PRUSA RESEARCH

by JOSEF PRUSA

SUSTAINABILITY REPORT

2021/2022

This report describes the activities of four companies: Prusa Development a.s., Prusa Manufacturing a.s., Prusa Polymers a.s., and Prusa Research a.s. (hereafter referred to as Prusa Research only). The activities of Prusa Research that are not directly related to the development, manufacturing, and sale of 3D printers, filaments, and resins, are not the subject of this report.

HELLO, WE ARE PRUSA RESEARCH!

AND WE MAKE AMAZING 3D PRINTERS!

Prusa Research was founded as a one-man startup in 2012 by Josef Prusa, a Czech hobbyist, maker and inventor – and now one of the most known names in the 3D printing industry.

Josef found his passion for 3D printers as a student of the University of Economics in Prague. That was in 2009. Back then, he considered 3D printing to be nothing but a hobby, an amazing new technology open to changes and improvements. Josef then joined the open-source RepRap project and the rest is history.

Click the link below and see the milestones of our history – from the very beginning to reaching the top of the global charts!

LINK

2012
FOUNDING
PRUSA RESEARCH

10/2013
OUR FIRST
EMPLOYEE

06/2015
ORIGINAL PRUSA i3

05/2016
ORIGINAL
PRUSA i3 MK2

09/2017
ORIGINAL
PRUSA i3 MK3

09/2018
ORIGINAL PRUSA
SL1 A PRUSAMENT

10/2018
WE SHIP 1000 PACKAGES
PER DAY

10/2019
ORIGINAL PRUSA MINI

08/2019
NEW WORLD RECORD:
1 096 PRINTERS PRINTING
SIMULTANEOUSLY

05/2019
PRUSASLICER

09/2020
PRUSA EDUCATION

10/2021
PRUSA PRO AFS
INTRODUCED AT
EXPO 2020 IN DUBAI

03/2022
PRINTABLES.COM

03/2023
ORIGINAL PRUSA MK4

05/2022
PRUSA ACADEMY

PRUSA RESEARCH IN 2022

101 232
PRINTERS MANUFACTURED

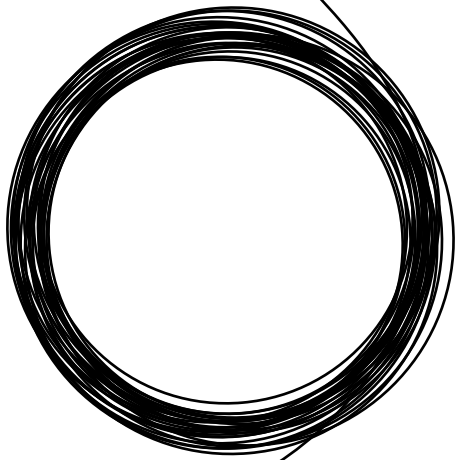
545 TONS
OF PRUSAMENT MANUFACTURED

285 483
MODELS ON PRINTABLES.COM

WE SENT OUR PRODUCTS TO **149** COUNTRIES

320 000
ANSWERED QUESTIONS AND REQUESTS

52 TEAM BUILDINGS
AND **2** COMPANY PARTIES



PRUSA AND OPEN SOURCE

Without open source, we couldn't exist. The Original Prusa 3D printers were born from open source roots and we are still faithful to this heritage. The source code of our firmware, the PrusaSlicer software, and printed parts of our printers – all are available for free download. This presents a huge benefit not only for our customers but for the whole 3D printing community.

LINK

SUSTAINABILITY IN PRUSA RESEARCH

At Prusa Research, we have not expressly addressed the sustainability topic up till half of the year 2021. We've simply done the things we think are right, without labeling them as sustainable. Just the fact that our printers are upgradeable is pretty uncommon in the age of "disposable" electronics. Likewise, the fact that all the parts you find on our printers have a purpose and are there not just for decoration is a natural result of our design thinking.

However, by the end of summer 2021, I finally decided that we want to clearly focus on sustainability, throughout the whole company. Why? First and foremost, we have always enjoyed doing things with a positive spin and we care about the environment in which we make business.

At the same time, I think this topic represents an opportunity for innovation and further development of the company, and could also help minimize risks brought by the often unstable worldwide situation.

I am aware that this is not an easy topic. In the times of the post-covid crisis and the war in Ukraine, we are struggling with the rising prices of practically everything nowadays. Getting the right components to produce our printers on time and in the required quality is often a superhuman feat, therefore we have to accept that not everything can be implemented as quickly as we would like. Still, I believe that thinking about sustainability in a broader context and on a longer horizon is worthwhile and will pay off in the end, not only for us but for the community as a whole.

On the following pages, we would like to sum up both our achievements so far and plans for the future.

Happy printing,
Josef Prusa

JOSEF PRŮŠA

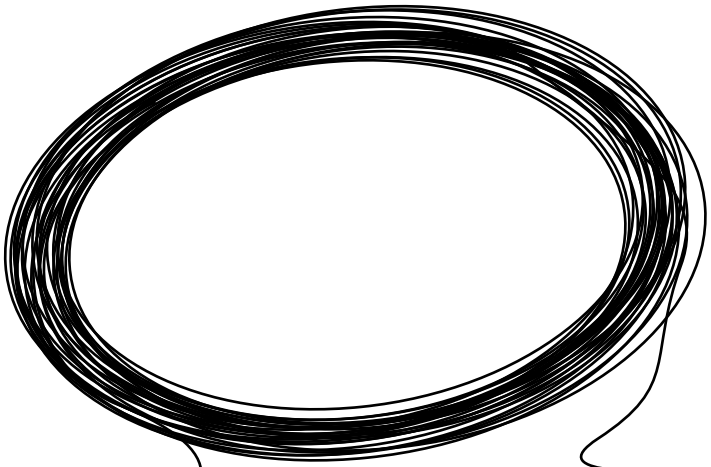
OUR FIRST SUSTAINABILITY REPORT

Starting in 2026, the Sustainability Report, also known as an ESG report or non-financial report, will become a common part of the information that larger companies in the EU will disclose, in addition to their financial results. Many companies already provide such reports on a voluntary basis. Customers, investors, and public institutions are increasingly interested in understanding the impact of a company's activities on the environment, how it addresses working conditions in its supply chain, or the durability and repairability of the products it delivers to the market. The report also serves as a self-reflection for our company, showing areas of success as well as areas where improvements are needed.

We began comprehensively addressing sustainability in the second half of 2021. In some areas, we lack sufficient historical data, in others, we are still unable to set clear goals. However, we have made progress in certain areas. The following content represents our first attempt to summarize what we have accomplished in recent years. If you have any questions, ideas, or recommendations after reading this report, please let us know at: sustainability@prusa3d.cz.

For the purpose of the Sustainability Report, we took inspiration from the international standard "Global Reporting Initiative" (GRI), which sets out what the content should be and defines the indicators that are subject to disclosure. The facts and data presented are for the period of January 1, 2021, to December 31, 2022.

VLADIMÍR VÍŠEK, SUSTAINABILITY



WE DEVELOPED THE SUSTAINABILITY STRATEGY WITH OUR KEY PARTNERS AND THE ENTIRE 3D PRINTING COMMUNITY.

EMPLOYEES AND COWORKERS

We started with an internal survey, asking about what our priorities should be. We collected 137 ideas which we used to set the 3 cornerstones of our strategy.

SUPPLIERS

We discussed the sustainability-related risks and opportunities in the supply chain with selected suppliers.

EXPERTS

We consulted our sustainability strategy concept with experts from the business, academic, and non-profit sectors.

3D PRINTING COMMUNITY

We asked the members of our community for feedback.

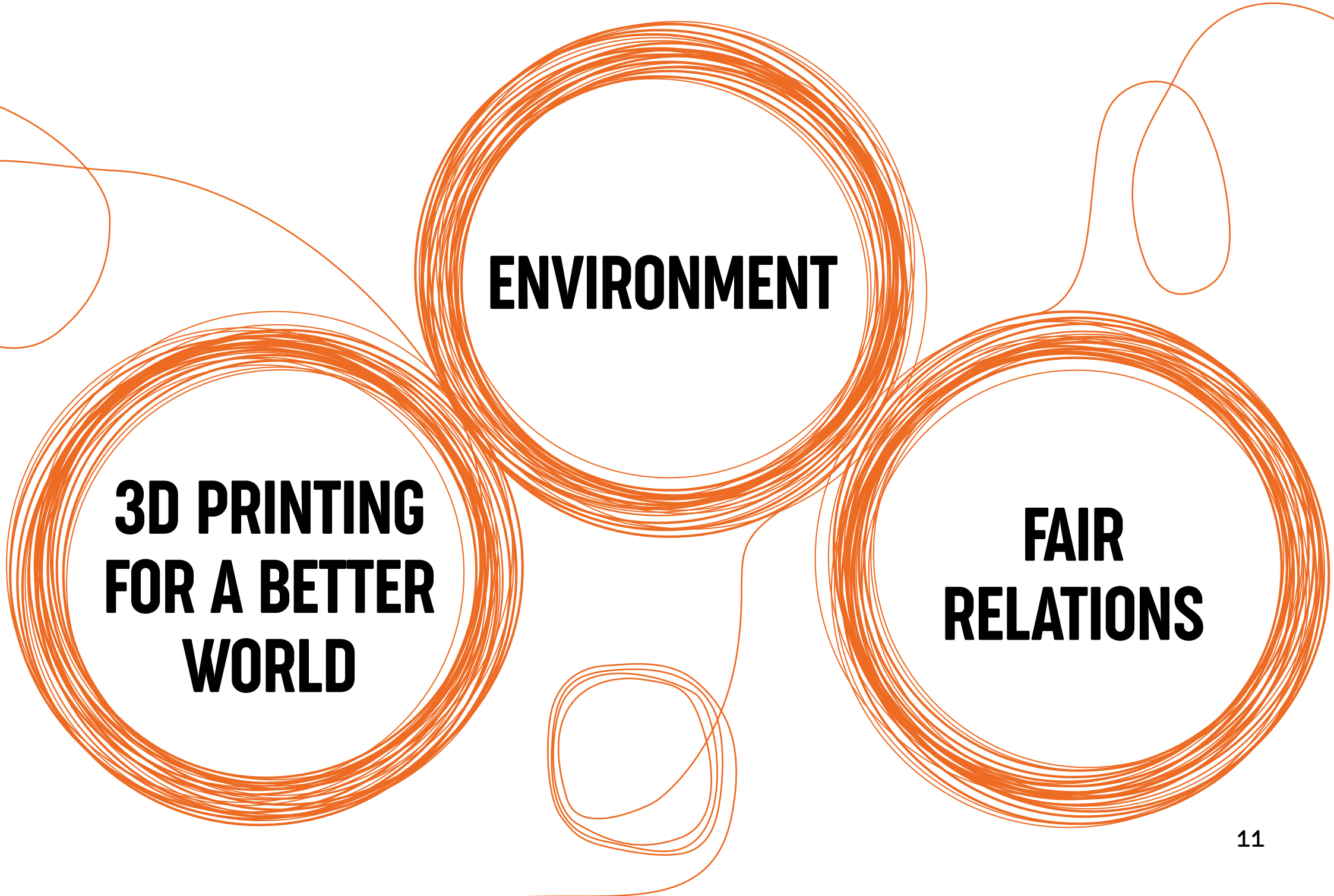
Three topics perceived as the most important emerged from this research:

1. help us recycle useless prints and leftover filament (31.7% answers)
2. start to offer filament on spools without sides (15.9% answers)
3. raise awareness about printing meaningful things (6.8% answers)

Later in this report, you will find more about our attempts at solving these problems.

