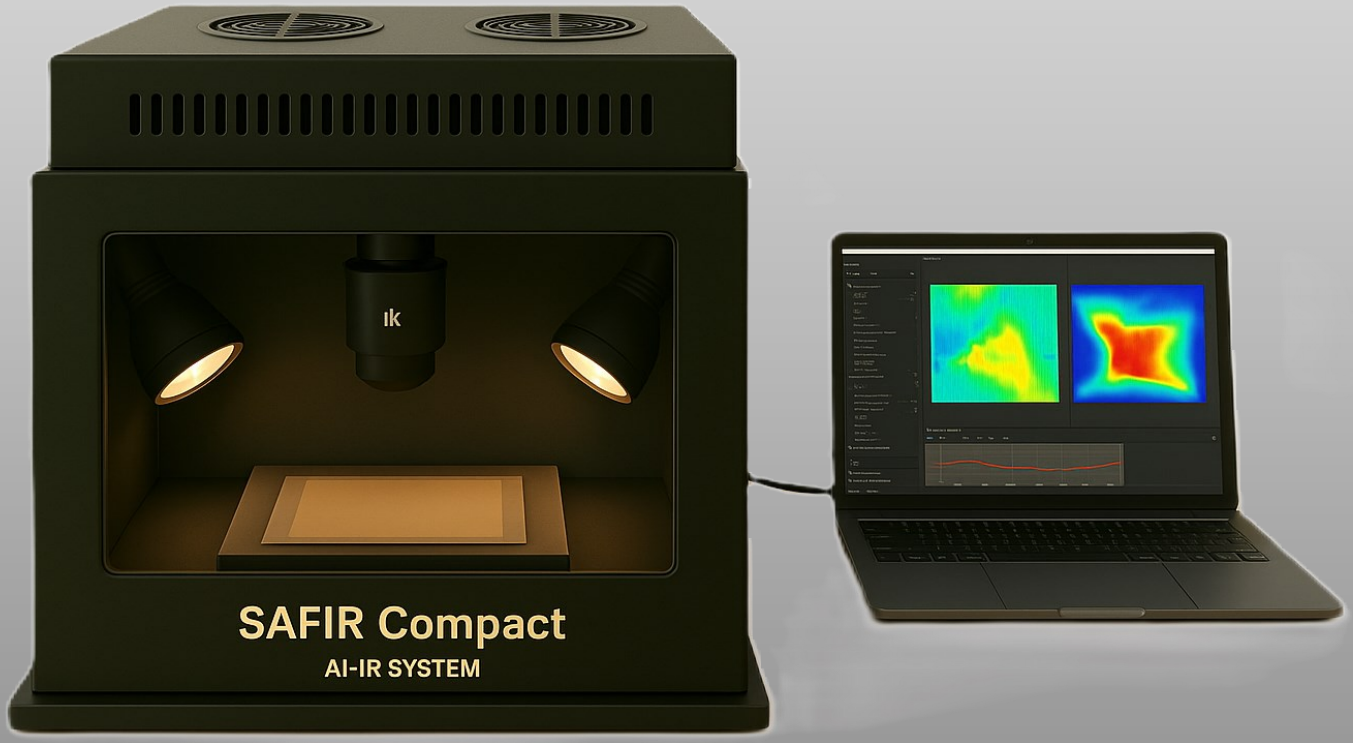
SAFIR

EPSYL

Defect Detection Imaging System

Compact Series



Reveal defects in material

Infrared Penetrant Vision

PROBLEM TO SOLVE

In the Mobility, Energy, Defence and composite Industries, internal defects (porosity, delamination, cracks) are difficult to detect during the prototyping or quality control phases.

Conventional methods (X-rays, ultrasound) are sometimes costly, slow or incompatible with laboratory and production line environments.

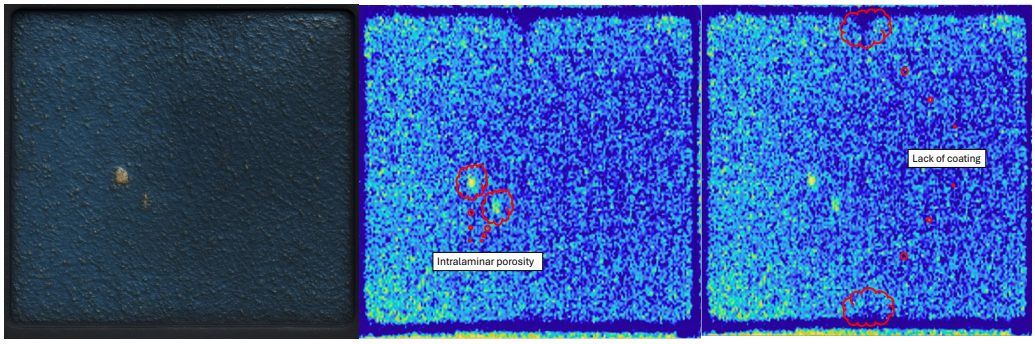
SAFIR Compact Series

SAFIR Compact is a configurable serie plug-and-play desktop device that combines:

