



# Use of TR26 for trussed rafters and metal web joists

## Introduction

In light of the current timber supply situation this information sheet has been produced for members describing the technical background to why TR26 grade is the predominant requirement for the trussed rafter sector in the UK.

The requirement to switch from UK M75 grade to the European wide C27 grade in the late 1990s reduced grading yield by around 9%. TR26 grade was developed to compensate for this loss of yield by reducing some less critical properties of C27 to enable Sawmills to achieve a similar grading yield to M75. The characteristic properties of TR26 grade are summarised in this [TRA information leaflet](#) and sawmills wishing to produce TR26 graded stock can obtain the necessary grading machine settings from their certification body.

In the intervening years, TR26 has remained the most popular strength grade used in our sector and alongside this grade, a list of custom requirements has also grown up to meet the specific raw material needs for the production of trussed rafters and metal web joists. These include:

- Custom TR26 Grade
- Need for specific sizes - particularly minimum thickness of 35.5mm and 46.5mm
- Requirement for full specification of odd and even lengths
- Need for square edged material
- Tighter requirements on wane and distortion than standard graded products

## Square edge essential for metal web joists

In terms of other technical parameters, it is important to warn members that for metal web joists, square edge raw material must always be used as a greater proportion of teeth fixings are close to the edge making this zone critical to the safe performance of floor designs.

Trussed rafter designs could potentially allow some degree of eased edged material, but the size of radius is critical to the correction measures necessary, which may include increased edge distances and larger truss plates. Fabricators must always contact their system provider to discuss correction measures before using eased edge raw materials.

Timber suppliers have specialised in meeting these custom requirements and it is economically viable to do so because there are economies of scale resulting from the significant and consistent quantity of demand for raw material meeting these standard 'trussed rafter' parameters. This means the sector benefits from a TR26 m<sup>3</sup> price which tracks only marginally above the standard C24 m<sup>3</sup> price in the UK market.

There are no technical barriers to prevent TRA members using alternative standard strength classes as system design software allows the intended raw material strength class to be set as a parameter of the design. For instance, C27 grade is a direct replacement for TR26 but the lower grading yield would raise material costs on individual designs. Below this, in principle, as strength class reduces section size will need to increase. C24 is a lower grade than TR26 and therefore there is an expectation that greater chord depth would be necessary for many standard trussed rafter designs. In theory lower grades such as C16 could be used but test work looking at the opportunity for the greater use of UK and Irish stock indicates that required chord depth quickly exceeds sizes available in these markets.

Research work organised by the TRA confirmed that finger jointed structural wood is suitable to produce metal web joists provided the correct quality assurance is in place for the facility undertaking the finger jointing operations. Such finger jointed material is not currently permitted for use in trussed rafter production.

## Can C24 be a substitute for TR26?

Key question for the current supply situation is whether fabricators in the absence of sufficient TR26 could use the 'Standard' UK C24 product which is 45mm thick with eased edge radius varying between 2 & 5mm, in even lengths only?

Trussed rafter design software allows standard grades (eg C24) and thickness (eg 45mm) to be set at the start of the design process so such material could be considered. However, there is no 'standard' UK C24 product in sizes which are an alternative for current 36mm thick material. In addition, with standard truss spacings, lower grade (C24 vs TR26) and varying radius to eased edges, larger truss plates and increased edge distances will be necessary for some work. These factors combined with even only

lengths are likely to radically increase the cost of trussed rafter production for most standard truss profiles so should not be undertaken lightly and only in full consultation with your system provider.

Looking forward, will TR26 grade remain the predominant requirement for the truss sector in the UK? TRA members have always had the option to use alternative raw materials and many fabricators have looked at the economics of doing so. However, very few have made the decision to switch even part of their production. This suggests that even in the present market conditions TR26 and standard 'trussed rafter' parameters still represent the most cost-effective solution for TRA members.