

LAVEE SOLAR · LAVEE XTREME · LAVEE ACQUA

Lavee User Manual

How to clean solar panels without a drop of water. The three steps, the equipment, the questions that come up most in the field and the technical data — to look up on the spot, not to memorize beforehand.



Version 2.1 · September 2026 **Public document** — may be shared

Questions WhatsApp +55 11 97351-1188

1 About BioForcis

Chemistry that works for people, processes and the planet.

BioForcis is a Brazilian company specializing in chemistry for professional cleaning, founded in **2018**, headquartered in **Vinhedo, São Paulo**, and operating nationwide. We work with processes that use fewer natural resources: instead of treating the water afterwards, our approach is not to use water at all.

How Lavee was born

In 2018 we developed a waterless car-cleaning process, approved and validated by a global automaker. In 2023 we took the same technology to solar energy: Lavee was born, to clean photovoltaic panels with 50 ml of product and zero liters of water.

What we do

Lavee

Waterless cleaning of solar panels, from residential rooftops to ground-mounted plants.

Waterless cleaning

The line the company was founded on: automotive, residential and industrial.

Professional cleaning products

Cleaning, disinfection and degreasing for industry, food service, healthcare and services.

Henkel adhesives

Loctite and Teroson distribution for mechanical maintenance and body repair.

WEBSITE

bioforcis.com.br

LAVEE

lavee.com.br

ONLINE STORE (BRAZIL)

loja.bioforcis.com.br

WHATSAPP

+55 11 97351-1188

E-MAIL

contato@bioforcis.com.br

INSTAGRAM

@bioforcisbrasil

2 What Lavee is

Spray, spread and pull with the squeegee. No water, no dilution, nothing to dismantle.

0 L

of water per panel

50 ml

of product per panel

~30 s

per panel, working in pairs

2 years

shelf life in the sealed container

What it does

- Cleans and degreases **without leaving residue** on the module.
- **Does not generate static electricity** during cleaning — which is why dust takes longer to return to the glass.
- Is safe for the **glass and the anti-reflective coating**, and also for the plastics, rubbers and silicones that seal the module and protect the cables.
- Water-based, **neutral pH** and biodegradable. No wax, no alcohol and no petroleum solvent.
- Comes **ready to use**: it is not diluted.

Registrations and tests

- Cleaning product **notified to Anvisa** (Brazilian Health Regulatory Agency) under number 25351.360025/2024-96.

- Tests at **UNICAMP** (University of Campinas): no risk to the panel materials or to energy generation.
- Test at **TÜV SÜD** (China).
- In the safety data sheet (MSDS), it is **not classified as hazardous** and carries no warning symbol.

Approved by 11 module manufacturers

These manufacturers have approved the Lavee waterless cleaning process in writing:

Canadian Solar

Trina Solar

JA Solar

JinkoSolar

LONGi

DAH Solar

DAS Solar

GCL System

Tongwei (TW Solar)

ZNSHINE

EGing PV

Need the letter from the manufacturer of your modules? Ask on WhatsApp [+55 11 97351-1188](https://wa.me/5511973511188) and we will send you the document.

Packaging and yield

PACKAGE	YIELD (AT 50 ML PER PANEL)	SUITED TO
5 liters	about 100 panels	installers and small teams
20 liters	about 400 panels	cleaning and O&M teams
200 liters	about 4,000 panels	solar plants
1,000 liters (IBC)	about 20,000 panels	large solar plants

LAVEE SOLAR



5 L



20 L



200 L



1,000 L · IBC

LAVEE XTREME



5 L



20 L



200 L



1,000 L · IBC

LAVEE ACQUA — not yet on sale



5 L



20 L

Lavee Xtreme — for the dirt Solar can't remove

An acid-based shock treatment for panels impregnated with mineral deposits: cement dust, calcium, construction residue. Uses 100 to 150 ml per panel, **requires an assessment by our technical team first** and always ends with an application of Lavee Solar. It is not a product for routine use.

Lavee Acqua — for those who clean with water · not yet on sale

Lavee Acqua is a concentrated neutral detergent for conventional panel cleaning, the kind that uses water. It does not replace Lavee Solar, which cleans without water: it is the option for teams that already work with water and want a product made for panel glass, instead of kitchen detergent. It comes in 1, 5 and 20 liters and is diluted according to how dirty the panel is.

This product is not yet on sale. The launch is planned for the coming weeks, and the information still missing from this manual — such as the Anvisa notification number — will be filled in before the first sale. To be notified, contact us on WhatsApp [+55 11 97351-1188](https://wa.me/5511973511188).

