SAFER MADE: INVESTING IN SAFER CHEMISTRY AND CONSUMER PRODUCTS

Marty Mulvihiill, Ph.D
Safer Made is a new venture fund investing in companies and technologies that create safer alternatives for people and the natural world. The companies we invest in remove or reduce the use of harmful chemicals in products and manufacturing processes. The results are healthy people, clean waters, and nourishing soils. We harness our network of brand manufacturers that lead their sectors in safer chemistry to invest in the solutions that address their challenges.

People’s concern about their families’ chemical exposure translates into multi-billion dollar demand for safer products.
Safer Made is a new venture fund investing in companies and technologies that create safer alternatives for people and the natural world. The companies we invest in remove or reduce the use of harmful chemicals in products and manufacturing processes. The results are healthy people, clean waters, and nourishing soils. Safer product solutions already exist and need attention and capital to get to market.
Safer Made is a new venture fund investing in companies and technologies that create safer alternatives for people and the natural world.

We invest in companies that remove or reduce the use of harmful chemicals in products and manufacturing processes. The results are healthier people, cleaner waters, and more nourishing soils.
BRANDS BUILT ON SAFETY AND SUSTAINABILITY ATTRIBUTES

- Patagonia
  - Revenue $600 million (2013)

- Method
  - Acquired by SC Johnson (2017)

- Seventh Generation
  - Acquired by Unilever for $700 million (2016)

- Schmidt’s
  - Schmidt’s Acquired by Unilever (2018)
  - Revenue $170 million, valued at $1.7 billion (2014)

- Burt’s Bees
  - Acquired by Clorox for $925 million (2007)

- Native
  - Acquired by P&G for $100 million (2017)

The rapid growth in revenue and valuations of brands that focus on safety:

• Confirms that safety drives competitive advantage
• Puts pressure on existing brands to adopt safer chemistry
WORKING TOGETHER TO IMPROVE CONSUMER PRODUCTS

Innovation Landscape

Incumbent Business

Advocacy/Government

Startups

Finance

SAFER MADE
HARMFUL CHEMICALS PROVIDE FUNCTION AND PERFORMANCE

Beauty and Cosmetics
Cleaning
Apparel
Building Materials
Food Contact Packaging
## INNOVATION OPPORTUNITIES

<table>
<thead>
<tr>
<th>Safer Chemistry Need Addressed</th>
<th>Relevant Market</th>
<th>Market Size ($ Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Formaldehyde-free, non-iron textiles</td>
<td>Textile Finishing</td>
<td>19,600**</td>
</tr>
<tr>
<td>• Non-fluorinated water and oil-resistant compounds for textiles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Safe and effective preservatives</td>
<td>Preservatives</td>
<td>3,300*</td>
</tr>
<tr>
<td>• Safe and selective herbicides, insecticides, and fungicides</td>
<td>Pesticides</td>
<td>47,400*</td>
</tr>
<tr>
<td>• Safe food contact packaging</td>
<td>Styrene</td>
<td>6,300</td>
</tr>
<tr>
<td>• Testing / formulation / design hardware and software tools</td>
<td>Testing, Information Tools</td>
<td>NA.</td>
</tr>
<tr>
<td>• Safe dyes and colorants</td>
<td>Dyes</td>
<td>10,600*</td>
</tr>
<tr>
<td>• Safe adhesives and epoxy composites</td>
<td>Adhesives</td>
<td>12,200*</td>
</tr>
<tr>
<td>• Dry cleaning without harmful chemicals</td>
<td>Dry Cleaning</td>
<td>9,300*</td>
</tr>
<tr>
<td>• Lubricants without VOCs, PFCs, or aromatic hydrocarbons</td>
<td>Lubricants</td>
<td>24,000*</td>
</tr>
<tr>
<td>• Isocyanate-free foams</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Flame- and heat-resistant plastics without flame retardants, antimony, or phthalates</td>
<td>Urethane Foams</td>
<td>10,800*</td>
</tr>
</tbody>
</table>

* Source: IBIS World Manufacturing Sector Reports (US Revenue 2014)
** Source: IBIS World Manufacturing Sector Reports (Global Revenue 2014)
Look for ways to eliminate the need for
the functions

Look for alternative ways to
deliver the same functions

Look for chemical substitutes

CREATE A RESEARCH AND INNOVATION AGENDA

Textile and Apparel Innovation Agenda
Safer Made is a new venture fund investing in companies and technologies that create safer alternatives for people and the natural world. The companies we invest in remove or reduce the use of harmful chemicals in products and manufacturing processes. The results are healthy people, clean waters, and nourishing soils. We harness our network of brand manufacturers that lead their sectors in safer chemistry to invest in the solutions that address their challenges.

