PLASTIC IN THE FIGHT AGAINST COVID-19

Filipe Fagundes

who we are

Largest manufacturer of thermoplastic elastomers in South America

Present in all major car brands produced in Brazil

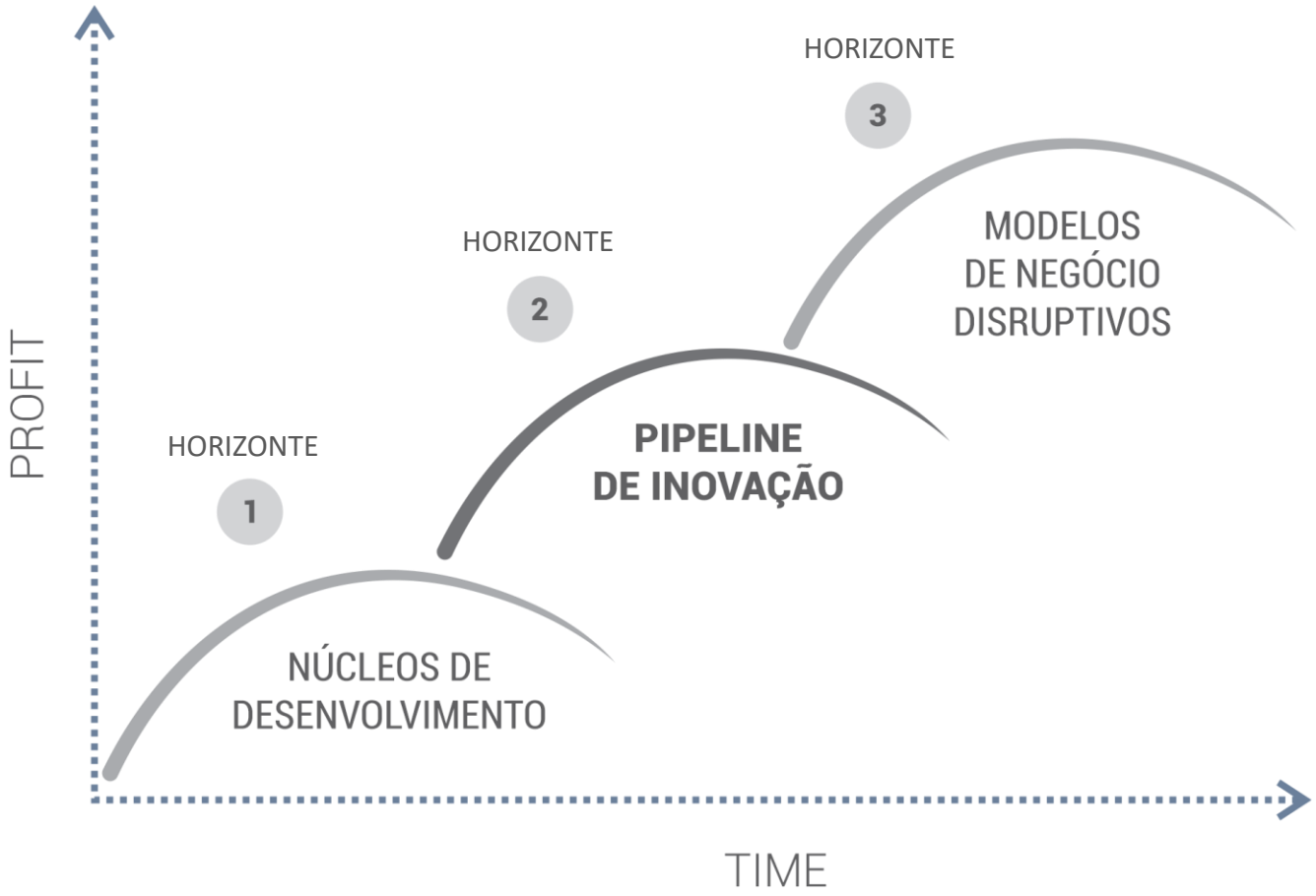
Largest polymeric mortar manufacturer in Latin America

Largest producer of seals for silos and body shells in Latin America

4º Congresso Brasileiro do PLÁSTICO

We are tireless in the search for the new,
transforming ideas into materials that change the world

PROCESS, SPEED TIMING& CONNECTIONS



PROCESS, SPEED TIMING& CONNECTIONS

PROCESS, SPEED TIMING& CONNECTIONS

NEW NORMAL

With the evolution of the coronavirus pandemic in Brazil and in the world, we had to reinvent ourselves and acquire new habits. Some changes will be fleeting, others are here to stay. Care to prevent the spread of viruses, fungi and bacteria will become the new normal of an entire generation.

Sensitive to this new moment, we work on a solution that unites technology and material science to our advantage, providing antiviral and antibacterial properties to the materials we already know.

