

### Aim of the project

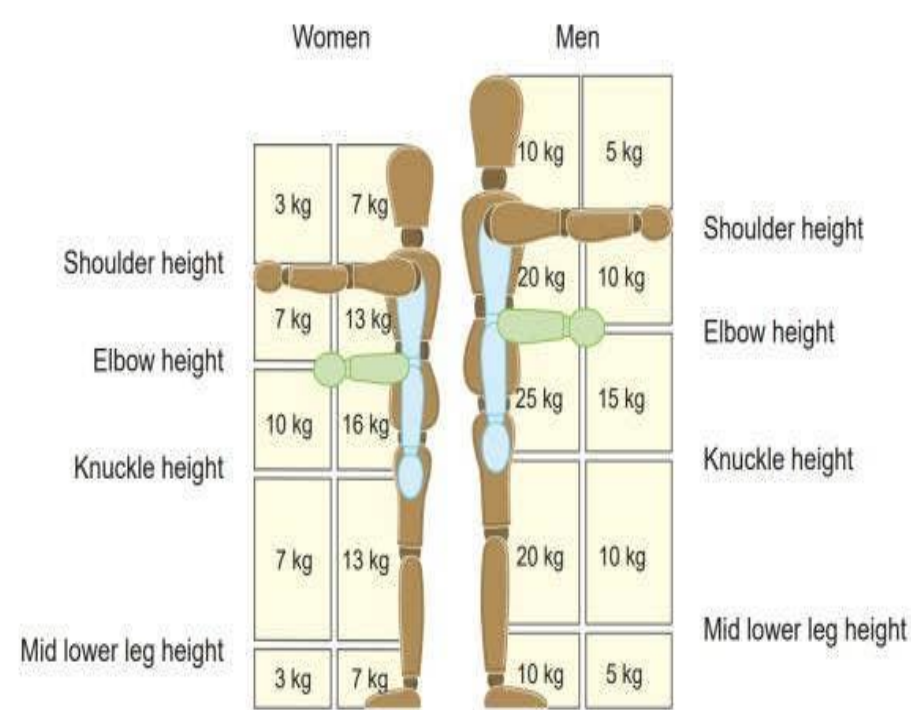
The aim of this project was to research CE markings and machine directives and also ISO standards for a the wheel to hub alignment tool that was designed in the group project. A procedure and safety manual was also made to provide instruction and well being advice to the user

### Background

User safety on products is a major part of design process in modern day engineering. This includes the risk assessment factors and overall ergonomics. A risk assessment has 5 steps



The lifting of a wheel is a strenuous activity that if done in the wrong position can cause many injuries the maximum lifting weight for the average man is 25kg and for an average woman is 16kg. The max lifting weights of each



### Machine directives

CE marking directive 2006 /42/EC , this directive is relevant to the wheel to hub alignment tool as it gives a step by step guide on how to show relevant information about a tool , it states that the tool should be used for its intended use only. It gives its input on the importance of safety integration into a system. The machine directive gives information on how the user should be informed about the hazards associated with the tool.



### ISO

The mentioned ISO standards in the manual and report provide essential guidelines for ensuring safety ,quality and ergonomic design of machinery and tools , while some standards did not directly apply to the wheel to hub alignment tool they offered up valuable insights into risk assessment, ergonomic principles and design considerations that can enhance product safety .

