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INDUSTRIAL DEVELOPMENT ORGANIZATION
INVESTMENT AND TECHNOLOGY PROMOTION OFFICE ITALY

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IMPORTANCE OF APPROPRIATE TESTING AND CERTIFICATION OF SOLAR TECHNOLOGIES

How to limit problems doing business with long-term renewable energy technologies

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MARKET PLAYERS AND INTERESTS

In Italy we say: “If you are interested into the real performances of anything, you can divide by two the values declared by the manufacturer; alternatively, you can divide by four the values declared by the retailer”.

Manufacturers

They produce the maximum standardized item at the lowest price as possible.

Most of the equipment built all around the world are high quality products, but they are not always suitable for every application.

There is also a remarkable percentage of very low quality products.

Retailers

They usually have commercial experience, but limited skills regarding scientific aspects.

They are essential to connect manufacturers with clients, but in general, they are not technical consultants.

Clients

The clients pay close attention to prices and less attention to performances.

They usually have no idea about safety and endurance of the equipment they are buying.

End-users necessities

The final client is perfectly able to select good quality for common products, i.e. food or clothes, but the choice of durable and long-term equipment needs specialist knowledge.

The most common risk is the premature ageing of the equipment they are buying.

The manufacturer's warranty, if any, does not help: most manufacturers will not be present to repair or replace parts on 2027.

Regulators answers

Main regulator's duties are:

1. to set the minimum requirements to limit the probability of commercial errors or fraud
2. at a technical level, to define the minimum technical requirements, considering the local market, the natural environment and the type of use.
3. to promote the diffusion of the technical culture.

Of course, the regulator must verify compliance with the rules and punish any abuse.

Conversely, the worldwide experience shows that it is a bad idea to keep the regulator directly in charge of the technical verifications, because it's too much specific.

The professional controller

The check of equipment performances, safety and durability is more efficient if in charge of the so-called "third parties".

They are experienced professionals, separated from manufacturers/retailers and final customers, to avoid "conflict of interests".

The presence of a third-party test report and/or certificate increase the confidence of the end-customer.

There are two types, often operating together:

Laboratory

It examines sample from production, performing different technical tests.

It is guided by international standards, clients specification and its own experience.

Finally it issues a "test report", describing the good and bad technical results.

It operates as regulated by the international standard IEC17025.

Certification body

It examines the results from testing and the technical documentation, also performing factory inspections.

Finally it issues a "certificate", assessing the overall compliance to all the requirements, not only the technical ones.

It operates as regulated by the international standard IEC17065.

It is usually paid by the original manufacturer.

It accepts to spend money because sincerely interested in measurement of the real performances; sometimes, only because requested by the market or the regulator.

Sometimes "third-parties" are paid by big end-customers; it increases their confidence, but they feel to sustain a not-due additional cost.

Testing standards

IEC60068-x-xx: family of standard providing details for environmental testing
IEC61215-xx:2016: Terrestrial photovoltaic (PV) modules - Design qualification and type approval
IEC61730-xx:2016: Photovoltaic (PV) module safety qualification
ISO9806: Solar energy - Solar thermal collectors
IEC62108:2016: Concentrator photovoltaic (CPV) modules and assemblies

Operational standards

IEC17025: General requirements for the competence of testing and calibration laboratories
IEC17065: Conformity Assessment. Requirements for bodies certifying products, processes and services

Accreditation authorities

Europe: EA agreement (Accredia for Italy, Dakks for Germany)

<http://www.european-accreditation.org/>

USA: A2LA for laboratory, OSHA for certification bodies

<https://www.a2la.org/index.cfm>

<https://www.osha.gov/about.html>

World: ILAC-MRA agreement for laboratories

<http://ilac.org/ilac-mra-and-signatories/>

World: IECCE CB scheme, both for laboratories and certification bodies

<https://www.iecee.org/about/cb-scheme/>

Other Countries: a number of local organizations, often mainly intended to establish not-customs commercial barriers



Working principle

Usually, laboratories/certification bodies are not interested into the result itself, so they issue an independent judgment.

They are committed to issue correct evaluations, because their business is based on reputation: if wrong judgments are issued, their reliability is lost and so their business; this is the main warranty for the system. Of course they are commercial companies, gaining money from their activity.