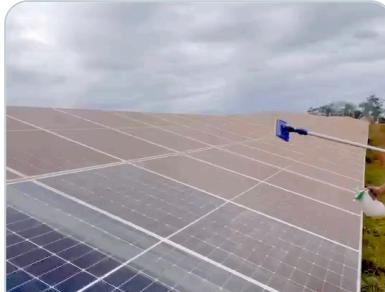
3 How to use

One panel at a time, always the three steps. Work in pairs: one sprays and spreads, the other finishes with the squeegee. It is faster and keeps the product from drying on the panel.



1 Spray

Apply about 50 ml directly on the dirty panel, without wetting it first. That is about 10 seconds of continuous spraying. It does not need to come out as a mist.



2 Spread

With the white pad, make single, straight strokes from top to bottom. No scrubbing, no pressing and no going over the same spot twice.



3 Squeegee

Finish with the window squeegee, in single strokes from top to bottom. Don't stop halfway: a stop leaves a mark.

Watch on video: [how to use Lavee Solar](#) and [application in more critical conditions](#).

Lavee Xtreme — five steps

- 1 Spray **100 to 150 ml** of Lavee Xtreme over the whole panel.
- 2 Scrub with the white pad in lengthwise strokes, with pressure, until the dirt comes loose. Foam is normal; on heavily impregnated panels, go over the same spot more than once.
- 3 Remove with the window squeegee. **Do not let it dry** on the panel — if it dries, repeat the process.
- 4 Apply **50 ml of Lavee Solar** to remove the Xtreme residue (up to 100 ml if the panel is hot).
- 5 Finish with the squeegee, in single strokes from top to bottom.

With Xtreme, each pad lasts 10 to 20 panels; with heavier dirt, fewer.

Lavee Acqua — five steps, with water

Product not yet available for sale — the process below is here for the teams that will use it at launch.

- 1 **Dilute according to the dirt:** light cleaning **1:100**, medium cleaning **1:50**, heavy cleaning **1:10** — one part of Lavee Acqua to 100, 50 or 10 parts of water. If in doubt, start with the medium dilution.
- 2 **Apply the solution with the pressure sprayer**, covering the whole panel. It is the same pump used for Lavee Solar, thoroughly rinsed beforehand.
- 3 **Loosen the dirt with the white sponge**, in straight strokes. The sponge must be white and made for glass: nothing abrasive on the panel.
- 4 **Rinse with water** until all the solution and the loosened dirt are off the glass.
- 5 **Pull the window squeegee**, in single strokes from top to bottom, without stopping halfway — the panel dries without marks.

Always prefer demineralized water

Both for dilution and for rinsing. Demineralized water contains no mineral salts or chlorine, which are harmful to the panel. Hard water leaves mineral spots as it dries — exactly what you want to avoid when cleaning.

4 Field tips

Ten details that separate a properly cleaned panel from rework.

Time of day

Prefer the morning, late afternoon or a cloudy day. In strong sun the product evaporates before you finish: use up to 100 ml per panel, do the three steps in quick succession and, if needed, split the panel into two or four parts and clean one at a time.

Streaks

A few streaks are normal, don't affect generation and come off with the first rain. Many streaks have two causes: too little product for the panel's condition, or a dirty squeegee. Repeat the three steps with more product and wipe the squeegee with a cloth every now and then.

Bird droppings

Spray a little more product on the droppings and go over them with the pad more firmly. They come off easily and you don't need to wait for the product to act. There is [a video just on this](#).

Cement and encrusted dirt

Encrusted mineral residue takes a lot of product and time with Lavee Solar: it calls for Lavee Xtreme, with a technical assessment first. Grease, even encrusted, Solar handles well.

Don't dilute

Lavee already comes in its final, ready-to-use form. Diluting it removes the formula's properties and the result gets worse.

Mind the next panel

Don't let the spray splash onto the neighboring panel that is already clean: it leaves streaks and has to be redone.

The pad

Each white pad cleans 10 to 15 panels. Use both sides and, when it gets dirty, wash it with water to reuse it.

The squeegee

At least 55 cm wide, which does the panel in two strokes. Wipe it with a cloth every now and then and replace the blade when it dries out.

Aluminum frame

It is worth cleaning the frame too: apply Lavee directly on it and wipe with an ordinary cloth. The result is surprising.

Plant running

In general there is no need to switch off the inverter: grounding and earth-leakage protection, installed to standard, take care of that. Confirm with the plant's technical manager and wear the PPE.

5 Equipment and PPE

Everything is simple, inexpensive and easy to find. The references below are the ones we use in the field.

