US softwood plywood panels can be manufactured to conform to several voluntary as well as proprietary end-use standards. Trademarking is the responsibility of the individual agency performing the quality assurance services. Several independent agencies provide these services to US manufacturers.

This guide describes common uses of the most widely available plywood grades from United States production. For additional information or assistance in using or specifying US manufactured plywood, contact any of the following offices:

APA—The Engineered Wood Association
MWB Business Exchange
Hinton Road
Bournemouth
Dorset, BH1 2EF
UK

Tel: 01202 201007
Fax: 01202 201008

PFS & TECO Corporations
PO Box 46
Harrogate
North Yorkshire, HG2 0TW
UK

Tel: 01423 560394
Fax: 01423 527785

Professional Service Industries Inc
4820 West 15th Street
Lawrence
Kansas, 66049
USA

Tel: +1 800 548 7901
Fax: +1 800 979 3727

1 Introduction

Plywood is a construction material which has characteristics that make it ideal in today's construction market where performance, process and price are main drivers. Plywood is easy to handle, low in weight, consistent in size and performance, low in cost and available in sheet form. This has led to a UK consumption of over 1 million m^3 of plywood in 1996. Most of this comes from North America.

This guide is intended to help the users of American plywood to derive the maximum benefits from plywood in roof constructions in terms of performance, durability and cost-effectiveness. It provides carefully written information to help users to make the right decisions when specifying, selecting, designing and fabricating roof constructions using plywood. It has been written by BRE, who are the UK authority on construction-related issues, in partnership with APA—The Engineered Wood Association.

What is plywood?

Plywood consists of thin layers ('veneers' or 'plies') of timber bonded together. The simplest plywood consists of three layers with the grain direction of the middle veneer at right angles to the two outer ones. Usually an odd number of veneers is used so that the number and grain direction of the plies is mirrored around the middle veneer. This gives a 'balanced' board. Some American plywoods contain four or six layers and the same stability is achieved by the two central veneers having the same grain direction. The plywood is then symmetrical around the middle glue-line.

The properties of solid timber are very different along the grain and across the grain. Alternating the grain directions of the veneers means that the high tensile strength of timber parallel to the grain direction is used in both directions of the plywood. This is also true for strength and stiffness in bending. The dimensional stability of plywood is almost equal in both directions. Plywood also has improved resistance to splitting along the grain and high resistance to impact loads. Like solid timber, plywood generally has high strength relative to its weight. On a weight-for-weight basis the stiffness of plywood can be greater than that of steel sheet. Plywood does have a main strength axis which needs to be used correctly to maximise the panel's potential.

The USA has forests on around one-third of its land surface. Two-thirds of these forests could be used for timber production but restrictions on logging mean that only 50% are used. America has a long-term forest management programme which aims to harvest wood in a sustainable manner that will protect and enhance the environment. The annual growth increment exceeds extraction by 37%, after taking into account losses arising from fire, hurricanes and natural wastage such as rot and insect attack.

Timber is a natural biological material which can be produced sustainably. Growing trees take up carbon dioxide from the atmosphere and convert this into wood. Carbon accounts for about half the mass of completely dry wood from any tree. Timber acts as a carbon store unless the carbon is released by decay or by burning.