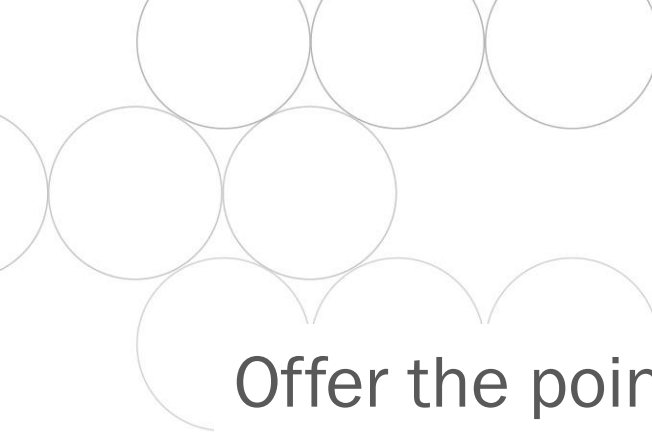




Environmental Considerations for Stain-Resistant Upholstery



WE MAKE AMAZING



Objectives

Offer the point-of-view of manufacturers of (semi)durable textiles

Brief overview of C6 for textiles

Draw distinctions between textile end-uses

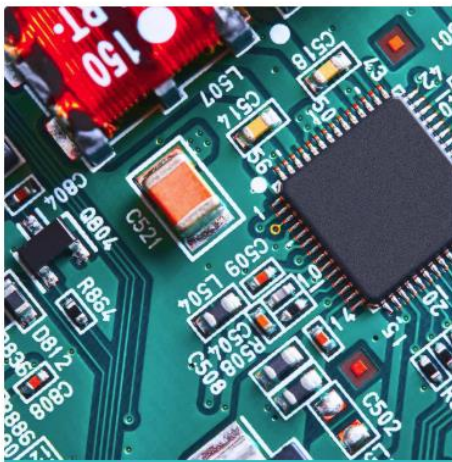
Compare performance of alternatives

Listen to the customer

Consider the consequences of removing stain resistance



Numerous Products Benefiting from FluoroTechnology



SEMICONDUCTORS

Fluorinated chemistries are essential to the manufacturing environment of micro-technology.

[Learn More](#)



AUTOMOTIVE

Today's safe and fuel-efficient trucks, buses and automobiles rely on the unique, high-performance properties of FluoroTechnology.

[Learn More](#)



AEROSPACE

Fluorinated chemistries play a role in the creation of a number of critical components of airplanes and helicopters.

[Learn More](#)

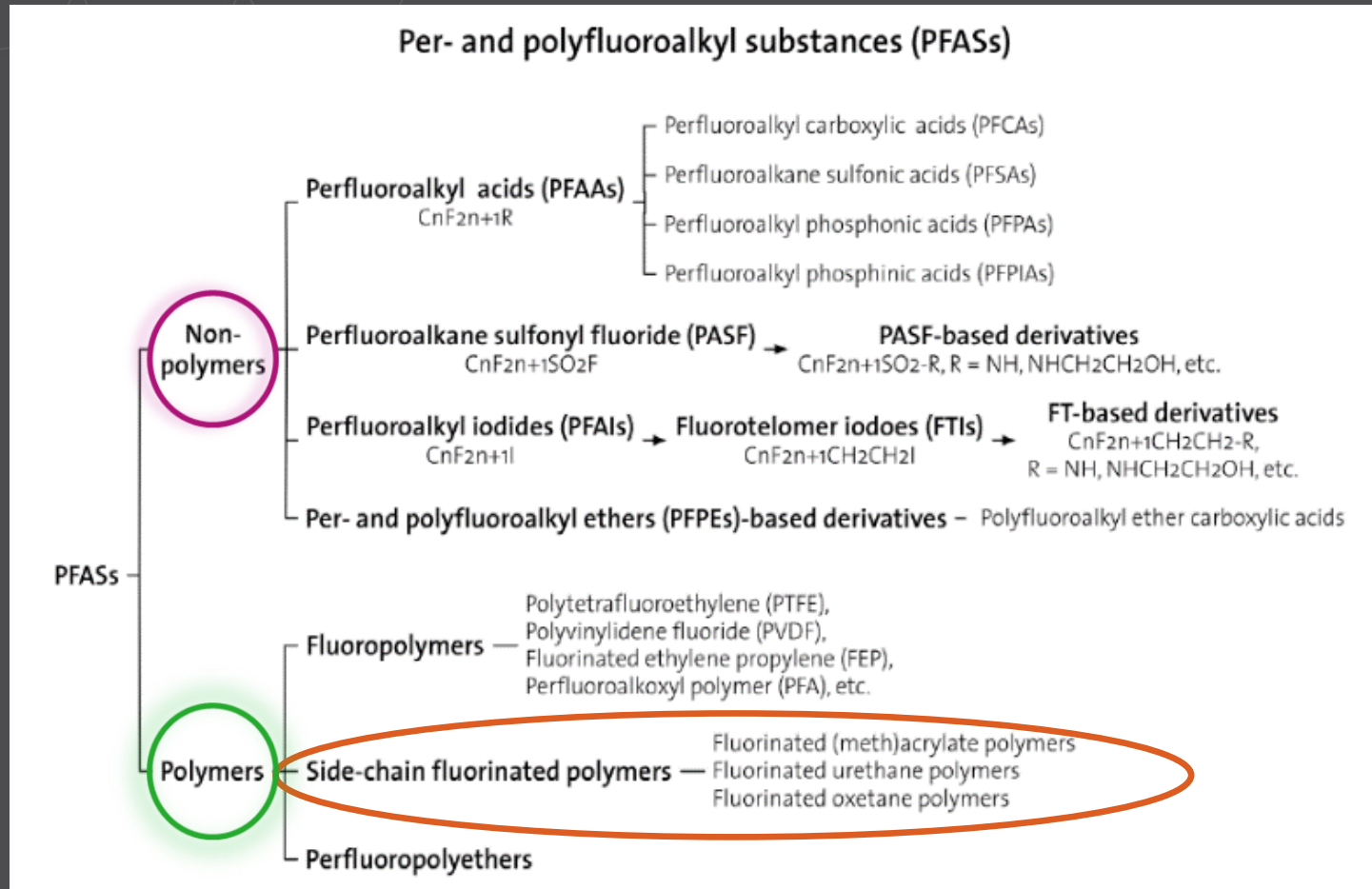
Consumer Products Benefiting from PFAS

Sport Band

Custom high-performance fluoroelastomer with a pin-and-tuck closure.

