



WATER-BASED COATINGS FOR WOODEN FRAMES AND SHUTTERS

QUALITY BY THE LIGHT OF THE SUN





WATER-BASED COATINGS FOR WOODEN FRAMES AND SHUTTERS  
QUALITY BY THE LIGHT OF THE SUN



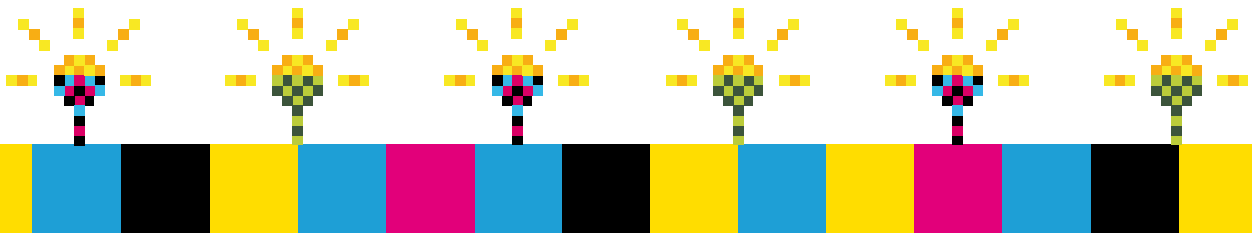
## EXPERIENCE AND QUALITY FEAR NO CHALLENGE

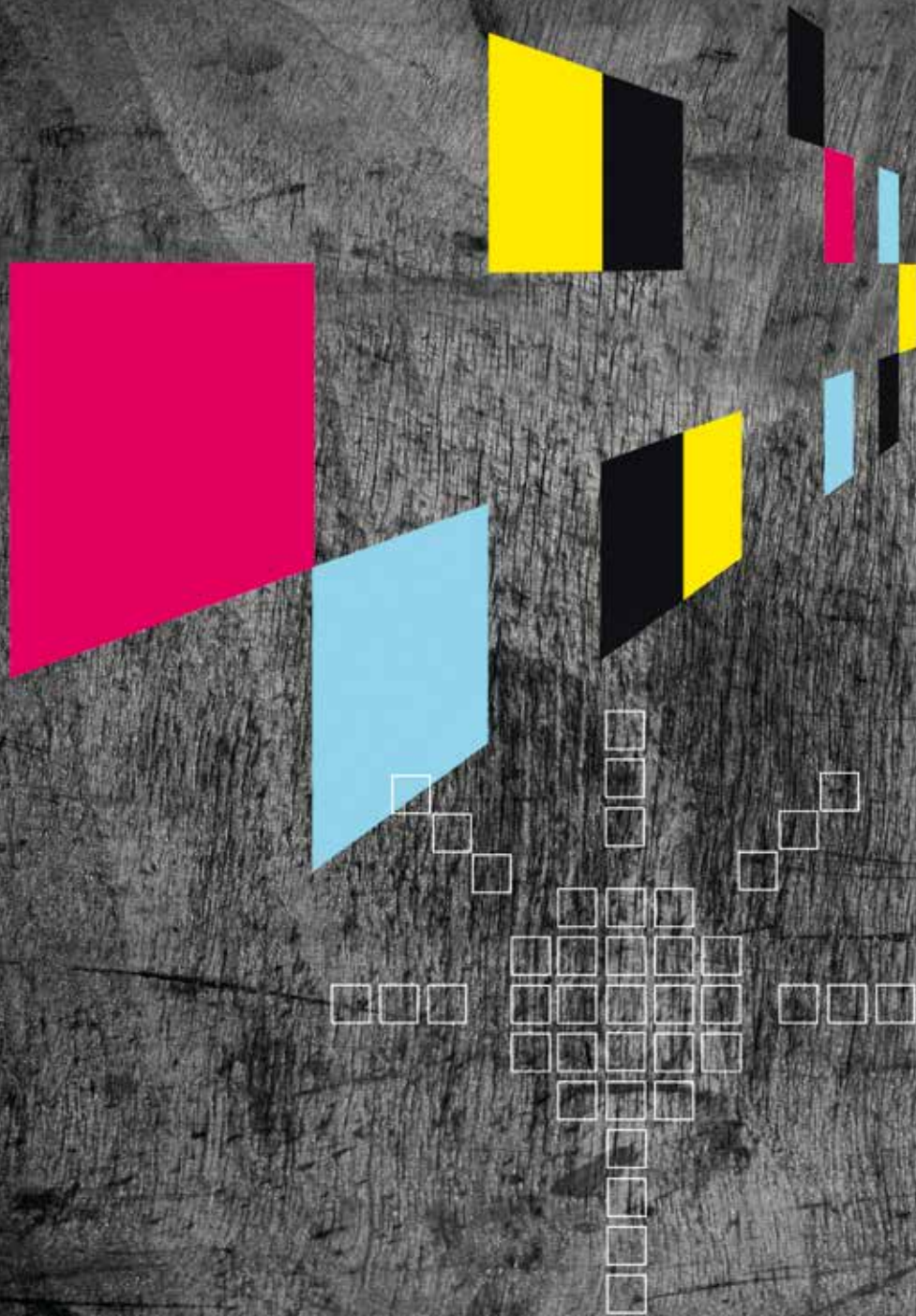
For more than two decades, **ICA** has been developing **water-based products for exterior use** and has, therefore, accumulated a wealth of experience in the field that allows it to select very accurately the raw materials and formulations that are best suited to their use.

