Were Twin Towers felled by chemical blasts? (Update)

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Smoke billows up after the first of the two towers of the World Trade Center collapses in 2001 in New York City. A mix of sprinkling system water and melted aluminium from aircraft hulls likely triggered the explosions that felled New York's Twin Towers on September 11, 2001, a materials expert has told a technology conference.

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"If my theory is correct, tonnes of aluminium ran down through the towers, where the smelt came into contact with a few hundred litres of water," Christian Simensen, a scientist at SINTEF, an independent technology research institute based in Norway, said in a statement

released Wednesday.

"From other disasters and experiments carried out by the aluminium industry, we know that reactions of this sort lead to violent explosions."

The official report blames the collapse on the over-heating and failure of the structural steel beams at the core of the buildings, an explanation Simensen rejects.

Given the quantities of the molten metal involved, the blasts would have been powerful enough to blow out an entire section of each building, he said.

This, in turn, would lead to the top section of each tower to fall down on the sections below.

The sheer weight of the top floors would be enough to crush the lower part of the building like a house of card, he said.

The aluminium-water scenario would also account for explosions from within the buildings just prior to their collapse that have fuelled conspiracy theories suggesting that the structures had been booby-trapped.

Simensen presented his theory at an international materials technology conference in San Diego, California, and has detailed his calculations in an article published in the trade journal Aluminium International Today.

"The aluminium industry had reported more than 250 aluminium-water explosions since 1980," he said.

In a controlled experiment carried out by Alcoa Aluminium, 20 kilos (44 pounds) of molten aluminium was allowed to react with 20 litres of

water, along with a small quantity of rust.

"The explosion destroyed the entire laboratory and left a crater 30 metres (100 feet) in diameter," Simensen said.

By comparison, the aircraft carried 30 tonnes of aluminium into each of the towers, according to his calculations.

Simensen speculates that the two commercial jets were immediately trapped inside an insulating layer of building debris within the skyscrapers.

The debris -- especially plaster, which blocks the transfer of heat -- would have formed a shield protecting the rest of the building.

At the same time, however, it would created a super-hot, oven-like zone around the aircraft, heated by burning fuel.

Aluminium alloy, which in jet hulls also contains magnesium, melts at 660 degrees Celsius (1,220 degrees Fahrenheit). If heated to 750 C (1382 F), the alloy "becomes as liquid as water," Simensen said.

This molten aluminium could then have flowed downward through staircases and gaps in the floor, causing a chemical reaction with water from sprinklers on the levels below.

The mix would immediately boost temperatures by several hundred degrees, releasing combustible hydrogen in the process. Such reactions are even more powerful in the presence of rust or other catalysts, which can boost temperatures to more than 1,500 C (2,700 F).

A meltdown period of 30 to 45 minutes would also be consistent with the timing of the explosions and subsequent collapse of both buildings in

relation to the moment of impact.

Simensen said there are lessons to be learned, if his theory is correct, that could help avoid a similar disaster were another skyscraper to be hit by a big jet.

"We could develop means of rapidly emptying sprinkler systems in the floors beneath the point of impact," he said.

Firing a rocket with fire-retardant that could coat the aircraft body could also help prevent metal alloy from melting.