in: Community Articles, Updateme, Mechanics

Fire Rate

Maximum number of projectiles that can be launched per second.

—In-game Description

Fire Rate is a base stat of all ranged weapons, denoting the number of times per second a weapon discharges a projectile, or applies a discrete instance of damage, which normally corresponds to units of ammo being spent (normally one round per shot, and for continuous weapons 0.5 rounds per tick).

Contents

Mechanics

As a general principle, the **Fire Rate bonus increases fire rate linearly, regardless of the Trigger Type**, which ensures that the effective damage increase from improving this stat will be the same for *Automatic weapons* (e.g. Braton) and weapons with more complex trigger types – so on *Burst weapons* (e.g Burston), it affects both the speed of the burst as well as the time between bursts. For the same reason, apart from increasing the weapon's fire rate in the narrowest sense, the Fire Rate bonus also affects **Spool-up Time** (a hidden stat of *Auto-Spool weapons*, e.g. Gorgon), and **Charge Time** (a base stat of bows and other *Charged weapons*, e.g. Opticor).

Increasing fire rate of *Semi-auto weapons* increases the cap on how quickly they can be fired. Likewise, for *Duplex-trigger weapons* (e.g Zylok), fire rate increases the cap on how quickly each two-shot sequence can be initiated (while the interval between the shots in a sequence remains completely voluntary, i.e. player-determined). Notably, Semi-Auto weapons are capped at 10 rounds per second.

On *Continuous weapons* (e.g. Ignis), the Fire Rate bonus increases the frequency of "ticks" (damage instances).

Shot Delay

Another way of viewing fire rate is that it determines the time before shooting another shot or reloading when the magazine is empty. Taking the inverse of resultant fire rate will give the time between shots in seconds.

$$\text{Shot Delay in Seconds} = \frac{1}{\text{Modded Fire Rate}}$$

Note that the Vectis and Vectis Prime are not affected by this shot delay before reloading and reloads instantly after the last shot instead.

Fire Rate and Charge Time

For some weapons, the effective fire rate is dependent on the **Charge Time** of the

Rate. For example, the Scourge lists its "Charge Rate" as 0.5, however that is actually the charge time (0.5 **seconds**). The actual charge rate of a weapon is as follows:

$$\text{Charge Rate} = \frac{1}{\text{Charge Time}}$$

The charge time is the time it takes the charge circle to progress to full. Bonuses from fire rate mods works as so:

$$\text{Charge Time} = \frac{\text{Base Charge Time}}{1 + \text{Mod Bonus}}$$

The charge rate is the speed at which the charge circle progresses to full. Bonuses from fire rate mods works as so:

$$\text{Charge Rate} = \text{Base Charge Rate} \times (1 + \text{Mod Bonus})$$

For charged weapons, **charge time cannot go above 10 times the base charge time** (achieved by having at least -90% fire rate bonus).

$$\text{Effective Fire Rate} = \frac{1}{\text{Modded Charge Time} + \frac{1}{\text{Modded Fire Rate}}}$$

Calculation for true fire rate for charge weapons with the exception of bows, Epitaph, and Lanka.

$$\text{Effective Fire Rate} = \frac{1}{\text{Modded Charge Time} + \text{Modded Reload Time}}$$

Calculation for true fire rate for bow weapons.

$$\text{Effective Fire Rate} = \frac{1}{\text{Modded Charge Time}}$$

Calculation for true fire rate for Lanka which does not have a delay between charged shots.

The following is a list of Charge Times possessed by Charged weapons:

Artemis Bow (1.00 sec)

Cernos (0.50 sec)

Cernos Prime (0.50 sec)

Daikyu (1.00 sec)

Dread (0.50 sec)

Kuva Bramma (0.40 sec)

Lenz (1.20 sec)

Prisma Lenz (0.8 sec)

MK1-Paris (0.50 sec)

Mutalist Cernos (0.50 sec)

Nataruk (1.00 sec)

Paris (0.50 sec)

Paris Prime (0.50 sec)

Proboscis Cernos (0.70 sec)

Rakta Cernos (0.25 sec)

Some automatic weapons do not start out firing at the fire rate listed in the Codex or Arsenal. Instead, the first few shots are fired more slowly as the weapon 'spools up' to the maximum fire rate. Once the maximum fire rate is reached, the weapon will continue firing at that rate until either the wielder stops firing or runs out of ammo. The period during which the maximum fire rate has not yet been reached is called **Spool-up Time**. The number of shots needed to reach maximum fire rate, the starting (decrease in) fire rate, and the rate of increase per shot fired, is sometimes called the *Spool cadence*.