NEW CONSUMER JOURNEY

1

PURCHASE NEED

2

WAY TO THE STORE

3

STORE EXPERIENCE

4

RETURN HOME

https://assets.kpmg/content/dam/kpmg/it/pdf/2020/04/KPMG_COVID-19_New-Retail-Customer-Experience.pdf

NEW CONSUMER JOURNEY

PURCHASE NEED

WAY TO THE STORE

STORE EXPERIENCE

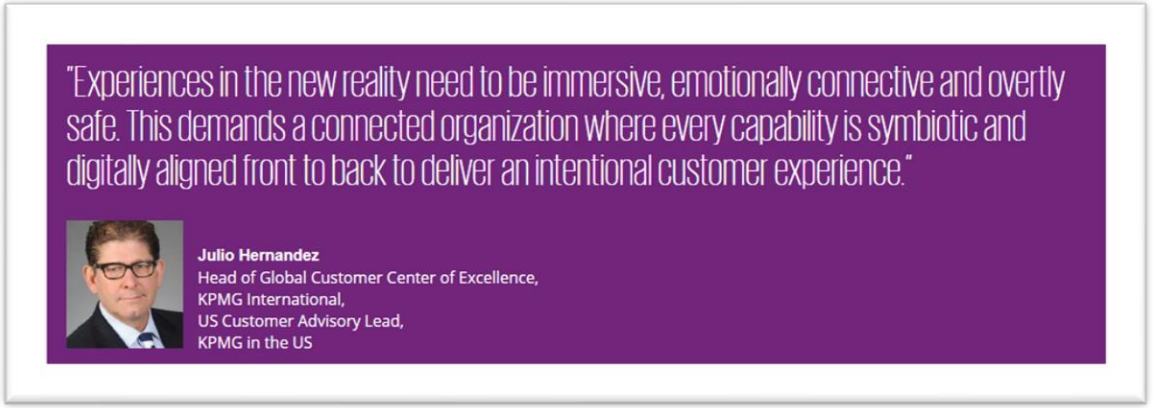
RETURN HOME

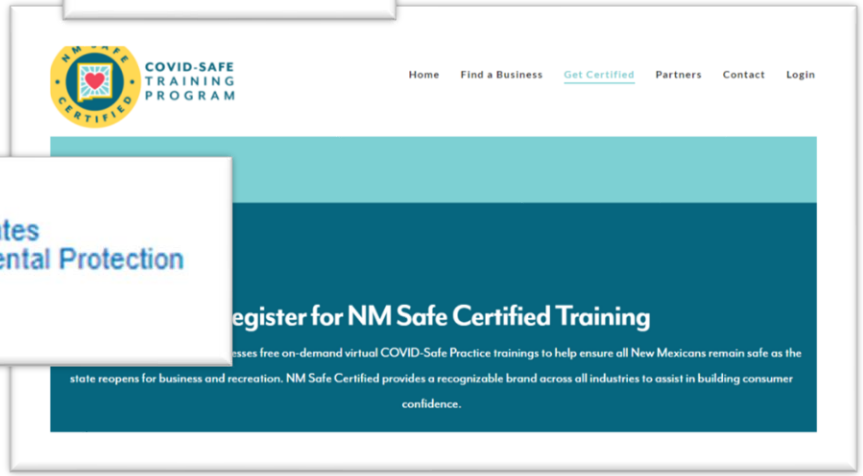
SAFETY

Consumer behavior is constantly changing, but the pandemic has accelerated these changes, and especially the relationship between people and brands / companies, consumers not only want agility and personalization, but also safety and protection.

https://assets.kpmg/content/dam/kpmg/it/pdf/2020/04/KPMG_COVID-19_New-Retail-Customer-Experience.pdf

MEGATREND - Safety Obsessed





The impact of COVID-19 on customer behavior was immediate and widespread across all industries, countries and demographics. Expectations have heightened as priorities have shifted to health and safety first, which have in turn changed decision making and buying behavior. - https://home.kpmg/xx/en/home/insights/2020/01/customer-first-insights-home.html

Importance of plastic for COVID

Most of the devices used to save lives are, totally or partially, made of plastic, such as respirators, thermometers and tests for COVID-19, in addition to other more common items, such as syringes, tubes, oropharyngeal cannulas, suction probes, catheters , packaging of saline solutions and medicines, among many others.

This is also the case for expanded polystyrene, which acts as a thermal insulator and protects against mechanical stresses, protecting sensitive pharmacological products.

In addition, single-use glasses and cutlery are important in hospitals to prevent the spread of the virus.

Indispensable during the pandemic, the personal protective equipment (PPE) used by hospital workers, consisting of masks, gloves, clothes, aprons, caps, covers and glasses are mostly plastic.

