UV-C Disinfection

The new norm for a healthy & productive workplace

July 2020

Our new company name

Signify

Our global product brand

PHILIPS

Signify is the world leader in lighting.

We provide high-quality energy efficient lighting products, systems and service.

Light sources	Luminaires	Systems and Services
		

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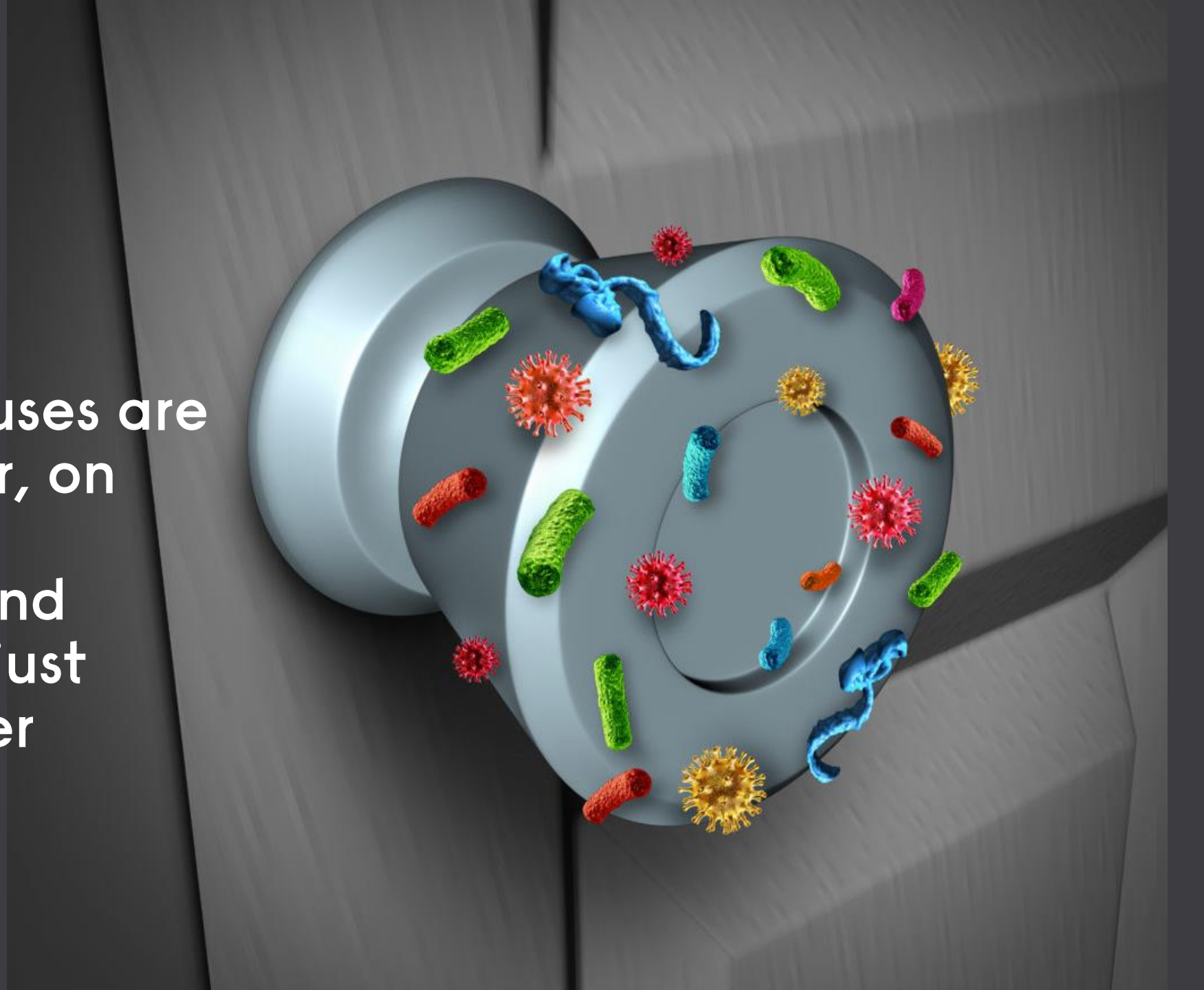
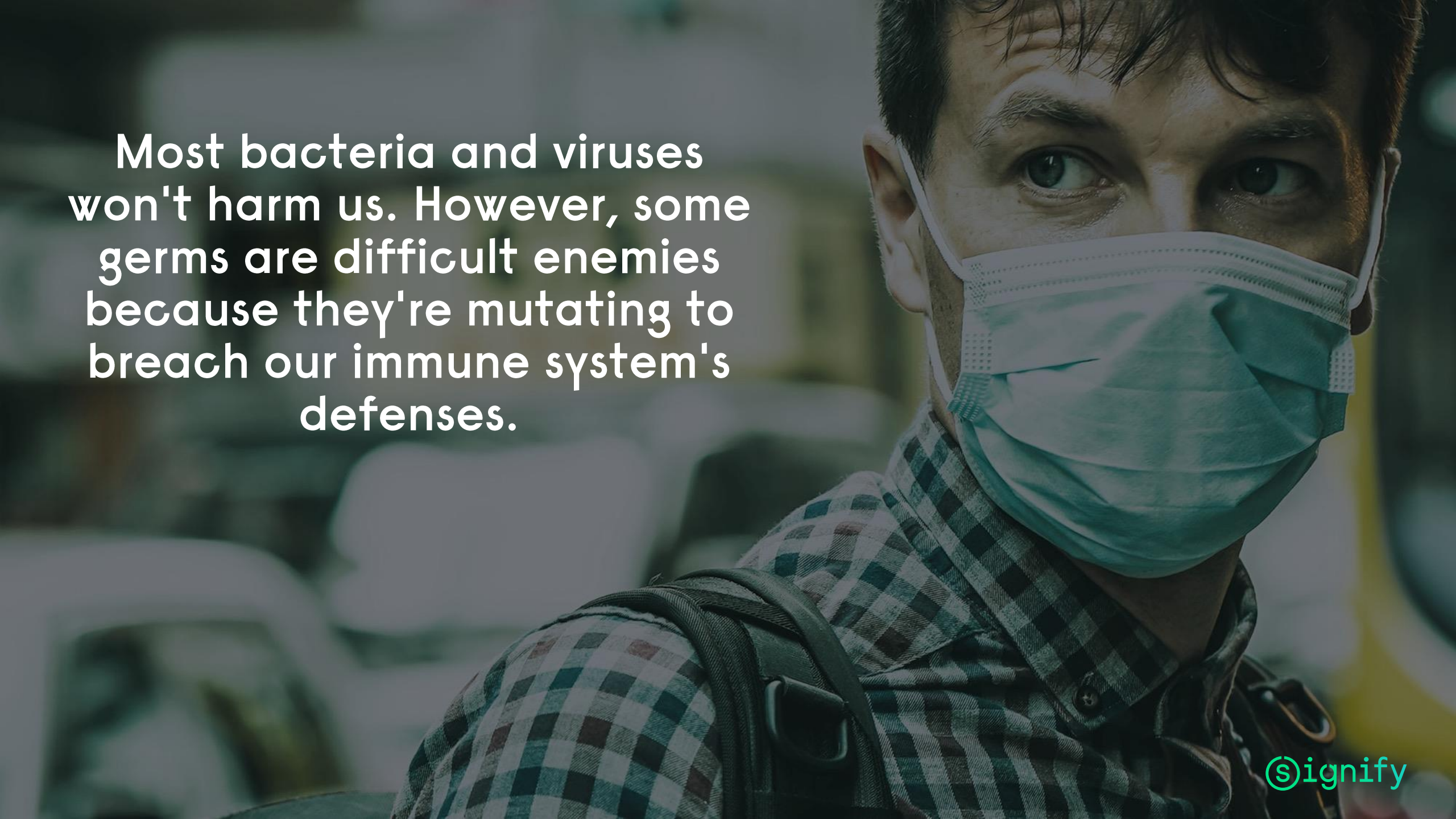
Contents

Bacteria and viruses are present in the air, on food, plants and animals, in soil and water — and on just about every other surface…




Most bacteria and viruses won't harm us. However, some germs are difficult enemies because they're mutating to breach our immune system's defenses.
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We touch our faces all the time

Scientists researching this behavior find that people are constantly touching their faces.

