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Cleaning Instructions: Lunar-X

Industrial Laundry Instructions for Fabric Containing X-Static Silver Antimicrobial Fiber

Step	Operation	Time	Temperature	Level	Conditions
1	Rinse	3 Minutes	Cold	High	N/A
2	Wash	3 Minutes	71°C (160°F)	Low	Non-ionic Detergent and alkali pH 10, see Note 4 Below.
3	Rinse	3 Minutes	60°C (140°F)	High	N/A
4	Spin	2 Minutes	N/A	N/S	Preferably low speed
5	Rinse	2 Minutes	50°C (120°F)	High	N/A
6	Rinse	2 Minutes	40°C (100°F)	High	N/A
7	Rinse	2 Minutes	Cold	High	N/A
8	Acidify	5 Minutes	Cold	Low	Acidify to pH6
9	Spin	3-5 Minutes	N/A	N/S	Preferably low speed

Notes & Recommendations

- Non-ionic detergent should have a cloud point above 71°C (160°F).
- pH should not exceed 10.
- Oxidative bleaching agents should not be used as these will damage X-Static silver antimicrobial fiber. These include sodium, hypochlorite, hydrogen peroxide, and per(oxy)acetic acid (PAA).
- For soiled linen, the temperature of the load is maintained as 65°C (150°F) for not less than 10 minutes or preferably at 71°C (160°F) for not less than 3 minutes. With both options, "mixing time" must be added to ensure heat penetration of the wash load. Typically, this can be 4 minutes for a lightly loaded machine, and up to 8 minutes for a machine with a heavy degree of loading.
- A thorough rinse is essential to remove traces of surfactant, as residual detergent will adversely affect the X-Static silver antimicrobial fiber.
- Do not overload the washer or dryer.
- Fabric softeners should not be used.
- Always ensure that the fabric is thoroughly dried with heat. The dryer exhaust temperature should not exceed 75°C (170°F).
- Washers and dryers should be inspected regularly to ensure there are no rough spots that could damage the fabric.
- Silver is a natural element and may tarnish. This does not affect the biocidal properties of the material.

List of Incompatible Chemicals for Use With X-Static Silver Antimicrobial Fiber

The Table below contains a general list of chemicals that are incompatible for use with X-Static filament or staple fibers. While this list is not comprehensive, it does reference the most common chemicals used in processing, dyeing and finishing that are incompatible with the X-Static technology.

Incompatible Chemicals	Effect on X-Static Silver Antimicrobial Fiber	Impact on End-Use Requirement	Recommended Substitutes
Sulfur Powder	Sulfur degrades X-Static	<ul style="list-style-type: none"> Potential issue with consistency of color, luster Potential issue with reduction in thermal and electrical properties 	<ul style="list-style-type: none"> Non-sulfur powder-containing chemicals Non-sulfur-containing atmosphere (that is, away from high vehicle exhaust areas)
Ammonium Sulfide	Sulfur containing compounds degrade X-Static	<ul style="list-style-type: none"> Potential issue with consistency of color, luster Potential issue with reduction in thermal and electrical properties 	Non-ammonium sulfide-containing chemicals
Sodium Hypochlorite (Household Bleach)	Sodium hypochlorite degrades X-Static	<ul style="list-style-type: none"> Potential issue with consistency of color, luster Potential issue with reduction in thermal and electrical properties 	Non hypochlorite-containing cleaning agents
Chlorine Gas	Chlorine degrades X-Static	<ul style="list-style-type: none"> Potential issue with consistency of color, luster Potential issue with reduction in thermal and electrical properties 	Non-hypochlorite-containing cleaning agents
All Strong Acids	Strong acids degrade, dissolve and oxidize X-Static	<ul style="list-style-type: none"> Potential issue with consistency of color, luster Potential issue with reduction in thermal and electrical properties 	Alternate process that does not expose X-Static to strong acids
Strong Oxidizing Agents	Strong oxidizing agents, degrade, dissolve and oxidize X-Static	<ul style="list-style-type: none"> Potential issue with consistency of color, luster Potential issue with reduction in thermal and electrical properties 	Alternate process that does not expose X-Static to strong oxidizing agents
Sodium Silicate	Sodium Silicate reacts with X-Static	<ul style="list-style-type: none"> Visual color change Deposits of orange yellow precipitate of silver silicate on substrate 	Magnesium salts of ethylenediamine tetra acetic acid (EDTA) and tetrasodium pyrophosphate (TSPP)
Sodium Hydrosulfite (Sodium Dithionite)	Degrades X-Static and effects overall hue of fabric	<ul style="list-style-type: none"> Potential issue with consistency of color, luster Potential "tea stains" on finished fabric Potential uniform change in hue (towards brown) Potential issue with reduction in thermal and electrical properties 	Non hydrosulfite reducing agents such as isopropyl alcohol

Working Conditions - Temperature & pH

X-Static Silver antimicrobial fiber has been tested and approved for processing within the following guidelines:

Working, Stable pH Range: 3 to 12

Working Temperature and Time Range:

1. 20°C to 100°C in de-ionized water for 1 hour
2. 20°C to 200°C in dry heat for 5 minutes