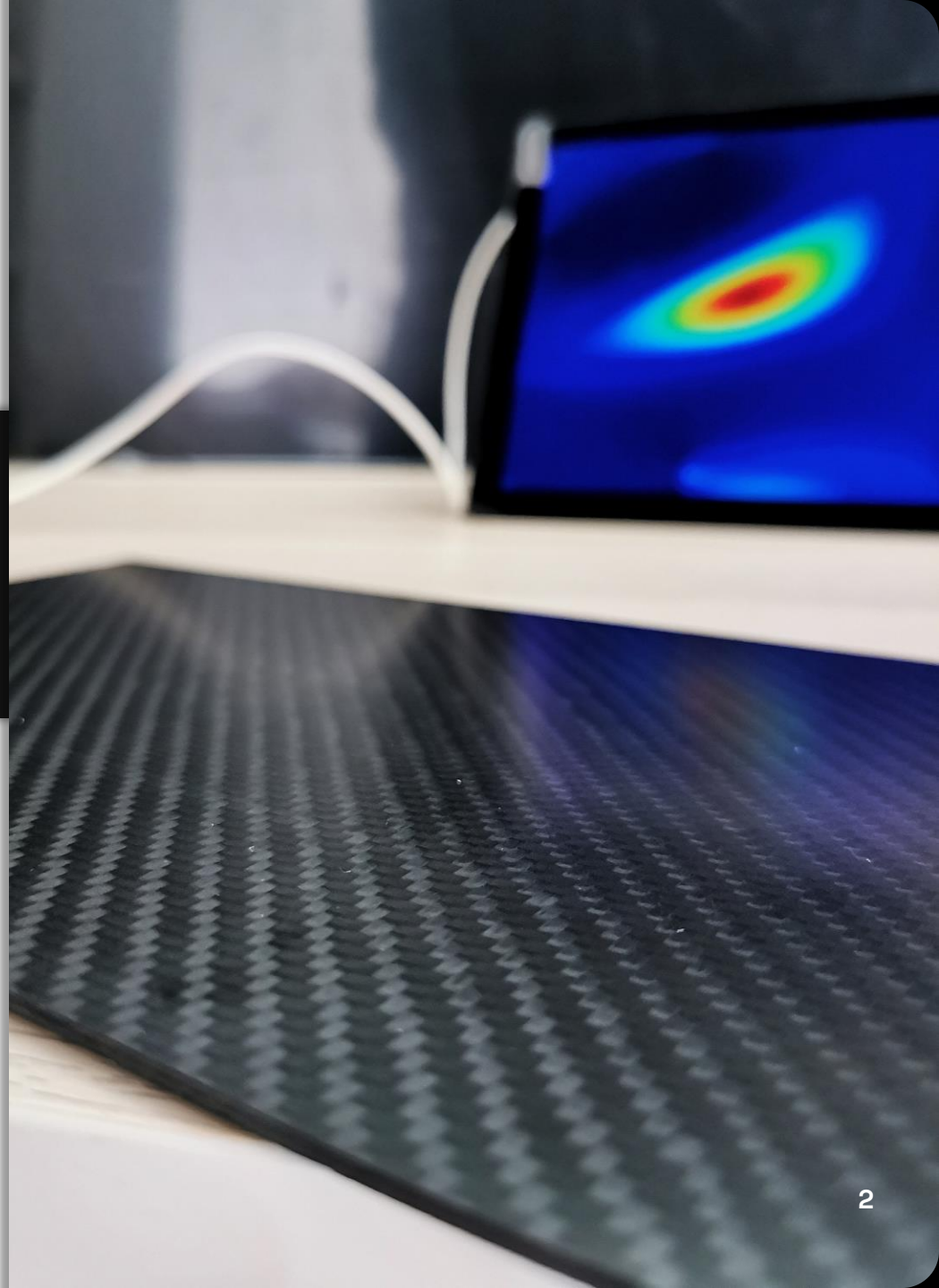
TOUCH SENSITY

MAKING MATERIALS SMART

Making materials smart with Touch Sensity

Exhaustive cartography of all impacts, pressures and damages of a material with non-invasive technology

- **No sensors** required
- **Minimally invasive.** Preserves the **material properties**
- **Capture the whole part,** without shadow zone
- Adapted to **all sizes**, **topologies** and **types of parts.**



