FIRE FROM THE SEA: RUSSIAN NAVAL LAND-ATTACK MISSILES

Systems, Platforms, Production and Combat Use in Ukraine 2022-2025

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CONFIDENCE LEVELS USED IN THIS PAPER: [HIGH] Confirmed from multiple open-source/official records. **[MEDIUM]** Single or fragmentary sourcing; probable but not confirmed. **[LOW]** Assessed from technical/contextual inference; treat with caution. **[ASSESSED]** Western/Ukrainian intelligence estimate, unverified.

ÂÂ PURPOSE AND SCOPE

This supporting paper to Russia Observatory extended study of Russia's Navies examines the Russian Navy's sea-launched land-attack and anti-ship missile inventory from the ground up: who designs and manufactures each system, where it is built, what it is capable of, which platforms carry it, how many launch cells exist across the fleet, and — crucially — how many of these missiles have been fired at Ukraine since February 2022. The Caspian Flotilla introduced this capability to the world in October 2015. The Black Sea Fleet has since provided the primary sea-based launch platform for Ukraine strikes. Between them they have made the sea-launched cruise missile central to Russian operational doctrine in a way that neither their designers nor Western analysts fully anticipated. This paper maps that reality.

Scope is restricted to sea-launched systems: missiles fired from surface ships or submarines. Ground-launched cruise missiles (Iskander-K/9M728, 9M729) and air-launched variants (Kh-101, Kh-55, Kh-22/32) are excluded except where they share production or guidance elements with naval variants. Nuclear warhead assignments are addressed in a discrete section rather than integrated into the main platform tables, reflecting both the analytical distinction and the considerably lower confidence level that attaches to nuclear loading data.

ÂÂ THE INDUSTRIAL BASE: WHO MAKES THESE MISSILES AND WHERE

ÂÂ NPO Novator (OKB-8) — Yekaterinburg

NPO Novator, formally JSC Experimental Design Bureau Novator (OKB Novator), is Russia's primary designer and producer of the Kalibr family and its variants. Founded in 1947 in Sverdlovsk (now Yekaterinburg) as OKB-8 under chief designer Lev Lyulyev, it became independent in 1991 and was subsequently absorbed into the Almaz-Antey state defence conglomerate. Its main facility is at Prospekt Kosmonavtov 18, Yekaterinburg, where design, development, and serial production are co-located with the Kalinin Machine-Building Plant (JSC MZiK). The bureau employs approximately 2,500 staff. Novator has been under US, EU, UK, Swiss, and Ukrainian sanctions since March 2022.

The TRDD-50B turbofan engine that powers the Kalibr family is not manufactured at Novator but at ODK-Saturn (formerly Rybinsk Motor Plant) in Rybinsk, Yaroslavl Oblast — the same plant responsible for a range of Russian aerospace turbofan engines. Ukrainian strikes targeting the Smolensk Aviation Plant in October 2023 disrupted one element of the Kalibr production chain (the plant produces airframe components), and Ukrainian intelligence noted that ODK-Saturn expanded production in 2022, adding over 500 jobs, indicating a deliberate wartime production surge. Pre-war annual Kalibr production was estimated at under 225 units across all variants; by late 2024 open-source analysis suggested monthly goals approaching 30 units, underpinned by classified contracts revealed in leaked documents: 240 missiles ordered for 2022–2024, 450 more projected for 2025–2026. A separate order for 56 nuclear-armed 3M-14S variants was reported. [ASSESSED]

NPO Mashinostroyeniya (NPO MIC) — Reutov, Moscow Oblast

NPO Mashinostroyeniya (also styled NPO Mash) in Reutov, a suburb of Moscow, is the design and production authority for the P-800 Oniks (3M55), its export variant the Yakhont, and the 3M22 Tsirkon (Zircon) hypersonic cruise missile. It also produced the P-700 Granit (3M45). The bureau was established in the late 1940s and retains a sprawling campus in Reutov. It too sits under Almaz-Antey and has been sanctioned since 2022. Production rates for Oniks and Tsirkon are significantly lower than for Kalibr: Ukrainian GUR estimated approximately 10 Oniks

missiles per month as of mid-2024. Tsirkon production is assessed at a fraction of that figure — serial production claims are contested, with independent analysts describing it as 'piece-by-piece' rather than true serial manufacture as of 2023–24. [ASSESSED]