ITEM	WHAT IT IS FOR	REFERENCE
1.2 L pressure sprayer	Applies the product. Adjustable nozzle, with a jet of up to 4.5 m to reach the panel behind. A backpack sprayer also works, but it is heavy and tires the team.	Guarany 0424.00.00
Aluminum extension pole	Reaches the whole panel without anyone leaning over it. Use the same fitting for the pad holder and the squeegee.	Bralimpia EX450
Locking pad holder	Locks movement on one axis and keeps the pad steady during the stroke.	Bralimpia SE301
Soft white pad	Spreads the product with no risk to the glass. It must be white and made for glass.	Bralimpia F1M261
55 cm window squeegee	Aluminum base and silicone blade; finishes the panel in two strokes. An ordinary floor squeegee won't do.	Bralimpia LC550



You can buy the complete kit from BioForcis: loja.bioforcis.com.br (Brazil) or WhatsApp +55 11 97351-1188. See also the video on [equipment and references](#).

Automated processes

Electric rotating brushes are approved for use with Lavee: spray the product, fit the white pad to the base of the brush and finish with the window squeegee. Robots and attachments are in the approval process with partner manufacturers.

Protective equipment

Ground-mounted plant

UV-protection shirt, sunscreen, helmet, reflective vest, leg guards, safety shoes, PVC gloves and safety glasses.

Rooftop

Everything that applies to ground-mounted plants, plus a safety harness and work at height in line with **NR-35** (the Brazilian work-at-height regulation) or your local equivalent.

Check first what the client requires: occupational health certificates and electrical-safety and work-at-height training (in Brazil, ASO, NR-10 and NR-35) are frequently requested.

6 Questions and answers

The ones that come up most in day-to-day work.

Does cleaning with Lavee void the panel warranty? —

No. Eleven module manufacturers have already approved the Lavee waterless cleaning process in writing: Canadian Solar, Trina Solar, JA Solar, JinkoSolar, LONGi, DAH Solar, DAS Solar, GCL System, Tongwei (TW Solar), ZNSHINE and EGing PV. Ask on WhatsApp for the letter from the manufacturer of your modules. If your brand is not on the list, talk to us first.

Is water needed at any point? —

No: not to wet the panel before, nor to rinse it after. Water is only used to wash the pad at the end of the job.

How far does it go? —

About 20 panels per liter, at 50 ml per panel. A 5 L jug cleans around 100 panels. On hot or very dirty panels, consumption rises to up to 100 ml.

How long does each panel take? —

About 30 seconds, working in pairs.

Do I need to shut down the plant to clean? —

In general, no. Grounding and earth-leakage protection, installed to standard, take care of that. Confirm with the plant's technical manager and wear the PPE.

Doesn't rain clean the panels on its own? —

Rain washes away some of the loose dust, but it doesn't remove stuck-on dirt, bird droppings, grease or mineral dust. That is why periodic cleaning is still necessary.

Can I clean in strong sun? —

Yes, with care. The product is water-based and evaporates quickly on a hot panel: use up to 100 ml, do the three steps in quick succession and split the panel into parts.

There are streaks. What now? —

Repeat the three steps with more product. A few streaks are normal and come off with the first rain; many streaks are a sign of too little product or a dirty squeegee — neither is a product defect.

Can I dilute it to make it go further? —

No. It is supplied in its final, ready-to-use form; diluted, it loses the formula's properties.

Does it work on cement splashes? —

That is not a job for Lavee Solar. It calls for Lavee Xtreme, with a technical assessment first. Grease, even encrusted, Solar removes well.

Is it safe for the person applying it?

In the MSDS, Lavee Solar is **not classified as hazardous** and carries no warning symbol. Even so, wear gloves and glasses, as with any chemical product; in case of contact with the eyes, rinse with water. **Lavee Xtreme, however, is acidic and causes serious eye irritation:** with it, tight-fitting safety glasses and nitrile gloves are mandatory.

How should it be stored and transported?

Tightly closed container, in a dry, ventilated place protected from light. Shelf life of 2 years. It is not flammable and is not classified as dangerous for land or sea transport.

Is Lavee Acqua already on sale?

Not yet. Lavee Acqua, for those who clean with water, is **coming soon:** the process for using it is already in this manual, but the product is not yet sold and some technical data are still open. We will let you know if you ask on WhatsApp [+55 11 97351-1188](#).

Where can I buy it?

At the [BioForcis online store](#) (Brazil) or via WhatsApp [+55 11 97351-1188](#), which also handles solar plants and large orders.

Do you train the team?

Yes. Technical handover and training are part of the sale. For the training, choose an easily accessible panel, gather the team and let each person apply it.

