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### ***Xenolite Apron Cleaning Recommendations***

#### XENOLITE FABRICS - SELECTION, CARE, CLEANING & DISINFECTION

Lite Tech offers a wide range and colors of different fabrics for its XENOLITE aprons, with different properties ranging from exotic prints to more technical textiles with better disinfection and even anti-bacterial functionality.

The correct selection of the outer fabrics is important as the different groups have widely different properties in respect of staining, cleanability (and resistance to cleaning agents), disinfection and even abrasion/wear resistance (for example in contact with Velcro loop). The technical and care information is given below to assist in such selection, and to avoid surprises in use.

All the fabrics offered are effectively "non-stretch" or limited ("bias") stretch WOVEN fabrics, distinguished from stretchy knit-based coated fabrics offered competitively, which can be vulnerable to de-lamination and/or coating adhesion and wear issues.

#### Types of fabrics

##### **Solid color "Nylon"** (Fabric # 01-44, 70-79)

These are 200 denier woven 'nylon'/polyamide fibers (Oxford weave) with a light polyurethane coating which faces inside the apron. A variation of this type is "Rip-Stop" nylons (# 70-79) which have an attractive 3-D surface pattern from the intermittent interweaving of larger, higher denier (300-360) fibers. Despite manufacturer claims of imperviousness, they do, in fact, allow some types of fluids to penetrate to the inner protective core materials.

Nylons are also more susceptible to color fading with UV and/or bleach effect with certain chemicals, including hydrogen peroxide etc. The rip-stop versions have a lower wear/abrasion resistance than most other fabrics, in particular when in routine contact with abrasive materials, including Velcro loop, due to the raised larger denier fibers, such wear visible as "surface fluff".

The weave, which is visible, can harbor dirt, in particular barium contrast medium, but also iodine and congealed body fluids more readily than other fabric groups, which have various smoother surfaces and coatings. For this reason this fabric group is the hardest to clean and the worst for stain removal and disinfection. Furthermore due to their liquid porosity, they can leak alcohols or other solvent-based cleaning chemicals to the interior of the aprons, causing chemical attack and possible embrittlement and premature cracking of the core protection material, by solvating the softening agents used to make these protective sheets flexible. They are not recommended for use where procedures involve regular contact with bodily fluids, antiseptics etc, iodine or contrast agents, or under cheap sterile scrubs which are not impervious.

These nylon fabrics are used for most of the inner lining fabrics, which typically only require occasional cleaning/de-odorizing.

**Printed Fabrics** (Fabrics # 50-54, 80-99, 00)

These are woven polyester (PES) fibers, typically about 200 denier in an off-white “greige” format, on which is printed the visible design, on top of which (facing out) there is a thin polyurethane (PU) surface coating primarily to protect the print. As for the solid color nylons above, they do, in fact, allow some types of fluids to penetrate to the inner protective core materials, particularly if/where this thin coating is worn thin or ‘off’, making this group also somewhat vulnerable to alcohol or other solvent-based penetration and internal chemical attack, unless the .

However, due to this PU coating, the outer surface is smoother, the weave less accessible to hide dirt or other contaminants/stains, and they are the next “step- up” in easy cleanability and less vulnerable to staining etc.

**Rubber-coated Fabrics** (Fabrics # 61.62, 63)

These are woven #200 denier polyester fabrics with a thick coating of butyl rubber on one-side, and a light PTFE coating on the other. The coatings , which include anti-bacterial, anti-fungal additives, make the material liquid and air impervious and it is commonly used as a mattress cover material in hospitals, for easy cleaning and disinfection.

Unfortunately the 3 available color options are rather ‘drab’, and the rubber surface is not shiny and may have talc powder residues from processing.

However, it is the most resistant fabric to staining (except iodine) and cleaning/disinfecting agents, including alcohol based ones, hydrogen peroxide, dilute chlorine bleach (15% vol sodium hypochlorite), although there may be some color fading.

For maximum cleanability and anti-bacterial properties, order with rubber facing out.

Certificates of anti-bacterial efficacy (JIS test) are available on request.

**PVC -coated Fabrics** (Fabrics # 45, 46, 47, 48)

These are woven #200 denier polyester fabrics with a thick vinyl/pvc coating on one-side (facing out).

The coating , which includes anti-bacterial, anti-fungal additives, make the fabric substantially liquid impervious, and its smooth surface avoids stain build-up and makes for easier cleaning and disinfection. It is the second most resistant fabric to staining and can sustain brief exposures to many cleaning/disinfecting agents, including dilute hydrogen peroxide, dilute chlorine bleach (15% vol sodium hypochlorite), although there may be some color fading. For treatment with alcohol and alcohol-based disinfecting agents see Cleaning/Disinfecting notes below.

