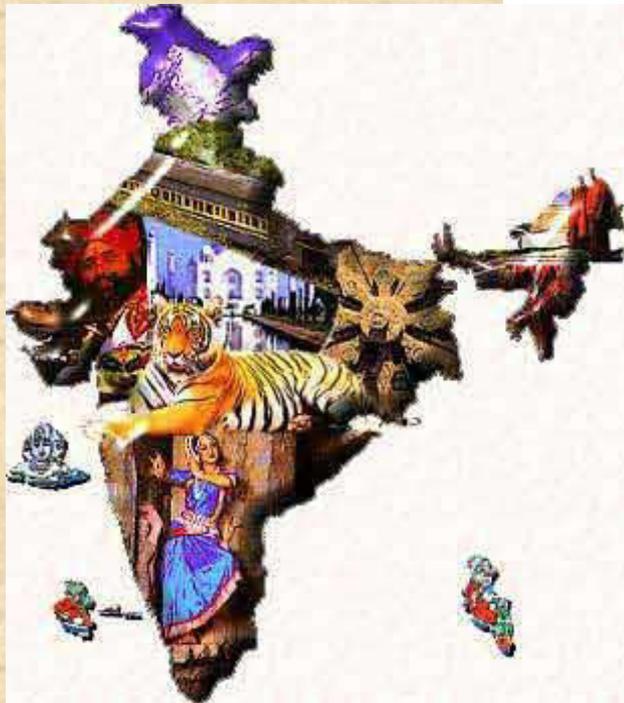


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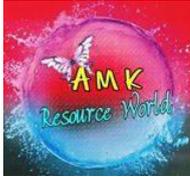
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India Missiles

Ballistic Missile

Ballistic missiles are basically projectiles. It is governed by the laws of gravity. Ballistic missiles are guided for brief duration just in starting phase of trajectory and the rest of the path is like a free falling projectile under gravity. These missiles are of three types mainly – SRBM, IRBM and ICBM. SRBM stands for short range ballistic missiles, IRBM stands for intermediate range ballistic missiles and ICBMs are the longest range which stands for Inter-continental ballistic missiles. All of the Prithvi and Agni series of missiles are Ballistic type. All the variants of Prithvi are SRBMs while Agni I to Agni IV are IRBM while Agni V and Agni VI are ICBMs.

Cruise Missile

These missiles are guided throughout their trajectory and doesn't falls freely like a normal gravity bound projectile. These missiles don't follow the laws of gravity and their path is controlled totally throughout their journey period. These missiles are self navigating and fly at extremely low altitudes to avoid being caught by radars. Level of accuracy in these missiles is extremely high. *Brahmos* and *Nirbhay* are the examples of Cruise missiles of Indian Armed Forces.

Prithvi Missile Series

Prithvi missiles are tactical short range surface-to-surface ballistic missiles. There are 3 variants of it. Prithvi-I is an Army Version with 150km range and 1,000kg payload capacity. Prithvi-II is an Air Force Version with 250-350 km range and 500kg payload capacity. Prithvi-III is a Naval Version with 350km range and 1000kg payload capacity.

Agni missile series

Agni missile are medium to intercontinental range ballistic missiles.

- ... Agni-I is a medium range (700 km to 1,200 km) missile with one stage.
- ... Agni-II is an intermediate range (2,000 km to 2,500 km) missile with two stages.
- ... Agni-III is an intermediate range (3,000 km to 5,000 km) missile with two stages.
- ... Agni-IV is an intermediate range (2,500 km to 3,700 km) missile with two stages.
- ... Agni-V is an intercontinental (5,000 km to 8,000 km) missile with three stages.
- ... Agni-VI is an intercontinental (10,000 km to 12,000 km) missile with three stages.

The Agni-I, Agni-II, Agni-III and Agni-IV are in service with Indian Army. Agni-V is under testing. Agni-VI is under development.

K Missile Series

The K family of missiles is a submarine-launched ballistic missile (SLBM). They are being developed to provide second-strike capabilities and thus the nuclear deterrence. There are three variants: K-15 (Sagarika), K-4 and K-5. K-15 has 750km range. K-4 missile has two sub-variants, one with 3,500km range and the other with 5,000km range. K-5 is under development with a range of 6,000km. The K family of missiles are used with nuclear powered Arihant class submarines.

Shaurya

It is a short range surface-to-surface ballistic missile developed for Indian Army. Its range is 700km and is capable of carrying a payload of one ton conventional or nuclear warhead.

BrahMos

BrahMos supersonic cruise missile is designed and developed by BrahMos Aerospace, a joint venture of India and Russia. It is capable of being launched from land, sea, sub-sea and air against sea and land targets. It is capable of carrying a warhead of 300 kilogram and can be launched from ships, land and submarines. It has top supersonic speed of Mach 2.8. It can strike a target at maximum range of 290-km. It is two-stage missile, the first one being solid and the second one ramjet liquid propellant.

BrahMos II

It is a hypersonic cruise missile and it is the second of the BrahMos series of cruise missiles. It is expected to have a range of 290 km and a speed of Mach 7. It will be powered by a scramjet engine instead of a ramjet one.

Nirbhay

It is long range subsonic cruise missile. The low altitude flying missile can evade detection by radars by flying at tree top level. It can strike targets that are more than 700 km away also and is capable of carrying nuclear warheads. It can also hover over targets, unlike other missile. It also has a "fire and forget" system which cannot be jammed by the enemy.

