**DRAFT REVISED QR & TDs OF NON SKID TACTICAL/COMBAT/**

**ADVANCE HIGH ANKLE BOOT :05 AUGUST 2021**

**DESCRIPTION**

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| **S No** | **QRs & TDs** | **Comments /Opinion of BIS** |
| 1. | The boots ankle described in this QRs are to be made from chrome tanned full grain leather upper. The boots are to be manufactured with cleated rubber outsole with anti-slip design using broad toe last. |  |
| 2. | The boots shall be made with or without zipper fastening system with 32 round D Ring/Hooks in one pair of boot to facilitate excellent FAST fastening system. |  |
| 3. | The boot shall be made by using broad toe last with minimum “G” fitting. |  |
| 4. | The boot must be black in colour. |  |
| 5. | The boot must have a shelf life of 3 year tested as per 10 D. |  |
| **ESSENTIAL FEATURES** |  |
| 6. | **BREATHABILITY** – Upper leather & Linings must be breathable for all day long comfort. |  |
| 7. | **ERGONOMICALLY FIT ASSESSMENTS** – Boots can be put on & taken off quickly without discomfort, it must be fitted correctly to be secure on the foot at all times. All normal daily activities i.e. climbing stair, driving etc. can be easily carried out. |  |

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| **S No** | **QRs & TDs** | **Comments /Opinion of BIS** |
| 8. | **SLIPS, OIL & HEAT RESISTANCE** – **Sole physical testing-** The sole must be designed for ‘long term’ slip resistance & should pass SRC test, Sole should not break down in FOL (Fuel, Oil , Lubricant), should resist 1 minute contact at 300 Deg C. Must be tested for flexing, tear& Abrasion. |  |
| 9. | **SHOCK ABSORPTION** – Should have adequate shock absorption property and must absorb 30 joules of impact force at heel area – Protects knees & Joints from impact injury. |  |
| 10. | **QUATLITY REQUIREMENT OF UPPER LEATHER** – Made from chrome tanned full grain leather.

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| **S.No** | **Parameters** | **Requirement** | **Trail directive as per Standard & clause** |
| A | Thickness | 2mm+/- 0.2 mm min. | 5.4.2 EN ISO 20345 : 2011 |
| B | Tear Strength  | 120 N min. | 5.4.3 EN ISO 20345 : 2011 |
| C | Tensile strength  | 15 N/mm min | 5.4.4EN ISO 20345 : 2011 |
| D | Upper- outsole Bond Strength | 4.0 N/mm min | 5.3.1.2 EN ISO 20345 : 2011 |
| E | Water vapour permeability  | 0.8mg/(cm2h) min. | 5.4.6 EN ISO 20345 : 2011 |
| F | Water vapour coefficient | 15 mg/cm2 min. | 5.4.6 EN ISO 20345 : 2011 |
| G | pH value | 3.2 min. | 5.4.7 EN ISO 20345 : 2011 |
| H | Chromium VI content | 3.0 mg/kg max.(Chromium VI should not be detectable) | 5.4.9 EN ISO 20345 : 2011 |
| I | Water penetration and absorption | 0.2 g max and 30% max. | 6.3 N ISO 20345 : 2011 |
| J | Chrome Content | 4.0% (Min) | IS:578:1985, RA |

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| **S No** | **QRs & TDs** | **Comments /Opinion of BIS** |
| 11. | **QUALITY REQUIREMENT OF SOLE**Sole is to be composite in nature. The mid-sole is to be of PU whereas outsole is to be slip-resistant rubber. Insole Antistatic penetration resistant fabric with removable antistatic in-sock. |
| 12. | **OUTSOLE**

