



New Testing Facility at WRA, Thane

Get Tested

Your PPE Coveralls

At



WRA TESTING LABORATORY

(NABL Accredited as per ISO 17025: 2017)

Wool Research Association, Thane
Center of Excellence(COE) in Sportech

(Linked to Ministry of Textiles, Govt. of India)

P. O. Sandoz Baug, Kolshet Road,
Thane (w) – 400 607, Maharashtra

Web: www.wraindia.com;

email: wra@wraindia.com





PPEs Coveralls are used as barrier against infectious contaminated objects

- Effective filter for the infectious contaminated objects
- Barrier to stop cross contamination spread through various infections such as nosocomial infections, human fluid contaminants such as blood, perspiration, saliva, vomit, semen, feces, urine and skin cells
- Transmission of microorganisms through PPEs depends upon various factors such as
 1. Pore size (filtering capacity), Thickness, Repellency of PPE
 4. Morphology, size, shape and, adaptation of environment
 5. Surface tension, volume, viscosity and force
 6. Physical, thermal, chemical and environmental stresses
 7. Type of carriers (body fluids, sloughed skin cells, lint, dust, respiratory droplets and aerosolized molecules)

WRA has created following Services for Meeting the current requirement of PPE items testing.

Sr. No.	Test Parameter	Test Method	Sample Requirement
1.	Fabric Weight	ASTM D 3776/IS 1964/ISO 3801	0.25mts
2.	Tensile Strength	EN ISO 13934-1 / ASTM D 5034/ ASTM D 5035	0.5 mtrs
3.	Tear Strength	IS 6489/ISO 13937-1/ ISO 13937-2/ISO 13937-3	0.5 mtrs
4.	Bursting Strength	ISO 1396938-1/ ISO 9073-5/IS 1966	0.5 mtrs
5.	Seam/Joint Strength	ISO 13935-1/ ISO 13935-2	0.5 mtrs
6.	Water Repellency	AATCC 22/IS 390/ ISO 1920	0.5 mtrs
7.	Impact Penetration	AATCC 22	0.5 mtrs
8.	Hydrostatic Head test	ISO 811/AATCC 127	0.5 mtrs
9.	Moisture Vappour Transmission Rate (MVTR)	ASTM E 96	0.25 mtrs
10.	Water Vapour Resistance (Ret)- breathability	ISO 11092/ASTM F 1868 part B/ IS 17334 Table I(x)	0.5 mtrs
11.	Synthetic Blood Penetration- Fabric	ISO 16603/ ASTM F 1670/ IS 16546	0.5 mtrs
12.	Synthetic Blood Penetration- Fabric & Seam both (Coverall)	ISO 16603/ ASTM F 1670/ IS 16546	One full coverall
13.	Pore size	ASTM D 6767	0.25 mtrs
14.	Air permeability	ASTM D 737/ISO 9237	0.5 mtrs
15.	Antistatic	EN 1149-5 (Testing based on EN 1149-1)	0.5 mtrs
16.	Resistance to ignition	16 CFR PT 1610	0.5 meters
17.	Antimicrobial Testing	AATCC 100	0.5 meters



