

Superheated Dry Steam



POLTI CIMEX
ERADICATOR+

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Section 1

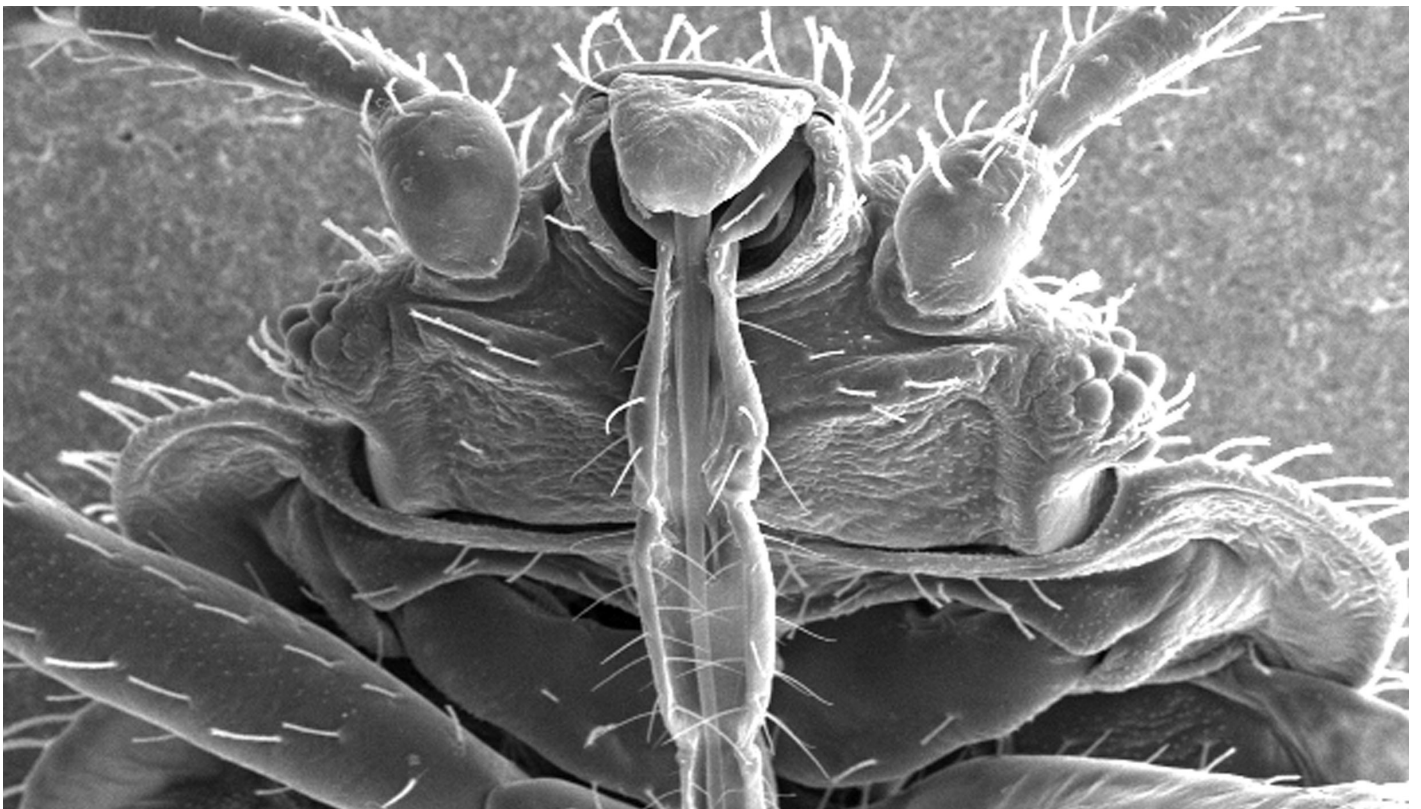
How Does Steam Kill Bed Bugs?

If you are looking for a way to **kill bed bugs instantly** and want to avoid unnecessary chemicals, steam should be your go-to choice. However, it isn't technically the steam that eradicates the bed bugs. Instead, it is the heat. 80°C is a commonly recommended temperature for killing bed bugs.