Unique technology protected by strong patents to make materials smart

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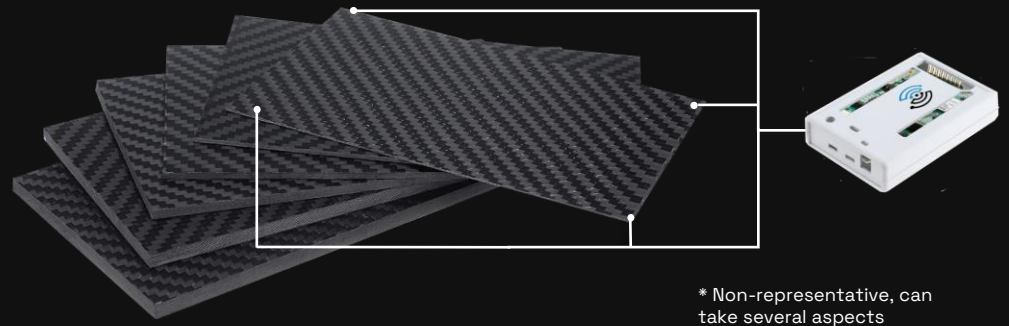
Years of **Research**

5

Patents



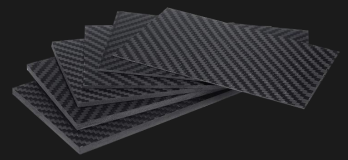
* Non-representative, can take several aspects

SENSITY TECH

- ✓ Embedded system connected to the material periphery
- ✓ Sending and receiving a signal
- ✓ Signal analysis for 2D and 3D modeling

A unique technology composed of three blocks :

THE MATERIAL



Two possible integration :

- ✓ Integrated directly into the material (without modification)
- ✓ Use of a coating on the surface, under or between the layers of the composite

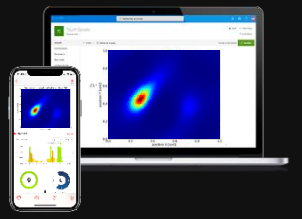
THE EMBEDDED SYSTEM

* Non-representative, can take several aspects

Connected to the periphery of the material to transmit and receive the signal,

- ✓ Connected via simple contacts (cable or silk-screen) via 2 to 32 contact points
- ✓ Low power consumption for real-time measurement (mA and 5-12 V)

THE SOFTWARE



A software allowing the restitution of the acquired data

- ✓ in the form of 2D and 3D reconstruction and
- ✓ integrable in a global architecture (open API)

Two problems, One solution !

Structural Health Monitoring

Obtain structural data in real time and remotely with a minimally invasive solution

