**ENGINEERED MATERIALS ARRSTING SYSTEM**

ABSTRACT

An engineered materials arrestor system, engineered materials arresting system (EMAS), or arrester bed is a bed of engineered materials built at the end of a [runway](https://en.wikipedia.org/wiki/Runway) to reduce the risk of a runway excursion. Engineered materials are defined in FAA Advisory Circular No 150/5220-22B as "high energy absorbing materials of selected strength, which will reliably and predictably crush under the weight of an aircraft". While the current technology involves lightweight, crushable concrete blocks, any material that has been approved to meet the FAA Advisory Circular can be used for an EMAS. The purpose of an EMAS is to stop an aircraft overrun with no human injury and minimal aircraft damage. The aircraft is slowed by the loss of energy required to crush the EMAS material. An EMAS is similar in concept to the [runaway truck ramp](https://en.wikipedia.org/wiki/Runaway_truck_ramp) made of [gravel](https://en.wikipedia.org/wiki/Gravel) or sand. It is intended to stop an aircraft that has overshot a runway when there is an insufficient free space for a standard [runway safety area](https://en.wikipedia.org/wiki/Runway_safety_area) (RSA). Multiple patents have been issued on the construction and design on the materials and process.

The first, original EMAS was developed in the mid-1990s by Zodiac Arresting Systems (then known as ESCO/Engineered Arresting Systems Corp.) as part of a collaboration and technical acceptance by the FAA. EMASMAX® (fourth generation EMAS) arrestor beds are composed of blocks of lightweight, crushable cellular cement material, encased in jet blast resistant protection, designed to safely stop airplanes that overshoot runways. Zodiac’s latest, most durable EMAS is installed on over 110 airport runways at over 65 airports on three continents. Zodiac's EMAS has undergone intense testing; including several live aircraft test runs at speeds up 55 knots and is the world’s first and only EMAS that has safely stopped aircraft in real emergency overrun situations at commercial airports.

Runway Safe EMAS (second generation EMAS) is a foamed silica bed made from recycled glass and is contained within a high-strength plastic mesh system anchored to the pavement at the end of the runway. The foamed silica is poured into lanes bounded by the mesh and covered with a poured cement layer and treated with a top coat of sealant.

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