

## KOKKUVÕTE

Antud töö eesmärgiks oli projekteerida universaalne haagis, millega saaks transportida nii veesõidukeid kui ka mootorrattaid. Haagise seadistamine kahe erineva veose veoks pidi olema mugav ning kiire. Esiolgu uuriti erinevaid turul olevaid haagiseid ja turuuuringu käigus selgus, et mitte ühtegi universaalset haagist turul saadaval ei ole.

Koostati kliendiküsitlus väljaselgitamaks, kas turul oleks antud haagise vastu suurem nõudlus kui ainult väiksel huvigrupil. Saadud tulemused kaardistati ning pandi paika nõudmised ning vajadused haagisele. Peamised nõudmised haagisele oli maksumus ning kasutusmugavus. Pidades silmas neid kahte alustati esmaste konseptsioonide loomist. Neid oli rohkem kui toodi välja antud töös. Tuginedes nõudmistele valiti antud töös välja kõige sobilikum ning jätkati tööd valitud ideega. Antud ideed arendati edasi ning tehti arvutused.

Igas punktis toodi välja kaks võimalikku lahendust probleemile, võrreldi neid ning valiti välja sobilikum. Haagise mudel on projekteeritud „Solidworks“ raalprojekteerimise tarkvara abil. Selle mudeli ning dokumentatsiooni abil on võimalik valmistada ning kokkupanna universaalne haagis.

Projekteeritud haagis ei ole küll välimuselt atraktiivne, sest madala omahinna nõue seadis disainile väga suured piirangud. Konstruktsioon on primitiivse ehitusega, keerukamates sõlmede oleks rohkem detaile ning iga töödeldav detail tõstaks omahinda. Haagisel on tagatud universaalsus ning funktsionaalsus kahe erineva veose veoks. Antud haagise omahind tuli kõrgem kui lähtepunktis prognoositu, kuid suurendades partiide mahtu langeks ka märgatavalt projekteeritud haagise hind. Seeriatootmisel kasutatakse Rumeenia allhanke tehaseid ning personaalsetest kogemustest järeldatakse üsna suurt hinnavõitu.

## **SUMMARY**

The aim of this thesis was to design a universal trailer for transporting both watercraft and motorcycles. Setting up the trailer for carrying these two different loads must be convenient and quick. Initially, trailers on different markets were examined, and market research revealed that there are no universal trailers on the market. A customer survey was conducted to find out whether the market would have a higher demand for this trailer outside a small group of enthusiasts. The results were mapped and the requirements and needs for the trailer were established. The main requirements for the trailer were cost and ease of use. With these two aspects in mind, the development of initial concepts began. There were more of those than mentioned in the final thesis. Based on the requirements, the most suitable idea was selected for further work. The idea was further developed and calculations were performed. At each point, two possible solutions to the problem were produced, compared and the more suitable one was selected. The trailer model was designed using SolidWorks computer-aided design software. With this model and documentation, it is possible to manufacture and assemble a universal trailer. The designed trailer is not attractive in appearance, because the lowest cost requirement placed major restrictions on the design. The structure is primitive, more complex assemblies would have more details and each manufactured part would increase the cost. The trailer is guaranteed to be versatile and functional for transporting two different loads. The cost price of this trailer was higher than initially forecasted, but increasing the batch volume would also significantly reduce the price of the designed trailer. Mass production is outsourced to plants in Romania which, based on personal experience, should lower the price significantly.