About 8,000 chemicals are used in the manufacturing of the 400 billion square meters of fabric sold globally every year. It takes 700 gallons of water to produce every tee-shirt. In 2016 global textile production exceeded 62 million tons, the equivalent of roughly 300 billion tee-shirts.
CAREFUL WHAT YOU LEAVE BEHIND

Tell outdoor brands to stop using hazardous chemicals and detox now.

- Awareness and Transparency
- Restricted substance lists
- Preferred substances and chemical screening
- Product and brand redesign
**STEP 1**
YARN
Oils to reduce friction

**STEP 2**
FABRIC PRODUCTION
Sizing chemicals, lubricants, solvents such as benzene adhesives, and binders

**STEP 3**
PRE-TREATMENT
Surfactants such as alkylphenol ethoxylates, solvents, bases for cleaning fabric, bleaches to prepare for dyeing

**STEP 4**
DYEING & PRINTING
Heavy metal fixes agents and dyestuffs, polymers and plasticizers for printing, detergents

**STEP 5**
FINISHING
Softening using ammonium compounds, silicones, polyurethanes; crease resistance using a formaldehyde-based resin; water and stain resistance using fluoro carbons
CHEMICAL CLASSES OF CONCERN FOUND IN THE TEXTILE INDUSTRY

Amines are as building blocks for dyes, polymers and surfactants (quaternary ammonia compounds). Amines are often contaminants or released during the breakdown of materials.

Dyes and residuals include some dyes that are harmful and should be avoided. Among the more harmful are aryl amine releasers (azo and benzidine dyes) and sensitizing disperse dyes.

Halogenated chemicals are used as preservatives, solvents, flame retardants, and durable water repellent finishes and membranes.

Heavy metals are used in dyes and as catalysts or formulation aids in resins and synthetic fibers. Many of the most dangerous heavy metals like lead and cadmium are regulated, while others like organotin compounds can be found in a wide variety of formulations.

Monomers are the building blocks of synthetic fibers and resins. They must be reactive to perform their function.

Solvents are widely used to transfer chemistry onto fabric and/or remove residuals. Solvents and process aids are used in large quantities and often affect workers. Some solvents fulfill specific functions, such as DMF used in foaming polyurethane, while others are used for many applications, such as the aromatic solvents used for cleaning or dispersion of dyes.
Safer Chemistry Innovation in the Textile and Apparel Industry

JUNE 2018

https://www.safermade.net/textile-report
# Textile Sector Innovation Challenges

<table>
<thead>
<tr>
<th>New Materials</th>
<th>New Safer Chemistries</th>
<th>Waterless Processing</th>
<th>Fiber Recycling</th>
<th>Supply Chain Information Management Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synthetic Fibers</td>
<td>Safer Finishing Chemistries</td>
<td>Waterless Dyeing Processes</td>
<td>Cotton</td>
<td>Chemicals Management Information Systems</td>
</tr>
<tr>
<td>Cellulosic Fibers</td>
<td>Bio Based Dyes</td>
<td>Waterless Finishing Processes</td>
<td>Polyester</td>
<td></td>
</tr>
<tr>
<td>Leather Alternatives</td>
<td></td>
<td></td>
<td>Blends</td>
<td>Traceability Systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nylon</td>
<td></td>
</tr>
</tbody>
</table>
STARTUPS ARE WILLING TO GO WHERE INCUMBENTS AREN’T
# NEW MATERIALS CAN MEAN SAFER CHEMISTRY: LEATHER

<table>
<thead>
<tr>
<th>Chemicals</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorinated aromatics</td>
<td>Solvent</td>
</tr>
<tr>
<td>Pentachlorophenol</td>
<td>Perservative</td>
</tr>
<tr>
<td>Chromium</td>
<td>Tanning agent</td>
</tr>
<tr>
<td>Chlorinated Paraffin</td>
<td>Softener</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>Contaminant in Tanning and Dyeing</td>
</tr>
<tr>
<td>Sodium Sulfide</td>
<td>Tanning agent</td>
</tr>
<tr>
<td>Acrylic and Isocyanate monomers</td>
<td>Cross-linkers and finishing agents</td>
</tr>
</tbody>
</table>
NEW MATERIALS CAN MEAN SAFER CHEMISTRY: LEATHER