Sr. No.	Test Parameter	Test Method	Sample Requirement
Specification: ANSI / AAMI PB70			
1	Water Impact Test	AATCC 42	0.5mtrs
2	Hydrostatic Head Test	AATCC 127	0.5 mtrs
3	Synthetic Blood Penetration- Fabric	ISO 16603/ ASTM F 1670/ IS 16546	0.5 mtrs
4.	Synthetic Blood Penetration- Fabric & Seam both (Coverall)	ISO 16603/ ASTM F 1670/ IS 16546	One full coverall
5	Blood borne pathogen penetration resistance.	ASTM F 1671	--
BS EN ISO 13982-1: 2004 Protective clothing for use against solid particulates (Type 5 Clothing)			
4.1	Materials		
1	Cleaning (Pretreatment) (Applicable only if material is washable)	five cycles of cleaning according to the manufacturer's instructions before testing, if the manufacturer's instructions indicate that the garment can be cleaned	
2	Abrasion Resistance	EN 530	0.25 meter
3	Flex Cracking	EN ISO 7854	0.25 meter
4	Trapezoidal tear resistance	EN ISO 9073-4/ ASTM D 5733	0.50 meter
5	Puncture Resistance	EN 863	0.25 meter
6	Resistance to ignition	EN 13274-4	0.5 meters
4.2.2	Seams, joins and assemblages (Applicable only for garment)	EN ISO 13935-2	0.5 meters specimens with seam at center
4.3	Inward leakage of aerosols & solid particles (Only for Garment)	as per ISO 13982-2	--
4.4	Visor	ISO 13982-1	--
Specification: EN 14325:2004 (Chemical protective clothing general requirements)			
1	Abrasion Resistance	EN 530 up to 10000 rubs	0.25 mtrs
2	Trapezoidal Test Strength	EN ISO 9073-4	0.5 mtrs
3	Tensile Strength	EN ISO 13934-1	0.5 mtrs
4	Puncture resistance	EN 863	0.25 mtrs
5	Flex Cracking	EN ISO 7854 Up to 25000 cycles Up to 50000 cycles Up to 1,00,000 cycles	0.25 mtrs
Specification: EN 13034, Type 6 Suit			
4.4	Abrasion Resistance	EN 530 up to 10000 rubs	0.25 mtrs
4.7	Trapezoidal Test Strength	EN ISO 9073-4	0.5 mtrs
4.9	Tensile Strength	EN ISO 13934-1	0.5 mtrs
4.10	Puncture resistance	EN 863	0.25 mtrs
4.12	Repellency of Liquid	EN ISO 6530	2 mtrs
4.13	Resistance to penetration by liquids		
4.14	Resistance to ignition	EN 13274-4	0.5 meters



Sr. No.	Test Parameter	Test Method	Sample Requirement
Specification EN 13795 : 2011			
1	Resistance to microbial penetration (Dry)	ENISO 22612	--
2	Resistance to microbial penetration (wet)	ENISO 22610	--
3	Cleanliness-microbial	ENISO 11737-1	--
4	Cleanliness-particulate matter	ENISO 9073-10	--
5	Resistance to liquid penetration	EN 20811	0.5mtr
6	Bursting strength (Dry)	ENISO 13938-1	0.25mtr
7	Bursting strength (Wet)	ENISO 13938-1	0.25mtr
8	Tensile strength (DRY)	EN 29073-3	0.5mtr
9	Tensile strength (Wet)	EN 29073-3	0.5mtr
Specification F 2407			
General Safety and Performance Requirements			
6.1	Biocompatibility	AAMV ANSIBE78. Alternatively, ISO 10993-10	--
6.2	Sterility assurance level	ISO 11134 for moist heat. ISO 11135 for EtO. ISO 71137 for Gamma or ISO 13683 also for moist heat.	--
6.3	Flame spread	16 CFR Part 1610	0.5 mtrs
6.4	Natural Rubber Latex	Declaration required	--
Barrier and Physical Property Requirements			
9.3/9.4	Laundeing Conditioning and/or Sterilization	As per manufacturer's instruction	--
Table 2	Tensile Strength	ASTM D 5034	0.5 mtrs
Table 2	Trapezoidal Test Strength	ASTM D 5587 (Woven /ASTM D 5733 (Non-Woven)	0.5 mtrs
Table 2	Seam Strength (Seam Sample	ASTM D 751	0.5 mtrs
Table 2	Lint Generation	ISO 9073 Part 10	--
Table 2	Evaporative Resistance or Water vapour Transmission	ASTM F 1868 part B, ASTM D6701	1.0 mtrs ---
Table 1	Impact Penetration	AATCC 42	0.5 mtrs
Table 1	Hydrostatic Resistance	AATCC 127	0.5 mtrs
Table 1	Viral Penelration Resistance	ASTM F 1671	--