



3D-printed luminaires

Innovations for a more sustainable world

Venture Telecaster

Do you recognise this?



Kodak's 1st digital camera in 1975.

Weighing more than 4 kg

Had an image quality of 0.01 M pixel

The tape recorder took 23 seconds to store the image.

Not an immediate commercial success at the time.....now one of the most present technologies in todays society

©ignify

How fast Technology can accelerate.

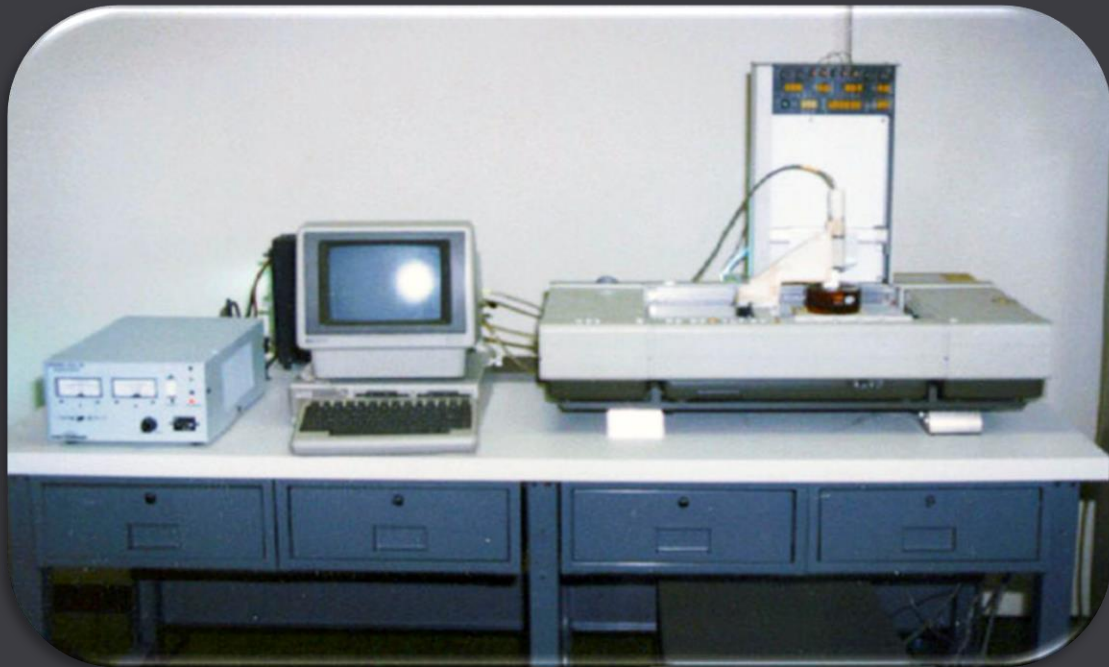
In 1927, Russian scientist Oleg Losev published details in a Russian journal about what might be considered the first LED and applied for a patent.

In addition, the materials he used were not particularly suitable for a good light output. It took until 1962 for the LED to be applied as indicator LED's in electronic equipment.

Only in the 21st century did LED's break through in general lighting

1963





The 1st 3D printers 1983

Additive manufacturing (AM) involves the whole process of making 3D solid objects from computer-generated files, or digital files. The actual 3D printing process is only one part of the entire procedure. Despite this, the two terms are largely interchangeable these days, so for the sake of simplicity we'll use 3D printing most of the time.



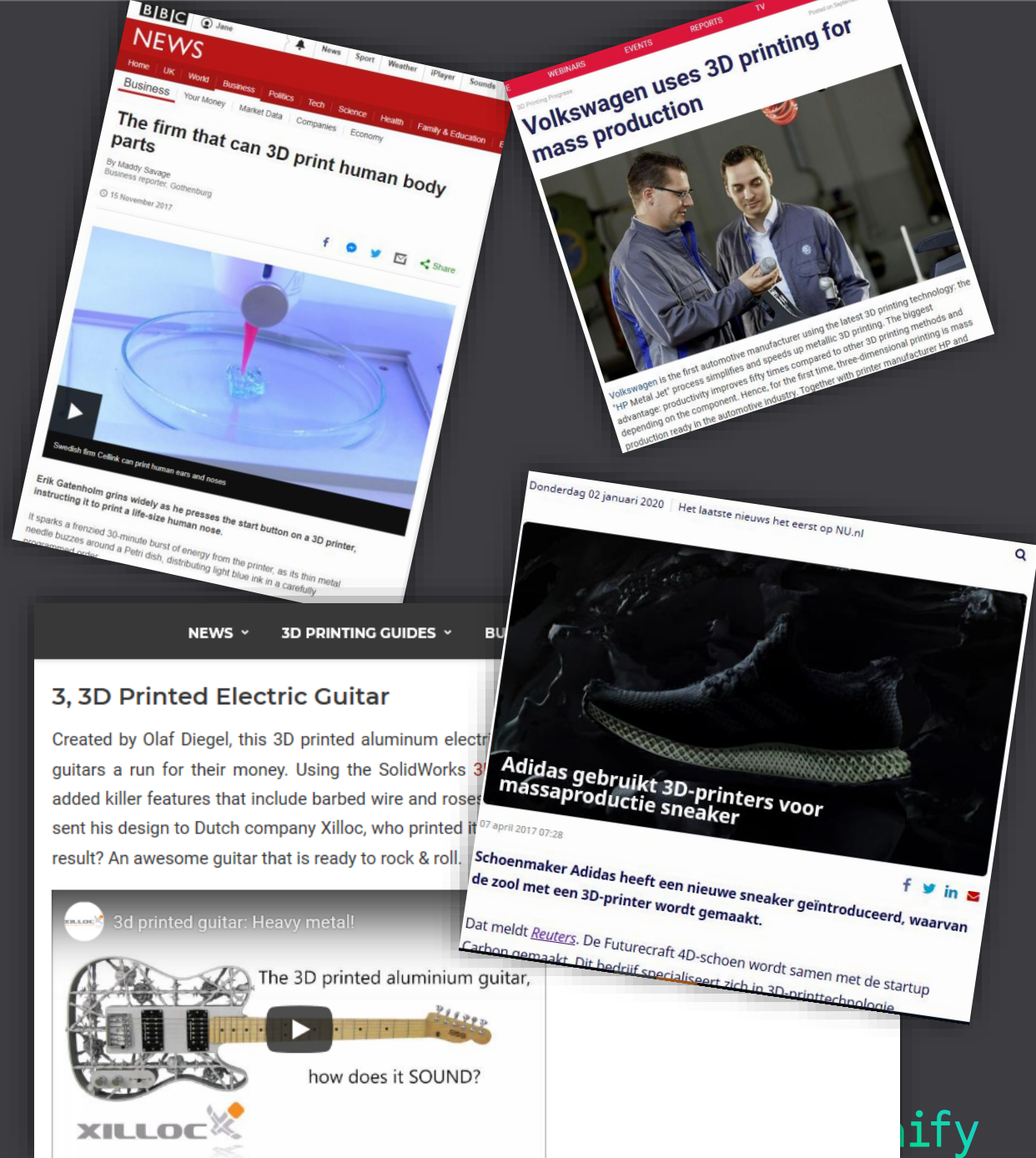
Also in 1992, DTM Inc. presented the first ever selective laser sintering (SLS) machine to the world. SLS works by shooting a laser at a powdered material rather than a liquid.

