

iBot: HOW

ARTIFICIAL INTELLIGENCE

ENHANCES
IRIS INSPECTION MACHINES?

An INTERNATIONAL HIGH TECH GROUP



“Always striving to do better, and to share it.”

FAMILY OWNED COMPANY

in a constant state of

Evolution

250

PEOPLE
IN THE GROUP

20 M€

IRIS TURNOVER
2022

45 M€

CONSOLIDATED
GROUP TURNOVER
2022

3

PRODUCTION
SITES
IN LYON

17%

R&D
EXPENSES
2022

IRIS Inspection machines

EVOLUTION 5

NEO AI

BASE, BASE STRESS,
FINISH & MOLD NUMBER



EVOLUTION 12/16/20

NEO AI

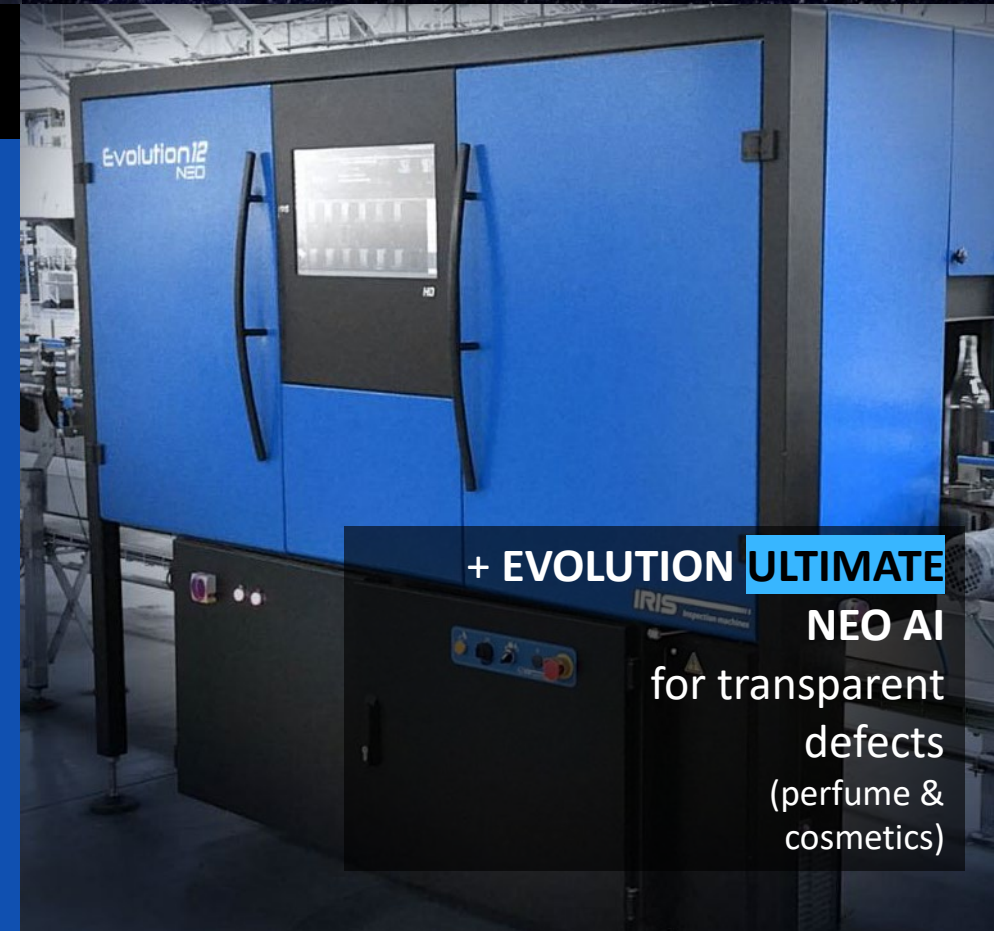
SIDEWALL, STRESS
& GEOMETRY



Evolution

- Constant innovation
- Upgradable
- No obsolescence policy
- Long life time
- Software Evolution

