure 27
- ram pressure 234
- rapeseed oil 60
 - for CR 137
- rate of low-temperature crystallization 89
- ratio of sulfur to accelerator 361
- reactive BR 15
- reactive EPDM 162
- reactive polymer and fiber dispersion 219
- rebound 52, 61, 325
- reclaim rubber 211, 282
- recycled ground rubber 76
- red iron oxide 134
- reduce mixing time 267
- reducing viscosity 197
- refractory 278
- reinforcing phenol-formaldehyde novolak resin 41, 176
- reinforcing resin 41, 176, 333
- release agents 295
- residual extension ratio 22, 68
- resilience 61
- Resin B20-S 108
- resin cure 142, 248, 371
 - systems 371
- resinous additives 214
- resinous homogenizing agents 49
- resinous process aids 214
- resins 201
- resistance to swelling 183
- resorcinol formaldehyde (RF) resin 106, 110
- resorcinol formaldehyde vinyl pyridene latex 22
 - for adhesion 51
- resorcinol resin 108
- retarders 230, 241
- reversion 247, 251
 - inhibitors 71, 250
 - resistance 249
- review panel 8
- RFL-treated fabric 110
- Rhenosin TP100[®] 160
- rhombic sulfur 210, 292
- ribbed smoked sheet no. 1 10
- ribbed smoked sheet no. 3 10
- rice husk 117
- Ricon[®] 43, 89, 293
- Ricon[®] 152 14, 244
- Ricon[®] grades 188, 232
- ring extruder 123, 284

- roller head die 259
- rollers 340, 347, 348, 349, 352
- rolling resistance 218, 313, 316, 317, 319, 325
 - index 325
- roll temperature for HIR 212
- rosin acid 244
- rosin-based emulsifiers 208
- rosin esters 369
- rotor speed 234
- RP 7
- RT 7
- rubber
 - blends 328
 - innerliner 287
 - makers sulfur 363
 - phases 217
 - phobic 217
- running temperature 334
- S
- S2-S4 55
- SAE J200 125
- SAF carbon black (N110 type) 215
- SAF masterbatches 215
- salicylic acid 230
- Saret® 633 21
- Saret® 634 71
- SBR 83, 88, 120, 298, 313, 314, 318
 - /BR 178, 324
 - blend 160
 - blend by 154
 - /PVC blend 73
- SBR 1013 63, 315
- SBR 1500 63, 119
- SBR 1502 63
- SBR 1505 63
- SBR 1606 119, 219, 266
- SBR 1721 315
- SBR 4503 17, 73
- scavenge hydrogen halides 113
- SCF black 93
- scorch problems 231
- scorch safety 359, 361, 367, 369
 - time 228, 229, 231
- scorch time 221, 231, 302, 312
- scorchy 232
- screw speed 275, 283
- screw temperature 285
- sealing products 151
- seals and gasket 340
- secondary accelerator 230
 - kicker 128
- secondary amine 360
- second-pass mix 220
- self-curable blends 189
- self-vulcanizable blends 188
- semicrystalline EPDM 224
 - grades 31
- semicrystalline polymers 88
- semi-efficient (semi-EV) 137, 155, 181, 249
 - cure system 45, 139
 - thiuram cure system 372
- sepiolite 117
 - as a filler 320, 332
- service life 149
- shear rate 203, 275
- shear thinning 203, 264
 - profile 259
- sheet 351
- shelf life 290
- shoes 339, 341, 343, 345, 350, 353, 355, 357
- Shore A 33, 41
- shot size for injection molding 259
- shrinkage 274
 - of part 303
- Si69 silane 317
- SIBR 64, 179, 316, 327
- silane 114
 - coupling agent 58, 76, 175, 314
 - treated clays 37, 200
- silanization 218
- silanization reaction 331
- silica 28, 58, 106, 128, 166, 175, 217, 218, 229, 283, 316, 319
 - and coupling agent 324
 - and silane coupling agents 201
 - based compounds 58
 - coated iron oxide 120, 246
 - compounds 116
 - concentration 98
 - dispersibility 218
 - dispersion 218
 - in polar elastomers 218
 - fillers 217
 - green tire tread 202
 - hydrid 317
 - loaded compound 326
 - loading 203, 331
 - mixtures 201
 - /silane 166

