



HOW SUSTAINABLE ARE THE FIBERS YOU SOURCE?

Today there are many different fiber options, from natural to man-made and synthetic. It is sometimes complicated to know which types of fiber are more sustainable, meaning they have a lower environmental impact or are less harmful to human and ecosystem health.

The following table outlines a sample of commonly used fibers, comparing their impacts on the environment or their sustainable benefits. Unless otherwise stated, the types of fibers compared represent the average or generic versions.

FIBER CATEGORIES & EXAMPLES		ANIMAL BASED	PLANT BASED	MAN-MADE CELLULOSIC		SYNTHETIC	
		Silk	Cotton	Viscose filament	Modal*	Naia™ cellulosic yarn (acetate)	Polyester
ORIGIN	Biobased	caterpillar secretions	cotton plant	wood pulp	wood pulp	wood pulp	no (oil based)
	Impact on natural resources	resource and energy-intensive cultivation; animal welfare issues	high water use in cultivation; high use of pesticides in nonorganic cotton	may be sourced from endangered or ancient forests	may be sourced from endangered or ancient forests	sourced from certified** plantations	sourced from a nonrenewable resource
	Biodegradable	yes	yes	yes	yes	yes	no
PROCESS	Chemical usage	pesticides used in cultivation	pesticides used in cultivation	made with carbon disulfide and sulfuric acid	made with carbon disulfide and sulfuric acid	made with acetic acid and acetone	terephthalic acid blended with ethylene glycol
	Closed-loop production	not applicable	not applicable	depends on manufacturer	depends on manufacturer	yes	depends on manufacturer
	Water usage	high (cultivation)	high (cultivation)	medium (wet spinning)	medium (wet spinning)	low (dry spinning)	low (melt spinning)

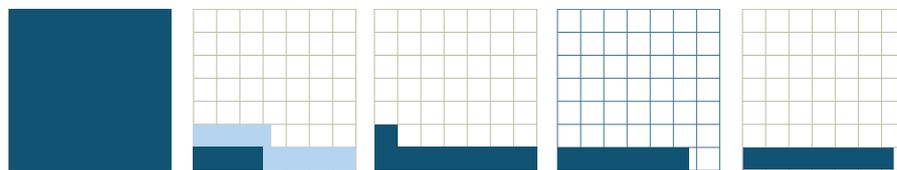
*The manufacturing process of modal can be considered similar to viscose staple.

**Sourced from sustainably managed forests and suppliers holding FSC® and/or PEFC Chain of Custody certification. Eastman FSC trademark code: C140711.

CRADLE-TO-YARN LIFE CYCLE COMPARISON*

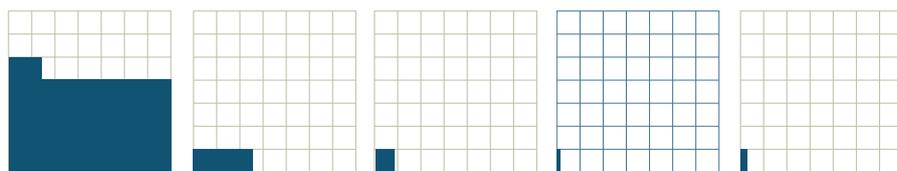
Silk (average/generic) Cotton (average/generic) Viscose filament (average/generic) **Naia™ cellulosic yarn (acetate)** Polyester (average/generic)

 **Climate change**
kg CO₂eq/kg yarn



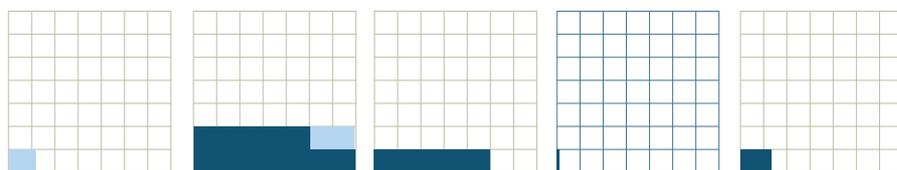
Indicates greenhouse gas emissions, as measured in carbon equivalents

 **Freshwater withdrawal**
m³/kg yarn



Indicates usage of fresh water in the production and preparation stages

 **Ecosystem quality impact**
PDF•m²•y/kg yarn



Indicates negative impact on nature, including elements such as land use, eco-toxicity and water acidification

■ = fiber production
■ = yarn spinning

*The data for each fiber comes from the following sources: Naia™ from ISO-reviewed LCA (Quantis, 2018), polyester, viscose and cotton from ecoinvent v3.4, cotton spinning from WALDB, and silk from WALDB, based on Astudillo 2014.

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