IRIS Inspection machines



+ EVOLUTION ULTIMATE

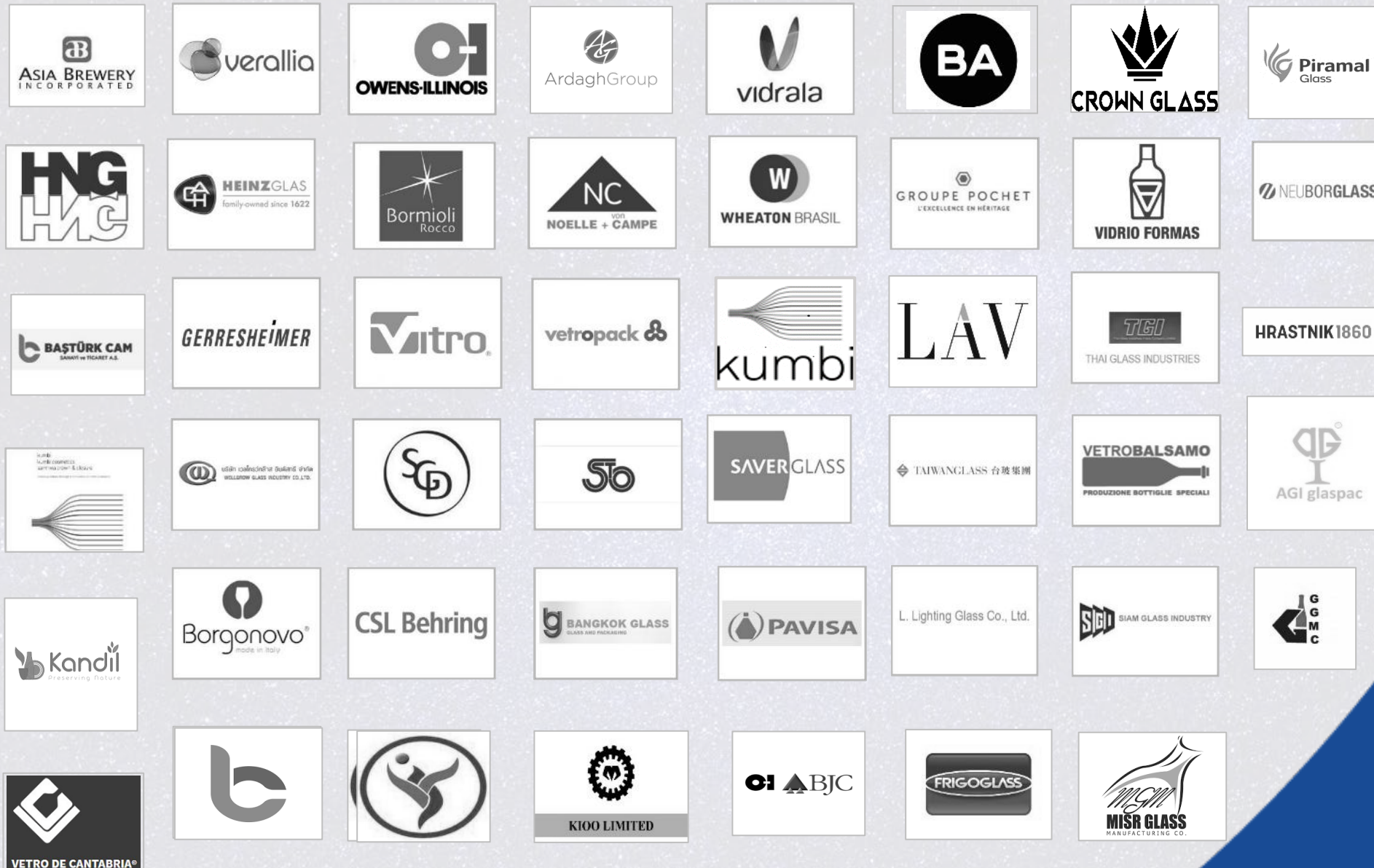
NEO AI
for transparent
defects
(perfume & cosmetics)

A **WORLDWIDE** PRESENCE



A old player in the region
Service centers in
Thailand and China

THEY TRUST US



& OTHERS...

IRIS Inspection machines

CHALLENGE for Glassworks:

Distinguish **GOOD SALEABLE** from **UNSALEABLE**.

HOW TO DISTINGUISH THEM?



BIG VARIATION depending on the end products :



Perfume container

with cosmetics defects

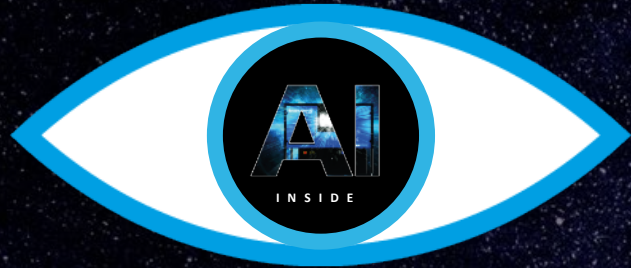
VS



Beer bottles

with critical faults

False rejection can have different root causes:



- Training
- Skills of operator
- Human errors
- Technology employed

So all these root causes have direct impact on pack to melt and on the **carbon footprint!**

That's where **ARTIFICIAL INTELLIGENCE** come in!

AI IS A REWARDING JOURNEY

Let's see...

- Why **AI** is a **LEADING INNOVATION** for glass plants all around the world?
- How **AI** connects each of the individual players within a **VALUE CREATION NETWORK?**

AI IMPROVES DEFECTS RECOGNITION

OBJECT DETECTION

Detect and locate **specific objects** in images

Example

Identify and frame areas where the defects are

SEGMENTATION

Assign a **class to each region** of an image

Example

The autonomous car: images from the cameras are segmented (road, pedestrians, vegetation, buildings, etc.)

GENERATIVE MODELS

Models capable of generating **artificial datas** (images, texts, sounds, etc.)