Main risks

Pay attention to these possible errors from laboratories/certification bodies:

- To ask for a lot of money to execute a big number of unnecessary tests, when conscious that activity is mandatory and without commercial competition.
- To issue a false “pass” result only because in case of “fail” the client does not pay for it.
- To accept bribe to declare incredible performances or not-existing safety/durability.

Keep in mind that:

- a real report/certificate ensures the final client about the performances/safety/durability of a good;
- a fake report/certificate is a piece of paper only;

Who controls the controller?

The best way to avoid these problems is to ask for the international accreditation of the laboratory/certification body.

Suggestions for a good approach:

1. To select the international standards, or part of them, fitting the specific natural environment and the characteristics of the local market
2. To prepare a National guideline, setting the absolute minimum requirements for testing, certification and verification
3. To avoid expensive and difficult-to-obtain mandatory requirements
4. To spread the technical culture into the local market
5. To ask for test reports/certificates issued by trustable and accredited “third parties”, complete of pictures and specific for each product
6. To accept reports/certificates as the best way to know the effective performances and to limit the risk of commercial scams
7. To avoid one only monopolist controller, in order to encourage commercial competition and to reduce bribery risk



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CAPACITY BUILDING

Operated Countries

Albarubens qualified hundreds of solar thermal, Photovoltaic and concentration photovoltaic, receiving samples to test in the Italian laboratory. Testing activities include explanation of “fails”, if any, suggesting the way to solve the problems.



Beyond testing

- Italy: training and internship for technicians - technical consultancy to manufacturers – traceability
- Mozambique: technical consultancy to manufacturers - traceability
- Cuba: traceability
- Saudi Arabia: local laboratory setup - training and internship for technicians – traceability
- Holland: local laboratory setup - training and internship for technicians – traceability
- China: technical consultancy to manufacturers – traceability

Training and internship for technician: training maybe in Italy and/or in local area; internship is in the laboratory, to gain experience about testing of solar equipment.

Technical consultancy: explanation of technical requirements and best approaches to satisfy them.

Local laboratory setup: design and supply of testing equipment and procedural methods, oriented to start-up laboratory with scientific partnership with Albarubens

Traceability: calibration of primary metrology standard; it means to calibrate a module with certified performances, useful to compare large batches of products.



