

Development of the Endura concept

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Keywords: Chain of custody approach, collaboration, modified wood, maintenance, sustainability

ABSTRACT

Wood is a very attractive building material. In the Netherlands, mainly wooden windows are used. Nonetheless, in order to compete with plastic and aluminium windows in the long run, it is important that the performance of the wooden window is improved and total costs are reduced. By using high-durable wood species, good manufacturing techniques and proper maintenance, this can be achieved. However, naturally high-durable wood species are getting scarce and bad experiences in the past with high maintenance costs promote the use of non-wood materials in joinery. Modified woods such as Accoya® wood can provide a solution to these problems. However, proper construction and maintenance is required. With this in mind, a new concept has been developed in the Netherlands by Endura BV. Endura BV is a joint venture between a joinery producer and a maintenance company that has developed the SpeQtra® window in collaboration with its suppliers, including PPG coatings and Titan Wood. The SpeQtra® window complies with all regulations and although the initial costs may be higher, the total maintenance costs are significantly lower over a period of 25 years. In this respect the modified wood Accoya® wood forms an essential part. Further, the principal can buy the maintenance at a fixed price over an agreed period. With collaboration and regular inspection of projects, more insight is gained and better joinery products can be made. This paper focuses on the manner of collaboration, the technical considerations and the marketing aspects of this concept.

INTRODUCTION

The market for the wooden window in Western Europe has contracted considerably in the previous years. This is partly due to the use of unsuitable wood species for the application and bad design of the window frame.

The wooden window, however, has several key advantages in comparison to plastic and metal windows. The advantages of wooden windows include a far longer lifespan than plastic and aluminium window frames, the ability to make minor changes after installation and the ease with which damage can be repaired. Another advantage is the better thermal isolation of wooden windows compared to plastic and aluminium windows. These aspects have been forgotten in the flow of negative reports on wooden windows. In particular, the cost of maintenance is often mentioned as disadvantage of the wooden window.

In response to these problems, Weijman Vastgoedonderhoud (a maintenance company) and TimmerSelekt Doornenbal (a joinery producer) have developed the Endura concept and the SpeQtra® window (www.endurabv.eu). The Endura concept is based on

collaboration with suppliers. Key considerations for a principal or home owner are overall performance and worry-free maintenance. Both in financial sense, and in practical sense. The goal for the SpeQtra[®] window was to develop the best possible wooden window frame and thereby reduce maintenance to such an extent that overall investment and maintenance costs do not exceed that of plastic and aluminium windows.

DEVELOPMENT OF THE ENDURA CONCEPT

Traditional approach

Traditionally, many businesses in the Netherlands are vertically organized, including the building sector. The companies in the chain communicate their requirements and desires from top to bottom. In this approach the product to be built is directed by the top level (see Figure 1).

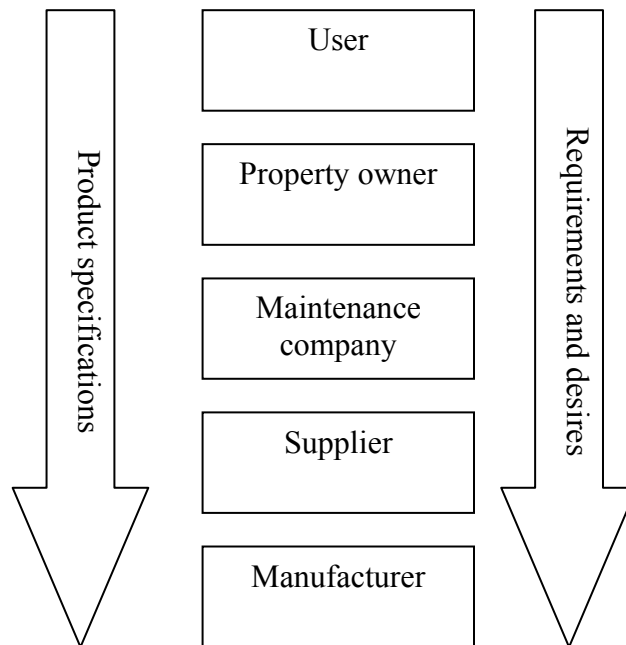


Figure 1: Traditional “vertical” approach

This vertical approach can result in poorly designed and manufactured products. This can lead to badly functioning or non-functioning products. Due to these (unnecessary) mistakes, additional costs, such as failure and maintenance costs, can be higher.

Poorly performing wooden windows were frequently reported in the Netherlands between the late 1990s and early 2000s. The inappropriate use of “new” wood species and incorrect design of wooden windows resulted in huge problems and costs. Complete windows had to be replaced due to enormous amounts of wood rot. The lifetime of windows in extreme circumstances was decreased to five years.

It was questioned who was responsible for the problem and who would pay for the repair and replacement costs. Suppliers normally mentioned that their semi-finished product was not correctly applied or that products from other suppliers were incompatible with their semi-finished product. These issues were largely the result of

poor communication within the chain of custody.. There was rarely any communication between companies on how to process the semi-finished products.

Due to enormous costs of replacement, the wooden window obtained a bad image and principals increasingly prescribed aluminium and especially plastic windows to control maintenance costs.

Endura concept

The heart of the Endura concept and the SpeQtra[®] window is the chain of custody collaboration approach. In this approach all “chain of custody” companies become partners (see Figure 2); for instance, coating supplier, joinery producer and maintenance companies.

