

Turkey has Unveiled Hypersonic Ballistic Missile Tayfun Block-4

Turkey's state-owned defence contractor Roketsan unveiled the Tayfun Block-4, its first hypersonic ballistic missile, at the IDEF 2025 international fair in Istanbul. This missile can travel at speeds of Mach 5 or greater, has a reported range of up to 1,000 kilometers, and can maneuver during flight, making it difficult for air defence systems to track and intercept.

Key Details

- **What it is:** The Tayfun Block-4 is Turkey's first indigenous hypersonic ballistic missile.
- **Developer:** Developed by the Turkish defence company Roketsan.
- **When and Where:** Unveiled at the International Defence Industry Fair (IDEF 2025) in Istanbul on July 22, 2025.
- **Speed:** Travels at hypersonic speeds, exceeding Mach 5.
- **Range:** Has an operational range of up to 800 kilometers, with a future target of 1,000 km.
- **Guidance:** Uses a combination of GPS, GLONASS, and an Inertial Navigation System (INS) for high accuracy, with a maximum error of 5 meters.
- **Target Types:** Designed to strike strategic military targets, including air defence systems, command centers, and military infrastructure.
- **Significance:** Marks a significant milestone for Turkey's defence industry, joining the global circle of nations possessing hypersonic weapons.

Technical Characteristics

- **Propellant:** Uses solid composite fuel.
- **Dimensions:** Approximately 6.5 meters in length and weighing around 2,300 kilograms.
- **Warhead:** Equipped with a fragmentation warhead.
- **Launch:** Can be launched from a mobile 8x8 transporter erector launcher.

Explanation of Exam Oriented Key Terms

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Countries having Hypersonic Missile

Countries that have successfully developed and tested hypersonic missiles include the United States, Russia, China, and India, placing them in an "elite club" for this advanced military technology. Several other nations, such as North Korea, France, Germany, Japan, Iran, South Korea, the United Kingdom, and Australia, are also actively researching and developing their own hypersonic capabilities.

Countries with operational hypersonic missiles

- **Russia:** Has deployed the air-launched Kinzhal, the ship-launched Zircon cruise missile, and the Avangard hypersonic glide vehicle (HGV).
- **China:** Has deployed the DF-17 medium-range ballistic missile with a DF-ZF HGV.
- **United States:** Has several active programs, with the goal of deploying conventionally armed hypersonic missiles in the near future.
- **India:** Successfully tested its first long-range hypersonic missile in late 2024, joining the elite group of nations with this capability.

Countries developing hypersonic weapons

- **Australia:** Collaborating with the U.S. on scramjet-powered hypersonic weapons as part of the SCiFiRE program.
- **France:** Tested its V-MaX hypersonic glide vehicle demonstrator in 2023.
- **Germany:** Is part of Europe's efforts to develop hypersonic missile defences.
- **Iran:** Has claimed to possess hypersonic missile technology, though experts are skeptical of its capabilities.
- **Israel:** Has developed the Arrow 3, an exoatmospheric hypersonic anti-ballistic missile.
- **Japan:** Is developing the Hyper Velocity Gliding Projectile (HVGP) to counter regional threats.
- **North Korea:** Has conducted multiple tests and claims to have a working hypersonic missile.
- **United Kingdom:** Is investing in hypersonic technology and working with the U.S. and Australia on the AUKUS initiative.

Practice Questions:

1. Consider the following statements regarding the 'Tayfun Block-4' missile, recently unveiled by Turkey:

- I. It follows a predictable parabolic trajectory like conventional ballistic missiles, making it easier for advanced air defence systems to track and intercept
- II. It has an official operational range of up to 1,000 kilometers, with potential for further extension

Which of the statements given above is/are correct?

- a) I only
- b) II only
- c) Both I and II
- d) Neither I nor II

Answer: d

Explanation: Statement I is incorrect: A key feature distinguishing true hypersonic missiles from conventional ballistic missiles is their ability to perform advanced maneuvers mid-flight within the atmosphere. This unpredictable trajectory and agility make them extremely difficult to detect, track, and intercept with existing air defence systems, unlike conventional ballistic missiles which follow a more predictable arc.

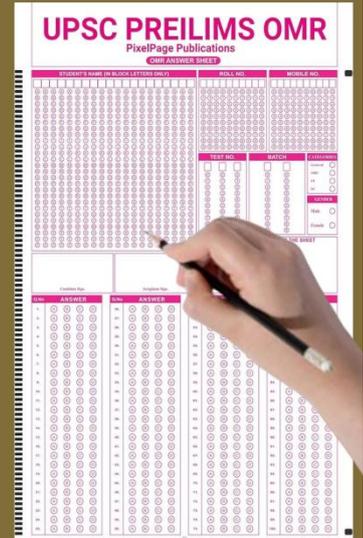
Statement II is incorrect: The current official operational range of the Tayfun Block-4 is stated as 800 kilometers (500 miles). While defence analysts and strategic planners have indicated future ambitions and potential for an extended range of 1,000 kilometers or more, this is not its current official operational range.

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