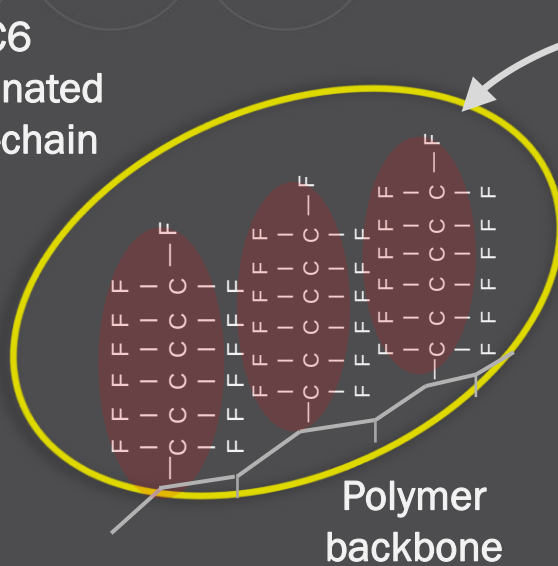


How is PFAS used in textiles?



Effectiveness can be achieved with as low as 0.1% fluorine.

C6
fluorinated
side-chain



Polymer
backbone

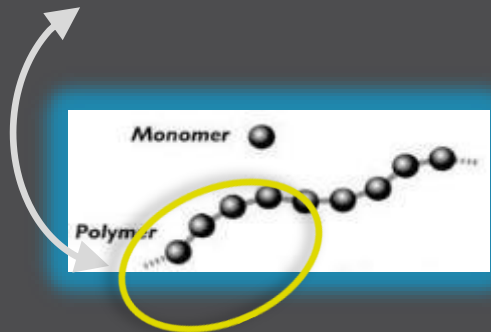


Crosslinked
polymeric
network for
durability

Sheath:
< 1% of finished
fiber =
Side-chain fluorinated
polymer

Core:
> 99% of
finished fiber =
fiber polymer

Fiber
Cross-Section





Is stain resistance necessary in Textiles?



Answer depends on type of textile



Fast fashion



Fast fashion is a term used to describe a highly profitable business model based on replicating catwalk trends and high-fashion designs, and mass-producing them at low cost. The term 'fast fashion' is also used to generically describe the products of the fast fashion business model. [Wikipedia](#)

Feedback

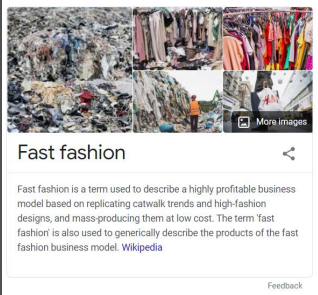


VS

VS



“Essential” use factors

	Fast Fashion 	Outer Wear 	Spot-Cleanable 
Functional	No	Yes	Yes
Relative Cost	Cheap	High	High / very high
Durability	No	Yes	Yes
Stain Exposure	Yes	Limited	Yes
Machine Wash	Yes	Yes	No or Limited

