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The Use of Composite Polymer Fittings in the Construction Industry

Khatamova Zumrad Nazirjonovna, Ph.D
Fergana Polytechnic Institute, Senior Lecturer of the "Social Sciences and Sports" Department, in History

Azamov Khabibullah Khusanjon
Master Student of Fergana Polytechnic Institute

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ABSTRACT

This thesis describes the application of composite polymer luminaires instead of traditional steel luminaires used in construction and the research carried out on them, the areas of application, the characteristics of composite polymer luminaires are presented.

The creation of composite polymer fittings is practically the fruit of the rapid development of the chemical industry. In a number of countries (former USSR, Germany, Japan, USA, Netherlands, etc.) it is noted that scientific research work on the construction of composite polymer fittings began in the 60s of the 20th century.

In many countries of the world, scientific work is being carried out in the field of construction on the application of fittings made of composite materials, for which reinforced concrete structures are an alternative to steel fittings, and the introduction of their results into construction practice, and from year to year their volume is increasing. Examples of them are studies carried out in Germany, Russia, China, Japan, the United States, Canada and other countries and built objects.

Currently, polymer composite fittings are effectively used in road transport infrastructure facilities, high electromagnetic fields formation, chemical industry, water preparation and treatment, melioration facilities, construction of seaports and port facilities, urban engineering infrastructure facilities, construction of Mines and tunnels of metropolitan areas, as well as the construction, repair and reconstruction of load-bearing and barrier structures of buildings and structures.

A promising scientific direction is the use of polymer composite fittings instead of steel fittings of reinforced concrete structures, which work especially in conditions of an corrosive environment.

In the development of the economy of the Republic of Uzbekistan, in raising its material and technical base, it is important to introduce into practice those elements that have new constructive

solutions, which are economically efficient, based on theoretical and experimental research. In recent years, important decisions are being made by the president of the Republic of Uzbekistan and the Cabinet of Ministers to increase the standard of living of the population and improve living conditions. The issues posed in this direction also take the application of composite materials that are relevant today according to their coverage. The use of composite materials in construction increases the overall reliability, technical economic efficiency of production, residential, public buildings and engineering structures in the reception of permanent, temporary and earthquake stresses.

Table 1. Properties of fibers used in the preparation of composite polymer fittings

Fiber type	Density	In the stretch strength	Elasticity module	Borderline relative deformation	From temperature expansion coeficient	Puasson coefficient
	kg/m^3	MPa	GPa	%	$10^{-6}/\,^0C$	
Glass (Ye)	2500	3450	72.4	2.4	5	0.22
Glass (S)	2500	4580	85.5	3.3	2.9	0.22
Alkaline glass	2270	1800-3500	70-76	2.0-3.0	-	-
Carbon (highly modular)	1950	2500-4000	350-650	0.5	-1.2…. -0.1	0.2
Carbon (high strength)	1750	3500	240	1.1	-0.6-…..-0.2	0.2
Aramid (Kevlar 29)	1440	2760	62	4.4	-2.0 (59*)	0.35
Aramid (Kevlar 49)	1440	3620	124	2.2	-2.0 (59*)	0.35
Aramid (Kevlar 149)	1440	3450	175	1.4	-2.0 (59*)	0.35
Aramid (Technora H)	1390	3000	70	4.4	-4.0 (59*)	0.35
Bazalt	2800	4840	89	3.1	8	-

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