Importance of plastic for COVID

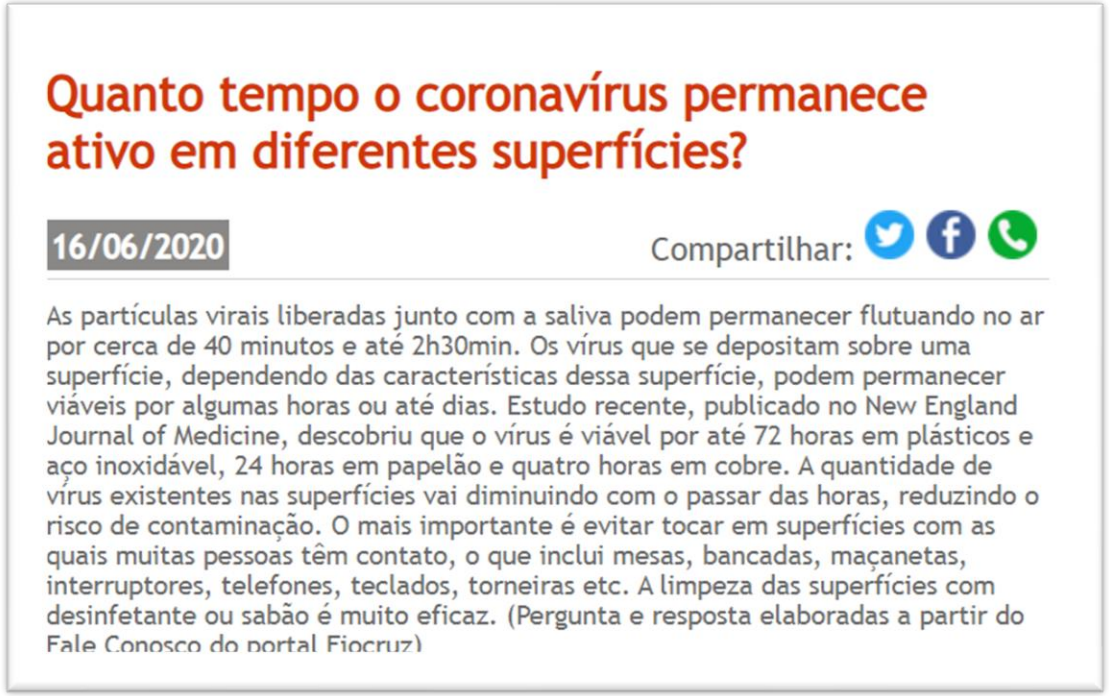
Various design elements: Our materials are used in a wide variety of components for ventilators

Ventilator in black having various design elements of differing geometries and dimensions

Machined mounting bracket in black for a ventilator

https://www.ufrgs.br/microbiologando/2020/11/11/pros-e-contras-do-plastico-durante-a-pandemia-de-covid-19-parte-2/

Persistence of the virus on surfaces vs. contagion



Quanto tempo o coronavírus permanece ativo em diferentes superfícies?

16/06/2020 Compartilhar:

As partículas virais liberadas junto com a saliva podem permanecer flutuando no ar por cerca de 40 minutos e até 2h30min. Os vírus que se depositam sobre uma superfície, dependendo das características dessa superfície, podem permanecer viáveis por algumas horas ou até dias. Estudo recente, publicado no New England Journal of Medicine, descobriu que o vírus é viável por até 72 horas em plásticos e aço inoxidável, 24 horas em papelão e quatro horas em cobre. A quantidade de vírus existentes nas superfícies vai diminuindo com o passar das horas, reduzindo o risco de contaminação. O mais importante é evitar tocar em superfícies com as quais muitas pessoas têm contato, o que inclui mesas, bancadas, maçanetas, interruptores, telefones, teclados, torneiras etc. A limpeza das superfícies com desinfetante ou sabão é muito eficaz. (Pergunta e resposta elaboradas a partir do Fale Conosco do portal Fiocruz)

https://portal.fiocruz.br/pergunta/quanto-tempo-o-coronavirus-permanece-ativo-em-diferentes-superficies

Superfície	Tempo máximo de viabilidade
Aerossol	3h (meia-vida 1.2 horas)
Plástico	Até 72h (meia-vida de 6.8 horas) em estudo que compara SARS-CoV-1 e SARS-CoV-2 (3)/ até 9 dias em revisão com outros coronavírus (1)
Aço inoxidável	Até 72h (meia-vida 5.6 horas)
Cobre	4h
Papelão	24h
Alumínio	2-8h
Metal	5 dias

adaptado de Kampf (2020) e van Doremalen (2020).

Persistence of the virus on surfaces vs. contagion

In November, Chinese authorities introduced guidelines requiring disinfection of imported frozen food packaging.

The CDC directs people to a comprehensive list of agents that kill SARS-C0V-2 and says, "Frequent disinfection of surfaces and objects touched by multiple people is important.

"Seventeen days after the Diamond Princess cruise ship was vacated, scientists found 3 viral RNA on the cabin surfaces of the 712 passengers and crew members who tested positive for COVID-19.

https://www.nature.com/articles/d41586-021-00251-4

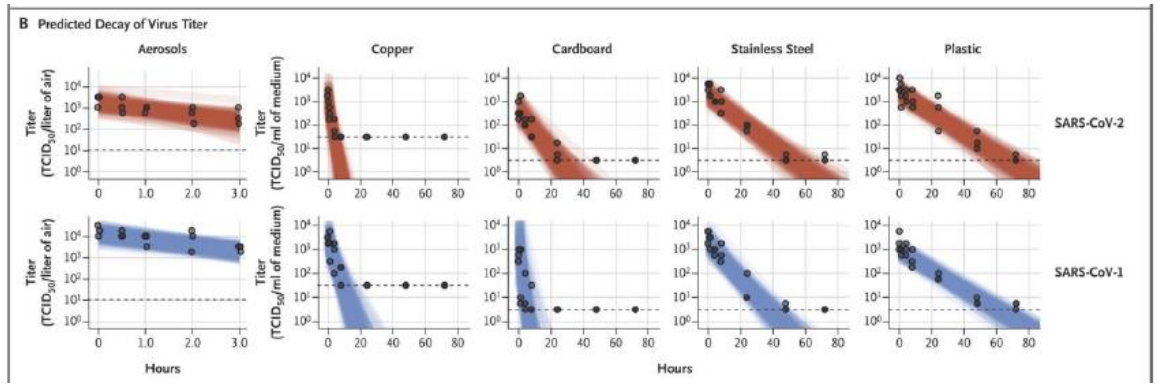
On October 20, WHO updated its official guidance, saying the virus could spread "after infected people sneeze, cough or touch surfaces or objects, such as tables, door handles and handrails.