Examples

*ChatGPT,
Midjourney,
Ernie Bot*

CLASSIFICATION

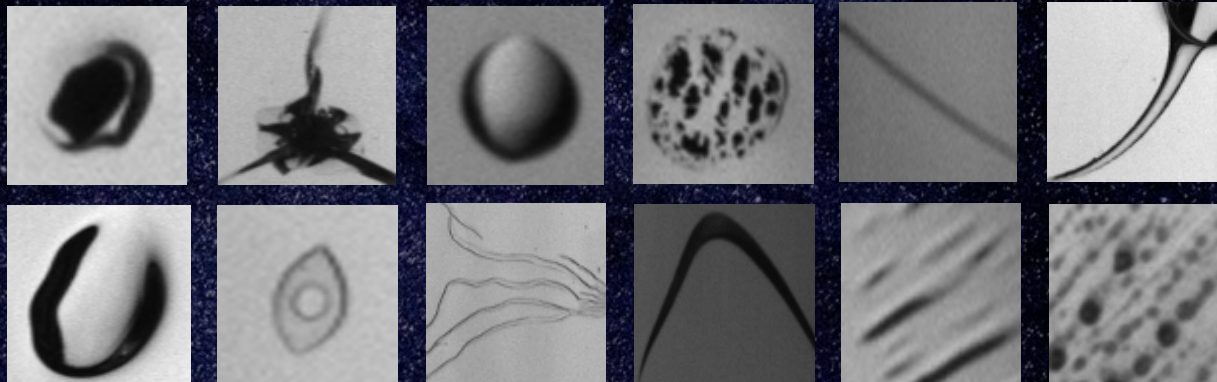
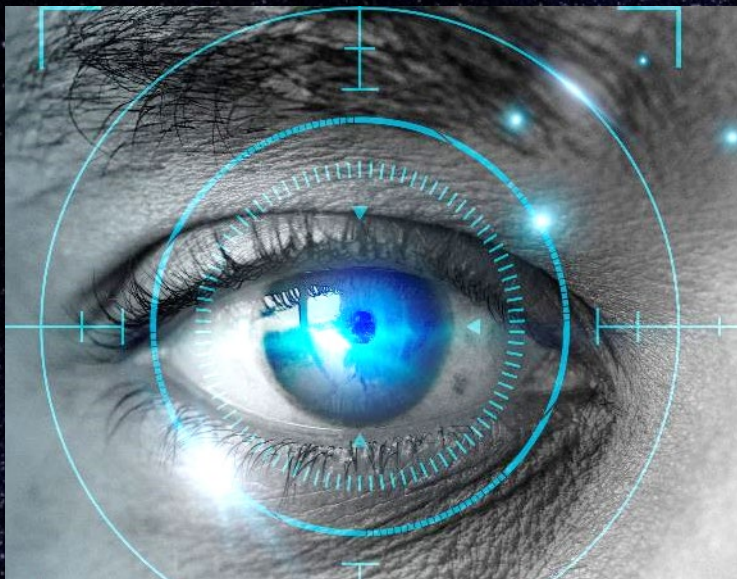
Classify objects, features or images in different **predefined categories**

Examples

Identify the nature of defects

- **Blisters** versus : hard blister / surface blister / big blister / unmelted glass
- **Grease marks** versus : stones

AI MIMICS HUMAN BRAIN



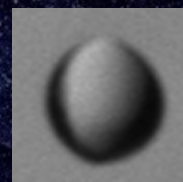
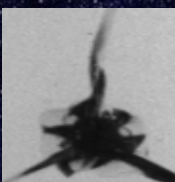
AI MIMICS HUMAN BRAIN



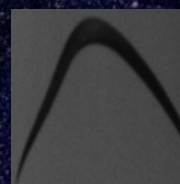
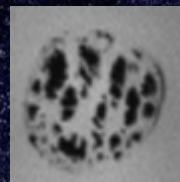
STONES



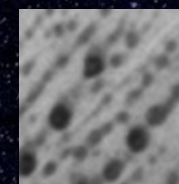
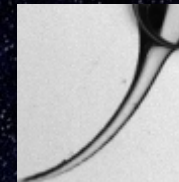
BLISTERS



