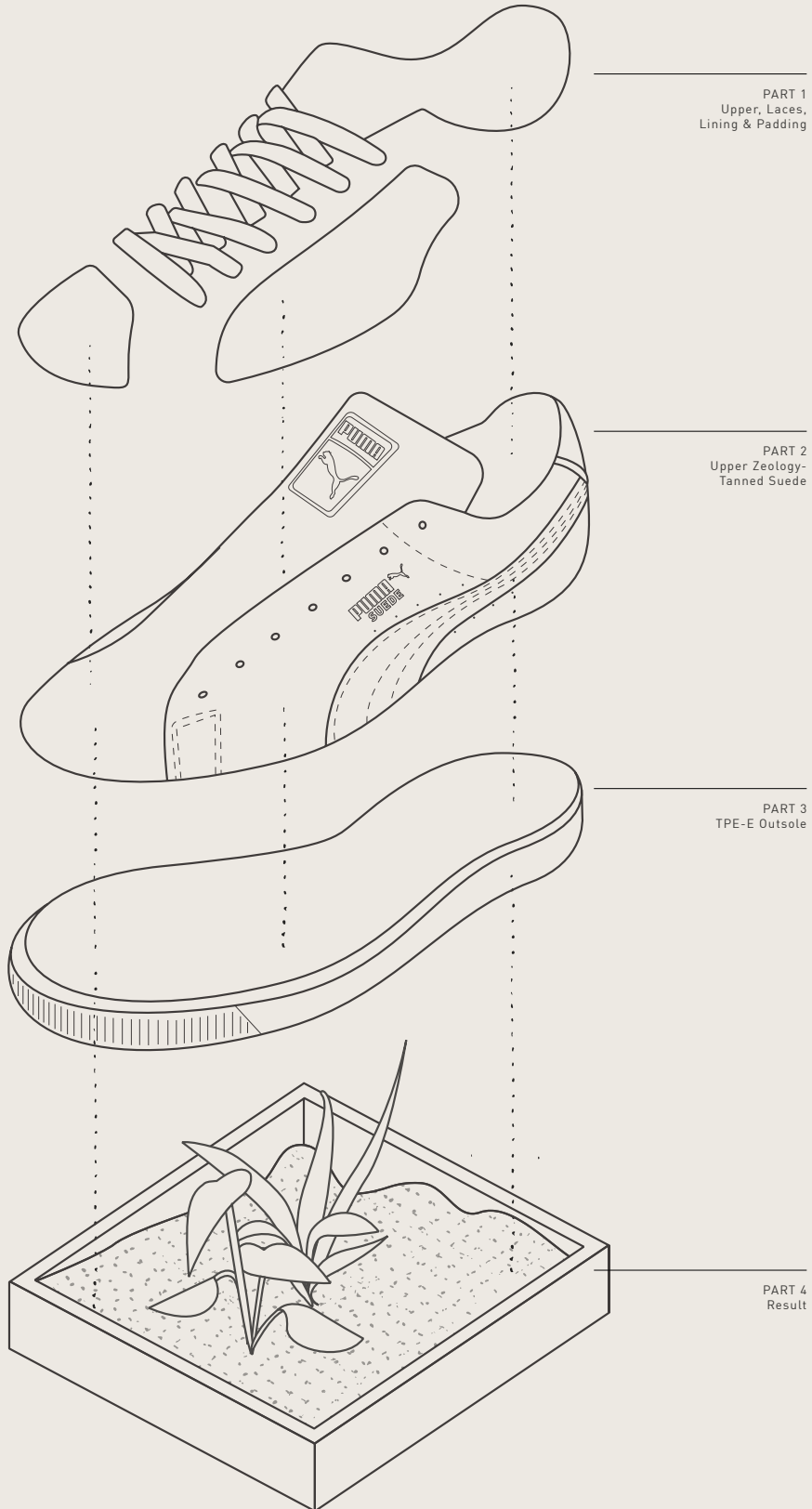


THE PUMA RE:SUEDE

AN EXPERIMENT
IN CIRCULARITY

2021 — 2023



FOREVER
BETTER.