- tread 319
- tetraethoxysilane (TEOS) 218
- silicate minerals 117
- silicone 111
 - and fluorosilicone rubber 194
 - /EPDM 135
 - oils 176
 - rubber 208, 245, 296
 - /silica 202
- siloxane elastomer 277, 295
- siloxane elastomer and talc 298
- silver 96, 99, 245
 - -coated microspheres 96
- single site constrained geometry 11
- SIR10 313
- six-wing VCMT rotor 266
- skin 259
- slab-dipped stock 258
- sliding abrasion resistance 177
- smaller size aggregates 91
- small vents 302
- small zones 149
- smoothness of the extrudate surface 276
- SMR 10 272
- SMR 20 272
- SnCl₂ 372
- soaps 201
- sodium bicarbonate 265, 307
- softener 324
- solubility parameters 16, 42, 205, 335
- solution SBR 179, 325, 326
- solvent resistance 183
- sources of ideas 7
- SP 1055 371
- special reactor technology 328
- special wax blend 145
- spews 302
- sponge 348, 350, 352, 358
 - rubber 67
- sports apparel 346, 347
- squeegee 261, 288
- squeeze roll 261, 288
- SR129 54, 328
- SR351 250
- SR401 54, 328
- SR444 250
- S-SBR, SSBR 64, 179, 218, 326, 330
 - and silica 318
 - functionalized 218
 - polymers 63
- SSCP-901 from shell 327
- staining 192
 - antiozonants 193
- stainless steel 299
- stainless tire sidewalls 193
- Stalite S 130
- star-branched halobutyl 287
 - polymers 265
 - rubbers 198, 268
- star-branched HIIIR 198
- star-branched polymers 223, 265, 287
- starch 167
- star polymer 289
- starving the extruder 280
- state-of-mix 56, 221, 234
- static modulus 27
- static ozone protection 144
- steam autoclave cure 259
- stearate-treated calcium carbonate 37, 200
- stearic acid 34, 107, 369
- steel 298
 - belted radial tire 108
 - cord 109
 - surfaces 108
- step-down cure 13, 256
 - in autoclave 256
- stereospecificity 335
- stickiness to metal surfaces 212
- stiffness 220
- stoichiometry 14, 71
- strain crystallization 9, 157, 159, 223
- strain-crystallizing polymer 10
- strain-induced crystallization 16, 47, 285
- straining 279
- stress crystallization 22
- stress relaxation resistance 47
- structure 164, 317
- Struktol 40 MS 214
- Struktol EF44 202
- Struktol HT 290 298
- Struktol WB16 296, 301
- Struktol XP1335 218
- Struktol XP1343 218
- styrene isoprene butadiene rubber (SIBR)
64, 327
- styrene-isoprene-butadiene terpolymer 179
- subjective ranking of rubber 125
- sulfenamides 229, 231, 239, 292, 360
 - accelerators 229
 - cure 230, 364

- system 118
 - sulfenimide 229, 239, 360
 - Sulfron[®] 59
 - Sulfron 3001 318
 - sulfur 108, 109, 120, 210, 231, 238, 241, 292, 362, 363, 366, 368, 369, 371, 372
 - bloom 210, 292
 - concentration 304, 361
 - -cured rubber compounds 250
 - cures 45
 - donor 45, 139, 361
 - guanidine cure systems 371
 - /peroxide cure 140
 - spender 233
 - -sulfur bond strength 140
 - vs. peroxide 155
 - sulfurless 364
 - cures 155
 - Superflex 167
 - super tackifiers 209
 - surface activity 53, 54, 164, 296
 - surface appearance 302, 306
 - surface area 164, 317, 319
 - of the carbon black 37
 - surface coating 220
 - surface-modified carbon 80
 - black 330
 - surface-treated fillers 37
 - surface treatment of fillers 200
 - surfactant 18, 201
 - swelling 185
 - swelling media 186
 - synergy 4
 - synthetic-based emulsification system 300
 - synthetic *cis*-1,4-polyisoprene (IR) 208
 - synthetic ester plasticizer 303
- T
- Tabor abrasion 174
 - TAC 35, 241
 - tack 207, 211
 - retention 211
 - tackifiers 212
 - tackifying resins 235
 - TAIC 35, 241
 - talc 27, 37, 76, 79, 103, 136, 166, 206, 213, 260, 266, 277, 278, 283, 294, 295, 304
 - loading 191
 - tan δ 64
 - tank lining 340
 - tank tracks 355
 - TAPDT 234
 - TATD 240
 - TATM 240
 - TBBS 13, 229, 230, 239, 240, 249, 360, 363, 364, 372
 - accelerator 240
 - TBSI 249, 360
 - cure 249
 - TBzTD 240
 - TDAE processing oil 321, 323
 - tearing energy 165
 - tear resistance 69, 170, 312
 - tear strength 70
 - TeDEC 292, 362
 - Teflon[®] 101, 176, 296, 300
 - tensile strength 9
 - TEPST 64, 326
 - TESPD 59, 201, 332
 - TESPT 58, 201, 250, 332
 - -treated silica 58
 - TETD 240, 368
 - tetra-alkyl thiuram disulfide (TATD) 230
 - tetrabenzylthiuram disulfide 231
 - tetrafluoroethylene 127, 184
 - tetrahydro-1,3,5-tri(*n*)-butyl(S)-triazin-ethione 193
 - T_g 78
 - thermal black 251
 - thermal conductivity 98, 245
 - thermally modified carbon blacks 99
 - thermal reversion 250
 - thermal stability 170
 - thermo-oxidation 97
 - thermooxidative attack 129
 - thermoplastic elastomers 189
 - thermoplastic vulcanizate alloys 135
 - thermoplastic vulcanizate (TPV) 17, 48, 87, 103, 135, 189
 - thiadiazole accelerator 245
 - thiazole 45, 229, 239, 360
 - accelerators 371
 - cure 364
 - thick articles 245
 - thiocarbonyl (A-1) 44, 237, 244
 - thioether plasticizers 128
 - thioglycolic acid derivatives 222
 - thiophene 220
 - thiourea cure 366
 - thiuram 229, 239, 360