Together with the laboratory tests that provide essential information in relatively short time frames, ICA also conducts **natural weathering tests at various sites**.

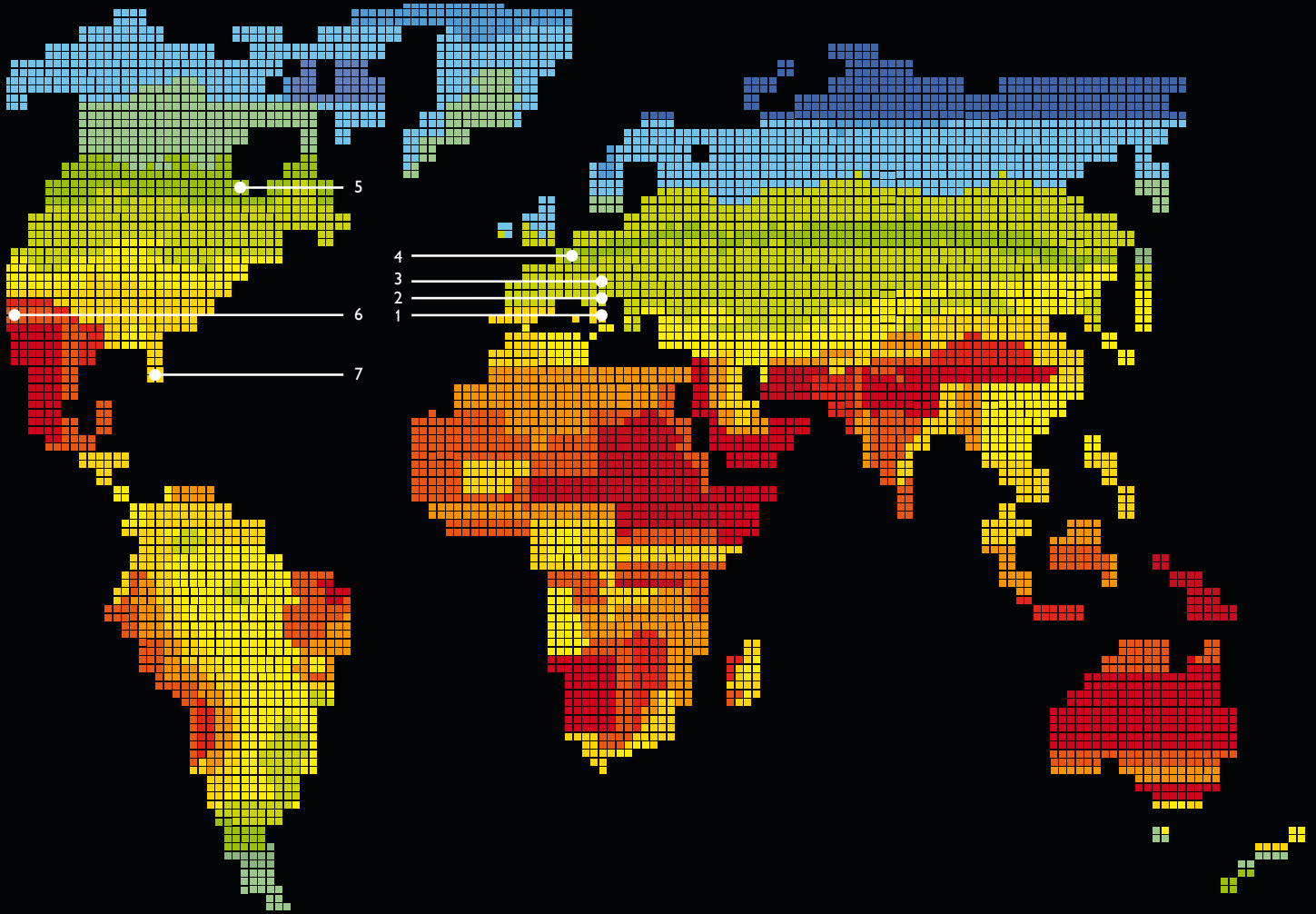
Right from its very earliest formulations of water-based coating products, which date from the late 1980s, ICA has used its R&D laboratories to conduct exterior durability testing on an ongoing basis.