New York



London



Chicago





**How do non-fluorinated
repellents compare?**

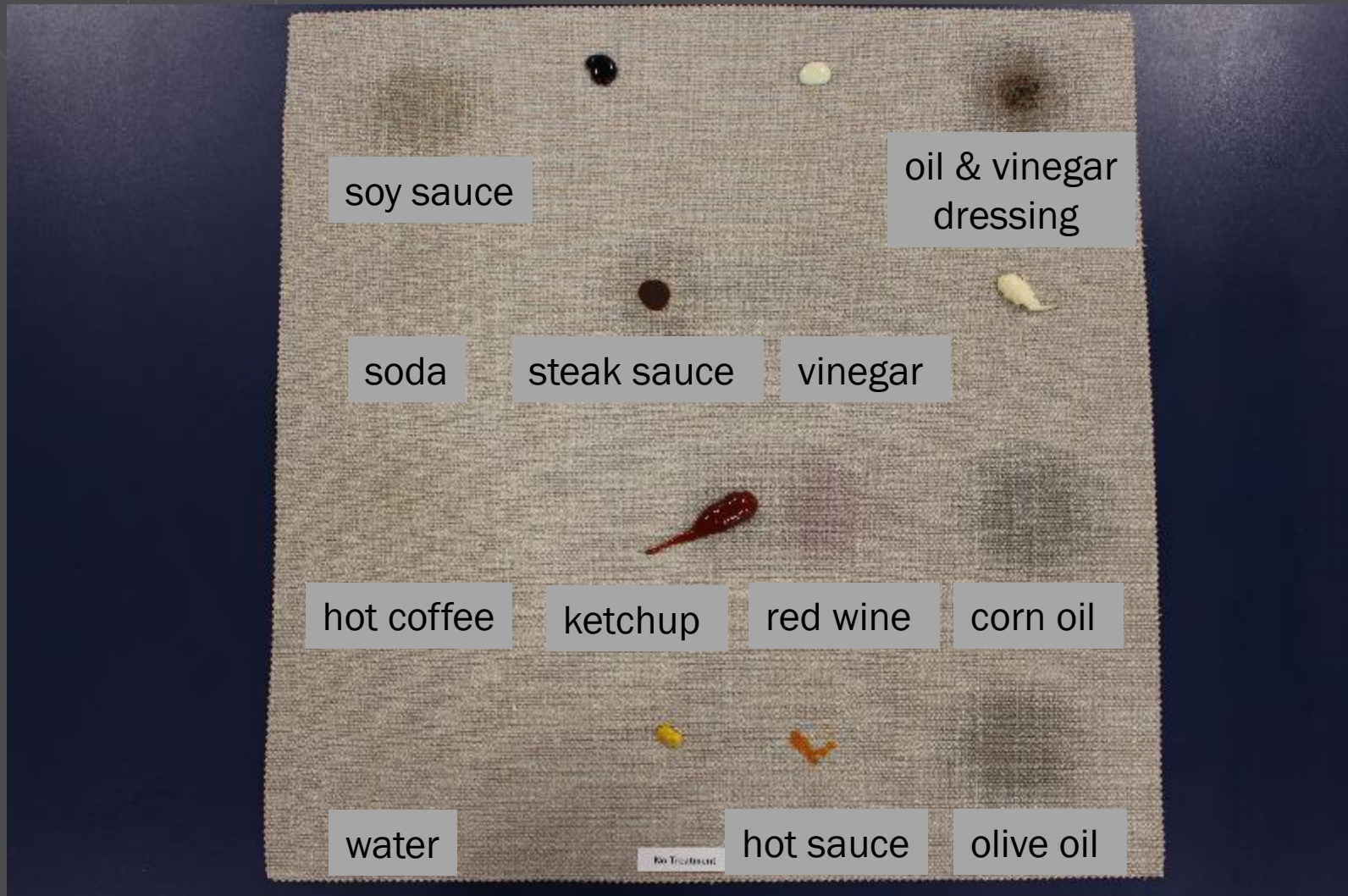


A collection of various condiments and beverages arranged on a blue table. Items include Coca-Cola, Heinz Tomato Ketchup, French's Yellow Mustard, Bertolli Extra Virgin Olive Oil, and several bottles of salad dressing and vinegar. Two white mugs, one containing coffee and the other water, are also present.