Stephen Kells, an associate professor in the Department of Entomology at the University of Minnesota, notes that steam is a very effective

approach when you need to **kill bed bugs at every stage** of their development. When steam is applied properly to fabric or mattresses, it can penetrate not only the surface but also inside stitch seams.

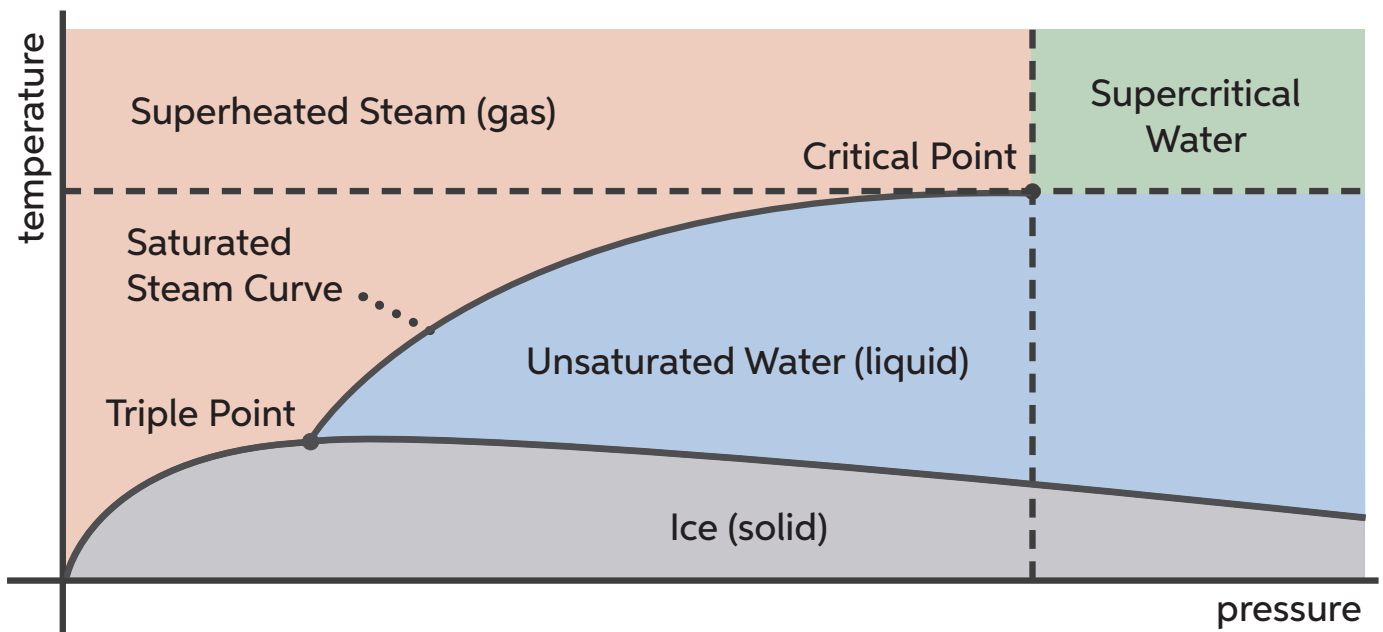
According to a laboratory study, all of the steamers tested had 100 % bed bug mortality for treating bed bugs exposed on mattresses and those hiding in cracks. For bed bugs below fabric covers, the mortality rate for all steamers was >89%.



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Section 2

What is Super-Heated Dry Steam?



Triple Point: 0°C, 0.61 KPa abs (32°F, 0.09 psia)
Critical Point: 374°C, 22.1 MPa abs (705°F, 3208 psia)

Most commercial steamers rely on saturated steam, which, according to Uni Klinger, occurs when the temperature and pressure conditions allow steam (as a gas) and water (as a liquid) to coexist. Essentially, when the rate of condensation and rate of water vaporization are equal, saturated steam can form.

Dry steam, in comparison, occurs when saturated steam from a boiler is run through a **superheater**. Wa-

ter is first heated to the boiling point and then, when additional heat is applied, is vaporized. Once the steam is heated above its saturation point, the result is **superheated dry steam**. As a result, according to Corrosionpedia, there are no micro drops present. The lack of micro drops prevents the steam from being “wet.”