- Penetrating infrared imaging
- Integrated artificial intelligence
- Operating software included + training

Capable of effectively inspecting composites, metals, insulators, textiles and multi-materials to detect any type of defect, visible or hidden

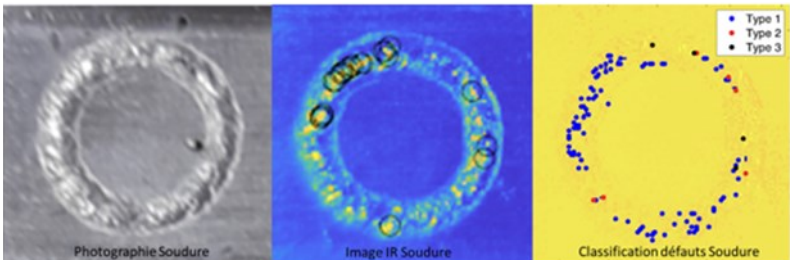
Inspection of passivation coating on electronic chip



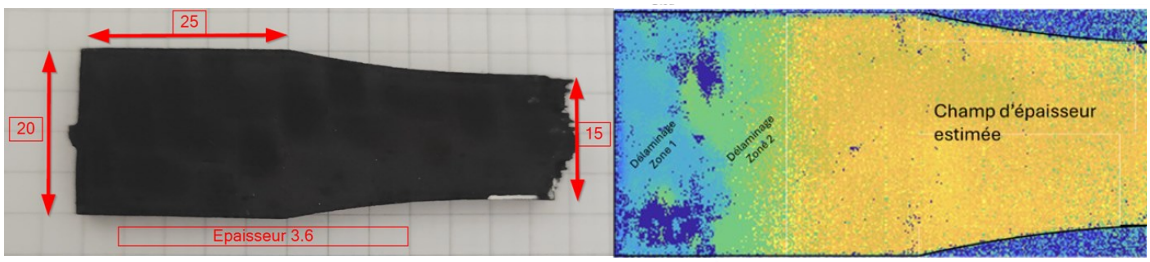
EXAMPLES OF CASE-STUDIES

- Aeronautics: inspection of carbon parts
- Electric mobility: inspection of battery modules
- Electronic: analysis of multilayer materials
- Technical textiles: detection of invisible defects

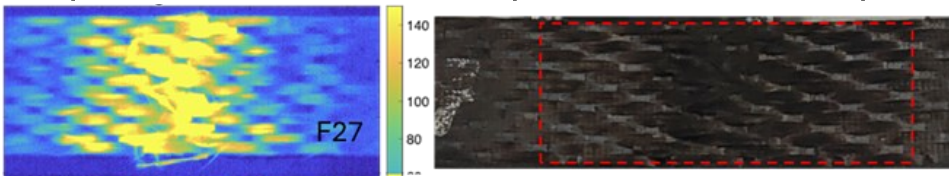
Inspection of welded cord of metallic part in carbon-free Energy

