

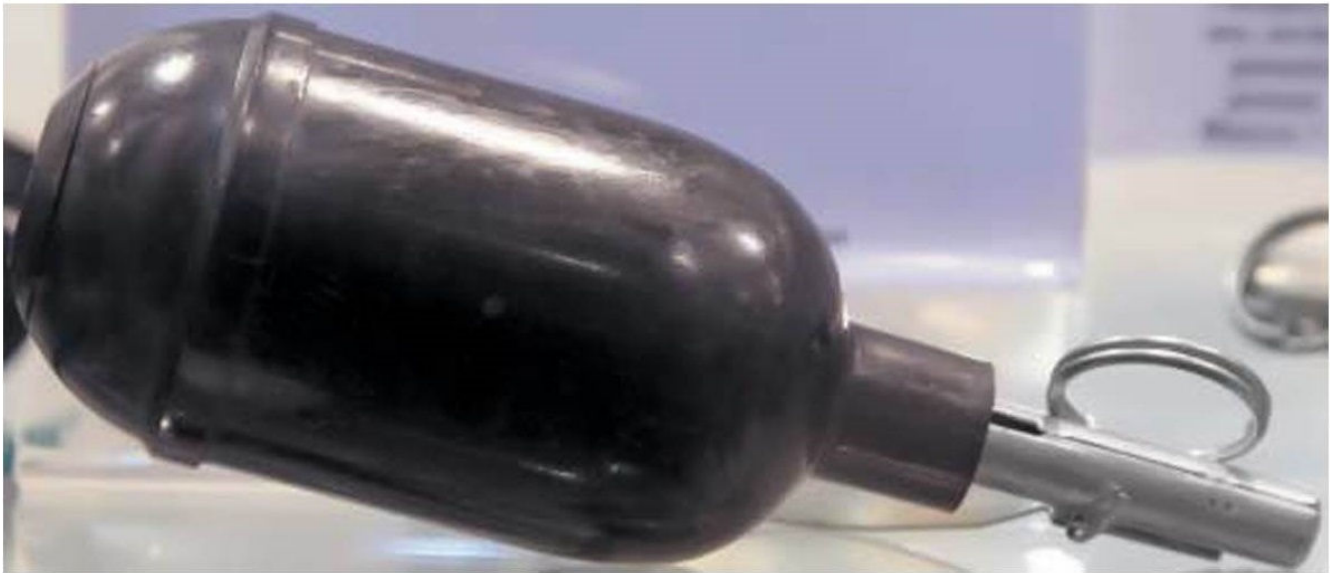
Thermobaric hand grenade RG-60TB

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Volumetric explosion is efficient and effective. With the help of ammunition, which has a special charge of thermobaric action, it is possible to destroy targets in an open area or in shelters, causing them the most serious damage. Such warheads have long been used in various fields, from artillery to aviation. More recently, a new proposal has appeared on the use of such systems in a different field. The Russian defense industry has offered customers a three-dimensional hand grenade. Such a product is produced under the name RG-60TB.

Hand grenade with an unusual effect appeared in the first half of the last decade. The development of these [weapons](#) was carried out by the Federal Research and Production Center “Research Institute of Applied Chemistry” (Sergiev Posad). At that time, the company offered a whole family of special grenades with various equipment. Having a similar appearance, such products were intended to solve a wide range of problems. The presented family of grenades included several non-lethal action models that facilitate the neutralization of the enemy and the work of the special forces as a whole. In addition, the product also included a product designed to destroy manpower.



RG-60TB grenade at the exhibition. Photo "Rosoboronexport" / roe.ru

To combat the manpower or light unprotected enemy equipment in open areas or in shelters, the RG-60TB thermobaric grenade was proposed. This product in its form factor corresponds to existing hand grenades of existing types and almost does not differ from them in terms of operation. At the same time, special equipment made it possible to obtain a significant increase in power in comparison with other grenades. According to published data, the power of the warhead of the RG-60TB grenade is comparable to artillery shells.

The special grenade has an official designation that fully reflects all its features. The first two letters of the name stands for "hand grenade." The numbers indicate the diameter of the hull in millimeters, and the last two letters indicate the thermobaric type of equipment. Similar designations, but with different letters at the end, were received by other grenades of the family.

Externally, the RG-60TB product is similar to some domestic hand grenades for various purposes. Its main element is a metal case of a rather simple form. The outer contours of the hull are formed by a cylindrical surface smoothly conjugated with the upper hemispherical bottom. On the last is a small sleeve for installing a tubular fuse housing. The functions of the second bottom are performed by a separate hemispherical cover, which is rigidly fixed to the body during assembly.

As follows from the available data, thermobaric equipment is placed inside such a case, including combustible liquid and a pair of charges for various purposes. The first charge is responsible for undermining the body and dispersing the liquid over the available volume. The second, respectively, should at a given point in time ignite the sprayed liquid, which leads to a volume explosion. Both charges are controlled by a standard grenade fuse.

