

ISO 20344:2011-12 (E)

Personal protective equipment - Test methods for footwear

Contents	Page
Foreword	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Sampling and conditioning	2
4.1 Sampling	2
4.2 Conditioning	2
4.3 Prerequisites on the testing procedure	2
5 Test methods for whole footwear	5
5.1 Specific ergonomic features	5
5.2 Determination of upper/outsole and sole interlayer bond strength	6
5.3 Determination of internal toecap length	11
5.4 Determination of impact resistance	12
5.5 Determination of compression resistance	15
5.6 Behaviour of toecaps and inserts (thermal and chemical)	17
5.7 Determination of leakproofness	18
5.8 Determination of the dimensional conformity of inserts and the penetration resistance of the sole	18
5.9 Determination of the flex resistance of penetration-resistant inserts	22
5.10 Determination of electrical resistance	22
5.11 Determination of footwear slip resistance	23
5.12 Determination of insulation against heat	26
5.13 Determination of insulation against cold	28
5.14 Determination of energy absorption of the seat region	29
5.15 Determination of resistance to water for whole footwear	31
5.16 Determination of impact resistance of a metatarsal protective device	36
5.17 Determination of the shock absorption capacity of ankle protection materials incorporated into the upper	40
6 Test methods for upper, lining and tongue	42
6.1 Determination of thickness of upper	42
6.2 Measurement of the height of the upper	42
6.3 Determination of tear strength of the upper, lining and/or tongue	43
6.4 Determination of the tensile properties of the upper material	43
6.5 Determination of upper flexing resistance	44
6.6 Determination of water vapour permeability (WVP)	47
6.7 Determination of water vapour absorption (WVA)	51
6.8 Determination of water vapour coefficient	54
6.9 Determination of pH value	54
6.10 Determination of resistance to hydrolysis of upper	54
6.11 Determination of chromium VI content	54
6.12 Determination of abrasion resistance of lining and insock	54
6.13 Determination of water penetration and water absorption for upper	57
6.14 Determination of resistance of upper to cutting	59
7 Test methods for insole and insock	59
7.1 Determination of insole thickness	59

7.2	Determination of water absorption and desorption of insole	59
7.3	Determination of abrasion resistance of insole	62
8	Test methods for outsole	64
8.1	Determination of outsole thickness	64
8.2	Determination of tear strength of outsole	65
8.3	Determination of outsole abrasion resistance	65
8.4	Determination of flexing resistance of outsole	65
8.5	Determination of resistance to hydrolysis of outsole	70
8.6	Determination of resistance to fuel oil	70
8.7	Determination of resistance to hot contact	71
	Annex A (normative) Procedure for plasticine calibration	74
	Annex B (normative) Assessment of footwear by the laboratory during testing of thermal behaviour	76
	Annex C (informative) Footwear sizes	77
	Bibliography	78