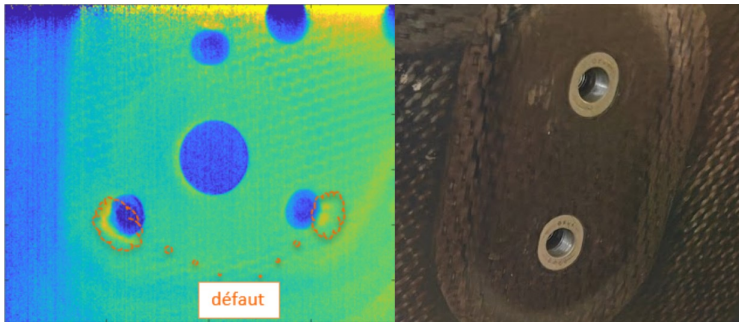


Inspection of Ceramic composites part in Scientific Research



Inspection of Carbone composites aeronautic part





NEW

SAFIR Compact Series

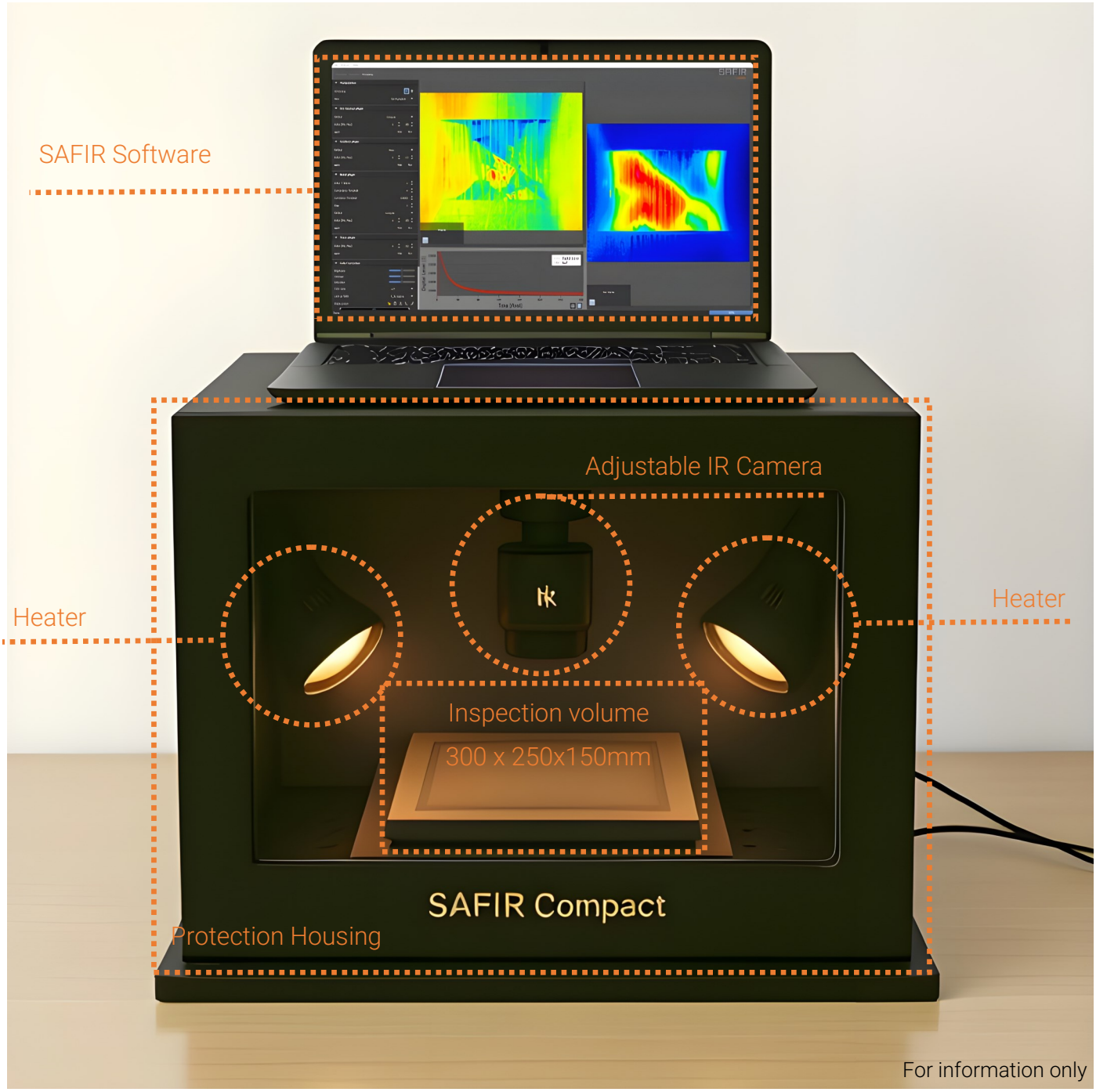
SAFIR Compact is a configurable plug-and-play desktop device that includes:

- 1 x adjustable infrared camera
- 1 x double synchronized heaters*
- 1 x large inspection volume
- 1 x protection housing in option**
- Many optional accessories***
- 1 x operating software WINx64 (SAFIR Technology)

* The device is delivered with infrared lamp in standard, but they can be replaced by Flash Lamp or Hot Air Jet in option, to increase the use cases.

**Recommended to use with Flash lamp or dusty or high reflective light environment

*** No accessories are delivered in standard. To maintain sample in the right position during the measurement, accessories as XY adjustable table or 360° indexed axis, may be highly recommended.


SAFIR Software
Adjustable IR Camera
Heater
Heater
Inspection volume
300 x 250x150mm
SAFIR Compact
Protection Housing
For information only