So as with the digital camera and LED's, 3D printing technology has  Signify

*<https://3dinsider.com/3d-printing-history/>

3D Printing, from niche to mainstream

- Medical Applications
- Instruments
- Foot wear
- Car industry





3D Printing on an Industrial Scale for Lighting

As with foot wear and the car industry 3D printing technology provides major benefits for lighting too

- Flexibility to offer choice & customisation possibilities
- New design possibilities to enhance atmosphere
- Sustainability benefits
- All at an affordable price

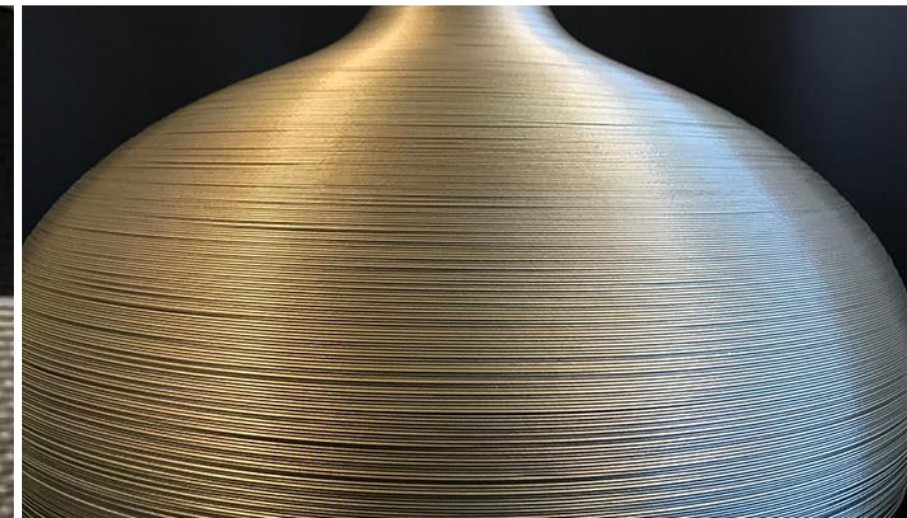
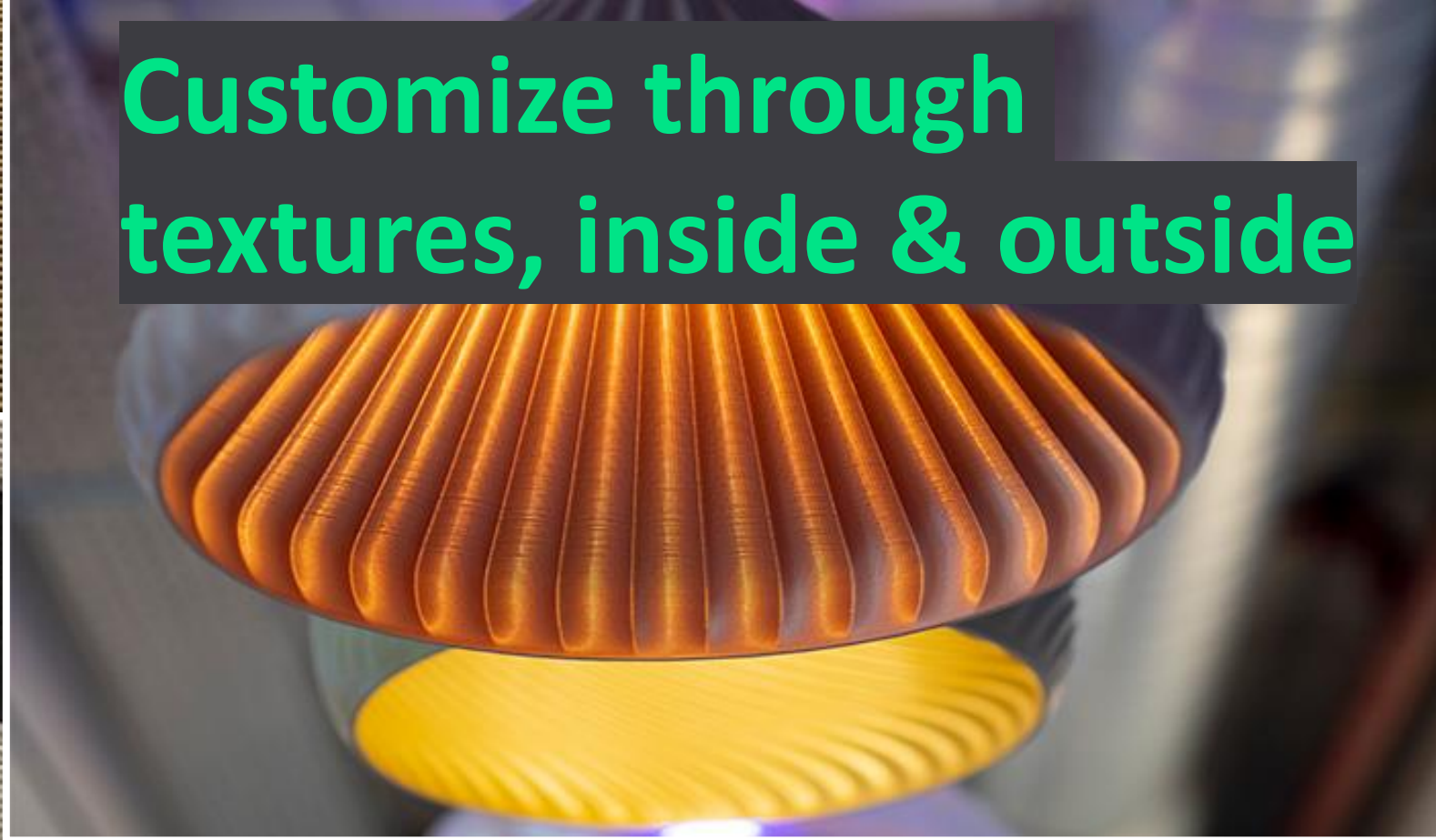
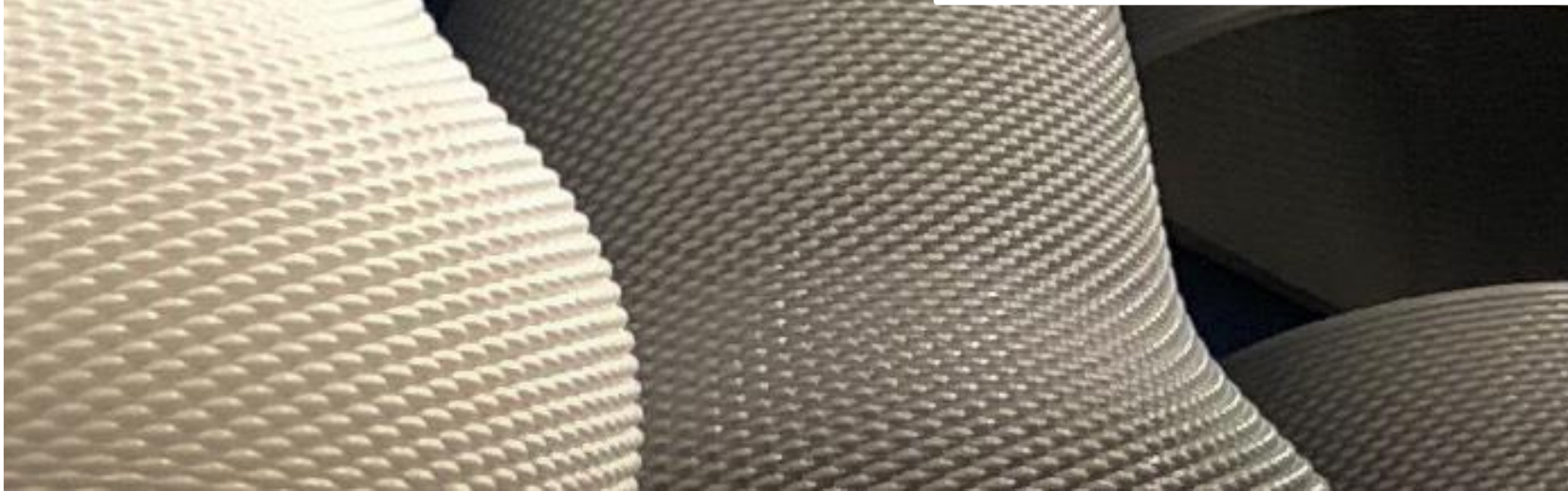
Flexibility & Customization