RE:SUEDE:
THE HANDBOOK

WHAT'S INSIDE

LET'S KICK THINGS OFF	A MESSAGE FROM ANNE-LAURE DESCOURS	03
THE RE:SUEDE ORIGIN STORY	REWIND: THE BACKSTORY	07
	RE:SUEDE: AN EXPERIMENT	08
THE PROCESS	REDESIGNING AN ICON	10
	HOW THE RE:SUEDE PILOT WORKED	11
	THE SEARCH FOR A COMPOSTING PARTNER	12
	WHAT IS TUNNEL COMPOSTING?	13
	HOW WEARABLE WAS THE RE:SUEDE?	14
	TURNING OUR RE:SUEDES INTO COMPOST	16
THE RESULTS ARE IN	RE:SUEDE CONCLUSION: WHAT WE'VE DISCOVERED	18
	RE:SUEDE CONCLUSION: WHERE WE'VE LANDED	19



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LET'S



KICK

THINGS

OFF



01



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A MESSAGE FROM ANNE-LAURE DESCOURS



Dear readers,

When we first introduced our 10FOR25 sustainability targets, we made circularity one of our focus areas. We quickly realized that developing the future of circularity at PUMA would require many different departments to work together, which is why in 2021 we started “Circular Lab”, an innovation hub, which is led by our innovation and design experts.

The first project to come out of “Circular Lab” was RE:SUEDE, a trial for a shoe that can turn into compost, and I’m proud to present the results in this report.

The answers that RE:SUEDE provided are crucial as we all should be working towards a future in which we care about and take responsibility for the afterlife of products. However, these and other sustainability challenges cannot be solved by one company alone, but they require an industry-wide approach. That is why it was especially important to us to share the details of our findings with others and be as transparent as possible.

RE:SUEDE was a first important step in shaping our circular future. We will take the learnings from this pilot project and assess how we can scale up this approach to circularity in the future.

Imagining a circular future takes determination and courage and I want to thank our recycling partners Ortessa, who looked beyond their day-to-day business to work on this experiment with us.

There’s only one forever, let’s make it better.

Anne-Laure Descours

ANNE-LAURE DESCOURS
Chief Sourcing Officer
PUMA

WHY WE MADE THIS HANDBOOK



On the track we're competitive, but when it comes to the planet we play as a team. We believe that being open and transparent about our efforts and actions – with our consumers, partners, and peers – is the only way we'll see results.

That's why we made this report. It's a transparent look at RE:SUEDE, an experiment in circularity, named after PUMA's iconic Suede shoe.

It explains everything from what we did and how, and all the lessons we learned along the way.

More than anything, this handbook is a call to action. We're sharing it in the hope that it will spark more research, dialogue, and collaboration across the industry. Please read it, share it, and build it into your own work to redesign the future of fashion.

**THERE'S ONLY ONE FOREVER.
LET'S MAKE IT BETTER.**



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LET'S KICK
THINGS OFF

THE RE:SUEDE ORIGIN STORY



02



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THE HANDBOOK

REWIND: THE BACK STORY



Before we jump into the RE:SUEDE experiment, let's take a look at where it came from. We've been working on the fashion industry's waste problem for some time. In fact, in 2012, we launched InCycle: a closed-loop collection which included a shoe which was designed for composting. Unfortunately, the infrastructure wasn't quite there, and neither was the demand, so it never took off. But we never lost sight of that dream.

In the years since InCycle, our innovation department worked hard to address the technological limitations of previous collections to apply such learnings to the RE:SUEDE experiment. It was also during this time that we noticed a positive shift in consumer behaviours. Conversations around circularity were gaining momentum, and consumer desires for better fashion choices were growing.

In 2021, PUMA's Circular Lab launched – our platform to speak out and learn about circularity together with our customers. The platform provided a perfect opportunity for the RE:SUEDE experiment to develop.

Almost a decade later, we picked up where we left off. And in 2021, RE:SUEDE was born.

“The fashion industry produces over 100 billion garments a year – 87% of these will end up in a landfill”

Earthday.org

RE:SUEDE: AN EXPERIMENT

RE:SUEDE is more than just a shoe: it's an experiment in circularity. Through this experiment, we set out to find answers to some important questions:

01

Could we make a shoe designed for composting that people would want to wear?



02

Would people go to the effort of returning their shoes after they'd been worn?

