

Timber quality for the construction industry

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Extended abstract

The Action E53 focuses on timber quality and aims to improve existing methods and techniques for fast, accurate quality assessment at every link in the forestry wood chain. The development of novel methods and techniques is another aim. This presentation gives a short background to timber quality in the past, aims with respect to timber quality in this Action, the results of the internet survey conducted last year and some conclusions about what needs to be done in the future.

The background is based on more than twenty years' experience of research on the subject of timber quality as a building material used in Sweden, the UK and Germany. Many of the problems associated with poor timber quality have been attributed to communication problems and questionable attitudes on the part of the industry. Different interested parties were identified (Johansson et al. 1994), together with their roles and importance when it comes to various requirements set for timber products along the forest-sawmill-building chain. Product specifications were drawn up for a number of structural timber and other wood products based on analyses and end-user requirements. The main conclusion twenty years ago was that timber must be fit for purpose. This conclusion was the starting point for this Action E53.

The technology used to produce timber using scanning, drying, advanced measurements and monitoring, as well as new grading equipment, is being continuously developed and is making it possible to produce sawn timber with more reliable properties and probably in accordance with end-user expectations.

However, the old questions still apply. For example, are we focusing on the correct requirements and right properties? What kind of knowledge does a producer of timber or a trader have of end-user needs? Does timber come up to end-user expectations? Is timber production governed by the property push or the property pull?

The internet survey was carried out in this Action in order to generate qualitative and quantitative knowledge about the demands and expectations that end-users in 25 European countries impose on various timber products. I would like to acknowledge the team at NTI, Norway, under the leadership of Anders Nyrud, and Ulrike Heinemann, for their tremendous work on the survey and the

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results and conclusions presented here are based on their work. Different parts of the survey are divided between, *firstly*, the secondary processing and integrated processing of soft wood and, *secondly*, trading companies and building construction and design. The companies defined in the group of integrated processing are companies producing their own sawn timber products and subsequently processing these products. Each group generated more than 100 responses, apart from traders who produced 80. Some of the preliminary conclusions from the survey now follow.

The survey revealed that the companies in the processing industry feel that the timber market is producer driven (property push), as customers have to accept what is offered by producers. More than half the companies in the integrated industry and about 45% of the companies in the secondary processing industry regard wood as a natural product and this is the reason for some quality defects and shortcomings which customers have to accept. The producers said that moisture content is one of the most important parameters when defining the quality of timber products. When specifying the moisture content in contracts, most companies in the secondary and the integrated processing industry use a plus/minus interval, e.g. 16% \pm 4%.

More than 75% of the companies in the secondary processing industry do not use limits regarding distortion in quality control, do not know and do not answer questions relating to twist distortion or to bow, spring and cup distortion. The percentage of companies in the integrated processing industry responding to distortion is approximately 65% for twist, bow and spring and about 75% for cup. In relation to their own products, companies in the secondary processing industry seldom reflect on the modes of distortion. The industries within integrated processing accept these defects more frequently than companies in secondary processing and are able to specify some acceptable distortion limits. When it comes to causes of distortion, the poor knowledge of the producing industry is striking. Only a small number of companies recognise that incorrect storage and small-diameter timber are causes of twist distortion.

Strength grading (visual, visual assisted by scanning, machine) is rarely applied in the industry. If it is applied, visual grading is most common. The least common is visual grading assisted by any scanning technology. A certain desire or demand for machine settings for a large variety of classes and raw materials from different regions can be observed, but most of the companies did not answer this question, so the general interest in strength grading appears not to be especially great. Most of the interested companies work in the integrated processing industry. Scanning techniques over and above machine strength grading are rarely used in the processing industries and the tendency to start using them is not very great. As far as questions about quality parameters are concerned, it is also possible that companies that do not answer focus on other parameters in their production.

Trading and building companies' answers revealed that customer requirements are not always met by the industry, even if customers feel that the industry is capable of delivering the right quality. It was assumed that one reason for customer dissatisfaction could be the cost of quality control in the industry. While trading companies usually work with flooring and with joinery, including windows, door manufacture and so on, building companies focus on other activities related to building and construction and within building/construction with timber kits. A fairly small number of the respondents in both groups work in fields that are not directly affiliated to building and construction, such as furniture production, fencing, garden and other outdoor use and pallets/packaging. The visible quality parameters, such as the extent of twist, spring and/or bow distortion, discoloration or mould, and the extent of visual defects, such as knots, cracks, wane (but not including colour), have higher priority, i.e. they are the highest priority for most companies. Twist distortion is recognised by building companies as the most important defect. Strength and strength class (the mechanical quality parameters) are the top priorities for both trading and building companies. Stiffness and density have medium-high priority for most trading companies. Building companies regard these two parameters as slightly more important. The importance of a low price for timber products in general varies for trading companies and building companies. Companies from the Nordic countries in particular regard price as a high priority, while it is a lower priority for companies in Central Europe and in the Mediterranean countries. It can be assumed that they are more willing than Nordic companies to pay more for better quality.

The internet survey conducted in this Action showed very clearly that the situation is improving and the awareness of timber quality is better now than 20 years ago. The majority of the respondents agree that the timber industry is capable of delivering products that match customer requirements. All of us working with building companies must have a mission. To speed up and improve communication between timber producers and users of timber as a building material, we need to improve the education of builders, buyers of building products and engineers.

References

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