In 1996, the chemical/physical department at the laboratories in Civitanova Marche began to conduct in-house **artificial weathering tests [QUV]**.






# ANNUAL SOLAR RADIATION



- |                               |                           |
|-------------------------------|---------------------------|
| 1 ITALY_Civitanova Marche_ICA | 5 CANADA_Ontario_ICA      |
| 2 ITALY_Udine_Catas           | 6 ARIZONA_Buckeye_Q-LAB   |
| 3 GERMANY_Rosenheim_IFT       | 7 FLORIDA_Homestead_Q-LAB |
| 4 GERMANY_Braunschweig_WKI    |                           |



Energy on surface unit



When developing its products, ICA also uses internationally renowned third-party laboratories to conduct evaluations of the durability of the coating cycles, including **Q-Lab** [USA], **Catas** [Italy], **WKI** and **IFT Rosenheim** [Germany].





# THE ARBOREA SUN PROJECT

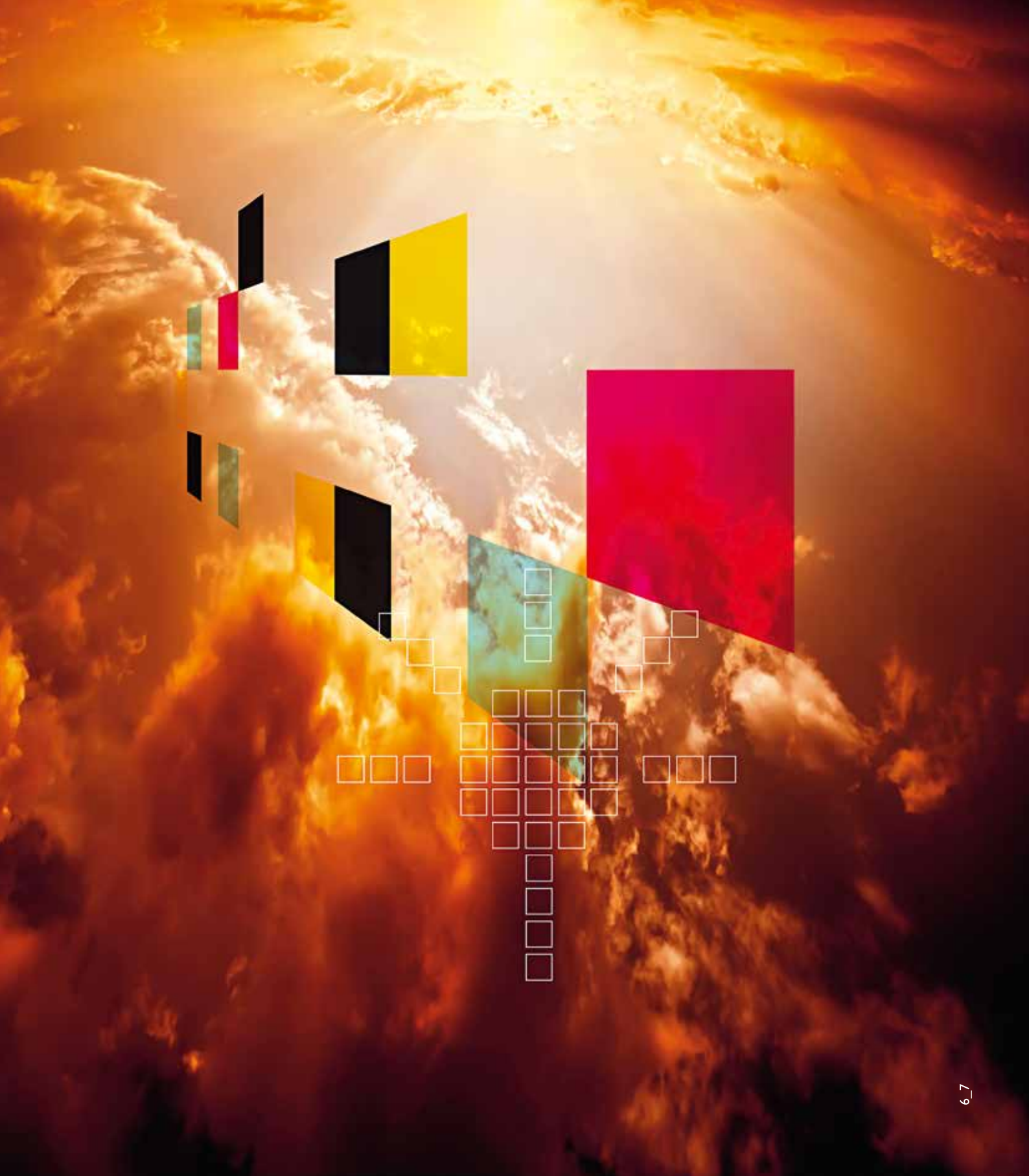


The **ARBOREA SUN** project, which analyzes the performance of ICA's water-based coatings for exteriors, was begun in 2010 in collaboration with ICA's **technology partner, Q-Lab**.

Q-Lab is an accredited laboratory that deals with the durability testing of materials. Established in 1956 in the United States, it is based in Ohio and has facilities in Germany, the United Kingdom and China. Its QUV Accelerated Weathering Tester is the most widely used tool of its type in the world.