"The WHO adds that "disinfection practices are important to reduce the potential for contamination by the COVID-19 virus".

The risk of transmitting fomites can be reduced by wearing masks consistently and correctly, practicing hand hygiene, cleaning and taking other measures to keep the premises healthy.

https://www.cdc.gov/coronavirus/2019-ncov/more/science-and-research/surface-transmission.html - Updated Apr. 5, 2021

Viruses on surfaces **vs**. technological route



N. van Doremalen *et al.*, “Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1,” *N. Engl. J. Med.*, vol. 0, no. 0, p. null, Mar. 2020, doi: 10.1056/NEJMc2004973.

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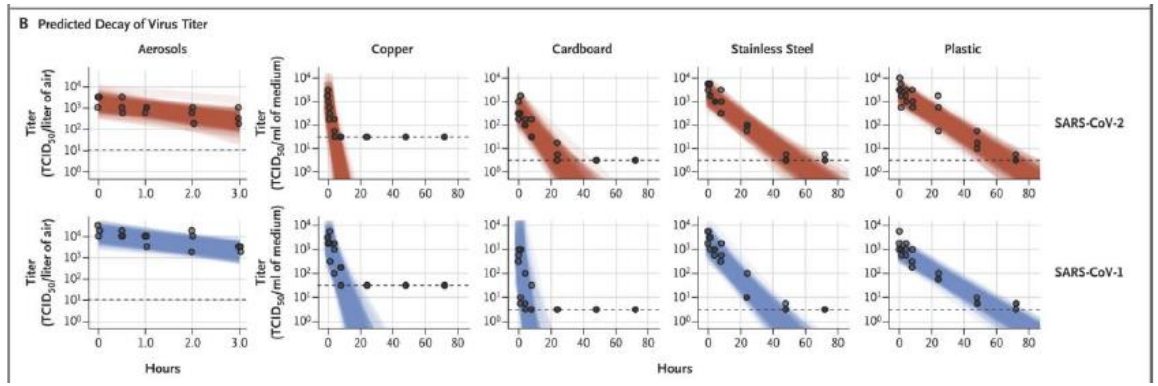

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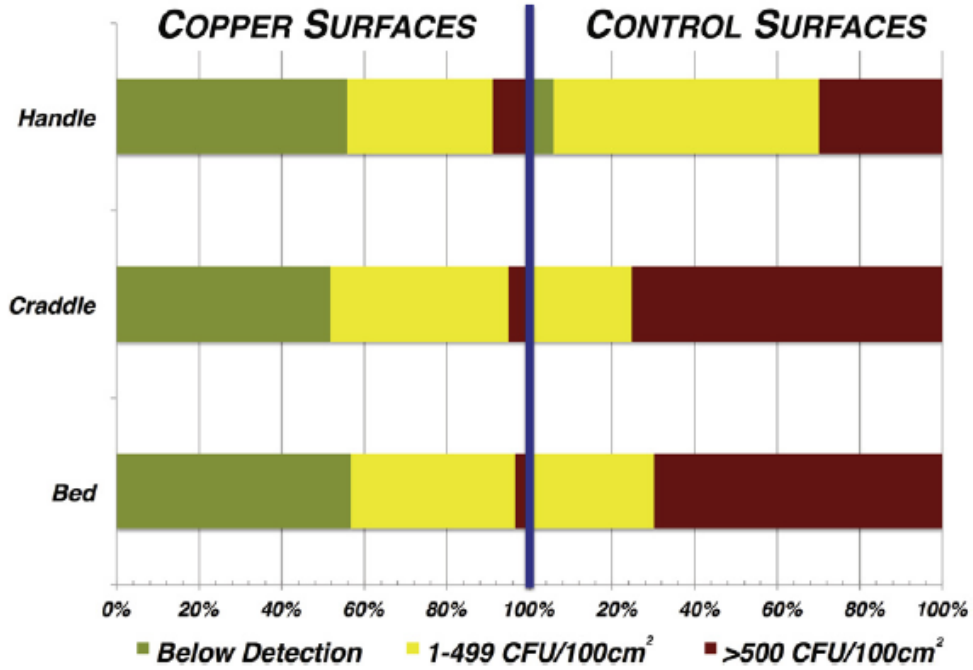


M. G. Schmidt *et al.*, “Copper surfaces are associated with significantly lower concentrations of bacteria on selected surfaces within a pediatric intensive care unit,” *Am. J. Infect. Control*, vol. 44, no. 2, pp. 203–209, Feb. 2016, doi: 10.1016/j.ajic.2015.09.008.