LONG FAULTS

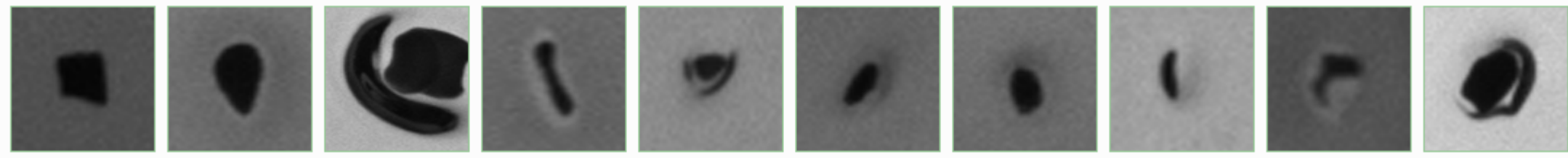


OTHERS

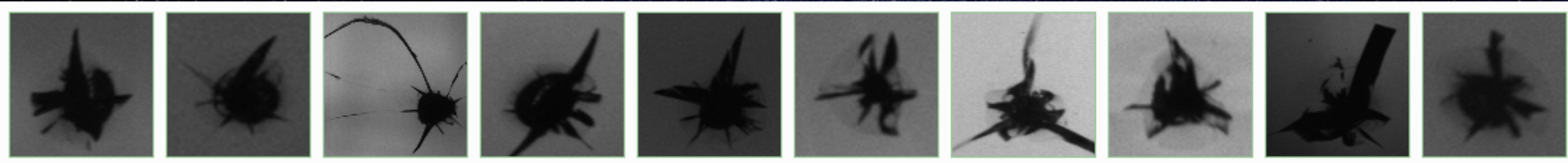


... but different types of STONES

STONES



BROKEN STONES

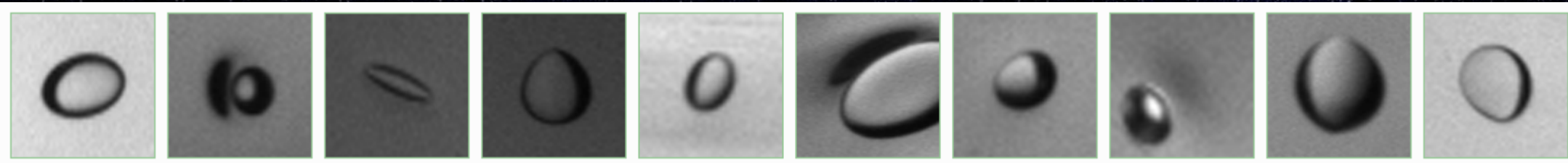


UNMELTED GLASS

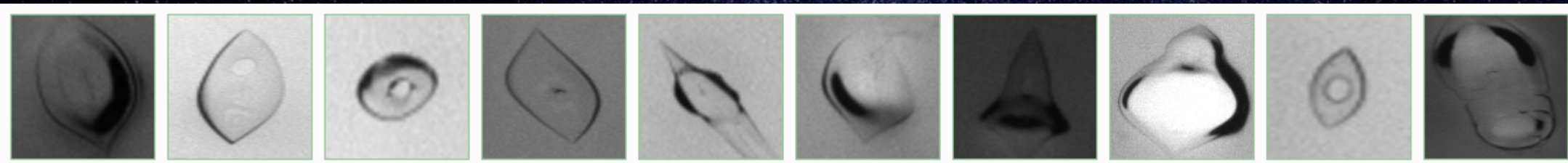


... but different types of **BLISTERS**

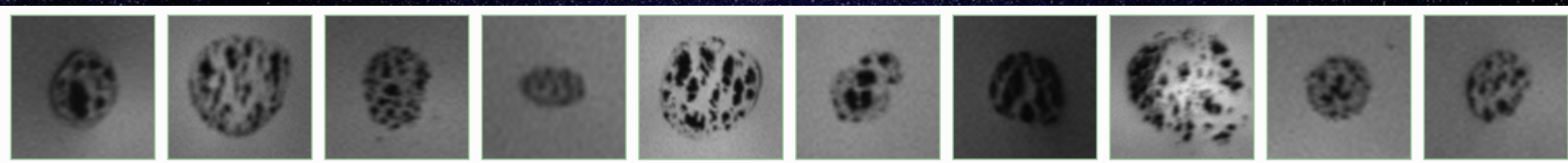
HARD BLISTERS



SURFACE BLISTERS

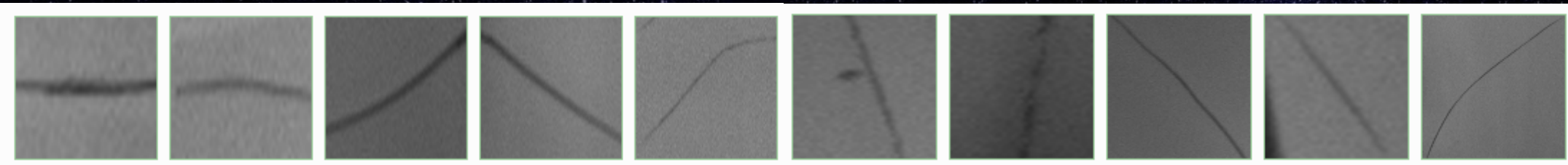


OIL BLISTERS

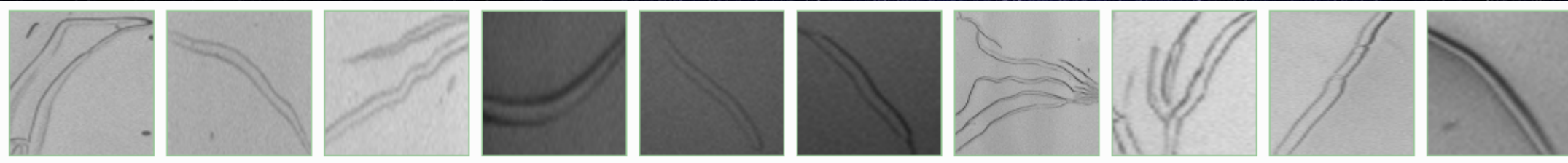


... but different types of **LONG FAULTS**

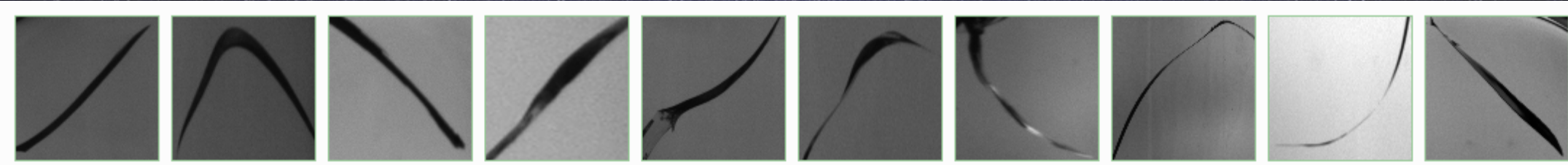
LAP MARKS / FOLDS (HORIZONTAL OR VERTICAL)