Human Machine Interface

Make any surface tactile using the material deformation

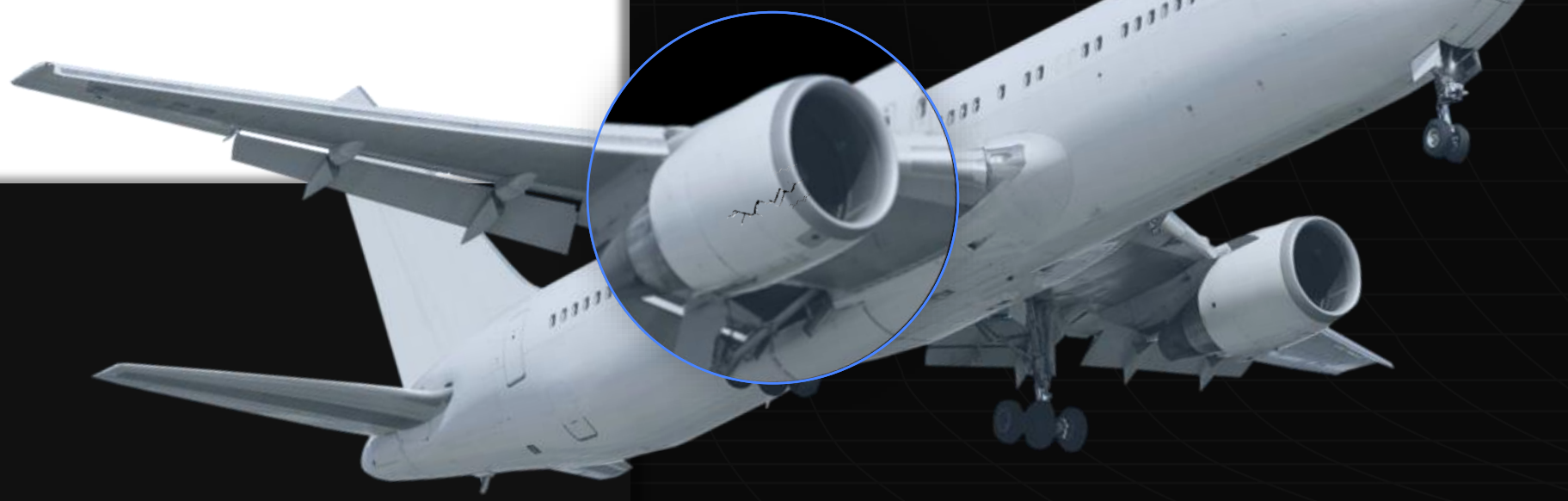
Industry coverage

Structural Health Monitoring

PROBLEM :

Current maintenance solutions (tapping, sound wave, NDT...) are limited:

- ✓ Not during operation
- ✓ Need to extract the part
- ✓ Time-consuming to implement



CONSEQUENCES :

- ✓ Increase maintenance costs
- ✓ Increase device downtime
- ✓ Process not optimized
- ✓ A lot of raw material scrapping when changing parts without valid reasons

TOUCH SENSITY

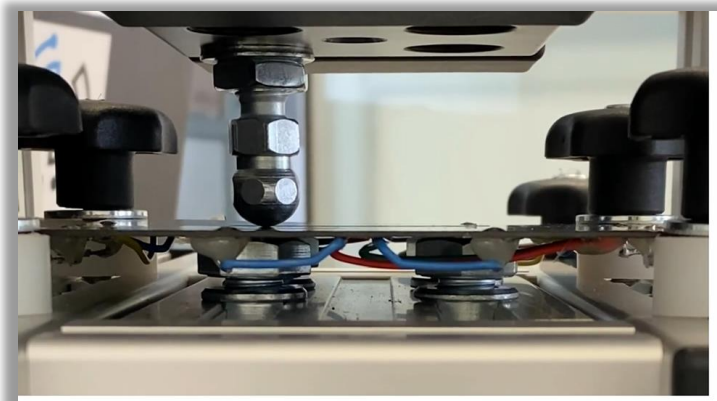
SHM : Detecting material defects in real time

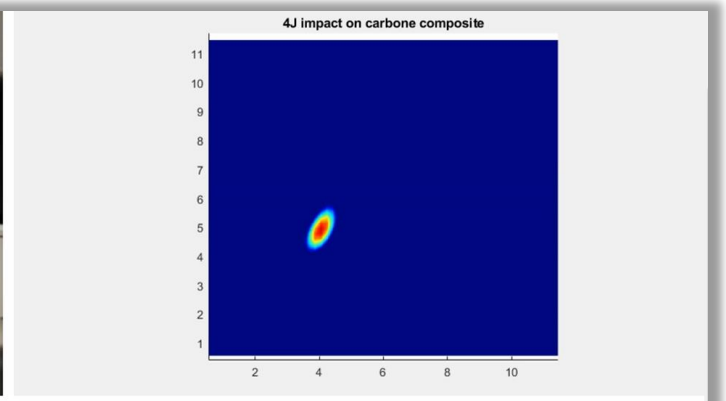
SENSITY TECH :

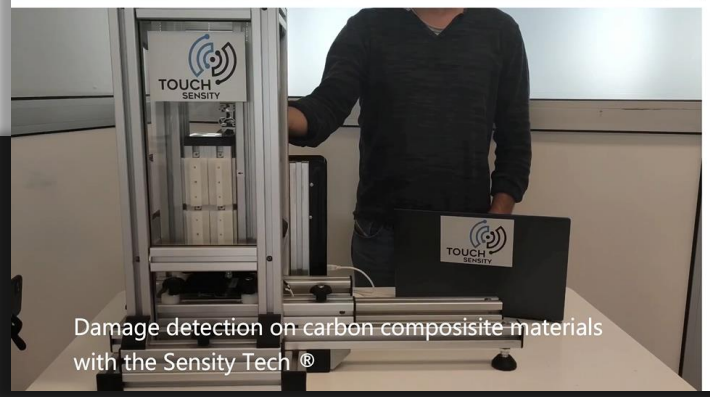
Obtaining data from damage, impact and deformation, suffered by a part

