



## ANALYSIS OF COMPOSITE POLYMER MATERIALS USED IN HIGH-PRESSURE GAS CYLINDERS

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<b>Received:</b> 11 <sup>th</sup> March 2021 <b>Accepted:</b> 30 <sup>th</sup> March 2021 <b>Published:</b> 10 <sup>th</sup> April 2021	Deepening of economic reforms based on the priorities set by the President of the Republic of Uzbekistan Sh.M.Mirziyoev Improvement of economic sectors Development of its social direction Transition from raw materials to production of competitive finished industrial products This requires the search for and implementation of new methods of organizing scientific, technical and innovation processes.

**Keywords:** industrial products, scientific, technical ,innovation processes.

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Improving the well-being of the population depends on the development of vehicles, including road and urban transport. More than 90% of cargo and more than 65% of passengers are transported by road in the country.

The automotive industry of the XXI century is developing in close connection with the creation of high-strength composite polymeric materials. Scientific and practical research is being conducted in many countries around the world to create a durable material that can provide the required strength.

In this regard, Russia, Japan, Ukraine and the United States are developing fiber-composite polymer materials, which are widely used not only in the automotive and mechanical engineering industries, but also in aerospace, aircraft and shipbuilding. Polymer composite materials have good physical and mechanical properties and their specific gravity is several times lower than metal composites. In particular, the specific gravity of polymer composite materials is 0.65 kg / l, while the specific gravity of metal composites is 1.25-1.87 kg / l. From such polymer composite materials (PKM) it is possible to obtain a very strong and lightweight material that can withstand the required stress. There is a high strength of fiber-reinforced PKMs and the possibility of obtaining a composite material for such a high-pressure gas cylinder from such materials.

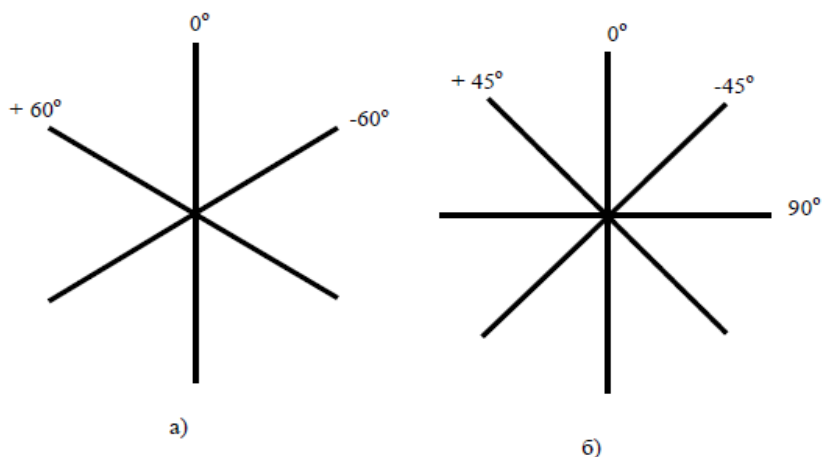
Table 1 shows the physical and mechanical properties of several types of PKMs. The materials listed in the table are fiber-reinforced polymer composite materials.

1-schedule

Peculiarity	Glass plastic	Carbon plastic	Organoplastik
Тола миқдори, %	65-70	60-70	65-70
Зичлик, кг/м <sup>3</sup>	2000	1550	1400
Мустахамлик:			
Силжишга, МПа	2500-2700	1800-3500	3500-4000
Сиқилишга, МПа	2000-2500	1200-1800	350-400

As can be seen from Table 1, the strength of polymer materials widely used in mechanical engineering is 8-10 times higher than that of cast steels. In order to ensure the operation of such high-strength composite polymeric materials in liquefied and compressed gas and gasoline fuels, it is possible to obtain gas cylinders of any shape and size by longitudinal and transverse testing of thermoplastic and reactoplastic polymer binders with special fibers. Providing cars with neighboring fuel is more convenient and efficient to manage, it will increase the demand in our country and the world market.

Since fiber tuning technology consists of a complex design tester and a complex process, the development of such technology requires a large-scale scientific task and a complex process. Therefore, along with the simplification of technology, special attention was paid to the development of technology for the production of durable composite materials.



1-photo. Form of making lattice of composite materials with fibers

Forms and methods of fiber testing on the technology of obtaining solid PKMs are of great importance. Because the main factor that increases the strength of composite materials depends on the form and method of testing, it is possible to increase the strength of the material by 20-30%.

The toughness pattern that provides the best strength, as shown in Figure 1, is the higher the toughness when the fibers are tipped at a small angle to each other.

Typically, composite materials consist of a filler with a plastic base (matrix): powder, fiber or particles of any other shape. The additives ensure the strength and rigidity of the composition, while the bonding materials ensure adhesion between the constituent components, making them strong and plastic when exposed to force.

In this regard, the prospects of obtaining composite polymer materials for gas cylinders that can withstand stresses of 25-30 MPa, modified furan compounds with epoxy polymers and widely used local mineral fillers, specially tested with glass and graphite fibers.

Plastics with sintered or dispersed phases have excellent properties: along with chemical stability, they have high relative strength, low thermal conductivity, and technological convenience in the manufacture of parts and structures. Tested plastics with the addition of special fillers used as heat shielding of space technology objects, as well as in structures with high longitudinal strength. The creation of a technology for obtaining high-strength structural materials that can withstand stresses of 25-30 MPa by testing polymer matrix composite materials in a special form with natural and synthetic fibers is of great importance in the development of machine building in our country. This will save a large amount of currency and bring additional economic benefits for the bright future of our independent country, as well as contribute to the development of the automotive industry.

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