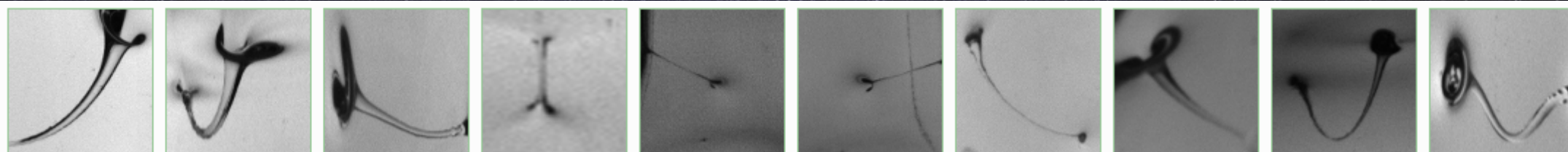
OPEN FOLDS



CRACKS

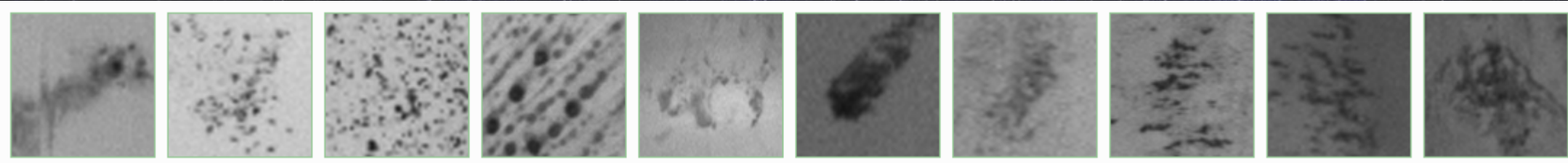


BIRDSWINGS

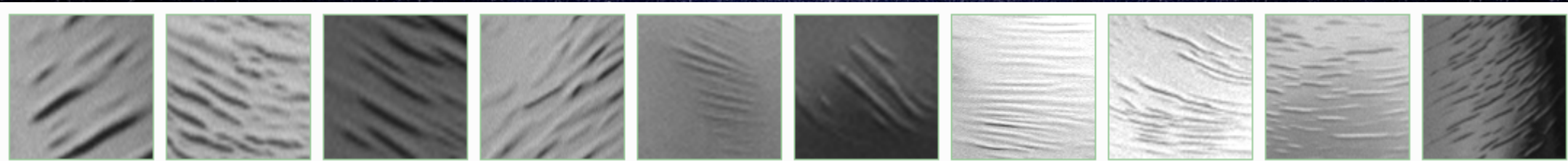


And more...

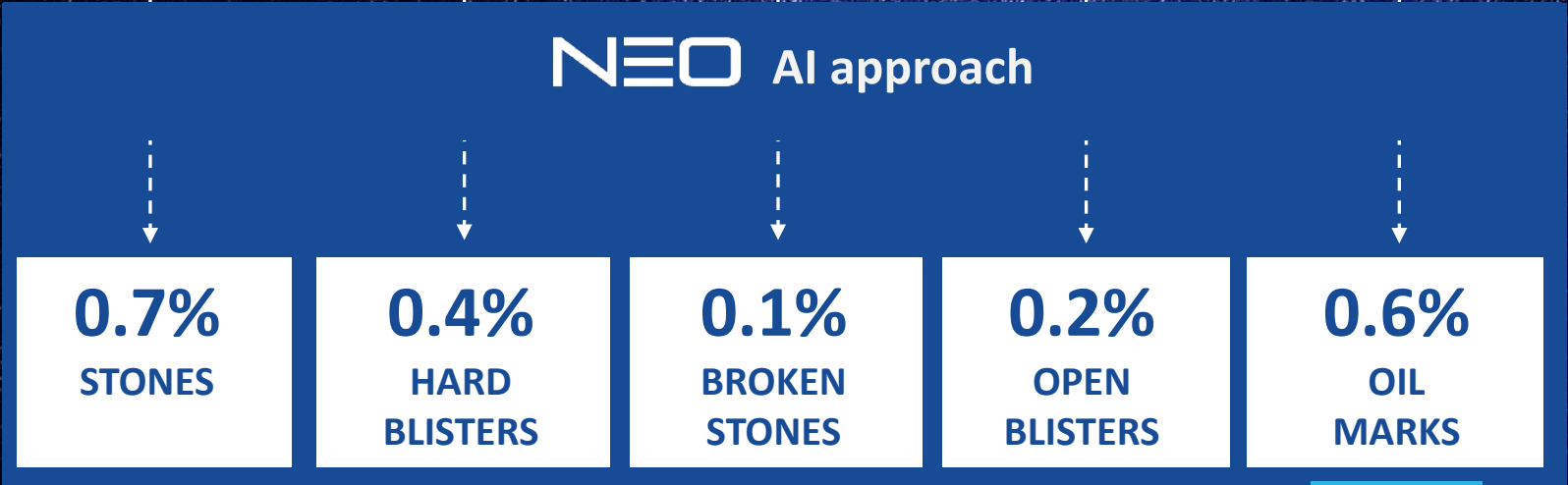
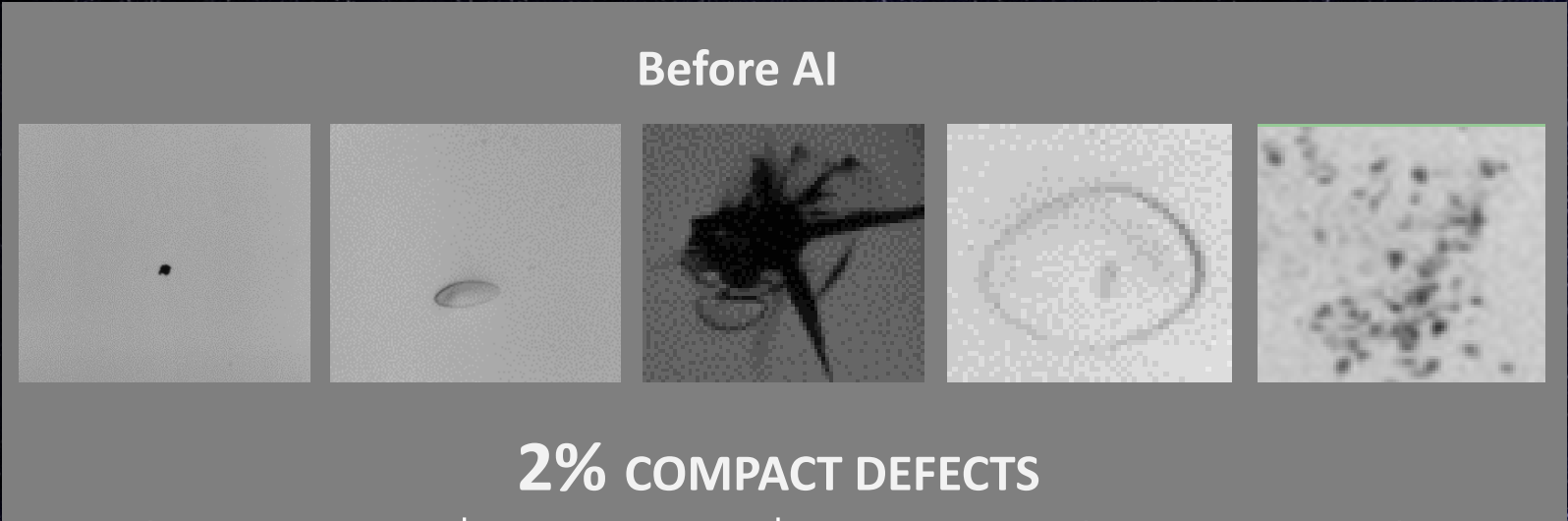
OIL MARKS