- ✓ Obtaining **physical measurements** (force, size...)
- ✓ Both a surface and an **internal material analysis**
- ✓ **2D and 3D modeling**
- ✓ In **real time** and **remotely**
- ✓ With and **Without coating**

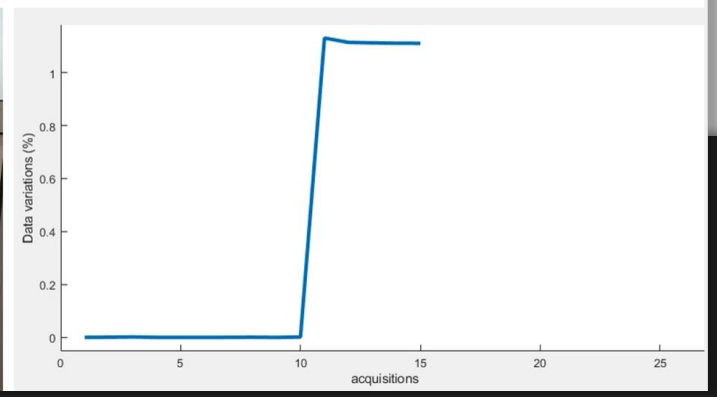
- Parts size between 0.1 and 10 m².
- Impact detection higher than 2.5 J
- Tensile, bending and torsion detection greater than 0.02%.
- Detection of thermal degradation from 100°C
- Resolution of 5 mm







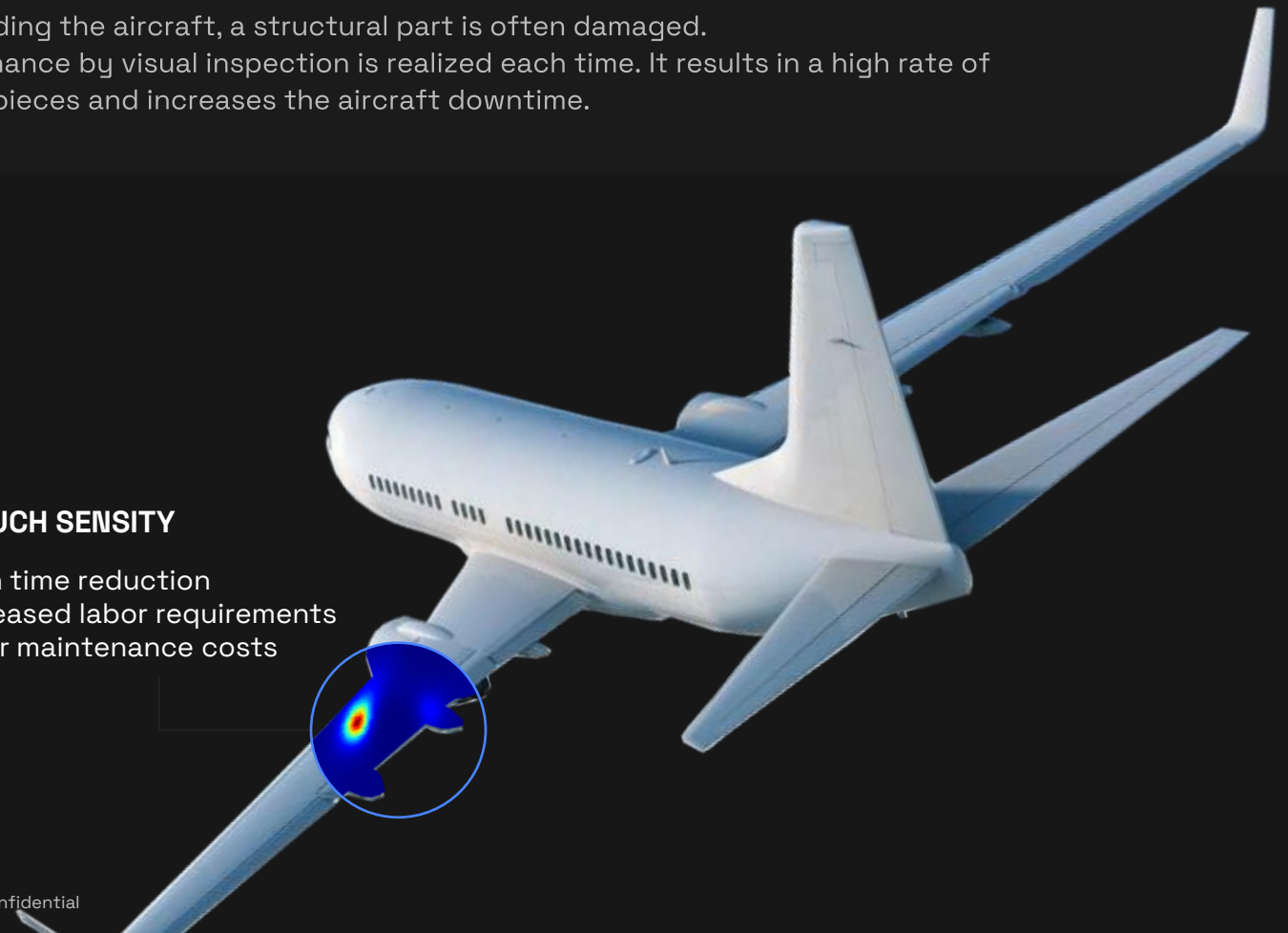
Damage detection on carbon composisite materials with the Sensity Tech ®



