

Steam-Treated or EtO? What to Ask About Indian Spices



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You only know how a spice lot was sterilised if you ask in writing and test it. US rules allow ethylene oxide fumigation of dried spices up to 7 ppm, while the limit EU authorities applied to Indian spices was mostly 0.1 mg/kg, so a lot that is legal in the US can fail in Europe by a wide margin. Ask for the method, the site and an ethylene oxide plus 2-chloroethanol result on your finished lot. Tellicherry is a size grade of Malabar pepper and says nothing about treatment.

The Short Version

- US rules permit ethylene oxide on dried spices up to 7 ppm, with 940 ppm for its by-product 2-chloroethanol.
- EU authorities mostly applied 0.1 mg/kg to Indian spices, about 70 times lower than the US tolerance.
- Part of the residue comes from the packer's sterilisation, so ask who sterilised your lot, where and how.
- Test the finished lot for ethylene oxide and 2-chloroethanol together, after the last treatment step.
- Tellicherry is a berry-size grade. It tells you nothing about treatment or origin.

You won't find out from the pack. Whether a spice lot was sterilised with steam or with ethylene oxide (EtO) is a processing choice made at the packer's site, and the only reliable answer is a written statement of the method for your lot plus a residue test on the finished goods. US buyers have to ask harder than European ones, because US rules allow EtO on dried spices and EU rules effectively don't.

A German trader who buys about 75 tonnes of Indian pepper a year put the split in one line to an American on a spice forum in 2022. "We don't do much Business with america, due to different food standard laws, but probably you would ask if the pepper was treated with ethylonoxide" ([r/spices, April 2022](#)). His lots for Europe were steam-treated as standard. A US buyer of the same pepper gets whatever the processor does for US lots, unless the contract says otherwise. Our [spice industry page](#) and the [black pepper contract page](#) set out the full specification, so this page answers one question, how you find out, and ends with the pepper grade that confuses so many buyers.

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- 01 **The US allows it.** EPA tolerances permit ethylene oxide as a post-harvest fumigant on dried herbs and spices (except basil) at 7 ppm, and its reaction product 2-chloroethanol at 940 ppm. ([40 CFR 180.151](#), read 18 October 2026)
- 02 **The EU limit is about 70 times lower.** The maximum level EU authorities most often applied to Indian spices in ethylene oxide notifications was 0.1 mg/kg, and failing lots ran a median 20 times over it. (*Our analysis of RASFF hazard records, January 2021 to September 2026*)
- 03 **Whole spices get fumigated too.** Among EU notifications whose product name says seeds or whole, we found ethylene oxide on cumin seeds, fennel seeds, coriander seeds, cloves and whole cassia. (*Our analysis of RASFF product names, script in research/india/data/rejections/ · Indicative, name-based*)

What we don't know yet

- What share of Indian spice processors still use EtO for any market. Nobody publishes it.

1. Why Would a Spice Be Sterilised at All?

Because spices are farm products dried in the open, and they arrive at the processor carrying microbes. Exporters reduce them before packing. A US food-industry voice summed up the options in 2021: "A lot of facilities use steam treatment or EtO/PPO" ([r/foodscience, October 2021](#)). Steam heats the spice and kills microbes. EtO is a gas that does the same job at low temperature, and PPO is a related fumigant.

That matters for where the residue comes from. When EtO turns up in a spice, it's usually not something the farmer did. People in the trade say part of it comes from the packer's own sterilisation and weak degassing afterwards, the vacuum step that is meant to pull the gas back out ([r/IndianFood, May 2024](#), quoted in full on the [spice industry page](#)). So the question goes to whoever sterilised and packed your lot, which isn't always the exporter on the invoice.

