

OSB vs MgO

Concerns about timber frame construction fires have pitched magnesium oxide boards against traditional OSB sheathing. Stephen Powney reports

The latest timber frame construction site fire – in Stockport at the end of May (p5) – is a good illustration of why there is increasing debate about how to improve the fire resistance of timber frame structures.

Like other notable timber frame construction site fires, such as those at Colindale in 2006 and Peckham in 2009, they are often dramatic and create bad publicity for the industry, despite being quite rare.

The UK Timber Frame Association (UKTFA) has risen to the challenge with its guidance, backed by the Health & Safety Executive, on building timber frame structures over 600m² in densely-populated and “high-risk” areas, including three categories of frame types outlined to suit any application.

The perceived need to come up with more robust systems has seen OSB go head-to-head with magnesium oxide boards (MgO) in the sheathing board market.

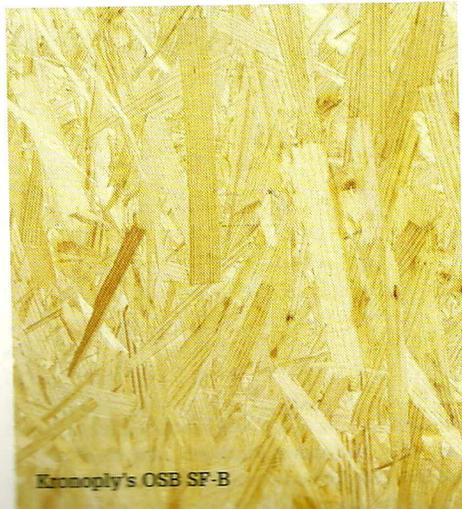
But some believe use of a non-timber panel as a racking board dilutes timber frame’s message.

TTJ understands it is a sensitive subject as MgO suppliers like DragonBoard are UKTFA members, along with OSB producers Norbord and SmartPly and several fire retardant treatments suppliers.

UKTFA chief executive Andrew Carpenter told TTJ that the association was “not about protecting vested interests”, but expanding timber frame construction to the benefit of all its stakeholders.

“Timber and wood-based panels will always remain at the core of our product offer; however, it is important for our manufacturing members to embrace alternative materials, particularly where end client demands drive a need for alternatives,” he said.

Many companies are waiting with bated breath for the UKTFA to release the results of recent testing and which “approved” new



Kronoply's OSB SF-B

SUMMARY

- UKTFA members have trialled MgO sheathing panels.
- MgO suppliers are targeting timber frame.
- Kronoply's OSB SF-B features fire resistance throughout the panel.
- Norbord and Coillte Panel Products are developing fire-resistant OSB.

systems will be listed as meeting its guidance categories.

Norbord Europe’s vice-president of sales and marketing, Dave McElroy, believes open panel timber frame with standard OSB sheathing will continue to dominate UK timber frame housebuilding, but different options were required for Category B and C buildings.

Norbord is currently working to perfect a fire-retardant OSB which it expects to launch before the end of 2012.

“A number of importers have been promoting mineral-based building boards made from MgO and marketing them as an alternative to OSB,” he said.

Broader criteria

While MgO was incombustible, Mr McElroy said timber frame manufacturers also needed to consider total system cost, weight and ease of handling, nailing compatibility and proneness to damage such as edge breakout, as well as strength, durability, thermal and acoustic performance.

“Our timber frame customers have told us repeatedly that they want to continue building with OSB because it fits well with their manufacturing processes, is cost-effective and fulfils all the requirements of a building panel,” he said.

A spokesperson for Coillte Panel Products confirmed to TTJ that it was also developing its own FR OSB for SmartPly.

Fire-retardant OSB products already offered in the UK are Kronoply’s OSB SF-B and FlamedXX.

The former, showcased at Timber Expo last year, offers fire resistance throughout the panel and is third-party certified.