- accelerators 371
 - cure 138, 251, 364
 - systems 369, 370, 372
 - disulfide accelerators 240
 - /guanidine cure 366
 - kicker 128
 - /thiazole cure system 370
 - tight gel 12, 27, 154, 197, 219
 - tin-butadienyl bonds 63
 - tin-coupled elastomer 326
 - tin-coupled polymer 63
 - tin-coupled SBR 63
 - tin coupling 326, 327
 - tin-styryl bonds 63
 - TINTM plasticizers 128
 - TiO₂ 116
 - tire 338, 341, 343, 345, 346, 354, 355, 356, 357
 - aging 143
 - building 207
 - operation 261, 288
 - carcass compounds 227
 - design 334
 - dry traction 321
 - inflation pressure 334
 - innerliner 261, 288
 - load 334
 - performance 178
 - rolling resistance 325
 - running temperature 334
 - temperature 322
 - wet traction 313
 - titanate coupling agents 114
 - titanate-treated titanium dioxide 37, 200
 - titanium dioxide 116
 - T_m 78
 - TMPTA 241
 - TMPTMA 241
 - TMQ 122, 141, 168
 - /6PPD 141, 146
 - /BLE 141
 - combination 168
 - TMTD 240, 251, 292, 299, 361, 362, 363, 364, 367, 368, 369, 370, 372
 - TMTD, TMTM, TETD, TBZTD 360
 - TMTM 240, 364, 366, 368
 - toluene 185
 - top coating 159
 - torn edges 279
 - total mixing time 264
 - TOTM 128
 - tough compound 198
 - toughness 41
 - TPE 103, 181
 - TPU 181
 - TPV 17, 48, 103, 163, 189
 - traction 313, 317
 - trans-BR based 242
 - transfermix extruder 284
 - transition elements 141
 - trans-polyoctenylene rubber (TOR)
 - 180, 199, 225, 248, 263, 273, 282
 - additive 199, 263, 273
 - transverse direction 77, 80
 - trapped air 259, 302
 - Traxsyn 315
 - tread abrasion 314
 - tread design 320
 - tread hardness 318, 321
 - tread wear 173, 313, 317
 - resistance 177
 - treated sulfur 265
 - treated with stearate 114
 - triacylate additives for NR compounds 250
 - trial-and-error experiments 4
 - triallyl cyanurate (TAC) 233
 - triallyl isocyanurate (TAIC) 233
 - triazine derivative curing systems 299
 - triblend 65, 147
 - triethanolamine 308
 - Trilene[®] 198
 - trimellitate plasticizers 128, 189
 - trimethylolpropane triacrylate (TMPTA)
 - 233, 250
 - trimethylolpropane trimethacrylate (TMPTMA) 233
 - triple 8 cure system 292
 - truck tread 181
 - TSR natural rubber 281
 - T-type 225
 - neoprene 225, 277, 283
 - two-part cast polyurethane system 25, 33
 - two-pass mix 210, 220
 - two-phase systems 336
 - types of crosslinks 181
- U
- UHV 127
 - ultimate crosslink density 60, 361
 - ultimate dispersion 221