# NATURAL WEATHERING\_FLORIDA

The natural weathering tests conducted at the **Q-Lab station in Homestead, Florida**, make it possible to verify the performance of ICA coatings **under warm/humid climatic conditions**. The quantity of energy produced by the solar radiation and the percentage of relative humidity in this location together give a clear idea of the severity of the testing and of the substantial stresses to which the coated wood sample is subjected.

## The climate in Florida

Latitude: 25° 27' North\_Longitude: 80° 20' West  
Annual solar energy: 6588 MJ/m<sup>2</sup>

Average annual temperature: 24°C  
Average annual humidity: 70% RH



## ACCELERATED NATURAL WEATHERING\_ARIZONA

With a view to verifying the effectiveness of its coating cycles under conditions of exceptional exposure, ICA goes beyond the natural weathering tests conducted in the punishing climate of Florida by also putting its products to the test in the even more unforgiving environment of the Arizona desert. The **warm/dry climate of Arizona** is characterized by very intense sunlight, very high temperatures, which reach up to 46°C during the summer, minimal rainfall and very low humidity.

**The sun exposure** here is around **20% higher than in Florida**. Over the course of a year, the average energy that reaches the sample in the form of solar rays is 8000 MJ/m<sup>2</sup>.

Alongside the very high temperature during the day, nights in the Arizona desert are generally cold. As such, the extreme **temperature shifts between day and night** put the wooden surface, and the coating film applied to it, under considerable stress.