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| **S.No.** | **Parameters** | **Requirement** | **Trail directive as per Standard & clause** |
| A | Density  | 1.05± 0.1 | SATR TM 134 |
| B | Tear Strength | 8 KN/m min. | 5.8.2 EN ISO 20345 : 2011 |
| C | Abrasion resistance (Volume loss) | 150 mm3 max. | 5.8.3 EN ISO 20345 : 2011 |
| D | Interlayer Bond Strength tasted after 3 weeks of conditioning as per Annx E ISO 5423:1992 | Not less than 4.0 N/mm | 5.8.6 EN ISO 20345 : 2011 |
| E | Resistance to fuel oil | Increase in Vol. Not more than 12% | 6.4.2 EN ISO 20345 : 2011 |
| F | Resistance to Hot contact at 300˚C. | No crack/ melting | 6.4.1 EN ISO 20345 : 2011 |
| G | Cleated Area of Outsole | Slip resistance requirement as per EN ISO 20345:2011-5.3.5 | 5.8.1.2 EN ISO 20345 : 2011 |
| H | Thickness of Cleated outsole | 4.0 mm min. | 5.8.1.1 EN ISO 20345 : 2011 |
| J | Cleat Height | 2.5 mm min. | 5.8.1.3 EN ISO 20345 : 2011 |
| K | Flexing resistance | 4mm max. After 30,000 flex cycles | 5.8.4 EN ISO 20345: 2011 |

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| **S No** | **QRs & TDs** | **Comments /Opinion of BIS** |
| 13.  | **MID SOLE**

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| **S.No.** | **Parameters** | **Requirement** | **Trail directive as per Standard & clause** |
| A | Hardness | 35-50 Shore A | SATRA 205 |
| B | Density | 0.40-0.55 gm/cc | SATRA TM 134 |

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| 14. | **INSOLE & INSOCK**

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| **S.No.** | **Parameters** | **Requirement** | **Trail directive as per Standard & clause** |
| A | Thickness of insole or insole with non- removable in-sock | Not less than 2 mm | 5.7.1 EN ISO 20345 : 2011 |
| B | pH value  | Not less than 3.2  | 5.7.2 EN ISO 20345 : 2011 |
| C | Water absorptionWater Desorption | 70 mg/cm2 min. 80% min. | 5.7.3 EN ISO 20345 : 2011 |
| D | Insole abrasion resistance | No severe damage after 400 cycles | 5.7.4.1 EN ISO 20345 : 2011 |
| E | In-sock Abrasion resistance | Shall not develop any hole before 25600 dry cycles & 12800 wet cycles | 5.7.4.2 EN ISO 20345 : 2011 |

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| **S No** | **QRs & TDs** | **Comments /Opinion of BIS** |
| 15. | **QUALITY REQUIREMENT OF LINING MOISTURE -** wicking, hydrophobic antimicrobial lining.

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| **S.No.** | **Parameters** | **Requirement** | **Trail directive as per Standard & clause** |
| A | Weight | 150 gm/mt2 min. | IS 1964:2001, RA 2010 |
| B | Tear Strength  | 15 N min. | 5.5.1 FN ISO 20345 : 2011 |
| C | Abrasion resistance | Shall not develop any hole before 25600 dry cycles & 12800 wet cycles for Vamp and Quarter lining and 51200 dry cycles & 25600 wet cycles for Seat Region lining | 5.5.2 EN ISO 20345 : 2011 |
| D | Water vapour permeability | 2 mg/cm2h min. | 5.5.3 EN ISO 20345 : 2011 |
| E | pH Value | 3.2 min. | 5.5.4 EN ISO 20345 : 2011 |

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| 16. | **QUALITY REQUIREMENT OF COUNTER STIFFENER**

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| **S.No** | **Parameters** | **Requirement** | **Trail directive as per Standard & clause** |
| A | Material | Thermoplastic | IS 7554-2009 Rev No 1 |
| B | Thickness | Min. 1.6 mm |  |
| C | Shape Retention | After first collapse 18% (max.). After 5th collapse-21% max.Recovery after two hours-21% max. | SATRA TM 186:2001 |
| D | Peel strength (N/mm) | 0.5 (min)  | IS 554:2009 Rev 1 |

