

# First 3D-printed rocket lifts off but fails to reach orbit

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California startup Relativity Space has successfully launched the world's first 3D-printed rocket, the Terran 1 -- though it failed to reach orbit.

The world's first 3D-printed rocket launched successfully on Wednesday, marking a step forward for the California company behind

the innovative spacecraft, though it failed to reach orbit.

Billed as less costly to produce and fly, the unmanned Terran 1 rocket launched from Cape Canaveral, Florida at 11:25 pm (0325 GMT Thursday) but suffered an "anomaly" during second-stage separation as it streamed towards low Earth [orbit](#), according to a livestream broadcast by aerospace startup Relativity Space.

The company did not immediately give further details.

While it failed to reach orbit, Wednesday's launch proved that the rocket—whose mass is 85 percent 3D-printed—could withstand the rigors of lift-off.

The successful launch came on the third attempt. It had originally been scheduled to launch on March 8 but was postponed at the last minute because of propellant temperature issues.

A second attempt on March 11 was scrubbed due to fuel pressure problems.

Had Terran 1 reached low Earth orbit, it would have been the first privately funded vehicle using methane fuel to do so on its first try, according to Relativity.

Terran 1 was not carrying a payload for its first flight, but the rocket will eventually be capable of putting up to 2,755 pounds (1,250 kilograms) into low Earth orbit.

The rocket is 110 feet (33.5 meters) tall with a diameter of 7.5 feet (2.2 meters).

Eighty-five percent of its mass is 3D-printed with metal alloys, including

the nine Aeon 1 engines used in its first stage and the one Aeon Vacuum engine employed in the second.

It is the largest ever 3D-printed object and was made using the world's largest 3D metal printers, according to the Long Beach-based company.



Tim Ellis, co-founder and CEO of Relativity Space.

### **Built in 60 days**

Relativity's goal is to produce a rocket that is 95 percent 3D-printed.

Terran 1 is powered by engines using [liquid oxygen](#) and liquid natural gas—the "propellants of the future," capable of eventually fueling a voyage to Mars, Relativity says.

SpaceX's Starship and Vulcan rockets being developed by United Launch Alliance use the same fuel.

Relativity is also building a larger rocket, the Terran R, capable of putting a payload of 44,000 pounds (20,000 kg) into low Earth orbit.

The first launch of a Terran R, which is designed to be fully reusable, is scheduled for next year.

A [satellite operator](#) can wait for years for a spot on an Arianespace or SpaceX [rocket](#), and Relativity Space hopes to accelerate the timeline with its 3D-printed rockets.

Relativity said its 3D-printed versions use 100 times fewer parts than traditional rockets and can be built from raw materials in just 60 days.

Relativity has signed commercial launch contracts worth \$1.65 billion, mostly for the Terran R, according to CEO Tim Ellis, who co-founded the company in 2015.

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