Prahaar

It is a solid fuelled surface-to-surface guided short-range ballistic missile. It would be equipped with omni-directional warheads and could be used for strike both tactical and strategic targets. Its operational range is 150km.

Astra

It is India's first beyond-visual-range air-to-air missile designed and developed indigenously by DRDO. It is capable of attacking targets with varying range and altitudes allowing for engagement of both short-range targets (up to 20 km) and long-range targets (up to 80 km) using alternative propulsion modes. Its test flights are launched from Su-30Mki.

Barak-8

It is a long-range anti-air and anti-missile naval defence system jointly developed by India and Israel. It is a surface-to-air missile.

Anti-Radiation Missile

It is designed to detect and home in on an enemy radio emission source.

Anti-Satellite Missile

It is under consideration for development.

Integrated Guided Missile Development Program

The Integrated Guided Missile Development Program (IGMDP) was launched in 1983 to develop five missile systems in the country viz. Trishul, Akash, Nag, Prithvi and Agni-I

(intermediate-range surface-to-surface missile). In 1990s, the program was expanded to develop the long range Agni Missile, Sagarika (ballistic missile), Surya (medium-range version of the Agni ballistic missile) and Dhanush (naval version of the Prithvi). In 2008, the DRDO announced the successful completion of the program.

Trishul

It is a short-range surface-to-air missile developed by DRDO with an operational range of 9 km.

Akash

It is a medium-range surface-to-air missile designed by DRDO with a range of 30 km. It can reach an altitude of 18 km. It can be fired from both tracked and wheeled platforms.

Nag

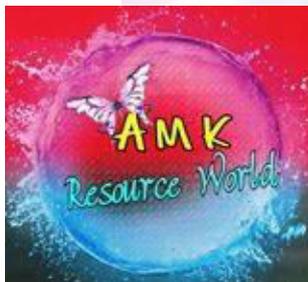
It is a third-generation “fire and forget” anti-tank guided missile. NAG will be produced in two basic variants: land version and air launched version. Originally Nag would have been available with 3 types of guidance: a wire guided version, an infra-red version and a millimetric wave (mmW) active radar homing version. But DRDO failed to develop a wire guided system. The missile is launched from 3 platforms: NAMICA (NAG missile carrier), HAL Dhruv Helicopter and HAL Light Combat Helicopter. HELINA (HELicopterNag) is an advanced variant of NAG and is based on ‘lock-on after launch’ system extending its range to 7 km.

Missile Name	Orgin	Type	Range	Speed
Air-to-air missiles				
Astra	India	Air-to-Air Missiles	60 – 80 km	Mach 4 +
K-100	Russia & India	Medium Range air-to-air missile	300–400 km	Mach 3.3
MICA	IAF	Air-to-Air Missiles		
Surface-To-Air Missiles				
Akash	India	Medium-range surface-to-air missile	30-35km	Mach 2.5 to 3.5
Barak 8	Isreal/India	Long Range surface to air Missile	100 km	Mach 2

Trishul	India	Short Range surface to air missile	9km	
Defence Missile				
Prithvi Air Defence (PAD)	India	Exo-atmospheric Anti-ballistic missile	Altitude-80km	Mach 5+
Advanced Air Defence (AAD)	India	Endoatmospheric Anti-ballistic missile	Altitude-30km	Mach 4.5
Prithvi Defence Vehicle (PDV)	India	Exo-atmospheric Anti-ballistic missile	Altitude-120km	
Cruise Missiles				
Nirbhay	India	Subsonic cruise missile(Ship, submarine, aircraft and land)	1,000 - 1500 km	Mach 0.8
BrahMos	Russia & India	Supersonic cruise missile(Ship, submarine, aircraft and land)	290 km	Mach 2.8 to 3 Mach
BrahMos II	India	Hypersonic cruise missile(Ship, submarine, aircraft and land)	300km	Mach 7
Surface-to-surface missiles				
Agni-I	India	Medium-range ballistic missile (MRBM)	700-1250 km	Mach 7.5
Agni-II	India	Intermediate-range ballistic missile(IRBM)	2,000-3,000 km	Mach 12
Agni-III	India	Intermediate-range ballistic missile(IRBM)	3,500 km - 5,000 km	5-6 km/s
Agni-IV	India	Intermediate-range ballistic missile(IRBM)	3,000 - 4,000 km	Mach 7
Agni-V	India	Intercontinental ballistic missile(ICBM)	5000 - 8000Km	Mach 24
Prithvi I	India	Short Range Ballistic Missile(Tactical)	150 km	
Prithvi II	India	Short Range Ballistic Missile(Tactical)	350 km	
Dhanush	India	Short Range Ballistic Missile(Tactical)	350 - 600 km	

Prahaar(Pragati)	India	Short Range Ballistic Missile(Tactical)	150 km	Mach 2.03
Shaurya	India	Medium-Range Ballistic Missile (MRBM)	750 to 1,900 km	Mach 7.5
Submarine Launched Ballistic Missiles				
Sagarika (K-15)	India	Ballistic Missile	700 – 1900Km	Mach 7+
K-4	India	Ballistic Missile	3,500– 5,000 km	Mach 7+
K-5	India	Ballistic Missile	6,000 km	
Ashwin	India	Ballistic Missile	150– 200km	Mach 4.5
Anti-Tank Missile				
Nag	India	Anti-Tank Guided Missile	4km	230 m/s
Helina(HELicopter launched NAg)	India	Anti-Tank Guided Missile	7–8km	
Amogha-1	India	Anti-Tank Guided Missile	2.8 km	

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