



NanoTek
ISO 3-4 (Class 1-10)

Valutek Launderable Garment Set

Boot Cover

Valutek's launderable boot covers are designed for use in a wide range of controlled environments with varying cleanliness and static requirements. Constructed from **NanoTek 2.5 fabric**, a blend of **94% polyester** and **6% carbon**, the 2.5x2.5 grid pattern is designed for the most critical ESD requirements.

The polyester material's weave, seam design, and stitch count effectively encapsulate operator-generated particles, and the fabric is tested for filtration efficiency and particle release. The polyurethane sole material is designed for adaptable use on a range of floor types.

All Valutek launderable garments are manufactured **without PFAS** chemical treatments, which are commonly used to enhance stain and liquid resistance in cleanroom garments. Valutek garments undergo independent "target analysis" testing for PFAS chemicals according to US EPA Method 1633. Test data and certificates are available upon request.

This boot cover is compatible with Valutek's launderable coverall (**Part Number: VTEPCVRL**) and hood (**Part Number: VTEPHOOD**) for a complete washable garment set.

All Valutek garments are manufactured in ISO-certified facilities, under Valutek's strict process control to meet quality standards and product specifications.



Part Number: VTEPBTCV

Features

- **NanoTek 2.5 Fabric:** 94% polyester filament yarn, 6% conductive yarn
- **No PFAS Added:** For operator safety; compliant with thresholds outlined in US EPA Method 1633.
- **Size Range:** Sizes XS-3X; other sizes available by special order
- **Adaptable Sole:** Polyurethane material designed to withstand wash cycles and is compatible with a range of floor types
- **Snap Placement:** Compatible with Valutek launderable coveralls (VTEPCVRL)
- **Cleanroom Compatibility:** Suitable for use in ISO 4 to ISO 8 environments

Application

As part of the **Valutek NanoTek** product family, these launderable boot covers are recommended for stringent cleanroom or controlled environments across many life science and advanced material applications.

When properly washed and packaged, the garment is suitable for the most critical cleanroom environments that require high levels of particle cleanliness and static control.

Packaging



- 1 pair/bag, 25 bags/case, 25 pair/case.
- Flat packed with a carton liner.
- Critical environment compatible.
- Part numbered and lot number traceable.

Please Note:

- **All garments require initial laundry before first use.**
- Proper washing techniques are vital to ISO cleanroom environment compatibility. Please consult a specialty cleanroom laundry provider for confirmation on washing protocols.



Gloves



Wipers



Apparel



Adhesive Mats



Cleaning & Maintenance



Documentation



Glove Liners



ESD



Valutek Launderable Garment Set – Boot Covers

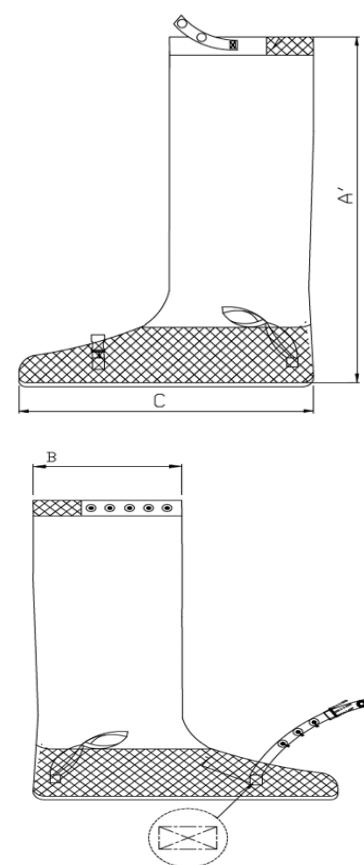
Part Number: VTEPBTCV

VTEPBTCV Sizes & Measurements (cm)

Part Number	Size	Strap Color Code	Total Height (A)	Leg Opening (B)	Sole Length (C)
VTEPBTCV-XS	X-Small	Sky Blue	44	22	25.5
VTEPBTCV-SM	Small	Orange	45	24	27.5
VTEPBTCV-MD	Medium	Yellow	46	26	29.5
VTEPBTCV-LG	Large	White	47	28	32.5
VTEPBTCV-XL	X-Large	Red	48	30	35.5
VTEPBTCV-2XL	2X-Large	Black	49	32	38
VTEPBTCV-3XL	3X-Large	Beige	50	34	40.4