Smart material SHM case study :
Aeronautics maintenance

PROBLEM :

When loading the aircraft, a structural part is often damaged.
A maintenance by visual inspection is realized each time. It results in a high rate of rejected pieces and increases the aircraft downtime.



WITH **TOUCH SENSITY**

- ✓ Down time reduction
- ✓ Decreased labor requirements
- ✓ Lower maintenance costs

TOUCH SENSITY SOLUTION

The part is made sensitive so that a light (green or red) indicates the part's state to the operator.
An independent terminal is also available to connect to and obtain a complete set of information.

WHAT'S NEXT

- ✓ POC validated
- ➢ 2022 - 2023: Creation of an industrial prototype
- ➢ 2023 - 2025: Solution certification and industrialization
- ➢ 2025: Deployment

Smart material SHM Case study:
H2 tank maintenance

SHM NOT ADAPTED

Current technologies do not allow a complete and accurate monitoring of the tanks without reducing the amount of H2 contained.

WITH TOUCH SENSITY

- ✓ Impacts monitoring (>2,5 J),
- ✓ Traction deformation monitoring (>0,02%)
- ✓ Damages monitoring
- ✓ In real time
- ✓ Without loss of filling capacity

TOUCH SENSITY SOLUTION

Make the composite tank sensitive in order to detect in real time impacts and damages with a non-intrusive solution and without coating.

WHATS NEXT

- ✓ POC validated
- ➢ 2023: Tests on full tanks
- ➢ 2023: Solution certification and industrialization
- ➢ 2024: Deployment

Human Machine Interface

PROBLEM :

Current tactile solutions do not allow functionalization of all surfaces:

- ✓ Limits of size, shape and topology
- ✓ Can create false positives on contact with the user

CONSEQUENCES :