**Customize through shapes,
materials & colours**

**Customize through
textures, inside & outside**



Tailored design **for everyone**

Configure your favorite design in functional and decorative lighting



Define your
shape & size

Choose
the **material**

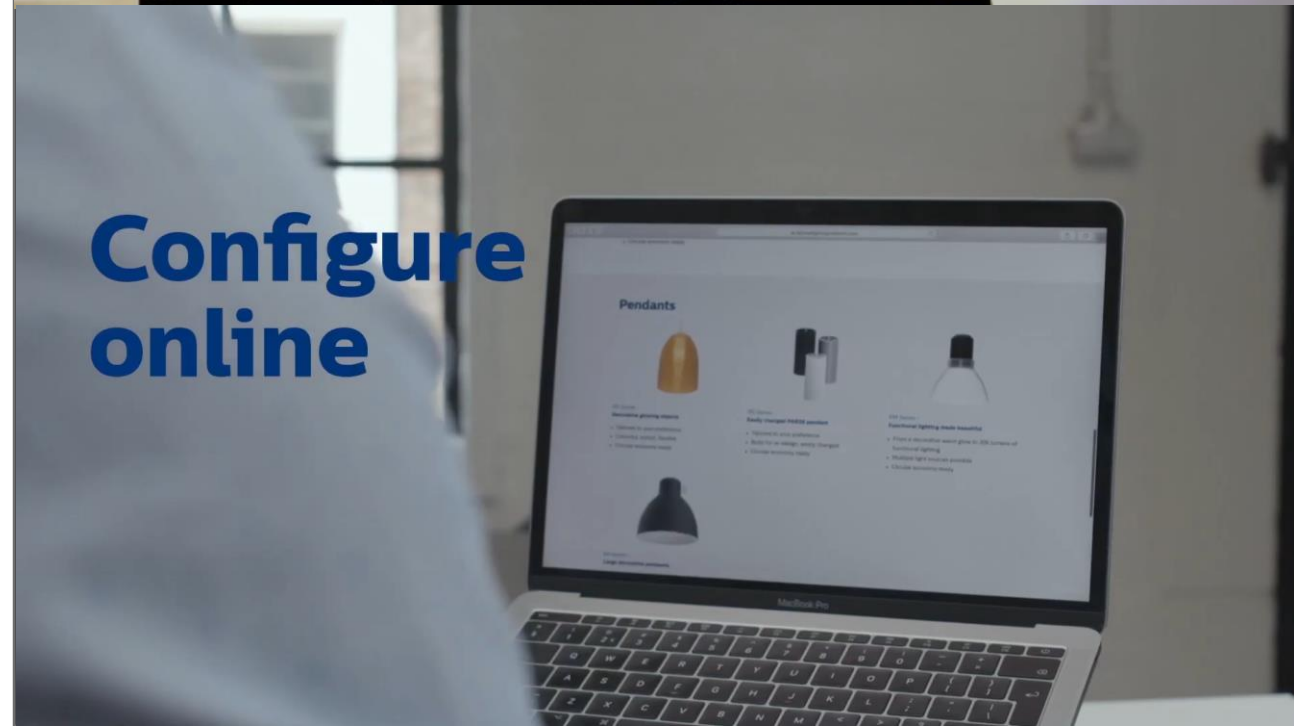
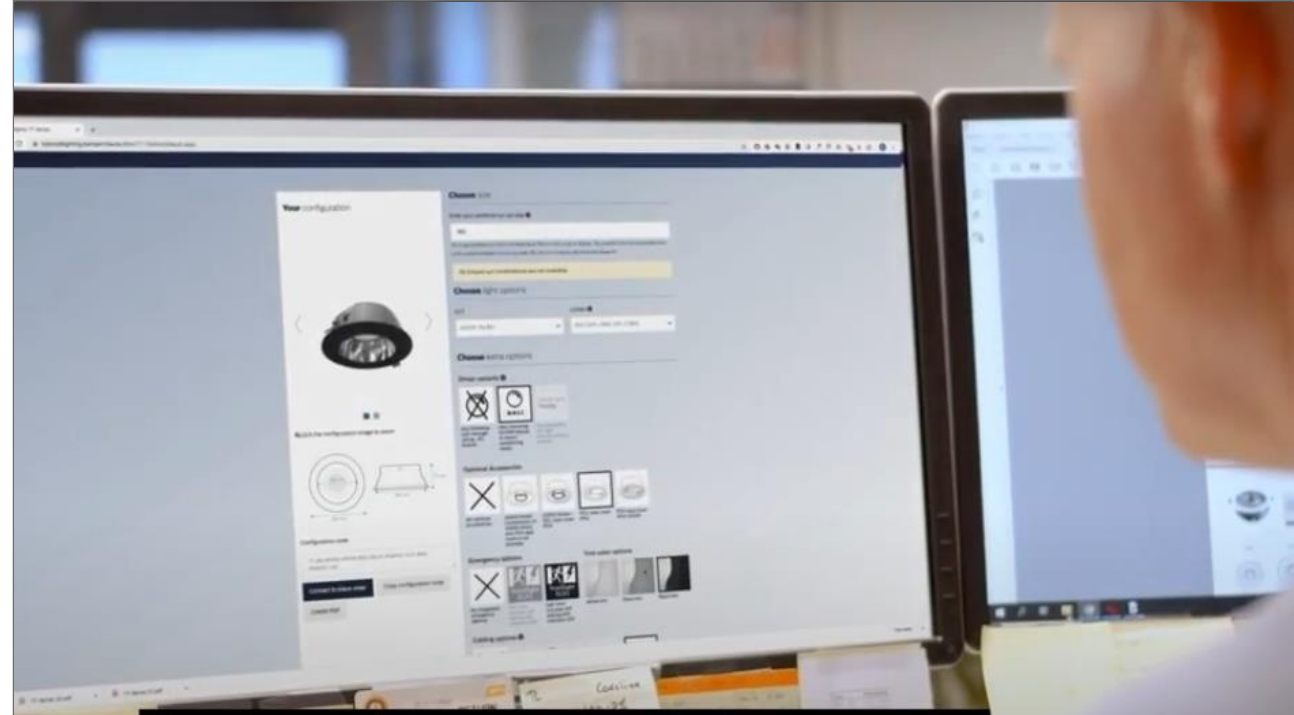
Select
the **texture**