Kronoply UK and Ireland representative Johnny Hamilton said fire retardants were added to OSB strands with the binder during manufacture.

Most sales are in the French and German markets for general building applications, such as stairwells, and UK and Ireland volumes are currently small.

Mr Hamilton said demand was being held up by the cost (twice as expensive as standard OSB), the absence of legislation requiring timber frame manufacturers to change their



Multi-Pro XS used as an internal racking board in the Renewable House at BRE's Innovation Park

systems and SF-B being a new product.

“There is a big interest but I think it will take another year before there is more demand,” he said.

One large timber frame manufacturer told him that it saw fire-resistant sheathing as perhaps being used on 10% of its volume in the future.

Kronoply will be selling through two UK distributors – Falcon Panel Products and International Plywood. In the next few weeks it will be distributing a new brochure highlighting SF-B, as well as an anti-termite product, Kronoply OSB4 and a new “earthquake-proof” OSB board.

Gary Owen of FlamedXX Europe, which imports FlamedXX fire-rated OSB from the US, believes timber frame manufacturers should focus on wood panels.

“The only competition is going to be MgO or cement particleboard. I think the timber frame industry could be shooting itself in the foot to use these – they may as well build the structure out of steel.”

At the end of an OSB production line, a 1mm fire-resistant coating is applied to FlamedXX OSB uniformly across the board faces and sides, conferring an orange colour.

Mr Owen said the product worked by localising fire and surface charring. It has been tested to Euroclass B fire classification by Exova Warringtonfire, giving a 30-minute fire resistance, compared with four minutes for normal OSB. He said a floordeck application achieved a one hour 30-minute fire resistance.

“We’re looking to get the product made in Europe to bring down the cost. It all comes down to the shipping costs, VAT, import rates and the timescales. From the US it is a four-week lead time, compared with three days in Europe.”

Discussions are taking place with Kronospan and others.

Mr Owen said the product was “massive” in the US and Canada and was picking up



orders in Continental Europe and further afield.

"Another market is going to be fire-rated I-beams [using fire-treated OSB webs]."

Intelligent Wood Systems (IWS) has both an MgO (IWS-FAST Board) solution for Category C applications and FR treatment for its Egger OSB.

It recommends timber framers adopt an MgO board for external sheathing because of its non-combustible nature and to minimise the potential for horizontal spread of flame to neighbouring properties.

"It is our belief that 9mm OSB sheathing will not perform following, even low pressure, FR treatment as it can induce irreversible swell and may negatively affect the structural properties," said IWS marketing manager Jonny Bell.

Surface treatment of OSB could cause dimensional issues, he added. IWS also said the cost of treatment was prohibitive.

It says it has developed a method of treating 15mm OSB without detrimental effect, which it said could play an important role in protecting against vertical fires when adopted as sub-decks, alongside appropriately treated floor joists.

Business opportunities

Some timber traders believe MgO boards represent an opportunity to supply an alternative product without a conflict of interest.

Belfast-based timber importer and distributor Tradewood & Co has set up its own Resistant Building Products business, with Multi-Pro XS – an MgO board targeted at the timber frame sector.

Tradewood has invested six years and hundreds of thousands of pounds developing the product with its Chinese manufacturing partner and completing testing to UK standards (Chiltern Fire and Ceram).

"We were being asked by our Irish importer customers for fire-resistant plywood," said Leo Bagnall, Tradewood managing director.

"But to get plywood fire resistant was perhaps not the answer, so we developed a board that ticked a lot of boxes for the timber industry and they are very happy.

"We see absolutely no conflict of interest [with MgO board being a non-wooden product]. Anything our customers can do to help their sales is welcome. We have doubled our sales year on year over the last six years."

He estimated that MgO sales in 2012 would be about £2.6m.

UK customers include several large timber frame manufacturers, plus Travis Perkins, the Grafton Group (through its Selco chain) and Cemco.