- ✓ Design limitation
- ✓ Unsuitable tactile interface

TOUCH SENSITY

Make all surface tactile

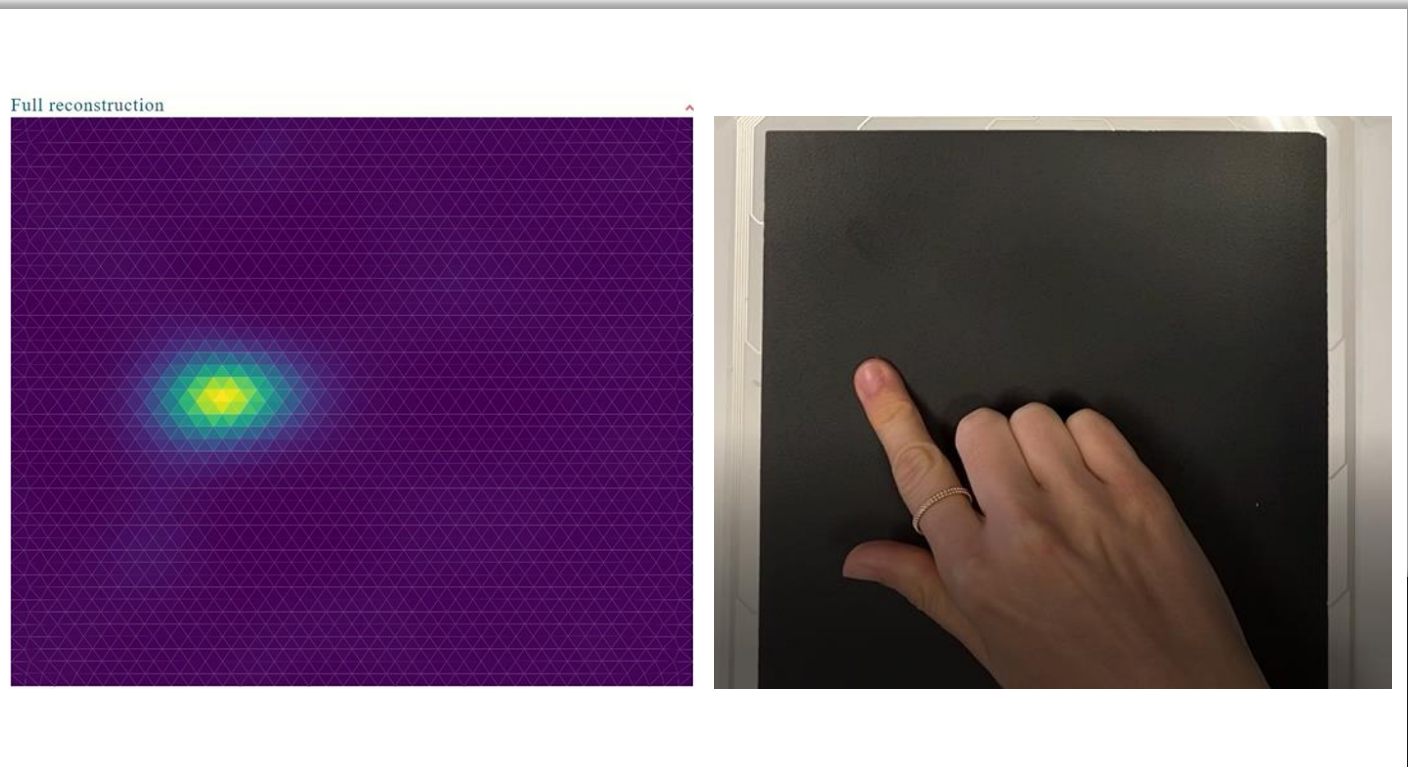
SENSITY TECH :

Use of a sensitive paint for pressures detection.
This paint is used as a coating:

- ✓ On the surface
- ✓ Underneath
- ✓ Between layers of composite material

Features :

- ✓ Multi Touch
- ✓ Sliders
- ✓ Detection of all type of pressure (finger, pen, feet…)



- Parts size from 1 cm² to several meters
- Impact detection higher than 2.5 grammes per cm²
- All topologies
- Can have holes, curves and angles

HMI Case study :
Tactile dashboard

HMI NOT ADAPTED

The use of capacitive solutions leads to false positives in the vehicle making it impossible to associate important vehicle actions.