03

Would we be able to successfully turn the shoe into compost after it had been worn?



04

If the experiment were a success, how feasible would it be to scale up?



EXPLORE THE PROCESS



03



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THE HANDBOOK

REDESIGNING AN ICON

Knowing the demand was there, our first real challenge was to make a shoe that people would want to wear. Stylish and comfortable: no compromises. What better candidate for a future-facing update than our original footwear legend, the Suede.

The Suede hit the scene in 1968 and has been changing the game ever since. The RE:SUEDE reimagines this icon, from the upper to the sole, lining and laces: every element has been designed with the goal to decompose it.

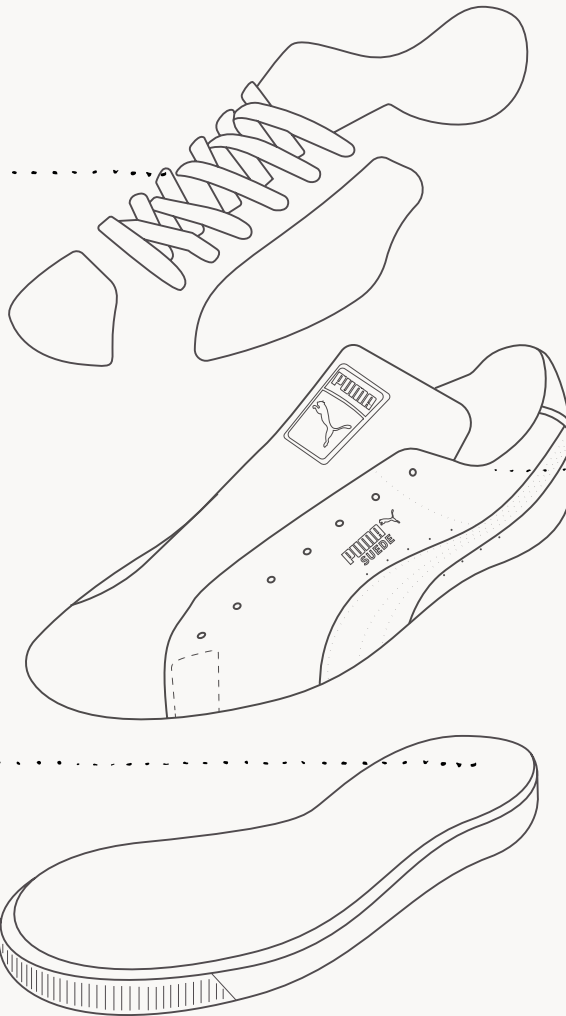
The RE:SUEDE materials were carefully chosen for their comfort and potential to decompose.



Padding, sockliner filler and laces are made of **Hemp** (bast fibre). Lining and sockliner cover comprise of **55% Hemp** and **45% Cotton**



The outsole is made to ensure optimal wear. It is made of **TPE-E** (thermoplastic elastomers)



The upper is made with **Zeology Suede** - a material that is made using an improved tanning process and that ensures better comfort for the wearer*

* when compared to other materials tested at PUMA



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EXPLORE
THE PROCESS

HOW THE RE:SUEDE PILOT WORKED

2021

AUTUMN



The first RE:SUEDE sneaker is made.

2022

JANUARY



We put a call out to PUMA fans in Germany to join the experiment.

MAY



We sent all 500 participants a pair of RE:SUEDES.

FEBRUARY



Over 2,000 answered our call. 500 were selected to take part.

MAY-OCT



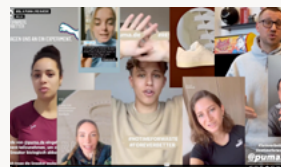
They wore them to walk, dance and skateboard.

OCTOBER



Participants returned the shoes using the free returns label in the original shoebox.

OCTOBER



The participants completed a survey so we could understand their experience.

2023

MARCH - JUNE



We took 412 shoes returned from the participants to our composting partners to put through their industrial composting process in a special procedure established for this experiment.

SEPTEMBER



We compiled the results into the report you're reading now.

THE SEARCH FOR A COMPOSTING PARTNER

Whilst developing the shoe, we began the search for an industrial composting partner who shared our vision for the experiment. Let us introduce you to the boldest composters in the business.