Chelomei/NPO Mashinostroyeniya — P-700 Granit

The P-700 Granit was designed by Vladimir Chelomei's bureau (now NPO Mashinostroyeniya) and entered service in 1983. Production ended around 1994. No new Granit missiles are being manufactured; the existing inventory is maintained and in some cases refurbished. The missile is being phased out of operational service as Oscar-class submarines are modernised to carry Kalibr and Oniks under the Project 949AM programme, though this modernisation has moved slowly due to sanctions and industrial capacity constraints.

ÂÂ THE MISSILES: SYSTEMS, SPECIFICATIONS AND NUCLEAR NOTES

ÂÂ Kalibr Family (3M14 / 3M54) — NATO: SS-N-27 Sizzler / SS-N-30A

The Kalibr is a modular cruise missile family designed for anti-ship and land-attack roles, with an anti-submarine variant (91R) used in a different operational context. The two principal variants relevant to land attack and surface strike are:

3M14 (land attack, surface ship / submarine): Range up to 2,500 km [MEDIUM — Russian state TV has cited 4,000 km for the submarine variant, but this is assessed as optimistic; Western analysis converges on 1,500–2,500 km depending on warhead and trajectory]. Speed Mach 0.8 subsonic throughout. Warhead: 450–500 kg HE conventional; nuclear-armed 3M-14S variant confirmed by leaked contract data [ASSESSED]. Guidance: inertial navigation system (INS) + GLONASS satellite navigation + terrain contour matching (TERCOM) + active radar/electro-optical terminal seeker. Flight altitude: 20–50 m cruise, as low as 10 m terminal. CEP: assessed at under 10 m [ASSESSED].

3M54 (anti-ship, surface ship / submarine): Range 440–660 km [HIGH]. Subsonic cruise phase (Mach 0.8), with a solid-fuel booster stage in the terminal phase accelerating to Mach 2.9 for the final 20–30 km — the 'sprint' that complicates interception. Warhead: 200 kg HE. Sea-skimming at 4.6 m terminal altitude. The surface-launched variant is designated 3M54T; submarine-launched 3M54K.

The 3S14 Universal Vertical Launch System (UKSK) is the standard launch system for both variants on surface ships. Submarines use standard 533 mm torpedo tubes for the Kalibr-PL (Club-S) submarine variants, with the missiles housed in torpedo-tube-compatible launch canisters. The same UKSK cells can be loaded with Kalibr or Oniks interchangeably, giving commanders flexibility in mission loading. This modular characteristic is one of the system's most significant operational advantages.

NUCLEAR NOTE

The existence of a nuclear-armed 3M-14S Kalibr variant is confirmed by leaked Russian procurement co

P-800 Oniks (3M55) — NATO: SS-N-26 Strobile

The P-800 Oniks is a supersonic ramjet-powered anti-ship missile developed by NPO Mashinostroyeniya and commissioned in 2002. It is the successor to the P-270 Moskit and was designed as a replacement for the P-700 Granit. Its export designation is Yakhont; the Russian-Indian joint-development BrahMos is a derivative.

Specifications: Range: up to 300 km in high-altitude trajectory; 120 km in low-altitude sea-skimming mode [HIGH — these are the domestic figures; the Oniks-M extended-range variant is assessed at up to 800 km]. Speed: Mach 2.2–2.5 in cruise; up to Mach 2.9 in terminal phase. Warhead: 200 kg HE or 250 kg semi-armour-piercing. Length: 8.3 m (anti-ship) or 8.6 m (surface-to-surface). Launch weight: approximately 3,000 kg. Guidance: INS mid-course + active/passive dual-mode radar seeker terminal, with imaging infrared (IIR) seeker added post-2002 upgrade. Terminal altitude: 5–15 m sea-skimming. Group attack mode: one missile climbs to search altitude and assigns targets to others flying low — a sophisticated saturation capability [HIGH].

