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### Summary 'Research and development of a letterplate concept for Kegro Deuren'

This assignment has been carried out for Kegro Deuren. Kegro is a door manufacturing company located in Groesbeek. Kegro is a significant door-manufacturer and market leader in flat- and solid wooden exterior doors and internal doors for new construction-, renovation- and transformation projects in the Netherlands. Kegro is interested to research and develop their own letterplate product, to be manufactured at an external manufacturing company.

The challenge of this assignment has been to develop a new letterplate concept, that is suitable for mass production, with improved quality, and of which the costs are attractive relative to Kegro Deuren's current product assortment and the market demand.

During the research, different analysis have been done to find which requirements, wishes and bonuses the letterplate must satisfy to meet the demands of Kegro and other stakeholders. Issues looked at are:

- different relevant stakeholders within the process;
- the market situation and market demands;
- important letterplate performances required by standards and regulations;
- manufacturability and production costs of a letterplate
- the different letterplates that are currently in Kegro Deuren's assortment.

Concerning the market, Kegro wishes to develop a letterplate model that has a high 'quality of performance' and can be offered at a comparable price compared to their standard 3rd party market letterplates. This product price is important to attract the bulk of Kegro's clients. Other clients have demands for high quality products. This gives rise to the challenge of designing a concept with high quality that can be offered at low prices to be able to satisfy most of the clients.

Concerning important letterplate performances. The most important letterplate performances are related to the capillary effect, the air- and water tightness and the thermal insulation. A small end-user study indicates that Kegro's expectations of their most sold letterplate lacking in quality is true in practice. Most common complaints concerned air tightness, thermal insulation and noise through clattering.

The manufacturing analysis looked at different choices for materials, manufacturing methods and applied a Design for assembly method. The material analysis of materials found in existing letterplates, resulted in a list of suitable materials for the development of a new letterplate product. Secondly, a list of different manufacturing methods used for the production of common letterplate components has been created. Some of these manufacturing methods, are also proposed to produce the components of the newly developed letterplate model.

From the research it became apparent that the currently most sold products from Kegro's current letterplate assortment lack in some areas of the product's quality. However, these products dominate Kegro's current assortment, which is caused by the markets' demand for low budget products. Different methods are used to develop a new letterplate with improved quality while remaining an attractive cost price to offer for Kegro's clients.

The resulting proposed concept has led to letterplate 'Kegro BP' in a rounded and straight variant. It shows that the letterplates concepts can significantly improve the product quality compared to Kegro's currently most sold letterplates. However, the research also shows that the letterplate concepts would most likely not be able to be produced at a similar cost compared to the currently most sold letterplates. Mainly therefore, it remains questionable whether the newly developed letterplate concept satisfies the demands set by Kegro Deuren.

*Below you will find some renders of the modelled letterplate concept (Concept Kegro BP)*