SAFIR

EPSYL

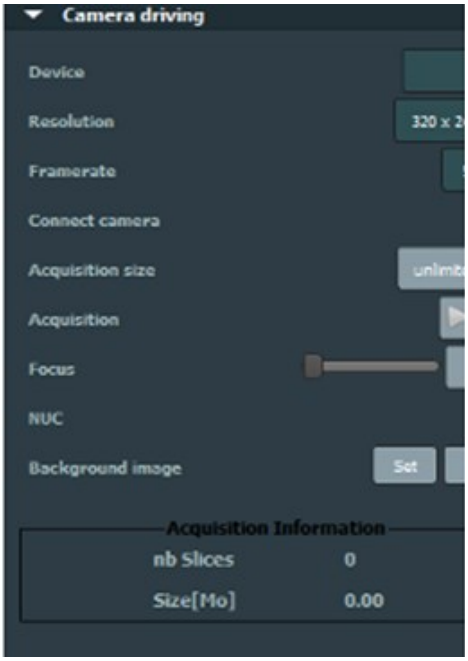
SAFIR Acquisition & Processing Software

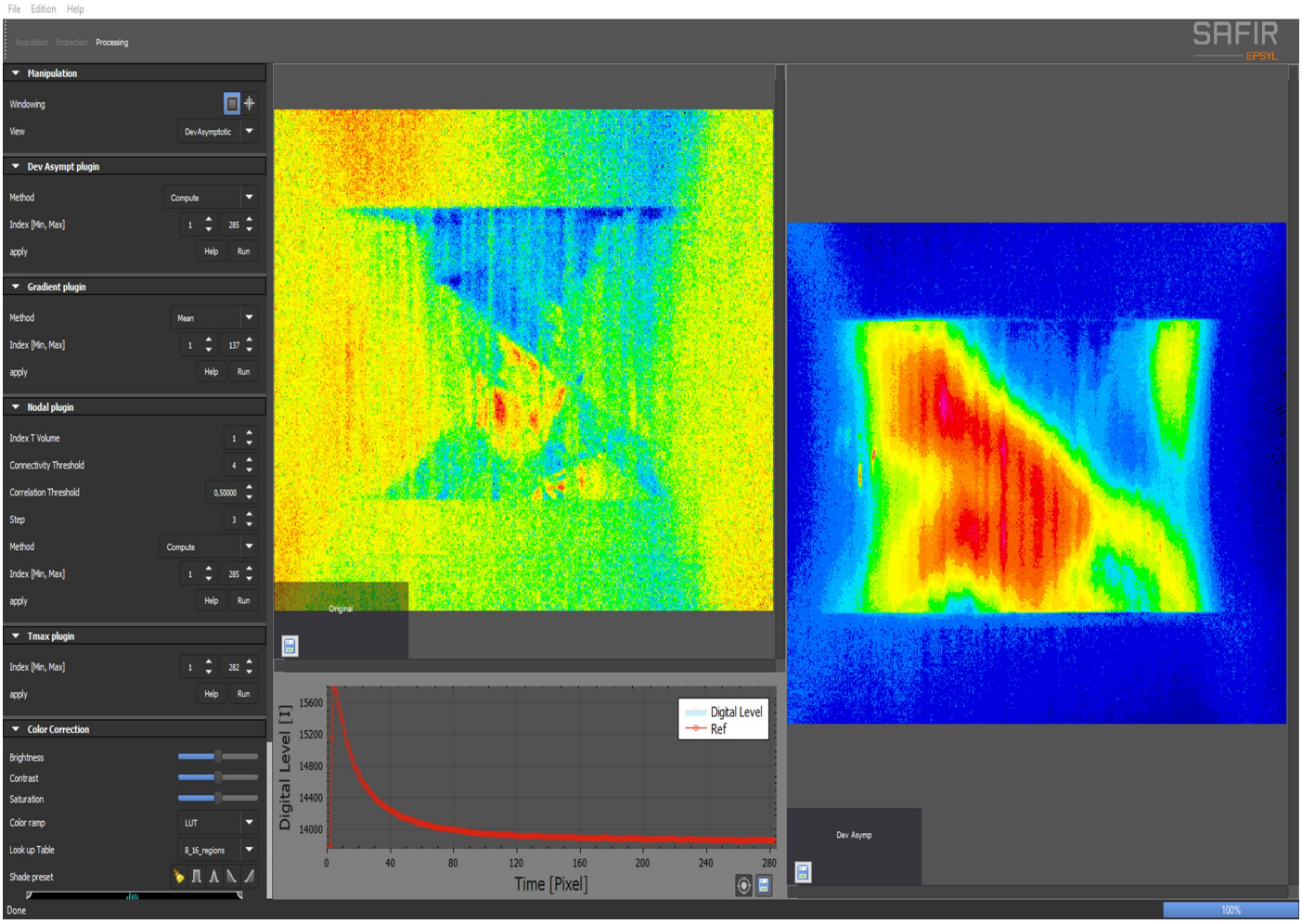
SAFIR is a complete software suite for Thermography Testing developed by EPSYL—Alcen Group.