The Oniks has been used in land-attack mode against Ukrainian targets — notably Odesa region strikes from May 2022 — despite being optimised for anti-ship use. Its high speed complicates interception, though Ukrainian Patriot and SAMP/T batteries have achieved intercepts against it. The Oniks-M extended-range variant, with reported range up to 800 km, is assessed as in limited service or late development [ASSESSED].

NUCLEAR NOTE

The P-800 Oniks warhead bay is physically large enough to accommodate a nuclear device, and the mi

P-700 Granit (3M45) — NATO: SS-N-19 Shipwreck

The P-700 Granit is the legacy heavy anti-ship missile of the Russian Navy, designed by the Chelomei bureau in the 1970s and entering service in 1983. It remains in operational use on Oscar II-class submarines and Kirov-class battlecruisers, though it is being replaced on all platforms as modernisation proceeds. Production ended approximately 1994; existing inventory is maintained rather than replenished.

Specifications: Range: 550–700 km (optimistic Russian sources cite up to 1,000 km) [MEDIUM]. Speed: Mach 1.5–2.5 depending on altitude. Warhead: 750 kg HE conventional or 500 kt thermonuclear [HIGH — the nuclear variant is formally acknowledged and was the original operational configuration]. Length: 10 m. Launch weight: approximately 7,000 kg. Guidance: INS + active radar terminal seeker + EORSAT satellite targeting (the Legenda/Liana targeting constellation). Note: the missile is entirely too large for any VLS cell; it is fired from fixed angle launch tubes external to the pressure hull in Oscar-class boats (24 tubes at 40-degree angle), or from fixed deck launchers on Kirov-class ships.

The Granit is the only missile in this paper for which a nuclear warhead assignment to operational platforms is formally acknowledged. Oscar II submarines were designed from the outset to carry nuclear Granits as part of Russia's sea-based deterrence against US carrier battle groups. The Oscar II-class boats now being modernised to Project 949AM standard have their Granit launchers replaced with smaller cells capable of carrying up to 72 Kalibr or Oniks missiles — a significant increase in volume if not individual warhead yield. [HIGH]

3M22 Tsirkon / Zircon — NATO: SS-N-33

The 3M22 Tsirkon is a scramjet-powered hypersonic cruise missile developed by NPO Mashinostroyeniya. It entered operational service — formally — with the Russian Navy in December 2022, when Defence Minister Shoigu announced reception by the frigate Admiral Gorshkov. It has been used in combat against Ukraine, confirmed by Putin in February 2024.

Specifications (with confidence caveats): Claimed speed: Mach 8–9 [LOW — actual observed test speeds assessed at approximately Mach 5.2–5.5, not the Mach 8–9 of official claims; the missile is indisputably hypersonic but Russian performance claims are treated with caution by Western analysts]. Range: 500–1,000 km depending on trajectory; 250–500 km at low altitude, up to 750 km in semi-ballistic profile; Russian official claim of 1,000 km [ASSESSED as plausible at maximum trajectory]. Warhead: estimated 300–400 kg conventional; nuclear-capable design [MEDIUM]. Guidance: INS + terminal active radar seeker; plasma cloud during hypersonic phase may affect radar seeker operation. Launch platform: 3S14 UKSK vertical launch cells (same as Kalibr/Oniks) on Gorshkov-class frigates and Yasen/Yasen-M class submarines.