ORTESSA B.V.

Based in the Netherlands, Ortesa is a family business that takes a different approach to waste: they see it as an opportunity to innovate. For RE:SUEDE, we worked specifically with Ortesa's Valor Composting Facility, the first in the world to use tunnel composting to process organic waste.

Each year, the Valor Composting Facility generates 47,000 tons of Grade A² compost from vegetable, garden and fruit waste. Our ambition was to get to this output with the RE:SUEDE.

“There is a lot more we can all be doing to tackle waste management, but taking on that challenge alone can be a difficult task for any brand.”

²**Grade A compost** (the highest certification from Keurcompost in the Netherlands) can be used in agriculture and horticulture.

Find out more
<https://keurcompost.nl/beoordelingsrichtlijn/>

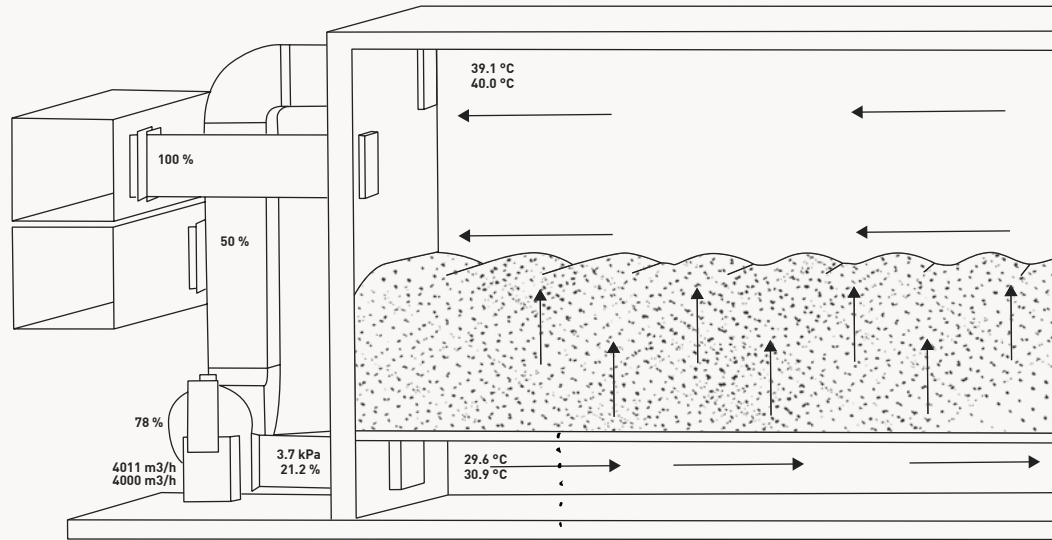


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WHAT IS TUNNEL COMPOSTING?

Tunnel 1 Fase 4.1 Conditioneren
Fasetijd: 04 + 13:08
Startdatum: 7 dec 2010 11:41



In short, it's an industrial composting process that takes place in a large tunnel, around 150m2.

Organic waste is shredded and treated with bacteria, then left to biodegrade in the tunnel.

Inside the tunnels, the temperature, humidity, and oxygen levels are carefully controlled to create the perfect conditions for bacteria to break down organic matter.

In Valor's usual composting processes, it takes around two weeks to turn regular organic matter into compost.

With our composting partners in place, and RE:SUEDEs landing on the soles of our 500 participants, the experiment was in full swing.