7 Technical data

The summary. The full data sheet is in each product's MSDS.

Lavee Solar

Class	Cleaning product (Anvisa “saneante” category) — general-purpose cleaner
Anvisa notification	25351.360025/2024-96, of 24 Jun 2024

Composition	Water-based, with surfactants and 5th-generation quaternary ammonium
Appearance	Colorless to slightly yellowish liquid
pH	6.5 to 7.5 (neutral)
Relative density	1.00
Dilution	Ready to use — do not dilute
Abrasives	None
Consumption	50 ml per panel (up to 100 ml on hot or very dirty panels)
Yield	About 20 panels per liter
Packaging	5, 20, 200 and 1,000 liters
Shelf life	2 years
GHS classification (ABNT NBR 14725)	Not classified — no warning symbol
Flammability	Not flammable
Biodegradability	Biodegradable — 80% in less than 72 h, according to the MSDS
Transport	Not classified as dangerous goods (ANTT and IMDG)

[Open the Lavee Solar MSDS · PDF](#)

Lavee Xtreme

Use	Shock treatment for encrusted mineral dirt, with technical assessment
Base	Acidic (citric acid)
Appearance	Colorless liquid
pH	About 1.7
Consumption	100 to 150 ml per panel

Always followed by	An application of Lavee Solar (50 to 100 ml)
GHS classification	Serious eye irritation, category 2 (H319)
Mandatory PPE	Tight-fitting safety glasses and nitrile gloves
Packaging	5, 20, 200 and 1,000 liters
Shelf life	24 months

[Open the Lavee Xtreme MSDS · PDF](#)

Lavee Acqua — not yet on sale

The blank fields below are data that have not yet been finalized. They will be filled in before the launch; until then, do not use this table in proposals or audits.

Use	Conventional panel cleaning, with water — concentrated neutral detergent
Class	Cleaning product (Anvisa “saneante” category) — general-purpose cleaner
Anvisa notification	
Composition	
Technical manager	
Appearance	Opaque white gel
pH	7.0 to 9.0
Active content	10.0 to 14.0%
Density	1.020 to 1.050 g/cm ³
Dilution	Light cleaning 1:100 · medium cleaning 1:50 · heavy cleaning 1:10
Abrasives	None
Yield (medium dilution 1:50)	Up to 60 panels with 1 L · up to 300 with 5 L · up to 1,200 with 20 L
Packaging	1, 5 and 20 liters

Shelf life	24 months
GHS classification	
MSDS	
Availability	Coming soon — product not yet on sale

8 Videos and documents

To watch before going to the field and to send to whoever will apply the product.



How to use Lavee Solar

youtu.be/9fb6yZECcyU



Application in critical conditions

youtu.be/yiHfi8Aon2c



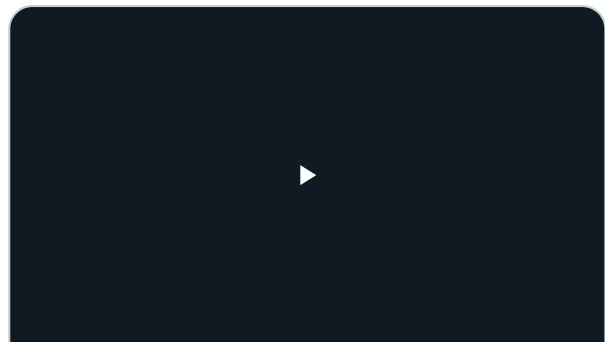
Recommended equipment

youtu.be/ywtWJAMrMeE



Bird droppings

youtu.be/teWREUyl-Yg

**Lavee corporate video**youtu.be/KgWfnEBpYQ4**YouTube channel**youtube.com/@LaveeLimpezaSeco**MSDS****MSDS — Lavee Solar**

Material safety data sheet, required in audits

MSDS**MSDS — Lavee Xtreme**

Material safety data sheet for the shock treatment

DOC**Lavee document center**

All materials in a single link

Test reports and manufacturer approval letters are sent on request, via WhatsApp [+55 11 97351-1188](https://wa.me/5511973511188).

9 Contact us

Before improvising in the field, ask. The answer usually comes the same day.

Waterless cleaning is different from what the market has always done, and the process in this manual came out of months of application on real solar plants. If your team runs into a situation that isn't covered here, or has a suggestion for improvement, tell us: that is how this manual gets better.

WHATSAPP[+55 11 97351-1188](https://wa.me/5511973511188)**E-MAIL**contato@bioforcis.com.br**WEBSITE**bioforcis.com.br

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