No Treatment

Before Spot-Cleaning



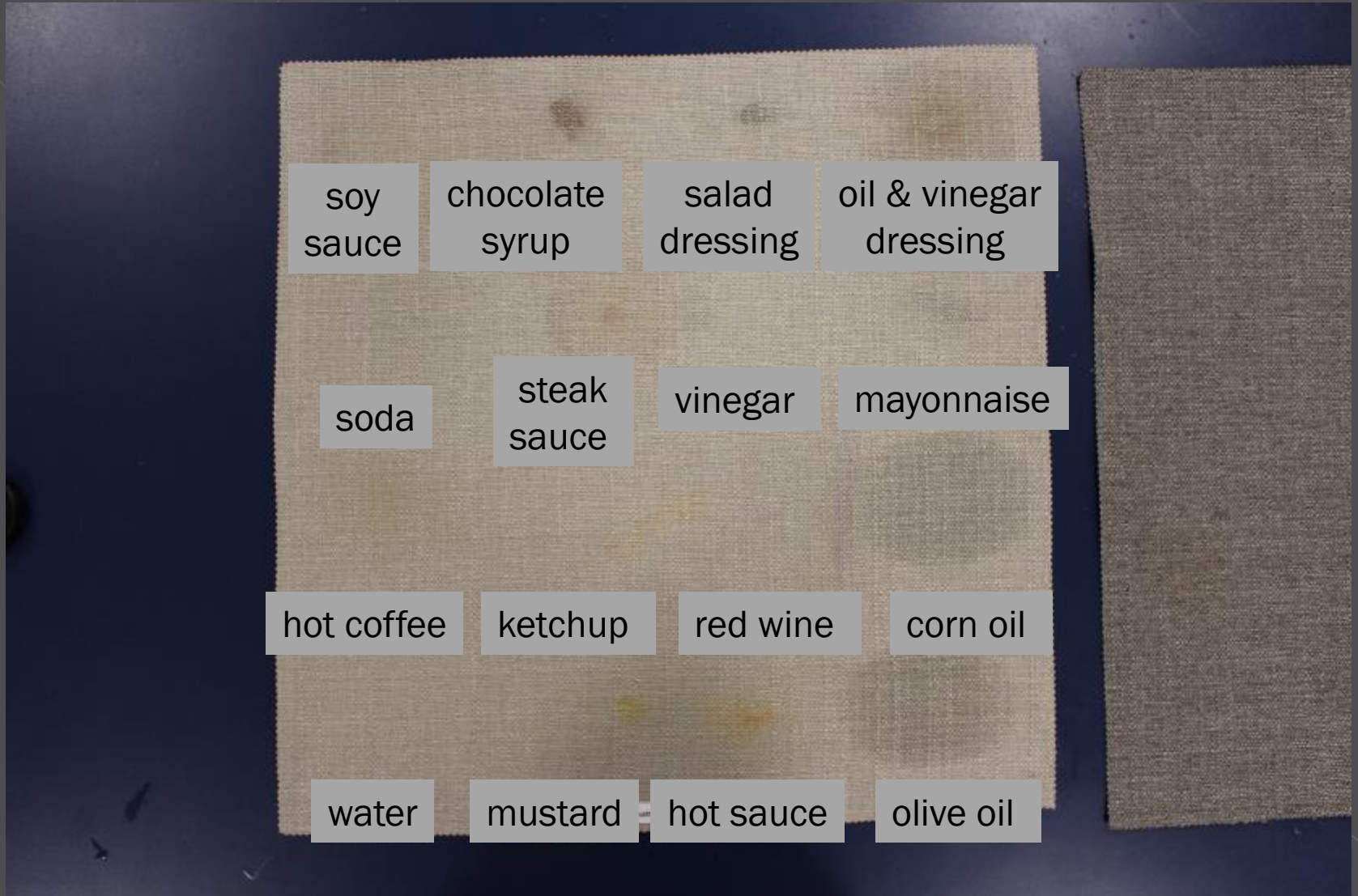
No Treatment

After Spot-Cleaning



No Treatment

After Spot-Cleaning



Non-Fluorinated Repellent

Before Spot-Cleaning



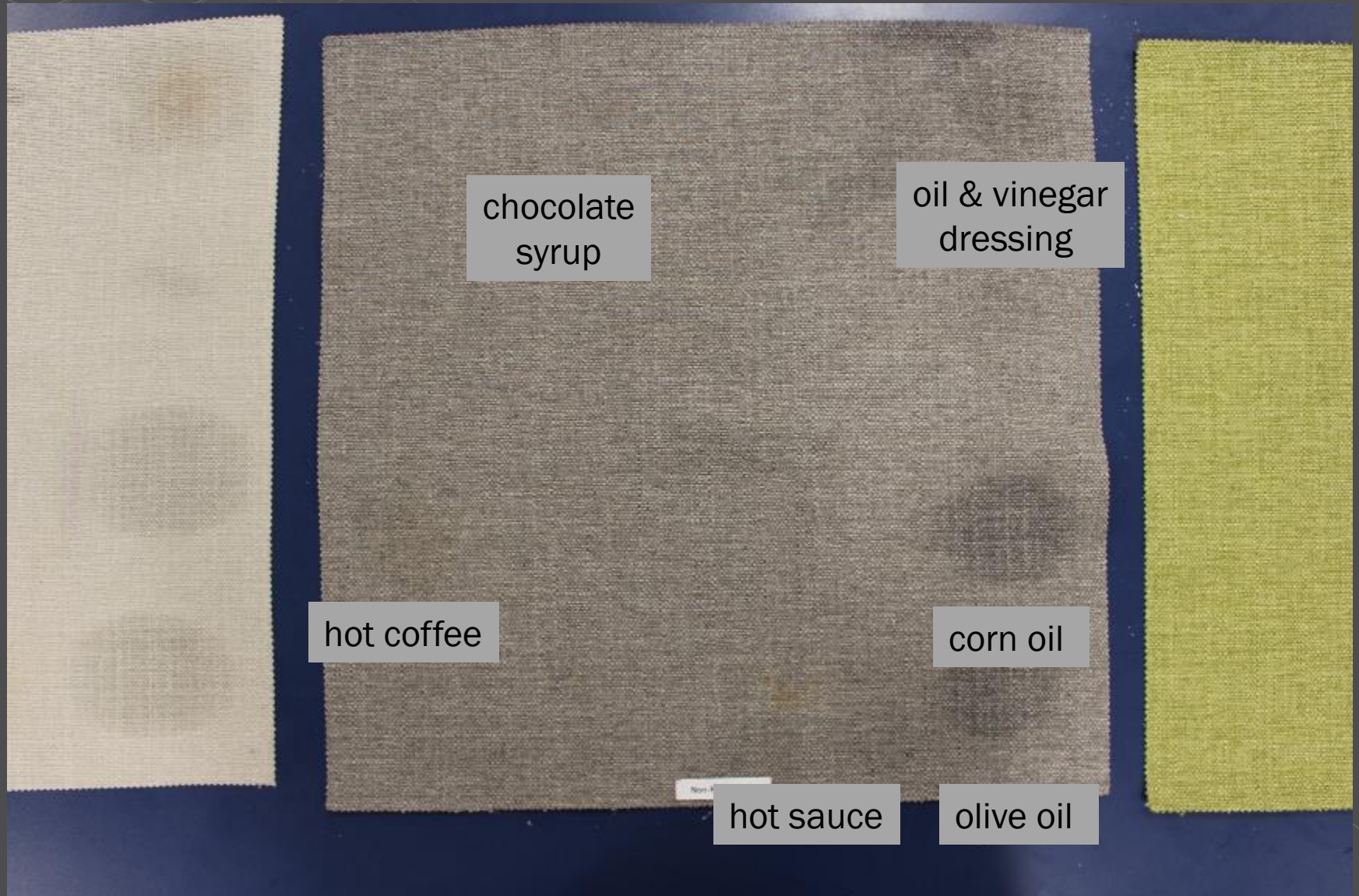
Non-Fluorinated Repellent

Before Spot-Cleaning



Non-Fluorinated Repellent

After Spot-Cleaning



C6 Side-Chain Fluorinated Repellent

Before Spot-Cleaning



C6 Side-Chain Fluorinated Repellent

After Spot-Cleaning



How does non-fluorinated technology compare?

- Okay

Repellency of water-based liquids and stains can be comparable

- Not okay

Stain resistance is inferior ... and will lead to premature replacement



What do customers say?



Interior Design Surveys

Weaving in New Ways

ACT
October 2016

MARK STRAUSS,
President Emeritus
*Interior Design**

FACTORS MOST IMPORTANT WHEN SPECIFYING TEXTILES

workplace

aesthetic/design (style/pattern) 85%

color selection 76%

durability/quality 75%

cleanability/maintenance 74%

price 65%

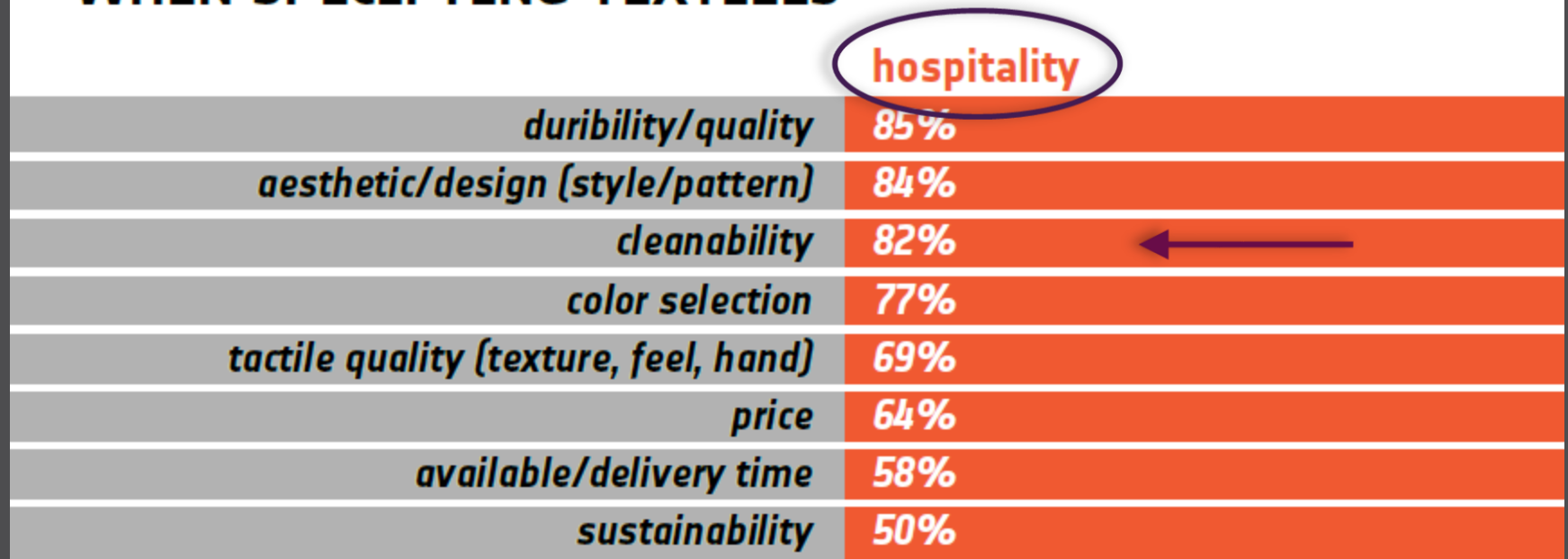
tactile quality (textile, feel, hand) 61%