2. Is EtO Legal, and Where?

It depends on the border, and the gap is wide. The US Environmental Protection Agency sets a tolerance of 7 parts per million for ethylene oxide on dried herbs and spices, and 940 ppm for 2-chloroethanol, the compound EtO forms in food ([40 CFR 180.151](#)). In the EU, the limit authorities applied to Indian spices in our count of RASFF records was mostly 0.1 mg/kg, the same unit as ppm. That's a ratio of about 70 to 1, and the EU figure is stricter than it looks, because the EU residue definition counts ethylene oxide and 2-chloroethanol together, expressed as ethylene oxide ([Regulation \(EU\) 2015/868](#), read 18 October 2026), while the US sets the two separately.

So a lot fumigated within US law can be far over the EU limit and still be perfectly legal to sell in the US. Here's why that matters to a US buyer -

- Your retailer or brand may have its own "no ethylene oxide" policy, especially since Hong Kong's 2024 action against Indian spice mixes that tested positive for it (covered on [food import testing](#)).
- If any of the lot goes on to Europe or the UK, it has to meet their limit, not the US one.
- Your customers may simply ask, and "we don't know" is a poor answer.

UK and other limits change, so confirm the current number for your product with your lab or customs broker before you ship.

3. How Do You Find Out What Your Lot Got?

Ask for it in writing, then test. These are the questions that settle it, in the order I'd ask them.

1. **Which method was used on this lot?** Steam, EtO, PPO, another method or none. The answer goes on the proforma or a signed declaration, lot number included.
2. **Where was it done?** In the exporter's own plant, or at a contract sterilisation unit? If it's a contract unit, ask for its name and the treatment record for your lot.
3. **When was it done, relative to grinding and blending?** A blend is only as clean as each part, so for a masala ask the method for every component.
4. **What was the moisture after treatment?** Steam that isn't done well leaves water behind. A US spice-company food safety manager in our logs warned that poor steaming "can cause spoilage sooner", so a moisture result belongs with any steam claim.
5. **Will you accept a residue test on the finished lot?** Ethylene oxide and 2-chloroethanol, reported together, on a sample drawn after the last treatment step by someone who doesn't work for the packer.

The fifth one is the real answer. A declaration tells you what someone says happened, and the test tells you what's in the bag. If the supplier hesitates over any of the five, that's information too.

4. Is Steam Always the Better Choice?

For the residue question, yes, because steam leaves no EtO behind. But it isn't free. Besides the moisture risk, the same US food safety manager noted that steam-treated organic lots lose some of their oils, which can show up as flavour and aroma. So if you specify steam, specify the result you expect afterwards too – moisture, and for spices where it matters, volatile oil. The [black pepper contract page](#) shows how to write treatment as a destination clause.

5. Has the EtO Problem Gone Away?

Largely, at the EU border. Ethylene oxide was in 30 of 69 Indian spice notifications in the EU in 2021 and 5 of 82 in 2025, while farm pesticides took over (our RASFF count, told in full on [same spice, three borders](#)). Indian exporters fixed a lot of it. But two things keep the question alive. US lots were never under EU rules in the first place, and the cases that remain still run well over the limit. Keep EtO in the test panel for ground spices, blends and anything going to Europe, and put pesticides ahead of it for EU lots.

6. What Does "Tellicherry" Mean on Pepper?

It's a size grade, not a separate pepper and not a sterilisation standard. Tellicherry grades are the bolder berries sorted out of the same Malabar crop, bought by jar packers for how they look (traders on a spice forum, 2022 and 2025). So the word tells you how big the berries are, and nothing about treatment, residues or even origin, and the treatment line in your

contract has to stand on its own. Write the grade, the minimum density, the origin and the treatment as four separate lines. The grade definitions and the density clause are on the [black pepper contract page](#), and the district and US import alert detail, including the origin-mixing claim, on [black pepper from India](#).

If you want someone at the processor to confirm the method, draw the sample after treatment and send it to your lab, [SourcingSync](#) does that for buyers in India.

Questions Buyers Ask

Can I tell from the label whether a spice was EtO-treated? ^

No. Treatment isn't a labelling requirement in most markets. Ask for the method in writing and test the lot.

Is EtO-treated spice illegal in the US? v

What test should I order? v

Does organic mean no EtO? v

Is Tellicherry better pepper? v