- ultimate elongation 26
 - properties 168
 - ultimate modulus buildup per accelerator loading 359
 - ultimate tensile elongation 25
 - ultra-accelerators 45, 137
 - ultraclean carbon blacks 278
 - ultrafine particle sized carbon blacks 263
 - ultra-high-viscosity 127
 - ultra-low-structure 115, 200, 300
 - carbon blacks 200
 - ultrasonically aided extrusion 286
 - ultraviolet light 110, 194
 - uncured compound strength 222
 - undercoat 129
 - undercuring 12
 - under-the-hood 125
 - unsaturation 127
 - upside down 220
 - mixes 216
 - urea 308
 - useful service life 127
 - utilisation 38, 54
 - UV stability 112
- V
- vacuum during molding 260
 - Vamac 14, 43, 67, 244
 - Vamac[®] GLS 186
 - Vanax[®] 189 132, 245, 253
 - Vanax[®] PML 47, 367, 368
 - van der Waals interaction 314
 - Vaporlink 27, 267
 - vehicle speed 334
 - vented barrels 259
 - vented extruder 259
 - vent holes 260
 - ventilation 138
 - very high damping 66
 - very high pressure and very high temperature 127
 - very high structure carbon black 54
 - VGCs 291
 - vinyl 1,2-polybutadiene resins 89
 - vinyl 1,2-polybutadiene rubber 316
 - vinyl acetate 151, 196, 322
 - wax 215
 - as an additive 263
 - vinyl content 62, 179
 - vinylidene fluoride 127, 184
 - vinylsilanes 58
 - vinyl solution SBR 64
 - viscosity 197, 257, 287, 302
 - gravity constants 291
 - viscous heating 234, 283
 - Viton GLT 86
 - VMQ 84
 - silicone gums 134
 - voids 255
 - volatile 258
 - volatile content 92
 - volatile vulcanization byproducts 256
 - VP Si 363 59, 332
 - Vulcavit CRV 47
 - Vulcan 1436 38, 317
 - vulcanized vegetable oil (VVO) 137, 260, 274, 279, 321, 323
 - vulcanizing agent 366, 369
 - Vulcuren 250
 - Vulkazon AFS 146
 - Vultac 236
 - Vultac 5 371
- W
- waiting time 261, 288
 - water content 231
 - water washed clays 116
 - wax 144, 210, 309
 - /PPDs 145
 - wear conditions 172
 - wear resistance 170
 - weatherability resistance 195
 - weathering resistance 194
 - wet grip 314, 330
 - enhancer 314
 - wet out 215, 217
 - wettability 91
 - wet traction 116, 313, 314, 316, 317, 319
 - whiting 117, 168
 - Wingtack 95 209
 - winter traction 323
 - wipers 351
 - wire coat adhesion 107
 - wollastonite 77, 81
 - wood cellulose fiber 22
 - wood rosin 235, 369
 - tackifiers 209
 - work history 56, 205, 231, 274
 - wrap 259
 - W-type 225, 244, 366

- neoprenes 47

X

xanthate-modified neoprene 133
xanthate-modified types of CR 26
XC-72 94
XHNBR 80
XLPE 135
XNBR 11, 32, 72, 80, 83, 110, 180

Z

ZB47 58, 332
ZBDC 292, 363
ZBPD 249, 252, 360, 363, 366, 372
ZBPD/TBBS/sulfur cure system 372
- higher modulus 372
- short cure time 372
ZDBC 240
ZDEC 240
ZDMC 240
zero strain under tension 169
Ziegler-Natta catalyst 23
- technologies 224, 276
zinc 108
zinc 2-mercaptotoluimidazole 168

zinc and potassium soaps of fatty acids 306
zinc-based coagent peroxide cures 155
zinc-based coagents 155
zinc borate 111, 112, 113
zinc-containing materials 133
zinc diacrylate metallic coagent 21
zinc dibutylphosphorodithiate 252
zinc dimethacrylate metallic coagent 71
zinc-free processing aids 199
zinc methacrylate salts 250
zinc-*O,O*-di-*n*-butylphosphorodithioate (ZBPD)
249
zinc oxide 78, 107, 127, 128, 130, 139, 180,
210, 229, 251, 366, 369, 370
- cure system 370
- loading 241
zinc/potassium soap 199, 202
zinc soap 58, 201, 332
ZMDC 363
ZMTI 140, 161, 168, 237
ZnDEC 370
ZnDMC 370
ZnDMC, ZnDBC 360
ZnO at the interface 106
ZnO Loading 249