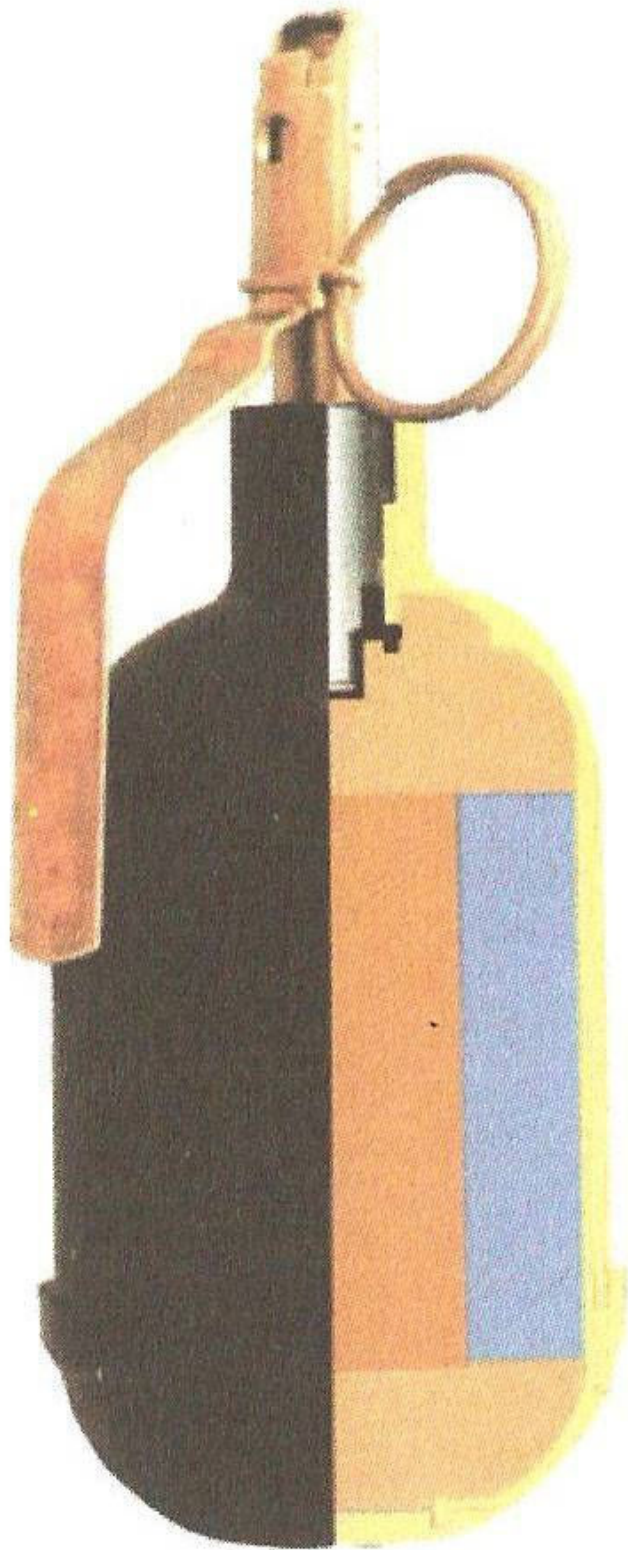
According to open data, the RG-60TB grenade contains a thermobaric charge weighing only 240 g. The correct selection of a combustible substance made it possible to obtain outstanding combat qualities.

Products of different types of development of the Research Institute of Applied Chemistry, including RG-60TB, should be used with unified fuses of a hand grenade of the UZRG family. Similar devices are used with other domestic grenades of recent decades. UZRG has a tube-body, inside of which there is an impact mechanism, an igniter capsule, a moderator and a detonator. In the cocked position, the fuse drummer is held by the trigger lever, which is fixed by a check with a ring. The fuse is placed in the corresponding socket of the grenade RG-60TB or other similar product and is fixed on the thread.

The thermobaric grenade in the form prepared for use has a length (taking into account the tubular fuse case) of not more than 180 mm. The diameter of the product along the body is 60 mm. The trigger lever lying along the body does not increase the diameter and does not affect the dimensions. The mass of a grenade ready for battle is less than 350 g. According to the developer, the RG-60TB grenade can be used at air temperatures from -40°C to $+50^{\circ}\text{C}$.

Grenades of several models developed by the Research Institute of Applied Chemistry, differing in their purpose, have similar contours and dimensions. The thermobaric product can be distinguished from others by the corresponding marking, or by its black body without any additional signs. Other products of the family have a different color, or colored cross rings are present on the black coloring.

The main difference between the RG-60TB product and other domestic and foreign grenades is the special equipment operating on the principle of a volume explosion. Due to the use of atomized flammable liquid, which simultaneously burns in a relatively large volume, it was possible to obtain significant advantages over other hand weapons.



RG-60TB in a section. Figure Russianguns.ru

During the undermining of the first charge, which is responsible for spraying a combustible liquid, the grenade body is destroyed with the formation of fragments. The striking elements, when scattered, are capable of inflicting some damage to manpower and unprotected equipment at distances of up to several meters. However, in terms of the lethal force of the scattered fragments, the RG-60TB is seriously losing to the “specialized” fragmentation munitions. Simultaneously with the expansion of the fragments, the main charge of the liquid is sprayed, followed by its ignition.