Determine the
lighting details

**Hit the
button!**

Tailored design for everyone

- ✓ Save time and energy browsing through catalogues.
- ✓ You can configure your product in less than 1 minute
- ✓ Check it out:
- ✓ <https://www.tailored.lighting.philips.com/en/series.aspx>



Meet the Series | No need to start from scratch

Pendant Series



Downlight Series



Projector Series



Spot Series

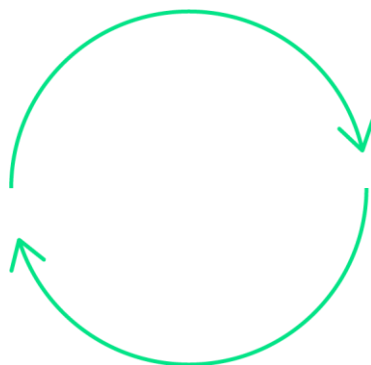


BR Series



Signify & Sustainability

The Brighter Lives, Better World program,
our contribution to a sustainable world



Signify & 3D printing

How 3D printed sustainable solutions
contribute to sustainability



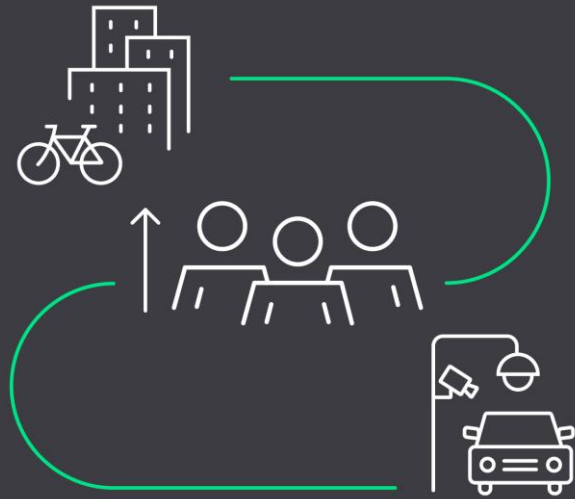


©ignify

Brighter Lives, Better World
our contribution to improved living
conditions and a sustainable world

Sustainability, Signify

Our world is changing - Global trends shaping our business



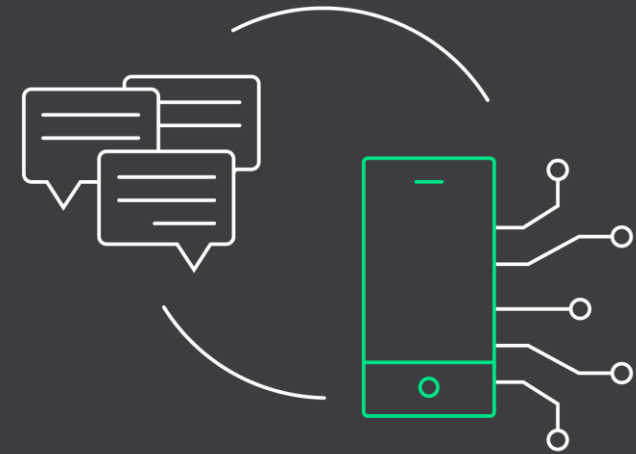
Population growth

▼
more light



Resource challenges

▼
more energy efficient light



Digitalization

▼
more digital light

**Today, lighting accounts for 13% of the world's electricity demand.
The global shift to LED will reduce this to 8% by 2030.**

Global shift to LED

LED reduces global electricity demand from 13% to 8%

This equals 1200 coal-fired power stations

So the air will be cleaner, and we contribute to fighting global warming



Coal-fired power station in Juliette, Georgia. Using 12 million ton coal per annum.