Because we see a potential for interdisciplinary cooperation, we became a member of the Additive Manufacturer Green Trade Association (AMGTA).

3 CORNERSTONES OF OUR SUSTAINABILITY STRATEGY


ENVIRONMENT
3D PRINTING FOR A BETTER WORLD
FAIR RELATIONS

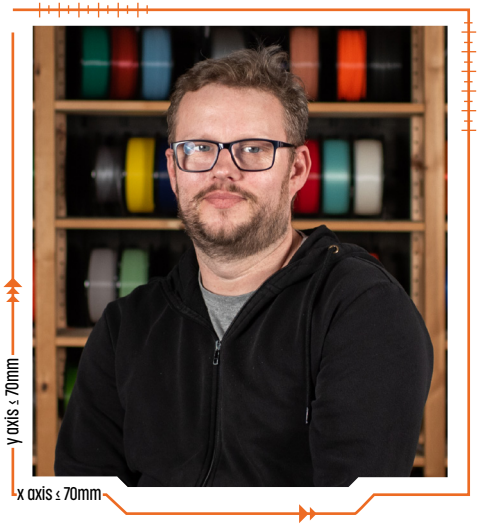
3D PRINTING FOR A BETTER WORLD

We are trying to utilize 3D printing to solve contemporary social and environmental problems.

3D PRINTING COMMUNITY

There is a large 3D printing community, able to tackle every challenge. We try to inspire and actively engage its members in sustainability topics.

MARTIN BACH, CONTENT & MARKETING



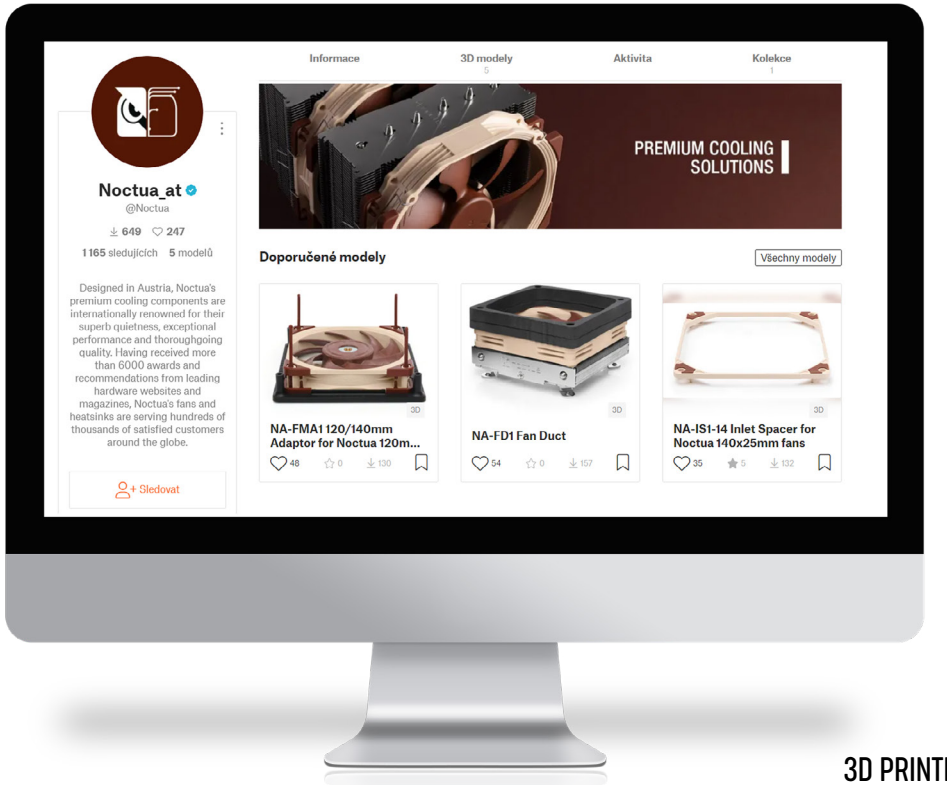
WE RUN PRINTABLES.COM,
ONE OF THE LARGEST 3D PRINTING DATABASES IN THE WORLD

2021	number of registered users: 199,257
2022	number of registered users: **509,120**

2021	number of published models: 70,000
2022	number of published models: **285,483**

In December 2022, we introduced official brand profiles on Printables.com. To increase the longevity and repairability of their products, the companies can offer free 3D models of replacement parts and accessories. If your company wants to participate, please let us know at brands@printables.com!

LINK



WE INCLUDE SUSTAINABILITY TOPICS IN OUR REGULAR CONTESTS

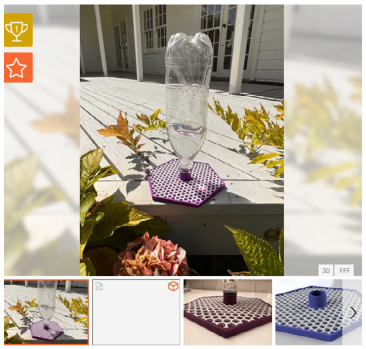
On International Repair Day, we invited the community to share their experience repairing something with the help of 3D printing. We collected more than 1,100 ideas.

LINK

Utilizing the last five meters of filament:

LINK

Reusing PET bottles:



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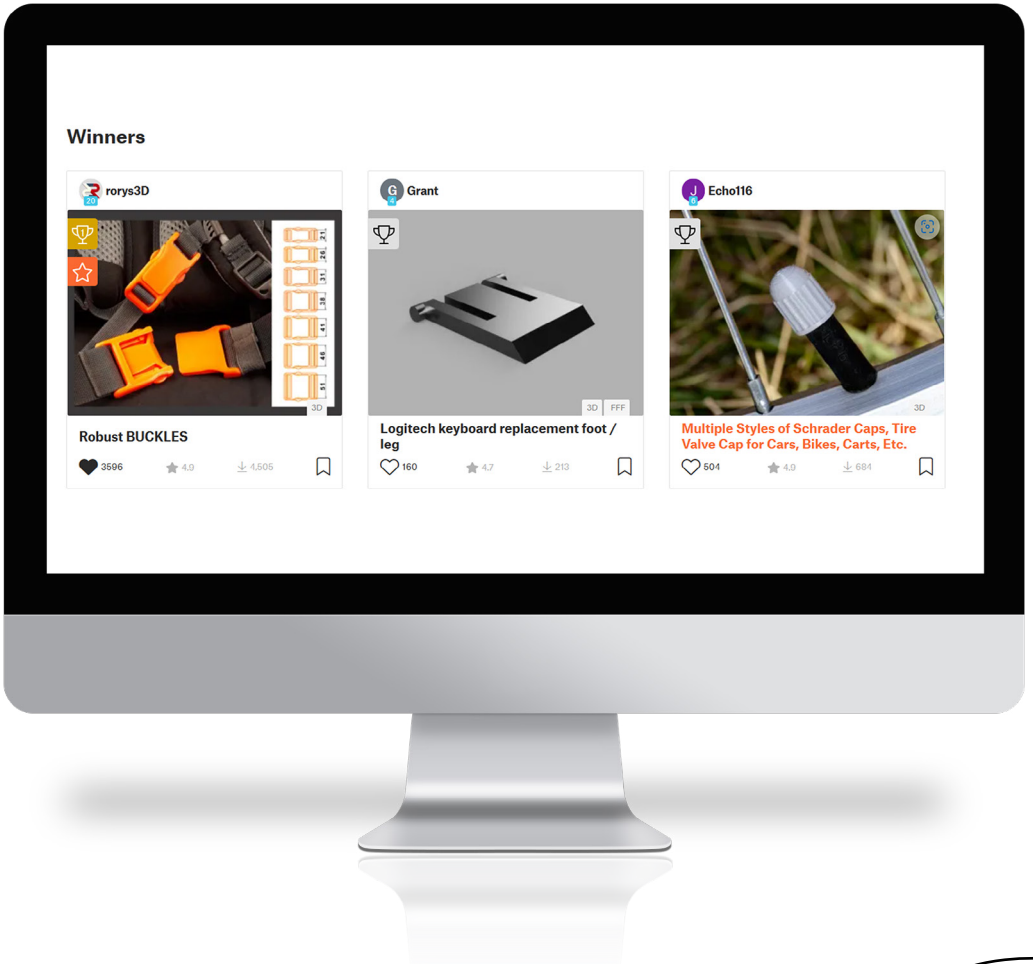


We try to inspire the community to more sustainable 3D printing – here are our **10 tips**.

LINK

COMPANIES AND INSTITUTIONS

3D printing may help to make manufacturing more sustainable: from more efficient prototyping to speeding up production or printing replacement parts.

JAKUB KMOŠEK, PRUSA STORIES

ŠKODA AUTO

“Most often, the tool room workers are printing various shape parts for fixtures, which were earlier manufactured in the machining centers. It makes the production process faster and less expensive.”

LINK

LASVIT GLASSWORKS

“Thanks to 3D printing, the designers can make various prototypes in a matter of hours and the production receives only the fine-tuned version. This significantly reduces the amount of glass scrap, from hundreds of pieces to just a few.”