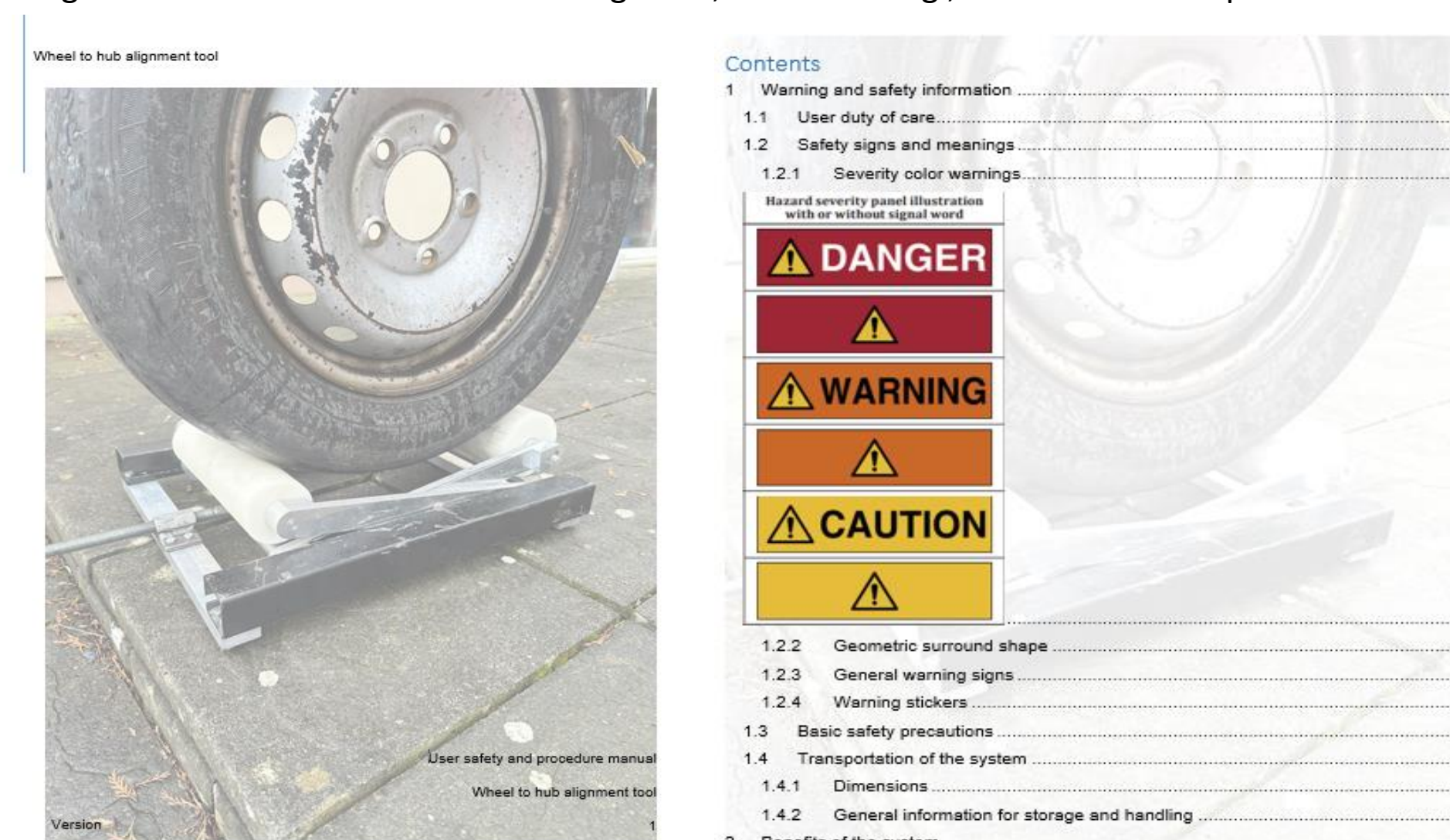
- ISO 12100: Provides general principles for machinery design and risk reduction.
- ISO 9241 series: Offers ergonomic recommendations for human-system interaction.
- ISO 14400-1: Focuses on design principles considering user needs, abilities, and limitations.
- ISO 11228 series: Addresses ergonomic considerations for manual handling, optimizing tools and workstations.
- ISO 11226: Discusses ergonomic design principles for machinery, emphasizing user safety.
- ISO 10377: Focuses on consumer product safety and ergonomic design principles, emphasizing risk assessment.
- ISO 20646: Provides guidelines for addressing musculoskeletal workloads in workplaces.

### Weights of wheels of top 10 most sold cars in Ireland 2023

Hyundai Tucson	15.87 kg
Kia sportage	21 kg
Toyota corolla	19.5 kg
Toyota Yaris cross	19 kg
Volkswagen ID.4	23 kg
Toyota C-HR	20 kg
Toyota Yaris	19 kg
Nissan Qashqai	18 kg
Skoda Octavia	22.5 kg
Hyundai Kona	20 kg

### User safety and procedure manual

A user safety and procedure manual was created to advise users on the dangers of the product and the procedure of the product. It gives recommendations on the well keeping of the wheel to hub alignment tool this includes the use of gloves ,Hi-Viz clothing ,lubrication of the product



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