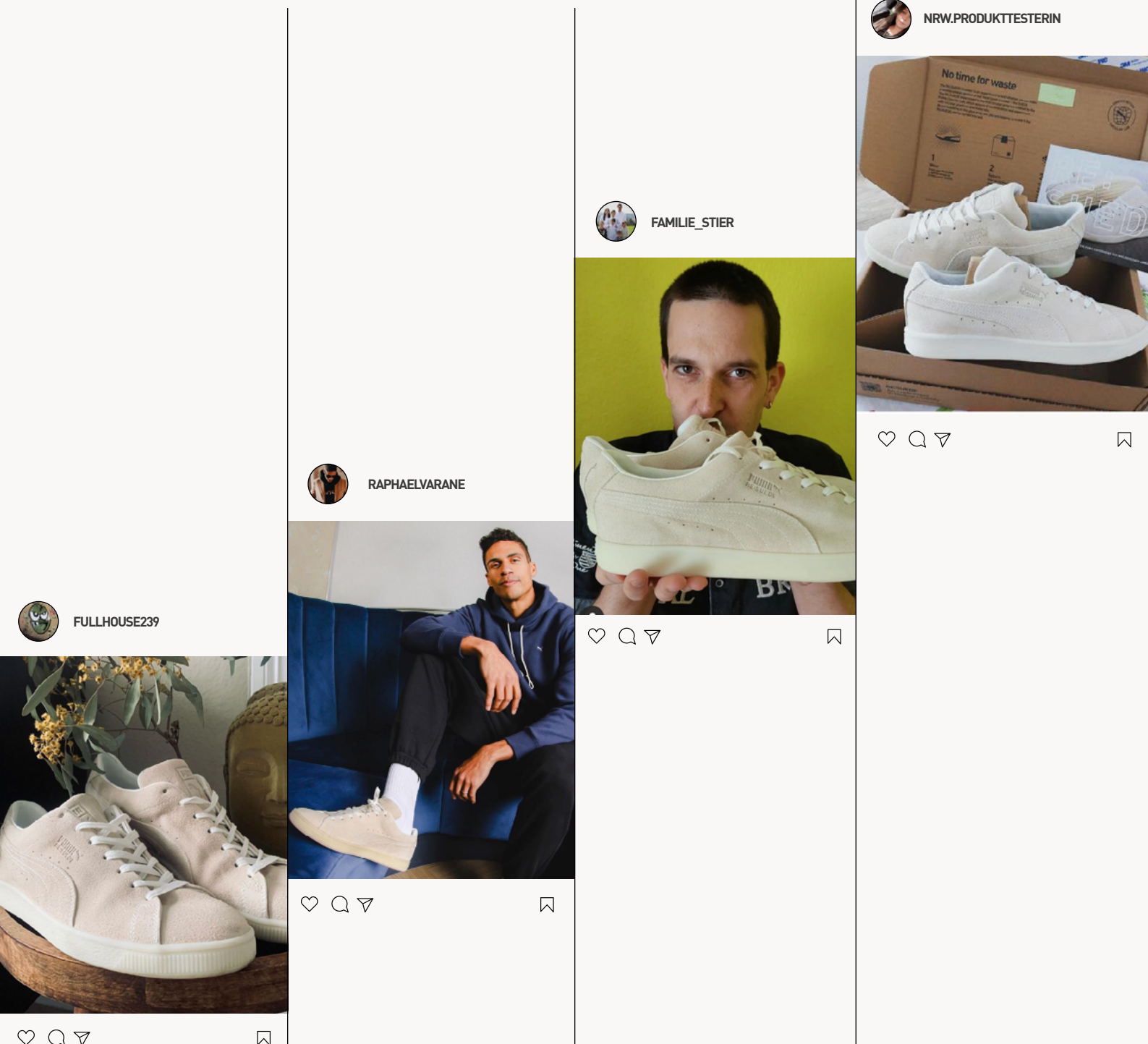
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HOW WEARABLE WAS THE RE:SUEDE?

Fast-forward six months and the shoes started to make their way back to us as part of the returns phase.

Whilst consolidating the returns, we checked in with participants to get their feedback on RE:SUEDE. After all, our first challenge was to make RE:SUEDE a comfortable shoe that people would want to wear.



HOW WEARABLE WAS THE RE:SUEDE?

Overall, people who took part in the experiment
enjoyed wearing their RE:SUEDEs:

88%

Wore their RE:SUEDEs
2-3 times per week for
everyday occasions

68%

Said they would
recommend the sneakers
to friends, family or
colleagues in the future

But we still have work to do to make the RE:SUEDE
as comfortable as the original:

57%

Found the RE:SUEDE
uncomfortable, with lack
of cushioning and fit given
as the top reasons

As a result of the feedback from our RE:SUEDE testers, we are improving the comfort of the shoes by enhancing the overall fit. The fit will be improved by using a new material pattern for the upper and sock liner.

Consumer feedback in tow, we delivered all returned RE:SUEDEs to Ortesa's Valor Composting Facility for the final stage of experiment.