LINK

ETH ZURICH

“We use 3D printing to create prototypes or as a standard working tool for designing buildings in architecture. We print everything from full models all the way down to the various construction details.”

LINK

TATRA METALURGIE

“The models are made of wood, aluminum, steel, or cast iron, usually using CNC machining. However, various technological modifications often have to be made during the design process, many of them last-minute. This is when Original Prusa printers come on the scene.”

LINK

COMMUNITY SUPPORT AND DEVELOPMENT PROGRAMS

3D printing is changing and improving the usual ways of manufacturing and distribution.

JIŘÍ PRŮŠA,
GRANTS AND DEVELOPMENT COOPERATION

PRUSA EDUCATION

We launched the Prusa Education (Průša pro školy) program in September 2020, for all schools, universities, and other educational institutions in the Czech Republic. The goal of the program is to develop 3D print related technical skills in a fun way. We donate a free printer to each school that publishes an educational project on 3D printing. These projects are then available free of charge to all other schools. So far we have donated 1,369 printers.

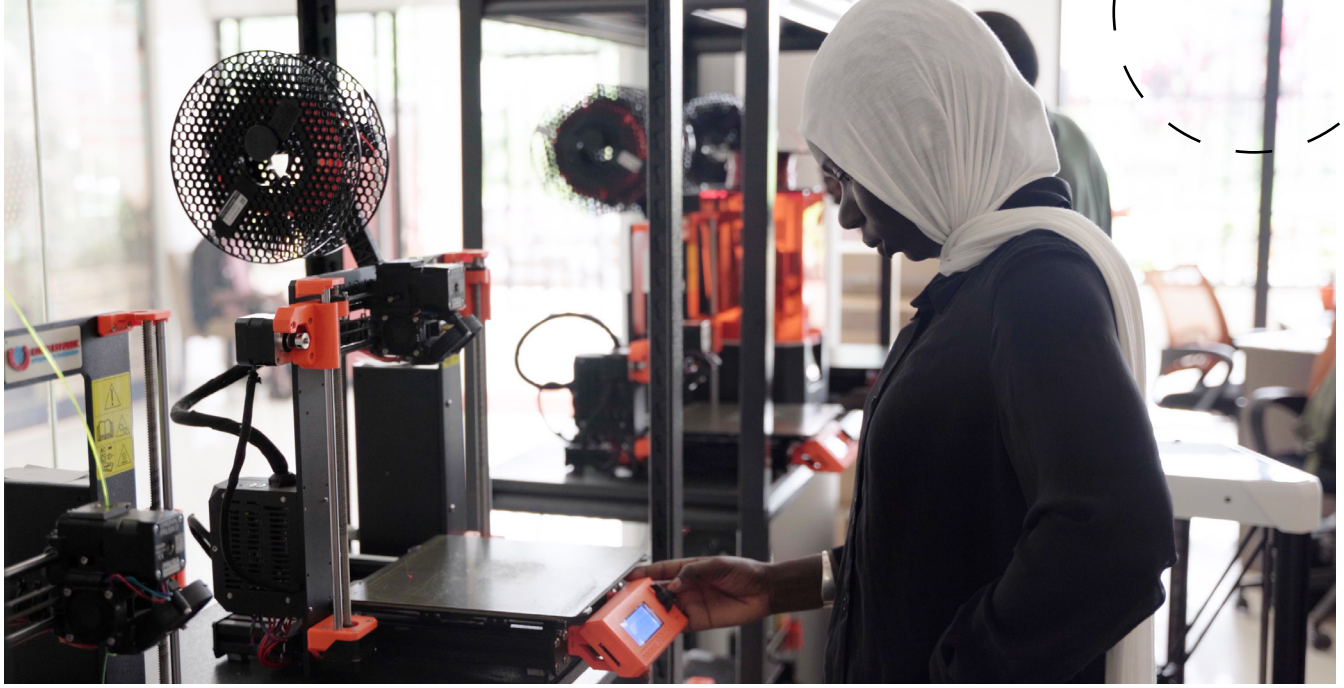
LINK

3D PRINTED FACE SHIELDS

In reaction to the immediate shortage of medical wear during the Covid-19 pandemic, we quickly developed and mass-printed protective face shields.

In the Czech Republic, we printed and donated nearly 200,000 shields to medical personnel and other professionals. Thanks to the design being completely open-source, the shields were soon printed globally. The 3D models and instructions have been downloaded by over 250,000 users.

LINK



3D PRINTING IN DEVELOPING COUNTRIES

3D printing also helps in developing countries, where it is changing the established ways of production and distribution. Thanks to 3D printing, it's just a matter of hours to design and produce something on-site, instead of waiting for weeks or months.

In 2022, thanks to the support of the Czech Development Development Agency, we implemented the project "Support socially beneficial 3D printing in The Gambia"*, which significantly strengthened the technical and professional potential of our local partner, company Make3D Ltd.

The project also included a practical training course focused on sharing experience with 3D printing between doctors and biomedical engineers from the Czech Republic and The Gambia.

LINK

*For our project in The Gambia and activities in Ukraine we won 3rd place in the category "Development Cooperation, Peace and Partnership" of the prestigious SDGs Award of the Czech Social Responsibility Association. For details please see Appendix No.2.

SUPPORT OF NON-PROFIT ORGANIZATIONS

Apart from schools and other educational institutions, we have also donated 3D printers and material to other non-profit organizations, providing for example social services. During the years 2021/2022, we provided a total of 309 printers and 320 spools of filament. In November 2022, we organized a course for representatives of non-profit organizations on the use of 3D printing in development cooperation. The course was attended by various organizations such as Caritas, Člověk v tísni (People in Need) or Doctors Without Borders.

FURTHER PLANS AND GOALS

- Continue supporting local 3D printing communities in developing countries. Promote 3D printing from local sources and utilize waste material.
- In cooperation with both Czech and international non-profit organizations, to seek and support further use of 3D printing for socially beneficial purposes, especially in medicine and humanitarian aid.
- Invite new schools into the Prusa Education program, while also engaging the existing members.

HELPING UKRAINE

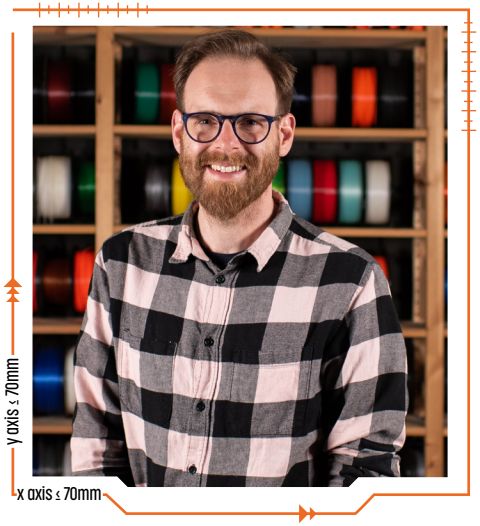
In response to the invasion of Ukraine, we have quickly established close contact with local 3D printing communities and organized a delivery of printers and filament. In total, we have donated 40 printers and almost 900 kg of filament so far. In cooperation with doctors from the Brno Hospital, we prepared models of 3D printed splints for various hand fractures. We are also helping in Ukraine via the Czech Red Cross – on our print farm, we manufacture mobile phone holders for quick charging. In our premises which we normally use for recreational and team building purposes, we have provided accommodation for 60 refugees.

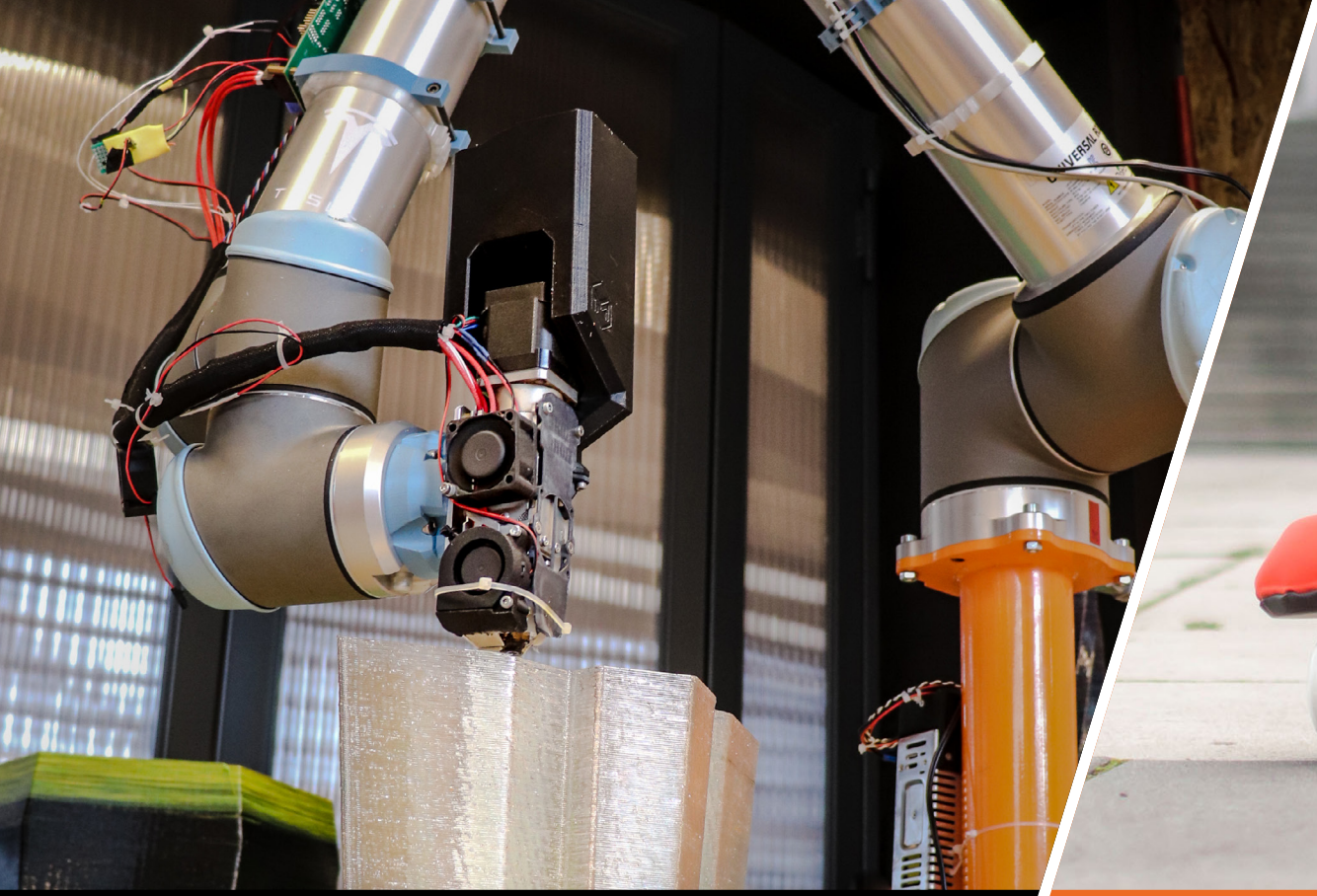
LINK

PRUSALAB

PrusaLab is our prototype workshop and makerspace for education and the development of innovations. It's a place where makers, hobbyists, architecture and design students, entrepreneurs, or simply put, anyone with a creative vision, can develop their projects.