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TESTING

PV MODULES QUALIFICATION





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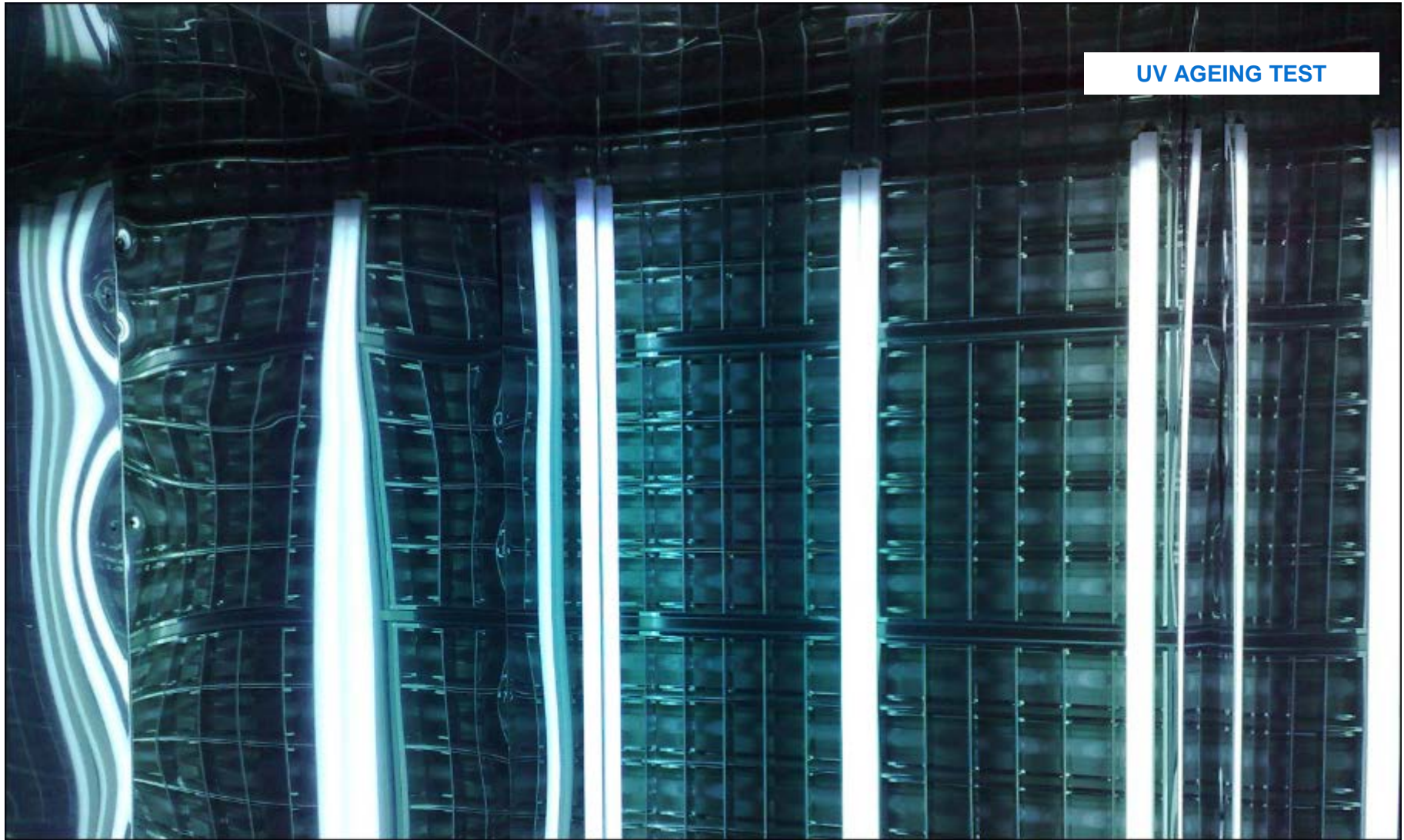
PV MODULES AGEING
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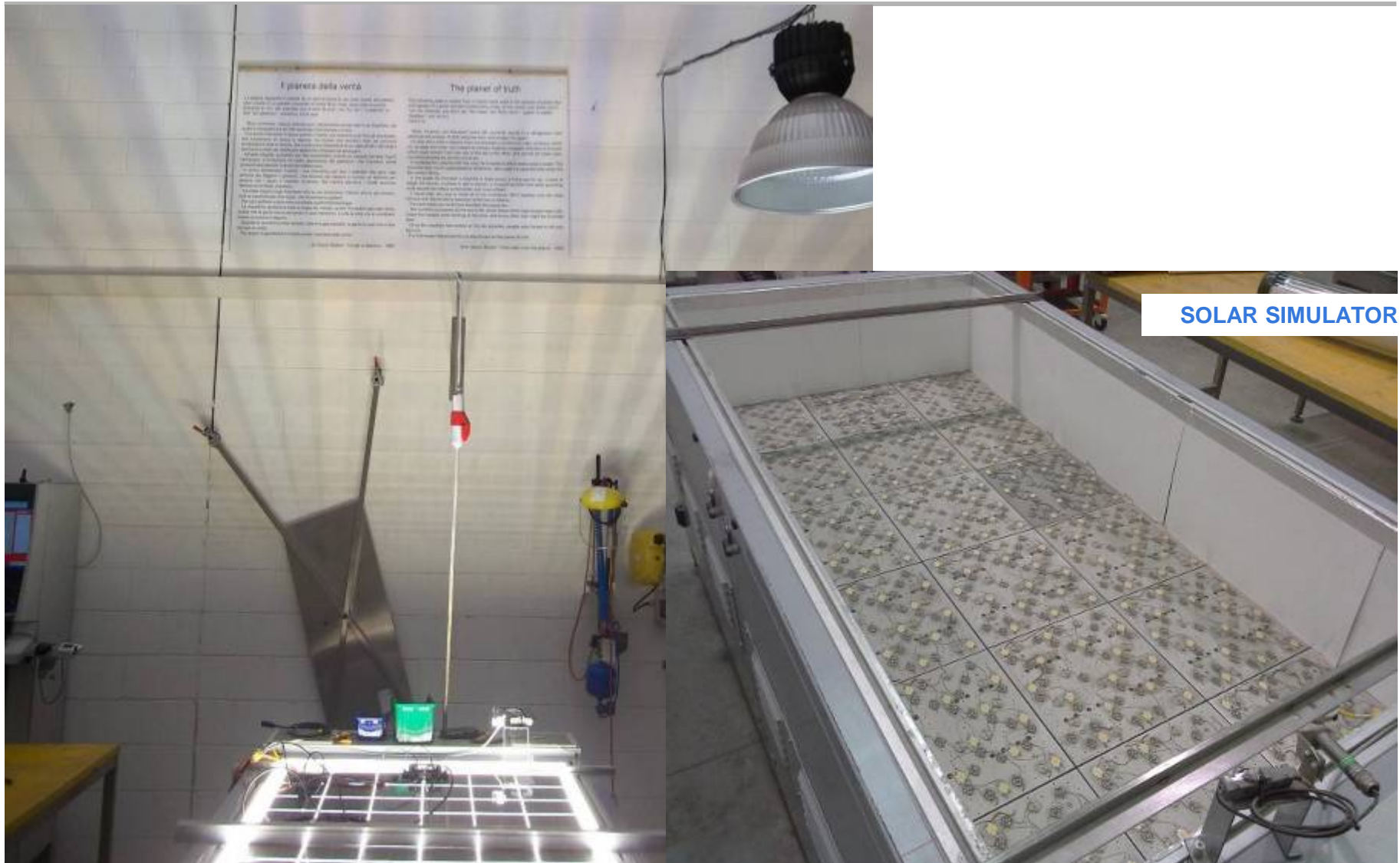
**INSULATING FILM
DELAMINATION**