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>TECHNOLOGY/SOURCE MATERIAL</th>
<th>WEBSITE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amadou</td>
<td>Mushroom</td>
<td>amadouleather.com</td>
</tr>
<tr>
<td>Atlantic Leather</td>
<td>Fish</td>
<td>atlanticleather.is</td>
</tr>
<tr>
<td>bleed clothing GmbH</td>
<td>Cork</td>
<td>bleed-clothing.com/english</td>
</tr>
<tr>
<td>E-Leather</td>
<td>Recycled leather fibers with synthetic fiber support</td>
<td>eleathergroup.com</td>
</tr>
<tr>
<td>Ecovative / Bolt Threads</td>
<td>Mushroom</td>
<td>ecovative.design.com</td>
</tr>
<tr>
<td>Fruitleather</td>
<td>Fruit waste</td>
<td>fruitleather.nl</td>
</tr>
<tr>
<td>Geltor</td>
<td>Bio-fabricated leather made from fermentation produced collagen</td>
<td>geltor.com</td>
</tr>
<tr>
<td>Modern Meadow</td>
<td>Bio-fabricated leather made from fermentation produced collagen</td>
<td>modernmeadow.com</td>
</tr>
<tr>
<td>MycoWorks</td>
<td>Fungal mycelium</td>
<td>mycoworks.com</td>
</tr>
<tr>
<td>Noani</td>
<td>Eucalyptus fiber</td>
<td>noanifashion.de/en</td>
</tr>
<tr>
<td>Okinawa</td>
<td>Plant and wood</td>
<td>okinawa.it</td>
</tr>
<tr>
<td>Pinatex</td>
<td>Pineapple leaf</td>
<td>ananas-anan.com</td>
</tr>
<tr>
<td>Provenance</td>
<td>Bio-fabricated leather made from fermentation-produced collagen</td>
<td>provenance.bio/technology</td>
</tr>
<tr>
<td>Thamon</td>
<td>Sal leaf</td>
<td>thamon.co.uk</td>
</tr>
<tr>
<td>Vegea</td>
<td>Grape waste</td>
<td>vegea.company.com/en</td>
</tr>
</tbody>
</table>
## FABRIC DYEING AND FINISHING WITHOUT WATER

<table>
<thead>
<tr>
<th>COMPANY NAME</th>
<th>PRODUCT/TECHNOLOGY</th>
<th>TEXTILE PROCESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>APJet</td>
<td>Atmospherically stable plasma for chemical deposition</td>
<td>Fabric finishing</td>
</tr>
<tr>
<td>Applied Separations</td>
<td>Super critical CO2 technology</td>
<td>Dyeing</td>
</tr>
<tr>
<td>ColorZen</td>
<td>Efficient and safe cationization of cotton</td>
<td>Dyeing</td>
</tr>
<tr>
<td>DyeCoo</td>
<td>Super critical CO2 for dyeing synthetics</td>
<td>Dyeing</td>
</tr>
<tr>
<td>eDye</td>
<td>Dope dyeing of polyester</td>
<td>Dyeing</td>
</tr>
<tr>
<td>Green Theme International</td>
<td>Waterless chemistry platform providing high performance durable water repellency</td>
<td>Finishing/dyeing</td>
</tr>
<tr>
<td>MTI-X</td>
<td>Plasma processing for textile dyeing and finishing</td>
<td>Finishing/dyeing</td>
</tr>
<tr>
<td>SpinDye</td>
<td>Dope dyeing processes using recycled polyester</td>
<td>Dyeing</td>
</tr>
<tr>
<td>Xeros</td>
<td>Polymer bead-based cleaning system that eliminates water use and microfiber pollution in commercial laundry</td>
<td>Finishing/dyeing</td>
</tr>
</tbody>
</table>
## Textile Recycling Types