The Tsirkon's combat debut against Ukraine provides rare validation data. Ukrainian air defence (Patriot, SAMP/T) has achieved intercepts, which is analytically significant: if the missile were genuinely travelling at Mach 8–9 throughout its terminal phase, interception would be near-impossible with current systems. The evidence suggests the terminal phase involves deceleration from peak hypersonic speed, creating an intercept window. This is consistent with Western assessments that the plasma cloud generated at hypersonic speeds may also degrade the missile's own sensor function. The missile is operationally real but its practical performance envelope is narrower than Russian official statements suggest. [ASSESSED]

Production volume is the most significant constraint. Leaked Russian contracts indicate an order for 80 Tsirkons annually for 2024–2026. Independent analysts assess actual production as significantly lower — probably dozens per year rather than hundreds [ASSESSED]. The missile is expensive, technically complex, and produced by a single facility under sanctions pressure. It cannot be treated as a mass-production system.

NUCLEAR NOTE

The Tsirkon is explicitly described as nuclear-capable in Russian official statements, and its physical des

ÂÂ PLATFORM ANALYSIS: LAUNCH CELLS, CAPACITY AND FLEET DISTRIBUTION

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The following analysis covers each major platform class in Russian naval service that carries sea-launched cruise missiles. 'Strike VLS cells' refers to those cells capable of carrying Kalibr,

Oniks, or Tsirkon; air defence VLS cells are excluded from the count. Where platform numbers have changed due to losses in Ukraine, the most recent open-source assessment (April 2025) is used. The table is followed by explanatory notes.

Platform / Class	**Project No.**	**Missile Systems**	**Strike VLS Cells**	**Active Hulls (Apr 2025)**	**Fleet Assignment**
Admiral Gorshkov-class frigate	Pr.22350	Kalibr, Oniks, Tsirkon	16 (first 4 hulls); 24–32 (later hulls)		

5 commissioned; 2+ fitting out

Northern (3), Pacific (2+)

Karakurt-class corvette

Pr.22800

Kalibr, Oniks

8

~12 commissioned; 2 in Caspian (Apr 2025)

BSF, Baltic, Caspian

Buyan-M-class corvette

Pr.21631

Kalibr, Oniks

8

~10 operational (losses/damage)

BSF (reduced), Baltic, Caspian

Admiral Grigorovich-class frigate

Pr.11356

Kalibr

8

3 (BSF; degraded by losses)

Black Sea

Gepard-class frigate (Caspian)

Pr.11661K

Kalibr

8

1 (Dagestan)

Caspian

Gremyashchy-class corvette

Pr.20385

Kalibr, Oniks, Tsirkon (planned)

8

2 commissioned

Pacific

Yasen-class SSGN

Pr.885
Kalibr, Oniks, Tsirkon
24 VLS (8 launchers)
1 (Severodvinsk)
Northern
Yasen-M-class SSGN
Pr.885M
Kalibr, Oniks, Tsirkon
32–40 VLS (10 launchers)
4 (Kazan, Novosibirsk, Krasnoyarsk, Arkhangelsk)
Northern (3), Pacific (1)

Improved Kilo-class SSK

Pr.636.3

Kalibr (4 per patrol mix)

Torpedo tubes (4 Kalibr max per load)

~11 active across all fleets (losses taken)

BSF (reduced), Baltic, Pacific, Northern

Oscar II-class SSGN

Pr.949A

Granit (24 tubes); 949AM: Kalibr/Oniks (up to 72)

24 Granit OR up to 72 Kalibr/Oniks (949AM)

5–6 active (2 Northern, 3–4 Pacific)

Northern, Pacific

Kirov-class battlecruiser
Pr.1144
Granit (20 tubes); refit: Kalibr/Oniks/Tsirkon
20 Granit / 72 planned post-refit
1 active (Pyotr Velikiy); Admiral Nakhimov in extended refit
Northern

Platform Notes and Caveats

Karakurt and Buyan-M corvettes: These are the primary surface-launched Kalibr platforms, each carrying eight UKSK cells. The Buyan-M class has suffered significant losses: multiple hulls damaged or destroyed in Black Sea Fleet operations, with the fleet forced to relocate from Sevastopol to Novorossiysk. By mid-2024, no functional Kalibr surface ship carriers remained in Crimea. Two Karakurt-class corvettes (Tucha, Typhoon) are assigned to the Caspian in April 2025, transferred from the Black Sea where they are too exposed. [HIGH]

