Timber (Screens)

Behaviour of timber in fire

Timber chars and possibly flames under fire conditions at a rate and to an extent of deterioration which is dependent on a number of factors:

• The intensity of exposure to radiant heat flux or flame

• The time of continuous exposure

• The density, grain structure and moisture content of the timber

As a rule, for fire safety designers, non-piloted ignition ("spontaneous" or "auto ignition") does not generally occur unless radiant heat intensities reach the range 25kW/m2 to 33kW/m2. Under piloted (i.e. naked flame) ignition, flaming can occur at lower intensities of 12kW/m2 to 13kW/m2.

As timber shows limited expansion in a fire, timber screens and doors generally do not result in significant mechanical stresses in neighbouring constructions.

Both 30 and 60 minute timber systems need to be carefully designed because of this reduction. The type/ species of timber, section thicknesses, fixings, and bead shapes all must be specified in detail. When 60 minute timber fire screens and doors are required, additional detailing will need to be implemented because of the increased fire exposure time.

Timber density

The type of timber and its density is a key attribute which determines the rate at which timber chars and deteriorates under fire conditions. The grain density and straightness of the grain also exert an effect in terms of the degree to which twisting may occur in the event of fire. Timber is a naturally occurring material and a certain amount of natural variation in properties, especially density, can occur.

The following information is in relation to the charring rates of timber:

• Hardwood timbers used in fire-resistant glazed systems, generally have densities more than 630 kg/m3, with typical char rates in the order of 0.5mm per minute e.g. Sapele, Iroko or Dark Red Meranti – note exceptions below

• Softwood timbers used in fire-resistant glazed systems generally have densities more than 480 kg/m3, with typical char rates of around 0.7mm per minute e.g. European Redwood.

However, there are some exceptions:

• Certain temperate-zone hardwoods e.g. Ash, demonstrate burning characteristics closer to those found for softwood timbers. These types of hardwood must therefore be designed with thicker frames and beads to take into account the increased charring rate. Fire test evidence or third party assessments should be referred to prior to specifying timber species, to ensure performance.

• Some softwoods e.g. Douglas Fir, with densities lower than 480 kg/m3 which char faster than 0.7mm per minute must therefore be used in.

Cattles Specialist Woodwork Ltd – Density Figures

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EVOSCREEN Glazing Beads:

Wood Species	**KG/M3**	**Fire Resistance**
AW Ash	630kg/m3	FD30/FD60
Beech Steamed	720kg/m3	FD30
Beech White	720kg/m3	FD30
AM Cherry	580kg/m3	FD30/FD60
Koto	650kg/m3	FD30/FD60
Maple	740kg/m3	FD30/FD60
Oak AW	770kg/m3	FD30/FD60
Oak Euro	720kg/m3	FD30/FD60
Oak AM Red	790kg/m3	FD30/FD60
Sapele	640kg/m3	FD30/FD60
Tulipwood	510kg/m3	FD30/FD60
Utile	660kg/m3	FD30/FD60
Walnut AB	660kg/m3	FD30/FD60

Declaration of Data and Specification resourcing:

Evolution declare that the data contained within this document is a collation of information and certification supplied by the manufacturers that are used within Evolution screen systems.

Evolution pride ourselves on using highly accredited suppliers backed up by sufficient data and testing provided by the likes of The Certifier Warrington Fire and British Standard EN13501-1 (Fire Classification of Construction Products and Building Elements).

All components of the Evolution glazing systems are constructed and fitted in line with the requirements of the appropriate product specifications, installation methods and guidelines to ensure that all products fulfil their displayed Fire Resisting status.

If you require any further information regarding the Evolution Screens don't hesitate to contact a member of our team. (See below for details)

Yours Sincerely,

Jonathan Rose – Managing Director

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