WASHBOARDS



BETTER ACCURACY, BETTER PRODUCTIVITY



SAVED

AI **ALLOWS EXCEPTIONAL DETAILED ANALYSIS**

With a classification of defects **directly from the images**, AI offers:

Richer classification of defects

Ex. with blisters : open blister, internal blister, oil blister

Critical defects identification

Ex. : Birdswings, crack, open blister, stone with crack...

Reduction of false rejection

Spots: no more considered as inclusion = no more rejected

Hard blisters: possible to configure the size

More reactivity and accuracy in corrective actions

AI provides the **right information** at the **right time** and to the **right person**

AI IS A MATTER OF Evolution

With iBot

Before AI

INSPECTION BASED ON GEOMETRY ANALYSIS

(ex: size, compacity...)

- DIFFICULT TO ADJUST
LONG FINE-TUNING
- NOT PRECISE ENOUGH
- DEPENDANT ON
HUMAN FACTOR

With NEO AI

DISTINCTION OF CRITICALITY & ORIGIN

IN-DEPTH ANALYSIS
WITH LEARNING
ALGORITHMS

**Exact picture
of the glass quality**

- REDUCE FALSE REJECT
- LESS DEPENDANT ON
HUMAN FACTOR

All Evolution machines can be
upgraded with NEO AI.

ABILITY TO PREDICT DRIFTS & INCREASE PTM

PRECISE RECOGNITION
& DRIFTS ANTICIPATION

**Alerts in real time for
better productivity**

- DEFECTS LINKED WITH
FORMING PROCESS
- SEARCH FOR ROOT CAUSES

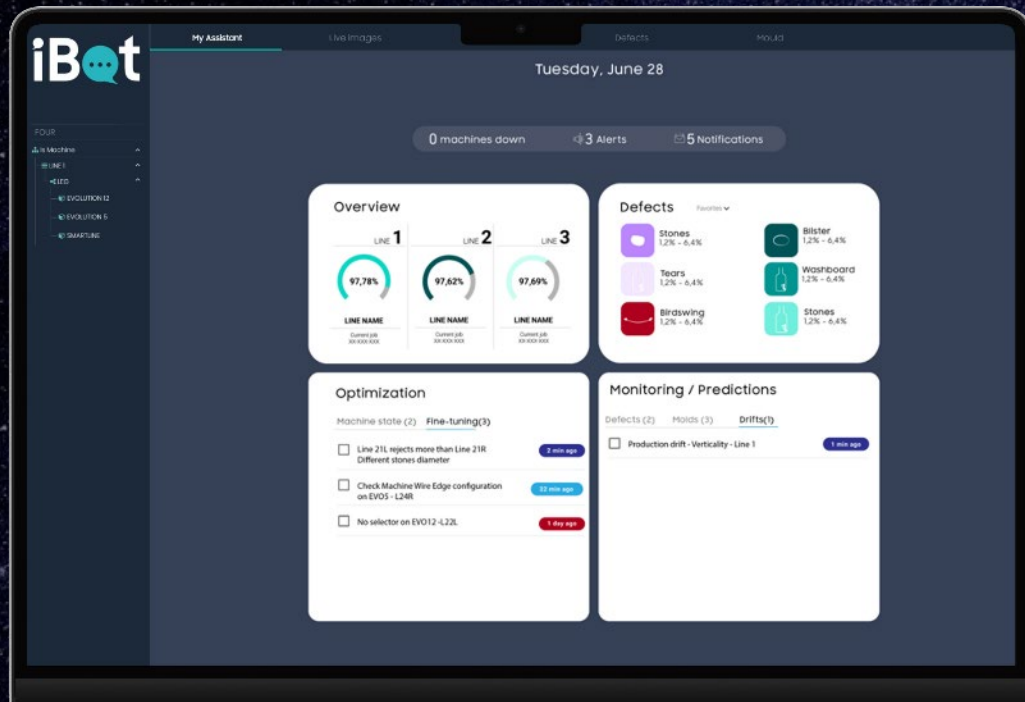


ai-based assistant

« Iris Boosts your Operator's Talents »

iBot is an **AI-BASED INNOVATION**

iBot does not simply monitor the optimization of settings...
... but goes beyond by **PREDICTING PROCESS DEFECTS.**

