



REQUEST#GC9390116 Nike Material Recovery Challenge

QUESTIONS? Visit us at:

<https://nikeinnovationchallenge.com/recovery>

Call-To-Action

Develop new technologies to help transform retired footwear into pure material streams for recycling.

Overview

Nike has been leading the industry in athletic footwear recycling for nearly three decades. Through this challenge, Nike is calling on innovators around the world to help us invent the next generation of footwear recycling technology.

Timeline

Phase 1: Propose your solution

Proposal submissions are due by May 1, 2018 at 5pm EDT.

Phase 2: Prove your solution

Up to 5 submissions will be selected as finalists and will be invited to demonstrate proofs of concept for their proposed solutions. Finalists will each receive a \$10,000 development grant and may be provided with material samples.

Opportunity

Finalists will compete for \$50,000.

The winning solution and all promising proposals will be considered for implementation by Nike.



CHALLENGE DESCRIPTION

Nike is seeking innovations that substantially advance the physical footwear recycling process. Solutions should complement or replace existing process steps (detailed below) to recover purer material outputs than are currently achievable. Promising solutions will be considered for a Nike footwear recovery site.

BACKGROUND

We live in a time of relentless change and unlimited opportunity.

Nike believes the science is right, climate change is real, and we must take action now to power and protect the future of sport. This will require that the world radically redesign industrial systems and economies. It is not enough to adapt to what the future may bring, but that the future we want must be created through sustainable innovation.

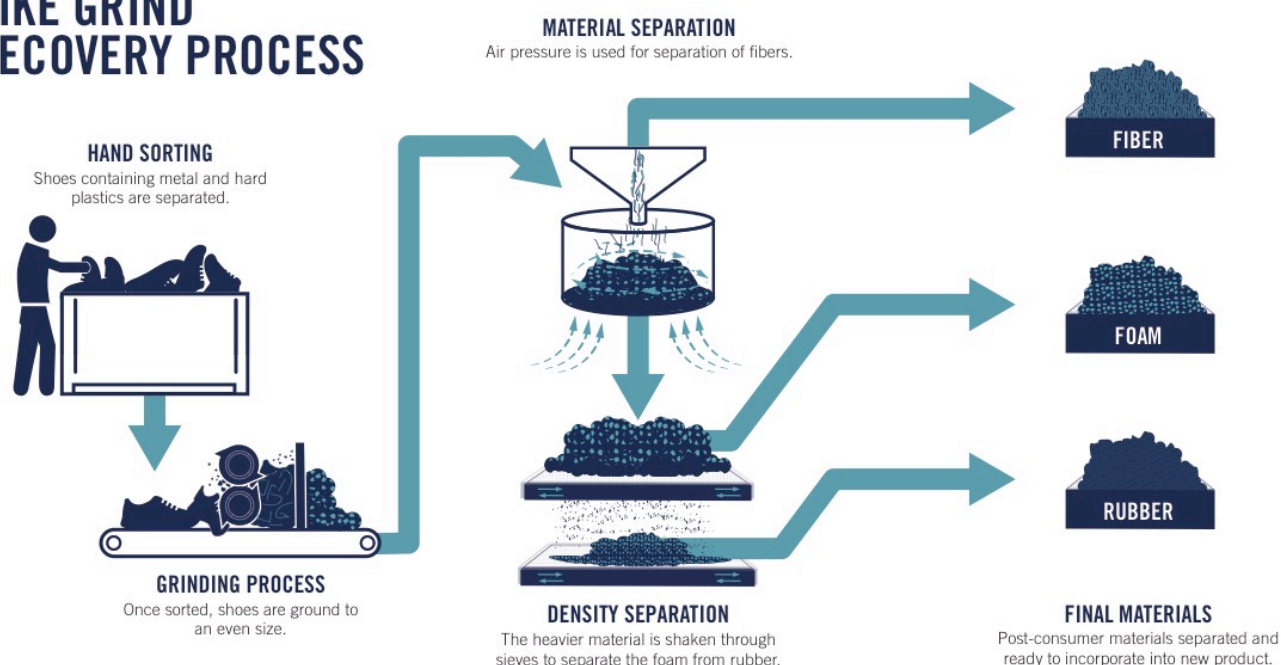


The future demands a transition to a circular economy – a world in which materials can be used and reused at their highest potential. Nike is pushing the boundaries of the circular economy by transforming waste into value streams.

Nike Grind is a palette of premium recycled materials recovered from used footwear and manufacturing scrap. Since 1990 Nike's Reuse-a-Shoe program has collected and recycled more than 30 million pairs of used shoes – including non-Nike footwear. And to date, Nike Grind materials have been incorporated into more than 1 billion square feet of sport surfaces, such as running tracks, athletic fields, gym floors, and playgrounds.

For more information on sustainable innovation at Nike, visit <https://about.nike.com/sustainability>

NIKE GRIND RECOVERY PROCESS



FOOTWEAR RECYCLING TODAY

Nike employs a state-of-the-art recycling process for recovering useful material from retired footwear. As in all recycling processes, a key barrier to capturing even more value from waste is the difficulty in separating mixed-material product components into streams of pure material types.