Improved Kilo (Project 636.3): The Kilo's Kalibr capacity is constrained by torpedo tube diameter — the missiles are loaded in torpedo-tube-compatible canisters, limiting a single patrol load to four Kalibr within a mixed weapon loadout of 18 total slots. The Black Sea Fleet's six 636.3 boats have been the primary submarine launch platform against Ukraine. Of these: B-237 Rostov-on-Don was assessed as destroyed (struck September 2023, reportedly sunk in follow-up strike August 2024); B-261 Novorossiysk suffered damage from a fuel system malfunction in the Mediterranean (September 2025) and was struck by a 'Sub Sea Baby'

underwater drone (December 2025) — its status is contested. The remaining boats have operated from Novorossiysk after evacuating Sevastopol. [HIGH for confirmed losses; MEDIUM for current readiness of surviving hulls]

Oscar II-class (Project 949A/949AM): These are the largest and potentially most powerful Kalibr-capable platforms once the 949AM modernisation is complete. The conversion of 24 Granit tubes to carry up to 72 Kalibr/Oniks missiles represents a dramatic increase in conventional strike volume from a single hull. However, the 949AM programme has been slow — sanctions impacted component supply, and the 2024–25 position is that two Pacific Fleet boats (K-132 Irkutsk, K-442 Chelyabinsk) have achieved post-refit status, while the programme for additional hulls is in limbo. Active Oscar IIs not yet converted still carry P-700 Granit. [MEDIUM for 949AM completion; HIGH for active hull count]

Yasen and Yasen-M: These are Russia's most capable strike submarines, with Tsirkon capability in addition to Kalibr and Oniks. The Yasen-M (Project 885M) carries ten VLS launchers versus eight on the original Yasen, with each launcher capable of housing multiple missiles. The total Kalibr/Oniks magazine is reported at 32 per Yasen and 32–40 per Yasen-M in standard load, though some sources claim up to 40 Kalibr and 32 Oniks per boat. Arkhangelsk (K-564), the fifth Yasen overall and fourth Yasen-M, was commissioned December 2024 and assigned to the Northern Fleet. Four more are under construction (Perm, Ulyanovsk, Voronezh, Vladivostok). [HIGH for commissioned hulls; MEDIUM for magazine sizes]

Admiral Gorshkov-class frigates: The first four frigates (Project 22350) carry 16 UKSK strike VLS cells; later hulls (Admiral Amelko, Admiral Chichagov) are reported to have 24–32 cells. The Admiral Gorshkov frigate was the first to carry Tsirkon operationally and deployed to the Atlantic in 2022–23 in what was widely seen as a demonstration patrol. Admiral Kasatonov was upgraded with Tsirkon in December 2023. The Project 22350M 'Super Gorshkov' with 48–64 VLS cells remains on the drawing board; no keel has been laid as of April 2025. [HIGH for existing hulls; LOW for 22350M timeline]

Aggregate Strike Cell Count — Working Estimate

On the basis of the platform table above, and applying confirmed hull counts with stated VLS capacity, the following represents a working estimate of total sea-launched strike cells across the Russian Navy as of April 2025. This excludes Granit tubes on unmodernised Oscar IIs (which carry a different missile in a different category), and excludes torpedo tubes on Kilo submarines (which carry Kalibr but are not dedicated strike cells).

Platform Type
Approx. Active Hulls
Strike Cells/Hull
Total Strike Cells
Gorshkov-class frigates (Pr.22350)
5
16–32 (avg 18)
~90
Karakurt corvettes (Pr.22800)
12
8

~96

Buyan-M corvettes (Pr.21631)

10

8

~80

Grigorovich frigates (Pr.11356)

3

8

24

Gepard frigate — Caspian (Pr.11661K)

1

8
8
Gremyashchy corvettes (Pr.20385)
2
8
16
Yasen / Yasen-M SSGNs
5
32–40 (avg 35)
~175
Improved Kilo SSKs (Pr.636.3) — Kalibr via tubes