ONDŘEJ KAŠPÁREK, PRUSALAB





PLASTIC RECYCLING

One of the flagship projects of our workshop is the “large format” – an experimental 3D printer attached to a robotic arm. It combines a UR-10 robot with a custom-designed print head that can reuse the material from unwanted old prints or production waste.

LINK

ACCELERATOR

Since 2020, we operate a unique accelerator program focused on hardware prototyping and innovative product development. Sustainability is one of the factors that influence the selection of accelerated projects. In the last season, we helped to develop energy-efficient lighting technology and “pocket” skates that will support urban mobility.

LINK

NON-PROFIT COLLABORATIONS

We also cooperate on projects with a social aspects, either free of charge or just for a nominal fee. Often these projects are developed in cooperation with non-profit organizations and individuals. The recent projects include a unique physiotherapy facility for the 1st Medical Faculty of Charles University, haptic 3D prints for the visually impaired, and sports equipment for handicapped players.

LINK LINK

MEET THE MAKERS

We are exploring the area of sustainability in our regular training courses and community events, for example at “Meet the Makers”, a series of short lectures introducing a single topic. One of the topics was recycling – together with experts we discussed when recycling makes sense and when not, what obstacles we might encounter and how to promote such solutions in the community.

LINK

FURTHER PLANS AND GOALS

- We are planning a cooperation with makerspaces across Europe with the aim of promoting the efficient reuse of 3D printing waste.
- When designing products in our accelerator program, we plan to further emphasize the environmental benefits of the solution.
- When giving lectures on 3D printing and modeling, we will emphasize the meaningfulness of the finished product.

ENVIRONMENT

We try to minimize the impact of our activities on the environment. We look for ways to introduce more sustainable products and services, and to optimize our production.

CARBON FOOTPRINT

For a better understanding of our environmental impact, we've had the company's carbon footprint calculated.

COMPANY'S CARBON FOOTPRINT*

We wanted to have a comprehensive overview of our impact on the environment, so we started by calculating the carbon footprint associated with our business. Frankly, it was a lot of work – considering and accurately identifying all the materials we use in our production, contacting suppliers and finding out from where and how a given component is delivered to us, keeping track of the energy and water consumption, or making a survey on how our colleagues travel to work.

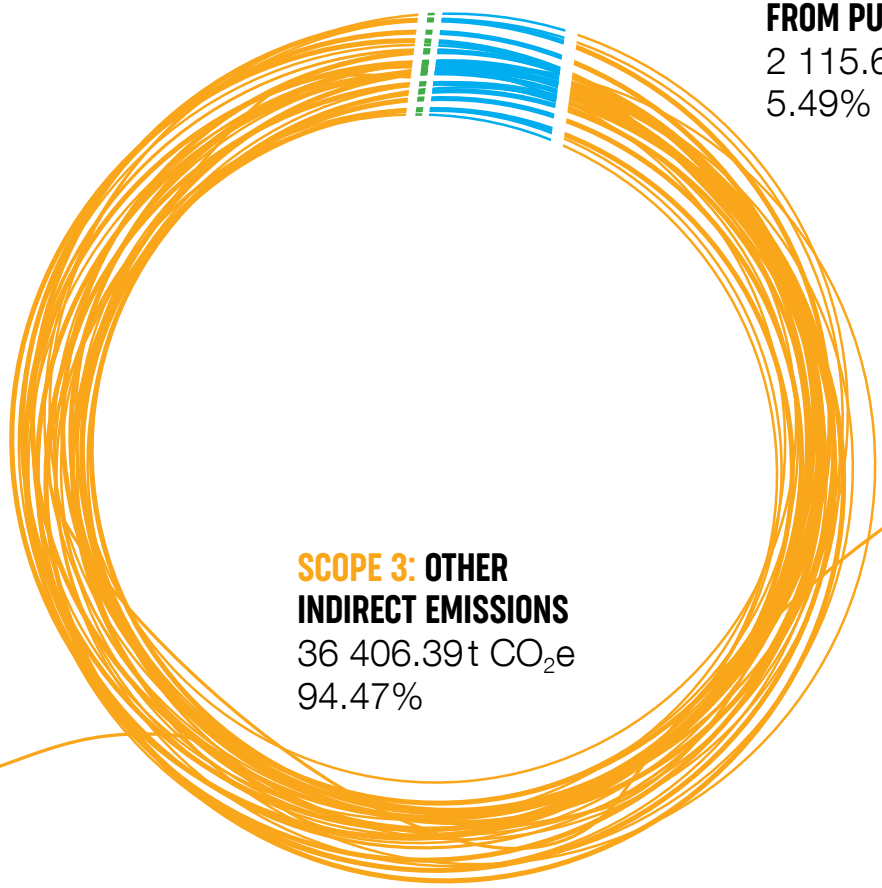
*Carbon footprint is a sum of all greenhouse gas emissions converted to their CO_2 equivalents.

The carbon footprint was calculated by **CI3** company and independently verified by **Envitrail** company. The calculation is made according to the international GHG protocol and ISO 14064-1. See Appendix No.3 for both certificates and a description of the carbon footprint structure according to ISO 14064-1.

THE CARBON FOOTPRINT WAS CALCULATED IN THE EXTENT OF SCOPES 1, 2, AND PARTIALLY SCOPE 3.

SCOPE 1: DIRECT EMISSIONS
14.42 t CO_2e
0.04%

SCOPE 2: INDIRECT EMISSIONS FROM PURCHASED ENERGIES
2 115.62 t CO_2e
5.49%



SCOPE 3: OTHER INDIRECT EMISSIONS
36 406.39 t CO_2e
94.47%

SCOPE 1: Direct emissions from own sources inside the company. In the case of Prusa Research, it is fuel for company cars and refrigerants for air conditioners.

SCOPE 2: Indirect emissions from purchased energies. In the case of Prusa Research, electricity, and district heating supply.

SCOPE 3: Includes purchased supplies and their transportation to us, transportation of finished products from us to customers, investments into Prusa Research tangible assets, business trips, commuting, or home office. Also, water consumption and waste management.

Scope 3 does not include emissions of 3D printers operated by customers, or their disposal. We don't have reasonable data in this regard so far.

FOUR CATEGORIES WITH THE BIGGEST IMPACT:

- purchased supplies / components for our production
- tangible assets investments in 2021
- transporting products from our company
- electricity consumption and heating

FURTHER PLANS AND GOALS

- We plan to analyze what materials we can purchase with a lower carbon footprint.
- We further improve the packaging efficiency of our products (for details see the Packaging Materials chapter) and look for alternative, low-emission means of transport via our current or future shipping partners (see chapter Shipping).
- Decrease the energy consumption of our production and operation and seek energy from renewable sources (see the chapter Energies, Water, Waste).

3D PRINTING MATERIALS

We are considering the sustainability aspects of 3D printing materials, and how to effectively reuse the print waste.

ADAM PINKNER, FILAMENTS DEVELOPMENT

During the production of Prusament, we generate waste material, e.g. from spools that do not meet our strict quality standards. Therefore, we decided to reuse this material and introduced two versions of recycled filaments – PETG and PLA, which are 100% made from our own production waste.

We had calculated the environmental impact of selected products. The tool for determining the environmental impact is called Life Cycle Assessment. We have started with our flagship printer Original Prusa i3 MK3S+*, and two types of best-selling filament, Prusament PETG and PLA.

PETG AND PLA FILAMENTS

were compared with their recycled variants, to make sure that the reuse of the waste material actually makes sense from the environmental point of view. Both recycled filaments have more than 50% lower carbon footprint than their virgin material equivalents.

LINK

Based on customer demand, in November 2022 we introduced spools without sides, i.e. Prusament Refill. Customers can reuse the spool over and over again.

LINK

*More on the LCA of the printer in the chapter Easily Repairable Product – Prusa Product Passport.

RECYCLING 3D PRINTING WASTE

The most frequent feedback topic (one-third of all answers) was the recycling of failed or no longer needed prints.

> “Do your analyses and plans also include the 3D printing waste generated by customers, such as failed prints or print supports? I’d like to see more effort in establishing a recycling system in this industry.”
>
> 3D printer user from Germany

> “I really want to have the opportunity to recycle my 3D printing waste. I have a whole bag full of Prusament Galaxy Black which I don’t want to throw out to a landfill, so I keep it at home. I think this is a very important topic.”
>
> 3D printer user from Great Britain

> “I always feel bad when throwing out failed or no longer used prints, print supports, etc. I’d appreciate easily available ways of recycling and/or effectively reusing all plastic material.”
>
> 3D printer user from Italy

WE ARE AWARE THAT THIS IS NOT AN EASY TASK, BUT WE ACCEPT THE CHALLENGE! THE CURRENT SITUATION IS AS FOLLOWS:

- 3D printing waste is dispersed in small amounts throughout the world (households, workshops, schools, etc.).
- PLA and PETG are the most frequently used materials. Both are recyclable in theory, but in most countries, there is no existing infrastructure for these particular materials.
- During the take-back it will not always be possible to distinguish which material it is, which makes further recycling more difficult.

WHAT IS OUR GOAL:

- Explore local recycling options (i.e. as close to the source of waste as possible) or other uses of the waste material with partners from different parts of the world.
- We look for a solution that makes sense both from the environmental and commercial point of view. We don't want to recycle just for the sake of it.