The following is a list of Spool cadences possessed by Auto-Spool weapons (note: only the number of shots is listed; for a full description visit the weapon articles):

Rifle | Shotgun | Secondary | Robotic | Archgun

Gorgon (9 shots)

Gorgon Wraith (6 shots)

Prisma Gorgon (7 shots)

Soma (6 shots)

Soma Prime (4 shots)

Supra (5 shots)

Supra Vandal (4 shots)

Tenora (9 shots)

Tenora Prime (9 shots)

Fire Rate and Burst Weapons

The effective Fire Rate for Burst Trigger weapons is a derived stat that is calculated on three factors:

- Burst Count: Number of shots per burst (hidden value)
- Burst Delay: Delay between shots fired in a single burst (hidden value)
- Fire Rate: Number of bursts per second if Burst Delay is 0 seconds. In other words, the reciprocal of this value is the delay before being able to fire another burst after completing a burst. This is the "Fire Rate" value listed in the arsenal.

- For example, Burston has a Fire Rate of **5**, a Burst Delay of **0.061**, and a Burst Count of **3**.
- Note that for weapons with instantaneous bursts like Quartakk (Burst Delay = 0), the Effective Fire Rate equals the arsenal Fire Rate.

The effective Fire Rate for Burst Trigger weapons is calculated by the following expression:

$$\textbf{Effective Fire Rate} = \frac{\textbf{Burst Count}}{\frac{1}{\textbf{Fire Rate}} + [(\textbf{Burst Count} - 1) \cdot \textbf{Burst Delay}]}$$

$$\textbf{Effective Fire Rate} = \frac{\textbf{Burst Count}}{\textbf{Burst Time In Seconds} + \textbf{Total Burst Delay In Seconds}}$$

Burst Delay is not affected by net negative Fire Rate bonuses.

Bar visualization of single Burst firing event

▾ 0 seconds elapsed — Burst Time + Total Burst Delay seconds elapsed ▾

Shot 1 (instant)	Burst Delay	Shot 2 (instant)	Burst Delay	...	Shot N (instant)
Single Fire Button Input = One Burst of N Shots					

Bar visualization of multiple Burst firing events

▾ 0 seconds elapsed — (Burst Time + Total Burst Delay) * 2 seconds elapsed ▾

Burst 1, Shot 1 (instant)	Burst Delay	...	Burst 1, Shot N (instant)	Delay (1 / Fire Rate)	Burst 2, Shot 1 (instant)	Burst Delay	...	Burst 2, Shot N (instant)
Burst 1				Delay	Burst 2			
Holding Fire Button Input For Two Bursts of N Shots								

Sources of Fire Rate Bonus

Abilities

The following Abilities affect Fire Rate positively:

Gauss Harrow Wisp

4 100	**Redline** Push Gauss' battery beyond the redline, supercharging his Abilities and setting Fire Rate, Attack Speed, Reload Speed, and Holster Rate into overdrive. When past the redline, bolts of arcing electricity dance periodically from Gauss, exploding en masse when the ability is deactivated. Introduced in Update 25.7 (2019-08-29)	**Strength**: 100 / 200 / 300 / 400 (Impact and Puncture area damage) **Duration**: 15 / 20 / 25 / 30 s (duration) 6 - 30% / 9 - 45% / 12 - 60% / 15 - 75% (fire rate buff) 5 - 25% / 6 - 30% / 7 - 35% / 8 - 40% (attack speed buff) 4 - 20% / 6 - 30% / 8 - 40% / 10 - 50% (reload speed buff) 4 - 20% / 6 - 30% / 8 - 40% / 10 - 50% (casting speed buff) **Range**: N/A **Misc**: ? m (activation knockback radius) +20% (battery limit release) 50% (projectile accuracy) 50% (energy discount for Mach Rush) 100% (melee damage bonus and stagger chance for Kinetic Plating) 100% (Cold freeze chance and Heat ignite chance for Thermal Sunder) ≤100% (Blast enemy armor reduction for Thermal Sunder)