~11
4 (max patrol mix)
~44
Oscar II 949AM (Kalibr-equipped)
2 est.
72
~144
TOTAL (excl. unmodernised Oscar IIs and Granit)
—
—
~677 cells

Important qualification on the ~677 cells figure: this represents theoretical maximum single-salvo capacity if every hull simultaneously fired every cell, every cell was loaded, and no missile was fired in reload (naval VLS does not have at-sea reload capability). The operationally meaningful figure is the number of Kalibr-capable platforms available for a given strike at a given moment, which depends on maintenance cycles, operational readiness, geographic deployment, and — in the Black Sea — the degree to which Ukrainian strikes have degraded or displaced the fleet. The figure is useful as a ceiling for capability assessment, not as an operational firing rate. [MEDIUM confidence on aggregate; individual platform figures range HIGH to MEDIUM]

CONFIRMED AND REPORTED FIRINGS AT UKRAINE: 2022–2025

ÂÂ Methodology and Confidence Framework

Attributing specific missiles to specific platforms in specific strikes is analytically demanding. Russia rarely specifies launch platforms in its own statements. Ukrainian air force reporting identifies missiles by type (Kalibr, Oniks, Tsirkon, Kh-101) but not consistently by launch platform. Western intelligence assessments, where declassified, provide the most reliable platform attribution. The following section uses: [HIGH] for strikes confirmed by both Russian statements and Ukrainian/Western forensic evidence; [MEDIUM] for strikes reported by credible sources with partial corroboration; [ASSESSED] for aggregate estimates from analytical organisations with acknowledged methodological limitations.

Pre-Ukraine: Syria 2015–2017 (Baseline)

The combat debut of sea-launched Kalibr occurred on 7 October 2015, when the Caspian Flotilla (Gepard-class frigate Dagestan and three Buyan-M corvettes — Grad Sviyazhsk, Uglich, Veliky Ustyug) fired 26 3M14T missiles at 11 targets in Syria, striking Raqqa, Aleppo, and Idlib provinces. Range: approximately 1,500 km. [HIGH] The US DoD claimed four missiles crashed in Iran; Russia and Iran denied this. On 20 November 2015 the Flotilla fired a further 18 3M14T missiles at Syrian targets. [HIGH] On 9 December 2015, the Improved Kilo submarine B-237 Rostov-on-Don, deployed in the Mediterranean, fired the first submarine Kalibr combat strike against ISIL targets in Syria. [HIGH] Further strikes from Mediterranean-based frigates and submarines followed in 2016–17, validating the Kalibr's operational range and precision.

Ukraine 2022: Opening Phase and Mass Strikes

The invasion began on 24 February 2022 with an opening cruise missile barrage that included

approximately 30 Kalibr missiles from Black Sea Fleet surface ships (Buyan-M corvettes, Grigorovich frigates) and submarines (Improved Kilo class), targeting command and control, airbases, and air defence installations. [HIGH] The Caspian Flotilla joined on 20 March 2022, firing Kalibr at a fuel depot in Kostiantynivka, Mykolaiv Oblast — the first confirmed Caspian launch against Ukraine. [HIGH]

Key 2022 strikes with confirmed sea-launched component:

14 July 2022: Kalibr strikes on Vinnytsia city centre killed at least 23 civilians. Attribution to submarine-launched Kalibr from Black Sea Fleet (Kilo class). [HIGH — forensic evidence, confirmed by US DoD]

23 July 2022: At least two Kalibr missiles struck Odesa port; two intercepted. [HIGH]

10 October 2022 onwards: Mass coordinated strikes mixing Kalibr (sea-launched), Kh-101 (air-launched), Iskander ballistic, and S-300. Sea-launched Kalibr confirmed as component of multiple barrages targeting Ukrainian energy grid through October–November 2022. By mid-November approximately half of Ukraine's energy infrastructure had been damaged. [HIGH for sea component being present; MEDIUM for specific salvo attribution]