According to the manufacturer, a volumetric explosion of a 240-gram grenade charge is equivalent to undermining 550-660 g of TNT. Liquid combustion is accompanied by the release of a large amount of heat, as a result of which ignition of surrounding objects is possible. When using the RG-60TB grenades in an open area, a continuous defeat of the main targets is ensured in a radius of 7 m. The grenade simultaneously performs several effects on the target. In fact, it is fragmentation, explosive and incendiary.

The developer organization compared its hand grenade to existing ammunition of various types. Obviously, an explosion with a power of 600-650 g of TNT goes beyond the capabilities of conventional grenades. For this reason, other ammunition of more serious classes was mentioned in advertising materials. So, explosive charges weighing more than 600 g are usually used as part of high-explosive shells for artillery systems of 76 mm caliber or more. However, a special grenade loses to shells in terms of the generated stream of fragments. However, with all objective limitations, only one fighter can carry several RG-60TB grenades, which in a sense replace an entire salvo of artillery.

The grenades of the family developed by the Research Institute of Applied Chemistry, for the most part, are intended for the non-lethal neutralization of the enemy, but the RG-60TB has other tasks. It is proposed to use it for the destruction and destruction of manpower and unprotected or lightly armored vehicles both in open areas and in rooms or other shelters. In some situations, this product may be considered a replacement or addition to existing fragmentation grenades. In some situations, special forces soldiers may use existing types of fragmentation grenades, while in other circumstances, thermobaric can be more effective.

According to well-known data, in the middle of the last decade, the garnet family from the Federal Scientific Research Center for Applied Chemistry was able to interest a potential customer and become the subject of supply contracts. In 2006, the Russian Ministry of the Interior adopted these products and soon purchased a certain amount of them. According to various sources, several types of grenades, including the thermobaric RG-60TB, were primarily supplied to special units of the Ministry of Internal Affairs.

It is known that new weapons were purchased in large quantities and quickly replenished the arsenals of units from the Ministry of Internal Affairs. The volume and cost of procurement, as well as the speed of execution of contracts is perfectly illustrated by one of the latest contracts, data on which are freely available. In April 2014, the Russian Ministry of Internal Affairs purchased special grenades of several types, including RG-60TB. In accordance with this order, the developer organization supplied 1838 grenades of such a model at a cost of 3307 rubles each. It is noteworthy that in the framework of that order, two more types of products were purchased, and thermobaric grenades in their quantity occupied an intermediate position between them.

Grenades from the Research Institute of Applied Chemistry remain in service with the special units of the Ministry of Internal Affairs and are still used. In connection with the current situation, such

weapons, most likely, are now being used as part of combat training activities, as well as during counter-terrorism operations. However, the Ministry of the Interior is in no hurry to disclose the details of the combat use of such weapons, and if it finds a job, it does not receive well-deserved fame.

Special units of the Ministry of the Interior or the army in certain situations may need hand grenades of various types. Among such special weapons, the most famous are smoke and light-sound grenades, which are used in various operations. In the recent past, the Russian defense industry proposed a whole family of special grenades, which included samples of known types, as well as a fundamentally new weapon. The advent of the RG-60TB thermobaric grenade gave the soldiers new opportunities in dealing with various threats.



Grenades from the Research Institute of Applied Chemistry (from left to right): light-sounding RGK-60SZ, RGK-60RD irritating and cluster RGK-60KD.

All the advantages of the RG-60TB product are directly related to the used warhead. It is she who provides a sharp increase in the main combat characteristics while maintaining acceptable dimensions and mass. The declared blasting power at the level of 600-660 g of TNT This means that the power of a shock wave thermobaric grenade is several times higher than serial fragmentation grenades. Such an advantage can be decisive when detonating a grenade in a confined space. In this case, the shock wave from a burning aerosol is more effectively reflected from obstacles and enhances the impact on

manpower.

Despite certain advantages over other weapons, the RG-60TB is not without drawbacks and to a certain extent inferior to it. So, the lightweight body of this product cannot form sufficiently heavy and large fragments that pose a serious danger to “soft” targets. From the point of view of fragmentation effects on manpower or unprotected objects, a new type of thermobaric grenade can seriously lose to older products.

However, do not forget that the RG-60TB and other grenades of this family are special tools for solving special problems. In those situations where the use of a thermobaric grenade is justified and makes sense, it is able to show the highest characteristics and confirm the advantages over other weapons. The wrong choice of weapons, in turn, can drastically reduce the results and effectiveness of their use.

The domestic project RG-60TB also has a curious feature. Hand grenades with thermobaric charge can not yet be called a common and popular weapon. In fact, the development of the Research Institute of Applied Chemistry is currently the only representative of this class brought to real operation. Whether this direction will receive further development is unknown. At the moment, this concept looks very interesting, and the availability of orders for serial grenades allows us to evaluate its future in an optimistic manner.