

PHYSICAL STANDARDS

Parameter	Standard/ Procedure	Requirement	Sample Size
1. Outsole abrasion	EN 12770	≤250 mm ³ (cut EVA flip flop ≤600mm ³ / Outdoor ≤100mm ³)	1 piece of shoe
2. Outsole flexing	ISO 17707	cut growth ≤6mm after 30,000 cycles, without any additional spontaneous crack * N/A in case the force >30N when reach 45° angle or the angle < 45° when reach 30N force.	1 piece of shoe
3. Whole shoe flexing * launch test if failed on outsole flexing	In-house method Refer to ISO 24266 (350,000 cycles for lady and 500,000 for men and children)	Outsole cracking ≤6mm Remark in case upper crack or unbonding length Lady heel height <4cm: 35° Lady heel height 4cm ~7cm: 30° Lady heel height >7cm: 20° Men & Children: 45° Observe stages at: 50K, 150K, 250K, 350K & 500K.	1 piece of shoe
4. Slip resistance	ISO 13287/ ISO 24267	Flat position ≥0.30 μ, heel position ≥0.28 μ all <1.25 μ Ceramic tile (water condition)	1 piece of shoe
5. Upper flexing resistance	ISO 17694	No worse than slight damage after Dry 50,000 cycles, Wet 20,000 cycles (Patent leather/Coated Textile : Dry 20,000 cycles)	1 piece of A4 size material
6. Bond strength	ISO 17708	≥3 N/mm (Outdoor ≥4 N/mm)	1 piece of shoe
7. Color fastness to rubbing of lining/insock	ISO 17700 - A ISO 11640	Leather ≥3, Textile ≥4 (Microfiber ≥3) Dry 50 & Wet 20 cycles Only for microfiber & leather	1 piece of A4 size material
8. Color fastness to rubbing of upper	ISO 17700 - A ISO 11640	Suede/finished leather ≥2/3 Non leather ≥4, Microfiber/Nubuck PU ≥3 Dry 50 & Wet 20 cycles Only for microfiber & leather	1 piece of A4 size material
9. Color fastness to perspiration	Leather: ISO 11641 Textile: ISO 105-E04	≥3. Only for microfiber & leather, on skin contact: lining, insock, etc.	1 piece of A4 size material
10. Color fastness to light	ISO 105-B02	≥4(grey scale) Grade 4. Only for microfiber & leather, on light colors	1 piece of A4 size material
11. Color migration by aging - For dark color upper & white/light color soles. Non leather & Suede leather	In-house method refer to EN 12749	No migration. 70 °C, 7 days, saturated steam (check on the 3rd & 5th day)	1 pair of shoes
12. Toplift abrasion	EN 12770	Width >4cm, D ≥ 0.9: ≤ 250 mm ³ 2cm < Width ≤ 4cm, D ≥ 0.9: ≤ 100 mm ³ Width < 2cm, D ≥ 0.9: ≤ 50 mm ³	8 pieces of toplifts
13. Toplift attachment	Slender: ISO 24264 Stacked: ISO 19958	Slender heel ≥140N Stacked heel ≥200N	1 piece of shoe

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14. Heel fatigue	ISO 19956	No functional damage after 14,000 cycles (for heel height exclude toplift $\geq 5\text{cm}$)	3 pieces of raw heels
15. Heel attachment (include toplift $\geq 5\text{cm}$)	ISO 22650	Inflexibility 200N $\leq 25\%$ Deformation at 400N $\leq 15\%$ Resistance to heel fixation $\geq 600\text{N}$	1 piece of shoe
16. Shoelace abrasion	ISO 22774	3,000 cycles (1,000 cycles for 100% cotton lace) through eyelet, through lace if not applicable	3 pieces of shoe laces
17. Shoelace breaking strength	ISO 24263 via eyelet BS 5131 3.7 dry	Average $\geq 250\text{N}$ Outdoor: Average $\geq 350\text{N}$	3 pieces of shoe laces
18. Velcro peeling resistance	ISO 22777	$\geq 1.3\text{ N/cm}$. After 5,000 cycles $\geq 0.65\text{ N/cm}$	3m length of Velcro
19. Velcro shear resistance	ISO 22776	$\geq 6.0\text{ N/cm}^2$. After 5,000 cycles $\geq 3.0\text{ N/cm}^2$	3m length of Velcro
20. Zipper performance	EN 16732-F	≥ 1000 cycles (code D) for functional zippers	3 pieces of zippers with 30cm length
21. Small parts pulling strength	EN71-1	Largest accessible part $\leq 6\text{mm}$: $\geq 50\text{N}$ Largest accessible part $> 6\text{mm}$: $\geq 90\text{N}$	1 pair of shoes
22. Sharp point & sharp edge	EN71-1	Per regulation. For all shoes, not only kids	1 pair of shoes
23. Material water repellency	Leather: ISO 17231 Textile: ISO 4920	Leather ≥ 3 , Non leather ≥ 4	1 piece of A4 size material
24. Whole shoe water resistance	DIN SPEC 53264-1 / ISO 20344: §5.15.2	Resistance $> 120\text{ min}$ / 4200 cycles	1 pair of shoes
25. Fiber composition (only pile)	ISO 1833	100% wool	1 piece of A4 size material
26. Pulling strength of strap/ Attachment of trims	ISO 24263	$\geq 200\text{N}$ (Outdoor $\geq 300\text{N}$) for strap width $< 4\text{cm}$ and functional trims	1.5 pair of shoes

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