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THE PROCESS

TURNING OUR RE:SUEDES INTO COMPOST

412 pairs of worn RE:SUEDEs were returned to PUMA from the consumer test. These shoes were sent to Valor Composting.

There, the shoes went through an industrial composting process. The RE:SUEDEs were shredded and mixed with other green household waste and placed into a composting tunnel.

They were then sprayed with leaching-water from earlier composting that contains nutrients and naturally heated due to the biological activity and controlled air circulation in the tunnel.

Every 10-14 days, depending on processing parameters, the contents of the tunnel were sieved to see how small the pieces of RE:SUEDE had become. According to our partner Ortesa:



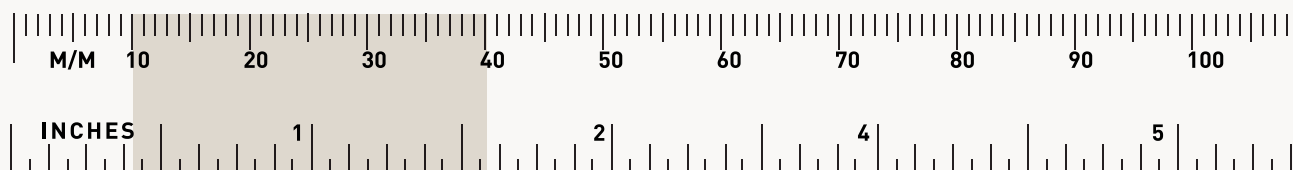
<10MM/40MM>

Material between 10mm and 40mm = compost starter mix (Remain in composting tunnel)



40MM>

Material over 40mm in size = too big to be considered compost or compost starter mix



10MM<

Material under 10mm = compost (Sold to market after certifying as Grade A compost)



THIS PROCESS WAS REPEATED UNTIL ALL THE RE:SUEDE MATERIALS WERE OBSERVED EITHER <10MM OR 10-40MM IN 2 CONSECUTIVE RUNS



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THE RESULTS ARE IN



04



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RE:SUEDE CONCLUSION: WHAT WE DISCOVERED



Ortessa found, from the 1st to 4th run, that there were remaining granules over 40mm in size.

.....

After the 5th run (approximately 2.5 months), the majority of the RE:SUEDEs had broken into pieces small enough for compost (<10mm) or compost starter mix (10-40mm).

.....

The results were re-confirmed in the 6th and 7th run (approximately 3.5 months).

.....

The compost (<10mm) measuring from the process was tested and confirmed as Grade A compost under the Netherland standard applicable to Ortessa.

.....

The certified compost (<10mm) has been sold on and is somewhere in the Dutch landscape right now.

.....

Meanwhile, pieces in 10-40mm size, mainly parts of the soles, became the compost starter mix and remained in the composting process until the parts further decompose <10mm size.

.....

According to Ortessa, the sole material showed clear evidence of bacterial decomposition, but needed more time to decompose in the composting facilities. The compost starter mix, containing the sole materials, remained in the tunnel, Ortessa estimated that it turned into compost (<10mm) within approximately 6 months.

RE:SUEDE CONCLUSION: WHERE WE'VE LANDED

RE:SUEDE has given us a lot to learn from, celebrate and build on. The experiment proved that there is an appetite for RE:SUEDE, and we can make sneakers that people want to wear. So far, so good.

We also discovered that it is possible to turn the RE:SUEDE into Grade A compost under specific industrial conditions provided by Ortessa. That's a huge win.

The soles slow the process down, resulting in more composting cycles required to turn the shoe into Grade A compost, meaning they can't be processed using today's standard industrial composting operating procedures. But with a new business model in composting, and a higher volume of input into it, those standard operating procedures can change.

There is a future for RE:SUEDE.
To get there, we need more scale.

And that's where you come in. Please help us create this scale by sharing this report and building the learnings into your own work to redesign the future of fashion.



**THIS ISN'T THE END OF THE RE:SUEDE.
THIS IS JUST THE BEGINNING.**

**THERE'S ONLY ONE FOREVER.
TOGETHER WE CAN MAKE IT BETTER.**

Find out more at
<https://about.puma.com/en/sustainability>



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THE HANDBOOK