Our Brighter Lives, Better World commitments for 2020

Sustainable revenues

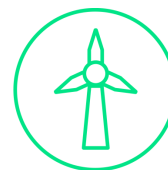


80% of revenues from sustainable products, systems and services



More than 2 billion LED lamps and luminaires delivered by 2020

Sustainable operations



100% carbon neutral & 100% renewable electricity



Zero waste to landfill in our operations









Safe and healthy workplace



Sustainable supply chain

Our progress and Q1 2020 results

| | | 2015 baseline | Q1 2020 result | 2020 target |
|--|---|------------------------------|-----------------------------|--------------------------|
| Sustainable revenues |  | 72.1% | 83.5% | 80% |
| LED lamps & luminaires delivered <i>(Cumulative since 2015)</i> |  | 0 | 2.427 Billion | >2 billion |
| Carbon footprint |  | Gross 666 kt CO ₂ | Gross 79 kt CO ₂ | Net 0 kt CO ₂ |
| Waste to landfill |  | 3,304 tonnes | 45 tonnes | 0 tonnes |
| Safe & healthy workplace |  | TRC = 0.66 | TRC = 0.26 | TRC = 0.35 |
| Sustainable supply chain |  | 90% performance rate | 97% performance rate | 90% performance rate |



We achieved the **highest score** in the CDP climate disclosure: A-List



We are named **DJSI Industry Leader** for 3 consecutive years



We received the EcoVadis **Platinum Medal** and are in the **top 1%** of companies assessed

Carbon Footprint

Savings Q1 extrapolated for full 2020 reduces carbon footprint with 316 kt CO₂

Equivalent of:

CO₂ absorption of 14 Mio trees*

OR

Emissions of 45,000 EU residents**



*Source: <https://mossy.earth/pages/carbon-offsetting-guide>

**Source: https://ec.europa.eu/eurostat/statistics-explained/index.php/Greenhouse_gas_emission_statistics_-_carbon_footprints

Waste to landfill

Target savings end 2020
= 3304 tons

Equivalent of:

275 garbage trucks*

So we contribute to a
cleaner world now and
for our children



*Source: <https://www.scdhec.gov/environment/land-and-waste-landfills/how-landfills-work>

Our partners in achieving the Sustainable Development Goals

3 GOOD HEALTH AND WELL-BEING

SDG 3 Good Health and Well-Being



7 AFFORDABLE AND CLEAN ENERGY

SDG 7 Affordable and Clean Energy



8 DECENT WORK AND ECONOMIC GROWTH

SDG 8 Decent Work and Economic Growth



Responsible Business Alliance
Formerly the Electronic Industry Citizenship Coalition
Advancing Sustainability Globally



11 SUSTAINABLE CITIES AND COMMUNITIES

SDG 11 Sustainable Cities and Communities



WORLD GREEN BUILDING COUNCIL



LIGHTING EUROPE
THE VOICE OF THE LIGHTING INDUSTRY



12 RESPONSIBLE CONSUMPTION AND PRODUCTION

SDG 12 Responsible Consumption and Production



EucoLight
European Association of lighting
WEEE compliance schemes



13 CLIMATE ACTION

SDG 13 Climate Action



south pole



THE CLIMATE GROUP

United Nations
Framework Convention on
Climate Change





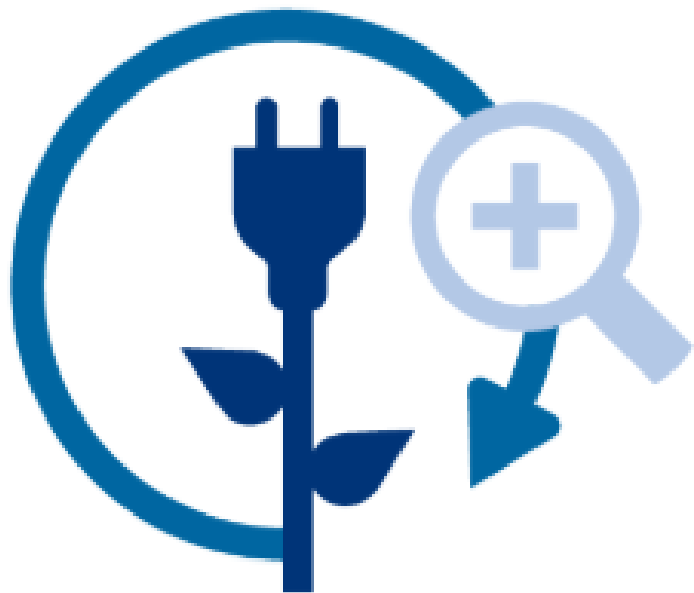
3D-printed luminaires

a contribution to sustainability

Venture Telecaster

Our contribution to sustainability

Reduce carbon footprint , support the circular economy



Support the circular economy



Reduce your carbon footprint

Our contribution to sustainability

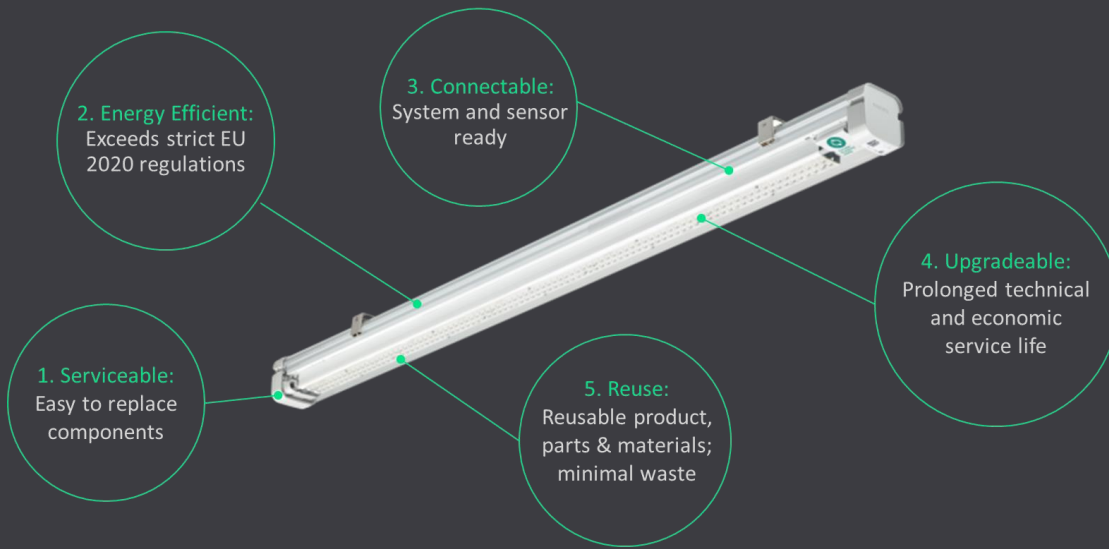
Support the circular economy – circular economy ready luminaires

Circular specifications:

- Replaceable driver, controls and mechanical parts
- Luminaire can interface with a system or sensor
- Exceeds the strict 2020 EU Single Lighting regulation
- Environmental Product Declaration (family level)
- All circular benefits and specs in product leaflet

Other Circular Economy ready families:

- Pacific LED
- Truelne
- GentleSpace
- Maxos fusion
- Various outdoor products



Our contribution to sustainability

Support the circular economy – additional benefits 3D Printing



No paint, less parts, less screws

3D-printed luminaires are designed for a circular economy, reducing significant waste

- Higher serviceability and upgradable by default due to smart modular design. Advantage of these modular designs is that at the end of life dismantling of these products for recycling becomes easier.



