

RIF-M

Air Defence Missile System

Mission

Rif-M air defence missile system is intended to protect naval order from massed air raids of aircraft, air-launched cruise missiles, anti-ship and anti-radar missiles (including low flying and manoeuvring ones), and to engage missile-carrying and jammer aircraft beyond their stand-off distances (to move away jamming and weapons delivery lines).

Composition

- underdeck launcher
- 48N6E surface-to-air missiles in TLCs
- radar control system
- ground support equipment

Features

Within its phased array antenna working sector the fire control radar system can track six targets and guide 12 missiles onto them simultaneously. It contains built-in test equipment, crew training assets and combat data recording system. The control system provides data processing, presentation and exchange with external supporting systems.

48N6E single-stage solid-propellant missile can effectively engage a wide range of air targets thanks to its high speed, allowable overloads and powerful fragmentation warhead. SAMs are supplied, stored, transported and loaded for launch in TLCs. Missiles in TLCs do not require testing and adjustment during ten years.

Vertically-launched missiles are tilted towards the target in the beginning of their trajectory according to a programme fed at their launch sequence, to exclude laying.

A drum-type launcher is installed below



deck. It includes a loader taking TLCs from the ship's deck to the missile magazine and into the drums' launch guides.

The Rif-M ADMS can be installed on board surface ships displacing 5,000-plus tonnes. Its engagement zone covering 360 degrees in azimuth is limited only by the ship's architecture.

Basic specifications

Target engagement envelope:	
range, min-max, km	8-120
altitude, min-max, m	10-25,000
Min speed of aerodynamic targets, m/s	950
Number of targets tracked simultaneously	6
Missile launch interval, sec	4
Number of missiles guided simultaneously	12

KLINOK

Air Defence Missile System

Mission

Klinok multichannel self-contained air defence missile system is designed to protect warships from massive air attacks of sea-skimming anti-ship missiles and manned/unmanned aircraft, as well as to engage enemy ships, including wing-in-the-ground-effect craft.

Composition

- underdeck launchers with missile loaders
- 9M330E-2 surface-to-air missiles in transport-launch containers
- shipborne multichannel fire control system
- ground support equipment

Basic specifications	
Target engagement envelope:	
in range, km	1.5-12
in altitude, m	10-6,000
Target flight speed, m/s	up to 700
Number of simultaneously engaged targets	up to 4
Guidance mode	radiocommand
Target detection range (at 3.5km altitude), km	45
Working frequency band (NATO)	J, I
Operational mode (main)	automatic
Reaction time, sec	8-24
	(depending on the target acquisition radar working mode)
One-missile launch time, sec	3
Into-action time:	
cold started, min	not more than 3
on duty, sec	15
Missile allowance:	
in one launcher module	8
total	up to 64
Weight, kg:	
missile at launch	167
warhead	15
Crew	13



Features

Klinok ADMS can autonomously detect and engage up to four air/surface targets simultaneously with vertically-launched surface-to-air missiles stored in underdeck TLCs. Each launcher comprises 3-4 launch modules with eight missile TLCs in each.

Medium- and large-displacement ships can mount 2-4 Klinok ADMS with one fire control system per four launchers. Klinok ADMS can get target designation data from other shipborne systems, and provide such data for 30mm gun mounts to build up the ship's close-in defence starting from 200 m and further off.

Klinok SAM system is mounted on ships displacing 800-plus tonnes.

SHTIL-1

Air Defence Missile System



Mission

Shtil-1 multi-channel medium-range air defence missile system, a follow-on modification of Shtil ADMS, is intended for all-round protection of single surface ships and naval groupings from massed strikes of sea-skimming anti-ship missiles, fixed- and rotary-wing aircraft, ships and boats in heavy ECM environment.

Composition

- single-beam modular elevated launchers with missile storage, loading and reloading systems
- 9M317E SAMs
- KMSUO multi-channel fire control system
- automated modular launch equipment
- unified recording system
- ADMS software
- ground support equipment

Features

- Variable composition with number of target channels depending on ship displacement and customer requirements to simultaneous target engagement (2-12 targets);
- Modular design ensuring high combat survivability and ease of maintenance;
- 3D omnidirectional target acquisition and tracking radar;
- Optional integration of TV/optical sights with customer-defined number of target channels.

Shtil-1 ADMS can be mounted on ships displacing 1,500-plus tonnes with 3D all-round surveillance radars on board, or used in a shore-based version.



Basic specifications

Engagement envelope:	
range, km	3.5-32
altitude, min-max, m	5-15,000
Max target speed, m/s	830
Operational mode (main)	automated
Number of targets simultaneously tracked	12
Number of targets simultaneously engaged	depends on the number of radio beacons
Deployment time:	
cold started, min	3
standby mode, sec	10-19
SAMs per launcher	24
Weight, t:	
one launcher, w/o missiles	30
whole system, w/o missiles	13-28
Combat crew	
SAM specifications:	
length, m	5.55
diameter, m	0.4
wing span, m	0.86
launch weight, kg	715
max flight speed, Mach number	3
homing head	Doppler, semi-active
warhead type	HE/fragmentation
warhead weight, kg	70
fuse	pulse
Launcher specifications:	
azimuth sector, deg	-330... +330
azimuth turning speed, deg/sec	84
elevation sector, deg	+10... +80
elevation turning speed, deg/sec	46