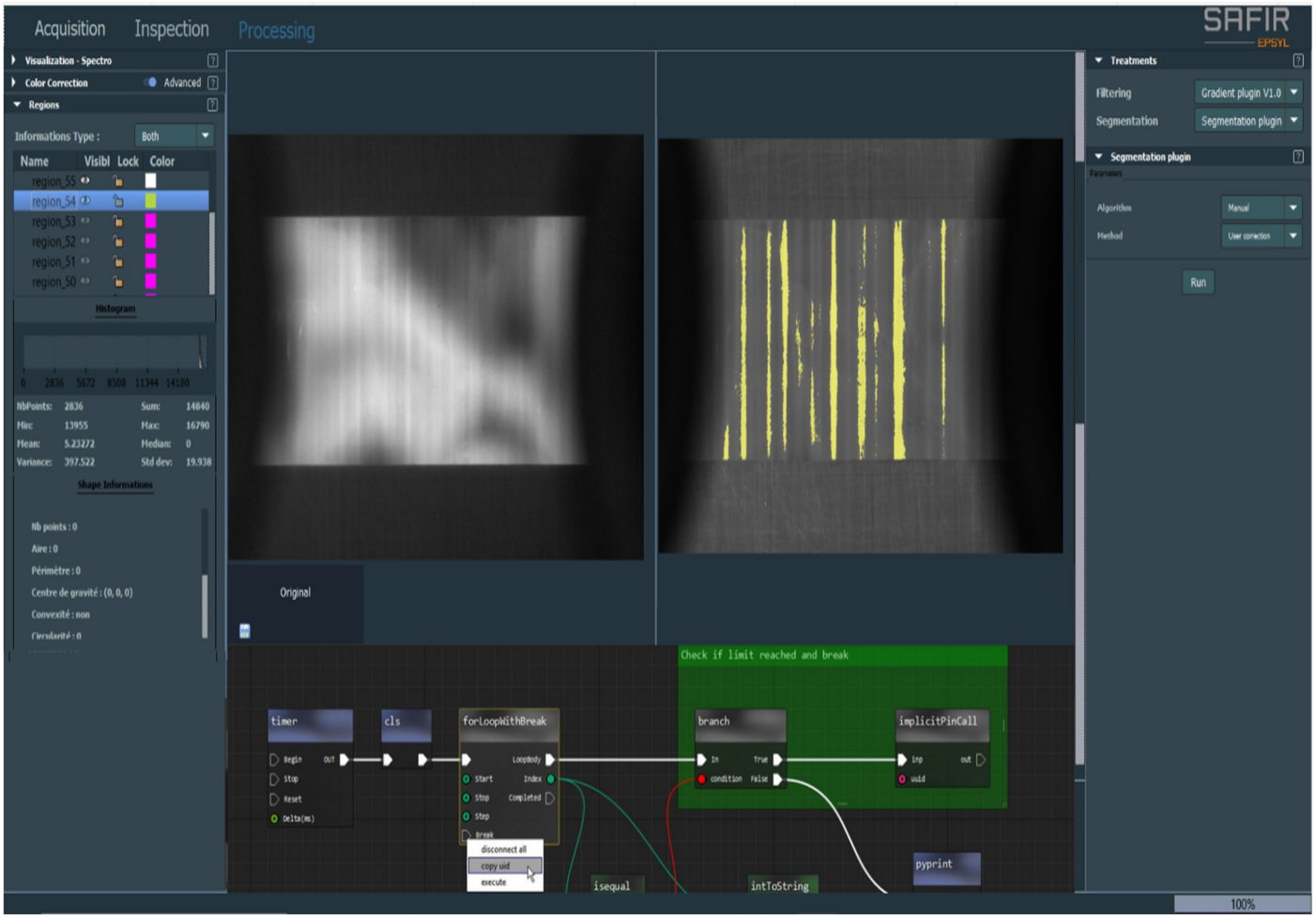
- 1 x Interface easy to use for acquisition and analyse thermograms from SAFIR Compact System
- 1 x toolbox for Acquisition settings
- 1 x toolbox for Heater Synchronizing settings
- 1 x toolbox for Image processing
- 1 x toolbox for advanced methods processing*
- 1 x toolbox image and data export for post-processing

* The methods includes allow to reveal the defects by scientific methods of spatial and temporal analysis of thermogram developed by EPSYL QNDT.

EPSYL QNDT is a French highly specialized Company in thermography analysis software

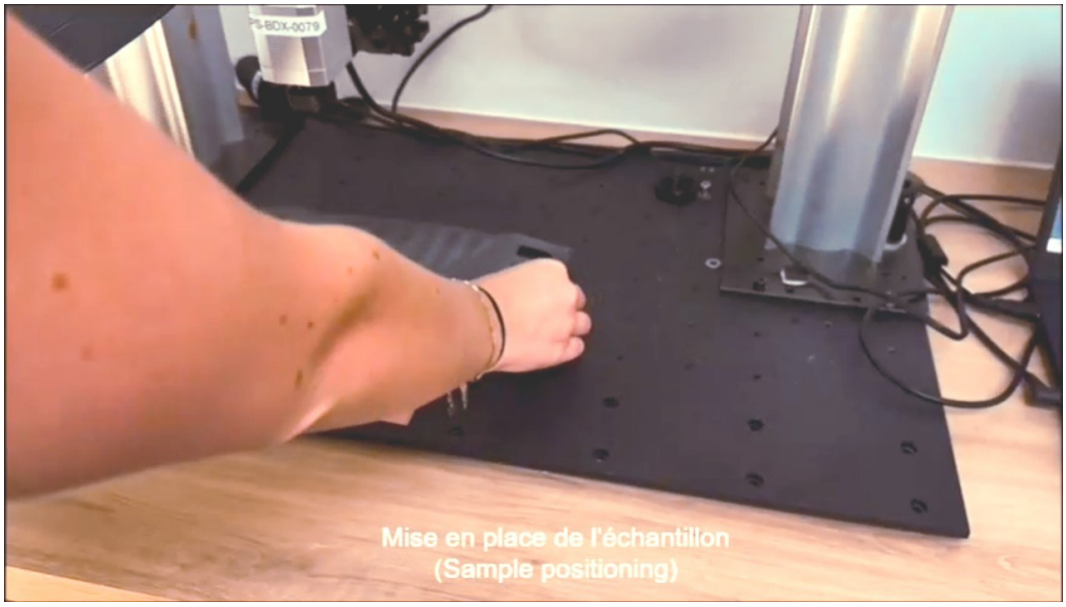



File Edition Help
Acquisition Inspection Processing
SAFIR
EPSYL
Manipulation
Windowing
View
DevAsymptotic
Dev Asympt plugin
Method
Compute
Index [Min, Max]
apply
Help
Run
Gradient plugin
Mean
Nodal plugin
Index T Volume
Connectivity Threshold
Correlation Threshold
Step
Tmax plugin
Color Correction
Brightness
Contrast
Saturation
Color ramp
LUT
Look up Table
8_16_regions
Shade preset
Original
Digital Level [I]
Digital Level
Ref
Time [Pixel]
Dev Asymp
Done
100%


