Index

A
aberration resistance, 17, 18
adhesive, 8
aftermarket insert, 2, 21, 35
ankle/leg height, 4
aramid, 17
articulated strut tribometer, 51–52
ASTM F1116, 38
ASTM F1117, 38, 40
ASTM F1646, 43
ASTM F1897, 33
ASTM F2412, 33, 34, 35, 36, 37, 40
ASTM F2413, 20, 21, 33, 39, 40
ASTM F2508, 54
ASTM F2892, 33, 39, 37, 40
ASTM F2913, 56
ASTM International Committee F13
Pedestrian/Walkway Safety and
Footwear, 58
available friction, 45–46

B
blown soling, 12
bond welt construction, 9
bootie construction. See membrane
waterproofing
BOT 3000, 49 (figure)
breathability, 16–17
Brungabler MK II, 52 (figure)
Brungabler MK III, 52 (figure)

C
Canadian Standards Association
(CSA), 56
cement construction, 6 (figure), 9
(figure)
chemical resistance, 28
chemically treated natural fibers, 17
close edge construction, 9
closure systems, 17–18
coefficient of friction (COF), 44,
45–47, 54–55, 57
safe threshold COF number,
57–58
utilized (uCOF), 46–47
cold weather protection, 20
compression molded rubber, 13
compression test, 34 (figure)
conductive materials, 37, 39
conductive protective footwear, 36
(figure)
construction, 4–5
direct-attach, 10 (figure), 10–13,
11 (figure)
external, 16–18
internal, 18–22 19 (figure)
materials of, 11–13. See also
materials
methods, 5–13, 6 (figure)
corner stitch. See Opanka (corner
stitch)
crepe, 29

damaged footwear. See footwear,
damaged
dielectric footwear, 38–39
dielectric testing, 38 (figure)
direct-attach construction, 6 (figure), 10–13
drag sled tribometer, 48–50
dual density, 13, 28

eight-inch, 4, 5 (figure)
electric hazard (EH) resistant footwear, 36–38, 37 (figure)
EN ISO 13287, 55–56
environment, 15, 31
ethylene vinyl acetate (EVA), 28–29
European Committee for Standardization Personal Protective Equipment (PPE) Footwear Committee, 55–56
external footwear construction, 16–18. See also closure systems; leather; synthetic material; thread eyelets, 17–18

flame-resistant treatment, 18
flat lasted construction, 8
footbeds, 21–22, 22 (figure)
footwear care and disposal, 35–38, 39–40, 41
construction, 4–5, 10–13, 16–22. See also construction; direct-attach construction; Goodyear welt construction; specific methods
damaged, 35–38, 39–40, 41
design of, 4, 5 (figure), 8, 29–31
fit and sizing, 2–3
materials, 8, 10, 11–13, 25. See also materials; soling materials
test methods for, 55–56, 57–58
types, 33–41. See also polymeric footwear; slip resistance; stitching; upper materials
force lasted construction, 8–9
friction, 45–47
available, 45–46
coefficient of, 44, 45–47. See also coefficient of friction (COF) walkway testing and, 47–54

Goodyear welt construction, 5–7
grounded reaction forces (GRF), 46

hazard assessment, 15, 16
heel materials, 19–20
high oil content. See leather, high oil content
Horizontal Dynomometer Pull Meter, 48–49, 49 (figure)
Horizontal Pull Slipmeter (HPS), 48 (figure)
hybrid construction, 17. See also specific materials

impact tests, 33, 34 (figure), 35 (figure)
injection molding, 10, 28
insensible perspiration, 19
insoles, 21–22. See also footbeds internal footwear construction, 18–22. See also insoles; linings

last, 3, 11. See also lasting
lasting, 8–9, 10. See also direct-attach construction
leather, 16
high oil content, 8
insulation and, 20
as a lace material, 18
as a soling material, 29
See also seam seal waterproofing
lightweight technology, 28–29
low-cost material, 29
lug pattern, 30 (figure)

M
materials, 18, 20–21. See also specific materials
membrane waterproofing, 16–17
metal impact resistance, 35 (figure)
metallic plates, 21
metatarsal guard, 21
midsole design, 10
Model 80 slip tester, 48, 49 (figure)
molds, 12, 13
molten protection, 18
motorized drag sleds, 49

N
net fit construction, 9
non-metallic devices, 21, 27 (figure)
nylon materials, 17, 18
nylon-based synthetic uppers, 17

O
Opanka (corner stitch), 6 (figure), 8
open pour, 10
outsole, 13, 25. See also soling materials
Oxford, 4, 5 (figure)

P
pendulum tribometer, 50–51
perspiration, 18–19, 19 (figure), 20
polymeric footwear, 10–11
polyurethane (PU), 11–12, 25–28, 26 (figure)
polyvinyl chloride (PVC), 13, 29
portable tribometer, 48
protective footwear. See footwear protective toe compression resistance, 33–34, 34 (figure), 35
protective toe impact resistance, 33, 34 (figure), 35
puncture-resistant device testing, 40, 41 (figure)
puncture-resistant footwear, 21, 40 (figure), 40–41
steel, 27 (figure)
testing, 40, 41 (figure)

R
rubber, 26 (figure), 28. See also crepe; thermal plastic rubber (TPR)

S
safe threshold COF number, 57–58
safety, 15. See also footwear; hazard assessment; safety toe footwear; specific types of footwear
safety toe footwear, 33–34
SATRA STM 603, 55 (figure)
SATRA Technology Centre of the United Kingdom, 55
SATRA TM142, 22
SATRA TM144, 55
SATRA TM159, 21–22
SATRA TM230, 16
SATRA TM376, 17
seam seal waterproofing, 16, 17
sensible perspiration, 19
shock absorption, 28
shock-resistance, 38
shoe-floor interface, 43, 45–46, 47.
See also friction; slip resistance
Sigler pendulum, 51 (figure)
single density, 12, 28
six-inch, 4, 5 (figure)
slip resistance value, 54. See also safe threshold COF number
slip resistance, 28, 30 (figure), 43
problems of testing, 54–55
test methods, 55–56, 56–57
testing, 44, 47–54, 54–57. See also tribometers
slip resistant, 43. See also slip resistance
slipping, 44–45. See also slip resistance
sole design, 8
soling designs, 29–30, 30 (figure)
soling materials, 9–13, 25–29
static dissipative (SD) footwear, 39–40
steel puncture resistant devices, 27
(stripe)
stitch-down construction, 6 (figure), 8
stitching, 5–7, 6 (figure)
string lasted, 9
Strobel construction, 8–9
synthetic construction, 16, 20. See also
nylon-based material; specific
materials

T
temperature
hazard assessment and, 17
perspiration rate and, 19
polyurethane and, 12
See also molten protection
thermal plastic rubber (TPR), 13, 29
thermal set, 28
thermoplastic polyurethane, 27
(thread), 28
thread, 18
toe cap, 2, 20–21
toe shapes, 21
Tortus II, 49
Tortus III, 49
tread, 30 (figure)
tribometers, 4, 47–54, 48 (figure),
48–53 (figure). See also whole shoes
 testers

U
unit sole, 25
upper materials
external, 16–18
internal, 18–22, 19 (figure)
urethanes, 28
utilized friction, 46

V
vulcanized footwear. See polymeric
footwear

W
walking, 46
walkway friction, 44, 47–54, 48–53
(figure)
waterproof technology, 11, 12. See also
membrane waterproofing; seam seal
waterproofing
Wellington, 4, 5 (figure)
Wessex pendulum, 51 (figure)
whole shoe testers, 54–57, 55 (figure),
56 (figure)
woven textiles, 17