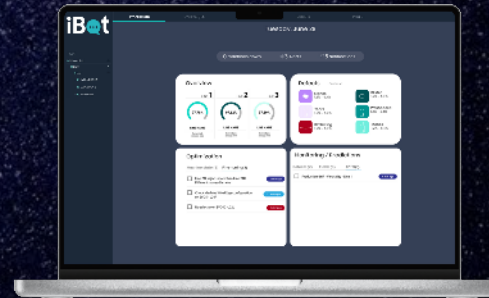


PRODUCING
SAFELY EFFICIENTLY
QUICKLY
SMARTLY



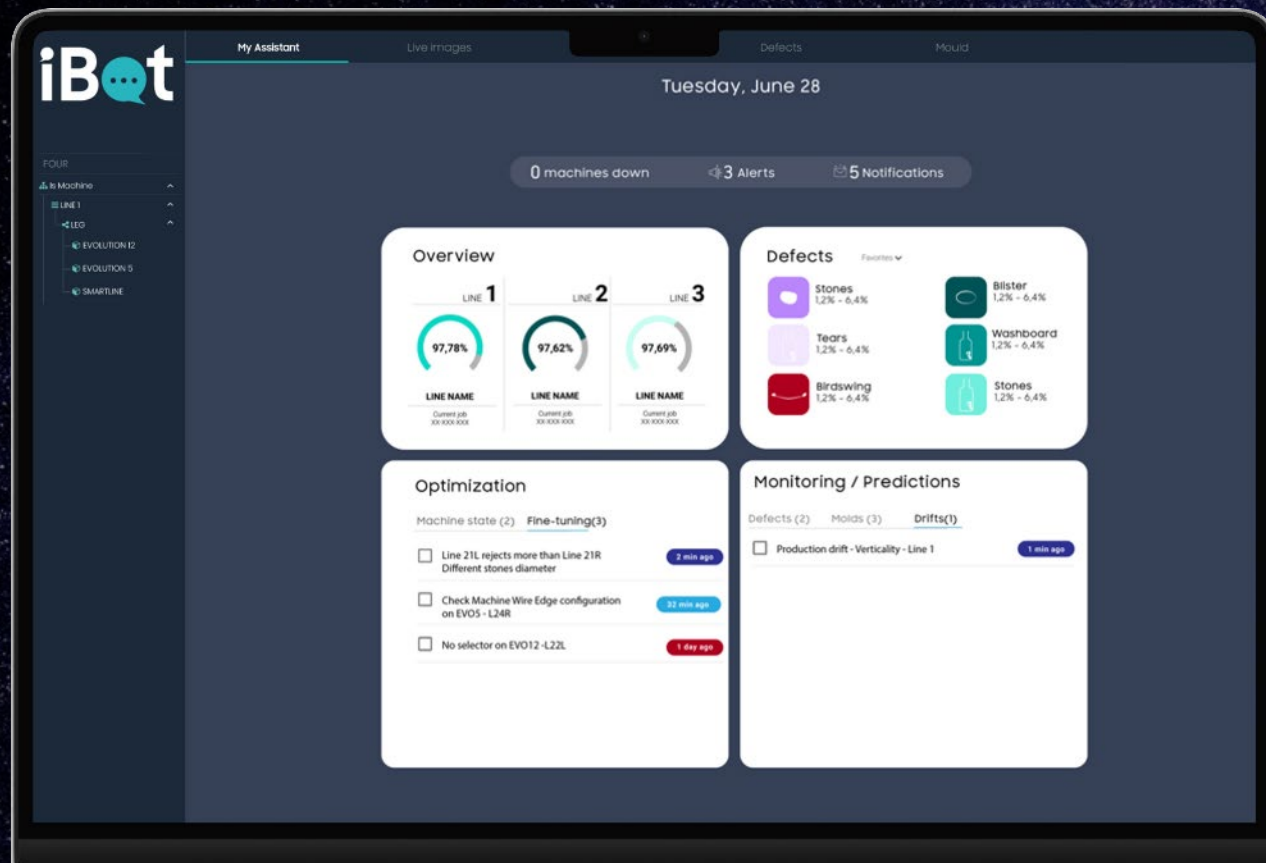
assists in REAL TIME operators and managers,
from the Cold to the Hot-End
with its **web app**.

iBot can also be connected
to your **information system** (MES).



iBot

does not require internet access nor cloud access.



Already
in operation
in Europe (3
plants).

