CONCLUSIONS

1. An analysis of the literature data on possible powder materials for their use, as metal inserts in tram cars, has been carried out to increase their thermal conductivity. It has been shown that promising material in this respect can be inserts of powder material based on powdered aluminum and iron alloys.

2. The processes of compression of powder mixtures from aluminum and iron, powders obtained by mechanical dispersion of castings, powders obtained by mechanical dispersion of a melt are investigated. It is established that the basis of the processes of sealing of the investigated materials lies plastic deformation of components of the initial charge. In this case, the presence of an oxide film worsens the pressing processes.

3. Investigated processes of sintering of presses. It is shown that when the mixture of aluminum and iron powders is spun, an interaction between iron and aluminum occurs with the formation of FeAl intermetallide with a higher specific volume than the initial components, which influences the formation of the density and structure of materials and, as a consequence, their properties. When sintering powders of alloys, due to the fact that the formation of the intermetallic phase took place at the powder formation stage, sintering is observed due to the factor of surface diffusion.

4. It is established that the investigated technologies of obtaining materials on the basis of aluminum-iron alloys contribute to obtaining with a dimensional structure and properties. From the economic point of view, the most suitable technology is to obtain powders by mechanical dispersion of the melt, followed by compression at a pressure of 700 MPa and sintering in a medium of hydrogen at a temperature of 800 ° C, for 30 minutes.

5. The principles of safety and environmental protection have been developed, which provide safe conditions for the production of materials based on Al-Fe alloys.

6. Economic calculations show that the creation of new materials based on Al-Fe composition is economically viable.