100% recyclable polycarbonate

3D-printed luminaires are designed for a circular economy, reducing significant waste

- Closing the material loop within the factory, like with other Signify factories, re-using own material

Meet the New Quartz one

The lamp made from music Inspired by the best tunes from 24 CD's

[Read more](#)



EXAMPLE 1

By buying a Quartz table lamp you reduce CD's waste & contribute to a cleaner world

[Discover more here!](#)



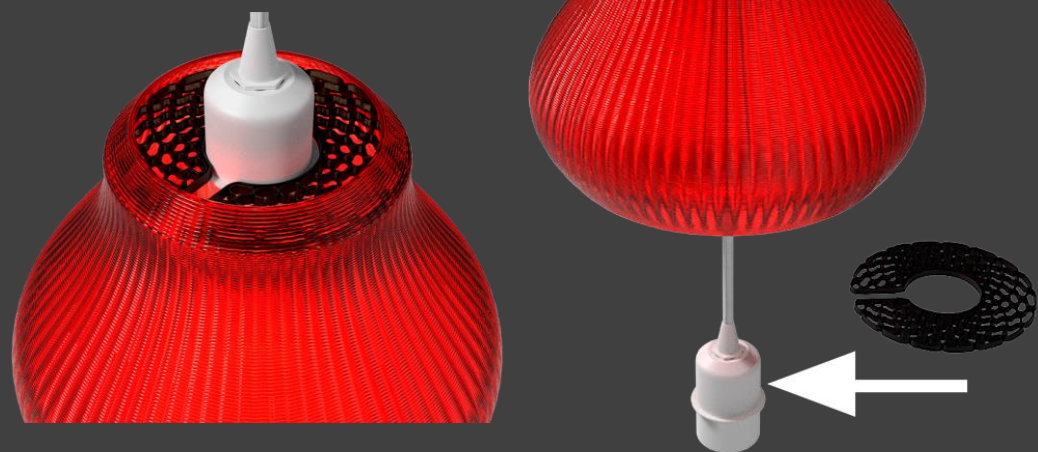


Refresh your design & Reduce waste

You can refresh your style and concept while feeling good about limiting the environmental impact. How?

We limit, and where possible eliminate, the number of screws. Check out the smart modular design of our [RD series](#).

- You can simply exchange the shade, while re-using the lamp, cable, and lamp holder. Without the need for tooling to disassemble these parts.
- Dismantling of our products at the end of life for recycling becomes easier.

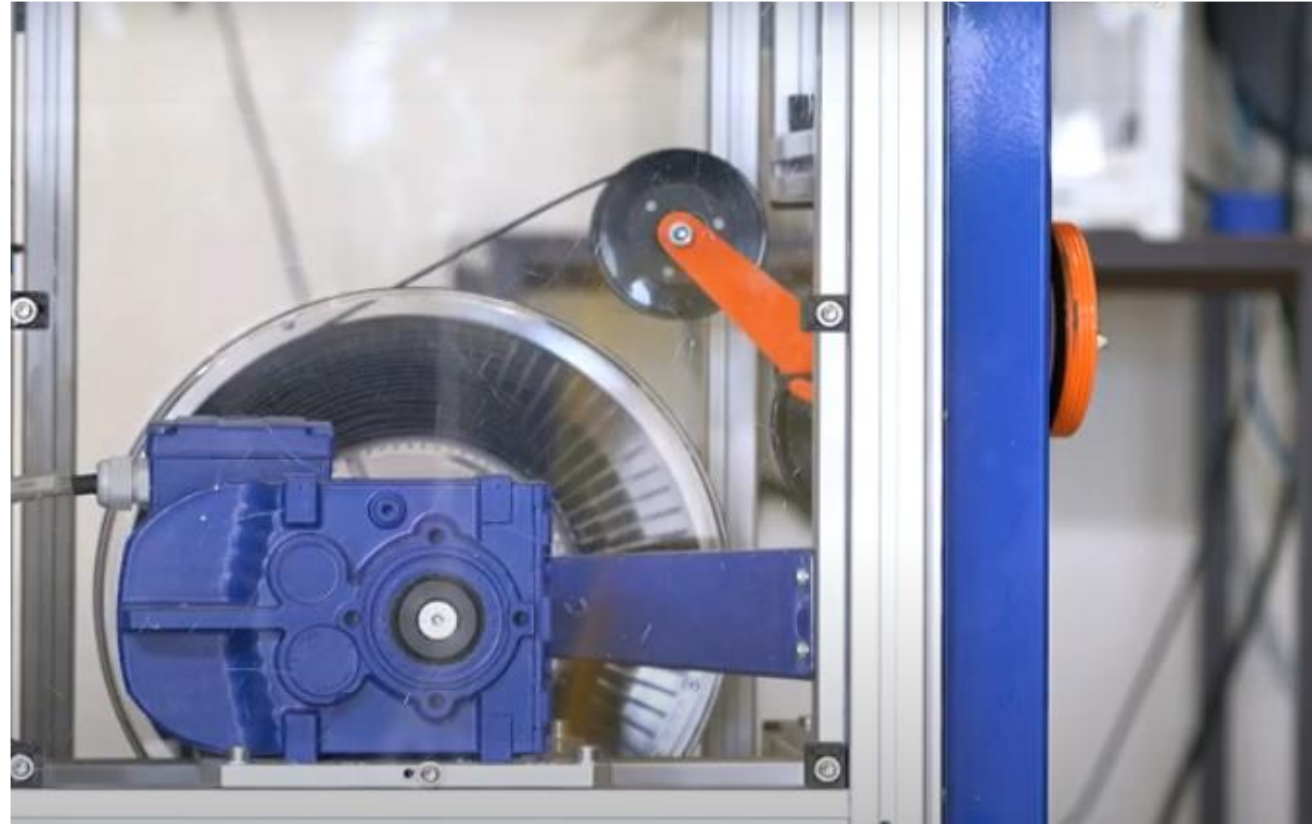


EXAMPLE 2
REDUCE WASTE

EXAMPLE 3

REDUCE WASTE & RECYCLE

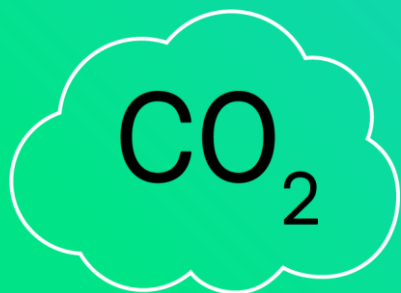
We recycle rejects in our filament production. This means that we minimize waste when producing our 3D printed products, so the environment benefits too.