How to measure and test viral action on surfaces?

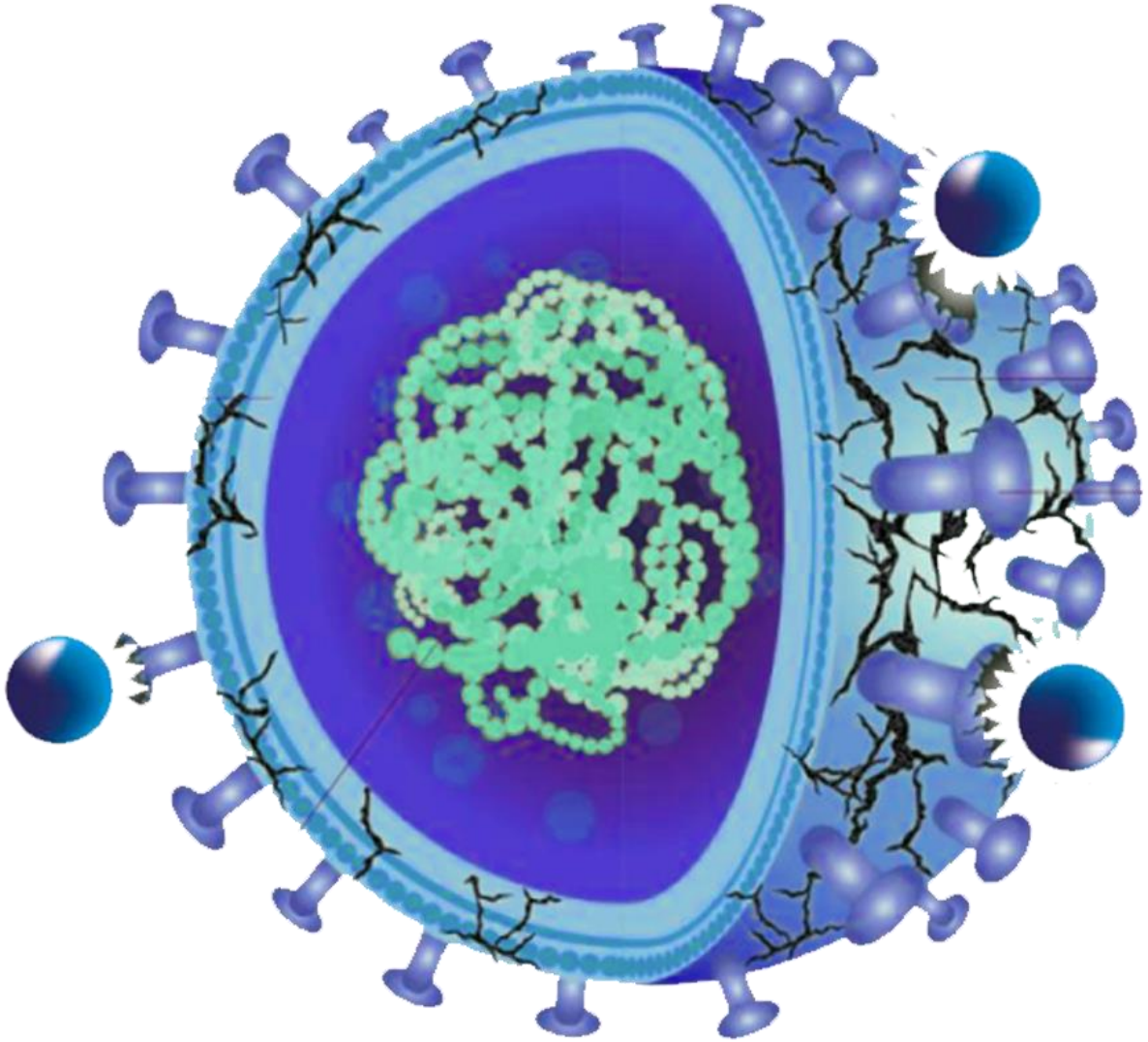
ICS › 83 › 83.080 › 83.080.01

ISO 21702:2019

Measurement of antiviral activity on plastics and other non-porous surfaces

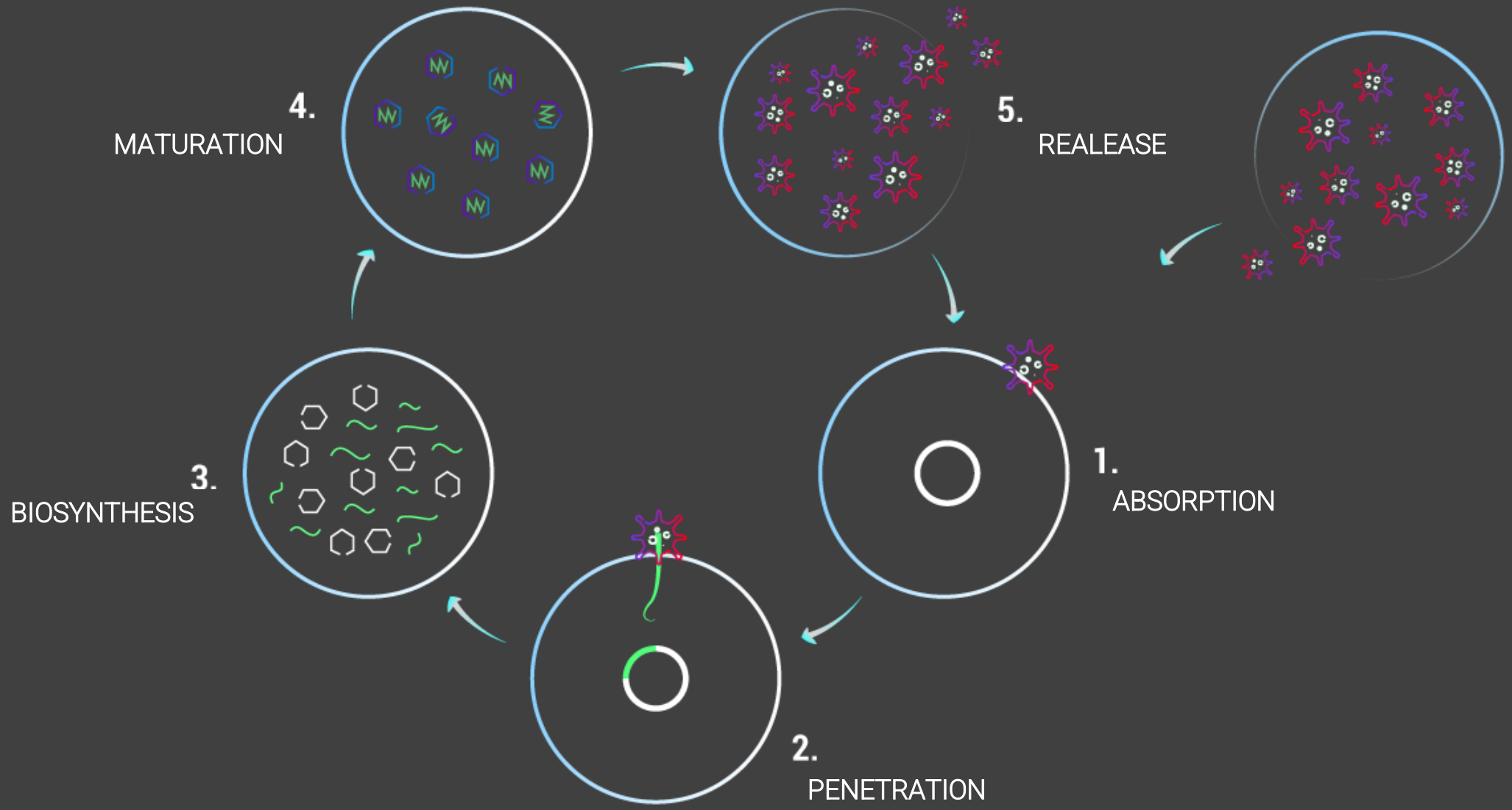
Within the scope of the implementation of this standard, antiviral refers to the situation in which the number of infectious virus particles on the product surfaces is reduced. Antiviral agent is the agent that reduces the number of infectious viruses on the surface of products. Antiviral activity means fighting viruses.

https://www.laboratuar.com/pt/testler/medikal/iso-21702-plastiklerde-ve-diger-gozeneksiz-yuzeylerde-antiviral-aktivitenin-olculmesi/