Common
functionalities

COUNTERS

IMAGES





goes further

VERTICALITY VALUES

COUNTERS

ARTICLE SETTINGS

MACHINES SETTINGS

IMAGES

MACHINE STATUS

BODY MEASUREMENTS

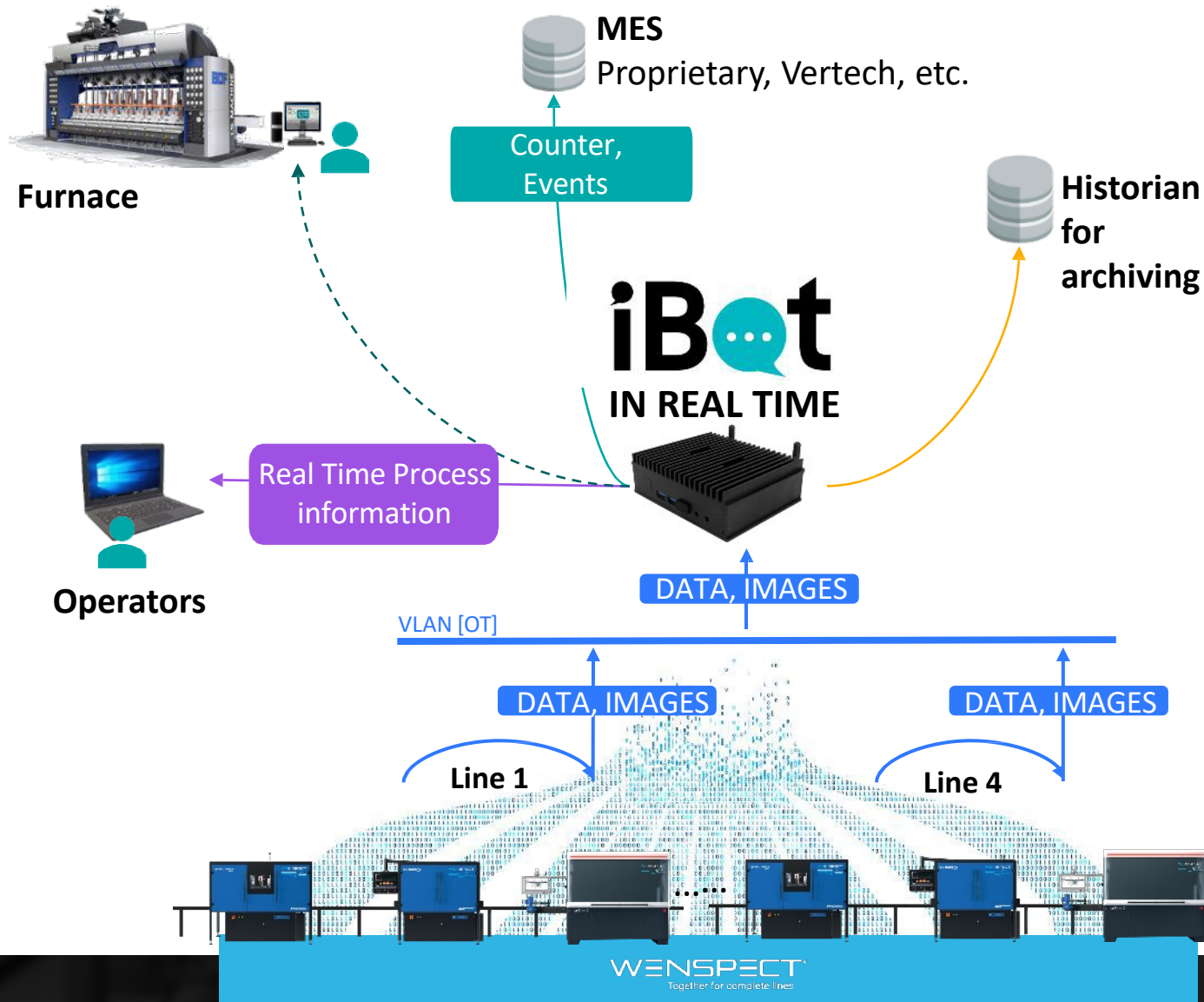
TOP DEFECTS

DEFECTS PER CAVITY

DEFECT CHARACTERISTICS



PROCESS OVERVIEW



DATA ANALYSIS

- Collect **data per line/furnace**
- Optimization **machine settings**
- Prediction of **process defects**
- **History** (images, parameters...)
- Help **monitor performance**

PROCESS DEFECTS

- Glass defect **by name**
- **Measured values**
- **Verticality drift, deformation**
- **Generate alerts** for corrective actions **without delay**

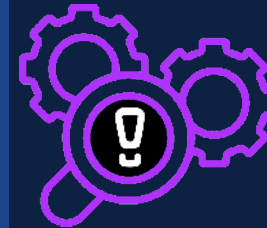
iBot MAKES THE MOST OF AI



EXCEPTIONAL DETAILED ANALYSIS of glass defects



REPEATABILITY & ACCURACY
with less false rejection



DRIFTS ANTICIPATION & SYSTEMIC DEFECTS PREDICTION



ACCURATE INFORMATION
including **ORIGIN & CRITICALITY**



SIMPLE SET-UP
with limited time for a **FAST JOB CHANGE**



ERRORS PREVENTION & PACK TO MELT IMPROVEMENT



ADDED-VALUE INFORMATION
to the plant



Easy deployment
on Evolution Range with **SOFT/HARDWARE UPGRADES**



PRODUCTIVITY & ENERGY CONSUMPTION SAVINGS

The background of the slide is a deep blue space scene filled with numerous small white stars. In the bottom-left corner, a portion of the Earth's blue and white horizon is visible. A large, solid blue curved shape sweeps across the right side of the image.

**THANK YOU
FOR YOUR ATTENTION!**