### Mechanical Methods Use Physics
- **Process:**
  - Downcycling
  - High Value Recycling

- **Input Fiber:**
  - Plant Based
  - Animal Based
  - Oil Based

- **# of Fibers:**
  - Single Fiber
  - Two Fiber
  - Multi Fiber

- **Output:**
  - Non-Wovens
  - Needles

### Chemical Methods Use Chemistry
- **Process:**
  - High Value Recycling

- **Input Fiber:**
  - Plant Based
  - Oil Based

- **# of Fibers:**
  - Single Fiber
  - Two Fiber

**Source:** Revolve Waste 2017, Traci Kinden, [http://revolvewaste.com/](http://revolvewaste.com/)
ADOPTION RELIES ON PARTNERSHIP WITH TEXTILE INDUSTRY
<table>
<thead>
<tr>
<th>COMPANY</th>
<th>ACCELERATORS, INCUBATORS AND INVESTMENT FUNDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alante Capital</td>
<td>Venture capital fund focused on sustainable apparel.</td>
</tr>
<tr>
<td>Eureka Innovation Lab</td>
<td>Levi Strauss’ testing and development facility that pilots sustainable technologies and supports entrepreneurs through their Collaboratory program.</td>
</tr>
<tr>
<td>Fashion for Good</td>
<td>Fashion for Good convenes brands, producers, retailers, suppliers, non-profit organizations, innovators and funders in a global platform for innovation.</td>
</tr>
<tr>
<td>Future Tech Labs</td>
<td>Fashion innovation platform with staff in Russia, Europe and the U.S.</td>
</tr>
<tr>
<td>Green Chemistry and Commerce Council</td>
<td>Nonprofit organization that drives the commercial adoption of green chemistry across different industries.</td>
</tr>
<tr>
<td>Hydra Ventures</td>
<td>The corporate venturing arm of Adidas supporting technology that can improve product performance, customer experience and sustainability for Adidas products.</td>
</tr>
<tr>
<td>New York Fashion Tech Labs</td>
<td>Nonprofit program co-founded by Springboard Enterprises and fashion retailers to support women-led companies that have developed innovations at the intersection of fashion, retail and technology.</td>
</tr>
<tr>
<td>Safer Made</td>
<td>Venture capital fund that invests in teams that bring safer products and technologies to market (and the authors of this report).</td>
</tr>
<tr>
<td>The H&amp;M Global Challenge Award</td>
<td>Accelerator program to promote circular innovation in the textile and apparel sector.</td>
</tr>
<tr>
<td>Tin Shed Ventures</td>
<td>Patagonia’s investment arm supporting companies and projects that improve the environmental performance in the outdoor apparel and equipment space.</td>
</tr>
</tbody>
</table>
FINANCE: PROVIDE MONEY TODAY TO BUILD THE BUSINESSES OF THE FUTURE
A SPECTRUM OF BUSINESSES AND INVESTMENT OPPORTUNITIES

TRADITIONAL CHARITY
- Purely charitable funding from grants, donations or endowment
- Additional market-based revenue stream

SOCIAL ENTERPRISES
- Potentially self-sustaining >75% market revenues
- Social Business: Profits are reinvested
- Mission-driven for-profit enterprise ("B-Corp")

TRADITIONAL BUSINESS
- CSR & corporate philanthropy (target for SRI)
- Pure profit orientation; mainstream investors

Not-for-profit | for-profit

Source: Adapted from J. Kingston Venturesome, CAF Venturesome, and EVPA.
THE VENTURE CAPITAL PROCESS

Source
- Extensive Deal Sourcing
  - 200-400 Companies / Yr

Learn
- Initial Screening & Elimination
  - 40-80 Companies / Yr (20%)
- Preliminary Due Diligence
  - Go (50%, 20-40) / No Go (50%, 20-40)
- 2nd Level Due Diligence
  - Investment Committee: Go (50%, 10-20) / No Go (50%, 10-20)
- Final Due Diligence
  - Investment Committee: Go (50%, 5-10 Companies / Yr)

Invest
- Term-Sheet & Investment Execution
  - 5-10 Investments / Yr (1-3%)

Exit
- Monitor, Support, Follow-Ons
  - Reporting & Oversight
- Exit Management
  - Focus on Winners, Not Losers

Sign NDA if needed
OUR INVESTMENTS

- **ecologic**
  - Packaging the earth can live with
  - Sustainable packaging

- **Mimikai**
  - Insect Repellent
  - Effective and safe alternative to DEET
Our Team

Adrian Horotan is an experienced early stage investor.

Marty Mulvihill is a well respected green chemistry expert.

Investors
Safer Made’s investors include 27 foundations, family offices, individuals and one corporate investor.

Terms & Details

$20-$30M
Target Fund Size

10-15
Target Number of Portfolio Companies

FEB 2017
Initial Close