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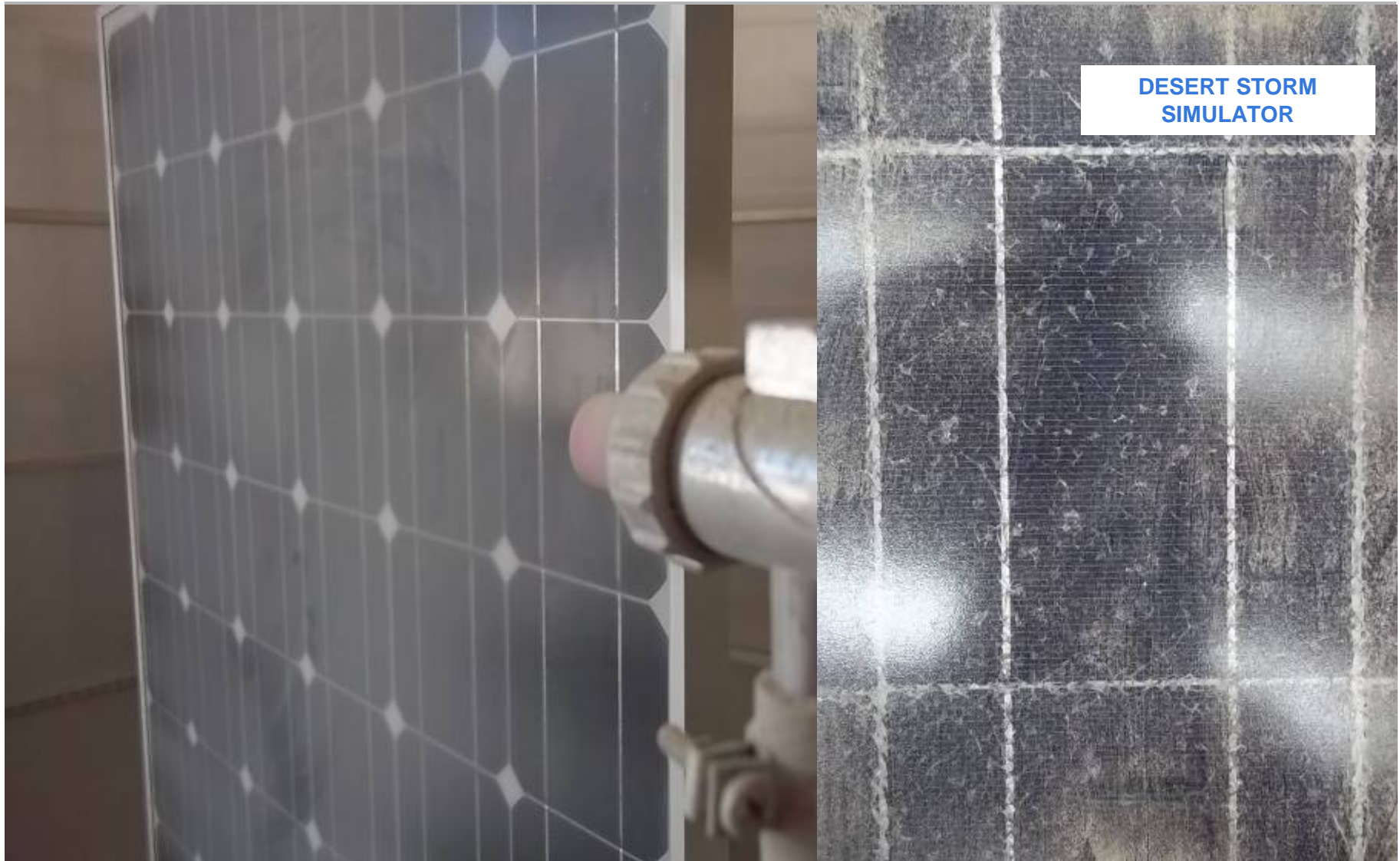
**DESERT STORM
SIMULATOR**