A study from 2015, observed 26 medical students at a university in Australia to discover they touched their faces **23 times per hour**.

Almost half of the face touches involved the **mouth, nose, or eyes**, which are the easiest pathways for viruses and bacteria to enter our bodies.

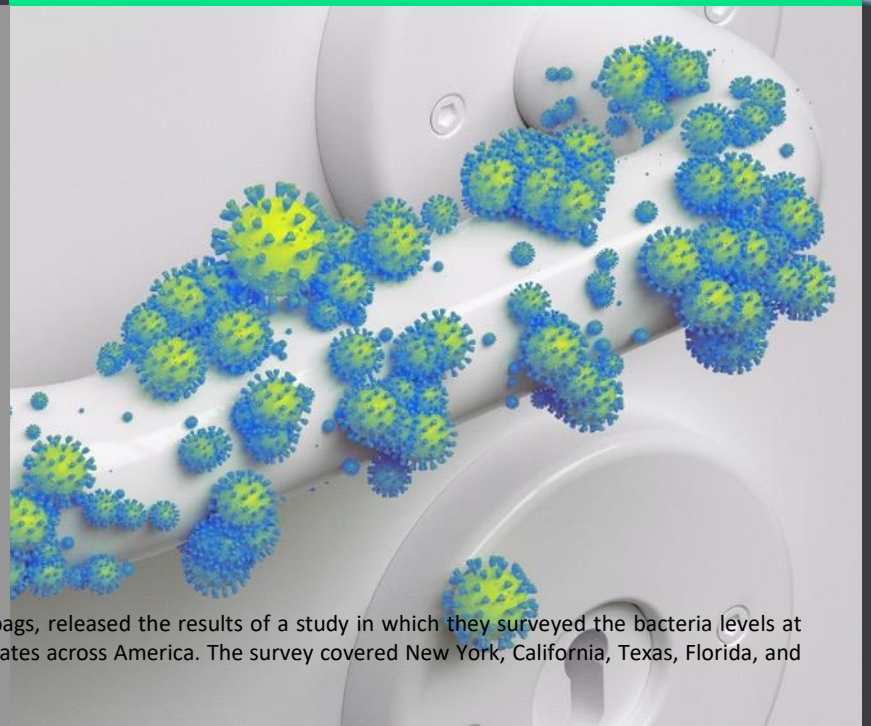
23 times per hour!

Source: PubMed.gov
A Study Quantifying the Hand-To-Face Contact Rate and Its Potential Application to Predicting Respiratory Tract Infection, Face Touching: A Frequent Habit That Has Implications for Hand Hygiene

Grocery stores have several high touch areas that are prone to bacteria transmission