28 November 2022: 28 Kalibr missiles launched by Black Sea Fleet — assessed as 3 warships and 1 submarine involved. [MEDIUM]

Ukraine 2023: Platform Attrition and Tactical Adaptation

Sea-launched Kalibr strikes continued through 2023 but with increasing platform attrition as Ukrainian capabilities improved. According to FPRI analysis, sea-delivered Kalibr represented approximately 12.5% of overall missiles fired against Ukraine in Q1 2023. [ASSESSED — FPRI citing Ukrainian military data] Russia shifted toward mixing Kalibr with Shahed drones to saturate air defences, a tactic that proved effective at degrading interception rates.

10 February 2023: Ukraine reported 71 Kalibr and Kh-101 cruise missiles launched in a single

day, with up to 61 intercepted. Sea component attributed to Black Sea Fleet ships. [HIGH]

13 September 2023: Ukrainian Storm Shadow / SCALP-EG strikes on Sevastopol's dry dock damaged landing ship Minsk and submarine B-237 Rostov-on-Don — a Kalibr carrier. This was the first destruction of a Russian submarine by an adversary since World War II, by Western assessment. [HIGH]

By autumn 2023, the Black Sea Fleet's surface Kalibr capacity was severely degraded. Ships vacated Sevastopol for Novorossiysk permanently. Ukrainian intelligence reported in late 2023 that Russia was stockpiling Kalibr for a winter energy grid offensive, having shifted preference toward air-launched Kh-101 when sea-based platforms became too exposed.

Ukraine 2024: Tsirkon Debut and Continued Attrition

February 2024: Ukrainian forces recovered Tsirkon fragments for the first time, confirming combat use. Ukrainian GUR assessed Russia producing approximately 10 Tsirkons per month. [ASSESSED]

7 February 2024 and March 2024: Tsirkon missiles used in attacks on Ukraine — Putin confirmed this in his 29 February 2024 Federal Assembly address. On 25 March 2024, two Tsirkons struck Kyiv; Russia celebrated; Ukraine reported both intercepted (debris photographed). [HIGH for use; MEDIUM for Ukrainian intercept claims]

By mid-2024, open-source analysis (Maritime Security Forum and others) assessed that Russia had no Kalibr surface ship carriers afloat in Crimea. Sea-launched Kalibr activity continued from submarines operating from Novorossiysk and the Sea of Azov, emerging briefly, firing, and returning. This cat-and-mouse pattern — minimising exposure, maximising stand-off — is the defining characteristic of Russian naval strike operations by this point. Submarines became the primary sea-based Kalibr platform in the Black Sea theatre.

August 2024: B-237 Rostov-on-Don reported sunk in a follow-up Ukrainian strike while undergoing repairs — the first confirmed sinking of a Kilo-class submarine in action. [MEDIUM — Ukrainian official statement; Russian side silent]

Ukraine 2025: Dispersal and Northern Options

The November 2024 Ukrainian drone strike on Kaspiysk targeted Caspian Flotilla vessels (Tatarstan, Dagestan reported struck) and demonstrated that even the Caspian sanctuary was reachable. Black Sea submarine operations continued from Novorossiysk. In December 2025, a Ukrainian 'Sub Sea Baby' underwater drone reportedly struck a Kilo-class submarine in Novorossiysk — first successful use of an underwater drone against a Russian submarine. [MEDIUM — Ukrainian claim; vessel identity unconfirmed]

The operational picture by April 2025 is one of significant but incomplete sea-based Kalibr capacity. The Northern Fleet's submarines (Yasen, Yasen-M, Improved Kilo) retain substantial Kalibr capacity and have not been engaged by Ukrainian forces. A Northern Fleet Yasen or Oscar II strike on Ukraine is theoretically available through the Norwegian Sea/North Atlantic approach but would represent a dramatic escalation in operational geography and has not been used. The practical sea-launched Kalibr threat to Ukraine comes primarily from Black Sea submarines conducting limited exposure sorties.

