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**REPORT  
ON RESEARCH WORK**

SUBSTANTIATION OF PROSPECTIVES FOR CREATION, DEVELOPMENT AND  
APPLICATION OF MODERN AND EFFECTIVE MEANS AND METHODS OF PHYSICAL  
TRAINING IN THE ARMED FORCES OF UKRAINE

(Subject № 15102-020, code “Suhozhil”)

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The manuscript is finished on 30 September 2015.

Results of the work have been considered and approved at the meeting of the section № 2 of scientific and engineering council of the State Scientific Test Center of the Armed Forces of Ukraine (Minutes № 18 dated 30.09.2015)

## THE LIST OF AUTHORS

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## RECOMMENDATIONS

1. It is expedient to include isometric exercise in the system of physical training of the servicemen of combined regiments of all kinds of the Armed Forces of Ukraine, especially, in the Special Forces regiments.
2. It is expedient to use the gym apparatus “Suhozhil” in the training system of the servicemen of the Armed Forces of Ukraine.
3. It is expedient to conduct further experimental researches to define effectiveness of the gym apparatus “Suhozhil” for rehabilitation of the sick and the injured with damage of musculoskeletal and nervous systems, etc.

USE OF ISOMETRIC EXERCISES IN THE MODERN SYSTEM OF PHYSICAL TRAINING OF SERVICEMEN OF THE ARMED FORCES OF UKRAINE AND APPLICATION OF THE GYM MACHINE “Suhozhil” FOR REHABILITATION OF THE SICK AND THE INJURED WITH DAMAGE OF MUSCOSKELETAL AND NERVOUS SYSTEMS, ETC.

MURAVEYNIK M.S., inventor and designer of the gym machine “Suhozhil”

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Physical training plays an important role in improving operational capability of every army in the world, and its significance is not de-emphasized with rapid changes in the military field but continues to grow, as modern combat puts forward increased requirements to capability of the servicemen to withstand considerable physical and psychological tensions.

Considerable strain, ultimate physical and nervous and psychological loads that the manpower is to withstand in the course of military actions result in serious decline of the servicemen's operational capability. It is evident if we take the results of shooting and maneuvering on the battlefield, decrease of speed and accuracy of actions in operating military equipment and ammunition.

To increase operational capability of the contingent of the armed forces, new solutions to improve physical condition of the servicemen are considered.

Today, physical training of the servicemen includes commonly practiced complexes of exercises done with various equipments and intended to gain muscle strength. The bigger part of such equipment is designed to increase muscles strength as a result of their biological mass buildup and improvement of biomechanical characteristics.

Having designed the gym machine “Suhozhil” and methods of isometric exercises to be done on it, the inventor Muraveynik Mykola Serhiyovych has offered revolutionary way in physical training of the servicemen.

The inventor believes that basic strength of muscles depends on the degree of development of tendons and ligaments. The commonly known system of Oleksandr Zass is intended to develop strength and endurance of the muscles of a human body by developing strength of tendons.

Isometric (static) loads have become one of the mandatory elements of workouts not only for weightlifters, but also track and field athletes, rowers, and swimmers. Isometric exercises have been recognized in the world, their advantages are evident: usually, to gain strength athletes have to lift tons of iron, and spend lots of time for training. With isometric exercises they can cut down on time and energy as single muscles strain takes no more than 10 sec. Besides, equipment used for static loads is considerably simpler, and often no gym equipment is required!

Isometric trainings do not take much time: maximum 5-10-15 minutes. Regardless of positive changes, first of all, in increased strength, obtained as a result of isometric exercises, such results stay longer than those of long dynamic workouts.

The results and achievements obtained by Muraveynik M.S. during his observations and achievements of his disciples attracted interest of representatives of the Ministry of Defence of Ukraine and caused intention to introduce isometric exercises in the system of physical training of the servicemen.

To improve the system of physical training of the servicemen and to increase their operational capability, the State Scientific Test Center of the Armed Forces of Ukraine has conducted scientific and research work on “Suhozhil”, during which experiments were held involving a group of servicemen.

The results obtained are important from the practical point of view, substantiate and experimentally prove effectiveness of the gym machine “Suhozhil” and methods of doing such machine for the purpose of further improvement of the programs of physical training of the servicemen to increase their operational capability.

The experimental research was held from April 2015 to June 2015 with a group of the servicemen involved, in particular, training session on the gym machine “Suhozhil” were held regularly during 15 minutes a day three times a week.

Universality of this gym machine provides opportunity to strain tendons and muscles of the whole human body from tibia to head (number of exercises is limitless). A person defines independently an exercise and efforts that he wants and can use for workout, depending on his age and physical fitness.

During these experimental tests, values of cardiovascular system functions were taken (blood pressure and pulse were measured), dynamometric was held, and the participants were interviewed.

Following analysis of the data received from the interviewed persons who did the gym machine “Suhozhil”, the conclusions were made about positive impact of regular isometric exercises on gain of muscles and tendons strength of the participants and medical effect on the persons who had certain health conditions. Based on the conclusions of the report on research work held, the scientific workers of the State Scientific Test Center of the Armed Forces of Ukraine have offered further experimental research to evaluate effectiveness of the gym machine for rehabilitation purposes in treatment of the sick and the injured with damage of musculoskeletal and nervous systems, etc.

Based on the analysis of the research results obtained, the recommendation as to application of isometric exercises in the system of physical training of the servicemen of the Armed Forces of Ukraine and possibility and expediency of use of the gym machine “Suhozhil” for this purpose have been developed.

Currently, the measures are been taken to introduce the gym machine in the system of physical training the Armed Forces of Ukraine.