Athletic footwear typically consists of **three main components**: an **upper**, made of natural and synthetic fiber materials, such as polyester, leather, synthetic leather, and cotton; a **midsole**, which is usually made of ethylene-vinyl acetate (EVA) or polyurethane foams; and an **outsole**, which is usually made of synthetic rubber.

Footwear components are typically bonded together with a combination of stitching and cured adhesives. Component material densities generally range between 0.16 SG (airy foam) up to 1.4-1.6 SG (rubber sole). Other footwear components may also include hard plastics in cleats or metal eyelets – metals can be especially troublesome for mechanical recycling equipment that has been designed to handle softer footwear materials.

Shoes are fed into the system as an assorted mixture of various footwear types (at least 5,000 distinct types), and each batch of shoes may also incorporate a wide palette of colors.



Current footwear recycling systems employ multi-step processes to separate and sort constituent materials. As illustrated above, these steps can include hand sorting (to separate footwear with metal or hard plastic cleats), grinding the materials into smaller bits (granules), and separating granules by air and density in cyclonic separators and other mechanical means, such as a shaker table sieve and screen.

Today's recycling processes produce separated and sorted material outputs: rubber, foam, and thermoplastics that typically achieve around 85% purity. Recovered textile fibers are typically around 60% pure.

Pure material recovery is limited by the technology's ability to perfectly separate the different footwear materials from one another. Specifically, the existing recycling technology is limited by challenges such as dissimilar materials that have similar densities, bonded interfaces of dissimilar materials that survive the grinding process, and sinuous textile fibers that entrap rubber and foam particulates.

The goal of this challenge is to uncover new innovations that can aid in the recovery of more pure material outputs from existing footwear recycling facilities.

ABOUT THIS CHALLENGE

Challenge participants will compete for a \$50,000 cash award, and the possibility to collaborate with Nike to develop and implement new solutions for footwear recycling.

Phase 1 (February 27 – May 1, 2018): Participants must complete and submit the online submission form by May 1, 2018 at 5pm EDT. All submissions should include evidence to support how the proposed solution addresses the challenge outlined in this document.

Phase 2 (May – July 2018): Up to 5 finalists will be selected in May, and invited to submit further demonstration of their proposed solution. To aid in the creation of a proof of concept, semifinalists will each receive a development grant of \$10,000. Upon request, finalists may also be provided material samples. Each will have until early July 2018 to submit a proof of concept.

Grand prize (August 2018): The winning innovation will be selected and announced around August 2018, and will receive a \$50,000 cash award.

All promising solutions will be considered by Nike for further development and implementation.

SUCCESS CRITERIA

Successful solutions will:

- Represent a significant advance in the field of footwear recycling
- Help evolve existing recycling processes to reliably and efficiently recover more pure material outputs from a variety of footwear input types
- Produce a tangible proof of concept
- Demonstrate an achievable path to commercial readiness

POSSIBLE APPROACHES

Possible approaches might include, but are not limited to:

- Solutions that cleanly separate footwear into its major components (e.g., uppers, midsoles, and outsoles)
- Solutions that can rapidly identify and recover specific materials from granulated mixed material streams
- Material recovery solutions from other industries that can be shown to advance the clean recovery of footwear material
- Novel separation methods such as the use of acoustics, electrostatics, sensing and vision capabilities, and robotics
- Methods that can improve process flow challenges such as material 'bridging' and agglomeration due to static electricity, adhesion of components, significant fiber and textile fraction, etc.



- Solutions for handling challenging materials such as metal, sharp plastics, and textiles

APPROACHES NOT OF INTEREST

The following types of approaches are not of interest to this Challenge:

- New footwear design considerations
- Approaches that are not compatible with sustainability principles
- Approaches that are impractically slow, labor dependent, or energy intensive

APPROPRIATE RESPONSES TO THIS CHALLENGE

Appropriate responses will address the following:

- Clear description of the proposed approach
- Experience of the team submitting the proposal; discussion of related work
- Technical maturity of the approach and path to a fully implementable solution
- Evidence in support of solutions' performance claims
- Availability of samples, prototypes, or demonstration of proposed technology
- Inspiration behind proposed solution

SUBMITTING A RESPONSE

All proposals must be submitted online at <https://nikeinnovationchallenge.com/recovery>.

Responses from individuals, teams, and companies (small to large) are welcome.

For assistance, please contact the Solution Provider Help Desk (grandchallenge@ninesigma.com).

RESPONDING TO THIS CHALLENGE

By submitting a response, respondents acknowledge and agree to Nike's Material Recovery Challenge [Official Rules](#) and all of the following submission requirements:

Confidentiality

Respondents confirm and represent that their submissions do not contain any confidential information. Your entry will not be treated as confidential.

Selection/Review Process

Respondents acknowledge that Nike reserves the sole and absolute right and discretion to award prizes as stated in the challenge.

See [Official Rules](#) for details. No purchase necessary. Void where prohibited.