

FCC filing confirms 472 Starlink poisonous satellites burned up this year

Six percent of Starlink's LEO constellation burns in upper atmosphere, releasing irreversible heavy metal pollution

By

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SpaceX has de-orbited nearly 500 satellites in 2025.

A filing made with the Federal Communications Commission issued July 1st by SpaceX voluntarily disclosed the de-orbiting of just under 500 satellites between the period of December 2024 to May 2025, comprising six percent of its active fleet.



— Sebastian Moss

First launching in 2019, SpaceX satellites, like many LEO small sats, were designed to be short-lived, with many intended to operate for just five years. As we reach the end of those first satellites' lifespans, we are entering a period of many satellites de-orbiting at once, with de-orbiting set to accelerate rapidly in time with the exponential increase in satellites.

To date, Starlink has launched some 9,165 satellites, including more than 1,500 in 2025 alone. Last February, the company said it had initiated controlled **de-orbits on 406**, with another 100 due to be de-orbited due to a common fault.

Destructive burnup of these satellites releases the kind of heavy metal pollution into the upper atmosphere that worries scientists greatly, and exposes people to the risk of being hit by any debris that survives burnup.

“Unlike other operators with less emphasis on sustainability, SpaceX is willing to deorbit satellites based on long-term reliability forecasts rather than waiting for failure of critical subsystems,” its filing states. “This approach means that SpaceX may de-orbit a considerable number of satellites that would never experience a failure, to mitigate a small number of non-maneuverable satellites in orbit. ... SpaceX takes this more costly approach out of an abundance of caution to best preserve and protect low Earth orbit.”

In a study funded by NASA, it was found that the destructive deorbit of a 550-pound satellite releases about 66 pounds of aluminum oxide nanoparticles into the upper atmosphere, which contribute to greenhouse effects, with no current way of cleaning up.

In the summer of 2024, SpaceX disclosed it had retrieved a 5.5-pound piece of aluminium from a Starlink satellite on a farm in Saskatchewan, Canada.

“Aluminium oxide particles [disintegrated in abundance during satellite burn up] can provide surfaces for heterogeneous chemical reactions to take place, which can activate chlorine compounds, releasing active chlorine atoms that catalyze the breakdown of ozone,” Professor Chiara Manfretti, CEO of satellite-tracking firm Neuraspace, and former head of the Portuguese Space Agency, previously told *DCD*.

These sobering revelations have led to repeated calls for an immediate pause to destructive satellite re-entry, and even satellite launch, so that the problem can be urgently researched.

“We do not have the luxury of time for this issue,” Dr. Minkwan Kim, associate professor in astronautics at the University of Southampton, previously told *DCD*. “Immediate action is needed before it is too late. ... Establishing a global standard or protocol to assess metal oxide emissions from ablating satellites is essential.”