### The climate in Arizona

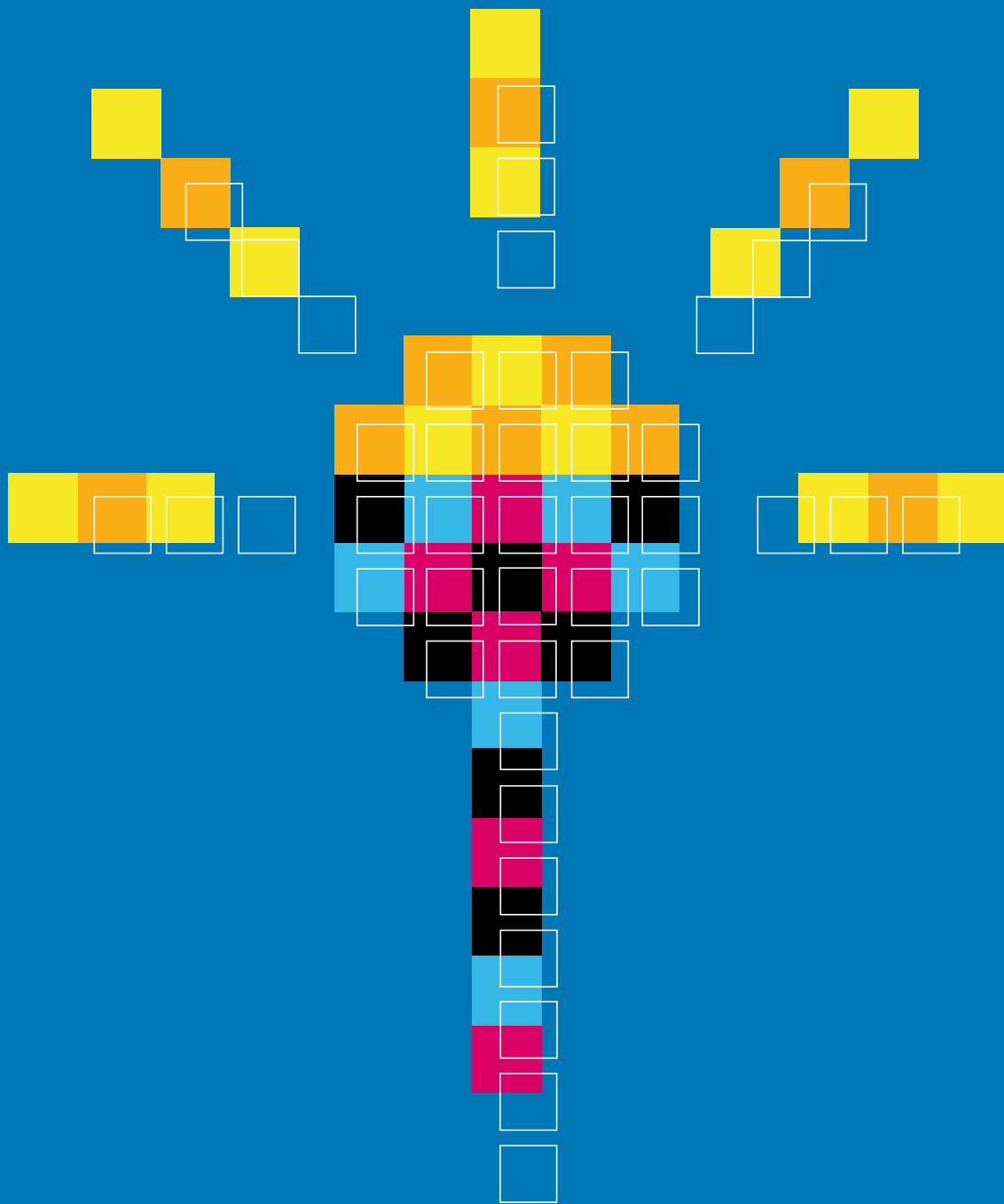
Latitude: 33° 23' North\_Longitude: 112° 35' West  
Annual solar energy: 8004 MJ/m<sup>2</sup>

Average annual temperature: 21°C  
Average annual humidity: 35% RH











To verify the performance of the products under even more extreme conditions, ICA has implemented, along with Q-Lab, a **program of accelerated weathering referred to as the Q-TRAC Natural Sunlight Concentrator.**

This system **makes it possible to concentrate, by means of a series of mirrors, the solar rays on the panel to be tested.** In this way, the natural sunlight concentrated on the samples puts the coating film under very high levels of stress.

In addition, during the day, a mechanism makes it possible to track the movement of the sun in order to guarantee maximum exposure at all times. In this way, the sum of the UV radiation is around five times higher than the natural exposure in Florida.

Moreover, from sunset until sunrise, the sample is subjected to a cycle of humidification using pre-programmed sprays. The test is, then, extremely tough, due not only to the energy involved but also to the artificially generated humidity.

The test conducted in Arizona **combines the rapidity that is characteristic of an accelerated weathering test with the reliability of a complete spectrum of natural sunlight.**

## Following the sun



Morning

Noon

Afternoon



## THE ENERGY OUTPUT OF THE SUN

The thermonuclear fusion that takes place within the sun releases enormous quantities of energy in the form of electromagnetic radiation. Once it has penetrated the atmosphere, a part of this energy reaches the ground with an intensity equal to around **15,000 times the current worldwide level of energy consumption**.