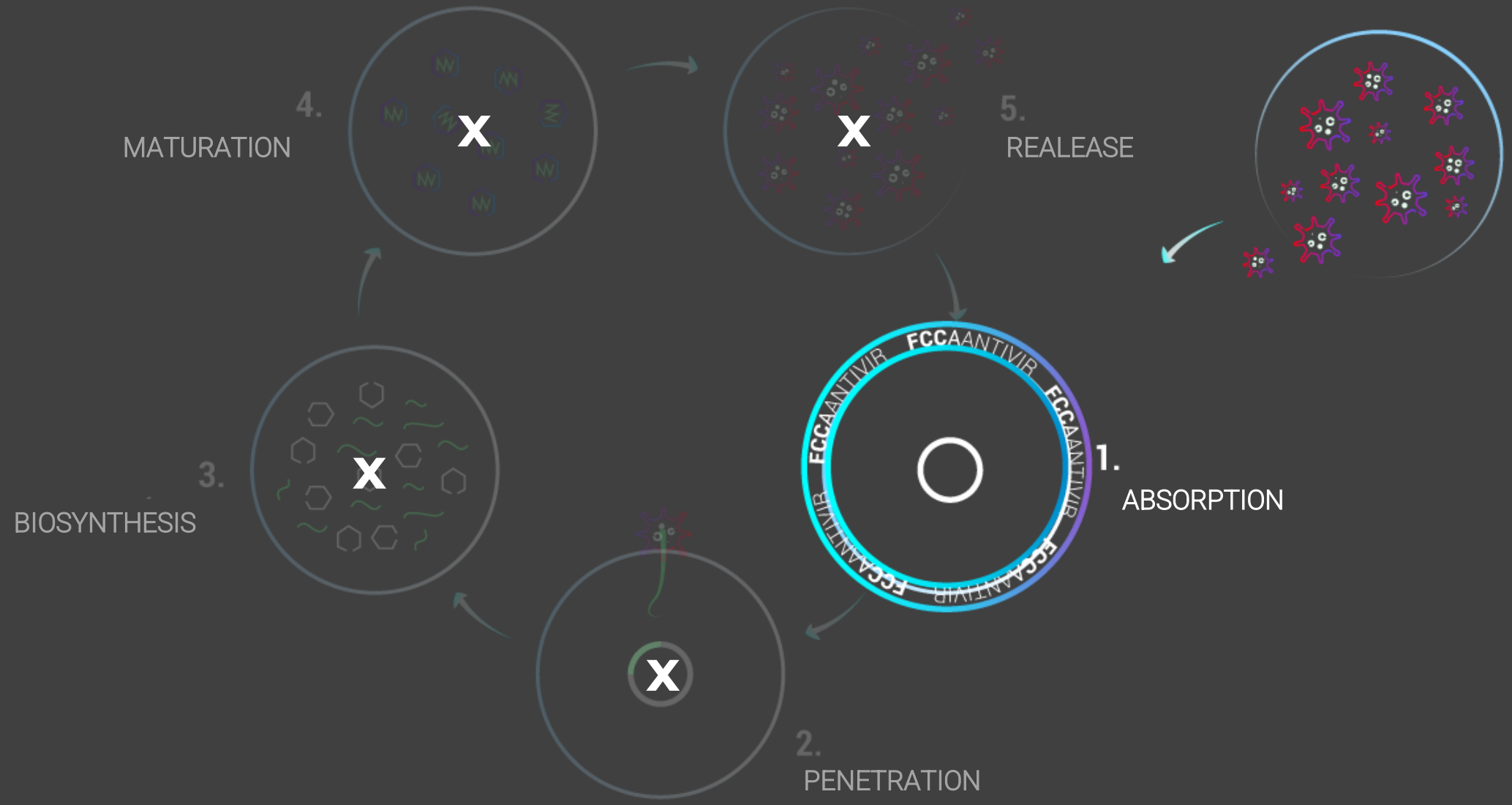


Action of FCC AANTIVIR

VIRAL REPLICATION CYCLE



VIRAL REPLICATION CYCLE



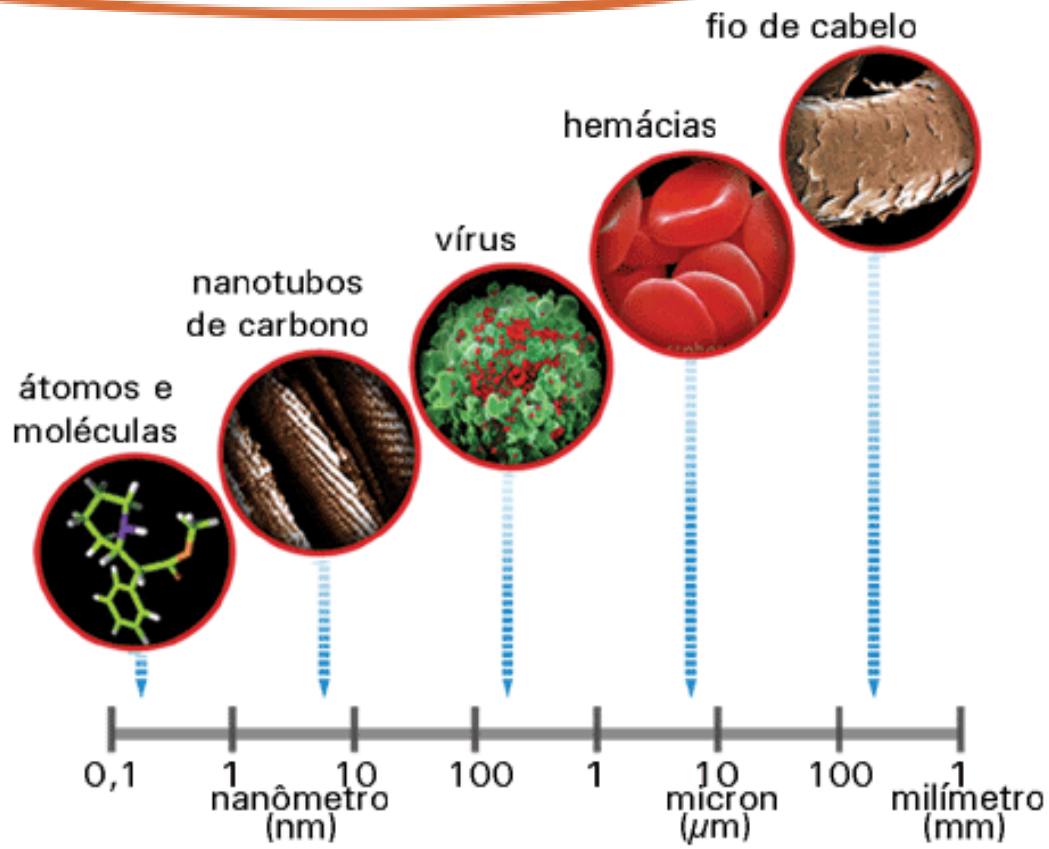
Technological challenge!
Solution> Nanotechnology

Maintain the mechanical and physical properties of the additive materials

Facilitate the incorporation and dispersion in the polymer

Use the same equipment and processing parameters

Particle size at the nanometer level, ensuring active principle available in the entire mass of the material.