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Section 3

Why Is Super-Heated Dry Steam So Useful For Killing Bed Bugs?

According to BedBugs.org, bed bugs cannot just survive, but thrive in moderate temperatures, such as 70°F (temperatures that would be uncomfortable to people). However, as temperatures increase to reach saturated steam conditions, the situation changes dramatically.




An exposure to 118°F (~48°C) temperature for 20 minutes kills bed bugs, but it also requires a substantial amount of time spent on a single area. However, at higher temperatures, less time is required to effectively kill bed bugs.

Superheated dry steam reaches a much higher temperature than saturated steam, which means it kills bed bugs instantly.

Most commercial steamers used by pest control professionals has a tip temperature of between 140°F-150°F.

Who has time to steam a bed bug for 5 minutes to make sure it is dead?

The **superheated dry steam** generated by the Polti Cimex Eradicator, instead, reaches **356°F**, which means it is hot enough to kill bed bugs instantly on contact. Plus, since superheated dry steam has **less moisture**, you get **greater penetration into fabrics**, allowing you to kill bed bugs that proliferate deeper below the surface. It also limits your cleanup, ensuring you can complete the treatment quickly.

Stress		 Egg	 Early instars	 Adults/late instars
Dehydration tolerance ¹		25 to 30%	35 to 40%	30 to 35%
Water loss rate ¹		0.03 to 0.05%/h	0.3 to 0.4%/h	0.1 to 0.4%/h
Heat tolerance ²	Short term ^a	36 to 39°C	44 to 46°C	44 to 46°C
	Long term ^b	32 to 35°C	35 to 37°C	36 to 39°C
Cold tolerance ²	Short term	-25 to -20°C	-25 to -20°C	-25 to -20°C
	Long term	-8 to -6°C	-10 to -15°C	-10 to -15°C
Starvation resistance ^{3, c}	Susceptible	–	27 to 70 days	70 to 130 days
	Resistant	–	10 to 30 days	40 to 75 days

a, 1-2 h; b, 1 week; ^cstarvation resistance likely equivalent to dehydration resistance. Sources: ¹Usinger, 1966; Benoit, 2011; Benoit et al., 2007, 2009a,b; ²Johnson, 1941; Usinger, 1966; Benoit et al., 2009a; Naylor and Boase, 2010; Olson et al., 2013; Rukke et al., 2015. ³Polanco et al. (2011b). Diagrams based on Benoit and Attardo (2013); early instar, 1st and 2nd instar nymphs; late instar, 3rd-5th instar nymphs. Dehydration tolerance in percent water loss tolerated. Susceptible and resistant relate to pesticide exposure.

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Section 4

How does the Polti Cimex Eradicator Produce Superheated Dry Steam?

Polti, the manufacturer of the Polti Cimex Eradicator, has manufactured products with built-in boilers since its founding in 1978. These steam-generating products range from small, household appliances to commercial steam cleaners. Polti designed the Polti Cimex Eradicator to go beyond the capabilities of these products.

The main boiler of the Polti Cimex Eradicator is not particularly revolutionary. It generates steam at 58 PSI with a adjustable rate ranging from 0 to 3.9 f. oz. per minute. With a working autonomy of 2 hours, it can be matched by most highend heavy duty commercial steamer.

The true innovation is in the nozzle.

Within this specially-designed nozzle there is a secondary heating element, which is essential to **transforming normal saturated steam into superheated dry steam.**

As the steam passes from the boiler through the hose of steamer, it begins to cool. As a result, the tip temperature of the steam can be significantly lower than the temperature in the boiler.

The **patented nozzle** chamber of the Polti Cimex Eradicator rapidly dries and re-heats the steam that was fed from the boiler before pushing it out of the barrel, resulting in **356° Superheated dry steam.**







The Ultimate Bed Bug Steamer

Watch videos from the field:

www.poltieradicator.com/in-the-field/

Request a call or video demo:

www.poltieradicator.com/demo/#live

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