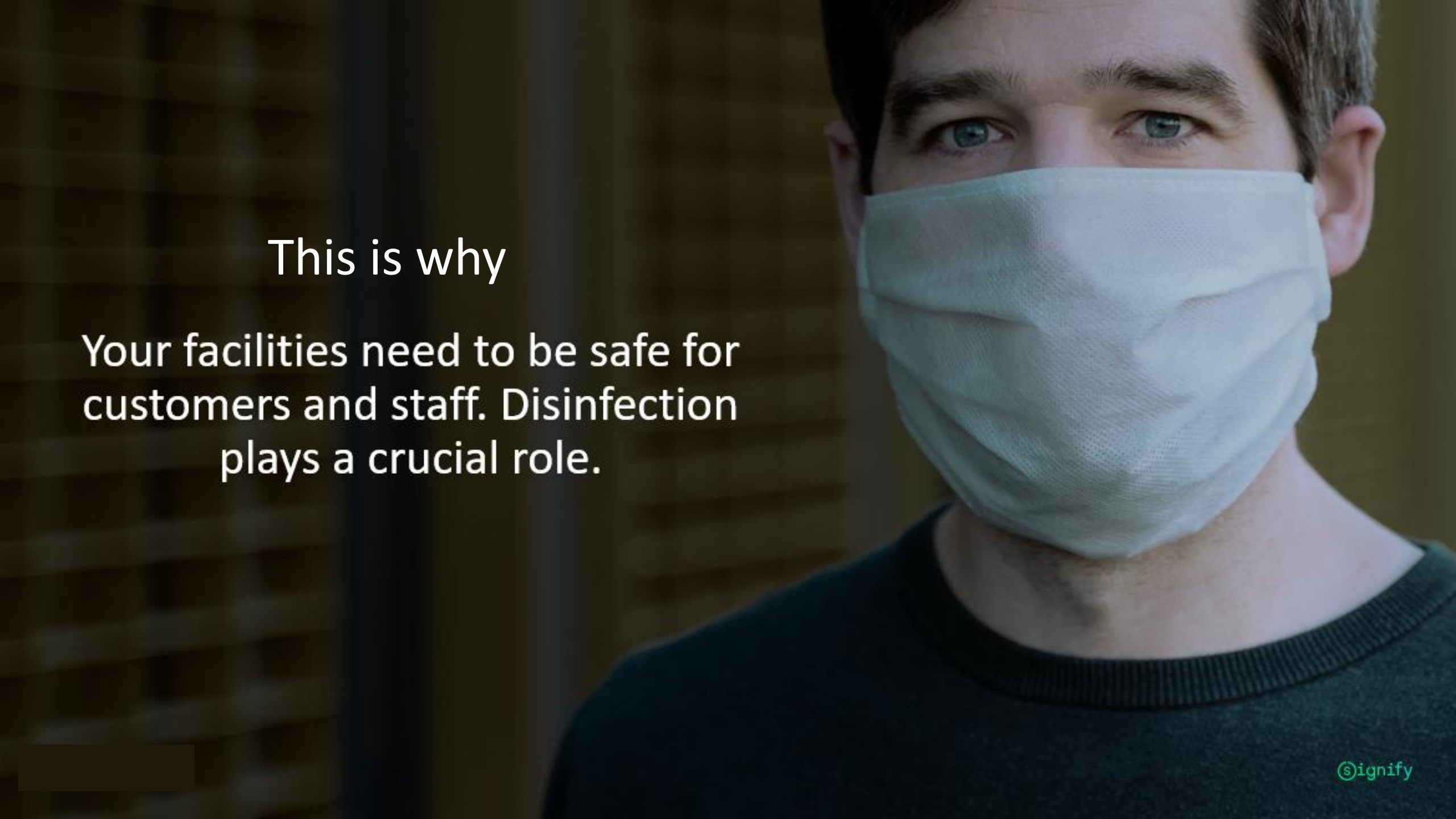
Traditional grocery store shopping carts have 361 times more bacteria than a bathroom doorknob.

Supermarket fridge doors have 1,235 times more bacteria than the surface of your cell phone.



50% of self-checkout touchscreens sampled had fecal bacteria on them.

Source : Reusethisbag.com, an online retailer for reusable shopping bags, released the results of a study in which they surveyed the bacteria levels at more than 100 grocery stores of varying sizes and price levels in 10 states across America. The survey covered New York, California, Texas, Florida, and Maine.


This is why
Your facilities need to be safe for customers and staff. Disinfection plays a crucial role.
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Signify and Boston University have validated the effectiveness of our light sources on inactivating the virus that causes COVID-19.

"Our test results show that above a specific dose of UV-C radiation, viruses were completely inactivated: in a matter of seconds we could no longer detect any virus."

Dr. Anthony Griffiths
Associate Professor of Microbiology, Boston University School of Medicine

BOSTON UNIVERSITY

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Solutions

What is UV light?

Ultraviolet (UV) light is invisible to human eyes. It can be subdivided into three categories:

UV-A (from 315 to 400 nm)