available/delivery time 55%

sustainability 51%

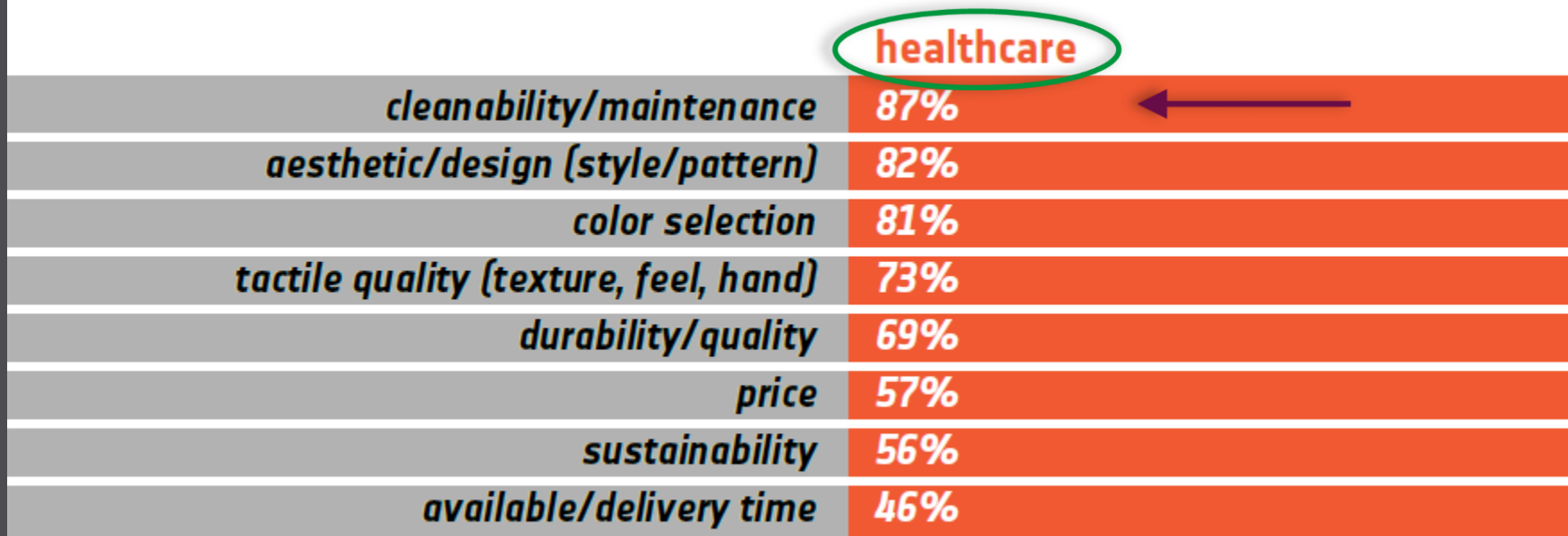
Source: 2016 ACT Specification Research

FACTORS MOST IMPORTANT WHEN SPECIFYING TEXTILES



Source: 2016 ACT Specification Research

FACTORS MOST IMPORTANT WHEN SPECIFYING TEXTILES



Source: 2016 ACT Specification Research

Down-sides of removing stain resistance

Repulsive stains and odors in fabrics and cushions

Customer dissatisfaction

Higher maintenance cost

Higher replacement cost

Diminished design choices – switch to coated fabrics

Negative environmental impact

- Landfill

- More harsh cleaners and disinfectants

- More fossil fuels, water, greenhouse gases and effluent

Down-sides of removing stain resistance