If you want to take part or share any ideas, contact us at: sustainability@prusa3d.cz

FURTHER PLANS AND GOALS

- We want to increase the sales of filaments considered as more sustainable (i.e. recycled + refill).
- We will develop and introduce new more sustainable Prusament products.
- We will evaluate data about recycling from the community, and if the ideas prove to be viable, we will start to implement them.

PACKAGING MATERIALS

We are constantly trying to reduce the packaging of our products so we save materials and costs, and don't ship half-empty boxes for no reason.

TOMÁŠ PAVELKA, PROCESS ENGINEER

REDUCING THE SIZE OF THE MK3S+ KIT BOX

Volume: 48.4 dm³
Used till: February 8, 2022

Volume: 47.6 dm³ (- 1.65%)
Used till: January 18, 2023

Volume: 45 dm³ (- 7%)
current box size

In 2022, we began using paper tape instead of plastic tape, making it easier to recycle the cardboard packaging afterwards. We now pack 90% of our shipments this way.

In addition, we are continuously replacing plastic packaging fillers with recycled paper fillers. Product protection plays an important role here, so we stick with plastic fillers where they are necessary to protect the product, e.g. with Original Prusa Enclosures.

We also want to be more efficient with the packages coming from our suppliers, many of which are now for single use. Some of the packaging we use in our warehouse or for internal logistics, while other is offered to companies that could make further use of them. We currently “rotate”, for example, containers for print sheets that our supplier takes back to reuse.

FURTHER PLANS AND GOALS

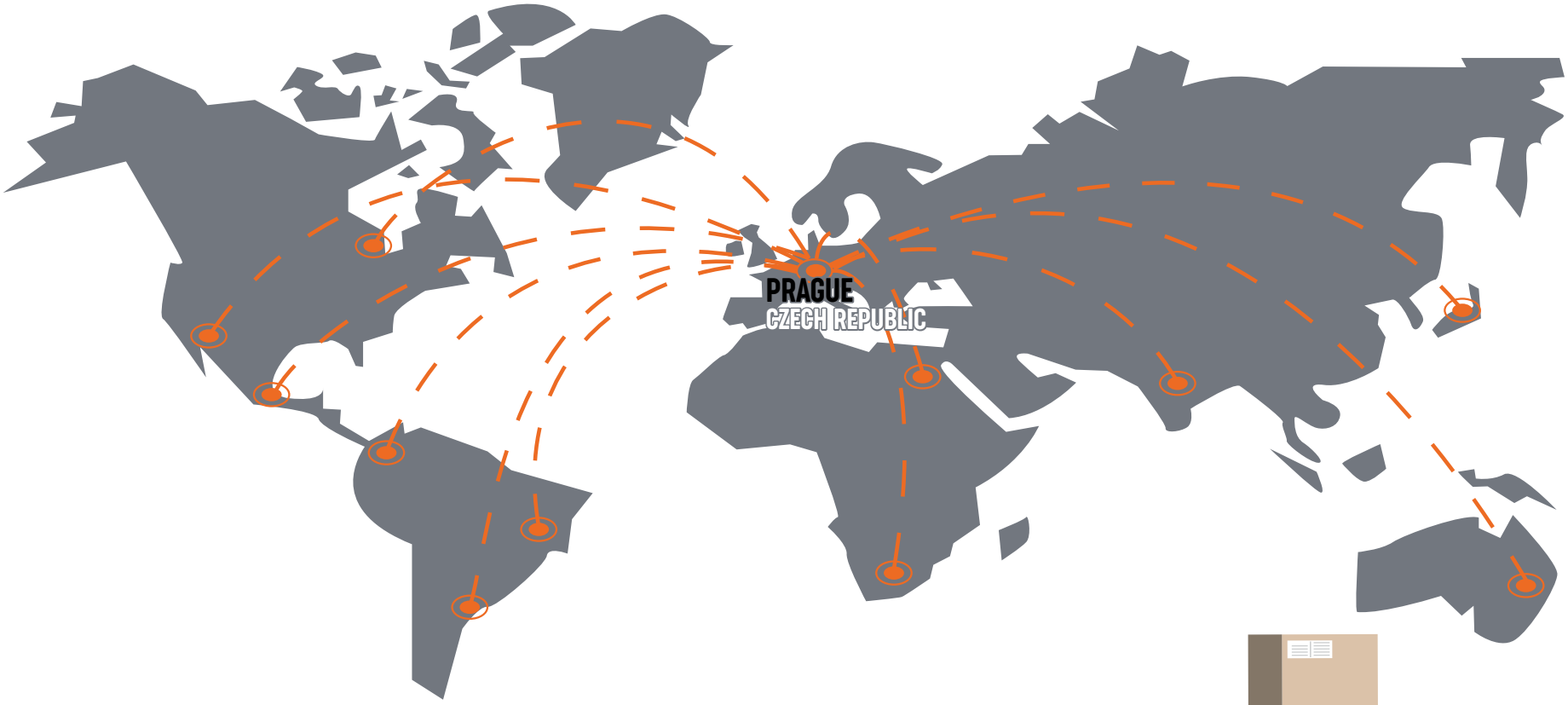
- In 2023, we want to make more efficient packaging of the Y-carriage and printer frame and abandon the cardboard cut out that holds the component in the box. That means that instead of extra cardboard, we will directly use the bottom of the box and cut out a small origami out of it. This will save 940 kg of cardboard per year.

- We want to hand over the packaging that we can’t reuse to a company that can.

SHIPPING

In order to reduce the environmental impact of shipping, we are looking for alternative, low-emission transport options.

ZUZANA KOLAŠÍNOVÁ, SHIPPING



In October 2022, we made the DHL GoGreen service available to our customers. It allows them to choose to have the carbon footprint of their shipment offset by investing in a project that reduces or prevents CO_2 emissions elsewhere.
From the launch of the service to the end of 2022, 2,006 shipments have been transported with the GoGreen service, with approximately 10% of customers using DHL delivery services choosing this method. According to DHL, the compensated carbon footprint was 46,130 kg CO_2e.
See Appendix No.4 for more information.

FURTHER PLANS AND GOALS

- Reduce the carbon footprint primarily by preferring logistics companies that use less fossil fuels.

ENERGY WATER WASTE

We started to monitor our energy and water consumption and the amount of our waste more closely.

PAVEL KRÁL, FACILITY MANAGEMENT

ENERGY

Since we are based in rented premises, we have limited options to reduce our energy consumption or invest in new solutions. We plan to do so in our new headquarters. Our electricity consumption in 2022 increased by 7% compared to 2021, due to the following reasons: we have localized the production of some components that we previously imported and we have expanded our premises to manufacture new products in our portfolio (Original Prusa XL, Original Prusa Enclosure).

In 2022, we replaced old lighting with LED. This should bring an 8% reduction in electricity consumption, returning the investment made within 9 months.

We source 100% of our energy from non-renewable sources, since our energy supplier does not currently supply renewable energy to our premises.

ELECTRICITY CONSUMPTION

2021	3,323 MWh
2022	3,558 MWh

WATER

Our water consumption consists of regular day-to-day use by employees (in kitchenettes, showers, and toilets) and consumption during the manufacturing of filaments. In order to reduce the water use, we installed faucet aerators on the water pipes in 2022. We have managed to keep water consumption at almost the same level, a decrease of 2.5%, despite the expansion and localization of some parts of our production (see details in the Energy chapter).

WATER CONSUMPTION

2021	3,865 m^3
2022	3,770 m^3

WASTE

In 2021 and 2022 we generated approximately the same amount of waste, an increase of 0.6%.

To minimize the waste, we took the following steps:

- In cooperation with Cyrkl.com (waste to resource market place), we made a “waste scan” to identify opportunities to minimize the waste.
- By changing the manufacturing process of plastic parts, we decreased the amount of waste by 7%.
- We started to use filament production waste to manufacture recycled filament.

We are actively looking for a better use of plastic waste from our production, which now goes mainly to waste-to-energy facilities, where it is burned to produce heat. We are in contact with several external partners who are interested in recycling this type of material.

THE TOTAL AMOUNT OF WASTE PRODUCED

2021	295.99 tons
2022	297.75 tons

THE FINAL MEANS OF DISPOSAL

2021	Recycling / material use	46.21 %
	Use for energy	45.86 %
	Landfill deposit	7.93 %

2022	Recycling / material use	40 %
	Use for energy	55.35 %
	Landfill deposit	4.65 %

FURTHER PLANS AND GOALS

- Improve energy efficiency during production.
- Seek energy supplies from renewable sources.
- Continuously reduce the amount of waste and increase the efficiency of its reuse, according to waste hierarchy:

PREVENT THE WASTE GENERATION

REUSE

RECYCLE

USE FOR ENERGY

LANDFILL

FAIR RELATIONS

We want to have fair relations with everyone
that helps us conduct our business successfully.

EMPLOYEES

In Prusa Research, we have a fair approach to all employees regardless of their position, education, gender, sexual orientation, or race.

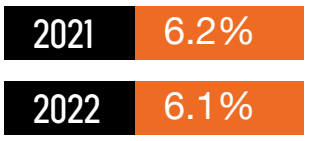
PETR MIKESKA, HR

REMUNERATION

The salary amount is set according to the category of the position and based on the experience of the new employee, regardless of gender, nationality, or level of education. Employees can influence the amount of their own remuneration – we reward improvements with individual yearly bonuses.

EMPLOYEE TURNOVER RATE

The employee turnover rate in 2021 and 2022 was partially influenced by the pandemic period, when we had to downsize due to a reduction in production volumes. Following the economic recovery, turnover was driven by increased competition in the labor market. We try to reduce turnover already during the recruitment process, where we provide candidates with detailed information about the job and the company culture. We place great emphasis on the quality of the onboarding and adaptation process.



WHAT DO WE HAVE EXTRA?

All employees after their trial period have the following benefits:

1. **One week of private family vacation in our holiday apartments, and a financial contribution for a children's recreation.**
2. **Up to 28 days of paid vacation.**
3. **Free fitness center right on the premises, Multisport discount card for sports activities.**
4. **Discounted massages, uLekare.cz service, online therapy and coaching.**
5. **Pension fund contribution.**
6. **Free mobile tariffs for two people.**
7. **Contribution to language training of its own choice.**
8. **Cleaning and laundry vouchers.**
9. **Meal vouchers of the highest possible value.**
10. **Up to 50% discount on our products, free PrusaLab membership, and discounts with our partners (electronics, shoes, clothing, banking, etc.).**

Whenever possible, we offer our colleagues on parental leave to continue with a part-time job.