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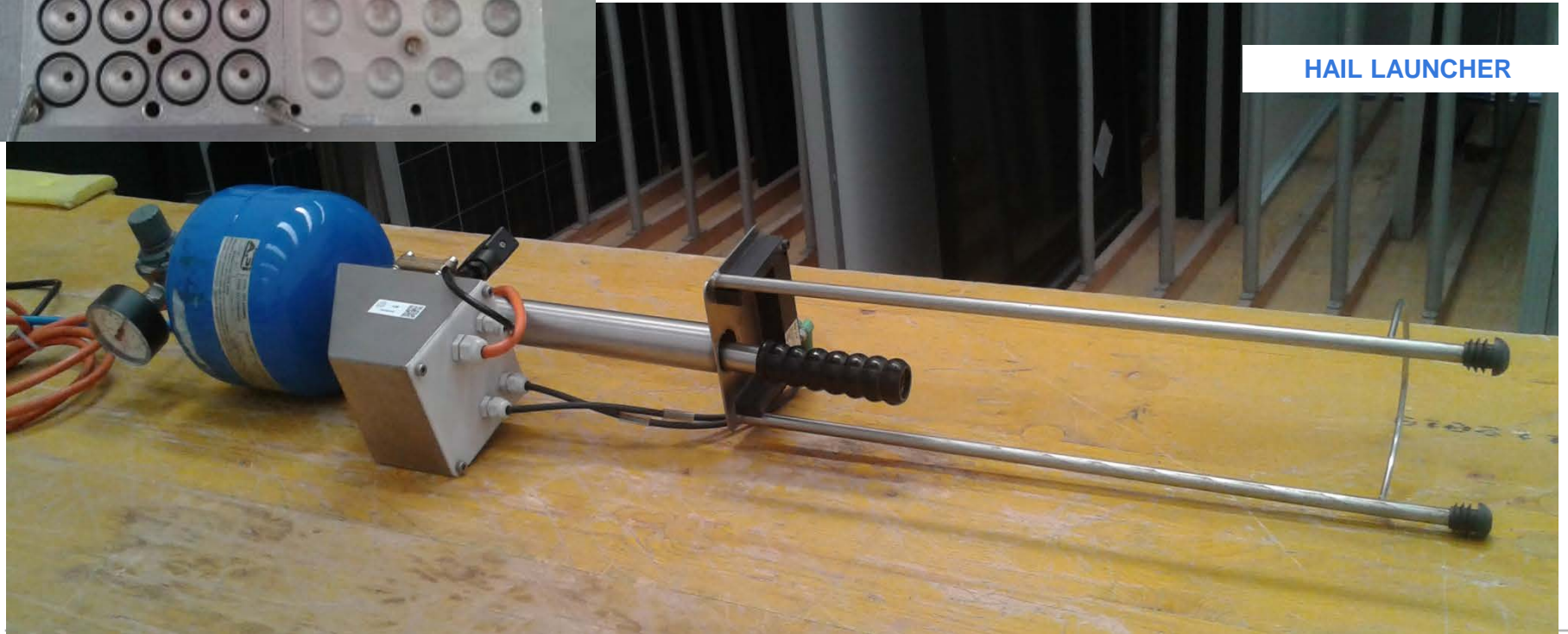




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TESTING





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QUESTIONS

THANK YOU.

ANY QUESTIONS?