Acquisition
Inspection
Processing
SAFIR
EPSYL
Visualization - Spectro
Color Correction
Advanced
Regions
Informations Type :
Both
Name
Visibl
Lock
Color
region_55
region_54
region_53
region_52
region_51
region_50
Histogram
NbPoints: 2836
Sum: 14840
Min: 13955
Max: 16790
Mean: 5.23272
Median: 0
Variance: 397.522
Std dev: 19.938
Shape Informations
Nb points : 0
Aire : 0
Périmètre : 0
Centre de gravité : (0, 0, 0)
Convexité : non
Original
Check if limit reached and break
timer
cls
forLoopWithBreak
branch
implicitPinCall
pyprint
isequal
intToString
disconnect all
copy uid
execute
Treatments
Filtering
Gradient plugin V1.0
Segmentation
Segmentation plugin
Algorithm
Manual
Method
User correction
Run
100%

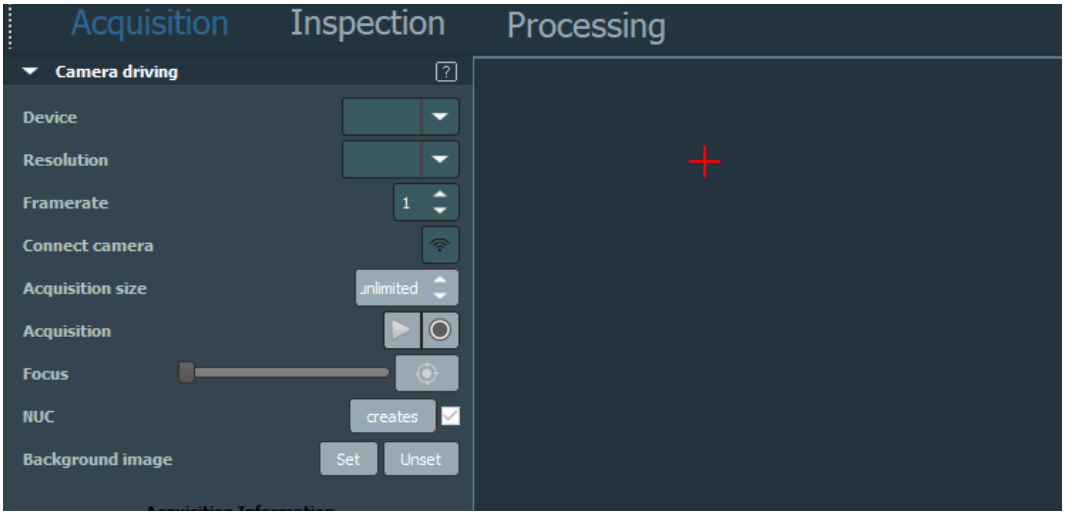
SAFIR Compact Instructions

SAFIR Compact is very easy to use device in 5 steps :