DEVELOPMENT, GROWTH AND EDUCATION

All employees have opportunity for their personal development. In addition to all the trainings mandatory by law, we support to develop the employees' skills and knowledge according to their annual objectives. We average around 37 training hours per employee per year (excluding language training). When choosing candidates for open positions, we reach out to internal candidates first.

FURTHER PLANS AND GOALS

- Further support the personal growth of our employees, better define their responsibilities, and make communication throughout the company more efficient.
- Decrease the employee turnover rate under 5.5%.

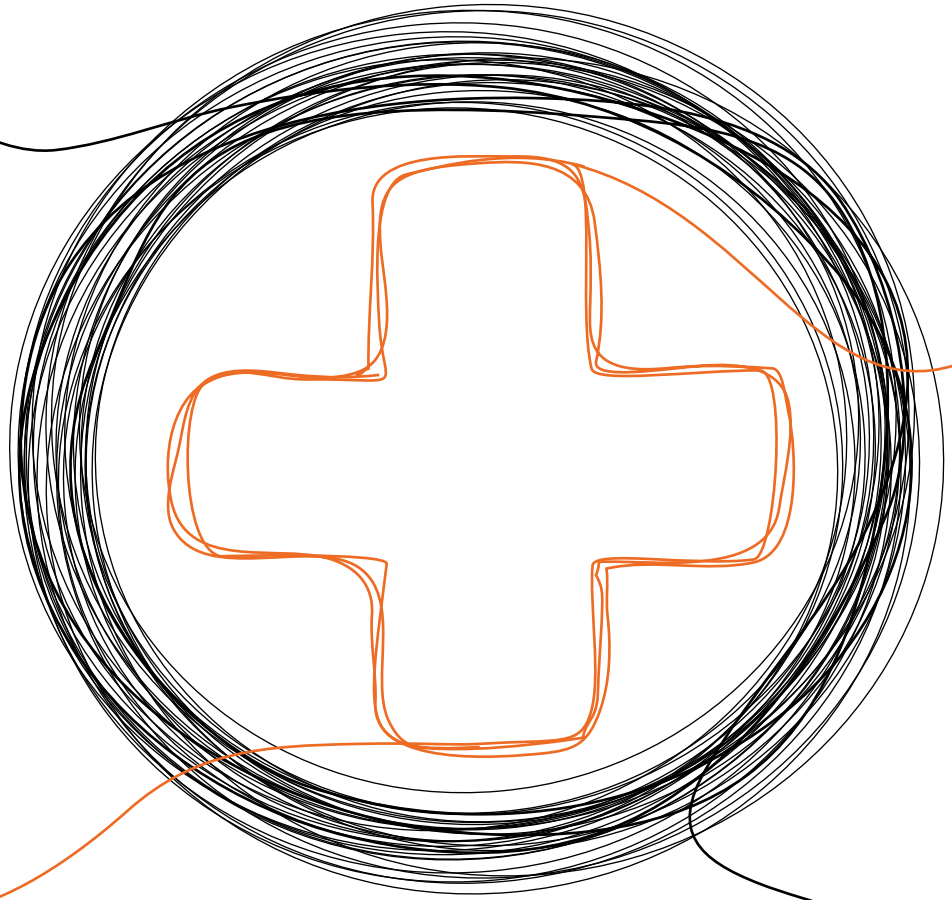
OCCUPATIONAL SAFETY AND HEALTH

We maintain a worker safety system above the legal standards.

PAVLÍNA ŘÍHOVÁ, HEALTH AND SAFETY

In the last 2 years, we have dealt with 5 accidents to our core employees resulting in sick leave (more than 3 calendar days), and no accidents to our external colleagues. To prevent similar injuries, we have conducted company-wide employee education, established safer work practices, and updated our list of evaluated risks.

Together with our occupational healthcare provider, we addressed 4 cases of suspected occupational illness/complaints of health problems arising at work. Eventually, none of the cases was confirmed as an occupational illness.



NUMBER OF INJURIES OF CORE EMPLOYEES	2021	INJURY RATE	2022	INJURY RATE
number of work accidents with permanent consequences, or fatal injuries	0	0	0	0
number of work accidents resulting in sick leave	4	1.11	1	0.23
main types of injuries	arm injuries – bruises, cuts, fractured finger			

*The injury rate per 200,000 work hours.

Another important step to increase employee safety was the introduction of a monitoring system in the form of a special watch/wristband for employees working alone. If necessary, the system is able to call for help (for example, if the employee would fall unconscious).

In 2022, we established a cooperation with the Faculty of Mechanical Engineering of the CTU. Together we conducted an ergonomics audit and set standards for our workplace. The aim of this project is to eliminate ergonomic injuries and occupational diseases and to have happy and healthy employees.

In addition to regular safety and fire protection training, we focused on first aid and working with automatic external defibrillators that we purchased for the company.

FURTHER PLANS AND GOALS

- We want to keep the zero occurrence of permanent injuries.
- We plan to apply the ergonomic standards at our assembly line and other workplaces.

QUALITY CONTROL

It’s no coincidence that our products earn regular awards for quality. We monitor the quality of products in three steps.

LUCIE KAUFMANOVÁ, QUALITY CONTROL

QUALITY CONTROL

At the supplier

We continuously address the reasons for customer complaints with our suppliers and immediately implement corrective actions in production to ensure that these errors are not repeated. With the supplier itself, we go through the entire production cycle from the input of material at the very beginning, through the production process, to the storage and transport of the final product to us.

Quality control of the supplied parts

Our quality department takes samples of the purchased product, evaluates them according to the relevant documents, and only they are released for production use.

Manufacturing process control

We are constantly updating lists of defects, work procedures, and machine capabilities. We manage the entire flow of material through production and make sure it's traceable, for example by using QR codes and production batches. This helps us to easily identify the extent of the problem and effectively eliminate it.

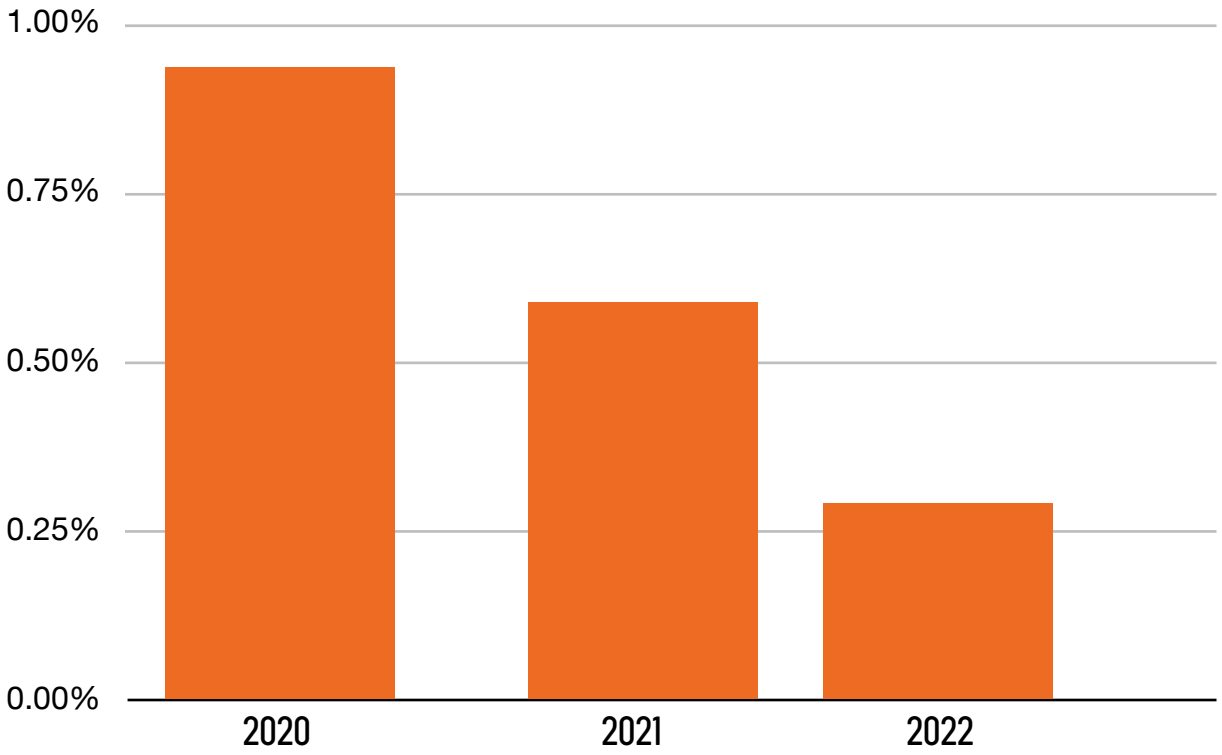
During launch of a new or redesigned product, quality control initiates the “sampling process”. In practice, this means that developers design the component and provide the relevant documentation, then the purchasing department requests samples from the supplier. Once these are received, the sampling process is established and the “test circle” begins:

QUALITY CONTROL → DEVELOPMENT → TESTING → QUALITY CONTROL

Based on a particular sample, various measurements, mechanical, climatic and stress tests, and test prints are performed. Our testing and development department plays an important role here, focusing on hardware and software testing, including long-term tests.

WARRANTY CLAIMS:

Thanks to our commitment to quality, we have been successful in reducing the number of warranty claims.



■ % of warranty claims: MK3/S/+, MINI/+, SL1/S, MMU2/S.