Our contribution to sustainability

Reduce the carbon footprint

We have a firm commitment to reduce our environmental impact.

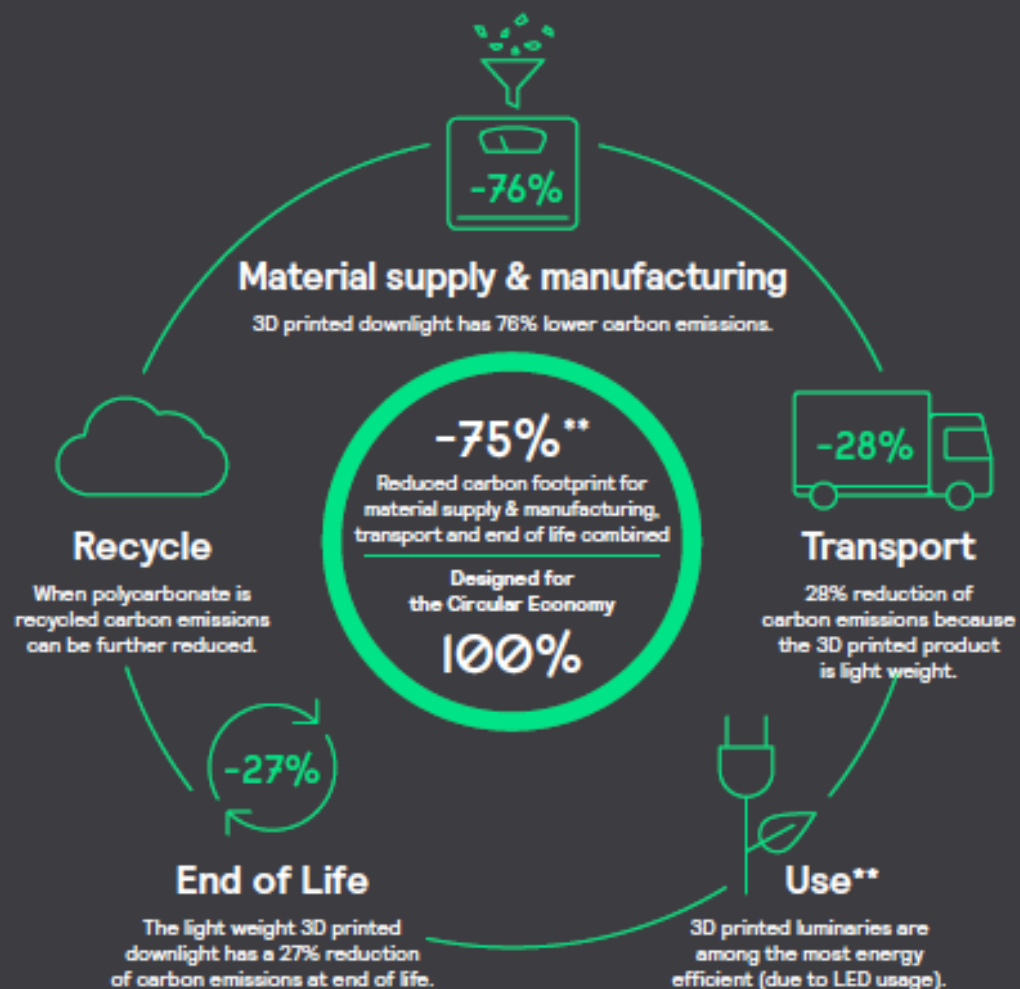


Up to 75% carbon footprint reduction for:

- Material supply & manufacturing
- Transport
- End of Life

Use phase = Dominant phase

- Select the most efficient product, use controls to dim the light when possible delivers the highest carbon savings during the lifetime
- As in Signify we use the same LED's, drivers and control systems the carbon emissions during the use phase are comparable between 3D printed and traditionally manufactures fixtures



*Impact Assessment Carbon footprint IPCC 2013 GWP 100. Data based on comparison of a traditionally manufactured downlight using a die casted aluminium housing with a 3D printed downlight in polycarbonate. Data for other products will vary.

** The use phase, though having the highest impact during the life cycle, is excluded as it is the same between the 2 compared products. The use phase relates to the electricity consumption of the downlight to provide light.

Carbon savings are product dependent



3D Printed

VS



Metal

Material supply & manufacturing, transport, end of life (excl. use phase)