Quantifying the environmental down-side



facts

Sustainability
Certification
Program

Development Partners



= NSF/ANSI 336

facts

Sustainability
Certification
Program

Sustainability Attributes

Fiber Composition

20%
fiber sourcing

30%
safety of materials

Manufacturing Process

6% water
conservation

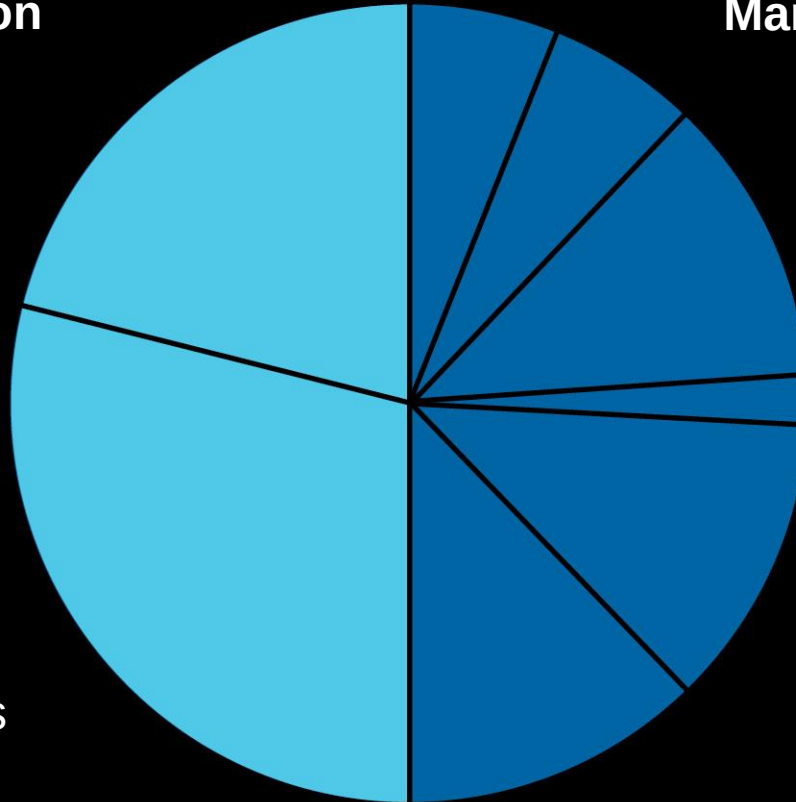
6% water
quality

12% energy

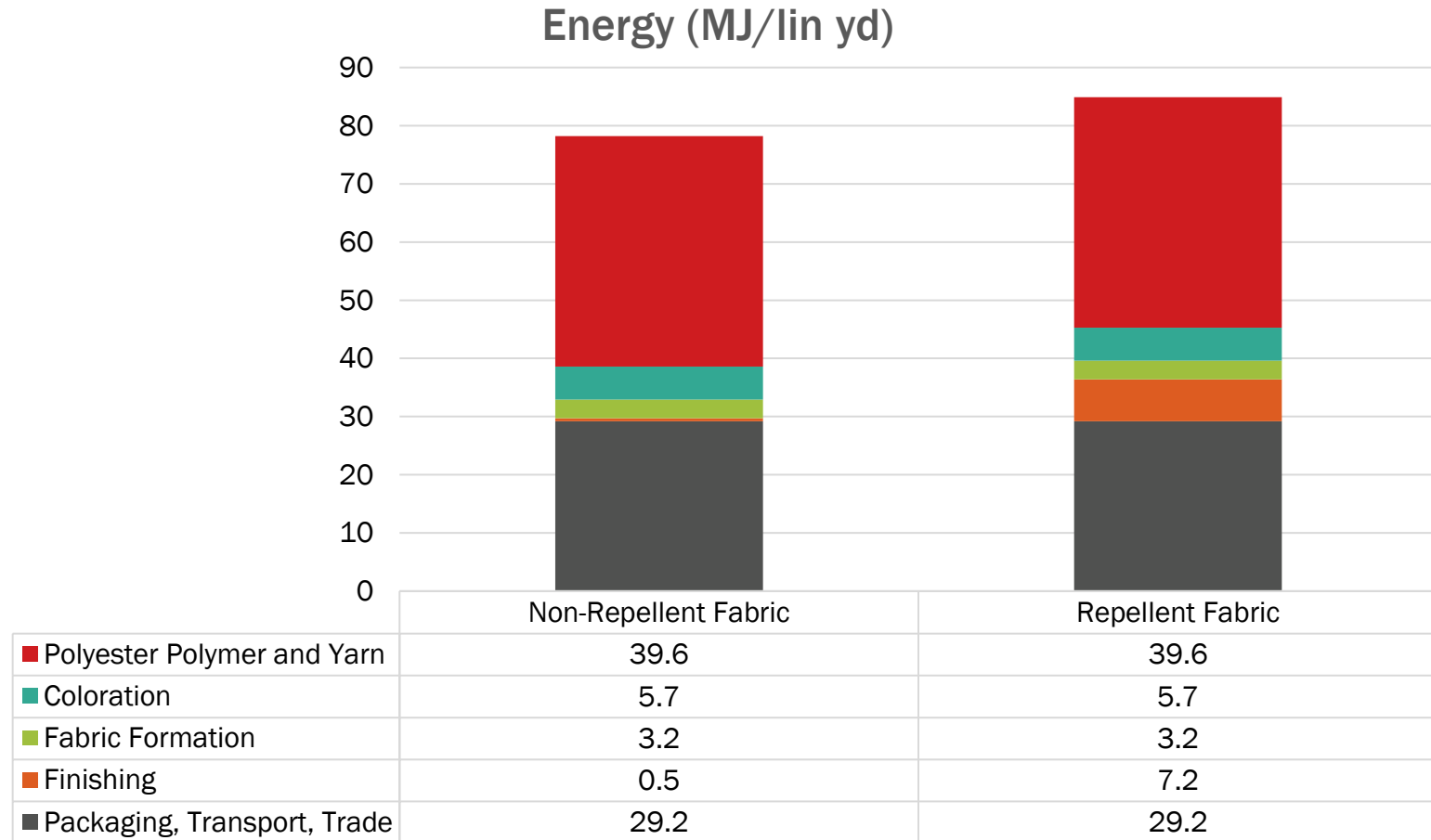
2% air quality

12% recycling
practices

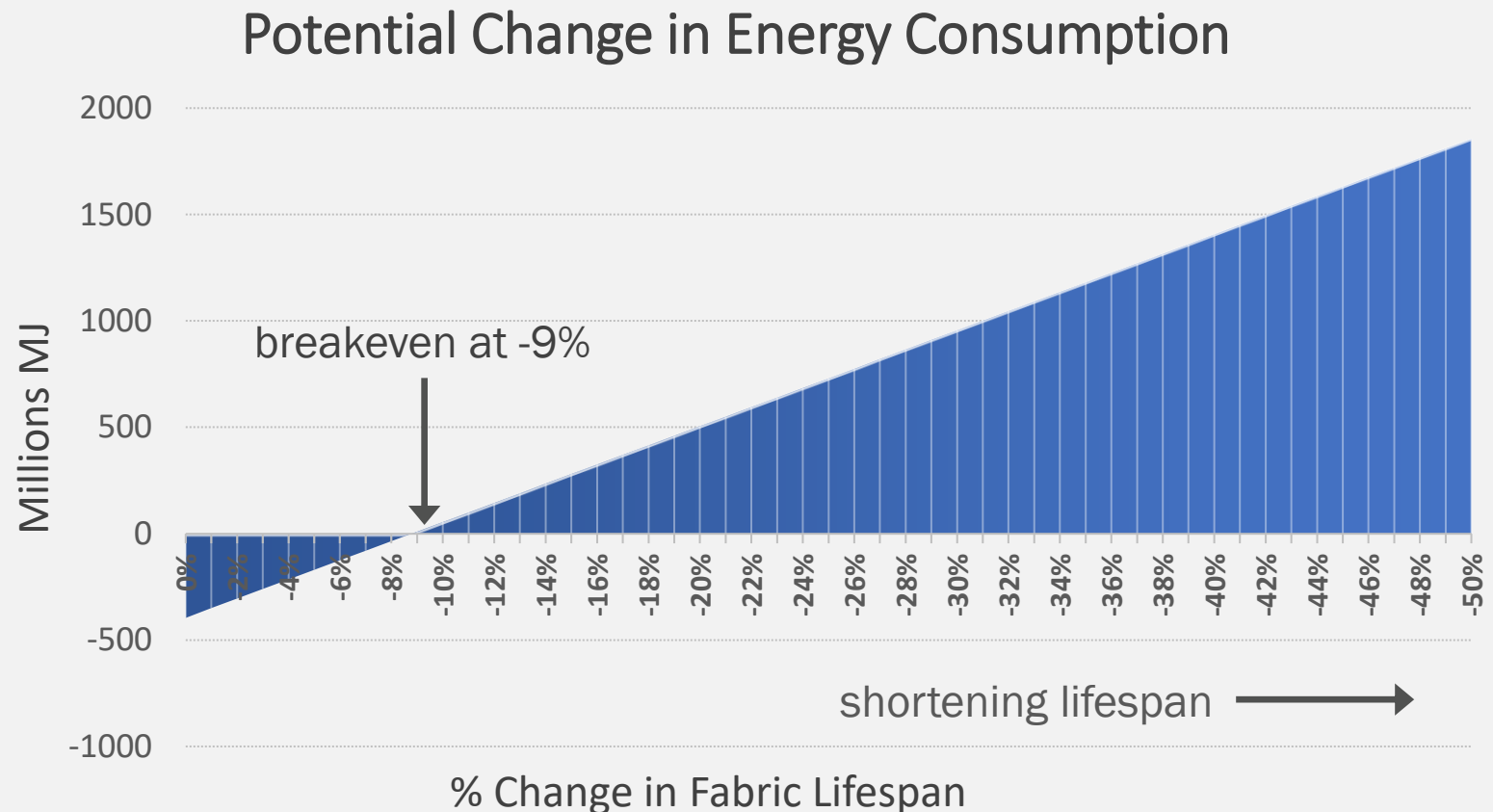
12% social
accountability



Energy Consumption Estimates

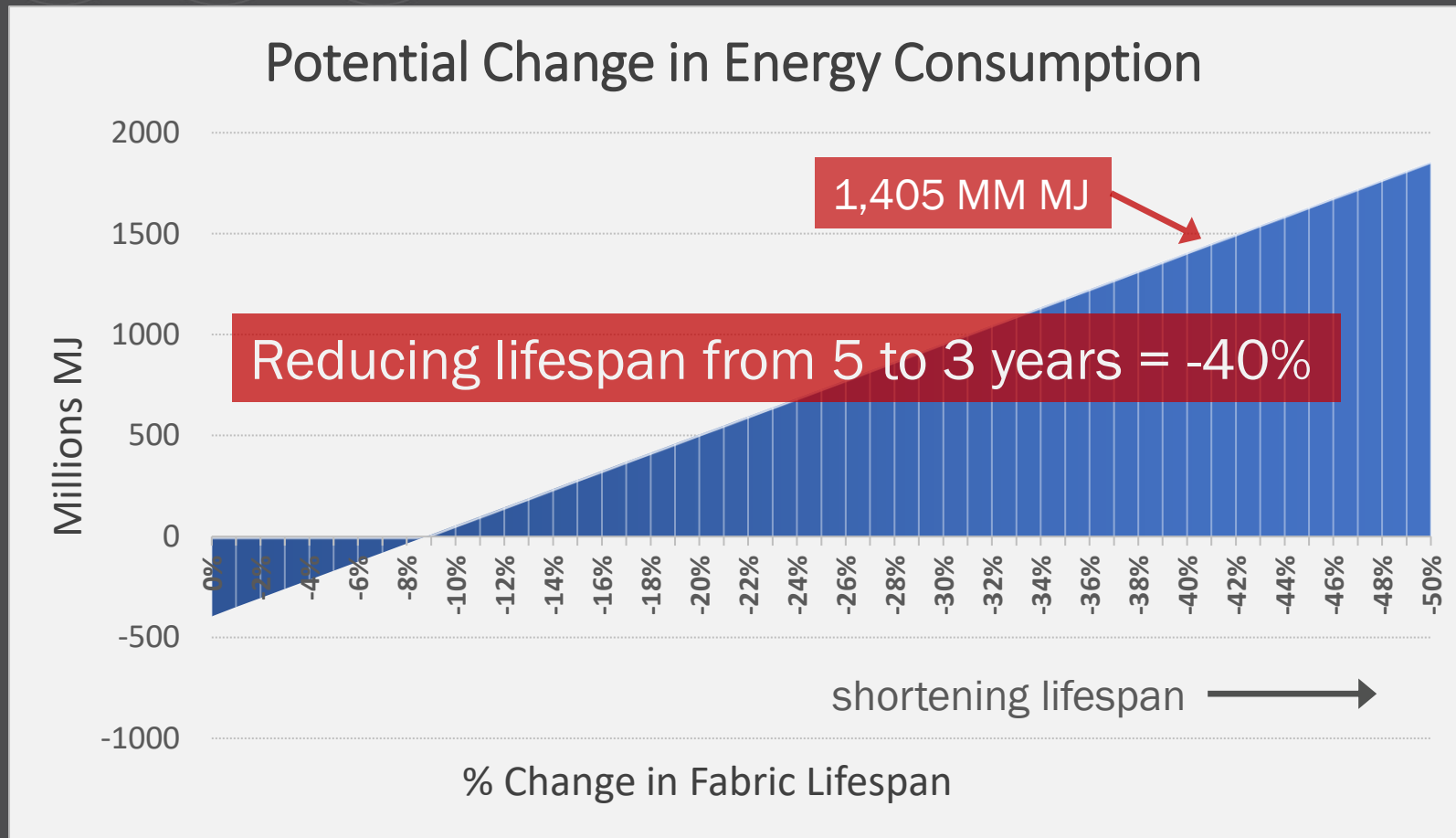


Impact of removing fabric stain resistance - US Commercial Market



Impact of removing fabric stain resistance - US Commercial Market

Approximately 59M yd



Impact of removing fabric stain resistance - US Commercial Market

Approximately 59M yd



[Environmental Topics](#)

[Laws & Regulations](#)

[About EPA](#)

Energy and the Environment

Greenhouse Gas Equivalencies Calculator



Impact of removing fabric stain resistance - US Commercial Market

Energy ⬆

1405000000 = 390277777.7778

Megajoule ⬆ Kilowatt hour ⬆

[More info](#)

If You Have Energy Data **If You Have Emissions Data**

390277777.777 kilowatt-hours of electricity ▼

Calculate

Impact of removing fabric stain resistance due to energy inputs

US Commercial Market

Approximately 59M yd

Equivalency Results

[How are they calculated?](#)