AWARDS:

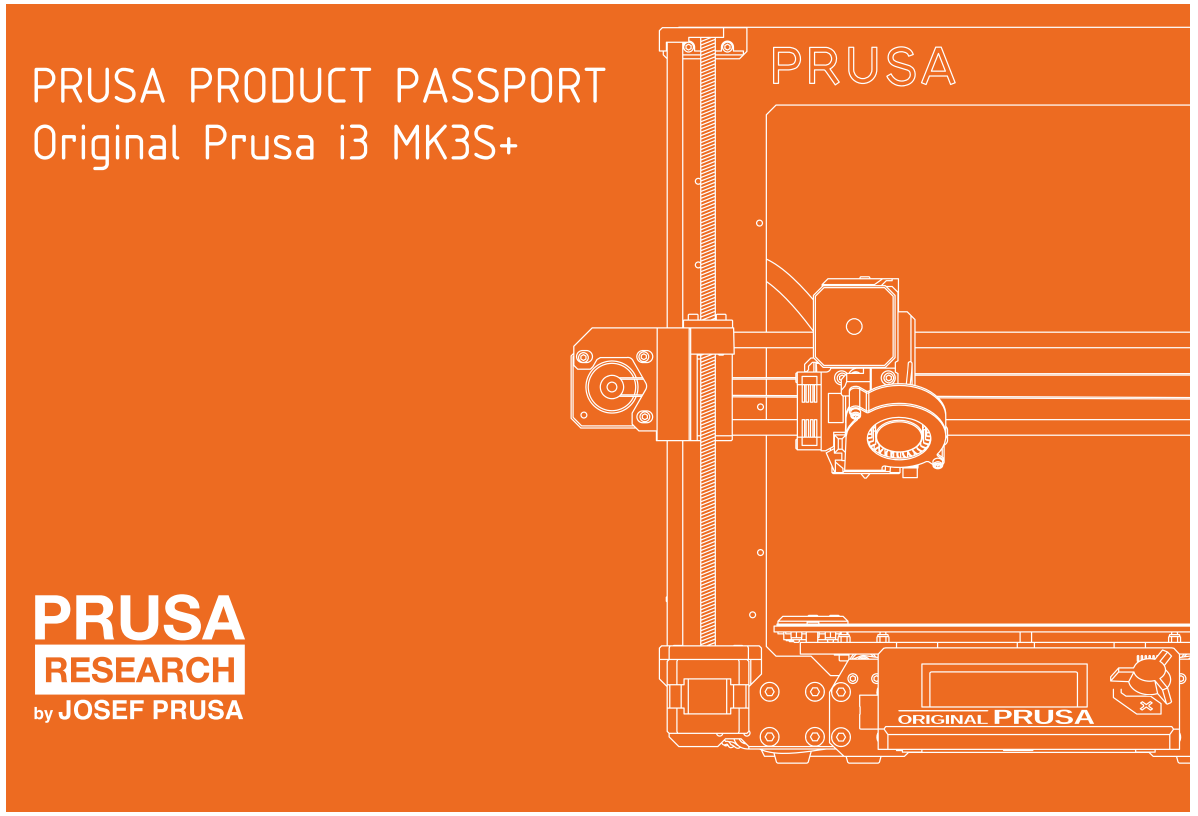
Wirecutter: Best 3D printer 2022 – Original Prusa MINI+
3D Printing Industry Awards: The Best FFF 3D printer 2019–2022 – Original Prusa MK3S+
Tom's Hardware: Editor's Choice – Original Prusa MK3S+
PCMag: Best overal 3D printer 2022 – Original Prusa MK3S+
PCMag: Best budget 3D printer 2022 – Original Prusa MINI+
Tom's Guide: Editor's Choice – Original Prusa MINI+

EASILY REPAIRABLE PRODUCT

One of our commitments is to produce 3D printers that comply with the principles of the circular economy. In practice, it means a product that is easy to maintain, update or repair. And at the end of its lifecycle, the components could be recycled or reused. We also want to communicate more transparently regarding the source of the materials and components we use and their impact on the environment. Therefore, we created our first Prusa Product Passport which contains:

- country of origin of printer parts
- carbon footprint of the printer
- maintenance, repairability, and spare parts information
- information on upgrades
- description of the materials for easier recycling
- inspiration on how to reuse selected parts at the end of their lifecycle

LINK



FURTHER PLANS AND GOALS

- We want to reduce costs while maintaining or improving the quality of the product.
- We will keep the warranty claim rate below 0.5%.
- We will create product passports for more of our products.

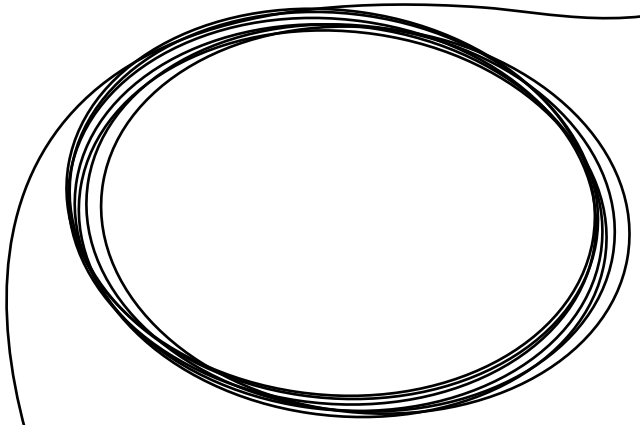
CUSTOMER RELATIONS

We put emphasis on transparency of communication.

AVOIDING GREENWASHING

We want to keep our communication on sustainability topics transparent and clear. To prevent misleading information, we have modified our statements about the recyclability of our spools and the biodegradability of PLA.

Prusament spools are made of recycled polycarbonate and this material is further recyclable. In practice, however, due to the lack of a collection and recycling infrastructure for this material in many countries, the material ends up either in an incinerator or in a landfill. For this reason, we have removed the claim “100% recyclable”.



BEFORE

AFTER

PLA AND BIODEGRADABILITY

The material is degradable in industrial composting plants. However, the same as with the spools, the theory is different from practice. This is due to the difficulty in identifying the material and the fact that industrial composting plants willing to process PLA are practically non-existent. According to available studies, PLA does not decompose on domestic compost and is not recommended to be added to it, e.g. because of the release of microplastics. We have therefore removed the claim that PLA is a biodegradable material from all our communications.

If you find any information in our sustainability communications unclear or misleading, please let us know at sustainability@prusa3d.cz

PERSONAL DATA PROTECTION

OUR GOAL IS TO MAKE THE PROCESSING OF PERSONAL DATA COMPREHENSIBLE AND TRANSPARENT.

During 2021 and 2022 we have implemented the following measures:

- We updated the documentation describing processing of personal data and associated potential risks to data subjects, including assessments of data transfers.
- With our existing business partners, we have executed new contractual clauses that comply with the GDPR standards regarding data transfers to third countries.
- We have introduced a due diligence tool in relation to new service providers which will act as our data processors.
- Our employees undergo regular professional training focused on privacy and the protection of personal data.
- For our customers and employees, we have introduced central contact addresses for exercising their rights regarding processing of personal data, these are privacy@prusa3d.com and hr-privacy@prusa3d.com.

In 2021 and 2022, we didn't receive any complaint regarding processing of personal data, or in relation to a data breach.

PRIVACY AND DATA PROTECTION METRICS	2021	2022
The Right of Access	1	1
The Right to Erasure	15	17
The Right to Object	0	0
Other Personal Data Related Rights	0	0
Number of Security Incidents	0	0
Number of Data Breaches	0	0

SUPPLIERS

We want to know about the conditions in which the components for our products are produced, and to be able to influence them.

MARTIN ČERNÝ, PURCHASING

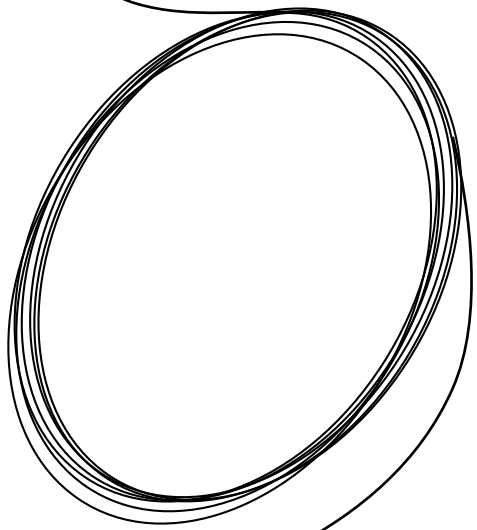
Our suppliers are from all over the world and we want to be aware of the conditions under which the components for our printers are produced, and to be able to influence them. That's why we have started a dialogue with our major suppliers. We reached out to those that supply us with more than one percent of the total volume we purchase, to find out how they address environmental and social conditions in their production, and with their own suppliers.

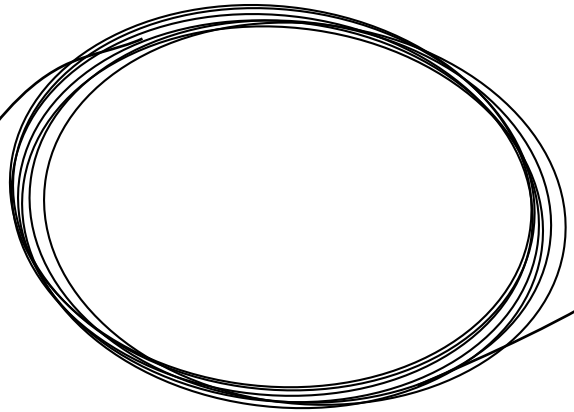
67% of our suppliers address social and environmental conditions above and beyond current legislation, not only in their own production but also in their supply chain.

We have offered to deal with this topic together with all suppliers who have expressed interest. This will be our focus in 2023.

LOCALIZATION OF PRODUCTION

We are also evaluating which parts of our production can be transferred directly to our factory in Prague. In recent years, we have started to manufacture some parts that we had to import earlier. As a result, we have direct control over working conditions as well as production quality and delivery flexibility.





FURTHER PLANS AND GOALS

- We will establish work groups with selected suppliers to deal with this topic together.

APPENDIX

APPENDIX 1: GRI

For the purpose of the Sustainability Report, we took inspiration from the international standard “Global Reporting Initiative” (GRI), which sets out what the content should be and defines the indicators that are subject to disclosure. The facts and data presented are for the period of January 1, 2021, to December 31, 2022.

GRI 201: Economic Performance
chapter Prusa Research in 2022

GRI 202: Market Presence
chapter Employees

GRI 203: Indirect Economic Impacts
chapter 3D printing for a better world

GRI: 206: Anti-competitive Behavior
chapter Prusa and open source

GRI 301: Materials
chapter 3D printing materials

GRI 302: Energy
chapter Energy, water, waste

GRI 303: Water and effluents
chapter Energy, water, waste

GRI 305: Emissions
chapter Carbon footprint

GRI 306: Effluents and Waste
chapter Energy, water, waste and 3D printing materials

GRI 308: Supplier Environmental Assessment
chapter Suppliers

GRI 401: Employment
chapter Employees

GRI 403: Occupational Health and Safety
chapter Health and Safety

GRI 404: Training and Education
chapter Employees

GRI 405: Diversity and Equal Opportunity
chapter Employees

GRI 406: Non-discrimination
chapter Employees

GRI 413: Local communities
chapter 3D printing for a better world

GRI 414: Supplier Social Assessment
chapter Suppliers

GRI 417: Marketing and Labeling
chapter Customer relations

GRI 418: Customer Privacy
chapter Customer relations

APPENDIX 2:
SUSTAINABLE DEVELOPMENT GOALS

Our activities contribute to the following Sustainable Development Goals.

