Surprising Fact: Tank Gun Barrel Lifespan Is Only 6 Seconds

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When talking about military weapons, we cannot help but mention tanks - a weapon with a relatively long history and widely equipped by many countries.

However, not everyone knows that the tank gun barrel only has a lifespan of 6 seconds even though this weapon can serve for 30 years or more. Moreover, to achieve such a feat is thanks to the continuous development of science and technology. During World War II, the gun barrels on tanks only had a lifespan of 2 to 3 seconds.

Basically, a tank gun can be considered an extension of a machine gun, operating by using the explosive force of the gunpowder in the rear chamber to generate a gas mass with very high temperature and pressure, causing the pressure in the chamber to increase to a maximum, and pushing the bullet out through the barrel.

Therefore, the chamber is under extremely high pressure at the moment of firing, so each firing can be considered a destructive event for the barrel.

History of tank gun barrel development

When the cannon first appeared, it was loaded with explosives and bullets from the muzzle. Because at that time, technology was not yet developed, so the cannon shell was an iron ball with a diameter smaller than the inner diameter of the cannon barrel. This caused the gas pressure to be partially lost through the gap between the bullet and the barrel when fired, causing the gas flow to move erratically, and the accuracy was not high.

Later, the structure of the gun barrel and the shell were gradually improved. And by World War II, the gun barrel had a spiral groove inside. And to make the most of the energy of the explosive, people made the bullet head part that was usually a little larger than the diameter of the gun barrel. This made the gun shell need to use a relatively easy-to-deform metal, and copper was the most suitable material. Copper is softer than cast iron and steel, so it can easily change shape after being pressured, helping to quickly seal the space in the gun barrel and the gun barrel is not too damaged.

Tank guns were also constantly improved. Initially, under ideal conditions, after each shot, a tank had to wait 3 to 4 seconds before firing the next shot.

Modern gun barrels use specially manufactured alloys that undergo a casting process that complies with very specific technological requirements, and have a heat dissipation mechanism that helps the heat dissipation speed to be much faster than before. This allows the gun to fire continuously for a period of time.

But the rapid heat dissipation will cause the inside of the gun barrel to experience rapid heating and rapid cooling with a temperature difference of more than 600 degrees Celsius. This makes the barrel's lifespan very short, only 6 seconds. But that time is quite enough for a gun.

Correct understanding of gun barrel life

The actual service life of a cannon barrel is very short, measured from the time the explosive ignites until the bullet flies out of the barrel. The firing speed of current cannons is almost always around 750m/s, twice the

speed of sound.

On a typical tank, the gun barrel is about 5m long. At that speed, the entire firing process takes only about 6 thousandths of a second. So with a 6-second barrel life, it can actually fire 1000 shells.

In fact, the gun barrels of tanks in the US, Russia, and China must be replaced after 1/3 of their life for insurance purposes.