Créditos: Prof. Dr. Henrique Toma USP

Present all functional characteristics, but maintaining the most important, safety for the process team and the user of the final part.

EFFICIENCY

FCC AAntivir can be applied to several substrates, having its effectiveness verified through tests in independent laboratories and based on international standards.

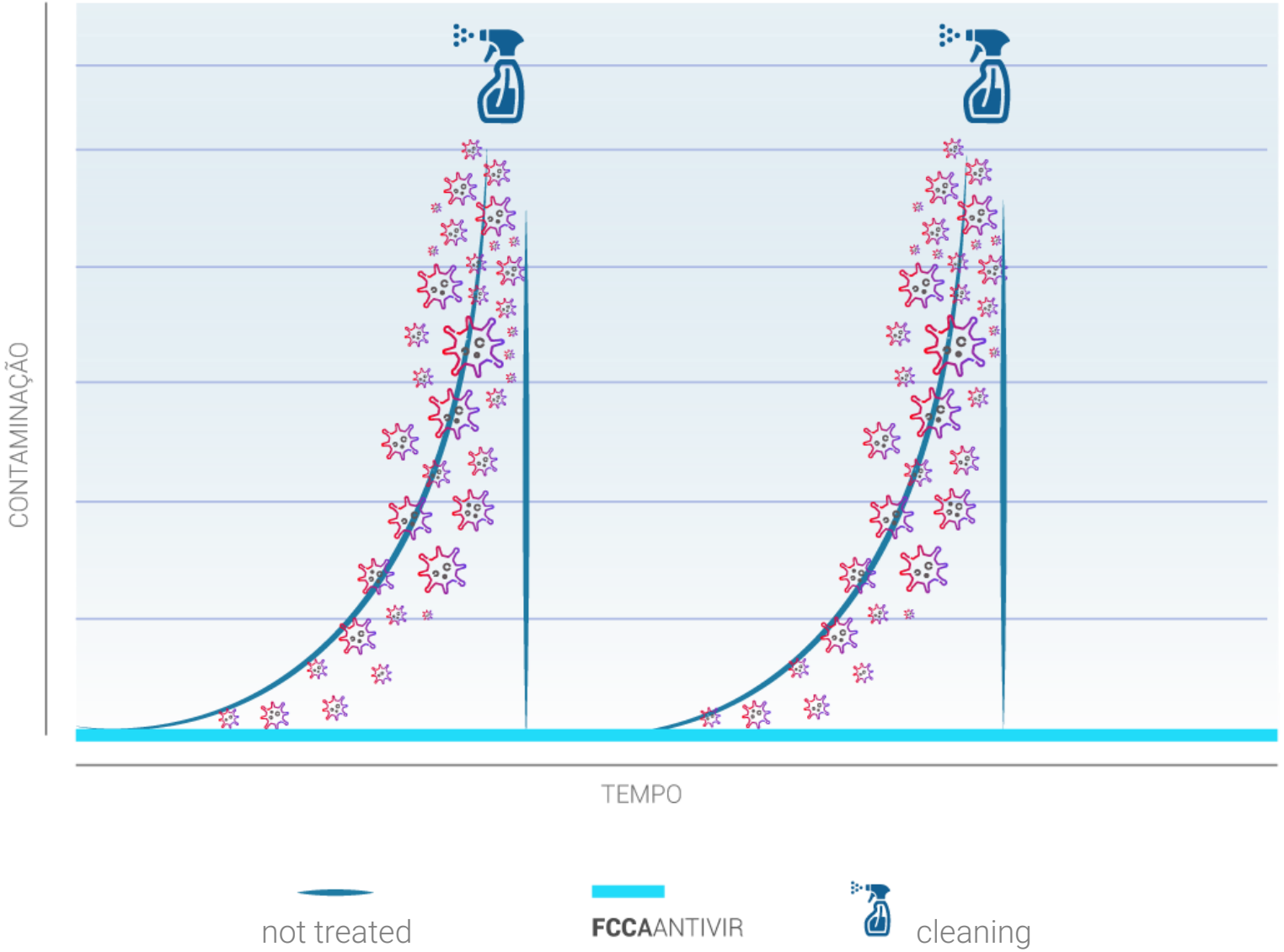
antiviral	antifungal	antibacterial
ISO 21702	ASTM G21	ISO 22196

ANTIVIRAL EFFECTIVENESS

99.8% ANTIVIRAL ACTION TO SARS-COV-2

COVID-19 VIRUS

CLEANING COMPARATIVE



Tested applications and success stories

Even with the use of technology, it is necessary to follow all instructions from health authorities:

- Wash your hands frequently, use soap and water or alcohol gel;
- Keep a safe distance from people who are coughing or sneezing;
- Wear a mask. When it is not possible, keep the physical distance;
- Avoid touching your eyes, nose or mouth.

This protects you and prevents the spread of viruses and other infections.

PLASTIC RETURNS AS

PROTAGONIST

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