Aggregate Firing Estimates

ASSESSED — TREAT WITH CAUTION

The following figures are aggregates compiled from Ukrainian MoD reporting, Western intelligence asse

Ukrainian Ministry of Defence estimate at invasion start (23 February 2022): approximately 500 Kalibr missiles in stock (3M-14 variant). [ASSESSED]

Production during war (GUR estimate): 15–20 per month initially; Ukrainian officials cited 'dozens per month' by July 2023; by late 2024 assessed at approximately 30 per month. Total produced since February 2022 through end-2024: likely in excess of 800 additional missiles across all variants. [ASSESSED — wide uncertainty range]

Total Kalibr family (all variants, all platforms) used against Ukraine February 2022 to end-2024:

multiple hundreds, with sea-launched component assessed at roughly 12–15% of total cruise missile strikes in documented periods. No reliable aggregate specific to sea-launched variant is publicly available. The opening barrage alone involved approximately 30 sea-launched; major strike waves in autumn 2022 involved 20–30 sea-launched per event; the pattern of dozens to low hundreds per year from sea platforms appears consistent with available evidence, but precision is not available in open sources. [ASSESSED]

Oniks firings at Ukraine: confirmed from May 2022 (Odesa strikes). Ongoing but at lower frequency than Kalibr. Production assessed at approximately 10 per month. [ASSESSED]

Tsirkon firings at Ukraine: confirmed from February 2024; estimated at low dozens total through April 2025, reflecting both limited production and the decision to reserve a scarce and expensive system for high-value, high-profile strikes. [ASSESSED]

ÂÂ WHAT THE NUMBERS TELL US — AND WHAT THEY DO NOT

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The aggregate strike cell figure of approximately 677 across the Russian sea-launched fleet is a ceiling, not a floor. The operational floor — missiles available to fire at Ukraine at any given moment from sea platforms that are both functional and within range — is considerably lower, and has been declining. The Black Sea Fleet's surface component has been effectively neutralised as a Kalibr platform by Ukrainian strikes and drone pressure. Its submarine component has been degraded by one confirmed sinking and multiple damage events and operates under severe tactical constraint. The Caspian Flotilla demonstrated in November 2024 that it is not immune to long-range attack.

What remains substantial and largely untouched is the Northern and Pacific Fleet submarine capacity — Yasen-class boats with 32–40 Kalibr cells each, Oscar IIs being modernised to carry 72 Kalibr/Oniks, and Improved Kilo submarines not yet committed to the Black Sea theatre. These represent Russia's reserve sea-strike capability: not currently engaged against Ukraine, but available. The question of whether and under what circumstances Moscow would commit Northern Fleet submarines to Ukraine strike operations is strategic rather than technical. The capability is real.

Production is the second key variable. At assessed rates of 30 Kalibr per month, Russia is producing approximately 360 per year — enough to sustain strike campaigns at current tempo

but not to rebuild depleted inventories rapidly while simultaneously conducting strikes. The 2025–2026 procurement contract for 450 missiles suggests Moscow believes it needs to rebuild stocks. The dependency on ODK-Saturn for TRDD-50B engines and on components that were subject to sanctions creates a production ceiling that Western interdiction of dual-use supply chains has periodically tightened.

The Tsirkon is a different problem: impressive in concept, uncertain in volume. A missile system that can be produced at perhaps 50–80 units per year and that costs significantly more than a Kalibr is not a mass-fire weapon. It is a selective, high-value instrument — suited to striking hardened targets, generating political effect, or testing air defences. Its use against Kyiv in 2024 fits this pattern. It is not, and for the foreseeable future will not be, a substitute for Kalibr in sustained strike operations.

Other papers will examine the maritime campaign in detail, including the systematic Ukrainian degradation of Russia's Black Sea Kalibr capacity and what that degradation means for the balance between sea and land-based strike in Russia's overall fires complex. The numbers in this supporting paper provide the baseline against which that degradation should be measured.

Curated and edited by Robin Ashby, Chair of the Eurodefense Russia Observatory, acting in a private capacity. April 2024

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