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| **S No** | **QRs & TDs** | **Comments /Opinion of BIS** |
| 17. | **QUALITY REQUIREMENT OF FLAT ARAMID LACE & BONDED THREAD**

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| **S.No** | **Parameters** | **Requirement** | **Trail directive as per Standard & clause** |
| A | Breaking Strength(lace) | ARAMID | Best Quality |
| B | Breaking Strength | Min. 750 Newton | IS 1969:2009 |
| C | Abrasion resistance | Should withstand min. Of 5000 cycles | ISO 22774:2004 |
| D | Breaking Load Aramid thread | Min. 1000 Newton | Min. 100 NewtonAs per BS EN ISO 2062 |

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| 18. | **QUALITY REQUIREMENT OF WHOLE FOOTWEAR**

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| **S.No** | **Parameters** | **Requirement** | **Trail directive as per Standard & clause** |
| A | Height of upper from insole | Min. 8 inch | 5.2.2 EN ISO 20345 : 2011 |
| B | Toe cap impact resistance | Not less than 14 mm for UK size 8 | 5.3.2.3 EN ISO 20345 : 2011 as per table 6 |
| C | Slip resistance (SRC) | Meet table No.9 | 5.3.5.4 EN ISO 20345 : 2011 |
| D | Specific Ergonomic Feature | As per EN ISO 20345 | 5.3.4 EN ISO 20345 : 2011 |
| E | Penetration Resistance | As per EN ISO 20345 | 6.2.1 EN ISO 20345 : 2011 |
| F | Energy Absorption of seat region | Min. 30 Joules | 6.2.4 EN ISO 20345 : 2011 |
| G | Electrical Resistance | Antistatic 100-1000 KO | 6.2.2.2 EN ISO 20345 : 2011 |

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| **S.No.** | **Parameters** | **Requirement** | **Trail directive as per Standard & clause** |
| H | Heat insulation of sole complex at 150˚C | Temp increase on upper surface of the insole shall not be greater than 22˚C after 30 minutes. | 6.2.3.1 EN ISO 20345 : 2011 |
| J | Cold insulation of sole complex | Temp decrease on upper surface of the insole shall not be greater than 10˚C | 6.2.3.2 EN ISO 20345 : 2011 |
| K | Water resistance  | Not more than 3 cm2 | 6.2.7 EN ISO 20345 : 2011 |
| L | Ankle protection | Mean value 10 KN max. and Single value 15 KN max. | 6.2.7 EN ISO 20345 : 2011 |
| M | Cut resistance | Cut-resistance index not less than 2.5 | 6.2.8 EN ISO 20345 : 2011 |

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| **S No** | **QRs & TDs** | **Comments /Opinion of BIS** |
| 19. | **MATERIAL FEATURES** |  |
| **(a).** **Upper**:- Black combination of full grain 2mm+/- 0.2mm thick leather and 1600 Denier based heavy duty ballistic grade nylon fabric for better flexibility in ankle/quarter region. The upper must be stitched with nylon anti-fraying stitching thread. |  |
| **(b).** **Tongue:-**Heavy duty ballistic grade nylon fabric. Below & padded with 5mm PU foam. Lined by moisture wicking padded lining meeting IS 15298. |  |
| **(c).** **Trims:-**Should be non-metallic. |  |
| **(d).** **Thread:-**Waterproof thread, seam sealed on inside, No decorative stitching. |  |
| **(e).** **In-sock:-**Fully moulded PU Antistatic with heel cushion for impact. |  |
| **(f).** **TOE CAP:-**The boot shall be fitted with 200 J EN 12568- marked Toe cap. It cannot be removed without damaging the footwear. |  |
| **(g).** **Lace:-** Kevlar laces of adequate length with breaking load of minimum 150 kg. |  |
| **(h).** **Marking:-** The boot shall have marking category of S3 (Table 13 of IS 15298 Part 2:2011) & as per IS 15298 Part 2:2011, 7. |  |