Mods

The following Mods affect fire rate positively or negatively:

General Nightmare Corrupt (Bonus) Corrupt (Penalty) Set Primed

Reinforced Bond

Arcanes

The following Arcanes affect fire rate positively:

Arcane Acceleration

Arcane Velocity

Arcane Tempo

Other

Afentis passive Dual Toxocyst passive

Effective Fire Rate

Effective Fire Rate is the *true* rate at which attacks happen per second. It is a derived stat that assumes perfect conditions and takes into account more stats and mechanics than the in-game arsenal's Fire Rate value. In other words, Effective Fire Rate may be a more accurate measure of how often a weapon attacks for theoretical DPS calculations.

Locking Fire Rate

Main article: Cannonade Mods

Introduced in Update 36.0 (2024-06-18) are **Cannonade Mods** that can only be installed on weapons with a Semi Trigger Type. When installed These mods effectively lock the fire rate of the weapon they're installed on, preventing **any** changes to the fire rate regardless if they're positive or negative. In exchange, these mods also increase Damage and add Punch Through. While a Cannonade Mod is installed, the arsenal UI will have a padlock next to the fire rate value.

For weapons with multiple trigger types, *all* of listed trigger types must be Semi in order to install any of these mods: Argonak for example starts with a Semi Trigger Type but can switch to an Auto Trigger Type with Alternate Fire.

Notes

- Fire Rate cannot drop below 0.05 rounds per second.

    - The automatic reload of the weapon when the magazine is empty.
    - The manual reload of the weapon when the magazine is **not** empty.
    - The ability to swap the weapon or use quick melee.
- Due to the principle of linear effects of fire rate, the relatively high number of shots-per-burst possessed by some weapons (e.g. Hind), does not merely make them "shoot more bullets", when measured in an appropriate span of time (longer than a couple of bursts).
- Increasing Fire Rate has important side-effects regarding the ability to successfully land hits:
    - Increasing fire rate exacerbates the effects of Recoil. When retaining their base rate of fire, low/moderate-recoil weapons, for which the crosshairs will have enough time to more or less re-zero after each shot, may be quite controllable; when modded for extra fire rate, the same weapons may start climbing or shaking unfavorably. Along the same lines, weapons already having strong recoil may become uncontrollable.
    - Separately from recoil, increasing fire rate may have an unpredictable effect on Accuracy. Normally quite accurate weapons may become inaccurate this way, while weapons with mediocre accuracy may only lose a little bit of accuracy. *To what extent accuracy is adversely affected by bonus Fire Rate* is an undisclosed characteristic of each individual weapon (a hidden stat).
        - The compounding effects of worsened recoil *and* lower accuracy due to bonus fire rate are often thought to be unacceptable on a number of weapons that are particularly susceptible to these side-effects.

Trivia

- Prior to Hotfix 17.4.3 (2015-09-16), the principle that the Fire Rate bonus increases fire rate linearly hadn't yet been in application, so fire rate didn't affect the interval between the shots of a burst, leading to it having an overall diminished effect on Burst weapons.

See Also

- Trigger Type, for more info on firing mechanisms of weapons.
- Attack Speed, for the melee equivalent of fire rate.

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	Damage Mechanics	Critical Hit • Damage • Damage Redirection • Damage Reduction • Damage Reflection • Damage Type Modifier • Damage Vulnerability • Health • Status Effect
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	Operator	Amp • Focus (Madurai, Vazarin, Naramon, Unairu, Zenurik) • Lens
	Drifter and Duviri	Decrees • Drifter Combat • Drifter Intrinsics • Kaithe
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	Audio	Mandachord • Music • Shawzin • Somachord • Sound
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