

# LX-DFENS

**#1 CORONAVIRUS KILLER**



**LX-DFENS**

**PERMANENT  
PROTECTION  
AGAINST  
VIRUSES**





LX-DFENS is a potent and persistent defense against dangerous viruses. LX-DFENS protects effectively against human coronavirus. It also defends against COVID-19 with -97.3% inactivity within 10 minutes, or -99.9% according to ISO 18184, at low 3% Masterbatch dosage. Effectiveness is proven against similar enveloped and non-enveloped viruses dangerous to humans.

Unlike overdosed cytotoxic copper yarns, the LX-DFENS end product formula is non-toxic (ISO 10993-5/11) and off white.

LX-DFENS is available in various categories with formulas containing 3 combined additives with very low silver, copper, zinc additives content in the final product, below 0.01%, hence fully dyeable.

LX-DFENS is available as masterbatch for a number of polymers including polyester, nylon, ABS, PE, or bio and recycled polymers, for various applications including textile, PPE, consumer products, etc.

LITRAX also offers LX-DFENS as non-permanent textile finishing treatment, for 40-50 washing cycles, with extremely low dosage per liter water (25 gram / liter), designed both protect environment and reduce the risk of virus and bacteria contamination to almost zero within minutes! Antiviral result can reach astounding >99% in just 30 sec. for special applications and coatings or resins, applying very little additive content, below 20ppm.

While most viruses are not enemies or killers, mosquitoes, ticks, bats etc. and the pathogens associated with them, have always been the most dangerous enemies of mankind.

SARS-CoV-2 (or COVID-19) has shown that we need a proactive defense against these enemies.

The success story of today's multitude of viruses on our planet started about 3.5 billion years ago when life began. Newly discovered giant viruses are almost bacteria in their composition, suggesting that the borderline

between dead matter and life seems continuous. The success story of shielding ourselves successfully against dangerous viruses has only begun and will lead to great product developments with LX-DFENS doped polymers for various industrial applications and materials.

Viruses like COVID-19 spread through aerosols, small drops of moisture in the air. If corona patients in need of respiratory support are likely to spread the virus through small droplets of moisture in the air, then extra protection is needed for nurses and doctors!

This is where LX-DFENS comes into action. Viruses that land on personal protective equipment (PPE), such as gloves, suits, caps, visors, jackets, or face masks, will quickly be terminated. This dramatically reduces cross contamination to another person or PPE. Future versions of LX-DFENS will also be proposed against biological warfare containing artificially modified virus RNA or bacteria DNA. Contact us for more information!



Human Herpes Virus  
(enveloped) ISO 21702

**HSV-1**



Avian Influenza A  
Method ISO 18184

**H5N1**



2013 Influenza A  
Method ISO 18184

**H7N9**



2019 Corona Virus / COVID-19  
Method ISO 18184

**SARS-COV-2**



**POLYMER**  
ABS

**APPLICATIONS**  
AUTOMOTIVE, TRANSPORTATION,  
CONSUMER PRODUCTS

**LITRAX PRODUCT**  
CHIPS, MASTERBATCHES

**CODE**  
LX-DFENS.ABS



**POLYMER**  
POLYESTER PES / PET / PBT  
PBS / RECYCLED PET

**APPLICATIONS**  
TEXTILES, NON-WOVEN,  
PPE / FACEMASKS,  
FASHION, BOTTLES,  
PACKAGING FILMS

**LITRAX PRODUCT**  
CHIPS, MASTERBATCHES,  
FILAMENTS, FIBERS

**CODE**  
LX-DFENS.PES - PET - PBT - PBS - RPET



**POLYMER**  
POLYAMIDE PA6 / PA6.6  
RECYCLED PA6

**APPLICATIONS**  
TEXTILES, FILMS, ETC. ETC.

**LITRAX PRODUCT**  
CHIPS, MASTERBATCHES,  
FILAMENTS, FIBERS

**CODE**  
LX-DFENS.PA6 - PA66 - RPA6



**POLYMER**  
POLYETHYLENE HDPE

**APPLICATIONS**  
FILMS FOR PACKAGING,  
CONSUMER PRODUCTS

**LITRAX PRODUCT**  
CHIPS, MASTERBATCHES

**CODE**  
LX-DFENS.HDPE





# STRONG ANTIVIRAL ACTION ON SARS-COV-2 (COVID-19)

## 100% POLYESTER TEXTILE DOPED WITH LX-DFENS

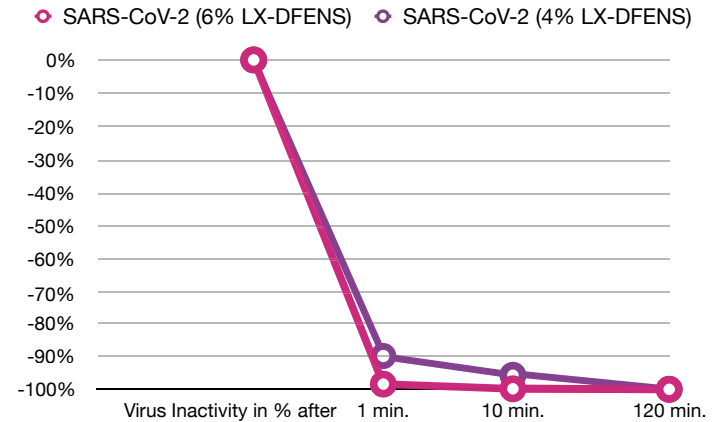
Following ISO-18184 normative in testing against the enveloped (corona type) virus SARS-CoV-2, the effectiveness is high and instant:

### DETERMINATION OF ANTIVIRAL ACTIVITY - METHOD ISO 18184

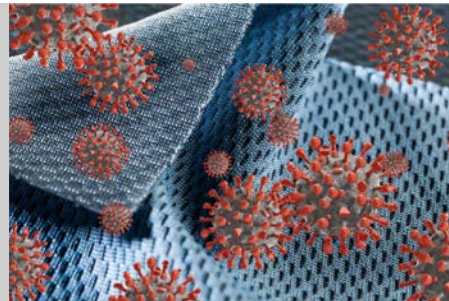
Virus	% LX-DFENS Masterbatch	% Inactivity within 1 minute	% Inactivity within 10 min	% Inactivity within 2 hrs	Log Reduction within 2 hours	Metal content in final product
SARS-CoV-2	6%	-99%	-99.9%	-99.999%	5 log	< 0.01%
SARS-CoV-2	4%		-97.3%	-99.99%	4 log	< 0.01%
H7N9 2013 Influenza A	4%		-99.9%	-99.99%	4 log	< 0.01%
229 Human Coronavirus	4%		-99.9%	-99.99%	4 log	< 0.01%

## STRONG & FAST EFFECTIVENESS

against SARS-CoV-2 within 1 to 10 minutes, adjustable with % dosage of Masterbatch.



01



## STEP 1 CAPTURE

Materials (textiles / polymers) containing LX-DFENS have substantial polarity charges per square centimeter to capture viruses and bacteria. Adsorption inhibits virus binding or fusion in cells.

02



## STEP 2 DESTROY

LX-DFENS charged textile or polymer surfaces break the bilipid layer and destroy the virus proteins, leaving dead RNA fragments that will fall off, or can be washed off. Depending on the virus type, this action is faster or slower, but it is between >99% to 99.999% effective. Higher dosage of LX-DFENS will result in greater and quicker effectiveness.

# LX-DFENS MATERIAL DOSAGE & APPLICATION MATRIX

BENEFITS \$  
DOSAGE



Polymer / Material Type	PBT - PA6 - PET - rPET - HDPE – ABS – TPU – PU				Resins / H2O
LITRAX Product	LX-DFENS.A		LX-DFENS.C		LX-DFENS.20
Masterbatch % in final product	3 - 6%		5 – 9%		1.5 to 2-5% / liter
Additive in final product	< 50 ppm				< 40 ppm
Application	TEXTILES – YARNS – FIBERS				Finishing
Microrganism	Bacteria	Virus / COVID-19	Bacteria	Virus / COVID-19	Virus / COVID-19
Test Norm	AATCC 100 - JIS L1902	ISO 18184	AATCC 100 - JIS L1902	ISO 18184	ISO 18185
Antimicrobial / Antiviral Effectivity	>99%	>99%	>99%	>99%	>99%
Dyeability	Yes		Yes		Yes
Application	PLASTCS, POLYMERS AND NON POROUS SURFACES				Coating
Microrganism	Bacteria	Virus / COVID-19	Bacteria	Virus / COVID-19	Virus / COVID-20
Test Norm	ASTM E2149 - JIS Z2801	ISO 21702	ASTM E2149 - JIS Z2801	ISO 21702	ISO 18185
Antimicrobial / Antiviral Effectivity	>99%	>99%	>99%	>99%	>99% in 30 sec.
Coloring	Slight color change in final product possible		NO color change in final product		NO color change
UV – protection	Optional		Optional		Optional
Min. Blend of Product in final application	100% or >60% adjusting Masterbatch dosage				100%

## WINNING BENEFITS OF LX-DFENS

- Instant SARS-CoV-2 killing within 30 sec.
- Fulfills ISO 18184 with -99.99% in minutes
- Highly effective in low concentrations (<50ppm)
- Sustainable technology
- Safe for humans (passes ISO 10993)
- Safe for environment
- Permanent high protection
- Excellent additive dispersion
- Effective antimicrobial & antivirus technology
- Superior deodorizer & freshness properties
- Works with most commercial polymers (ABS, PA6, PET, PP, PE, TPU, PU)
- Works with natural & synthetic textiles
- Works with filters in cars & home appliances
- Works with paints indoors and outdoors
- Works with resins
- Latest molecular-bonding technology
- Spinnable with high-speed systems
- Stable spinning process & viscosity
- Virgin polymer quality of final product
- Easy to texturize or coat.





**LX-DFENS**



**LITRAX**

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