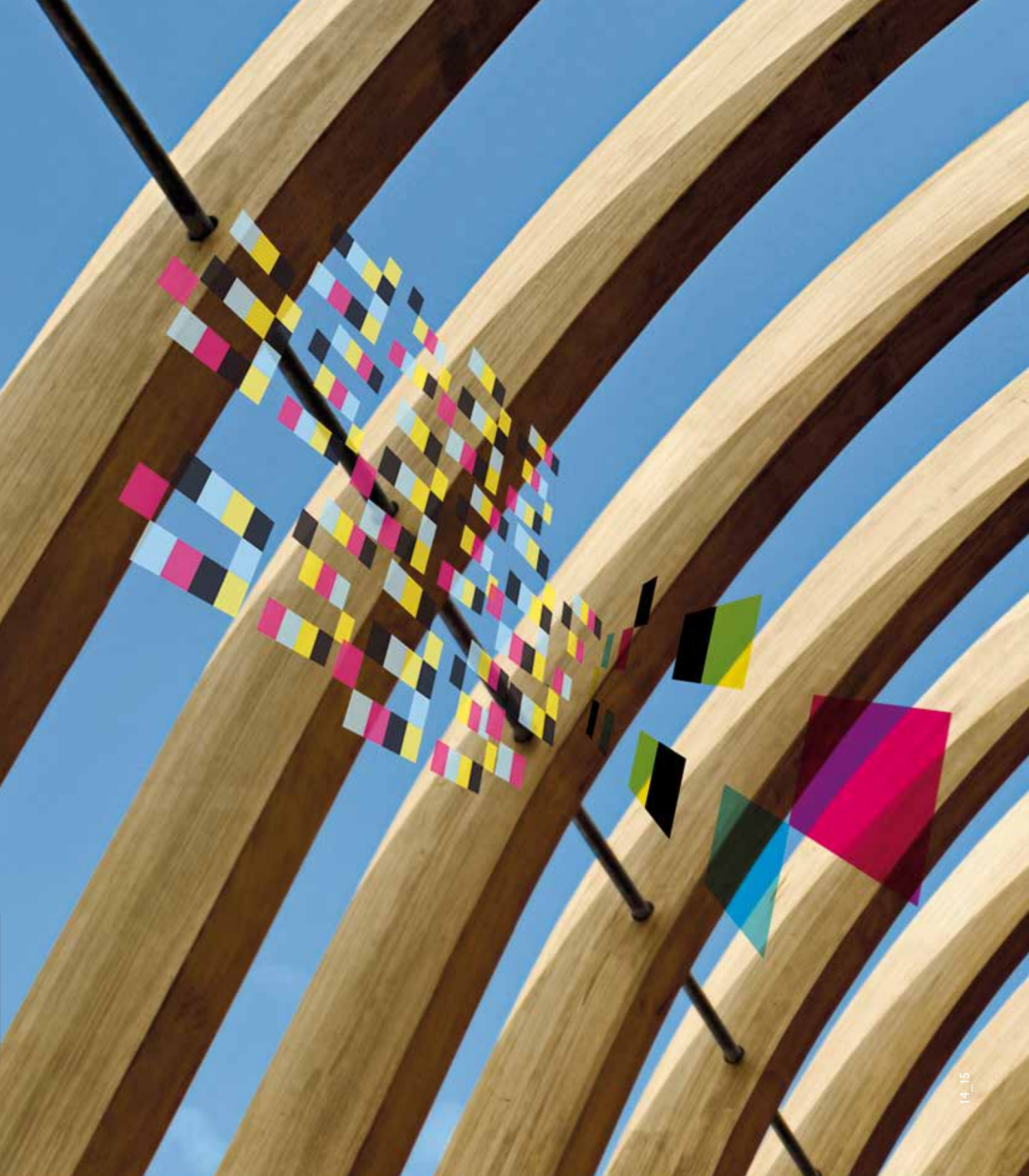
**Sunlight**, together with humidity, compromises the **appearance of frames and shutters** and is responsible for the degradation of the coating film and the wooden surface.