Certificates of anti-bacterial efficacy (JIS test) are available on request.

## **CLEANING & DISINFECTION**

### **Cleaning**

Most dirt and water-soluble stains, including blood, other body fluids and barium contrast media, can be removed using non-aggressive household dishwashing liquid-type soaps/detergents (eg “Palmolive”, “Dove” etc) in diluted form in **cold** water.

These are best applied by wiping the apron fabric with a cloth or disposable wipe dampened with this aqueous cleaner, (not sprayed or pooled on the surface).

More stubborn marks – especially congealed barium contrast medium on a woven surface, may be helped by the use of a soft scrubbing brush, using the same mild detergent liquid.

For other proprietary cleaners, including combined cleaning/disinfecting agents, avoid the use of alcohol or alcohol-based agents, especially IPA/ethanol, and harsh caustic or phosphate based agents.

QAT's – or quaternary ammonium cleaners/disinfectants – are OK and even recommended, provided they are substantially alcohol-free and made up in dilute water-based forms. Follow manufacturer's instructions for make-up/ dilution.

If necessary the rubber-coated and pvc-coated fabrics, only, may be wiped briefly with an alcohol-dampened cloth, the rinsed with water dampened cloth/wipe, and then dried.

In all cases, the fabric surface should be wiped / rinsed with a water- dampened cloth and then wiped dry.

**Do not machine-wash, do not use warm or hot water, do not machine-dry, do not iron. Avoid bleach (chlorine or peroxide) as this will discolor/damage fabrics and edge binding and sewing thread.**

#### Iodine stains ( Betadine, Povidine)

Iodine stains are the most difficult to clean, and are best cleaned as soon as possible after staining. Aqueous proprietary iodine cleaners, using sodium thiosulfate to oxidize out the color, should be used. Recommended is alcohol-free “Betanett” from Alkapharm in France ([info@alkapharm.fr](mailto:info@alkapharm.fr), Romainville, FR), available in a spray bottle.

Not recommended is “Fade-A-Dyne”, a USA equivalent (Russ Medical, NC, USA) which contains aggressive acetone and IPA.

In application, it is better if the iodine cleaner is first sprayed on a cloth and wiped on the stain, not sprayed directly on the surface.

In all cases, the fabric surface should be wiped / rinsed with a water- dampened cloth and then wiped dry.

#### **Disinfection**

All Xenolite fabrics may be disinfected with water-based QAT (quaternary ammonium-based) cleaning/ disinfecting agents or certain “active oxygen” disinfectants. A list of checked/approved such QAT /other disinfectants follows.

Specific bacterial/fungal/virocidal efficacy, and required dilutions/preparations/time, can be obtained from these manufacturers' websites.

Again, the preferred procedure is to use a cloth or disposable wipe dampened with the disinfectant. If a lengthier time is required for bacterial kill, such cloth/wipe may be left in contact for the required period.

In all cases, the fabric surface should be wiped / rinsed with a water- dampened cloth/disposable wipe and then allowed to dry.

If required, the rubber-coated and pvc-coated fabrics only, may be wiped briefly with an alcohol-dampened cloth (IPA 60% vol), the rinsed with water dampened cloth/wipe, then dried. These fabrics can also sustain brief exposure to dilute hydrogen peroxide by wiping with a dampened cloth/wipe, followed by water rinse and dry.

**Do not autoclave or use gamma irradiation for sterilizing.** Contact us for unusual ETO/gas sterilizing limits (long cycle, < 110 F)

List of checked/approved QAT or active oxygen proprietary disinfectants/cleaners (USA/Europe/global)

“Clorox Pro Quaternary All-purpose Disinfectant 30182, CLO 30423”	
“Decon BDD Bacdown”	(Decon Labs USA)
“Fiberlock IAQ 2000”	Fiberlock Technologies (USA)
“Antifect FF” at dilution < 2%	Schulke & Mayr, DE
“Terralin Protect” at max 2%	Schulke DE ...
<i>avoid use of Terralin liquid and Terralin PAA</i>	
“Terralin Perform”	Schulke DE (active oxygen)
“Lysol IC Quaternary Disinfectant”	Reckitt Benckiser
Medtrol “CTW”, CTG 175, 140 Clini-Tech	
Rely+On™ Virkon® (may cause minor fabric discoloration)	DuPont

If you need other cleaning/disinfecting agents, we will be pleased to check/advise compatibility.

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