"We think it will be a high volume product because of newer Building Regulations," added Mr Bagnall.

Multi-Pro XS was used as an internally-positioned racking board in the Renewable House at the BRE's Innovation Park in Watford.

Sales growth

Hanson Plywood has added the product to its offering and said sales continue to grow steadily.

"The product has carved its own niche and with all the testing and certification background to the product we can only see it continuing to achieve rapid sales growth," said Hanson Plywood managing director Gary Scott.

DragonBoard is carving out a name for itself. It owns an MgO factory in China, with a capacity of 200,000 boards a month.

The DragonBoard House at the BRE Innovation Park in Wales has created considerable international interest.

"We're looking at some large contracts over the next 10 years and we're seeing some of the major timber frame players take an interest," said DragonBoard managing director Greg Barton.

Racking tests for 8mm DragonBoard have resulted in 2.05kNm-1 compared with 1.68kNm-1 for 9mm OSB, while an 8mm 8x4ft board weighs 24kg.

Price-wise, Mr Barton said the product was slightly cheaper than fire-rated OSB.

"We have come up with a board that will suit the timber frame industry and others. But it's a very new product and for them to make a switch is an educational process."

Mr Barton said he was also talking to a large panels distributor. "OSB will always have a place in the market, but at some point DragonBoard will also," he said.

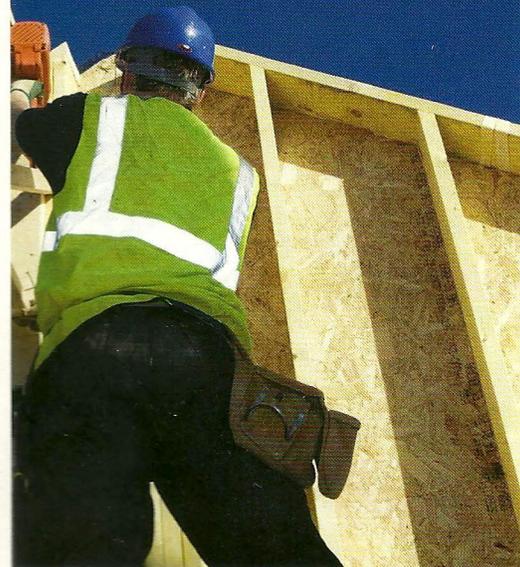
Glasgow-based Duncryne is also a UKTFA member and supplies Econicboard, a fully UKAS tested MgO board. It has been trialling the product with several timber frame manufacturers for use in closed panel, SIPs, volumetric systems, and floor applications.

"A properly engineered MgO specification will become very popular during the next few years once the market fully appreciates the versatility and high levels of structural, fire and acoustic performance of the material" said Duncryne's Keith Macnair.

"I would be very surprised if MgO products were not being used in a wide range of applications across all sectors and would anticipate a significant increase in volumes in the timber frame industry."

Duncryne, which has a Shanghai office,

OSB timber frame sheathing



predicts a take-up of 40-50,000m² [across all market sectors] in the current financial year.

Mr Macnair also predicts some large panel product distributors will be stocking the product by the middle of next year.

He said the product offered excellent fire performance without any toxicity problems, while good indoor air quality was ensured by Econicboard's breathability and the absence of formaldehyde, solvents or oil-based chemicals.

Val-U-Therm – a closed panel timber system used by Walker Timber and Scotframe – has used two different MgO suppliers so far in trials to meet the UKTFA's Category C and is waiting for the official results from the UKTFA.

"We've found MgO works well with our panels," said Val-U-Therm managing director Bryan Woodley.

He said MgO suppliers were very enthusiastic but they needed third-party certification and should publish racking test reports, while board quality was variable between different Chinese factories.

"A low-risk single-storey bungalow project will remain OSB sheathing but, with more difficult sites in urban areas that are a more significant fire risk, MgO board gives an alternative option," said Mr Woodley. ■

The DragonBoard MgO product