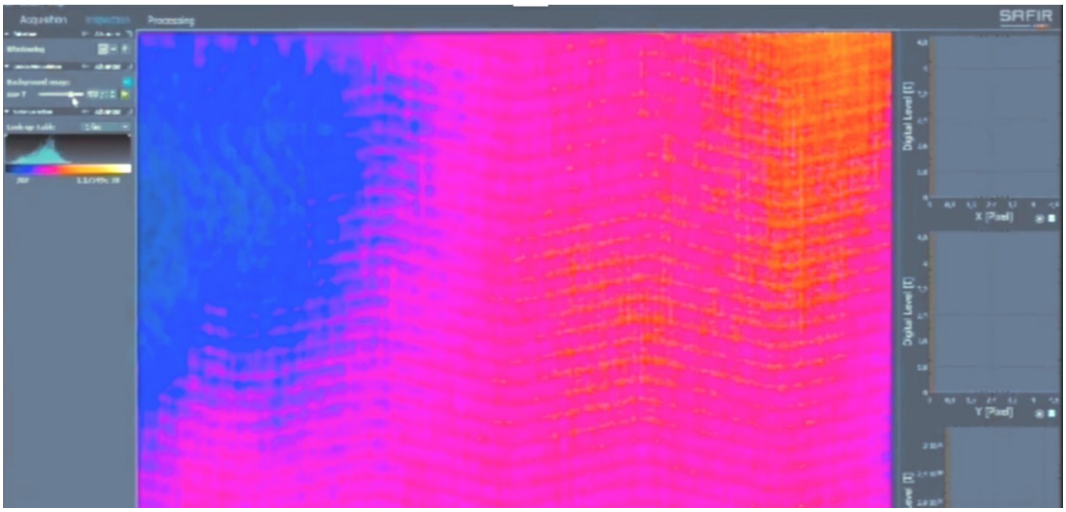


- Step 1 : Position the sample to inspect in the camera's field of view

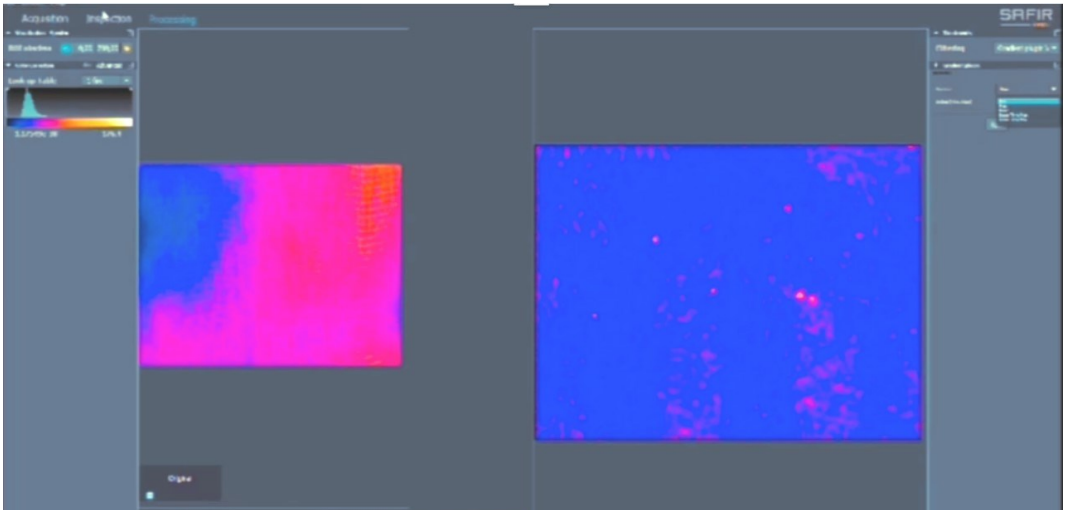
- Step 2 : Adjust the heaters and camera positioning if necessary



- Step 3 : Launch the Acquisition from SAFIR software



- Step 4 : Replay and Adjust acquired image setting from SAFIR software / Inspection Tab



- Step 5 : Apply exclusive Data Processing methods from SAFIR software / Processing Tab

SAFIR Compact Accessories

SAFIR Compact is a configurable desktop device adaptable for many applications. According to the material or geometry of the sample to inspect it could be highly recommended to transform the setup with the following kits :

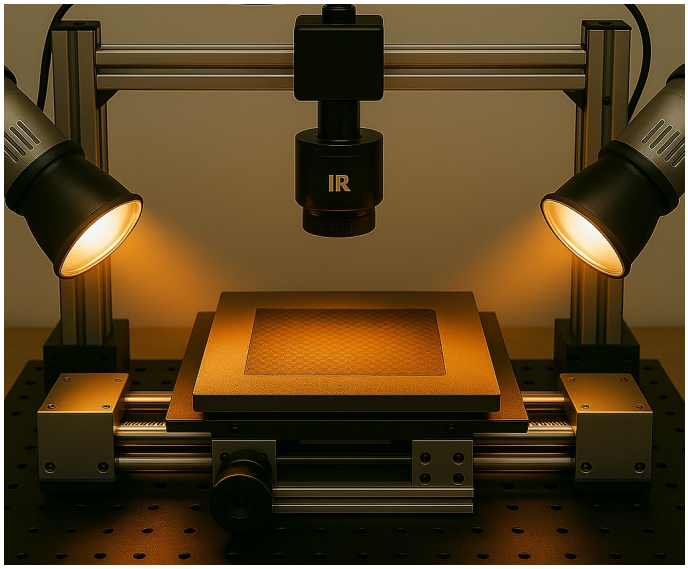
- 1 x Double Air Flow Heater replacement kit(1)
- 1 x Double Flash Lamp replacement kit(1)
- 1 x XY adjustable table (2)
- 1 x Pivoting indexed axis(2)
- 1 x Protection Housing(3)
- 1 x Ozone and Heat ventilation kit(3)
- 1 x Flash Protective Screen(3)
- 1 x Closed Door Sensor(3)
- 1 x IR Microscope Kit(4)

(1) This replacement kit include software plug-in associated for Acquisition, synchronizing and processing. These accessories allow to enlarge the type of material to inspect.