GOAL 4: QUALITY EDUCATION

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

4.4.: By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.

- Prusa Education
- PrusaLab
- 3D printing in developing countries

GOAL 8: DECENT WORK AND ECONOMIC GROWTH

Promote inclusive and sustainable economic growth, employment and decent work for all.

8.2: Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors.

- 3D printing in developing countries
- Companies and institutions

8.7: Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms.

- Suppliers

8.8: Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment.

- Employees
- Health and Safety
- Suppliers

GOAL 9: INDUSTRIES, INNOVATION AND INFRASTRUCTURE

Build resilient infrastructure, promote sustainable industrialization and foster innovation.

9.2: Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries.	Prusa Education 3D printing in developing countries Companies and institutions
9.B Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities.	3D printing in developing countries Companies and institutions

GOAL 12: RESPONSIBLE CONSUMPTION AND REDUCTION

Ensure sustainable consumption and production patterns.

12.2: By 2030, achieve the sustainable management and efficient use of natural resources.	Energy Water Waste 3D printing materials Packaging materials
12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.	Product passport Waste 3D printing materials
12.8: By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.	3D printing community PrusaLab
12.A: Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production.	3D printing in developing countries

GOAL 13: CLIMATE ACTION

Take urgent action to combat climate change and its impacts.

13.2: Integrate climate change measures into national policies, strategies and planning.

- Carbon footprint

GOAL 17: PARTNERSHIPS FOR THE GOALS

Revitalize the global partnership for sustainable development.

17.7: Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed.

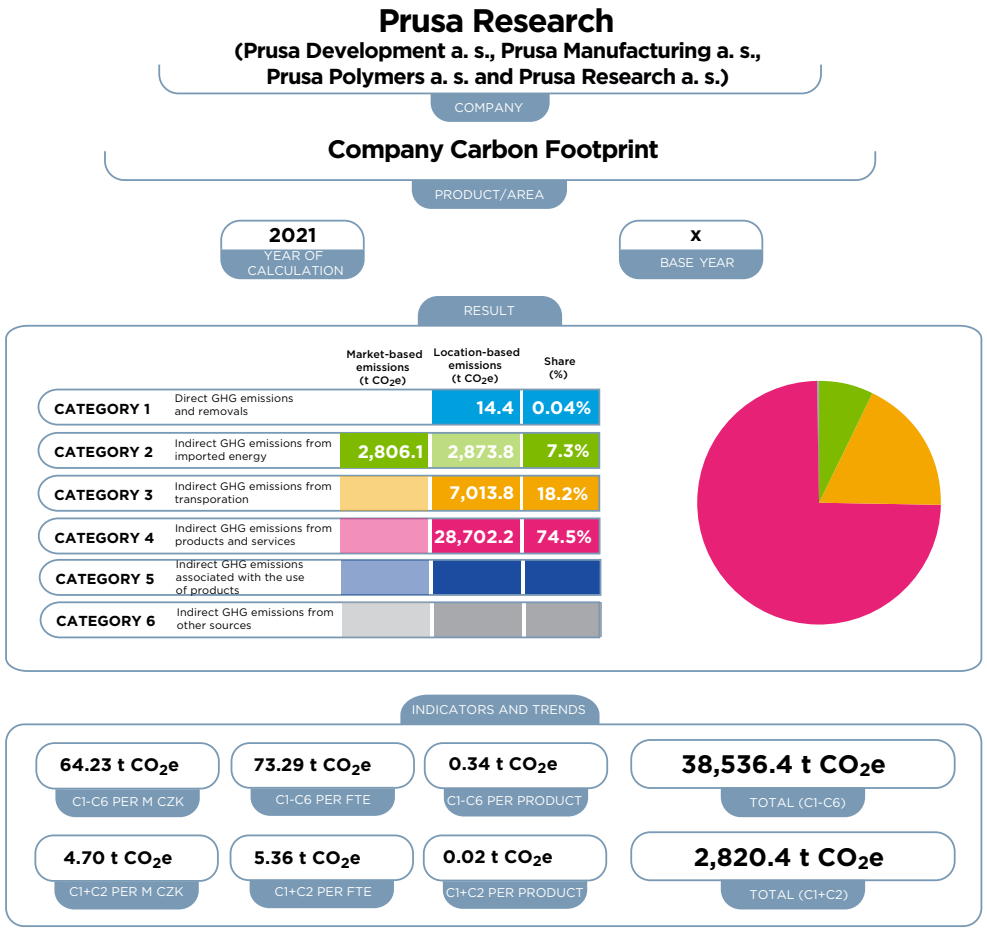
- 3D printing in developing countries

- For our project in The Gambia and activities in Ukraine we won 3rd place in the category “Development Cooperation, Peace and Partnership” of the prestigious SDGs Award of the Czech Social Responsibility Association.

APPENDIX 3:

COMPANY CARBON FOOTPRINT

Carbon footprint structure according to ISO 14064-1:



Independent verification of the carbon footprint calculation:

Prusa Research: Verification of the company's carbon footprint

Contracting authority:
Prusa Research a.s., Partyzánská 188/7a, 170 00 Prague 7 - Holesovice, ID No: 06649114

On the basis of the assignment of Prusa Research a.s. we have verified the calculation of the company's carbon footprint prepared by CI3, s.r.o. The analysis concerns the verification of the methodology and calculation of the company's carbon footprint according to ISO 14064. A summarizing meeting with CI3, s.r.o. was held, whereby some details were clarified. The following findings were found:

1. The methodology is fully compliant with EN ISO 14064-1.
2. The report and the attached input data contain all the information needed to perform the verification. For reasons of independent consideration, we have chosen the databases and other emission factors (see sources listed below) used by Envitrail.
3. For each ISO 14064-1 category (1-4), a sample of items with the highest carbon footprint (21 items in total) was selected and then the calculation was verified, additional items from each ISO 14064-1 category were additionally selected for broader coverage. The carbon footprint of such a verification sample represents more than 73% of the total emissions of Prusa Research a.s., therefore the sample is considered sufficiently representative.
4. We consider the total carbon footprint of Prusa Research a.s. of **38,536.4 t CO_2eq** to be correct. The calculation deviation of the verified sample is within the usual uncertainty level of the calculation (less than 1%).

Conclusion and recommendations:

The carbon footprint report of Prusa Research a.s. is methodologically correct and the sample used for verification was calculated correctly. **We have no objections to the overall calculation of the carbon footprint of Prusa Research a.s.**

References:

[1] IPCC. Transport. In Climate Change 2014 Mitigation of Climate Change. USA. 2014. p.599-670.
[2] AIB. European Residual Mixes, Results of the calculation of Residual Mixes for the calendar year 2021
[3] Czech Republic 2021 Energy Policy Review. www.iea.org (accessed Sept 11, 2022).
[4] Electric power transmission and distribution losses (% of output). The World Bank, DEFRA 2021 Advanced
[5] DBEIS 2022 Conversion Factors for greenhouse gas, DEFRA 2021 Advanced
[6] IEA Bioenergy. Municipal Solid Waste and Its Role In Sustainability. 2003 Alko. *Beverage Packing Material.* 2018.
[7] Deviatkin Ivan a kol. Carbon Footprint of Waste-derived Composites. *Reference Module in Materials Science and Materials Engineering.* 2021.
[8] Fujitsu. Product Life Cycle Assessment 2021. 2022.
[9] Lien-Chieh Lee a kol. Greenhouse Gas Emissions Embodied in the Chinese International Trade of Computer Products. Sustainability, 2018.
[10] Database worldsteel 2020 (EF 3.0) a ef_secondarydata_202202
[11] Ethos Research. Carbon footprint of Recycled Solvents. 2013
[12] Ministry of Industry and Trade. Value of CO_2 emission factor from electricity production for the years 2010-2021. 2021
[13] Total Carbon. Low carbon footprint of PLA confirmed by peer reviewed Life Cycle Assessment. 2019
[14] Toshio Isohara. Environmental Impacts of Steel Products (LCA of Steel Products). 2022

TÜV NORD CERT GmbH
confirms that **Envitrail s.r.o.** operates a management system in accordance with the requirements of ISO 9001:2015 with the scope of validity:

Carbon Footprint Calculation

Certificate Registration Number: 44 100 22 52 0013; Audit, Report No.: 0212/2022

EnviTrail www.envitrail.com

Envitrail s.r.o.
Bucharova 2257/12
158 00 Praha 5
Czech Republic

APPENDIX 4:
DHL CARBON FOOTPRINT COMPENSATION CERTIFICATE

GOGREEN CERTIFICATE 2022

Prusa Research a.s.

offset a total of **46,130.82 kg CO_2e**
for 2022 with GoGreen Climate Neutral services.

Deutsche Post DHL Group has offset the greenhouse gas emissions generated by transportation and logistics through worldwide, registered climate protection projects.

More details about the DPDHL GoGreen Projects Portfolio and selection criteria can be found at:
dpdhl.com/gogreen-projects

Michiel Greeven
Executive Vice President
Sales Express Global & Europe

This certificate is issued by Deutsche Post DHL Group. The greenhouse gas emissions stated on this certificate (reported as CO_2e*) include emissions from transport and logistics as well as upstream emissions from fuel and energy production. The emissions have been calculated and offset via expenditures on climate protection projects as mentioned above. SGS (Société Générale de Surveillance) has verified the tracked greenhouse gas emissions and the related offsets against the Carbon Management System and according to the „Greenhouse Gas Protocol - Product Life Cycle Accounting and Reporting Standard" for the period of 01.01.2022 to 31.12.2022.

* CO_2e: The CO_2 equivalents for our emissions offset include carbon dioxide (CO_2) as well as further GHG emissions such as methane (CH_4).

PRUSA RESEARCH by JOSEF PRUSA

If you have any questions, ideas or recommendations, please let us know at: sustainability@prusa3d.cz