### SOLAR ENERGY COMPARISON

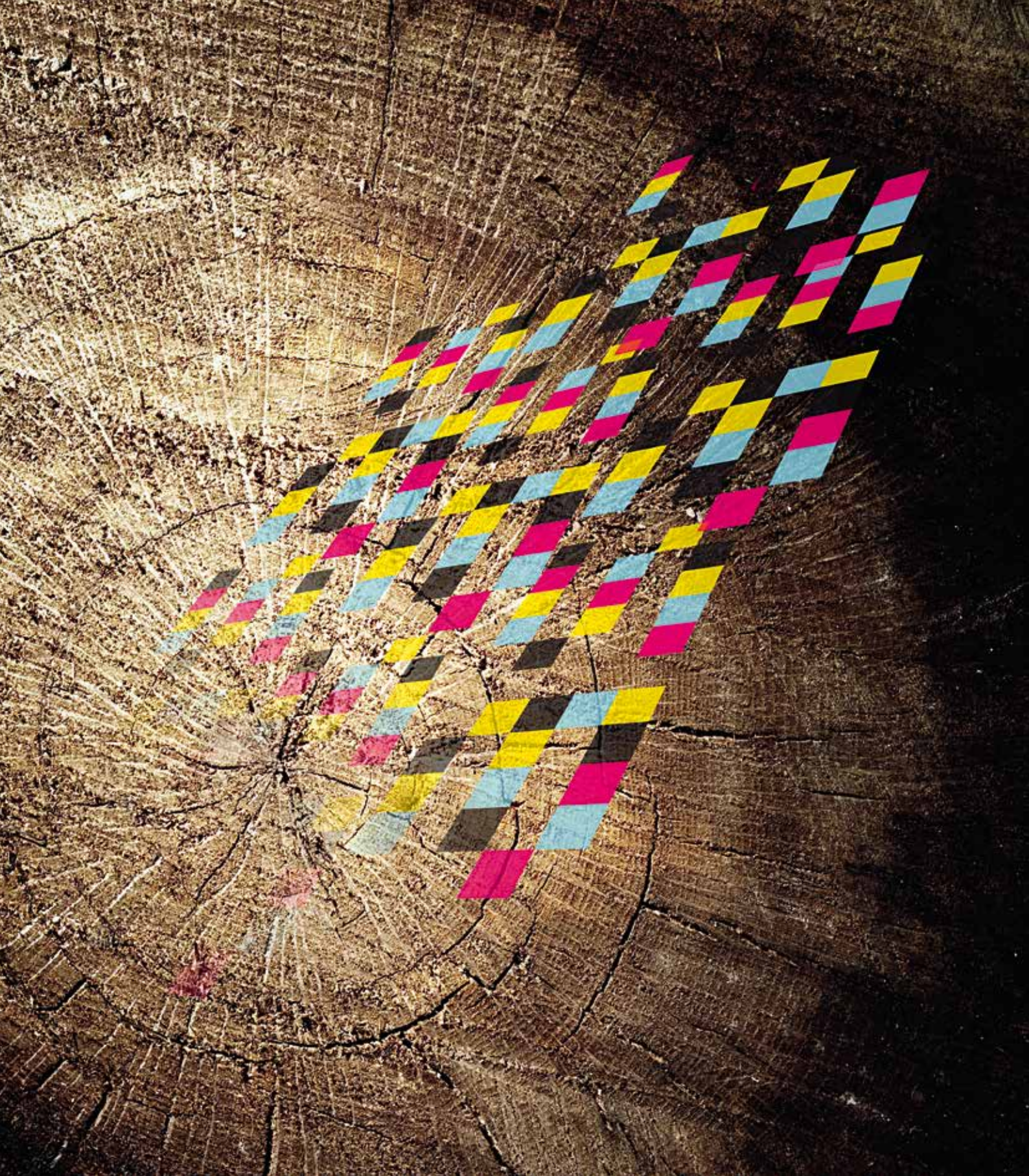
**A 6-month cycle with Q-TRAC in Arizona = 5 years of natural exposure in Italy**

With Q-TRAC, **lacquered, metallic and transparent stained cycles** were tested on various wood species. In addition, the same accelerated natural weathering tests were also conducted on coating cycles applied to **Accoya** [a molecularly modified acetylated wood]. The performance was extraordinary.