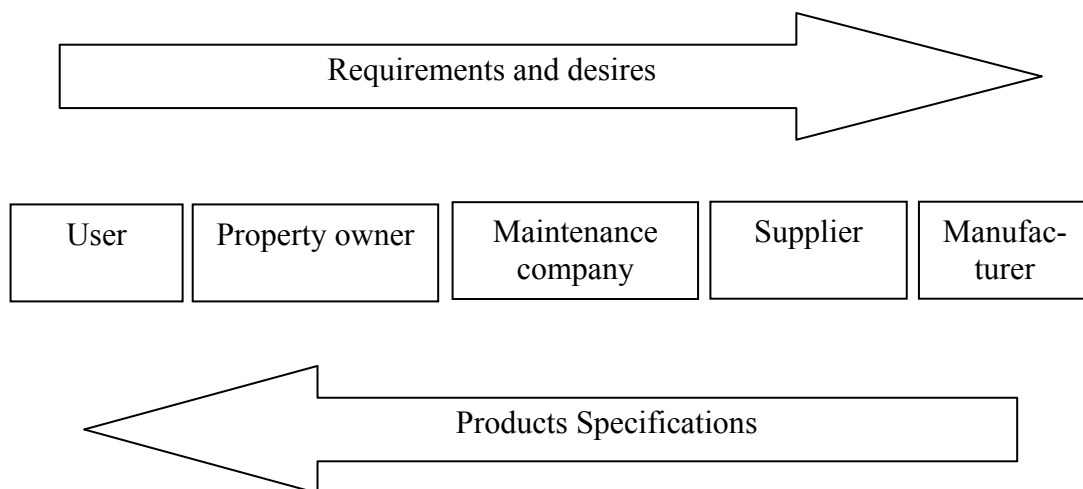


Figure 2: “horizontal” Chain of Custody

Endura has invited several suppliers to discuss collaboration as a chain of custody partner. Selection of the best partners is based on their knowledge, expertise, performance of their products and willingness to collaborate.

The Endura concept is based on performance requirements. The window frame needed to last for 25 years without technical maintenance, always remain functional and have a regular maintenance interval of at least eight years without appearance issues. Currently the standard maintenance interval in the Netherlands is five years. In the Endura concept, the house owner does not have to worry about their wooden windows. If problems occur, Endura is able to quickly solve the problem by collaborating with its suppliers.

Development of the SpeQtra[®] window

By utilizing the knowledge and the expertise of our partners and performing tests, the SpeQtra[®] window has been developed. It is not solely based on combining the best components together, but based on good design and engineering practices. This requires suppliers which have a thorough expertise and knowledge of their products and can guarantee their performance.

The SpeQtra[®] window frame has been tested by an independent research institute and complies with all Dutch building regulations. The SpeQtra[®] window has the lowest costs over time (see Table 1). Although the initial costs may be higher, the total costs including maintenance are approximately 30% lower over a period of 25 years. In this respect, Accoya[®] wood forms an essential part. The technology behind Accoya[®] wood (www.accoya.info) is based on wood acetylation. Acetylation of wood is a chemical modification process known to significantly improve dimensional stability (swelling due to moisture), UV-stability and durability (resistance against brown-, white- and soft rot fungi). Produced by Titan Wood in the Netherlands, Accoya[®] wood makes it possible to build the SpeQtra[®] window frame. With the high performance of Accoya[®] wood, and its consistent quality, the performance of the finished product (the window) can be much higher. Often, with other wood species, the high variability of the quality and performance is blamed when other semi-finished products used to make the window (such as coatings or glues) failed. Due to the stability of Accoya[®] wood as the substrate, the other components can be better optimised resulting in an overall higher performance of the window frame.

Traditional window		SPEQTRA [®] WINDOW FRAME				
Year	Activities	No guarantee		Activities	25 yrs guarantee	
1						
2				Cleaning	€	35,00
3				Cleaning	€	35,00
4	Maintenance	€	600,00	Inspection & cleaning	€	40,00
5				Cleaning	€	35,00
6				Cleaning	€	35,00
7				Cleaning	€	35,00
8	Maintenance	€	850,00	Maintenance	€	850,00
9				Cleaning	€	35,00
10				Cleaning	€	35,00
11				Cleaning	€	35,00
12				Inspection & cleaning	€	40,00
13	Maintenance	€	600,00	Cleaning	€	35,00
14				Cleaning	€	35,00
15				Cleaning	€	35,00
16				Maintenance	€	850,00
17				Cleaning	€	35,00
18	Maintenance	€	850,00	Cleaning	€	35,00
19				Cleaning	€	35,00
20				Inspection & cleaning	€	40,00
21				Cleaning	€	35,00
22				Cleaning	€	35,00
23	Maintenance	€	850,00	Cleaning	€	35,00
24				Maintenance	€	1.000,00
25	Degradation	€	750,00		€	-
Total		€	4.500,00		€	3.415,00

Table 1 : Maintenance (costs) per house of a traditional window frame compared to the SpeQtra[®] window

Market introduction

The SpeQtra[®] window was launched in the market in early 2008. The first customer contacts show that the improved design is especially desired in the market. Also appreciated is the combination of the investment cost of a window with the maintenance cost for a fixed price.

REFERENCE PROJECTS

Utrecht (NL)

Staircase window frame

As part of a pilot project, all window frames of a staircase have been replaced with the SpeQtra[®] window. The good design and quality of the window was convincing for the housing corporation



CONCLUSION

Due to good design and engineering practices as well as the collaboration of the chain of custody companies, wooden window frames have a new future in the Netherlands. Housing owners and principals are convinced that the Endura concept and its SpeQtra[®] window frame have enormous advantages over plastic and aluminium window frames. Furthermore, it has been shown that the maintenance of wooden windows does not need to be more expensive in the long term if they are designed and maintained correctly. First projects have been realised successfully.

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