Physical Properties

Physical Properties	Parameters	Test Method
Composition	94% Polyester filament yarn and 6% Conductive yarn	ASTM-D-629
Basis Weight	109 ± 3 g/m ²	ASTM-D-629
Sole Material	Polyurethane	ASTM-D-629
Sole Thickness	6.5 mm	ASTM-D-629
Sole Weight	5100 ± 510 g/m ²	ASTM-D-629
Sole Color	Master Batch	ASTM-D-629
Webbing Material	Polyester	ASTM-D-629
Conductive Grid Width	2.5 mm x 2.5 mm	ASTM-D-629
Thickness	0.17 ± 0.02 mm	ASTM-D-629
Yarns	100D	-
Surface Resistance	10 ⁵ ~ 10 ⁹ ohm	ANSI/ESD - STM2.1-2018
Ground Resistance	10 ⁴ ~ 10 ⁹ ohm	ANSI/ESD - STM2.1-2018
Fabric Breaking Strength	Warp > 490 N Zonal > 390 N	GB3923
Webbing Clip Material	100% Polypropylene	-
Snap Button Composition	65% Copper and 35% Zinc	-
Friction Voltage	< 100V	SJT10694-2006



Cleanliness Characteristics

Parameter	Test Method	U/M	Limit
Particles (Airborne) ≥0.3µm	IEST-RP-CC003.4 (Helmke Drum)	particles/min	< 1700
Particles (Airborne) ≥0.5µm	IEST-RP-CC003.4 (Helmke Drum)	particles/min	< 1000
Particle Filtration Efficiency >0.5 µm	IEST-RP-CC003.4	% retention	> 25
Particle Filtration Efficiency >5.0 µm	IEST-RP-CC003.4	% retention	> 85

* Cleanliness specifications are based on proper garment laundering according to defined **IEST Recommended Practice (RP-CC-003.4)**. Particle counts and particle filtration efficiency are subject to proper washing techniques to remove particles and maintain fabric integrity.

* **Note:** Technical data listed reflects upper/lower limits. Certificates of Analysis available upon request for actual lot-to-lot test data. 36 month lot trend analysis available upon request.



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INNOVATIVE SOLUTIONS FOR CRITICAL ENVIRONMENTS

APPENDIX: LAUNDRY REQUIREMENTS

Part Numbers: VTEPCVRL, VTEPHOOD and VTEPBTCV

Cleanroom Overall, Hood and Boot washing and drying requirements per **IEST-RP-CC003.4, section 6.1.10** (Laundering Procedures).

Washing Requirements:*

- **Water Quality:** Use deionized (DI) water with a resistivity of at least 18 megaohms (MΩ) to prevent contamination and ensure thorough cleaning. Water should be filtrated to at least 0.2-microm (μm).
- **Detergent:** Use a mild, non-ionic, low-suds, and non-residue foaming detergent to avoid leaving residues that could interfere with the cleanroom environment. Improper detergent may lead to contamination and fabric degradation.
- **Load Capacity:** Do not exceed 80% of the washing machine's load capacity. Overloading can lead to inadequate cleaning and increased wear on the garments. Washing at a capacity of 30% to 50% reduces physical stress on the fabric and extends its lifespan.
- **Washing Temperature:** Maintain water temperature between 30°C and 60°C (90°F to 140°F). This range effectively removes contaminants while protecting the integrity of the garment fabric.
- **Washing Cycle Duration:** Ensure that each wash cycle includes sufficient rinsing stages to remove all traces of detergent and contaminants. The exact duration may vary based on garment type and contamination level, but a typical wash cycle should last at least 20 minutes and include multiple rinsing stages.

***all garments require initial laundry before first use**

Drying Requirements:

- **Drying Temperature:** Dry garments at a temperature below 60°C (140°F) to prevent fabric damage and maintain the integrity of ESD properties. A heat control module must be used to ensure temperatures do not exceed this limit. Depending on the heat source (steam, gas, or electric), effective heat control is essential to avoid premature fabric degradation.
- **Drying Method:** Use a cleanroom-compatible dryer to prevent the reintroduction of contaminants during the drying process. The dryer should be equipped with HEPA filters to capture particles effectively.
- **Drying Duration:** The drying duration should be adequate to remove all moisture from the garments without overheating. This will vary based on the fabric type, thickness, and load size. After tumble drying at a moderate temperature, the cycle should gradually cool to prevent fabric shock.

General Requirements:

- **Inspection:** After washing and drying, inspect garments for signs of damage, wear, or residual contamination. Packaging should occur in a controlled environment that meets cleanroom facility requirements.
- **Documentation:** Maintain detailed records of the washing and drying cycles, including parameters such as water quality, detergent type, temperature settings, and duration. This ensures traceability and compliance with the necessary cleanroom class standards.

By adhering to these requirements, cleanroom operators can ensure that garments effectively control contamination, ESD, and protect cleanroom environments for up to 100 wash cycles. Failure to follow these guidelines may result in premature material degradation and a significantly reduced lifecycle.



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