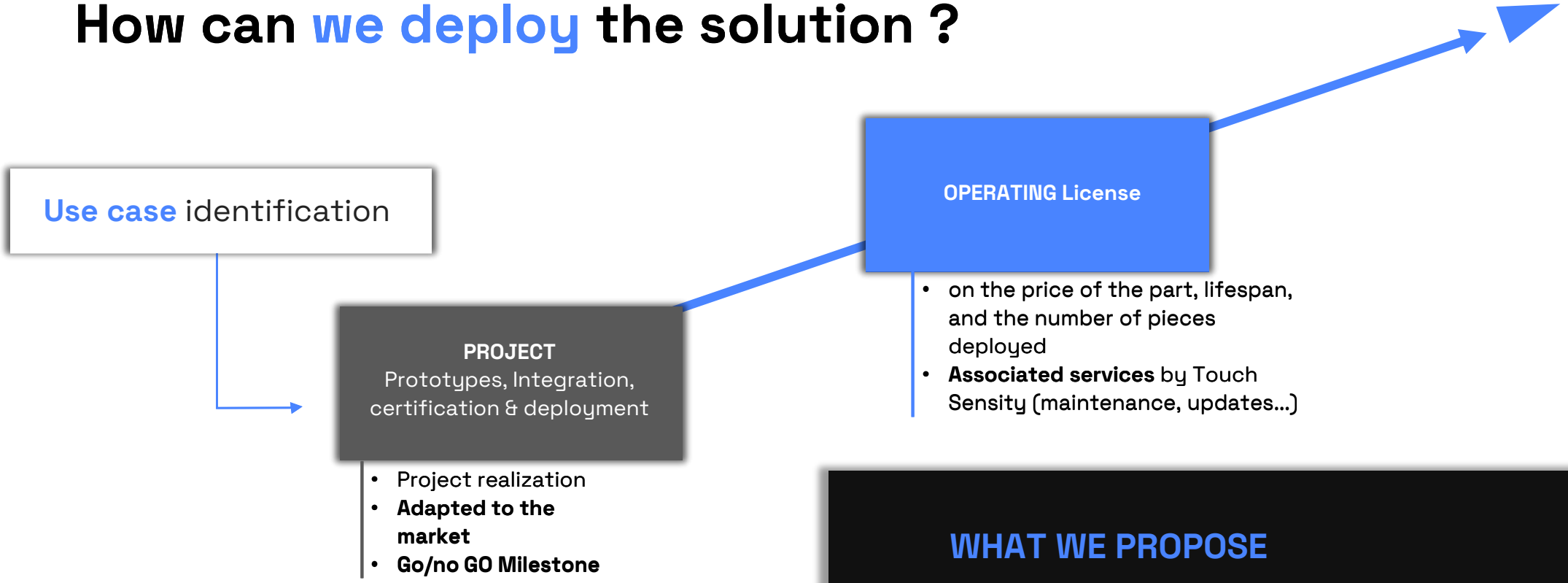
TOUCH SENSITY SOLUTION

Deposit a smart coating under the plastic dashboard to capture the micro pressures. Make parts of the dashboard sensitive and associate several force levels with action in the vehicle.

Open to
new design

No false positive
tactile zone

How can we deploy the solution ?



WHAT WE PROPOSE

- ✓ Use of your suppliers
- ✓ Adapted to your industrial processes
- ✓ Limited risk
- ✓ Autonomy of our clients

And they already trust us to deploy our solution massively

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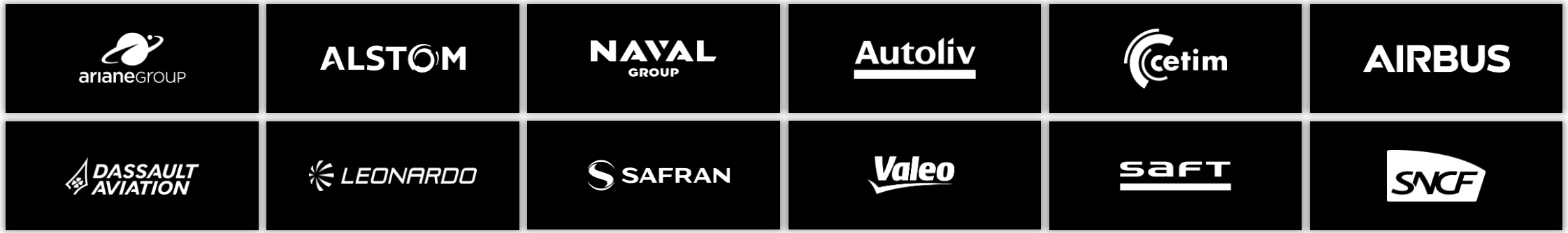
Proofs of **concept with TRL from 3 to 5**

3

Industrializations and deployments project (Automotive, Railway and Aeronautics)

+ 15

prizes and awards in France, Europe and USA



TOUCH SENSITY

Meet our team with 70% of PhDs defining a new leader category

Meet our **Founders...**

Cofounder & CTO

Developed the technology since 2012

- PhD from University of Paris and University of Kiev
- Electronical Engineer
- Master's degree in intelligent and connected systems

Cofounder & CEO

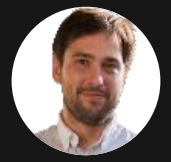
Commercial leader and engineering agency director for 5 years for large companies

- Engineering degree from the Polytechnic Institute of Bordeaux
- Master's degree in project management from Canada

And our **Technical Managers**

CAMILLE **GEFFROY, PhD**

PhD from Bordeaux and Tokyo
Engineer from Bordeaux



CHARLES **PASSET**

Engineer from Centrale Paris
Master degree from Georgia Tech

MARC **BRIANT, PhD**

PhD from Cambridge
Master degree from Supaéro
Master degree from Brown University

And a professional team of 10

CONTACT

Touch Sensity develops the new generation of connected materials for tomorrow's industry.

LET'S TAKE UP THIS CHALLENGE TOGETHER!

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