# DURABLE QUALITY

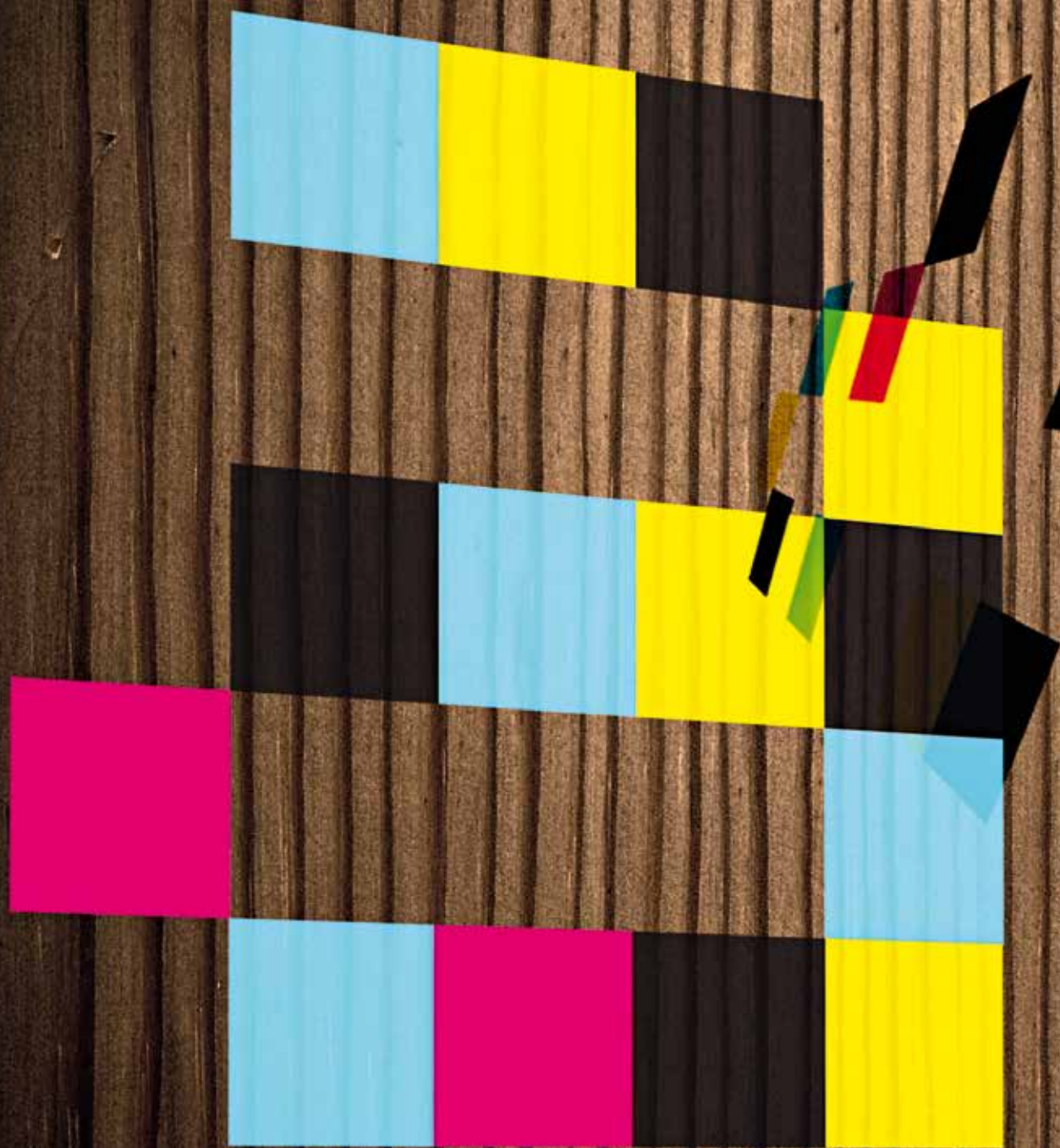
On the basis of this accurate and ongoing analysis of the performance of its products in terms of durability, and also by leveraging the experience it has built up in the field with its client base, ICA offers a warranty on newly constructed exterior frames and shutters, depending on the cycle and on the type of wood utilized.

The products used in the guaranteed coating cycles have been analyzed, tested and enhanced for more than a decade by the ICA R&D laboratory.

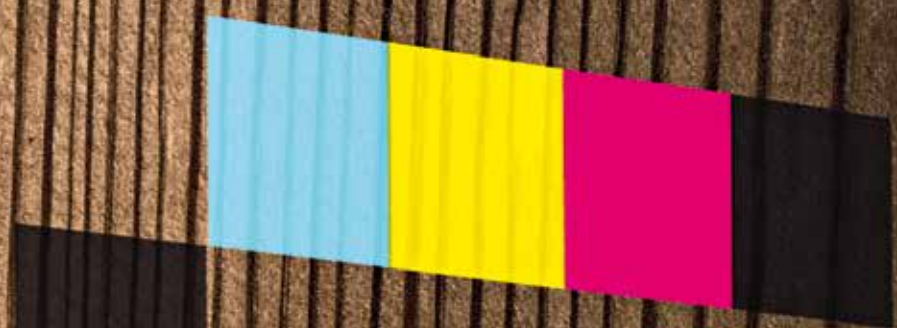
This has allowed the company to verify the effective resistance of its products and, as a result, to guarantee a durability of **more than 10 years**.

The tested and guaranteed cycles relate to the top coats of the **PLUS and Nanotech** ranges.















**Industria Chimica Adriatica SpA**

Via Sandro Pertini 52  
62012 Civitanova Marche (MC) Italy  
Tel. +39 0733 8080  
Fax +39 0733 808140

[info@icaspa.com](mailto:info@icaspa.com)

**Division ITALIAN COATINGS**

Via Alcide De Gasperi 73  
36060 Romano D'Ezzelino (VI) Italy  
Tel. +39 0424 8386  
Fax +39 0424 37497

[info@italiancoatings.com](mailto:info@italiancoatings.com)

[www.icaspa.com](http://www.icaspa.com)