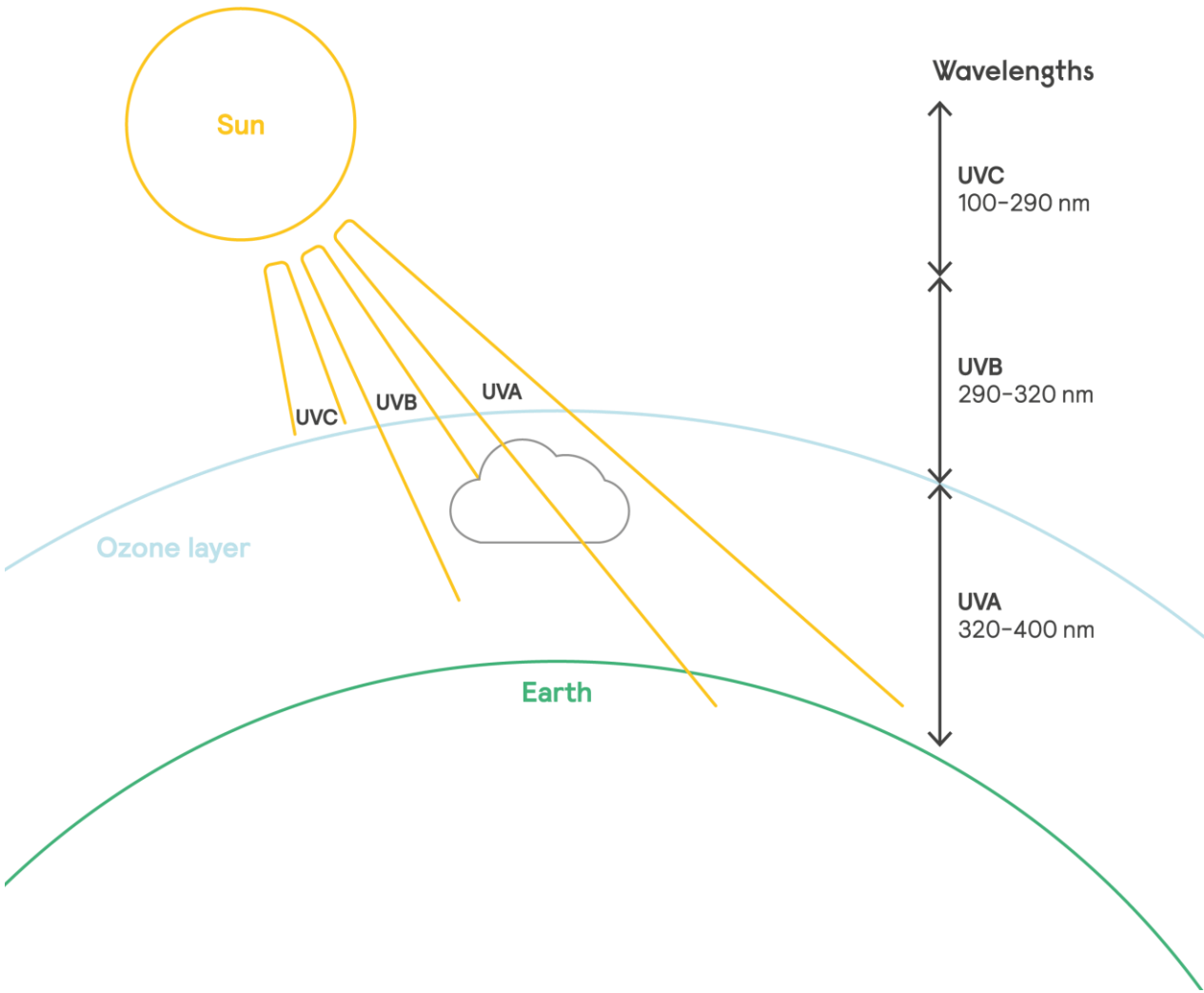
- For use with curing, sun tanning and insect traps.

UV-B (from 280 to 315 nm)

- For medical use (i.e. phototherapy to treat skin conditions, including psoriasis)

UV-C (from 200 to 280 nm)

- For disinfection purposes and germicidal application



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How can UV-C light support effective disinfection?