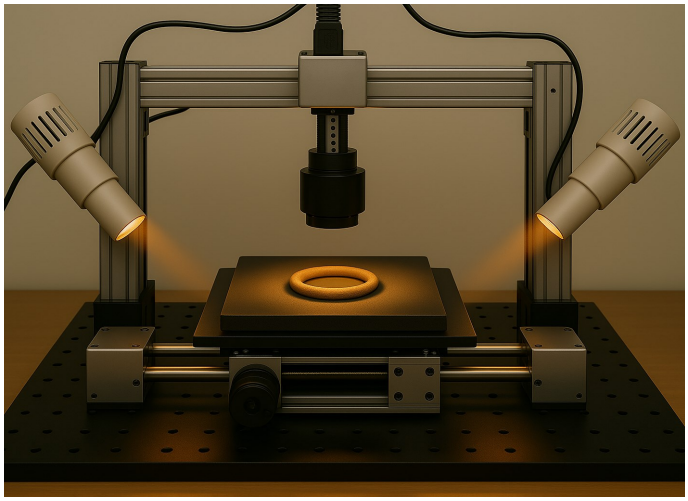
(2) This accessory could be useful for inspecting at different spatial or axial positions. These accessories can be delivered with manually or software piloted adjustment

(3) Recommended to use with Flash lamp or dusty or high reflective light environment

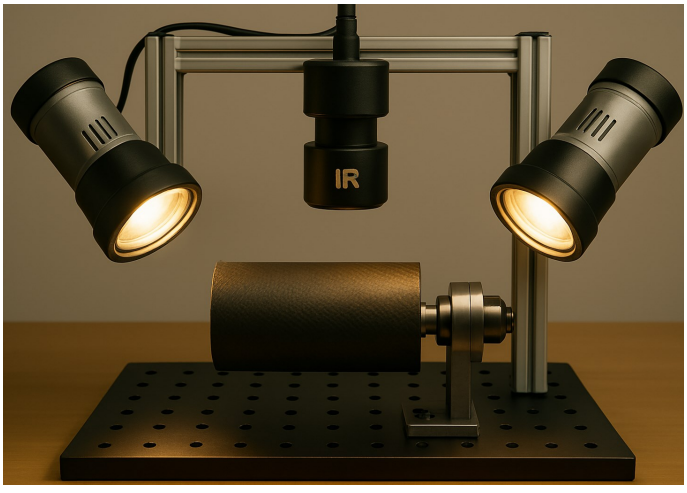
(4) For targets as small as 28 µm within a total field of view of 18.2 mm x 13.8 mm



XY Table



Double Air Flow Heater



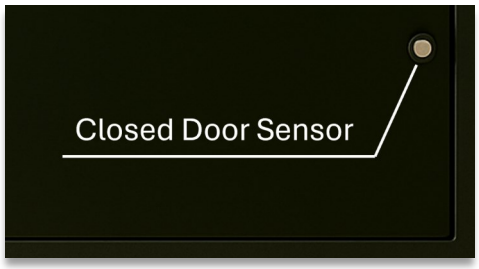
Pivoting indexed axis

IR Microscope Kit

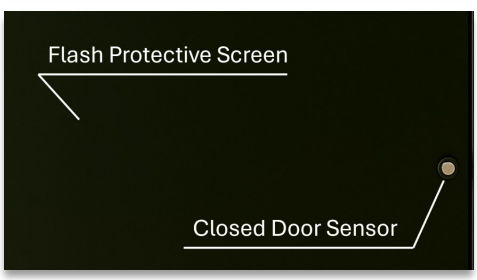
Recommended for Flash

Protection Housing

Ozone and Heat ventilation kit



Closed Door Sensor



Flash Protective Screen

Specifications

Model	SAFIR Compact	**XI400-H**	**XI400-F**	**XI400-A**	**PI640-H**	**PI640-F**	**PI640-A**
Camera	Model	XI400			PI6400		
	Optical resolution	382x288 pixels			640x480 pixels		
	Pixel pitch	17µm			17µm		
	Detector	Uncooled bolometer			Uncooled bolometer		
	Spectral Range	8 - 14 µm			8 - 14 µm		
	Frame Rate	80 Hz			32 Hz (Full resolution) 125Hz (Linescan)		
	Thermal Sensitivity (NETD)	50mK			40mK		
Heater	Type	**Halogen**	**Flash**	**Air Flow**	**Halogen**	**Flash**	**Air Flow**
	Power supply	220V - 50Hz 10-20A					
	Power	3kW	2kW	2kW	3kW	2kW	2kW
Interface	Alim	Cable H05RR-F 3G2.5-Type F : 1,5m					
	Camera Port	USB 2.0 (Ethernet optional)					
Environmental & certifications	Temperature	0...70°C					
	Humidity	10 - 95% non condensing					
	Dust	Protection recommended					
	Incident Light	Protection recommended					
	Vibration	IEC 60068-2-6 (sinus shaped) & IEC 60068-2-64 (broadband noise)					
	Shock	IEC 60068-2-27 (25 G and 50 G)					
	Standard	CE, UKCA, RoHS					
Inspection volume		300 x 250 150mm					
Dimensions		600 x 600 x 600 mm					
Material compatibility	Metal	NO	NO	YES	NO	NO	YES
	Insulator	YES	YES	YES	YES	YES	YES
	Composites	YES	YES	YES	YES	YES	YES
	Textile	YES	YES	YES	YES	YES	YES
	Multi-layer	YES	YES	YES	YES	YES	YES

CONTACT YOUR NEAREST OFFICE FOR RELEASE STATUS

EPSYL
Phone: +33 5 61 00 19 19
HQ : 3 rue Tarfaya — 31400 Toulouse — France
Web : https://safir-system.com