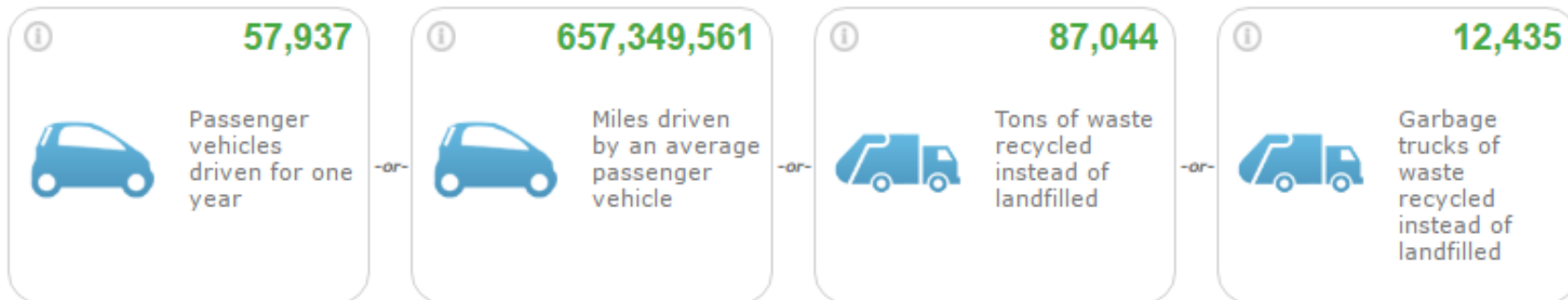
The sum of the greenhouse gas emissions you entered above is of Carbon Dioxide Equivalent. This is equivalent to:

274,278

Metric Tons



Greenhouse gas emissions from



Impact of removing fabric stain resistance due to energy inputs US Commercial Market

OR

Approximately 59M yd

Carbon sequestered by



7,108,224



tree seedlings
grown for 10
years

-or-



259,633



acres of U.S.
forests in one
year

-or-



2,186



acres of U.S.
forests
preserved from
conversion to
cropland in one
year

That was just energy consumption

facts

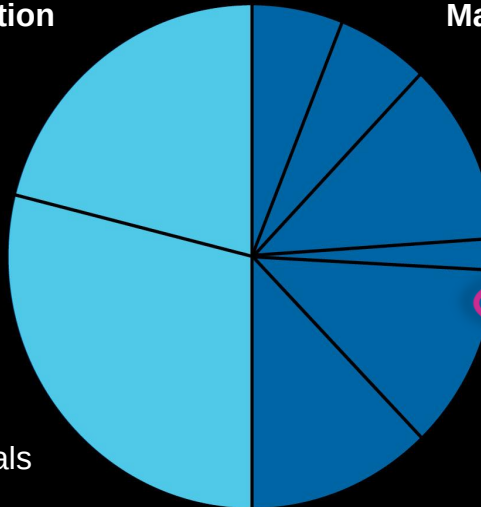
Sustainability
Certification
Program

Sustainability Attributes

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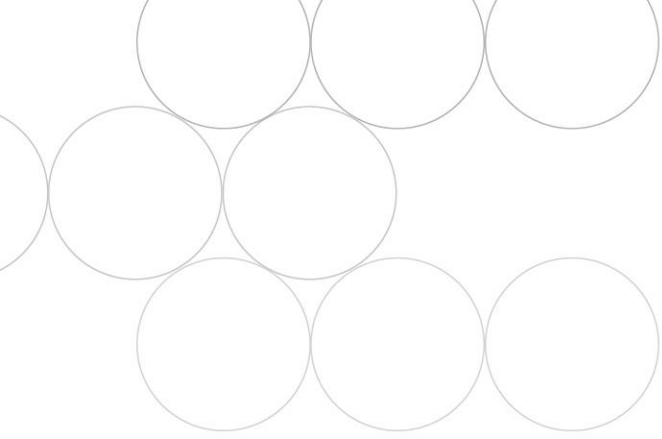
6% water
quality

12% energy

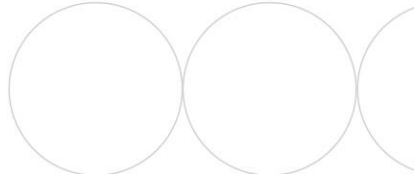
2% air quality

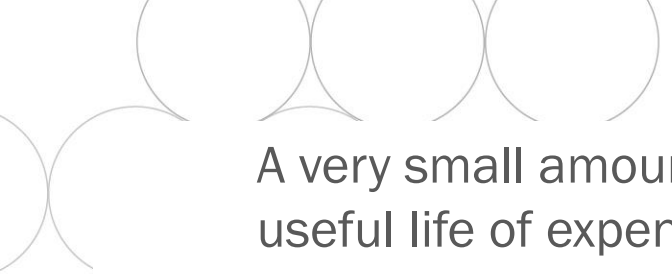
12% recycling
practices

12% social
accountability



Closing Thoughts





A very small amount of FluoroTechnology effectively extends the useful life of expensive furnishings (without hindering recyclability)

Special consideration should be given to functional, durable, spot-cleanable textiles

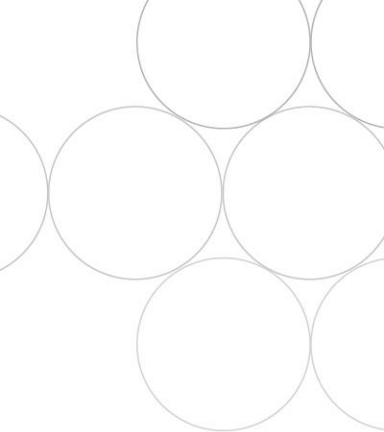
Only FluoroTechnology provides resistance to oily stains

The high molecular weight polymer poses no concern for bioaccumulation or toxicity

Degradation product of the latest generation FluoroTechnology is well-studied and has an improved environmental profile

Removing oily stain resistance would have quantifiable, negative environmental consequences





KNICK MEYER INC. NCTO

AMERICAN
TEXTILES

WE MAKE AMAZING

Knick Meyer made American textiles famous, and we're constantly working to adapt product and style to changing lifestyles. With innovations that make everyday clothing and home furnishings more durable and functional, we make Knick Meyer's legendary warmth and cool, glamorous and powerful better fitting and longer lasting. For over 100 years, Knick Meyer has been turning to the materials that make our homes, workplaces and personalities shine. American textiles make with experience a uniquely fashionable.

NCTO 006