As part of a cleaning routine, UV-C is:

- **Proven:** successfully used for air, surface and water disinfection for over 40 years
- **Effective:** no known pathogen is resistant to UV-C radiation
- **Fast:** disinfects surfaces and objects in a matter of minutes
- **Versatile:** can be used in numerous applications

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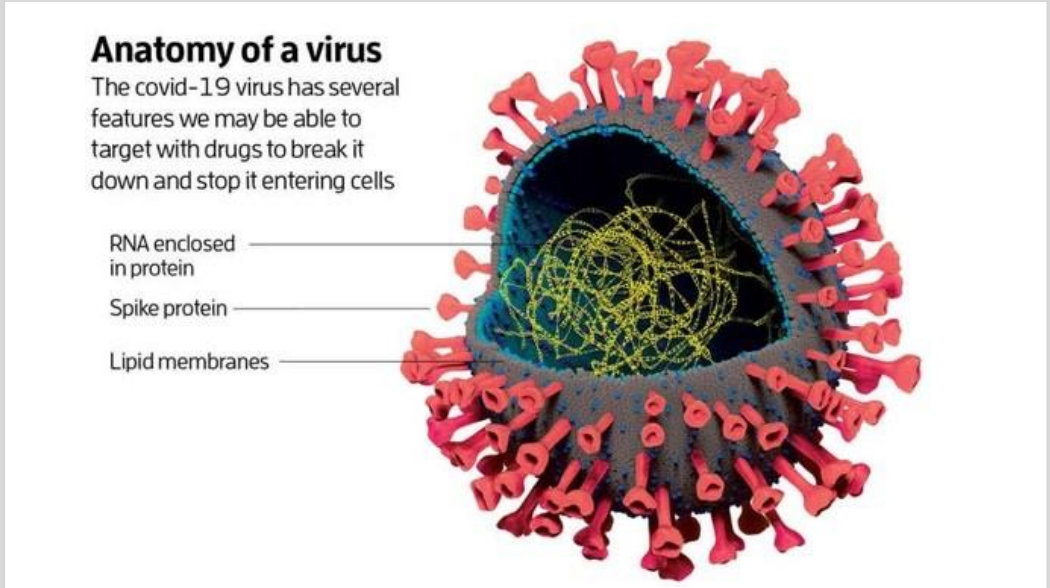
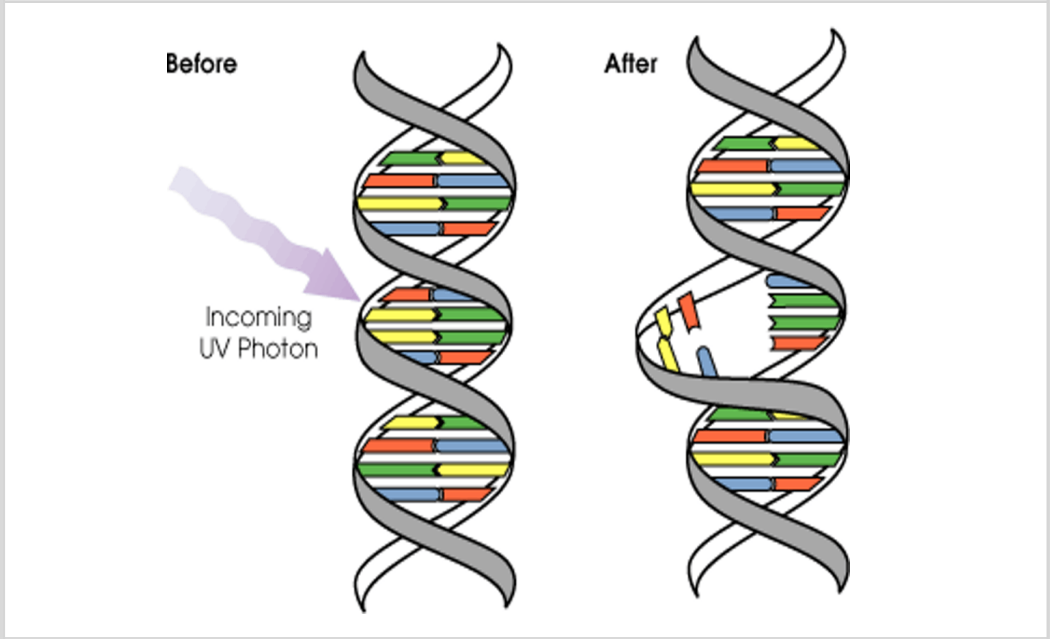
How does it work?