24% savings

- Full product comparison, all parts included



3D Printed

VS



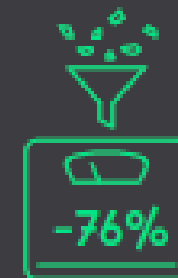
Alu die cast

75% savings

- Full product comparison, all parts included

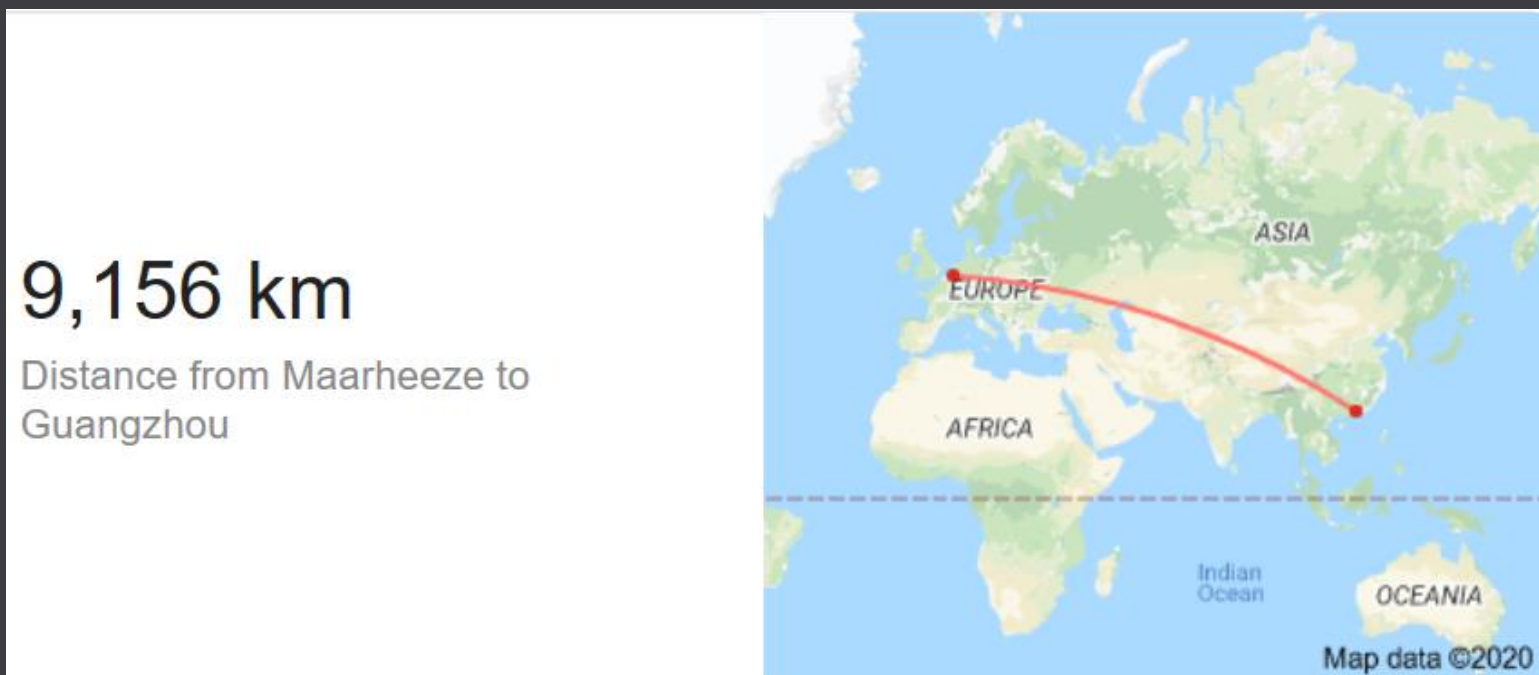
Our contribution to sustainability

Reduce the carbon footprint – material supply & manufacturing



Local production of parts that can be 3D printed saves carbon emissions versus die casted parts often sourced from the far east.

Parts concerned can be housings & back parts in projectors for instance



Our contribution to sustainability

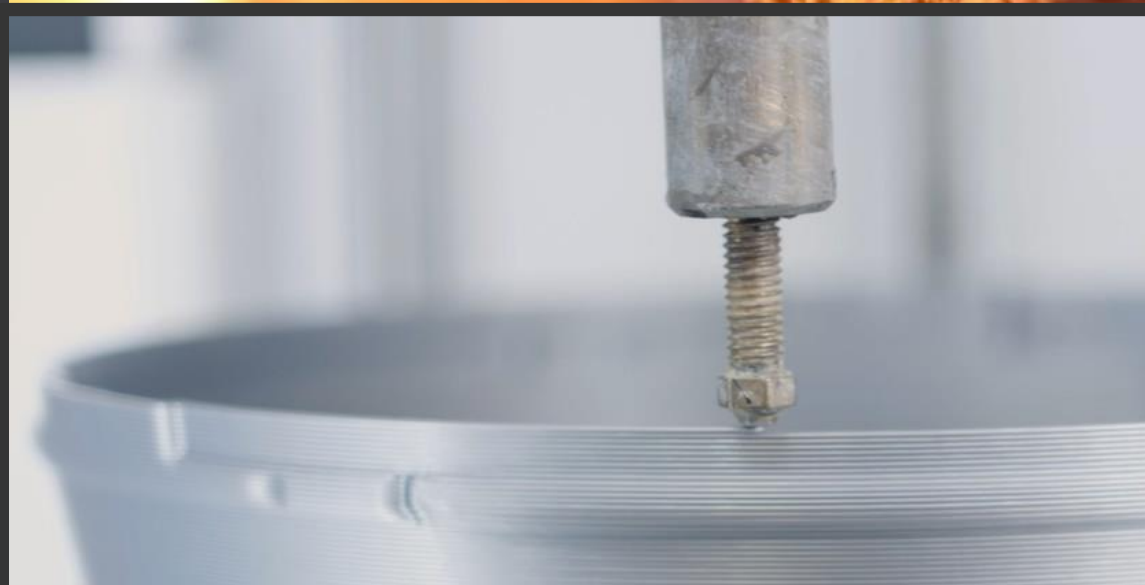
Reduce the carbon footprint – material supply & manufacturing*



Energy usage for die casting processes is 4X higher than for 3D printing

Melting aluminum consumes a lot of energy

*Data based on comparison of a traditionally manufactured downlight using a die casted aluminium housing with a 3D printed downlight in polycarbonate. Data for other products will vary.



Our contribution to sustainability

Reduce the carbon footprint – transport*



Due to the light weight of polycarbonate less fuel is used during transport



*Data based on comparison of a traditionally manufactured downlight using a die casted aluminium housing with a 3D printed downlight in polycarbonate. Data for other products will vary.

Our contribution to sustainability

Reduce the carbon footprint – end of life*

-27%

Due to the light weight of polycarbonate less energy is consumed during end of life for shredding

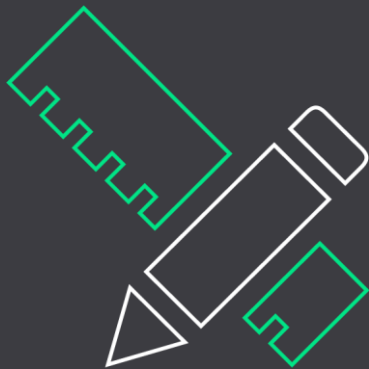


*Data based on comparison of a traditionally manufactured downlight using a die casted aluminium housing with a 3D printed downlight in polycarbonate. Data for other products will vary.

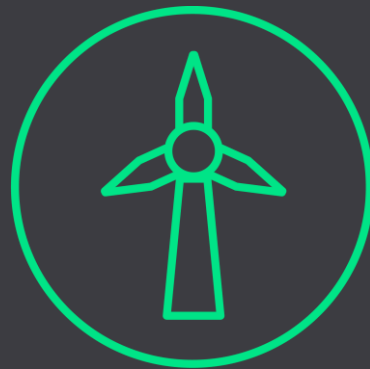
Shaping the future | revolutionary 3D printed lighting creations

We turn the dream into reality: customization for the mass.

Sustainability: Brighter lives, better world



Tailored design
for everyone



**100% carbon neutral &
100% renewable electricity**



Zero waste to landfill
in our operations



Additional 3D sustainability
benefits



Q&A

Kindly use the Q&A tab at the bottom of the screen for any questions you may have.

Signify