- UV-C radiation can **break the DNA and RNA** of bacteria, viruses and spores, meaning that they leave them harmless. There are **no known micro-organisms resistant** to UVC.[1]
- UV-C technology has been used **safely and effectively** in hospitals and governmental buildings for more than **40 years**[2]
- Most UV-C solutions **utilize conventional lighting**, with LED now improving in efficiency
- The **peak output of our germicidal lamps (253.7nm)** is close to the maximum effectiveness of UV-C (265nm)





1) Fluence (UV Dose) Required to Achieve Incremental Log Inactivation of Bacteria, Protozoa, Viruses and Algae Revised, updated and expanded by Adel Haji Malayeri, Madjid Mohseni, Bill Cairns and James R. Bolton. With earlier contributions by Gabriel Chevrefils (2006) and Eric Caron (2006) With peer review by Benoit Barbeau, Harold Wright (1999) and Karl G. Linden

2) EPA Report, "Building Retrofits for Increased Protection Against Airborne Chemical and Biological Releases" Pg. 56

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Why use UV-C as a disinfectant?

Reduce the risk of exposure for customers and staff

Make customers and staff feel better protected

Save cost by reducing disinfection cycle time

Prevent excessive spending on chemical sanitizers

Safe Usage of UV-C

The best safeguards are **proper application design**
in combination with **dedicated installer and user training**

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Applications

Looking at just surface and air, there are numerous real-world segments where UV-C lighting is a viable disinfection solution.

Retail

Work surfaces

Restrooms

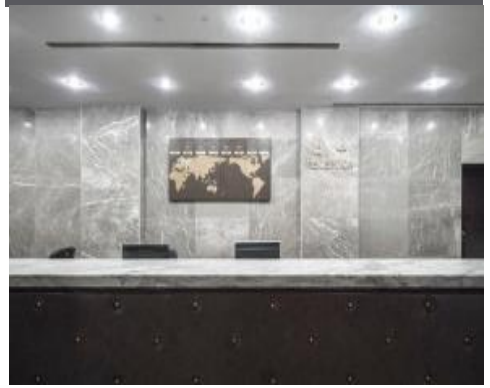
Food

Transportation

Labs

Offices

Hospitality



Entertainment

Custom chambers

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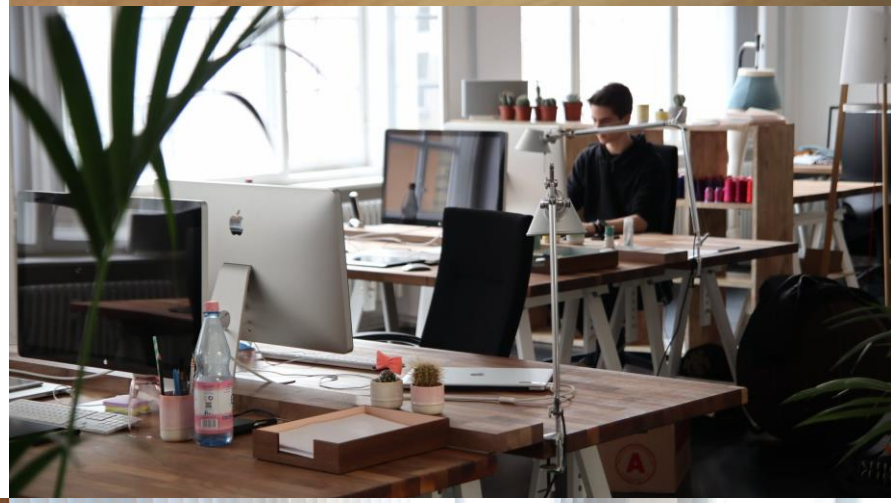
UV-C in the Workplace

- Spaces with high turnover of people presence
  - General working area
  - Reception
  - Meeting rooms
  - Pantry
  - Lifts
  - Washrooms

- Frequently touched surfaces
  - Phones, keys, headsets, remote controls, stationery
  - Doorknobs
  - Lift buttons



Preparing for a 'new normal' with UV-C disinfection

As Signify we foresee wide-ranging applications for UV-C that extend well beyond initial domains.

It is gratifying to know that the lighting technology we're providing can be on the front-line helping to eliminate the spread of the virus and enable business continuity.

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